

ELECTRONIC MULTI-MEASURING INSTRUMENT

ME series

MODBUS
Interface specifications

Model ME96NSR-MB
ME96SSH-MB/ME96SSR-MB/ME96SSE-MB
ME96SSHA-MB/ME96SSRA-MB/ME96SSEA-MB
ME96SSHB-MB/ME96SSRB-MB/ME96SSEB-MB
ME-0000MT-SS96/ME-0040MT2-SS96

SPEC.NO. LSPM-0075H

This Specification is as of October, 2020.
Please note that contents of the specification may change without notice.

MITSUBISHI ELECTRIC CORPORATION

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1. Functions

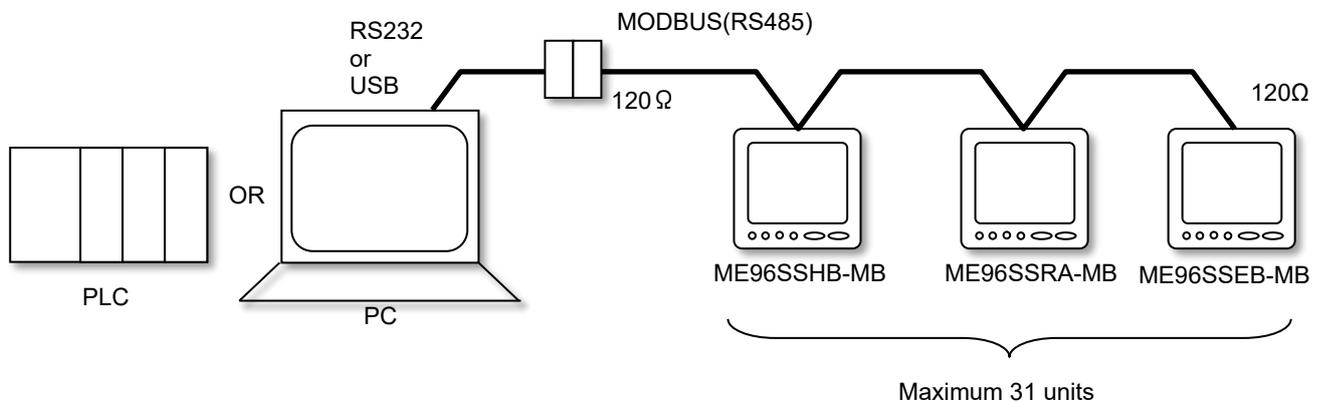
Mitsubishi Electronic Multi-Measuring Instruments (ME96NSR-MB/ME96SSH-MB/ME96SSR-MB/ME96SSE-MB/ME96SSHA-MB/ME96SSRA-MB/ME96SSEA-MB/ME96SSHB-MB/ME96SSRB-MB/ME96SSEB-MB) (hereinafter referred to as ME96) provide measurement values with MODBUS RTU protocol to a PLC or PC via an RS485 serial link (2 wires).

In addition, ME96SSHA-MB/ME96SSRA-MB/ME96SSHB-MB/ME96SSRB-MB with the Optional Plug-in Module ME-0000MT-SS96 or ME-0040MT2-SS96 provide measurement values with MODBUS TCP protocol to a PLC or PC via an Ethernet.

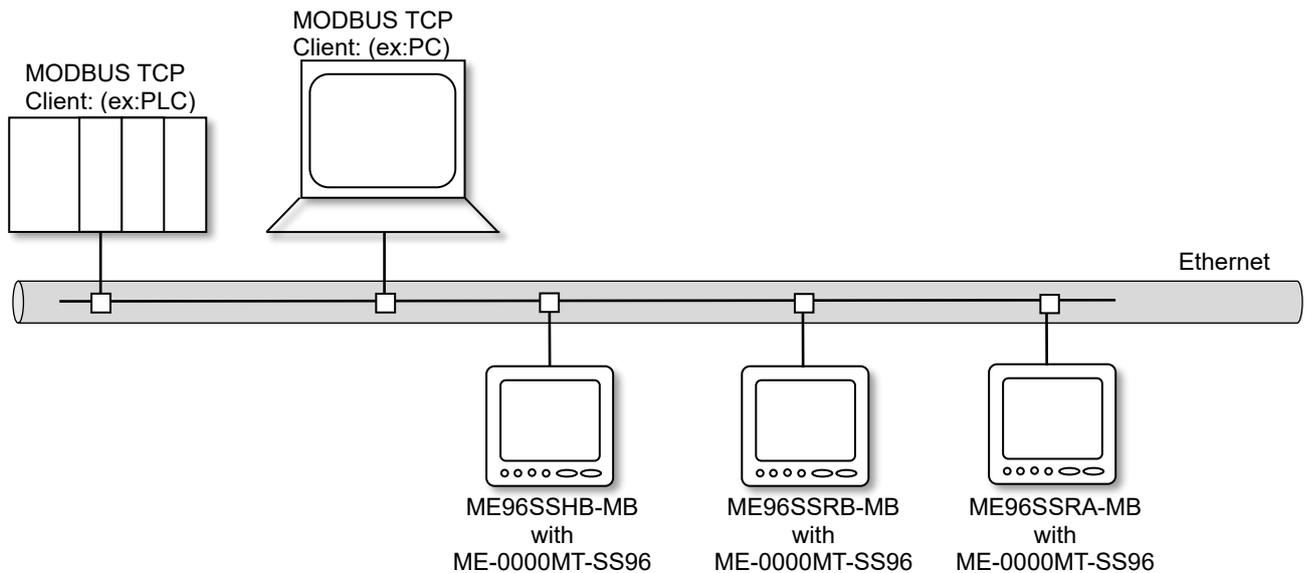
Note: ME-0040MT2-SS96 is only applicable to ME96SSHB-MB with firmware version 01.01 or later.

2. System Configurations

2.1 MODBUS RTU Example



2.2 MODBUS TCP Example



3. Technical Characteristic

3.1 MODBUS RTU

Item	Specifications
Physical interface	RS-485 2wires half duplex
Protocol	RTU mode
Transmission wiring type	Multi-point bus (either directly on the trunk cable, forming a daisy-chain)
Baud rate	2400, 4800, 9600, 19200, 38400 bps (Default is 19200 bps)
Data bit	8
Stop bit	1 or 2 (Default is 1)
Parity	ODD,EVEN or NONE (Default is EVEN)
Slave address	1~255(FFh) (Default is 1, 0 is for broadcast mode) (248 to 255 are reserved)
Response time	1s or less
Distance	1200m
Max. number	31
Terminate	120Ω 1/2W
Recommended cable	Refer to each user's manual.

Note: Baud rate, stop bit and parity are necessary to set in the setting-mode of the each ME96.

3.2 MODBUS TCP (Optional Plug-in Module:ME-0000MT-SS96)

Item	Specifications	
Interface	1 port (10BASE-T/100BASE-TX)	
Transmission method	Base band	
Maximum segment length*1	100 m	
Connector applicable for external wiring	RJ45	
Cable	10BASE-T	Cable compliant with the IEEE802.3 10BASE-T Standard (unshielded twisted pair cable (UTP cable), Category 3 or more)
	100BASE-TX	Cable compliant with the IEEE802.3 100BASE-TX Standard (shielded twisted pair cable (STP cable), Category 5 or more)
Protocol	MODBUS TCP (Port Number 502)	
Number of simultaneously connection*2	Max. 4	
Supported function	Autonegotiation (10BASE-T/100BASE-TX automatically detected)	
	Auto MDIX function (straight/crossover cable automatically detected)	

*1: Length between a hub and a node.

*2: Indicates the number of TCP connections that can be established simultaneously.

3.3 MODBUS TCP (Optional Plug-in Module:ME-0040MT2-SS96)

Item	Specifications	
Interface	2 ports (10BASE-T/100BASE-TX)	
Transmission method	Base band	
Maximum segment length*1	100 m	
Connector applicable for external wiring	RJ45	
Cable	10BASE-T	Cable compliant with the IEEE802.3 10BASE-T Standard (unshielded twisted pair cable (UTP cable), Category 3 or more)
	100BASE-TX	Cable compliant with the IEEE802.3 100BASE-TX Standard (shielded twisted pair cable (STP cable), Category 5 or more)
Protocol	MODBUS TCP (Port Number 502)	
Number of simultaneously connection*2	Max. 4	
Supported function	Autonegotiation (10BASE-T/100BASE-TX automatically detected)	
	Auto MDIX function (straight/crossover cable automatically detected)	

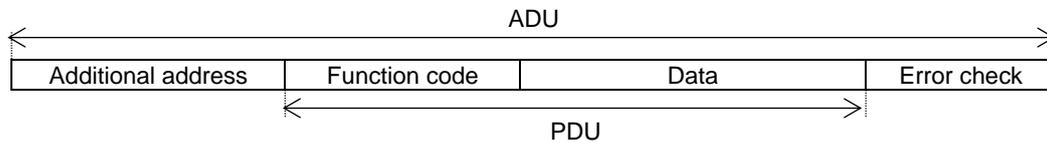
*1: Length between a hub and a node or between nodes.

*2: Indicates the number of TCP connections that can be established simultaneously.

4. Specification for Communication

4.1 General MODBUS frame

The MODBUS protocol defines a simple protocol data unit (PDU) independent of the underlying communication layers. The mapping of MODBUS protocol on specific buses or network can introduce some additional fields on the application data unit (ADU).

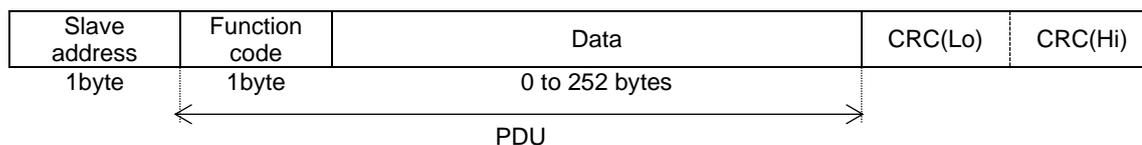


For details, please download and refer to Modbus Technical Resources and Modbus Specifications posted on the following URL; <http://www.modbus.org/>

4.2 MODBUS RTU

(1) MODBUS RTU Frame

The standard communications frame consists of:



Slave address : 00~FFH

*When selecting slave address 0, a message is sent to all the instruments present on the network. When the slave receives it, the slave does not make a response.

Function code : 03H Read Holding Registers (maximum 250 bytes)

: 08H Diagnostics

: 10H Write multiple registers

(ME96 does not support the other function codes.)

Data : 8 bit HEX data

CRC : The Cyclical Redundancy Check (CRC) field is two bytes, containing a 16-bit binary value.

<NOTE>

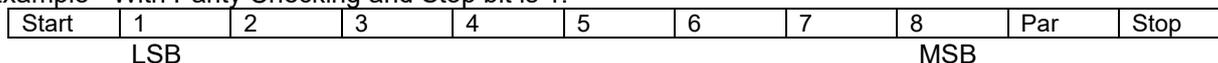
Procedure for generating CRC:

1. Load a 16-bit register with FFFF hex (all 1's). This is called the CRC register.
2. Exclusive OR the first 8-bit byte of the message with the low-order byte of the 16-bit CRC register, putting the result in the CRC register.
3. Shift the CRC register one bit to the right (toward the LSB), zero-filling the MSB. Extract and examine the LSB.
4. (If the LSB was 0): Repeat Step 3 (another shift).
5. (If the LSB was 1): Exclusive OR the CRC register with the polynomial value 0xa001 (1010 0000 0000 0001).
6. Repeat Steps 3 and 4 until 8 shifts have been performed. When this is done, a complete 8-bit byte will have been processed.
7. Repeat Steps 2 through 5 for the next 8-bit byte of the message. Continue this until all bytes have been processed.
8. The final content of the CRC register is the CRC value.
9. When the CRC is placed into the message, its upper and lower bytes must be swapped as described above.

(2) Bit Sequence

With RTU character framing, the bit sequence is below.

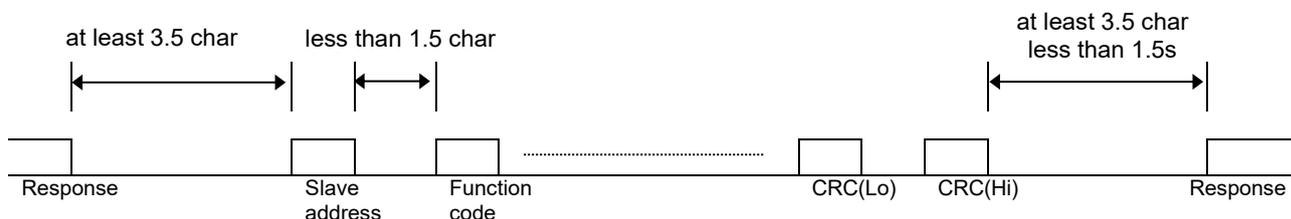
<Example> With Parity Checking and Stop bit is 1.



(3) MODBUS Message RTU Framing

A MODBUS message is placed by transmitting device into a frame that has a known beginning and ending point. This allows devices to receive a new frame to begin at the start of the message, and to know when the message is completed. Partial messages must be detected and errors must be set as a result.

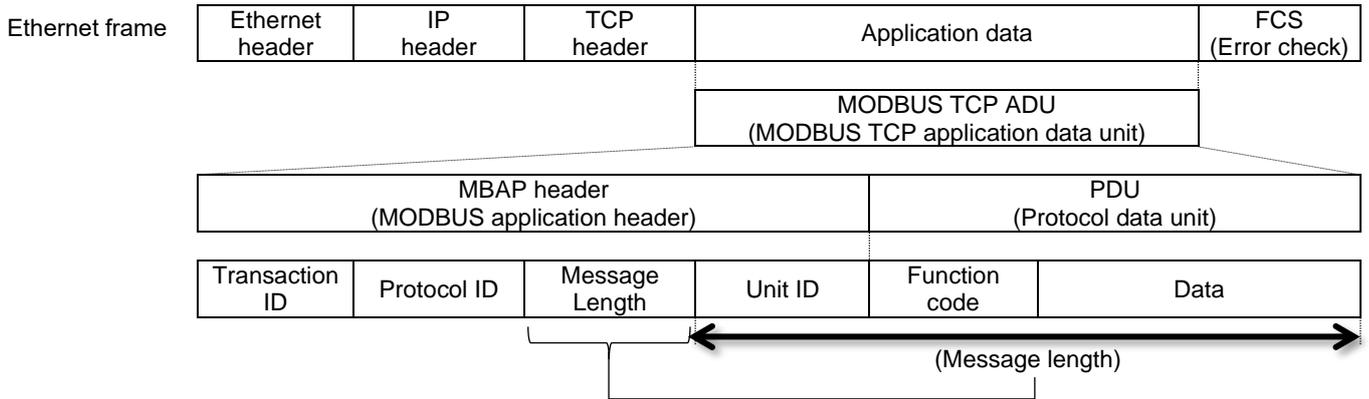
In RTU mode, message frames are separated by a silent interval of at least 3.5 character items.



4 .3 MODBUS TCP

(1) MODBUS TCP frame

The frame specifications of MODBUS TCP are indicated below.



Area Name		Area Size	Description
MBAP header (MODBUS application header)	Transaction ID	2 bytes	Used by the master for matching of the response message from the slave.
	Protocol ID	2 bytes	Indicates the protocol of the PDU (protocol data unit). Stores 0 in the case of MODBUS TCP.
	Message Length	2 bytes	Stores the message size in byte unit. The message length after this field is stored. (See the above figure.)
	Unit ID	1 byte	Stores FFh in the case of ME96SSHA/SSRA/SSHB/SSRB-MB with the Optional Plug-in Module ME-0000MT-SS96 or ME96SSHB-MB with the Optional Plug-in Module ME-0040MT2-SS96.
PDU (Protocol data unit)	Function code	1 byte	The master specifies the processing to be performed for the slave. 03H Read Holding Registers (maximum 250 bytes) 10H Write multiple registers (ME96 does not support the other function codes.)
	Data	1 to 252bytes	[When master sends request message to slave] Stores the requested processing. [When slave sends response message to master] Stores the result of processing execution.

5. PDU Framing of Query and Response

5.1 Read Holding Registers (03H)

(1) Query framing

Function Code	Data			
	Head holding register number		Read points	
03H	Hi	Lo	Hi	Lo

• Head holding register number : 2 bytes

• Read points : 0001H to 007DH (Maximum 125 points)

(2) Response framing (Maximum 255 bytes)

(a) When completed normally

Function Code	Byte count n x 2	Data						
		Data1		Data2		...	Data n	
03H		Hi	Lo	Hi	Lo	...	Hi	Lo

• Byte count : Byte count of response data (Maximum 250)

For example, if n = 4, the byte count is calculated as 4 x 2 = 8 bytes.

(b) When completed with an error

Function Code	Data
	Exception code
83H	*1

*1: Refer to Chapter 6.

(3) Example (ADU frame example)

<Example1> In case of monitoring the phase 2 current value (0301H), and the slave address is 01H in MODBUS RTU.

■ Query framing

01H	03H	03H	01H	00H	01H	D5H	8EH
Slave address		Head holding register number		Read points		CRC(=8ED5H)	

■ Response framing

01H	03H	02H	Hi	Lo	Lo	Hi
Slave address		Byte count	phase 2 current value		CRC	

<Example2> In case of monitoring from phase 1 current value (0300H) to neutral current value (0306H). Slave address is 01H in MODBUS RTU..

■ Query framing

01H	03H	03H	00H	00H	04H	44H	4DH
Slave address		Head holding register number		Read points		CRC(=4D44H)	

■ Response framing

01H	03H	08H	Hi	Lo	Hi	Lo	Hi	Lo	Hi	Lo	Lo	Hi
Slave address		Byte count	phase 1 current value		phase 2 current value		phase 3 current value		Neutral current value		CRC	

<Example3> In case of monitoring of the active energy (unit:Wh fixed) (056Eh) in MODBUSTCP.

■ Query framing

00H	00H	00H	00H	00H	06H	FFH	03H	05H	6EH	00H	02H
Transaction ID		Protocol ID		Message Length		Unit ID	Func. Code	Head holding register number		Read points	

■ Response framing

00H	00H	00H	00H	00H	07H	FFH	03H	04H	HH	HL	LH	LL
Transaction ID		Protocol ID		Message Length		Unit ID	Func. Code	Byte count	active energy (unit:Wh fixed)			

5.2 Write Multiple Registers (10H)

(1) Query framing

Function Code	Data											
	Head holding register number		Write points n		Byte count n x 2	Data1		Data2		...	Data n	
10H	Hi	Lo	Hi	Lo		Hi	Lo	Hi	Lo	...	Hi	Lo

- Head holding register number : 2byte
- Write points : 0001H to 007BH (Maximum 123 points)
- Byte count : Write point x 2 (Maximum 246)
- Data 1 to Data n : Write data

(2) Response framing

In MODBUS RTU, if the slave address is 0 (broadcast), a response is not made.

(a) When completed normally

Function Code	Data			
	Head holding register number *1		Write points *1	
10H	Hi	Lo	Hi	Lo

*1: The value same as in the request message is stored.

(b) When completed with an error

Function Code	Data
	Exception code
90H	*2

*2: Refer to Chapter 6.

(3) Example (ADU frame example)

<Example1> In case of setting a primary current value (0204H). Slave address is 01H in MODBUS RTU.

■ Query framing

01H	10H	02H	04H	00H	02H	04H	HH	HL	LH	LL	Lo	Hi
Slave address	Head holding register number		Write points	Byte count	Primary current				CRC			

■ Response framing

01H	10H	02H	04H	00H	02H	Lo	Hi
Slave address	Head holding register number		Write points	CRC			

<Example2> In case of restart of rolling demand calculation by 16bits set/reset register2 (0249H) in MODBUS TCP.

■ Query framing

00H	00H	00H	00H	00H	09H	FFH	10H	02H	49H	00H	01H	02H	40H	00H
Transaction ID	Protocol ID		Message Length	Unit ID	Func. Code	Head holding register number	Write points	Byte count	16bit set/reset register2					

■ Response framing

00H	00H	00H	00H	00H	06H	FFH	10H	02H	49H	00H	01H
Transaction ID	Protocol ID		Message Length	Unit ID	Func. Code	Head holding register number	Write points				

5.3 Diagnostics (08H) (Sub function code: 00H)

Diagnostics (08H) is the function dedicated to the MODBUS serial protocol.

(1) Query framing (Sub function code: 00H)

Function Code	Data			
	Sub function Code		Arbitrary data	
08H	00H	00H	Hi	Lo

(2) Response framing

(a) When completed normally

The slave returns the request message received from the master without change.

(b) When completed with an error

Function Code	Data
	Exception code
88H	*1

*1: Refer to Chapter 6.

(3) Example (ADU frame example)

<Example> In case of the data is 1234H. Slave address is 01H in MODBUS RTU.

■ Query framing

01H	08H	00H	00H	12H	34H	EDH	7CH
Slave address	Sub function code		Data		CRC(=7CEDH)		

■ Response framing

01H	08H	00H	00H	12H	34H	EDH	7CH
Slave address	Sub function code		Data		CRC(=7CEDH)		

6. Exception Codes

6.1 MODBUS RTU

ERROR	Meaning	Exception code	Display of ME96
Framing error	Stop bit is incorrect.	No response is returned.	COM in the display blinks until it receives the correct query.
Overrun error	The next data was received before completion of the current reception processing.		
Parity error	Parity data is incorrect.		
CRC error	Framing data is incorrect.		
Illegal function	The function code received in the query was except 03H, 08H and 10H.	01H	
Illegal data address	The data address received in the query is not an allowable address for the slave.	02H	
Illegal data value	The data value received in the query is not an allowable data value for the slave.	03H	
Device failure	Logging data was able to read from the internal memory because of failure to access it.	04H	
Slave busy	As the ME96 is executing in setting mode, the setting request message processing cannot be executed.	06H	

6.2 MODBUS TCP

ERROR	Meaning	Exception code	Display of ME96
Protocol ID error	The protocol ID in MBAP header is not 0. Review the data part of the request message.	No response is returned. (TCP connection is cut off.)	COM in the display blinks until it receives the correct query.
Illegal function	The function code received in the query was except 03H and 10H.	01H	
Illegal data address	The data address received in the query is not an allowable address for the slave.	02H	
Illegal data value	The data value received in the query is not an allowable data value for the slave.	03H	
Slave busy	As the ME96 is executing in setting mode, the setting request message processing cannot be executed.	06H	
Gateway unusable	Unit ID is abnormal (Except FFh). ME96 is not available for gateway function.	0AH	
Message length error	The message length in MBAP header is incorrect. Review The MBAP header length + 6 equals the application data unit length in Ethernet frame	04H or No response is returned. (TCP connection is cut off when next message received.)	

6.3 Example

< **Example** > In case of monitoring from total apparent power (Min)(0380H) to undefined address(0387H).Slave address is 01H in MODBUS RTU.

■ Query framing

01H	03H	03H	80H	00H	08H	Lo	Hi
Slave address	Starting address	Quantity of registers	CRC				

■ Response framing

01H	83H	02H	Lo	Hi
Slave address	Illigal data address	CRC		

7. Data

7.1 List of Parameters

At the list of parameters, precautions are following.

- *1 R/W : Reads and writes register.
When a data in the write multiple registers (10H) is 8000h or 80000000h, the setting of the address is skipped.
R : Reads only register.
If it receives the write multiple registers code for this register, exception code 02h is returned.
- *2 The data of negative number is expressed a two's complement.
The data is a big endian.
Multiplying the received data by the multiplying factor gives the actual value.(Refer to 7.3)
The data of time is described as BCD code (binary coded decimal).
- *3 Supported registers are different by the model and the setting of phase wiring. Also, "3P3W" means "3P3W_2CT" and "3P3W_3CT". "1P3W" means "1P3W_1N2" and "1P3W_1N3".
O: Applicable
△: Reserved. (If it is requested, reply data is 0. Do not write any data.)
×: Illegal data address. (Same as unregistered address.)
- *4 Applicable only when ME96SS ver.A (ME96SSHA-MB/ME96SSRA-MB/ME96SSEA-MB) and ME96SS ver.B (ME96SSHB-MB/ME96SSRB-MB/ME96SSEB-MB).
- *5 Applicable only when Optional plug-in module: ME-0000BU-SS96 installed.
- *6 Applicable only when Optional plug-in module: ME-0000MT-SS96 or ME-0040MT2-SS96 installed.
- *7 Applicable only when ME96SS ver.B (ME96SSHB-MB/ME96SSRB-MB/ME96SSEB-MB).
- *8 Reserved only when ME96SS ver.B (ME96SSHB-MB/ME96SSRB-MB/ME96SSEB-MB).

Note: Measurement data (Voltage/Current) correspond as follows according to setting of phase wiring. (Maximum / Minimum data and harmonic data are same.)

Name of channel	Phase wiring			
	3P3W	1P3W(1N3)	1P3W(1N2)	1P2W
Voltage V12	Voltage V12	Voltage V1N	Voltage V1N	Voltage
Voltage V23	Voltage V23	Voltage V3N	Voltage V2N	-
Voltage V31	Voltage V31	Voltage V13	Voltage V12	-
Phase 1 current	Phase 1 current	Phase 1 current	Phase 1 current	Current
Phase 2 current	Phase 2 current	Phase N current	Phase N current	-
Phase 3 current	Phase 3 current	Phase 3 current	Phase 2 current	-

(1) Setup Registers (0x0200)

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-ME		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
512	0200h	2	R/W	Phase wiring	Refer to 7.2(1)	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
513	0201h	4	R/W	Primary voltage	Refer to 7.2(2)	V	○	○	△*8	○	○	○	△*8	○	○	○	△*8	○	○	○	○	
515	0203h	4	R/W	Primary voltage (L-N)	Refer to 7.2(3)	x0.1 V	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
517	0205h	4	R/W	Secondary voltage	Refer to 7.2(4)	x0.1 V	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
519	0207h	4	R/W	Primary current	Refer to 7.2(5)	x0.1 A	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
521	0209h	2	R	Reserved		-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
522	020Ah	2	R/W	Time constant for DA	Refer to 7.2(7)	s	○	○	○	○	○	○	○	○	○	○	○*4	○*4	○*4	○*4		
523	020Bh	2	R/W	16bits Set/Reset register 1	Refer to 7.2(12)		○	○	○	○	○	○	○	○	○	○	○	○	○	○		
524	020Ch	2	R	16bits monitor 1	Refer to 7.2(14)		○	○	○	○	○	○	○	○	○	○	○	○	○	○		
525	020Dh	2	R	Reserved			△	△	△	△	△	△	△	△	△	△	△	△	△	△		
526	020Eh	2	R	Reserved			△	△	△	△	△	△	△	△	△	△	△	△	△	△		
528	0210h	2	R	Reserved			△	△	△	△	△	△	△	△	△	△	△	△	△	△		
530	0212h	2	R	Reserved			△	△	△	△	△	△	△	△	△	△	△	△	△	△		
531	0213h	2	R	Reserved			△	△	△	△	△	△	△	△	△	△	△	△	△	△		
532	0214h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
580	0244h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
581	0245h	4	R/W	Secondary current	Refer to 7.2(6)	A	x	x	○	○	○	○	○	○	○	○	○	○	○	○		
583	0247h	2	R/W	Interval time constant	Refer to 7.2(8)	min	x	x	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
584	0248h	2	R/W	Subinterval time constant	Refer to 7.2(8)	min	x	x	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
585	0249h	2	R/W	16 bits Set/Reset register 2	Refer to 7.2(13)		x	x	○	○	○	○	○	○	○	○	△	△	△	△		
586	024Ah	2	R/W	Frequency	Refer to 7.2(9)	Hz	x	x	○	○	○	○	○	○	○	○	△*8	△*8	△*8	△*8		
587	024Bh						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
593	0251h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
594	0252h	2	R	16bits monitor 2	Refer to 7.2(15)		○	○	○	○	○	○	○	○	○	○	○	○	○	○		
595	0253h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
740	02E4h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
741	02E5h	4	R/W	CO2 equivalent rate	0 to 999	x0.001	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x		
743	02E7h						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x	x		
750	02EEh	2	R	x1 Multiplier	0 (Fixed)		x	x	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4		
751	02EFh	2	R	Multiplying factor of voltage (L-L for 3P4W)	Refer to 7.2(10)		x	x	○	△	△	△	○	△	△	△	○	△	△	△		
752	02F0h			Reserved			x	x	△	△	△	△	△	△	△	△	△	△	△	△		
753	02F1h			Reserved			x	x	△	△	△	△	△	△	△	△	△	△	△	△		
754	02F2h	2	R	Multiplying factor of current	Refer to 7.2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○		
755	02F3h	2	R	Multiplying factor of voltage	Refer to 7.2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○		
756	02F4h	2	R	Multiplying factor of power	Refer to 7.2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○		

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-ME		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
757	02F5h	2	R	Multiplying factor of energy	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
758	02F6h	2	R	Multiplying factor of power factor	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
759	02F7h	2	R	Multiplying factor of frequency	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
760	02F8h	2	R	Multiplying factor of current THD.	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
761	02F9h	2	R	Multiplying factor of voltage THD.	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
762	02FAh	2	R	Multiplying factor of energy (extended)	Refer to 7 .2(10)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	
763	02FBh	2	R	Model code	Refer to 7 .2(11)		x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	

(2) Instantaneous Value / Maximum Value / Minimum Value Registers (0x0300)

Register	Address	Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB			
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
768	0300h	2	R	Phase 1 current	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
769	0301h	2	R	Phase 2 current	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
770	0302h	2	R	Phase 3 current	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
771	0303h	2	R	Neutral current	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
772	0304h	2	R	Average value current	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
773	0305h	2	R	Phase 1 current demand	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○*4	○*4	○*4	○*4		
774	0306h	2	R	Phase 2 current demand	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△		
775	0307h	2	R	Phase 3 current demand	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△		
776	0308h	2	R	Neutral current demand	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
777	0309h	2	R	Average value current demand	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△		
778	030Ah	2	R	Voltage V12	0 to 16383	V	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
779	030Bh	2	R	Voltage V23	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
780	030Ch	2	R	Voltage V31	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
781	030Dh	2	R	Average value voltage (L-L)	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△		
782	030Eh	2	R	Voltage V1N	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
783	030Fh	2	R	Voltage V2N	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
784	0310h	2	R	Voltage V3N	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
785	0311h	2	R	Average value voltage (L-N)	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
786	0312h	2	R	Phase 1 power factor	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
787	0313h	2	R	Phase 2 power factor	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
788	0314h	2	R	Phase 3 power factor	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
789	0315h	2	R	Σ Power factor	-0 to +1000 to 0	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
790	0316h	2	R	Frequency	0, 445 to 999	x0.1 Hz	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
791	0317h	2	R	Phase 1 active power	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
792	0318h	2	R	Phase 2 active power	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
793	0319h	2	R	Phase 3 active power	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△		
794	031Ah	2	R	Σ Active power	-16383 to 16383	kW	○	○	○	○	○	○	○	○	○	○	○	○	○	○		
795	031Bh	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
796	031Ch	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
797	031Dh	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
798	031Eh	2	R	Σ Rolling demand (kW) (Last) (Note1)	-16383 to 16383	kW	△	△	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
799	031Fh	2	R	Phase 1 reactive power	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
800	0320h	2	R	Phase 2 reactive power	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
801	0321h	2	R	Phase 3 reactive power	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
802	0322h	2	R	Σ Reactive power	-16383 to 16383	kvar	○	○	○	○	○	○	○	○	○	○	○*7	○*7	○*7	○*7		
803	0323h	2	R	Phase 1 apparent power	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
804	0324h	2	R	Phase 2 apparent power	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
805	0325h	2	R	Phase 3 apparent power	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△		
806	0326h	2	R	Σ Apparent power	0 to 16383	kVA	○	△	○	○*4	○*4	○*4	○	○*4	○*4	○*4	○*7	○*7	○*7	○*7		
807	0327h	2	R	Σ Rolling demand (kvar) (Last) (Note1)	-16383 to 16383	kvar	△	△	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	△	△	△	△		
808	0328h	2	R	Σ Rolling demand (kVA) (Last) (Note1)	0 to 16383	kVA	△	△	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	△	△	△	△		

Register Address	Byte	R/W	Register Name	RANGE	Unit	Applicable *3															
						ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB			
						3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.	Count	*1	*2																	
809	0329h	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
810	032Ah	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
811	032Bh	2	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
812	032Ch	2	R	Phase 1 current	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○	○	○	
813	032Dh	2	R	Phase 2 current	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
814	032Eh	2	R	Phase 3 current	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
815	032Fh	2	R	Neutral current	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○	△	△	
816	0330h	2	R	Average value current	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
817	0331h	2	R	Phase 1 current demand	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○	○	○	
818	0332h	2	R	Phase 2 current demand	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
819	0333h	2	R	Phase 3 current demand	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
820	0334h	2	R	Neutral current demand	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○	△	△	
821	0335h	2	R	Average value current demand	Max.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	
822	0336h	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
823	0337h	2	R	Voltage V12	Max.	0 to 16383	V	○	○	○	○	○	○	○	○	○	○	○	○	○	
824	0338h	2	R	Voltage V23	Max.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	
825	0339h	2	R	Voltage V31	Max.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	
826	033Ah	2	R	Average value voltage(L-L)	Max.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	
827	033Bh	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
828	033Ch	2	R	Voltage V1N	Max.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	
829	033Dh	2	R	Voltage V2N	Max.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	
830	033Eh	2	R	Voltage V3N	Max.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	
831	033Fh	2	R	Average value voltage(L-N)	Max.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	
832	0340h	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
833	0341h	2	R	Phase 1 power factor	Max.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	
834	0342h	2	R	Phase 2 power factor	Max.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	
835	0343h	2	R	Phase 3 power factor	Max.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	
836	0344h	2	R	Σ Power factor	Max.	-0 to +1000 to 0	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	
837	0345h	2	R	Frequency	Max.	0, 445 to 999	x0.1 Hz	○	○	○	○	○	○	○	○	○	○	○	○	○	
838	0346h	2	R	Phase 1 active power	Max.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	
839	0347h	2	R	Phase 2 active power	Max.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	
840	0348h	2	R	Phase 3 active power	Max.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	
841	0349h	2	R	Σ Active power	Max.	-16383 to 16383	kW	○	○	○	○	○	○	○	○	○	○	○	○	○	
842	034Ah	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
843	034Bh	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
844	034Ch	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	
845	034Dh	2	R	Σ Rolling demand (kW)	Max.	-16383 to 16383	kW	△	△	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	
846	034Eh	2	R	Phase 1 reactive power	Max.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	
847	034Fh	2	R	Phase 2 reactive power	Max.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	
848	0350h	2	R	Phase 3 reactive power	Max.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	
849	0351h	2	R	Σ Reactive power	Max.	-16383 to 16383	kvar	○	○	○	○	○	○	○	○	○	○	○*7	○*7	○*7	
850	0352h	2	R	Phase 1 apparent power	Max.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	
851	0353h	2	R	Phase 2 apparent power	Max.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	

Register	Address	Byte	R/W	Register Name	RANGE	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.	Count	*1	*2																		
852	0354h	2	R	Phase 3 apparent power	Max.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
853	0355h	2	R	Σ Apparent power	Max.	0 to 16383	kVA	○	△	○	○*4	○*4	○*4	○	○*4	○*4	○*4	○*7	○*7	○*7	○*7	
854	0356h	2	R	Σ Rolling demand (kvar)	Max.	-16383 to 16383	kvar	△	△	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	△	△	△	△	
855	0357h	2	R	Σ Rolling demand (kVA)	Max.	0 to 16383	kVA	△	△	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	△	△	△	△	
856	0358h	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
857	0359h	2	R	Reserved	Max.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
858	035Ah	2	R	Phase 1 current	Min.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
859	035Bh	2	R	Phase 2 current	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
860	035Ch	2	R	Phase 3 current	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
861	035Dh	2	R	Neutral current	Min.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
862	035Eh	2	R	Average value current	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
863	035Fh	2	R	Phase 1 current demand	Min.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○*4	○*4	○*4	○*4	
864	0360h	2	R	Phase 2 current demand	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△	
865	0361h	2	R	Phase 3 current demand	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△	
866	0362h	2	R	Neutral current demand	Min.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△	
867	0363h	2	R	Average value current demand	Min.	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○*4	○*4	○*4	△	
868	0364h	2	R	Voltage V12	Min.	0 to 16383	V	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
869	0365h	2	R	Voltage V23	Min.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
870	0366h	2	R	Voltage V31	Min.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
871	0367h	2	R	Average value voltage(L-L)	Min.	0 to 16383	V	○	○	○	○	○	△	○	○	○	△	○	○	○	△	
872	0368h	2	R	Voltage V1N	Min.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
873	0369h	2	R	Voltage V2N	Min.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
874	036Ah	2	R	Voltage V3N	Min.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
875	036Bh	2	R	Average value voltage(L-N)	Min.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
876	036Ch	2	R	Phase 1 power factor	Min.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
877	036Dh	2	R	Phase 2 power factor	Min.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
878	036Eh	2	R	Phase 3 power factor	Min.	-0 to +1000 to 0	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
879	036Fh	2	R	Σ Power factor	Min.	-0 to +1000 to 0	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
880	0370h	2	R	Frequency	Min.	0, 445 to 999	x0.1 Hz	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
881	0371h	2	R	Phase 1 active power	Min.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
882	0372h	2	R	Phase 2 active power	Min.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
883	0373h	2	R	Phase 3 active power	Min.	-16383 to 16383	kW	○	△	○	△	△	△	○	△	△	△	○	△	△	△	
884	0374h	2	R	Σ Active power	Min.	-16383 to 16383	kW	○	○	○	○	○	○	○	○	○	○	○	○	○	○	
885	0375h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
886	0376h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
887	0377h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
888	0378h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
889	0379h	2	R	Phase 1 reactive power	Min.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
890	037Ah	2	R	Phase 2 reactive power	Min.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
891	037Bh	2	R	Phase 3 reactive power	Min.	-16383 to 16383	kvar	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
892	037Ch	2	R	Σ Reactive power	Min.	-16383 to 16383	kvar	○	○	○	○	○	○	○	○	○	○	○*7	○*7	○*7	○*7	
893	037Dh	2	R	Phase 1 apparent power	Min.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
894	037Eh	2	R	Phase 2 apparent power	Min.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	

Register	Address	Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB			
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
895	037Fh	2	R	Phase 3 apparent power	Min.	0 to 16383	kVA	○	△	○	△	△	△	○	△	△	△	○*7	△	△	△	
896	0380h	2	R	Σ Apparent power	Min.	0 to 16383	kVA	○	△	○	○*4	○*4	○*4	○	○*4	○*4	○*4	○*7	○*7	○*7	○*7	
897	0381h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
898	0382h	2	R	Reserved	Min.	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	
899	0383h							x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...							x	x	x	x	x	x	x	x	x	x	x	x	x		
921	0399h							x	x	x	x	x	x	x	x	x	x	x	x	x		
922	039Ah	2	R	Σ Power factor Max. value occurrence time (Year, Month)		16h...99h+01h...12h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
923	039Bh	2	R	Σ Power factor Max. value occurrence time(Day, Hour)		01h...31h+00h...23h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
924	039Ch	2	R	Σ Power factor Max. value occurrence time(Minute,Second)		00h...59h+00h...59h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
925	039Dh	4	R	Current unbalance		0 to 99999	x0.01%	x	x	○*7	○*7	○*7	△*7	○*7	○*7	○*7	△*7	x	x	x	x	
927	039Fh	4	R	Voltage unbalance		0 to 99999	x0.01%	x	x	○*7	○*7	○*7	△*7	○*7	○*7	○*7	△*7	x	x	x	x	
929	03A1h							x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...							x	x	x	x	x	x	x	x	x	x	x	x	x		
953	03B9h							x	x	x	x	x	x	x	x	x	x	x	x	x		
954	03BAh	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
955	03BBh	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
956	03BCh	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
957	03BDh	2	R	Σ Rolling demand (kW)	Present	-16383 to 16383	kW	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
958	03BEh	2	R	Σ Rolling demand (kvar)	Present	-16383 to 16383	kvar	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
959	03BFh	2	R	Σ Rolling demand (kVA)	Present	0 to 16383	kVA	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
960	03C0h	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
961	03C1h	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
962	03C2h	2	R	Reserved	-	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	x	x	x	x	
963	03C3h	2	R	Σ Rolling demand (kW)	Predict.	-16383 to 16383	kW	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
964	03C4h	2	R	Σ Rolling demand (kvar)	Predict.	-16383 to 16383	kvar	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
965	03C5h	2	R	Σ Rolling demand (kVA)	Predict.	0 to 16383	kVA	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
966	03C6h	2	R	Current Max. value occurrence time (Year, Month)	(Note.2)	16h...99h+01h...12h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
967	03C7h	2	R	Current Max. value occurrence time(Day, Hour)	(Note.2)	01h...31h+00h...23h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
968	03C8h	2	R	Current Max. value occurrence time(Minute,Second)	(Note.2)	00h...59h+00h...59h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
969	03C9h	2	R	Current Min. value occurrence time (Year, Month)	(Note.2)	16h...99h+01h...12h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
970	03CAh	2	R	Current Min. value occurrence time(Day, Hour)	(Note.2)	01h...31h+00h...23h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
971	03CBh	2	R	Current Min. value occurrence time(Minute,Second)	(Note.2)	00h...59h+00h...59h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
972	03CCh	2	R	Voltage (L-L) Max. value occurrence time (Year, Month)	(Note.2)	16h...99h+01h...12h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	
973	03CDh	2	R	Voltage (L-L) Max. value occurrence time (Day, Hour)	(Note.2)	01h...31h+00h...23h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x	

Resister Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
974	03CEh	2	R	Voltage (L-L) Max. value occurrence time (Minute,Second)	(Note.2) 00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
975	03CFh	2	R	Voltage (L-L) Min. value occurrence time (Year, Month)	(Note.2) 16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
976	03D0h	2	R	Voltage (L-L) Min. value occurrence time (Day, Hour)	(Note.2) 01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
977	03D1h	2	R	Voltage (L-L) Min. value occurrence time (Minute,Second)	(Note.2) 00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
978	03D2h	2	R	Voltage (L-N) Max. value occurrence time (Year, Month)	(Note.2) 16h...99h+01h...12h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
979	03D3h	2	R	Voltage (L-N) Max. value occurrence time (Day, Hour)	(Note.2) 01h...31h+00h...23h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
980	03D4h	2	R	Voltage (L-N) Max. value occurrence time (Minute,Second)	(Note.2) 00h...59h+00h...59h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
981	03D5h	2	R	Voltage (L-N) Min. value occurrence time (Year, Month)	(Note.2) 16h...99h+01h...12h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
982	03D6h	2	R	Voltage (L-N) Min. value occurrence time (Day, Hour)	(Note.2) 01h...31h+00h...23h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
983	03D7h	2	R	Voltage (L-N) Min. value occurrence time (Minute,Second)	(Note.2) 00h...59h+00h...59h	-	x	x	O*7	Δ*7	Δ*7	Δ*7	O*7	Δ*7	Δ*7	Δ*7	x	x	x	x		
984	03D8h	2	R	Σ Active power Max. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
985	03D9h	2	R	Σ Active power Max. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
986	03DAh	2	R	Σ Active power Max. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
987	03DBh	2	R	Σ Active power Min. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
988	03DCh	2	R	Σ Active power Min. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
989	03DDh	2	R	Σ Active power Min. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
990	03DEh	2	R	Σ Power factor Min. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
991	03DFh	2	R	Σ Power factor Min. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
992	03E0h	2	R	Σ Power factor Min. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
993	03E1h	2	R	Frequency Max. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
994	03E2h	2	R	Frequency Max. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
995	03E3h	2	R	Frequency Max. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
996	03E4h	2	R	Frequency Min. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
997	03E5h	2	R	Frequency Min. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		

Resister Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
998	03E6h	2	R	Frequency Min. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
999	03E7h	2	R	Σ Reactive power Max. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1000	03E8h	2	R	Σ Reactive power Max. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1001	03E9h	2	R	Σ Reactive power Max. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1002	03EAh	2	R	Σ Reactive power Min. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1003	03EBh	2	R	Σ Reactive power Min. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1004	03ECh	2	R	Σ Reactive power Min. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1005	03EDh	2	R	Σ Apparent power Max. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1006	03EEh	2	R	Σ Apparent power Max. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1007	03EFh	2	R	Σ Apparent power Max. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1008	03F0h	2	R	Σ Apparent power Min. value occurrence time (Year, Month)	16h...99h+01h...12h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1009	03F1h	2	R	Σ Apparent power Min. value occurrence time(Day, Hour)	01h...31h+00h...23h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1010	03F2h	2	R	Σ Apparent power Min. value occurrence time(Minute,Second)	00h...59h+00h...59h	-	x	x	O*7	O*7	O*7	O*7	O*7	O*7	O*7	O*7	x	x	x	x		
1011	03F3h	4	R	Current unbalance	Max. 0 to 99999	x0.01%	x	x	O*7	O*7	O*7	Δ*7	O*7	O*7	O*7	Δ*7	x	x	x	x		
1013	03F5h	4	R	Voltage unbalance	Max. 0 to 99999	x0.01%	x	x	O*7	O*7	O*7	Δ*7	O*7	O*7	O*7	Δ*7	x	x	x	x		

Note1: "Last" means the rolling demand value of latest interval time completed.

Note2: Data used for the judgement of Max./Min. value occurrence time is as below table.

Register Name	3P4W	3P3W/1P3W	1P2W
Current Max./Min. value occurrence time	Average value current Max./Min.	Average value current Max./Min.	Phase 1 current Max./Min.
Voltage (L-L) Max./Min. value occurrence time	Average value voltage (L-L) Max./Min.	Average value voltage (L-L) Max./Min.	Voltage V12 Max./Min.
Voltage (L-N) Max./Min. value occurrence time	Average value voltage (L-N) Max./Min.	-	-

(3) Setup Registers 2 (0x0400)

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3, *4															
							ME96NSR-ME		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB-MB				ME96SSE/SSEA/SSEB-MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
1024	0400h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1025	0401h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1026	0402h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1027	0403h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1028	0404h	2	R/W	Logging ID	01h to FFh	-	x	x	○*5	○*5	○*5	○*5	○*5	○*5	○*5	○*5	○*5	○*5	○*5	○*5		
1029	0405h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1030	0406h	2	R/W	Current time (Year,Month)	16h...99h+01h...12h	-	x	x	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)		
1031	0407h	2	R/W	Current time (Day,Hour)	01h...31h+00h...23h	-	x	x	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)		
1032	0408h	2	R/W	Current time (Minute,Second)	00h...59h+00h...59h	-	x	x	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)	(Note1)		
1033	0409h	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1034	040Ah	2	R	Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1035	040Bh	2	R/W	Upper/Lower limit alarm item1	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1036	040Ch	4	R/W	Upper/Lower limit alarm value1	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1038	040Eh			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1039	040Fh			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1040	0410h			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1041	0411h	2	R/W	Upper/Lower limit alarm item2	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1042	0412h	4	R/W	Upper/Lower limit alarm value2	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1044	0414h			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1045	0415h			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1046	0416h			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1047	0417h	2	R/W	Upper/Lower limit alarm item3	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1048	0418h	4	R/W	Upper/Lower limit alarm value3	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1050	041Ah			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
...	...						x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1065	0429h			Reserved	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△		
1066	042Ah	4	R	MAC Address (1,2 octet)	Refer to 7.2(18)		x	x	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6		
1068	042Ch	4	R	MAC Address (3 to 6 octet)			x	x	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6		
1070	042Eh	4	R/W	IP Address			x	x	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6		
1072	0430h	4	R/W	Subnet mask address		Refer to 7.2(19)		x	x	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	
1074	0432h	4	R/W	Default gateway address			x	x	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6	○*6		
1076	0434h	2		Reserved	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7		
1077	0435h	2	R	16bits monitor 3	Refer to 7.2(16)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1078	0436h	2	R	Multiplying factor of current/voltage unbalance	Refer to 7.2(10)		x	x	○*7	○*7	○*7	△*7	○*7	○*7	○*7	△*7	○*7	○*7	○*7	○*7		
1079	0437h	2		Reserved	-	-	x	x	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7	△*7		
1080	0438h	2	R/W	Upper/Lower limit alarm item4	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		
1081	0439h	4	R/W	Upper/Lower limit alarm value4	Refer to 7.2(20)	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7		

Note1: Current time is valid in case of below. (OR condition.)

- Applicable only when Optional plug-in module: ME-0000BU-SS96 installed.
- Setting of Built-in logging use is "on" at ME96SSHB-MB/ME96SSRB-MB.

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB			
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
1378	0562h	4	R	Operating time 1	0 to 999999	h	x	x	0	0	0	0	0	0	0	0	0	0	0			
1380	0564h	4	R	Operating time 2	0 to 999999	h	x	x	0	0	0	0	0	0	0	0	0	0	0			
1382	0566h	4		Reserve			x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ			
1384	0568h	4		Reserve			x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ			
1386	056Ah	4	R/W	Periodic active energy (Period 2)	import	kWh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1388	056Ch	4	R/W	Apparent energy		kVAh	x	x	0	0*4	0*4	0*4	0*4	0*4	0*4	0*4	0*7	0*7	0*7	0*7		
1390	056Eh	4	R	Active energy (unit: Wh fixed)	import	Wh	x	x	0	0	0	0	0	0	0	0	0	0	0			
1392	0570h	4	R	Active energy (unit: Wh fixed)	export	Wh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1394	0572h	4	R	Reactive energy (unit: varh fixed)	import LAG	varh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1396	0574h	4	R	Reactive energy (unit: varh fixed)	export LAG	varh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1398	0576h	4	R	Reactive energy (unit: varh fixed)	import LEAD	varh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1400	0578h	4	R	Reactive energy (unit: varh fixed)	export LEAD	varh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1402	057Ah	4	R	Apparent energy (unit: VAh fixed)		VAh	x	x	0	0*4	0*4	0*4	0*4	0*4	0*4	0*4	0*7	0*7	0*7	0*7		
1404	057Ch	4	R	Periodic active energy (Period 1) (unit: Wh fixed)	import	Wh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1406	057Eh	4	R	Periodic active energy (Period 2) (unit: Wh fixed)	import	Wh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1408	0580h	4	R	Active energy (unit: kWh fixed)	import	kWh	x	x	0	0	0	0	0	0	0	0	0	0	0	0		
1410	0582h	4	R	Active energy (unit: kWh fixed)	export	kWh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1412	0584h	4	R	Reactive energy (unit: kvarh fixed)	import LAG	kvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1414	0586h	4	R	Reactive energy (unit: kvarh fixed)	export LAG	kvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1416	0588h	4	R	Reactive energy (unit: kvarh fixed)	import LEAD	kvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1418	058Ah	4	R	Reactive energy (unit: kvarh fixed)	export LEAD	kvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1420	058Ch	4	R	Apparent energy (unit: kVAh fixed)		kVAh	x	x	0	0*4	0*4	0*4	0*4	0*4	0*4	0*4	0*7	0*7	0*7	0*7		
1422	058Eh	4	R	Periodic active energy (Period 1) (unit: kWh fixed)	import	kWh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1424	0590h	4	R	Periodic active energy (Period 2) (unit: kWh fixed)	import	kWh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1426	0592h	4	R	Active energy (unit: MWh fixed)	import	MWh	x	x	0	0	0	0	0	0	0	0	0	0	0	0		
1428	0594h	4	R	Active energy (unit: MWh fixed)	export	MWh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1430	0596h	4	R	Reactive energy (unit: Mvarh fixed)	import LAG	Mvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1432	0598h	4	R	Reactive energy (unit: Mvarh fixed)	export LAG	Mvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1434	059Ah	4	R	Reactive energy (unit: Mvarh fixed)	import LEAD	Mvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1436	059Ch	4	R	Reactive energy (unit: Mvarh fixed)	export LEAD	Mvarh	x	x	0	0	0	0	0	0	0	0	0*7	0*7	0*7	0*7		
1438	059Eh	4	R	Apparent energy (unit: MVAh fixed)		MVAh	x	x	0	0*4	0*4	0*4	0*4	0*4	0*4	0*4	0*7	0*7	0*7	0*7		
1440	05A0h	4	R	Periodic active energy (Period 1) (unit: MWh fixed)	import	MWh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1442	05A2h	4	R	Periodic active energy (Period 2) (unit: MWh fixed)	import	MWh	x	x	0	0	0	0	0	0	0	0	Δ	Δ	Δ	Δ		
1444	05A4h						x	x	x	x	x	x	x	x	x	x	x	x	x			
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x			
1474	05C2h						x	x	x	x	x	x	x	x	x	x	x	x	x			
1476	05C4h	4	R/W	CO2 equivalent	0 to 999999	kg	x	x	0*7	0*7	0*7	Δ*7	0*7	0*7	0*7	Δ*7	x	x	x	x		
1478	05C6h						x	x	x	x	x	x	x	x	x	x	x	x	x			

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
Dec.	Hex.						ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB			
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
...	...						x	x	x	x	x	x	x	x	x	x	x	x	x			
1482	05CAh						x	x	x	x	x	x	x	x	x	x	x	x	x			
1484	05CCh	4	R/W	Periodic active energy (Period 3)	import	0 to 999999	kWh	x	x	0*7	0*7	0*7	0*7	0*7	0*7	0*7	0*7	x	x	x	x	
1486	05CEh	4	R	Periodic active energy (Period 3) (unit: Wh fixed)	import	0 to 999999999	Wh	x	x	0*7	0*7	0*7	0*7	0*7	0*7	0*7	0*7	x	x	x	x	
1488	05D0h	4	R	Periodic active energy (Period 3) (unit: kWh fixed)	import	0 to 999999999	kWh	x	x	0*7	0*7	0*7	0*7	0*7	0*7	0*7	0*7	x	x	x	x	
1490	05D2h	4	R	Periodic active energy (Period 3) (unit: MWh fixed)	import	0 to 999999999	MWh	x	x	0*7	0*7	0*7	0*7	0*7	0*7	0*7	0*7	x	x	x	x	

Note: For from register address 1304(0518h) to 1326(052Eh), the data of energy will change according to the total load setting of ME96. (This matches to display of ME96NSR.)

For from register address 1390(056Eh) to 1442(05A2h), the data of energy of selected unit will reply regardless to the total load setting of ME96. (This matches to the additional display (9 digits) of ME96SSH/ME96SSR/ ME96SSE.)

(Example) In case of Active energy (import) data is 876,543,210,987,654,321 mWh, each reply data are following.

Data =		8	7	6	5	4	3	2	1	0	9	8	7	6	5	4	3	2	1	
Register Address	Register Name	Total power[kW]																		Note
1304 (0518h)	Active energy (import)	less than 10																		Multiplying the received data by the multiplying factor of section 7 .3 gives the actual value (unit:kWh)
		10 or more and less than 100																		
		100 or more and less than 1000																		
		1000 or more and less than 10000																		
		10000 or more and less than 100000																		
1316 (0524h)	Extended active energy (import)	100000 or more																		
		less than 10																		
		10 or more and less than 100																		
		100 or more and less than 1000																		
		1000 or more and less than 10000																		
1390 (056Eh)	Active energy (unit: Wh fixed) (import)	10000 or more and less than 100000																		Data of energy of selected unit will reply regardless to the total load.
		100000 or more																		
		less than 10																		
		10 or more and less than 100																		
		100 or more and less than 1000																		
1408 (0580h)	Active energy (unit: kWh fixed) (import)	10000 or more and less than 100000																		
1426 (0592h)	Active energy (unit: MWh fixed) (import)	100000 or more																		

Note: About the reply data of CO2 equivalent (Register address 1476(05C4h), refer to follows.

		kg										g		
Item	Total power [kW]	Data=	2	3	4	5	6	7	8	9	0	1	2	Note
CO2 equivalent (Reply data)	less than 10							7	8	9	0	1	2	Multiplying the received data by the multiplying factor of section 7.3 gives the actual value (unit:kg)
	10 or more and less than 100					6	7	8	9	0	1			
	100 or more and less than 1000				5	6	7	8	9	0				
	1000 or more and less than 10000			4	5	6	7	8	9					
	10000 or more and less than 100000		3	4	5	6	7	8						
	100000 or more	2	3	4	5	6	7							
CO2 equivalent (LCD display)	less than 10							7	8	9	0	1	2	Unit:kg
	10 or more and less than 100					6	7	8	9	0	1			
	100 or more and less than 1000				5	6	7	8	9	0				
	1000 or more and less than 10000			4	5	6	7	8	9	0	1	2		
	10000 or more and less than 100000		3	4	5	6	7	8	9	0	1			
	100000 or more	2	3	4	5	6	7	8	9	0				

(5) Alarm Value Registers (0x0600)

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
1536	0600h	4	R/W	Current demand upper limit	0 to 4000000	x0.01 A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1538	0602h	4	R/W	Voltage(L-N) upper limit	0 to 7500000	x0.01 V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
1540	0604h	4	R/W	Current upper limit	0 to 4000000	x0.01 A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1542	0606h	4	R/W	Power factor upper limit	-50 to +1000 to 50	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1544	0608h	4	R/W	Frequency upper limit	445 to 665	x0.1 Hz	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1546	060Ah	4	R/W	Harmonics current upper limit	0 to 1200	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1548	060Ch	4	R/W	THD voltage upper limit	0 to 200	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1550	060Eh	4	R/W	Rolling demand (W) (Last) upper limit	0 to 1638300000	W	△	△	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1552	0610h	4	R/W	Active power upper limit	-1638300000 to 1638300000	W	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1554	0612h	4	R/W	Reactive power upper limit	-1638300000 to 1638300000	var	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1556	0614h	4	R/W	Current demand lower limit	0 to 4000000	x0.01 A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1558	0616h	4	R/W	Voltage(L-N) lower limit	0 to 7500000	x0.01 V	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
1560	0618h	4	R/W	Current lower limit	0 to 4000000	x0.01 A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1562	061Ah	4	R/W	Power factor lower limit	-50 to +1000 to 50	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1564	061Ch	4	R/W	Frequency lower limit	445 to 665	x0.1 Hz	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1566	061Eh	4	R	Reserved	-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△	△
1568	0620h	4	R/W	Active power lower limit	-1638300000 to 1638300000	W	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1570	0622h	4	R/W	Reactive power lower limit	-1638300000 to 1638300000	var	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
1572	0624h	4	R/W	Neutral current demand lower limit	0 to 4000000	x0.01 A	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
1574	0626h	4	R/W	Neutral current lower limit	0 to 4000000	x0.01 A	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
1576	0628h	4	R/W	Neutral harmonics current lower limit	0 to 1200	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
1578	062Ah	4	R/W	Voltage(L-L) upper limit	0 to 7500000	x0.01 V	○	○	△	○	○	○	△	○	○	○	△	○	○	○	○	○
1580	062Ch	4	R/W	Voltage(L-L) lower limit	0 to 7500000	x0.01 V	○	○	△	○	○	○	△	○	○	○	△	○	○	○	○	○
1582	062Eh			Reserved			x	x	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4
...	...			Reserved			x	x	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4
1592	0638h			Reserved			x	x	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4	△*4
1594	063Ah	4	R/W	Rolling demand (var) (Last) upper limit	0 to 1638300000	var	x	x	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4
1596	063Ch	4	R/W	Rolling demand (VA) (Last) upper limit	0 to 1638300000	VA	x	x	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4	○*4
1598	063Eh	4	R/W	Rolling demand (W) (Present) upper limit	0 to 1638300000	W	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7
1600	0640h	4	R/W	Rolling demand (var) (Present) upper limit	0 to 1638300000	var	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7
1602	0642h	4	R/W	Rolling demand (VA) (Present) upper limit	0 to 1638300000	VA	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7
1604	0644h	4	R/W	Rolling demand (W) (Predict) upper limit	0 to 1638300000	W	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7
1606	0646h	4	R/W	Rolling demand (var) (Predict) upper limit	0 to 1638300000	var	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
1608	0648h	4	R/W	Rolling demand (VA) (Predict) upper limit	0 to 1638300000	VA	×	×	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	×	×	×	×		
1610	064Ah	4	R/W	Current unbalance upper limit	0 to 9900	x0.01%	×	×	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	×	×	×	×		
1612	064Ch	4	R/W	Voltage unbalance upper limit	0 to 9900	x0.01%	×	×	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	×	×	×	×		

Note 1: Setting of alarm value will be valid only if the alarm items are set in the ME96.

Note 2: Monitor of rolling demand(W/var/VA) upper limit, active power upper/lower limit and reactive power upper/lower limit is up to $\pm 1638300000W(var)$.

(6) Harmonics Voltage (L-N) r.m.s. Registers (0x0700)

Register Address		Byte Count	R/W *1	Register Name		RANGE *2	Unit	Applicable *3															
								ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
								3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																						
1792	0700h	2	R	Harmonics value V1N	Total	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
1793	0701h	2	R	Harmonics value V2N	Total	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
1794	0702h	2	R	Harmonics value V3N	Total	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
1795	0703h	2	R	Harmonics value V1N	1st	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1796	0704h	2	R	Harmonics value V2N	1st	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1797	0705h	2	R	Harmonics value V3N	1st	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1798	0706h	2	R	Harmonics value V1N	3rd	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1799	0707h	2	R	Harmonics value V2N	3rd	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1800	0708h	2	R	Harmonics value V3N	3rd	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1801	0709h	2	R	Harmonics value V1N	5th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1802	070Ah	2	R	Harmonics value V2N	5th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1803	070Bh	2	R	Harmonics value V3N	5th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1804	070Ch	2	R	Harmonics value V1N	7th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1805	070Dh	2	R	Harmonics value V2N	7th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1806	070Eh	2	R	Harmonics value V3N	7th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1807	070Fh	2	R	Harmonics value V1N	9th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1808	0710h	2	R	Harmonics value V2N	9th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1809	0711h	2	R	Harmonics value V3N	9th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1810	0712h	2	R	Harmonics value V1N	11th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1811	0713h	2	R	Harmonics value V2N	11th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1812	0714h	2	R	Harmonics value V3N	11th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1813	0715h	2	R	Harmonics value V1N	13th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1814	0716h	2	R	Harmonics value V2N	13th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1815	0717h	2	R	Harmonics value V3N	13th	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
1816	0718h	2	R	Harmonics value V1N	15th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1817	0719h	2	R	Harmonics value V2N	15th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1818	071Ah	2	R	Harmonics value V3N	15th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1819	071Bh	2	R	Harmonics value V1N	17th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1820	071Ch	2	R	Harmonics value V2N	17th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1821	071Dh	2	R	Harmonics value V3N	17th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1822	071Eh	2	R	Harmonics value V1N	19th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1823	071Fh	2	R	Harmonics value V2N	19th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1824	0720h	2	R	Harmonics value V3N	19th	0 to 16383	V	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△		
1825	0721h	2	R	Harmonics value V1N	21st	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1826	0722h	2	R	Harmonics value V2N	21st	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1827	0723h	2	R	Harmonics value V3N	21st	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1828	0724h	2	R	Harmonics value V1N	23rd	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1829	0725h	2	R	Harmonics value V2N	23rd	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1830	0726h	2	R	Harmonics value V3N	23rd	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1831	0727h	2	R	Harmonics value V1N	25th	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		
1832	0728h	2	R	Harmonics value V2N	25th	0 to 16383	V	×	×	○	△	△	△	△	△	△	△	△	△	△	△		

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																					
1833	0729h	2	R	Harmonics value V3N	25th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1834	072Ah	2	R	Harmonics value V1N	27th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1835	072Bh	2	R	Harmonics value V2N	27th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1836	072Ch	2	R	Harmonics value V3N	27th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1837	072Dh	2	R	Harmonics value V1N	29th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1838	072Eh	2	R	Harmonics value V2N	29th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1839	072Fh	2	R	Harmonics value V3N	29th	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1840	0730h	2	R	Harmonics value V1N	31st	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1841	0731h	2	R	Harmonics value V2N	31st	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△
1842	0732h	2	R	Harmonics value V3N	31st	0 to 16383	V	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△

(7) Harmonics Voltage (L-L) r.m.s. Registers (0x0800)

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2048	0800h	2	R	Harmonics value V12	Total	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	○*4	○*4	○*4	
2049	0801h	2	R	Harmonics value V23	Total	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	○*4	○*4	Δ	
2050	0802h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2051	0803h	2	R	Harmonics value V12	1st	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2052	0804h	2	R	Harmonics value V23	1st	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2053	0805h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2054	0806h	2	R	Harmonics value V12	3rd	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2055	0807h	2	R	Harmonics value V23	3rd	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2056	0808h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2057	0809h	2	R	Harmonics value V12	5th	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2058	080Ah	2	R	Harmonics value V23	5th	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2059	080Bh	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2060	080Ch	2	R	Harmonics value V12	7th	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2061	080Dh	2	R	Harmonics value V23	7th	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2062	080Eh	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2063	080Fh	2	R	Harmonics value V12	9th	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2064	0810h	2	R	Harmonics value V23	9th	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2065	0811h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2066	0812h	2	R	Harmonics value V12	11th	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2067	0813h	2	R	Harmonics value V23	11th	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2068	0814h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2069	0815h	2	R	Harmonics value V12	13th	0 to 16383	V	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ	
2070	0816h	2	R	Harmonics value V23	13th	0 to 16383	V	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ	
2071	0817h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2072	0818h	2	R	Harmonics value V12	15th	0 to 16383	V	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ	
2073	0819h	2	R	Harmonics value V23	15th	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	
2074	081Ah	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2075	081Bh	2	R	Harmonics value V12	17th	0 to 16383	V	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ	
2076	081Ch	2	R	Harmonics value V23	17th	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	
2077	081Dh	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2078	081Eh	2	R	Harmonics value V12	19th	0 to 16383	V	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ	
2079	081Fh	2	R	Harmonics value V23	19th	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	
2080	0820h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2081	0821h	2	R	Harmonics value V12	21st	0 to 16383	V	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2082	0822h	2	R	Harmonics value V23	21st	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2083	0823h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2084	0824h	2	R	Harmonics value V12	23rd	0 to 16383	V	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2085	0825h	2	R	Harmonics value V23	23rd	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2086	0826h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2087	0827h	2	R	Harmonics value V12	25th	0 to 16383	V	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2088	0828h	2	R	Harmonics value V23	25th	0 to 16383	V	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	
2089	0829h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
Dec.	Hex.						3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2090	082Ah	2	R	Harmonics value V12	27th	0 to 16383	V	x	x	△	○	○	○	△	△	△	△	△	△	△	△	
2091	082Bh	2	R	Harmonics value V23	27th	0 to 16383	V	x	x	△	○	○	△	△	△	△	△	△	△	△	△	
2092	082Ch	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	
2093	082Dh	2	R	Harmonics value V12	29th	0 to 16383	V	x	x	△	○	○	○	△	△	△	△	△	△	△	△	
2094	082Eh	2	R	Harmonics value V23	29th	0 to 16383	V	x	x	△	○	○	△	△	△	△	△	△	△	△	△	
2095	082Fh	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	
2096	0830h	2	R	Harmonics value V12	31st	0 to 16383	V	x	x	△	○	○	○	△	△	△	△	△	△	△	△	
2097	0831h	2	R	Harmonics value V23	31st	0 to 16383	V	x	x	△	○	○	△	△	△	△	△	△	△	△	△	
2098	0832h	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	

(8) Harmonics Current r.m.s Registers (0x0900)

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
Dec.	Hex.						3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2304	0900h	2	R	Harmonics value I1	Total	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
2305	0901h	2	R	Harmonics value I2	Total	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	○	○	○	○	○
2306	0902h	2	R	Harmonics value I3	Total	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	○	○	○	△	△
2307	0903h	2	R	Harmonics value IN	Total	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○	△	△	△	△
2308	0904h	2	R	Harmonics value I1	1st	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2309	0905h	2	R	Harmonics value I2	1st	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2310	0906h	2	R	Harmonics value I3	1st	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2311	0907h	2	R	Harmonics value IN	1st	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2312	0908h	2	R	Harmonics value I1	3rd	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2313	0909h	2	R	Harmonics value I2	3rd	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2314	090Ah	2	R	Harmonics value I3	3rd	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2315	090Bh	2	R	Harmonics value IN	3rd	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2316	090Ch	2	R	Harmonics value I1	5th	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2317	090Dh	2	R	Harmonics value I2	5th	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2318	090Eh	2	R	Harmonics value I3	5th	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2319	090Fh	2	R	Harmonics value IN	5th	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2320	0910h	2	R	Harmonics value I1	7th	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2321	0911h	2	R	Harmonics value I2	7th	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2322	0912h	2	R	Harmonics value I3	7th	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2323	0913h	2	R	Harmonics value IN	7th	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2324	0914h	2	R	Harmonics value I1	9th	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2325	0915h	2	R	Harmonics value I2	9th	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2326	0916h	2	R	Harmonics value I3	9th	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2327	0917h	2	R	Harmonics value IN	9th	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2328	0918h	2	R	Harmonics value I1	11th	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2329	0919h	2	R	Harmonics value I2	11th	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2330	091Ah	2	R	Harmonics value I3	11th	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2331	091Bh	2	R	Harmonics value IN	11th	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2332	091Ch	2	R	Harmonics value I1	13th	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△	△
2333	091Dh	2	R	Harmonics value I2	13th	0 to 16383	A	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△
2334	091Eh	2	R	Harmonics value I3	13th	0 to 16383	A	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△
2335	091Fh	2	R	Harmonics value IN	13th	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△
2336	0920h	2	R	Harmonics value I1	15th	0 to 16383	A	x	x	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△	△
2337	0921h	2	R	Harmonics value I2	15th	0 to 16383	A	x	x	○	○(Note1)	△	△	○*4	○*4(Note1)	△	△	△	△	△	△	△
2338	0922h	2	R	Harmonics value I3	15th	0 to 16383	A	x	x	○	○	○	△	○*4	○*4	○*4	△	△	△	△	△	△
2339	0923h	2	R	Harmonics value IN	15th	0 to 16383	A	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△	△
2340	0924h	2	R	Harmonics value I1	17th	0 to 16383	A	x	x	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△	△

(9) Harmonics Voltage (L-N) THD/ Distortion ratio Registers (0x0A00)

Resister Address		Byte Count	R/W *1	Register Name	Total	RANGE *2	Unit	Applicable *3															
								ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
								3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2560	0A00h	2	R	THD V1N	Total	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
2561	0A01h	2	R	THD V2N	Total	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
2562	0A02h	2	R	THD V3N	Total	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
2563	0A03h	2	R	Harmonic distortion V1N	3rd	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2564	0A04h	2	R	Harmonic distortion V2N	3rd	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2565	0A05h	2	R	Harmonic distortion V3N	3rd	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2566	0A06h	2	R	Harmonic distortion V1N	5th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2567	0A07h	2	R	Harmonic distortion V2N	5th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2568	0A08h	2	R	Harmonic distortion V3N	5th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2569	0A09h	2	R	Harmonic distortion V1N	7th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2570	0A0Ah	2	R	Harmonic distortion V2N	7th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2571	0A0Bh	2	R	Harmonic distortion V3N	7th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2572	0A0Ch	2	R	Harmonic distortion V1N	9th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2573	0A0Dh	2	R	Harmonic distortion V2N	9th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2574	0A0Eh	2	R	Harmonic distortion V3N	9th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2575	0A0Fh	2	R	Harmonic distortion V1N	11th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2576	0A10h	2	R	Harmonic distortion V2N	11th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2577	0A11h	2	R	Harmonic distortion V3N	11th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2578	0A12h	2	R	Harmonic distortion V1N	13th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2579	0A13h	2	R	Harmonic distortion V2N	13th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2580	0A14h	2	R	Harmonic distortion V3N	13th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
2581	0A15h	2	R	Harmonic distortion V1N	15th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2582	0A16h	2	R	Harmonic distortion V2N	15th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2583	0A17h	2	R	Harmonic distortion V3N	15th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2584	0A18h	2	R	Harmonic distortion V1N	17th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2585	0A19h	2	R	Harmonic distortion V2N	17th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2586	0A1Ah	2	R	Harmonic distortion V3N	17th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2587	0A1Bh	2	R	Harmonic distortion V1N	19th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2588	0A1Ch	2	R	Harmonic distortion V2N	19th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2589	0A1Dh	2	R	Harmonic distortion V3N	19th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
2590	0A1Eh	2	R	Harmonic distortion V1N	21st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2591	0A1Fh	2	R	Harmonic distortion V2N	21st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2592	0A20h	2	R	Harmonic distortion V3N	21st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2593	0A21h	2	R	Harmonic distortion V1N	23rd	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2594	0A22h	2	R	Harmonic distortion V2N	23rd	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2595	0A23h	2	R	Harmonic distortion V3N	23rd	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2596	0A24h	2	R	Harmonic distortion V1N	25th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2597	0A25h	2	R	Harmonic distortion V2N	25th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2598	0A26h	2	R	Harmonic distortion V3N	25th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2599	0A27h	2	R	Harmonic distortion V1N	27th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2600	0A28h	2	R	Harmonic distortion V2N	27th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
2601	0A29h	2	R	Harmonic distortion V3N	27th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△		

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3															
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
Dec.	Hex.						3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2602	0A2Ah	2	R	Harmonic distortion V1N	29th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	
2603	0A2Bh	2	R	Harmonic distortion V2N	29th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	
2604	0A2Ch	2	R	Harmonic distortion V3N	29th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	
2605	0A2Dh	2	R	Harmonic distortion V1N	31st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	
2606	0A2Eh	2	R	Harmonic distortion V2N	31st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	
2607	0A2Fh	2	R	Harmonic distortion V3N	31st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	

(10) Harmonics Voltage (L-L) THD/ Distortion ratio Registers (0x0B00)

Register Address		Byte Count	R/W *1	Register Name		RANGE *2	Unit	Applicable *3															
								ME96NSR-MB		ME96SSH/SSHA-MB				ME96SSR/SSRA-MB				ME96SSE/SSEA/SSEB -MB					
								3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2816	0B00h	2	R	THD V12	Total	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	○*4	○*4	○*4		
2817	0B01h	2	R	THD V23	Total	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	○*4	○*4	Δ		
2818	0B02h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2819	0B03h	2	R	Harmonic distortion V12	3rd	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2820	0B04h	2	R	Harmonic distortion V23	3rd	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2821	0B05h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2822	0B06h	2	R	Harmonic distortion V12	5th	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2823	0B07h	2	R	Harmonic distortion V23	5th	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2824	0B08h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2825	0B09h	2	R	Harmonic distortion V12	7th	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2826	0B0Ah	2	R	Harmonic distortion V23	7th	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2827	0B0Bh	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2828	0B0Ch	2	R	Harmonic distortion V12	9th	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2829	0B0Dh	2	R	Harmonic distortion V23	9th	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2830	0B0Eh	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2831	0B0Fh	2	R	Harmonic distortion V12	11th	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2832	0B10h	2	R	Harmonic distortion V23	11th	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2833	0B11h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2834	0B12h	2	R	Harmonic distortion V12	13th	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
2835	0B13h	2	R	Harmonic distortion V23	13th	0 to 16383	x0.1%	Δ	○	Δ	○	○	Δ	Δ	○	○	Δ	Δ	Δ	Δ	Δ		
2836	0B14h	2	R	Reserved	-	-	-	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2837	0B15h	2	R	Harmonic distortion V12	15th	0 to 16383	x0.1%	x	x	Δ	○	○	○	○*4	○*4	○*4	Δ	Δ	Δ	Δ	Δ		
2838	0B16h	2	R	Harmonic distortion V23	15th	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	Δ		
2839	0B17h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2840	0B18h	2	R	Harmonic distortion V12	17th	0 to 16383	x0.1%	x	x	Δ	○	○	○	○*4	○*4	○*4	Δ	Δ	Δ	Δ	Δ		
2841	0B19h	2	R	Harmonic distortion V23	17th	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	Δ		
2842	0B1Ah	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2843	0B1Bh	2	R	Harmonic distortion V12	19th	0 to 16383	x0.1%	x	x	Δ	○	○	○	○*4	○*4	○*4	Δ	Δ	Δ	Δ	Δ		
2844	0B1Ch	2	R	Harmonic distortion V23	19th	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	○*4	○*4	Δ	Δ	Δ	Δ	Δ	Δ		
2845	0B1Dh	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2846	0B1Eh	2	R	Harmonic distortion V12	21st	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2847	0B1Fh	2	R	Harmonic distortion V23	21st	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2848	0B20h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2849	0B21h	2	R	Harmonic distortion V12	23rd	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2850	0B22h	2	R	Harmonic distortion V23	23rd	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2851	0B23h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2852	0B24h	2	R	Harmonic distortion V12	25th	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2853	0B25h	2	R	Harmonic distortion V23	25th	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2854	0B26h	2	R	Reserved	-	-	-	x	x	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2855	0B27h	2	R	Harmonic distortion V12	27th	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
2856	0B28h	2	R	Harmonic distortion V23	27th	0 to 16383	x0.1%	x	x	Δ	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		

Register Address		Byte Count	R/W *1	Register Name		RANGE *2	Unit	Applicable *3															
								ME96NSR-MB		ME96SSH/SSHA-MB				ME96SSR/SSRA-MB				ME96SSE/SSEA/SSEB -MB					
								3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
2857	0B29h	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	△	
2858	0B2Ah	2	R	Harmonic distortion V12	29th	0 to 16383	x0.1%	x	x	△	○	○	○	△	△	△	△	△	△	△	△	△	
2859	0B2Bh	2	R	Harmonic distortion V23	29th	0 to 16383	x0.1%	x	x	△	○	○	○	△	△	△	△	△	△	△	△	△	
2860	0B2Ch	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	△	
2861	0B2Dh	2	R	Harmonic distortion V12	31st	0 to 16383	x0.1%	x	x	△	○	○	○	△	△	△	△	△	△	△	△	△	
2862	0B2Eh	2	R	Harmonic distortion V23	31st	0 to 16383	x0.1%	x	x	△	○	○	○	△	△	△	△	△	△	△	△	△	
2863	0B2Fh	2	R	Reserved	-	-	-	x	x	△	△	△	△	△	△	△	△	△	△	△	△	△	

(11) Harmonics Current THD/ Distortion ratio Registers (0x0C00)

Resister Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3																
							ME96NSR-MB				ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB				
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W			
Dec.	Hex.																						
3072	0C00h	2	R	THD I1	Total	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3073	0C01h	2	R	THD I2	Total	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	○	○	○	○	○	○
3074	0C02h	2	R	THD I3	Total	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	○	○	○	○	○	○
3075	0C03h	2	R	THD IN	Total	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	○	△	△	△	○	△
3076	0C04h	2	R	Harmonic distortion I1	3rd	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3077	0C05h	2	R	Harmonic distortion I2	3rd	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3078	0C06h	2	R	Harmonic distortion I3	3rd	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3079	0C07h	2	R	Harmonic distortion IN	3rd	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3080	0C08h	2	R	Harmonic distortion I1	5th	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3081	0C09h	2	R	Harmonic distortion I2	5th	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3082	0C0Ah	2	R	Harmonic distortion I3	5th	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3083	0C0Bh	2	R	Harmonic distortion IN	5th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3084	0C0Ch	2	R	Harmonic distortion I1	7th	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3085	0C0Dh	2	R	Harmonic distortion I2	7th	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3086	0C0Eh	2	R	Harmonic distortion I3	7th	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3087	0C0Fh	2	R	Harmonic distortion IN	7th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3088	0C10h	2	R	Harmonic distortion I1	9th	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3089	0C11h	2	R	Harmonic distortion I2	9th	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3090	0C12h	2	R	Harmonic distortion I3	9th	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3091	0C13h	2	R	Harmonic distortion IN	9th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3092	0C14h	2	R	Harmonic distortion I1	11th	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3093	0C15h	2	R	Harmonic distortion I2	11th	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3094	0C16h	2	R	Harmonic distortion I3	11th	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3095	0C17h	2	R	Harmonic distortion IN	11th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3096	0C18h	2	R	Harmonic distortion I1	13th	0 to 16383	x0.1%	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3097	0C19h	2	R	Harmonic distortion I2	13th	0 to 16383	x0.1%	○	○	○	○(Note1)	△	△	○	○(Note1)	△	△	△	△	△	△	△	△
3098	0C1Ah	2	R	Harmonic distortion I3	13th	0 to 16383	x0.1%	○	○	○	○	○	△	○	○	○	△	△	△	△	△	△	△
3099	0C1Bh	2	R	Harmonic distortion IN	13th	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3100	0C1Ch	2	R	Harmonic distortion I1	15th	0 to 16383	x0.1%	x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3101	0C1Dh	2	R	Harmonic distortion I2	15th	0 to 16383	x0.1%	x	x	○	○(Note1)	△	△	○	○	○	○	○	○	○	○	○	○
3102	0C1Eh	2	R	Harmonic distortion I3	15th	0 to 16383	x0.1%	x	x	○	○	○	△	○	○	○	○	○	○	○	○	○	○
3103	0C1Fh	2	R	Harmonic distortion IN	15th	0 to 16383	x0.1%	x	x	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3104	0C20h	2	R	Harmonic distortion I1	17th	0 to 16383	x0.1%	x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	○
3105	0C21h	2	R	Harmonic distortion I2	17th	0 to 16383	x0.1%	x	x	○	○(Note1)	△	△	○	○	○	○	○	○	○	○	○	○
3106	0C22h	2	R	Harmonic distortion I3	17th	0 to 16383	x0.1%	x	x	○	○	○	△	○	○	○	○	○	○	○	○	○	○
3107	0C23h	2	R	Harmonic distortion IN	17th	0 to 16383	x0.1%	x	x	○	△	△	△	○	△	△	△	△	△	△	△	△	△
3108	0C24h	2	R	Harmonic distortion I1	19th	0 to 16383	x0.1%	x	x	○	○	○	○	○	○	○	○	○	○	○	○	○	○

Register Address		Byte Count	R/W *1	Register Name	RANGE *2	Unit	Applicable *3																
							ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB						
							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W			
Dec.	Hex.																						
3109	0C25h	2	R	Harmonic distortion I2	19th	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	○*4	○*4 (Note1)	△	△	△	△	△	△	△	△
3110	0C26h	2	R	Harmonic distortion I3	19th	0 to 16383	x0.1%	x	x	○	○	○	△	○*4	○*4	○*4	△	△	△	△	△	△	△
3111	0C27h	2	R	Harmonic distortion IN	19th	0 to 16383	x0.1%	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△	△	△
3112	0C28h	2	R	Harmonic distortion I1	21st	0 to 16383	x0.1%	x	x	○	○	○	○	△	△	△	△	△	△	△	△	△	△
3113	0C29h	2	R	Harmonic distortion I2	21st	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	△	△	△	△	△	△	△	△	△	△
3114	0C2Ah	2	R	Harmonic distortion I3	21st	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3115	0C2Bh	2	R	Harmonic distortion IN	21st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△
3116	0C2Ch	2	R	Harmonic distortion I1	23rd	0 to 16383	x0.1%	x	x	○	○	○	○	△	△	△	△	△	△	△	△	△	△
3117	0C2Dh	2	R	Harmonic distortion I2	23rd	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	△	△	△	△	△	△	△	△	△	△
3118	0C2Eh	2	R	Harmonic distortion I3	23rd	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3119	0C2Fh	2	R	Harmonic distortion IN	23rd	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△
3120	0C30h	2	R	Harmonic distortion I1	25th	0 to 16383	x0.1%	x	x	○	○	○	○	△	△	△	△	△	△	△	△	△	△
3121	0C31h	2	R	Harmonic distortion I2	25th	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	△	△	△	△	△	△	△	△	△	△
3122	0C32h	2	R	Harmonic distortion I3	25th	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3123	0C33h	2	R	Harmonic distortion IN	25th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△
3124	0C34h	2	R	Harmonic distortion I1	27th	0 to 16383	x0.1%	x	x	○	○	○	○	△	△	△	△	△	△	△	△	△	△
3125	0C35h	2	R	Harmonic distortion I2	27th	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	△	△	△	△	△	△	△	△	△	△
3126	0C36h	2	R	Harmonic distortion I3	27th	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3127	0C37h	2	R	Harmonic distortion IN	27th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△
3128	0C38h	2	R	Harmonic distortion I1	29th	0 to 16383	x0.1%	x	x	○	○ (Note1)	○	○	△	△	△	△	△	△	△	△	△	△
3129	0C39h	2	R	Harmonic distortion I2	29th	0 to 16383	x0.1%	x	x	○	○	△	△	△	△	△	△	△	△	△	△	△	△
3130	0C3Ah	2	R	Harmonic distortion I3	29th	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3131	0C3Bh	2	R	Harmonic distortion IN	29th	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△
3132	0C3Ch	2	R	Harmonic distortion I1	31st	0 to 16383	x0.1%	x	x	○	○	○	○	△	△	△	△	△	△	△	△	△	△
3133	0C3Dh	2	R	Harmonic distortion I2	31st	0 to 16383	x0.1%	x	x	○	○ (Note1)	△	△	△	△	△	△	△	△	△	△	△	△
3134	0C3Eh	2	R	Harmonic distortion I3	31st	0 to 16383	x0.1%	x	x	○	○	○	△	△	△	△	△	△	△	△	△	△	△
3135	0C3Fh	2	R	Harmonic distortion IN	31st	0 to 16383	x0.1%	x	x	○	△	△	△	△	△	△	△	△	△	△	△	△	△

Note 1: 3P3W_3CT setting only. In case of 3P3W_2CT setting, it is △(Reserved).

(12) Harmonics Voltage (L-N) r.m.s. Maximum Registers (0x0D00)

Register Address		Byte Count	R/W *1	Register Name			RANGE *2	Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
									3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																							
3328	0D00h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3329	0D01h	2	R	Harmonics value V(L-N)	1st	Max.	0 to 16383	V	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3330	0D02h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3331	0D03h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3332	0D04h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3333	0D05h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3334	0D06h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3335	0D07h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		

(13) Harmonics Voltage (L-L) r.m.s. Maximum Registers (0x0E00)

Register Address		Byte Count	R/W *1	Register Name			RANGE *2	Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
									3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																							
3584	0E00h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3585	0E01h	2	R	Harmonics value V(L-L)	1st	Max.	0 to 16383	V	△	○	△	○	○	○	△	○	○	○	△	△	△	△		
3586	0E02h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3587	0E03h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3588	0E04h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3589	0E05h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3590	0E06h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3591	0E07h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		

(14) Harmonics Current r.m.s. Maximum Registers (0x0F00)

Register Address		Byte Count	R/W *1	Register Name			RANGE *2	Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
Dec.	Hex.							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W			
3840	0F00h	2	R	Harmonics value current	Total	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	○*4	○*4	○*4	○*4		
3841	0F01h	2	R	Harmonics value current	1st	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3842	0F02h	2	R	Harmonics value current	3rd	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3843	0F03h	2	R	Harmonics value current	5th	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3844	0F04h	2	R	Harmonics value current	7th	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3845	0F05h	2	R	Harmonics value current	9th	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3846	0F06h	2	R	Harmonics value current	11th	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3847	0F07h	2	R	Harmonics value current	13th	Max.	0 to 16383	A	○	○	○	○	○	○	○	○	○	○	△	△	△	△		
3848	0F08h	2	R	Harmonics value current	15th	Max.	0 to 16383	A	△	△	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
3849	0F09h	2	R	Harmonics value current	17th	Max.	0 to 16383	A	△	△	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
3850	0F0Ah	2	R	Harmonics value current	19th	Max.	0 to 16383	A	△	△	○	○	○	○	○*4	○*4	○*4	○*4	△	△	△	△		
3851	0F0Bh	2	R	Harmonics value current	21st	Max.	0 to 16383	A	△	△	○	○	○	○	△	△	△	△	△	△	△	△		
3852	0F0Ch	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3853	0F0Dh	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3854	0F0Eh	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3855	0F0Fh	2	R	Harmonics value neutral current	Total	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
3856	0F10h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3857	0F11h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3858	0F12h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3859	0F13h	2	R	Harmonics value neutral current	1st	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3860	0F14h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3861	0F15h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3862	0F16h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3863	0F17h	2	R	Harmonics value neutral current	3rd	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3864	0F18h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3865	0F19h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3866	0F1Ah	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3867	0F1Bh	2	R	Harmonics value neutral current	5th	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3868	0F1Ch	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3869	0F1Dh	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3870	0F1Eh	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3871	0F1Fh	2	R	Harmonics value neutral current	7th	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3872	0F20h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3873	0F21h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3874	0F22h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3875	0F23h	2	R	Harmonics value neutral current	9th	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3876	0F24h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3877	0F25h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3878	0F26h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3879	0F27h	2	R	Harmonics value neutral current	11th	Max.	0 to 16383	A	○	△	○	△	△	△	○	△	△	△	△	△	△	△		
3880	0F28h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3881	0F29h	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		

Register Address		Byte Count	R/W *1	Register Name			RANGE *2	Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
Dec.	Hex.							3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W			
3882	0F2Ah	2	R	Reserved			-	-	△	△	△	△	△	△	△	△	△	△	△	△	△	△		
3883	0F2Bh	2	R	Harmonics value neutral current	13th	Max.	0 to 16383	A	○	△	○	△	△	△	△	△	△	△	△	△	△	△		
3884	0F2Ch								x	x	x	x	x	x	x	x	x	x	x	x	x	x		
...	...								x	x	x	x	x	x	x	x	x	x	x	x	x	x		
3917	0F4Dh								x	x	x	x	x	x	x	x	x	x	x	x	x	x		
3918	0F4Eh	2	R	Harmonics value current	23th	Max.	0 to 16383	A	x	x	○	○	○	○	△	△	△	△	△	△	△	△		
3919	0F4Fh	2	R	Harmonics value current	25th	Max.	0 to 16383	A	x	x	○	○	○	○	△	△	△	△	△	△	△	△		
3920	0F50h	2	R	Harmonics value current	27th	Max.	0 to 16383	A	x	x	○	○	○	○	△	△	△	△	△	△	△	△		
3921	0F51h	2	R	Harmonics value current	29th	Max.	0 to 16383	A	x	x	○	○	○	○	△	△	△	△	△	△	△	△		
3922	0F52h	2	R	Harmonics value current	31st	Max.	0 to 16383	A	x	x	○	○	○	○	△	△	△	△	△	△	△	△		
3923	0F53h	2	R	Harmonics value neutral current	15th	Max.	0 to 16383	A	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
3924	0F54h	2	R	Harmonics value neutral current	17th	Max.	0 to 16383	A	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
3925	0F55h	2	R	Harmonics value neutral current	19th	Max.	0 to 16383	A	x	x	○	△	△	△	○*4	△	△	△	△	△	△	△		
3926	0F56h	2	R	Harmonics value neutral current	21st	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3927	0F57h	2	R	Harmonics value neutral current	23rd	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3928	0F58h	2	R	Harmonics value neutral current	25th	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3929	0F59h	2	R	Harmonics value neutral current	27th	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3930	0F5Ah	2	R	Harmonics value neutral current	29th	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3931	0F5Bh	2	R	Harmonics value neutral current	31st	Max.	0 to 16383	A	x	x	○	△	△	△	△	△	△	△	△	△	△	△		
3932	0F5Ch	2	R	Harmonics value current (Total) Max. value occurrence time (Year, Month)			16h...99h+01h...12h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x		
3933	0F5Dh	2	R	Harmonics value current (Total) Max. value occurrence time (Day, Hour)			01h...31h+00h...23h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x		
3934	0F5Eh	2	R	Harmonics value current (Total) Max. value occurrence time (Minute,Second)			00h...59h+00h...59h	-	x	x	○*7	○*7	○*7	○*7	○*7	○*7	○*7	○*7	x	x	x	x		

(15) Harmonics Voltage (L-N) THD/ Distortion ratio Maximum Registers (0x1000)

Resister Address		Byte Count	R/W *1	Register Name		RANGE *2		Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
									3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
Dec.	Hex.																							
4096	1000h	2	R	THD Voltage L-N	Total	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	○*4	△	△	△		
4097	1001h	2	R	Harmonic distortion Voltage(L-N)	3rd	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4098	1002h	2	R	Harmonic distortion Voltage(L-N)	5th	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4099	1003h	2	R	Harmonic distortion Voltage(L-N)	7th	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4100	1004h	2	R	Harmonic distortion Voltage(L-N)	9th	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4101	1005h	2	R	Harmonic distortion Voltage(L-N)	11th	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4102	1006h	2	R	Harmonic distortion Voltage(L-N)	13th	Max.	0 to 16383	x0.1%	○	△	○	△	△	△	○	△	△	△	△	△	△	△	△	
4103	1007h	2	R	Harmonic distortion Voltage(L-N)	15th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△	△	
4104	1008h	2	R	Harmonic distortion Voltage(L-N)	17th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△	△	
4105	1009h	2	R	Harmonic distortion Voltage(L-N)	19th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	○*4	△	△	△	△	△	△	△	△	
4106	100Ah	2	R	Harmonic distortion Voltage(L-N)	21st	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4107	100Bh	2	R	Harmonic distortion Voltage(L-N)	23rd	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4108	100Ch	2	R	Harmonic distortion Voltage(L-N)	25th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4109	100Dh	2	R	Harmonic distortion Voltage(L-N)	27th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4110	100Eh	2	R	Harmonic distortion Voltage(L-N)	29th	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4111	100Fh	2	R	Harmonic distortion Voltage(L-N)	31st	Max.	0 to 16383	x0.1%	×	×	○	△	△	△	△	△	△	△	△	△	△	△	△	
4112	1010h	2	R	THD Voltage L-N Max. value occurrence time (Year, Month)			16h...99h+01h...12h	-	×	×	○*7	△*7	△*7	△*7	○*7	△*7	△*7	△*7	×	×	×	×		
4113	1011h	2	R	THD Voltage L-N Max. value occurrence time (Day, Hour)			01h...31h+00h...23h	-	×	×	○*7	△*7	△*7	△*7	○*7	△*7	△*7	△*7	×	×	×	×		
4114	1012h	2	R	THD Voltage L-N Max. value occurrence time (Minute,Second)			00h...59h+00h...59h	-	×	×	○*7	△*7	△*7	△*7	○*7	△*7	△*7	△*7	×	×	×	×		

(16) Harmonics Voltage (L-L) THD/ Distortion ratio Maximum Registers (0x1100)

Register Address		Byte Count	R/W *1	Register Name			RANGE *2	Unit	Applicable *3															
									ME96NSR-MB		ME96SSH/SSHA/SSHB-MB				ME96SSR/SSRA/SSRB -MB				ME96SSE/SSEA/SSEB -MB					
									3P4W	3P3W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W	3P4W	3P3W	1P3W	1P2W		
4352	1100h	2	R	THD Voltage L-L	Total	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	○*4	○*4	○*4		
4353	1101h	2	R	Harmonic distortion Voltage(L-L)	3rd	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4354	1102h	2	R	Harmonic distortion Voltage(L-L)	5th	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4355	1103h	2	R	Harmonic distortion Voltage(L-L)	7th	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4356	1104h	2	R	Harmonic distortion Voltage(L-L)	9th	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4357	1105h	2	R	Harmonic distortion Voltage(L-L)	11th	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4358	1106h	2	R	Harmonic distortion Voltage(L-L)	13th	Max.	0 to 16383	x0.1%	Δ	○	Δ	○	○	○	Δ	○	○	○	Δ	Δ	Δ	Δ		
4359	1107h	2	R	Harmonic distortion Voltage(L-L)	15th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ		
4360	1108h	2	R	Harmonic distortion Voltage(L-L)	17th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ		
4361	1109h	2	R	Harmonic distortion Voltage(L-L)	19th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	○*4	○*4	○*4	Δ	Δ	Δ	Δ		
4362	110Ah	2	R	Harmonic distortion Voltage(L-L)	21st	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4363	110Bh	2	R	Harmonic distortion Voltage(L-L)	23rd	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4364	110Ch	2	R	Harmonic distortion Voltage(L-L)	25th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4365	110Dh	2	R	Harmonic distortion Voltage(L-L)	27th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4366	110Eh	2	R	Harmonic distortion Voltage(L-L)	29th	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4367	110Fh	2	R	Harmonic distortion Voltage(L-L)	31st	Max.	0 to 16383	x0.1%	x	x	Δ	○	○	○	Δ	Δ	Δ	Δ	Δ	Δ	Δ	Δ		
4368	1110h	2	R	THD Voltage L-L Max. value occurrence time (Year, Month)			16h...99h+01h...12h	-	x	x	Δ*7	○*7	○*7	○*7	Δ*7	○*7	○*7	○*7	x	x	x	x		
4369	1111h	2	R	THD Voltage L- L Max. value occurrence time (Day, Hour)			01h...31h+00h...23h	-	x	x	Δ*7	○*7	○*7	○*7	Δ*7	○*7	○*7	○*7	x	x	x	x		
4370	1112h	2	R	THD Voltage L- L Max. value occurrence time (Minute,Second)			00h...59h+00h...59h	-	x	x	Δ*7	○*7	○*7	○*7	Δ*7	○*7	○*7	○*7	x	x	x	x		

7.2 Data of Setup Registers

In details of setting data and setting ranges, please refer each user's manuals.

When a data in the write multiple registers (10H) is 8000H or 80000000H, the setting of the address is skipped. In case of collective setting, use as the unset address.

(1) Phase Wiring

Phase wiring	Data
1P2W	0001H
1P3W_1N3	0002H
3P3W_2CT	0003H
3P4W	0004H
1P3W_1N2	0005H
3P3W_3CT	0006H

(2) Primary Voltage value (L-L)

The set value is the data in which the voltage value is converted into 4 bytes. (When the setup voltage is 6600 V, the set value is 6600(000019C8h).)

(a) 3P4W

Use the (2)primary voltage value (L-N).

(b) 3P3W_2CT, 3P3W_3CT

If setting value is a direct voltage value (Ex. 110 V, 220 V or 440 V), it is set "Direct input", and set the primary voltage which is transmitted as the direct input voltage. In other case, it is set "With VT".

(c) 1P3W

110 V or 220 V is valid only.

(3) Primary Voltage Value (L-N)

The set value is the data in which the 10 times voltage value is converted into 4 bytes. (When the setup voltage is 63.5 V, the set value is 635 (0000027Bh).)

(a) 3P4W

If setting value is a direct voltage value (Ex. 63.5 V, 100 V, 110 V, 220 V, 230 V, 240 V, 254 V or 277 V), it is set "Direct input", and set the primary voltage which is transmitted as the direct input voltage. In other case, it is set "With VT".

(b) 3P3W_2CT, 3P3W_3CT, 1P3W or 1P2W

Use the (2)primary voltage value (L-L).

(4) Secondary Voltage Value

The set value is the data in which the 10 times voltage value is converted into 4 bytes. (When the setup voltage is 63.5V, the set value is 635 (0000027Bh).)

(a) 3P4W, 3P3W_2CT, 3P3W_3CT, or 1P2W

About setting range, please refer to each user's manuals.

In case of 3P4W, set the voltage of L-N. In case of 3P3W_2CT or 3P3W_3CT, set the voltage of L-L. If the setting of ME96 is "Direct voltage", the setting is changed "With VT" and set the secondary voltage. Furthermore, the setting of the primary voltage is changed to the initial value or the previous value.

(b) 1P3W

It cannot set. If monitored, the data is the 10 times of the primary voltage.

(5) Primary Current Value

The set value is the data in which the 10 times current value is converted into 4 bytes. (When the setup current is 7.5 A, the set value is 75 (0000004Bh).)

(6) Secondary Current Value

The set value is the data in which the current value is converted into 4 bytes. (When the setup current is 5 A, the set value is 5 (00000005h).)

(7) Time Constant for Current Demand

The set value is the data in which the second unit value is converted into 2 bytes. (When the setup time is 2 min, the set value is 120 (0078h).)

(8) Interval Time Constant, Subinterval Time Constant

The set value is the data in which the minute unit value is converted into 2 bytes. (When the setup time is 15 min, the set value is 15 (000Fh).)

When the interval time constant is changed, the subinterval time constant is changed to 1 min. When the subinterval is changed, if the interval time constant cannot be divided by subinterval time constant, it will be the error of illegal data value.

(9) Frequency

The set value is the data in which the frequency value is converted into 2 bytes. (When the setup time is 50 Hz, the set value is 50 (0032h).)

(10) Multiplying factors (Register address 02EFh, 02F2h to 02FAh, 0436h)

These are multiplying factors of the current, voltage, power, energy, power factor, frequency, current THD, voltage THD, energy (extended) and current/voltage unbalance. The data of powers of 10 ("n" of [x10ⁿ]) is converted into 2 bytes. The data of negative number is expressed a two's complement. Multiplying the measuring data by [10ⁿ] gives the actual value.

(11) Model codes

The following table lists the model codes

Type	Data
ME96SSE-MB	0212h
ME96SSR-MB	0213h
ME96SSH-MB	0214h
ME96SSEA-MB	0215h
ME96SSRA-MB	0216h
ME96SSHA-MB	0217h
ME96SSEB-MB	0219h
ME96SSRB-MB	021Ah
ME96SSHB-MB	021Bh

(12) 16 Bits Set/Reset Register 1

Bit	Data		
	Content	ON(1)	OFF(0)
b0	Reset of all alarm	executed	-
b1	Reset of all energy(Note1) and all max/min value(Note2)	executed	-
b2	Reset of all max/min value(Note2)	executed	-
b3	Unusable	-	-
b4	Set of digital output 1 (DO1) (Note3)	Set	Reset
b5	Set of digital output 2 (DO2) (Note3)	Set	Reset
b6	Unusable	-	-
b7	Unusable	-	-
b8	Reset of all digital input (DI) latch (Note3)	executed	-
b9	Unusable	-	-
b10	Unusable	-	-
b11	Unusable	-	-
b12	Unusable	-	-
b13	Unusable	-	-
b14	Reset of all energy(Note1)	executed	-
b15	Unusable	-	-

Note1: Periodic active energy (period 1/2/3) and CO2 equivalent are not reset. Active energy (import/export), reactive energy (import(LEAD/LAG) /export(LEAD/LAG)), apparent energy and operating time are reset.

Note2: Maximum value of rolling demand power is not reset.

Note3: Depending on the used option, it becomes "Unusable".

(13) 16 Bits Set/Reset Register 2

Bit	Data		
	Content	ON(1)	OFF(0)
b0	Select of periodic active energy (period 1) (Note1)	Select	Cancel
b1	Select of periodic active energy (period 2) (Note1)	Select	Cancel
b2	Select of periodic active energy (period 3) (Note1)	Select	Cancel
b3	Unusable	-	-
b4	Reset of periodic active energy (period 1)	executed	-
b5	Reset of periodic active energy (period 2)	executed	-
b6	Reset of periodic active energy (period 3)	executed	-
b7	Unusable	-	-
b8	Reset of maximum value of rolling demand power	executed	-
b9	Reset of CO2 equivalent	executed	-
b10	Unusable	-	-
b11	Unusable	-	-
b12	Unusable	-	-
b13	Unusable	-	-
b14	Restart of rolling demand calculation	executed	-
b15	Unusable	-	-

Note1: When the bit in on(1), the active energy (import) is add to the active energy (period n). (where n= 1, 2, 3)

Note 2. Depending on the model, there are unused bits. Refer to the each user's manual for supported functions.

(14) 16 Bits Register for Alarm Monitor 1

Bit	Data		
	Content	ON(1)	OFF(0)
b0	Digital input 1 (DI1) (Note1)	ON	OFF
b1	Digital input 2 (DI2) (Note1)	ON	OFF
b2	Digital input 3 (DI3) (Note1)	ON	OFF
b3	Digital input 4 (DI4) (Note1)	ON	OFF
b4	Digital input 5 (DI5) (Note1)	ON	OFF
b5	Alarm (total)	Alarm	Non-Alarm
b6	Alarm of Demand current (Note2)	Alarm	Non-Alarm
b7	Alarm of Rolling Demand (W/var/VA) (Note3)	Alarm	Non-Alarm
b8	Alarm of Voltage (Note2)	Alarm	Non-Alarm
b9	Alarm of Current (Note2)	Alarm	Non-Alarm
b10	Alarm of Active power (Note2)	Alarm	Non-Alarm
b11	Alarm of Reactive power (Note2)	Alarm	Non-Alarm
b12	Alarm of Frequency	Alarm	Non-Alarm
b13	Alarm of Power factor (Note2)	Alarm	Non-Alarm
b14	Alarm of T.H.D (Voltage) (Note2)	Alarm	Non-Alarm
b15	Alarm of Harmonics current (Note2)	Alarm	Non-Alarm

Note1: Depending on the used option, it becomes "Unusable".

Note2: For the alarm judging items, refer to the next page.

Note3: ME96NSR-MB is non-applicable.

(15) 16 Bits Register for Alarm Monitor 2

Bit	Data		
	Content	ON(1)	OFF(0)
b0	Upper limit alarm of current (phase 1)	Alarm	Non-Alarm
b1	Upper limit alarm of current (phase 2)	Alarm	Non-Alarm
b2	Upper limit alarm of current (phase 3)	Alarm	Non-Alarm
b3	Upper limit alarm of current (phase N)	Alarm	Non-Alarm
b4	Upper limit alarm of current (total) (Note1)	Alarm	Non-Alarm
b5	Lower limit alarm of current (total) (Note1)	Alarm	Non-Alarm
b6	Upper limit alarm of L-L voltage (total)	Alarm	Non-Alarm
b7	Lower limit alarm of L-L voltage (total)	Alarm	Non-Alarm
b8	Upper limit alarm of L-N voltage (1-N)	Alarm	Non-Alarm
b9	Upper limit alarm of L-N voltage (2-N)	Alarm	Non-Alarm
b10	Upper limit alarm of L-N voltage (3-N)	Alarm	Non-Alarm
b11	Upper limit alarm of L-N voltage (total)	Alarm	Non-Alarm
b12	Lower limit alarm of L-N voltage (1-N)	Alarm	Non-Alarm
b13	Lower limit alarm of L-N voltage (2-N)	Alarm	Non-Alarm
b14	Lower limit alarm of L-N voltage (3-N)	Alarm	Non-Alarm
b15	Lower limit alarm of L-N voltage (total)	Alarm	Non-Alarm

Note1: For the alarm judging items, refer to the follows.

■ Alarm judging items of each phase wiring is shown as follows.

Upper/lower limit alarm element	Monitored phase			
	3P4W	3P3W(3CT,2CT)	1P3W(1N2)	1P3W(1N3)
Upper limit current, current demand	1, 2, 3	1, 2, 3	1, N, 2	1, N, 3
Lower limit current, current demand	1, 2, 3	1, 2, 3	1, 2	1, 3
Upper limit N-phase current, N-phase current demand	N	—	—	—
Lower limit N-phase current, N-phase current demand	N	—	—	—
Upper limit voltage (L-L) (Note 1)	12, 23, 31	12, 23, 31	1N, 2N, 12	1N, 3N, 13
Lower limit voltage (L-L) (Note 1)	12, 23, 31	12, 23, 31	1N, 2N, 12	1N, 3N, 13
Upper limit voltage (L-N)	1N, 2N, 3N	—	—	—
Lower limit voltage (L-N)	1N, 2N, 3N	—	—	—
Upper limit active power, reactive power, power factor	Total	Total	Total	Total
Lower limit active power, reactive power, power factor	Total	Total	Total	Total
Upper limit frequency	1N	12	1N	1N
Lower limit frequency	1N	12	1N	1N
Harmonic current total RMS value	1, 2, 3	1, 2, 3 (note 2)	1, 2	1, 3
Harmonic current total RMS value N-phase	N	—	—	—
Harmonic voltage total distortion ratio	1N, 2N, 3N	12, 23	1N, 2N	1N, 3N
Upper limit rolling demand	Total	Total	Total	Total

Note1: For phase 12 (or phase 31) at 1-phase 3-wire, alarm monitoring is executed using a value that is two times the set upper/lower limit alarm value.

Note2: Only 3P3W (3CT) is measured for the phase 2 harmonic current.

(16) 16 Bits Register for Alarm Monitor 3

Bit	Data		
	Content	ON(1)	OFF(0)
b0	Unusable	-	-
b1	Unusable	-	-
b2	Unusable	-	-
b3	Unusable	-	-
b4	Unusable	-	-
b5	Unusable	-	-
b6	Upper limit alarm of current unbalance	Alarm	Non-Alarm
b7	Upper limit alarm of voltage unbalance	Alarm	Non-Alarm
b8	Unusable	-	-
b9	Unusable	-	-
b10	Unusable	-	-
b11	Unusable	-	-
b12	Unusable	-	-
b13	Unusable	-	-
b14	Unusable	-	-
b15	Unusable	-	-

(17) Current time

When setting the current time of Logging unit or ME96, specify that the register address is 1030(0406h) and the write points is 3.

When a data of current time in the write multiple registers (10H) is 80000000H, the setting is not skipped.

Ex) When Logging unit time of ME-0000BU-SS96 is "October 23, 2016 02:34:56, the monitor data are follows.

Resister Address		Byte Count	R/W	Register Name	Data(Hex) *1
Dec.	Hex.				
1030	0406h	2	R/W	Current time (Year,Month)	16 10
1031	0407h	2	R/W	Current time (Day,Hour)	23 02
1032	0408h	2	R/W	Current time (Minute,Second)	34 56

*1 Data of logging unit current time are BCD code.

Note: Current time is 0 reply when no-installed logging unit and unused the built-in logging function.

(18) MAC Address

When monitoring MAC Address, specify that the register address is 1066(042Ah) and the read points is 4.

Ex) When MAC Address of ME-0000MT-SS96 is 00:26:92:FF:6F:A9, the monitor data are follows.

Resister Address		Byte Count	R/W	Register Name	Data(Hex)
Dec.	Hex.				
1066	042Ah	4	R	MAC Address (1,2 octet)	00 00 00 26
1068	042Ch	4	R	MAC Address (3 to 6 octet)	92 FF 6F A9

(19) IP Address/Subnet mask/Default gateway

When a data of IP Address/Subnet mask/Default gateway in the write multiple registers (10H) is 80000000H, the setting is not skipped.

Ex) When IP Address is 192.168.3.10, the monitor/setting data are follows.

Resister Address		Byte Count	R/W	Register Name	Data(Hex)
Dec.	Hex.				
1070	042Eh	4	R/W	IP Address	C0 A8 03 0A

(20) Upper/Lower limit alarm item/value

The following table lists alarm items and its corresponding data.

Refer to the each user's manual about the alarm value in details.

Items	Alarm item		Alarm value	
	Data		RANGE	Unit
	Dec.	Hex.		
non	0	00h	-	-
Current upper limit	1	01h	50 to 1200	x0.1%
Current lower limit	2	02h	30 to 950	x0.1%
Neutral current upper limit	3	03h	50 to 1200	x0.1%
Current demand upper limit	9	09h	50 to 1200	x0.1%
Current demand lower limit	10	0Ah	30 to 950	x0.1%
Neutral current demand upper limit	11	0Bh	50 to 1200	x0.1%
Voltage (L-L) upper limit	17	11h	250 to 1350	x0.1%
Voltage (L-L) lower limit	18	12h	200 to 950	x0.1%
Voltage (L-N) upper limit	19	13h	250 to 1350	x0.1%
Voltage (L- N) lower limit	20	14h	200 to 950	x0.1%
Active power upper limit	21	15h	-950 to 1200	x0.1%
Active power lower limit	22	16h	-1200 to 950	x0.1%
Rolling demand (W) (Last) upper limit	23	17h	50 to 1200	x0.1%
Rolling demand (W) (Present) upper limit	39	27h	50 to 1200	x0.1%
Rolling demand (W) (Predict) upper limit	42	2Ah	50 to 1200	x0.1%
Reactive power upper limit	25	19h	-950 to 1200	x0.1%
Reactive power lower limit	26	1Ah	-1200 to 950	x0.1%
Rolling demand (var) (Last) upper limit	35	23h	50 to 1200	x0.1%
Rolling demand (var) (Present) upper limit	40	28h	50 to 1200	x0.1%
Rolling demand (var) (Predict) upper limit	43	2Bh	50 to 1200	x0.1%
Rolling demand (VA) (Last) upper limit	36	24h	50 to 1200	x0.1%
Rolling demand (VA) (Present) upper limit	41	29h	50 to 1200	x0.1%
Rolling demand (VA) (Predict) upper limit	44	2Ch	50 to 1200	x0.1%
Power factor upper limit	27	1Bh	-50 to 1000 to 50	x0.1%
Power factor lower limit	28	1Ch	-50 to 1000 to 50	x0.1%
Frequency upper limit	29	1Dh	450 to 650	x0.1 Hz
Frequency lower limit	30	1Eh	450 to 650	x0.1 Hz
Harmonics current upper limit	31	1Fh	10 to 1200	x0.1%
Neutral harmonics current upper limit	33	21h	10 to 1200	x0.1%
THD voltage upper limit	32	20h	5 to 200	x0.1%
Current unbalance upper limit	37	25h	100 to 9900	x0.01%
Voltage unbalance upper limit	38	26h	100 to 9900	x0.01%

7.3 Multiplying Factor

Conditions of multiplying factor by setup of each element are shown below.

Element	Unit	Condition	Multiplying factor *3	Address		
				Address	Data	
Voltage Harmonics voltage (1P2W, 1P3W, 3P3W, 3P4W(L-N))	V	Primary voltage *1	less than 440V	x0.1	755(02F3h)	-1
			440 V or more and less than 3300 V	x1		0
			3300 V or more and less than 113.7 kV	x10		1
			113.7 kV or more	x100		2
Voltage Harmonics voltage (3P4W(L-L))	V	Primary voltage (L-L)	less than 440 V	x0.1	751(02EFh)	-1
			440V or more and less than 3300 V	x1		0
			3300V or more and less than 113.7 kV	x10		1
			113.7 kV or more	x100		2
Current Current demand Harmonics current	A	Primary current	less than 40 A	x0.01	754(02F2h)	-2
			40 A or more and less than 400 A	x0.1		-1
			400 A or more and less than 4000 A	x1		0
			4000 A or more	x10		1
Active power Reactive power Apparent power Rolling demand power (kW/kvar/kVA)	kW kvar kVA	Total load power *2	0 kW or more and less than 1.2 kW	x0.0001	756(02F4h)	-4
			1.2 kW or more and less than 12 kW	x0.001		-3
			12 kW or more and less than 120 kW	x0.01		-2
			120 kW or more and less than 1200 kW	x0.1		-1
			1200 kW or more and less than 12000 kW	x1		0
			12000 kW or more and less than 120000 kW	x10		1
Active energy Reactive energy Apparent energy CO2 equivalent	kWh kvarh kVAh kg	Total load power *2	0 kW or more and less than 10 kW	x0.01	757(02F5h)	-2
			10 kW or more and less than 100 kW	x0.1		-1
			100 kW or more and less than 1000 kW	x1		0
			1000 kW or more and less than 10000 kW	x10		1
			10000 kW or more and less than 100000 kW	x100		2
			100000 kW or more	x1000		3
Active energy (extended) Reactive energy (extended)	kWh kvarh	Total load power *2	0 kW or more and less than 10 kW	x0.00001	762(02FAh)	-5
			10 kW or more and less than 100 kW	x0.0001		-4
			100 kW or more and less than 1000 kW	x0.001		-3
			1000 kW or more and less than 10000 kW	x0.01		-2
			10000 kW or more and less than 100000 kW	x0.1		-1
			100000 kW or more	x1		0
Power factor	%	-	-	x0.1	758(02F6h)	-1
Frequency	Hz	-	-	x0.1	759(02F7h)	-1
Harmonics distortion (Current)	%	-	-	x0.1	760(02F8h)	-1
Harmonics distortion (Voltage)	%	-	-	x0.1	761(02F9h)	-1
Active energy (unit: Wh fixed) Reactive energy (unit: varh fixed) Apparent energy (unit: VA fixed)	Wh varh VAh	-	-	x1	-	-
Active energy (unit: kWh fixed) Reactive energy (unit: kvarh fixed) Apparent energy (unit: kVA fixed)	kWh kvarh kVAh	-	-	x1	-	-

Element	Unit	Condition		Multiplying factor *3	Address	
					Address	Data
Active energy (unit: MWh fixed)	MWh Mvarh MVAh	-	-	x1	-	-
Reactive energy (unit: Mvarh fixed)						
Apparent energy (unit: MVA fixed)						
Operating time	h	-	-	x1	-	-
Current/Voltage unbalance	%	-	-	x0.01	1078(0436h)	-2

*1: When 3P4W, it is L-N voltage.

*2: How to calculate primary rated power is the as follows.

$$\text{Total rated power [kW]} = \frac{\alpha \times (\text{Primary voltage}) \times (\text{Primary current})}{1000}$$

Phase wiring	α	Note
1P2W	$\alpha=1$	
1P3W	$\alpha=2$	Primary voltage is L-N voltage.
3P3W	$\alpha=1.732$	
3P4W	$\alpha=3$	Primary voltage is L-N voltage.

*3: ME96NSR-MB is non-applicable.

7.4 Specifications of built-in logging data

When the built-in logging function of the ME96SSHB-MB / ME96SSRB-MB is enabled, the measured data is stored in the internal memory (nonvolatile memory) as logging data. Alarm data, maximum / minimum value occurrence time, and system log data are also stored as events that occurred in the main unit. The stored data is read out using MODBUS RTU communication.

Note: This function is only for MODBUS RTU. Cannot be used with MODBUS TCP.

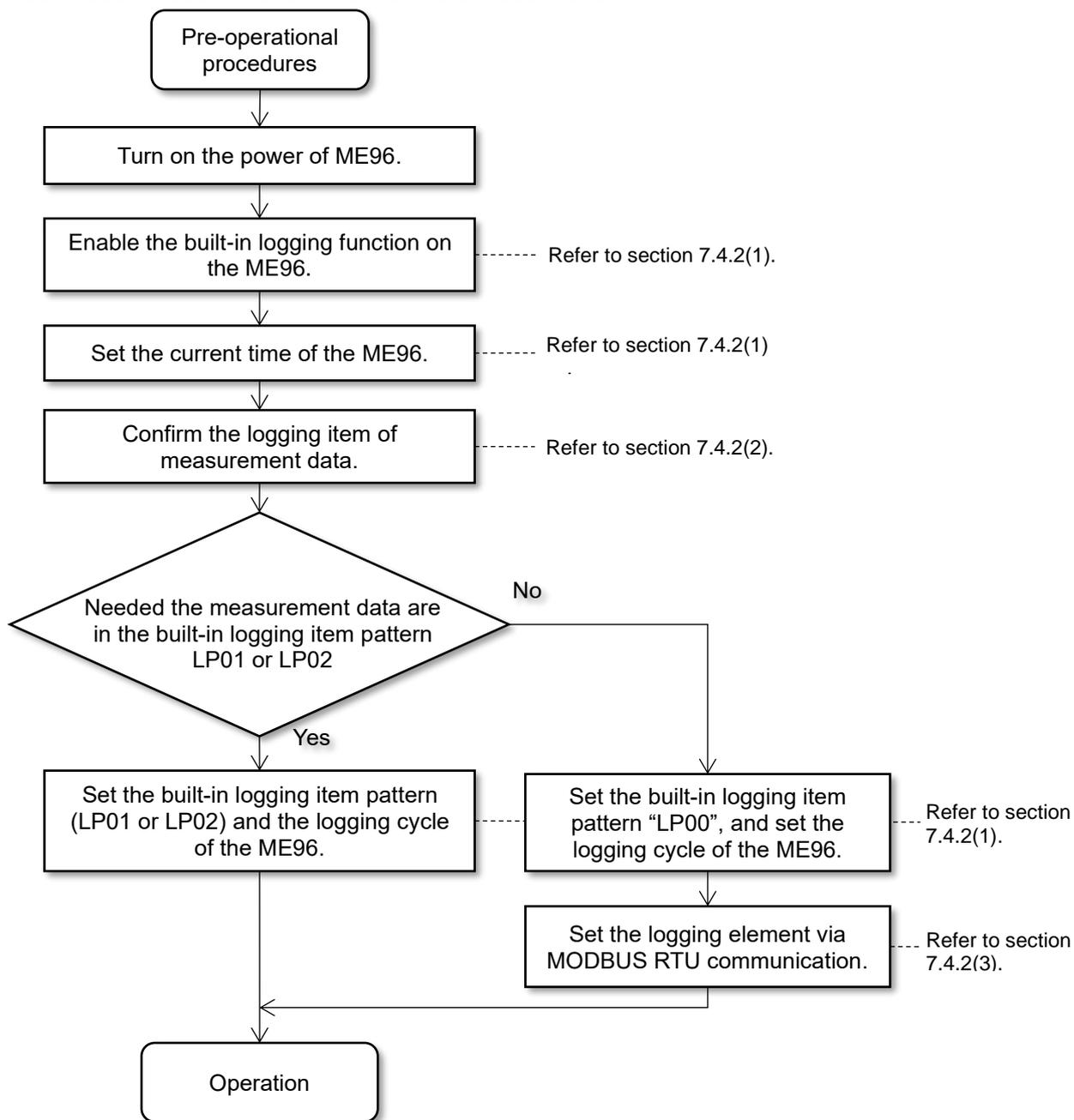
7.4.1 Logging data type

Logging data type	Description				
Measuring data	<p>Measuring data and time data are logged at the interval set at the data logging period. (15 min, 30 min, 60 min)</p> <table border="1"> <tr> <td>Number of logging items</td> <td>Integrated value data: 5 items, Data other than integrated value: 15 items (Total: A maximum of 20 items)</td> </tr> <tr> <td>Internal memory logging period</td> <td>30 days (Logging period: 15 minutes) 60 days (Logging period: 30 minutes) 120 days (Logging period: 60 minutes)</td> </tr> </table> <p>Also, there are registers that can get measurement data at any timing, even outside the logging cycle.</p>	Number of logging items	Integrated value data: 5 items, Data other than integrated value: 15 items (Total: A maximum of 20 items)	Internal memory logging period	30 days (Logging period: 15 minutes) 60 days (Logging period: 30 minutes) 120 days (Logging period: 60 minutes)
Number of logging items	Integrated value data: 5 items, Data other than integrated value: 15 items (Total: A maximum of 20 items)				
Internal memory logging period	30 days (Logging period: 15 minutes) 60 days (Logging period: 30 minutes) 120 days (Logging period: 60 minutes)				
Alarm data	Stores up to 100 records of alarm elements and time data when each alarm occurrence / retention / cancellation event occurs for the alarm elements set on the ME96.				
Max/Min value occurrence time	One record of time data when the maximum or minimum value is updated is stored for each element.				
System log data	Stores up to 100 records of time data when events such as setting changes occur.				

7.4.2 Pre-Operational Procedures and Setting

This section explains the procedures and setting method for built-in logging.. (Only concerned with the setting of built-in logging funtion)

Please read the user's manual in addition to this document.



(1) Setting of current time, built-in logging function, logging-item pattern and logging cycle

Setting of current time, built-in logging function, logging-item pattern and logging cycle are set at the ME96. Please refer the user's manual of ME96.

The current time can also be set from MODBUS RTU. Refer to "7.2(17)Current time".

	<p>When the following settings are changed, the stored measurement data in the built-in logging is deleted. When changing the settings, output the logging data in advance and check that the logging data is stored correctly before changing the settings.</p> <ul style="list-style-type: none"> • Changing the phase wire setting • Built-in logging data clear • Logging element change for built-in logging element pattern P00 • Changing the current time setting exceeding the logging period <p>In addition, when the current time exceeding the logging cycle is changed, processing to complement the data at the corresponding logging time is executed. It becomes 0 when monitoring data of built-in logging is monitored during complement processing. Please try again after a while.</p>
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(2) Built-in logging items

The logging items are grouped as the logging-item pattern (LP01, LP02) at the ME96 in advance. So, it is possible to select the logging item by setting the logging-item pattern. Refer to the below about the logging item. In addition, if there is no logging pattern that you want, select the LP00 to configure the logging item freely.

(a) In case of 3P4W

Data size	Logging-item pattern	LP01	LP02
4byte area	Logging measuring data (Integrated value data) 1	Active energy (import)	Active energy (import)
	Logging measuring data (Integrated value data) 2	Active energy (export)	Active energy (export)
	Logging measuring data (Integrated value data) 3	Reactive energy (import LAG)	Reactive energy (import LAG)
	Logging measuring data (Integrated value data) 4	Reactive energy (import LEAD)	Reactive energy (import LEAD)
	Logging measuring data (Integrated value data) 5	Apparent energy	Apparent energy
2byte area	Logging measuring data (Data other than integrated value) 1	Σ Active power	Σ Active power
	Logging measuring data (Data other than integrated value) 2	Σ Power factor	Σ Power factor
	Logging measuring data (Data other than integrated value) 3	Frequency	Frequency
	Logging measuring data (Data other than integrated value) 4	Σ Reactive power	Average value current
	Logging measuring data (Data other than integrated value) 5	Σ Apparent power	Average value voltage (L-L)
	Logging measuring data (Data other than integrated value) 6	Average value current	Phase 1 current
	Logging measuring data (Data other than integrated value) 7	Average value voltage (L-L)	Phase 2 current
	Logging measuring data (Data other than integrated value) 8	Σ Rolling demand (kW) (Last)	Phase 3 current
	Logging measuring data (Data other than integrated value) 9	Σ Rolling demand (kvar) (Last)	Neutral current
	Logging measuring data (Data other than integrated value) 10	Σ Rolling demand (kVA) (Last)	Voltage V12
	Logging measuring data (Data other than integrated value) 11	Σ Rolling demand (kW) (Max.)	Voltage V23
	Logging measuring data (Data other than integrated value) 12	Σ Rolling demand (kvar) (Max.)	Voltage V31
	Logging measuring data (Data other than integrated value) 13	Σ Rolling demand (kVA) (Max.)	Voltage V1N
	Logging measuring data (Data other than integrated value) 14	Harmonics value I1 (Total)	Voltage V2N
	Logging measuring data (Data other than integrated value) 15	THD V1N (Total)	Voltage V3N

(b) In case of 3P3W_2CT, 3P3W_3CT, 1P3W

Data size	Logging-item pattern	LP01	LP02
4byte area	Logging measuring data (Integrated value data) 1	Active energy (import)	Active energy (import)
	Logging measuring data (Integrated value data) 2	Active energy (export)	Active energy (export)
	Logging measuring data (Integrated value data) 3	Reactive energy (import LAG)	Reactive energy (import LAG)
	Logging measuring data (Integrated value data) 4	Reactive energy (import LEAD)	Reactive energy (import LEAD)
	Logging measuring data (Integrated value data) 5	Apparent energy	Apparent energy
2byte area	Logging measuring data (Data other than integrated value) 1	Σ Active power	Σ Active power
	Logging measuring data (Data other than integrated value) 2	Σ Power factor	Σ Power factor
	Logging measuring data (Data other than integrated value) 3	Frequency	Frequency
	Logging measuring data (Data other than integrated value) 4	Σ Reactive power	Average value current
	Logging measuring data (Data other than integrated value) 5	Σ Apparent power	Average value voltage (L-L)
	Logging measuring data (Data other than integrated value) 6	Average value current	Phase 1 current
	Logging measuring data (Data other than integrated value) 7	Average value voltage (L-L)	Phase 2 current
	Logging measuring data (Data other than integrated value) 8	Σ Rolling demand (kW) (Last)	Phase 3 current
	Logging measuring data (Data other than integrated value) 9	Σ Rolling demand (kvar) (Last)	non
	Logging measuring data (Data other than integrated value) 10	Σ Rolling demand (kVA) (Last)	Voltage V12
	Logging measuring data (Data other than integrated value) 11	Σ Rolling demand (kW) (Max.)	Voltage V23
	Logging measuring data (Data other than integrated value) 12	Σ Rolling demand (kvar) (Max.)	Voltage V31
	Logging measuring data (Data other than integrated value) 13	Σ Rolling demand (kVA) (Max.)	non
	Logging measuring data (Data other than integrated value) 14	Harmonics value I1 (Total)	non
	Logging measuring data (Data other than integrated value) 15	THD V12 (Total)	non

(a) In case of 1P2W

Data size	Logging-item pattern	LP01	LP02
4byte area	Logging measuring data (Integrated value data) 1	Active energy (import)	Active energy (import)
	Logging measuring data (Integrated value data) 2	Active energy (export)	Active energy (export)
	Logging measuring data (Integrated value data) 3	Reactive energy (import LAG)	Reactive energy (import LAG)
	Logging measuring data (Integrated value data) 4	Reactive energy (import LEAD)	Reactive energy (import LEAD)
	Logging measuring data (Integrated value data) 5	Apparent energy	Apparent energy
2byte area	Logging measuring data (Data other than integrated value) 1	Σ Active power	Σ Active power
	Logging measuring data (Data other than integrated value) 2	Σ Power factor	Σ Power factor
	Logging measuring data (Data other than integrated value) 3	Frequency	Frequency
	Logging measuring data (Data other than integrated value) 4	Σ Reactive power	non
	Logging measuring data (Data other than integrated value) 5	Σ Apparent power	non
	Logging measuring data (Data other than integrated value) 6	Phase 1 current	Phase 1 current
	Logging measuring data (Data other than integrated value) 7	Voltage V12	non
	Logging measuring data (Data other than integrated value) 8	Σ Rolling demand (kW) (Last)	non
	Logging measuring data (Data other than integrated value) 9	Σ Rolling demand (kvar) (Last)	non
	Logging measuring data (Data other than integrated value) 10	Σ Rolling demand (kVA) (Last)	Voltage V12
	Logging measuring data (Data other than integrated value) 11	Σ Rolling demand (kW) (Max.)	non
	Logging measuring data (Data other than integrated value) 12	Σ Rolling demand (kvar) (Max.)	non
	Logging measuring data (Data other than integrated value) 13	Σ Rolling demand (kVA) (Max.)	non
	Logging measuring data (Data other than integrated value) 14	Harmonics value I1 (Total)	non
	Logging measuring data (Data other than integrated value) 15	THD V12 (Total)	non

(3) Setting method with built-in logging element pattern LP00

When the built-in logging element pattern is LP00, the measurement element to be logged must be specified by communication using MODBUS RTU.

After setting LP00 on the main unit, use the “5.2 Write Multiple Registers (10H)” and set the measurement elements to be logged in the following registers. (After setting, built-in logging of measurement data starts.)

(a) Setting register for built-in logging element

Resister Address		Byte Count	R/W	Register name	Setting data	Unit
Dec.	Hex.					
57424	E050h	2	R/W	Setting for logging measuring data (Integrated value data) 1	Refer to “(i)Integrated value data”	-
57425	E051h	2	R/W	Setting for logging measuring data (Integrated value data) 2		
57426	E052h	2	R/W	Setting for logging measuring data (Integrated value data) 3		
57427	E053h	2	R/W	Setting for logging measuring data (Integrated value data) 4		
57428	E054h	2	R/W	Setting for logging measuring data (Integrated value data) 5		
57429	E055h	2	R/W	Logging measuring data (Data other than integrated value) 1 setting	Refer to “(ii)Data other than integrated value”	-
57430	E056h	2	R/W	Logging measuring data (Data other than integrated value) 2 setting		
57431	E057h	2	R/W	Logging measuring data (Data other than integrated value) 3 setting		
57432	E058h	2	R/W	Logging measuring data (Data other than integrated value) 4 setting		
57433	E059h	2	R/W	Logging measuring data (Data other than integrated value) 5 setting		
57434	E05Ah	2	R/W	Logging measuring data (Data other than integrated value) 6 setting		
57435	E05Bh	2	R/W	Logging measuring data (Data other than integrated value) 7 setting		
57436	E05Ch	2	R/W	Logging measuring data (Data other than integrated value) 8 setting		
57437	E05Dh	2	R/W	Logging measuring data (Data other than integrated value) 9 setting		
57438	E05Eh	2	R/W	Logging measuring data (Data other than integrated value) 10 setting		
57439	E05Fh	2	R/W	Logging measuring data (Data other than integrated value) 11 setting		
57440	E060h	2	R/W	Logging measuring data (Data other than integrated value) 12 setting		
57441	E061h	2	R/W	Logging measuring data (Data other than integrated value) 13 setting		
57442	E062h	2	R/W	Logging measuring data (Data other than integrated value) 14 setting		
57443	E063h	2	R/W	Logging measuring data (Data other than integrated value) 15 setting		

(i) Integrated value data

Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB		
		Dec.	Hex		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W
non		0	0000h	-	○	○	○	○	○	○
Active energy	import	1304	0518h	kWh	○	○	○	○	○	○
Active energy	export	1306	051Ah	kWh	○	○	○	○	○	○
Reactive energy	import LAG	1308	051Ch	kvarh	○	○	○	○	○	○
Reactive energy	export LAG	1310	051Eh	kvarh	○	○	○	○	○	○
Reactive energy	import LEAD	1312	0520h	kvarh	○	○	○	○	○	○
Reactive energy	export LEAD	1314	0522h	kvarh	○	○	○	○	○	○
Apparent energy		1388	056Ch	kVAh	○	○	○	○	○	○
Periodic active energy (Period 1)	import	1374	055Eh	kWh	○	○	○	○	○	○
Periodic active energy (Period 2)	import	1386	056Ah	kWh	○	○	○	○	○	○
Periodic active energy (Period 3)	import	1484	05CCh	kWh	○	○	○	○	○	○
Active energy (unit: Wh fixed)	import	1390	056Eh	Wh	○	○	○	○	○	○
Active energy (unit: Wh fixed)	export	1392	0570h	Wh	○	○	○	○	○	○
Reactive energy (unit: varh fixed)	import LAG	1394	0572h	varh	○	○	○	○	○	○
Reactive energy (unit: varh fixed)	export LAG	1396	0574h	varh	○	○	○	○	○	○
Reactive energy (unit: varh fixed)	import LEAD	1398	0576h	varh	○	○	○	○	○	○
Reactive energy (unit: varh fixed)	export LEAD	1400	0578h	varh	○	○	○	○	○	○
Apparent energy (unit: VAh fixed)		1402	057Ah	VAh	○	○	○	○	○	○
Periodic active energy (Period 1) (unit: Wh fixed)	import	1404	057Ch	Wh	○	○	○	○	○	○
Periodic active energy (Period 2) (unit: Wh fixed)	import	1406	057Eh	Wh	○	○	○	○	○	○
Periodic active energy (Period 3) (unit: Wh fixed)	import	1486	05CEh	Wh	○	○	○	○	○	○
Active energy (unit: kWh fixed)	import	1408	0580h	kWh	○	○	○	○	○	○
Active energy (unit: kWh fixed)	export	1410	0582h	kWh	○	○	○	○	○	○
Reactive energy (unit: kvarh fixed)	import LAG	1412	0584h	kvarh	○	○	○	○	○	○
Reactive energy (unit: kvarh fixed)	export LAG	1414	0586h	kvarh	○	○	○	○	○	○
Reactive energy (unit: kvarh fixed)	import LEAD	1416	0588h	kvarh	○	○	○	○	○	○
Reactive energy (unit: kvarh fixed)	export LEAD	1418	058Ah	kvarh	○	○	○	○	○	○
Apparent energy (unit: kVAh fixed)		1420	058Ch	kVAh	○	○	○	○	○	○
Periodic active energy (Period 1) (unit: kWh fixed)	import	1422	058Eh	kWh	○	○	○	○	○	○
Periodic active energy (Period 2) (unit: kWh fixed)	import	1424	0590h	kWh	○	○	○	○	○	○
Periodic active energy (Period 3) (unit: kWh fixed)	import	1488	05D0h	kWh	○	○	○	○	○	○
Active energy (unit: MWh fixed)	import	1426	0592h	MWh	○	○	○	○	○	○
Active energy (unit: MWh fixed)	export	1428	0594h	MWh	○	○	○	○	○	○
Reactive energy (unit: Mvarh fixed)	import LAG	1430	0596h	Mvarh	○	○	○	○	○	○
Reactive energy (unit: Mvarh fixed)	export LAG	1432	0598h	Mvarh	○	○	○	○	○	○
Reactive energy (unit: Mvarh fixed)	import LEAD	1434	059Ah	Mvarh	○	○	○	○	○	○
Reactive energy (unit: Mvarh fixed)	export LEAD	1436	059Ch	Mvarh	○	○	○	○	○	○
Apparent energy (unit: MVAh fixed)		1438	059Eh	MVAh	○	○	○	○	○	○
Periodic active energy (Period 1) (unit: MWh fixed)	import	1440	05A0h	MWh	○	○	○	○	○	○
Periodic active energy (Period 2) (unit: MWh fixed)	import	1442	05A2h	MWh	○	○	○	○	○	○
Periodic active energy (Period 3) (unit: MWh fixed)	import	1490	05D2h	MWh	○	○	○	○	○	○
Operating time 1		1378	0562h	h	○	○	○	○	○	○
Operating time 2		1380	0564h	h	○	○	○	○	○	○
CO2 equivalent		1476	05C4h	kg	○	○	○	○	○	○
Current unbalance		925	039Dh	x0.01%	○	○	○	○	○	○
Voltage unbalance		927	039Fh	x0.01%	○	○	○	○	○	○

(ii) Data other than integrated value

Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB		
		Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W
non		0	0000h	-	○	○	○	○	○	○
Current	Average value	772	0304h	A	○	○	-	○	○	-
	Phase 1	768	0300h	A	○	○	○	○	○	○
	Phase 2	769	0301h	A	○	○	-	○	○	-
	Phase 3	770	0302h	A	○	○	-	○	○	-
	Neutral	771	0303h	A	○	-	-	○	-	-
Current demand	Average value	777	0309h	A	○	○	-	○	○	-
	Phase 1	773	0305h	A	○	○	○	○	○	○
	Phase 2	774	0306h	A	○	○	-	○	○	-
	Phase 3	775	0307h	A	○	○	-	○	○	-
	Neutral	776	0308h	A	○	-	-	○	-	-
Voltage	Average value (L-N)	785	0311h	V	○	-	-	○	-	-
	V1N	782	030Eh	V	○	-	-	○	-	-
	V2N	783	030Fh	V	○	-	-	○	-	-
	V3N	784	0310h	V	○	-	-	○	-	-
	Average value (L-L)	781	030Dh	V	○	○	-	○	○	-
	V12	778	030Ah	V	○	○	○	○	○	○
	V23	779	030Bh	V	○	○	-	○	○	-
	V31	780	030Ch	V	○	○	-	○	○	-
Σ Active power		794	031Ah	kW	○	○	○	○	○	○
Σ Rolling demand (kW) (Max.)		845	034Dh	kW	○	○	○	○	○	○
Σ Rolling demand (kW) (Last)		798	031Eh	kW	○	○	○	○	○	○
Σ Reactive power		802	0322h	kvar	○	○	○	○	○	○
Σ Rolling demand (kvar) (Max.)		854	0356h	kvar	○	○	○	○	○	○
Σ Rolling demand (kvar) (Last)		807	0327h	kvar	○	○	○	○	○	○
Σ Apparent power		806	0326h	kVA	○	○	○	○	○	○
Σ Rolling demand (kVA) (Max.)		855	0357h	kVA	○	○	○	○	○	○
Σ Rolling demand (kVA) (Last)		808	0328h	kVA	○	○	○	○	○	○
Σ Power factor		789	0315h	x0.1%	○	○	○	○	○	○
Frequency		790	0316h	x0.1 Hz	○	○	○	○	○	○

(Continued on next page.)

Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB			
		Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W	
Current harmonics value	Total	Phase 1	2304	0900h	A	○	○	○	○	○	○
		Phase 2	2305	0901h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2306	0902h	A	○	○	-	○	○	-
		Phase N	2307	0903h	A	○	-	-	○	-	-
	1st	Phase 1	2308	0904h	A	○	○	○	○	○	○
		Phase 2	2309	0905h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2310	0906h	A	○	○	-	○	○	-
		Phase N	2311	0907h	A	○	-	-	○	-	-
	3rd	Phase 1	2312	0908h	A	○	○	○	○	○	○
		Phase 2	2313	0909h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2314	090Ah	A	○	○	-	○	○	-
		Phase N	2315	090Bh	A	○	-	-	○	-	-
	5th	Phase 1	2316	090Ch	A	○	○	○	○	○	○
		Phase 2	2317	090Dh	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2318	090Eh	A	○	○	-	○	○	-
		Phase N	2319	090Fh	A	○	-	-	○	-	-
	7th	Phase 1	2320	0910h	A	○	○	○	○	○	○
		Phase 2	2321	0911h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2322	0912h	A	○	○	-	○	○	-
		Phase N	2323	0913h	A	○	-	-	○	-	-
	9th	Phase 1	2324	0914h	A	○	○	○	○	○	○
		Phase 2	2325	0915h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2326	0916h	A	○	○	-	○	○	-
		Phase N	2327	0917h	A	○	-	-	○	-	-
	11th	Phase 1	2328	0918h	A	○	○	○	○	○	○
		Phase 2	2329	0919h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2330	091Ah	A	○	○	-	○	○	-
		Phase N	2331	091Bh	A	○	-	-	○	-	-
	13th	Phase 1	2332	091Ch	A	○	○	○	○	○	○
		Phase 2	2333	091Dh	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2334	091Eh	A	○	○	-	○	○	-
		Phase N	2335	091Fh	A	○	-	-	○	-	-
	15th	Phase 1	2336	0920h	A	○	○	○	○	○	○
		Phase 2	2337	0921h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2338	0922h	A	○	○	-	○	○	-
		Phase N	2339	0923h	A	○	-	-	○	-	-
	17th	Phase 1	2340	0924h	A	○	○	○	○	○	○
		Phase 2	2341	0925h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2342	0926h	A	○	○	-	○	○	-
		Phase N	2343	0927h	A	○	-	-	○	-	-
	19th	Phase 1	2344	0928h	A	○	○	○	○	○	○
		Phase 2	2345	0929h	A	○	○(*1)	-	○	○(*1)	-
		Phase 3	2346	092Ah	A	○	○	-	○	○	-
		Phase N	2347	092Bh	A	○	-	-	○	-	-
	21st	Phase 1	2348	092Ch	A	○	○	○	-	-	-
		Phase 2	2349	092Dh	A	○	○(*1)	-	-	-	-
		Phase 3	2350	092Eh	A	○	○	-	-	-	-
		Phase N	2351	092Fh	A	○	-	-	-	-	-
23rd	Phase 1	2352	0930h	A	○	○	○	-	-	-	
	Phase 2	2353	0931h	A	○	○(*1)	-	-	-	-	
	Phase 3	2354	0932h	A	○	○	-	-	-	-	
	Phase N	2355	0933h	A	○	-	-	-	-	-	
25th	Phase 1	2356	0934h	A	○	○	○	-	-	-	
	Phase 2	2357	0935h	A	○	○(*1)	-	-	-	-	
	Phase 3	2358	0936h	A	○	○	-	-	-	-	
	Phase N	2359	0937h	A	○	-	-	-	-	-	
27th	Phase 1	2360	0938h	A	○	○	○	-	-	-	
	Phase 2	2361	0939h	A	○	○(*1)	-	-	-	-	
	Phase 3	2362	093Ah	A	○	○	-	-	-	-	
	Phase N	2363	093Bh	A	○	-	-	-	-	-	
29th	Phase 1	2364	093Ch	A	○	○	○	-	-	-	
	Phase 2	2365	093Dh	A	○	○(*1)	-	-	-	-	
	Phase 3	2366	093Eh	A	○	○	-	-	-	-	
	Phase N	2367	093Fh	A	○	-	-	-	-	-	
31st	Phase 1	2368	0940h	A	○	○	○	-	-	-	
	Phase 2	2369	0941h	A	○	○(*1)	-	-	-	-	
	Phase 3	2370	0942h	A	○	○	-	-	-	-	
	Phase N	2371	0943h	A	○	-	-	-	-	-	

*1: Applicable only when 3P3W_3CT.

(Continued on next page.)

Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB			
		Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W	
Current harmonics distortion	Total	Phase 1	3072	0C00h	x0.1%	○	○	○	○	○	○
		Phase 2	3073	0C01h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3074	0C02h	x0.1%	○	○	-	○	○	-
		Phase N	3075	0C03h	x0.1%	○	-	-	○	-	-
	3rd	Phase 1	3076	0C04h	x0.1%	○	○	○	○	○	○
		Phase 2	3077	0C05h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3078	0C06h	x0.1%	○	○	-	○	○	-
		Phase N	3079	0C07h	x0.1%	○	-	-	○	-	-
	5th	Phase 1	3080	0C08h	x0.1%	○	○	○	○	○	○
		Phase 2	3081	0C09h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3082	0C0Ah	x0.1%	○	○	-	○	○	-
		Phase N	3083	0C0Bh	x0.1%	○	-	-	○	-	-
	7th	Phase 1	3084	0C0Ch	x0.1%	○	○	○	○	○	○
		Phase 2	3085	0C0Dh	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3086	0C0Eh	x0.1%	○	○	-	○	○	-
		Phase N	3087	0C0Fh	x0.1%	○	-	-	○	-	-
	9th	Phase 1	3088	0C10h	x0.1%	○	○	○	○	○	○
		Phase 2	3089	0C11h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3090	0C12h	x0.1%	○	○	-	○	○	-
		Phase N	3091	0C13h	x0.1%	○	-	-	○	-	-
	11th	Phase 1	3092	0C14h	x0.1%	○	○	○	○	○	○
		Phase 2	3093	0C15h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3094	0C16h	x0.1%	○	○	-	○	○	-
		Phase N	3095	0C17h	x0.1%	○	-	-	○	-	-
	13th	Phase 1	3096	0C18h	x0.1%	○	○	○	○	○	○
		Phase 2	3097	0C19h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3098	0C1Ah	x0.1%	○	○	-	○	○	-
		Phase N	3099	0C1Bh	x0.1%	○	-	-	○	-	-
	15th	Phase 1	3100	0C1Ch	x0.1%	○	○	○	○	○	○
		Phase 2	3101	0C1Dh	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3102	0C1Eh	x0.1%	○	○	-	○	○	-
		Phase N	3103	0C1Fh	x0.1%	○	-	-	○	-	-
	17th	Phase 1	3104	0C20h	x0.1%	○	○	○	○	○	○
		Phase 2	3105	0C21h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3106	0C22h	x0.1%	○	○	-	○	○	-
		Phase N	3107	0C23h	x0.1%	○	-	-	○	-	-
	19th	Phase 1	3108	0C24h	x0.1%	○	○	○	○	○	○
		Phase 2	3109	0C25h	x0.1%	○	○(*1)	-	○	○(*1)	-
		Phase 3	3110	0C26h	x0.1%	○	○	-	○	○	-
		Phase N	3111	0C27h	x0.1%	○	-	-	○	-	-
	21st	Phase 1	3112	0C28h	x0.1%	○	○	○	-	-	-
		Phase 2	3113	0C29h	x0.1%	○	○(*1)	-	-	-	-
		Phase 3	3114	0C2Ah	x0.1%	○	○	-	-	-	-
		Phase N	3115	0C2Bh	x0.1%	○	-	-	-	-	-
	23rd	Phase 1	3116	0C2Ch	x0.1%	○	○	○	-	-	-
		Phase 2	3117	0C2Dh	x0.1%	○	○(*1)	-	-	-	-
		Phase 3	3118	0C2Eh	x0.1%	○	○	-	-	-	-
		Phase N	3119	0C2Fh	x0.1%	○	-	-	-	-	-
25th	Phase 1	3120	0C30h	x0.1%	○	○	○	-	-	-	
	Phase 2	3121	0C31h	x0.1%	○	○(*1)	-	-	-	-	
	Phase 3	3122	0C32h	x0.1%	○	○	-	-	-	-	
	Phase N	3123	0C33h	x0.1%	○	-	-	-	-	-	
27th	Phase 1	3124	0C34h	x0.1%	○	○	○	-	-	-	
	Phase 2	3125	0C35h	x0.1%	○	○(*1)	-	-	-	-	
	Phase 3	3126	0C36h	x0.1%	○	○	-	-	-	-	
	Phase N	3127	0C37h	x0.1%	○	-	-	-	-	-	
29th	Phase 1	3128	0C38h	x0.1%	○	○	○	-	-	-	
	Phase 2	3129	0C39h	x0.1%	○	○(*1)	-	-	-	-	
	Phase 3	3130	0C3Ah	x0.1%	○	○	-	-	-	-	
	Phase N	3131	0C3Bh	x0.1%	○	-	-	-	-	-	
31st	Phase 1	3132	0C3Ch	x0.1%	○	○	○	-	-	-	
	Phase 2	3133	0C3Dh	x0.1%	○	○(*1)	-	-	-	-	
	Phase 3	3134	0C3Eh	x0.1%	○	○	-	-	-	-	
	Phase N	3135	0C3Fh	x0.1%	○	-	-	-	-	-	

*1: Applicable only when 3P3W_3CT.

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Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB			
		Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W	
Voltage (L-N) harmonics value	Total	Phase 1-N	1792	0700h	V	○	-	-	○	-	-
		Phase 2-N	1793	0701h	V	○	-	-	○	-	-
		Phase 3-N	1794	0702h	V	○	-	-	○	-	-
	1st	Phase 1-N	1795	0703h	V	○	-	-	○	-	-
		Phase 2-N	1796	0704h	V	○	-	-	○	-	-
		Phase 3-N	1797	0705h	V	○	-	-	○	-	-
	3rd	Phase 1-N	1798	0706h	V	○	-	-	○	-	-
		Phase 2-N	1799	0707h	V	○	-	-	○	-	-
		Phase 3-N	1800	0708h	V	○	-	-	○	-	-
	5th	Phase 1-N	1801	0709h	V	○	-	-	○	-	-
		Phase 2-N	1802	070Ah	V	○	-	-	○	-	-
		Phase 3-N	1803	070Bh	V	○	-	-	○	-	-
	7th	Phase 1-N	1804	070Ch	V	○	-	-	○	-	-
		Phase 2-N	1805	070Dh	V	○	-	-	○	-	-
		Phase 3-N	1806	070Eh	V	○	-	-	○	-	-
	9th	Phase 1-N	1807	070Fh	V	○	-	-	○	-	-
		Phase 2-N	1808	0710h	V	○	-	-	○	-	-
		Phase 3-N	1809	0711h	V	○	-	-	○	-	-
	11th	Phase 1-N	1810	0712h	V	○	-	-	○	-	-
		Phase 2-N	1811	0713h	V	○	-	-	○	-	-
		Phase 3-N	1812	0714h	V	○	-	-	○	-	-
	13th	Phase 1-N	1813	0715h	V	○	-	-	○	-	-
		Phase 2-N	1814	0716h	V	○	-	-	○	-	-
		Phase 3-N	1815	0717h	V	○	-	-	○	-	-
	15th	Phase 1-N	1816	0718h	V	○	-	-	○	-	-
		Phase 2-N	1817	0719h	V	○	-	-	○	-	-
		Phase 3-N	1818	071Ah	V	○	-	-	○	-	-
	17th	Phase 1-N	1819	071Bh	V	○	-	-	○	-	-
		Phase 2-N	1820	071Ch	V	○	-	-	○	-	-
		Phase 3-N	1821	071Dh	V	○	-	-	○	-	-
	19th	Phase 1-N	1822	071Eh	V	○	-	-	○	-	-
		Phase 2-N	1823	071Fh	V	○	-	-	○	-	-
		Phase 3-N	1824	0720h	V	○	-	-	○	-	-
	21st	Phase 1-N	1825	0721h	V	○	-	-	-	-	-
		Phase 2-N	1826	0722h	V	○	-	-	-	-	-
		Phase 3-N	1827	0723h	V	○	-	-	-	-	-
	23rd	Phase 1-N	1828	0724h	V	○	-	-	-	-	-
		Phase 2-N	1829	0725h	V	○	-	-	-	-	-
		Phase 3-N	1830	0726h	V	○	-	-	-	-	-
	25th	Phase 1-N	1831	0727h	V	○	-	-	-	-	-
		Phase 2-N	1832	0728h	V	○	-	-	-	-	-
		Phase 3-N	1833	0729h	V	○	-	-	-	-	-
27th	Phase 1-N	1834	072Ah	V	○	-	-	-	-	-	
	Phase 2-N	1835	072Bh	V	○	-	-	-	-	-	
	Phase 3-N	1836	072Ch	V	○	-	-	-	-	-	
29th	Phase 1-N	1837	072Dh	V	○	-	-	-	-	-	
	Phase 2-N	1838	072Eh	V	○	-	-	-	-	-	
	Phase 3-N	1839	072Fh	V	○	-	-	-	-	-	
31st	Phase 1-N	1840	0730h	V	○	-	-	-	-	-	
	Phase 2-N	1841	0731h	V	○	-	-	-	-	-	
	Phase 3-N	1842	0732h	V	○	-	-	-	-	-	

(Continued on next page.)

Logging element			Set data		Unit	ME96SSHB-MB			ME96SSRB-MB		
			Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W
Voltage (L-N) harmonics distortion	Total	Phase 1-N	2560	0A00h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2561	0A01h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2562	0A02h	x0.1%	○	-	-	○	-	-
	3rd	Phase 1-N	2563	0A03h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2564	0A04h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2565	0A05h	x0.1%	○	-	-	○	-	-
	5th	Phase 1-N	2566	0A06h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2567	0A07h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2568	0A08h	x0.1%	○	-	-	○	-	-
	7th	Phase 1-N	2569	0A09h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2570	0A0Ah	x0.1%	○	-	-	○	-	-
		Phase 3-N	2571	0A0Bh	x0.1%	○	-	-	○	-	-
	9th	Phase 1-N	2572	0A0Ch	x0.1%	○	-	-	○	-	-
		Phase 2-N	2573	0A0Dh	x0.1%	○	-	-	○	-	-
		Phase 3-N	2574	0A0Eh	x0.1%	○	-	-	○	-	-
	11th	Phase 1-N	2575	0A0Fh	x0.1%	○	-	-	○	-	-
		Phase 2-N	2576	0A10h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2577	0A11h	x0.1%	○	-	-	○	-	-
	13th	Phase 1-N	2578	0A12h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2579	0A13h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2580	0A14h	x0.1%	○	-	-	○	-	-
	15th	Phase 1-N	2581	0A15h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2582	0A16h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2583	0A17h	x0.1%	○	-	-	○	-	-
	17th	Phase 1-N	2584	0A18h	x0.1%	○	-	-	○	-	-
		Phase 2-N	2585	0A19h	x0.1%	○	-	-	○	-	-
		Phase 3-N	2586	0A1Ah	x0.1%	○	-	-	○	-	-
	19th	Phase 1-N	2587	0A1Bh	x0.1%	○	-	-	○	-	-
		Phase 2-N	2588	0A1Ch	x0.1%	○	-	-	○	-	-
		Phase 3-N	2589	0A1Dh	x0.1%	○	-	-	○	-	-
	21st	Phase 1-N	2590	0A1Eh	x0.1%	○	-	-	-	-	-
		Phase 2-N	2591	0A1Fh	x0.1%	○	-	-	-	-	-
		Phase 3-N	2592	0A20h	x0.1%	○	-	-	-	-	-
23rd	Phase 1-N	2593	0A21h	x0.1%	○	-	-	-	-	-	
	Phase 2-N	2594	0A22h	x0.1%	○	-	-	-	-	-	
	Phase 3-N	2595	0A23h	x0.1%	○	-	-	-	-	-	
25th	Phase 1-N	2596	0A24h	x0.1%	○	-	-	-	-	-	
	Phase 2-N	2597	0A25h	x0.1%	○	-	-	-	-	-	
	Phase 3-N	2598	0A26h	x0.1%	○	-	-	-	-	-	
27th	Phase 1-N	2599	0A27h	x0.1%	○	-	-	-	-	-	
	Phase 2-N	2600	0A28h	x0.1%	○	-	-	-	-	-	
	Phase 3-N	2601	0A29h	x0.1%	○	-	-	-	-	-	
29th	Phase 1-N	2602	0A2Ah	x0.1%	○	-	-	-	-	-	
	Phase 2-N	2603	0A2Bh	x0.1%	○	-	-	-	-	-	
	Phase 3-N	2604	0A2Ch	x0.1%	○	-	-	-	-	-	
31st	Phase 1-N	2605	0A2Dh	x0.1%	○	-	-	-	-	-	
	Phase 2-N	2606	0A2Eh	x0.1%	○	-	-	-	-	-	
	Phase 3-N	2607	0A2Fh	x0.1%	○	-	-	-	-	-	

(Continued on next page.)

Logging element		Set data		Unit	ME96SSHB-MB			ME96SSRB-MB			
		Dec.	Hex.		3P4W	3P3W 1P3W	1P2W	3P4W	3P3W 1P3W	1P2W	
Voltage (L-L) harmonics value	Total	Phase 1-2	2048	0800h	V	-	○	○	-	○	○
		Phase 2-3	2049	0801h	V	-	○	-	-	○	-
	1st	Phase 1-2	2051	0803h	V	-	○	○	-	○	○
		Phase 2-3	2052	0804h	V	-	○	-	-	○	-
	3rd	Phase 1-2	2054	0806h	V	-	○	○	-	○	○
		Phase 2-3	2055	0807h	V	-	○	-	-	○	-
	5th	Phase 1-2	2057	0809h	V	-	○	○	-	○	○
		Phase 2-3	2058	080Ah	V	-	○	-	-	○	-
	7th	Phase 1-2	2060	080Ch	V	-	○	○	-	○	○
		Phase 2-3	2061	080Dh	V	-	○	-	-	○	-
	9th	Phase 1-2	2063	080Fh	V	-	○	○	-	○	○
		Phase 2-3	2064	0810h	V	-	○	-	-	○	-
	11th	Phase 1-2	2066	0812h	V	-	○	○	-	○	○
		Phase 2-3	2067	0813h	V	-	○	-	-	○	-
	13th	Phase 1-2	2069	0815h	V	-	○	○	-	○	○
		Phase 2-3	2070	0816h	V	-	○	-	-	○	-
	15th	Phase 1-2	2072	0818h	V	-	○	○	-	○	○
		Phase 2-3	2073	0819h	V	-	○	-	-	○	-
	17th	Phase 1-2	2075	081Bh	V	-	○	○	-	○	○
		Phase 2-3	2076	081Ch	V	-	○	-	-	○	-
	19th	Phase 1-2	2078	081Eh	V	-	○	○	-	○	○
		Phase 2-3	2079	081Fh	V	-	○	-	-	○	-
	21st	Phase 1-2	2081	0821h	V	-	○	○	-	-	-
		Phase 2-3	2082	0822h	V	-	○	-	-	-	-
	23rd	Phase 1-2	2084	0824h	V	-	○	○	-	-	-
		Phase 2-3	2085	0825h	V	-	○	-	-	-	-
	25th	Phase 1-2	2087	0827h	V	-	○	○	-	-	-
		Phase 2-3	2088	0828h	V	-	○	-	-	-	-
	27th	Phase 1-2	2090	082Ah	V	-	○	○	-	-	-
		Phase 2-3	2091	082Bh	V	-	○	-	-	-	-
	29th	Phase 1-2	2093	082Dh	V	-	○	○	-	-	-
Phase 2-3		2094	082Eh	V	-	○	-	-	-	-	
31st	Phase 1-2	2096	0830h	V	-	○	○	-	-	-	
	Phase 2-3	2097	0831h	V	-	○	-	-	-	-	
Voltage (L-L) harmonics distortion	Total	Phase 1-2	2816	0B00h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2817	0B01h	x0.1%	-	○	-	-	○	-
	3rd	Phase 1-2	2819	0B03h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2820	0B04h	x0.1%	-	○	-	-	○	-
	5th	Phase 1-2	2822	0B06h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2823	0B07h	x0.1%	-	○	-	-	○	-
	7th	Phase 1-2	2825	0B09h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2826	0B0Ah	x0.1%	-	○	-	-	○	-
	9th	Phase 1-2	2828	0B0Ch	x0.1%	-	○	○	-	○	○
		Phase 2-3	2829	0B0Dh	x0.1%	-	○	-	-	○	-
	11th	Phase 1-2	2831	0B0Fh	x0.1%	-	○	○	-	○	○
		Phase 2-3	2832	0B10h	x0.1%	-	○	-	-	○	-
	13th	Phase 1-2	2834	0B12h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2835	0B13h	x0.1%	-	○	-	-	○	-
	15th	Phase 1-2	2837	0B15h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2838	0B16h	x0.1%	-	○	-	-	○	-
	17th	Phase 1-2	2840	0B18h	x0.1%	-	○	○	-	○	○
		Phase 2-3	2841	0B19h	x0.1%	-	○	-	-	○	-
	19th	Phase 1-2	2843	0B1Bh	x0.1%	-	○	○	-	○	○
		Phase 2-3	2844	0B1Ch	x0.1%	-	○	-	-	○	-
	21st	Phase 1-2	2846	0B1Eh	x0.1%	-	○	○	-	-	-
		Phase 2-3	2847	0B1Fh	x0.1%	-	○	-	-	-	-
	23rd	Phase 1-2	2849	0B21h	x0.1%	-	○	○	-	-	-
		Phase 2-3	2850	0B22h	x0.1%	-	○	-	-	-	-
	25th	Phase 1-2	2852	0B24h	x0.1%	-	○	○	-	-	-
		Phase 2-3	2853	0B25h	x0.1%	-	○	-	-	-	-
	27th	Phase 1-2	2855	0B27h	x0.1%	-	○	○	-	-	-
		Phase 2-3	2856	0B28h	x0.1%	-	○	-	-	-	-
	29th	Phase 1-2	2858	0B2Ah	x0.1%	-	○	○	-	-	-
		Phase 2-3	2859	0B2Bh	x0.1%	-	○	-	-	-	-
	31st	Phase 1-2	2861	0B2Dh	x0.1%	-	○	○	-	-	-
Phase 2-3		2862	0B2Eh	x0.1%	-	○	-	-	-	-	

7.4.3 Data read of built-in logging data

The built-in logging data can be read using MODBUS RTU communication.

(1) Logging measuring data

The following table describes the procedure to read the logging measuring data stored in the logging cycle by the ME96.

No.	Procedure	Register address	Remarks
1.	Specify the time (request time) of the data you want to read with the "Write Multiple Registers (10H)".	Refer to (a)	The specification method is the same as the current time in 7.2(17).
2.	Read the built-in logging measurement data with the "Read Holding Registers (03H)".	Refer to (b)	If time data other than the record stored in the internal memory is specified as a request time, error code 03h is returned.
3.	If there are multiple request times, repeat steps 1 and 2 above.	-	-

(a) Request time register

Register Address		Byte	R/W	Register name	RANGE *1	Unit
Dec.	Hex.	Count				
57344	E000h	2	R/W	Request time (Year,Month)	16h...99h+01h...12h	-
57345	E001h	2	R/W	Request time (Day,Hour)	01h...31h+00h...23h	-
57346	E002h	2	R/W	Request time (Minute,Second)	00h...59h+00h...59h	-

*1. The data of time is described as BCD code (binary coded decimal).

(b) Logging measuring data register

Register Address		Byte	R/W	Register name	RANGE	Unit
Dec.	Hex.	Count				
57360	E010h	4	R	Logging measuring data (Integrated value data) 1	The RANGE / unit is the same as the "7.1List of Parameters". Check each logging element that has been set.	
57362	E012h	4	R	Logging measuring data (Integrated value data) 2		
57364	E014h	4	R	Logging measuring data (Integrated value data) 3		
57366	E016h	4	R	Logging measuring data (Integrated value data) 4		
57368	E018h	4	R	Logging measuring data (Integrated value data) 5		
57370	E01Ah	2	R	Logging measuring data (Data other than integrated value) 1		
57371	E01Bh	2	R	Logging measuring data (Data other than integrated value) 2		
57372	E01Ch	2	R	Logging measuring data (Data other than integrated value) 3		
57373	E01Dh	2	R	Logging measuring data (Data other than integrated value) 4		
57374	E01Eh	2	R	Logging measuring data (Data other than integrated value) 5		
57375	E01Fh	2	R	Logging measuring data (Data other than integrated value) 6		
57376	E020h	2	R	Logging measuring data (Data other than integrated value) 7		
57377	E021h	2	R	Logging measuring data (Data other than integrated value) 8		
57378	E022h	2	R	Logging measuring data (Data other than integrated value) 9		
57379	E023h	2	R	Logging measuring data (Data other than integrated value) 10		
57380	E024h	2	R	Logging measuring data (Data other than integrated value) 11		
57381	E025h	2	R	Logging measuring data (Data other than integrated value) 12		
57382	E026h	2	R	Logging measuring data (Data other than integrated value) 13		
57383	E027h	2	R	Logging measuring data (Data other than integrated value) 14		
57384	E028h	2	R	Logging measuring data (Data other than integrated value) 15		

(2) Multiplying factors for Logging measuring data

This is a register that can monitor the multiplying factor corresponding to each measurement element of the “Logging measuring data”.

The acquired “Logging measuring data” can be converted to an actual value by multiplying the “7.3 Multiplying Factor”

When reading the multiplying data, it is not necessary to specify the request time in “Request time register”

(a) Multiplying factors register for Logging measuring data

Resister Address		Byte Count	R/W	Register name	RANGE	Unit
Dec.	Hex.					
57392	E030h	2	R	Multiplying factors for Logging measuring data (Integrated value data) 1	The RANGE is the same as the “7.2(10)”. Check each logging element that has been set.	-
57393	E031h	2	R	Multiplying factors for Logging measuring data (Integrated value data) 2		
57394	E032h	2	R	Multiplying factors for Logging measuring data (Integrated value data) 3		
57395	E033h	2	R	Multiplying factors for Logging measuring data (Integrated value data) 4		
57396	E034h	2	R	Multiplying factors for Logging measuring data (Integrated value data) 5		
57397	E035h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 1		
57398	E036h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 2		
57399	E037h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 3		
57400	E038h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 4		
57401	E039h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 5		
57402	E03Ah	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 6		
57403	E03Bh	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 7		
57404	E03Ch	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 8		
57405	E03Dh	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 9		
57406	E03Eh	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 10		
57407	E03Fh	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 11		
57408	E040h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 12		
57409	E041h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 13		
57410	E042h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 14		
57411	E043h	2	R	Multiplying factors for Logging measuring data (Data other than integrated value) 15		

(3) Current values for Logging measuring data

This register can acquire the current value of each measurement element in the built-in logging measurement data.

It can be acquired at any timing other than the logging cycle.

When reading current value data, it is not necessary to specify the request time in “Request time register”

(a) Current values register for Logging measuring data

Resister Address		Byte Count	R/W	Register name	RANGE	Unit
Dec.	Hex.					
57456	E070h	4	R	Current value for Logging measuring data (Integrated value data) 1	The RANGE / unit is the same as the “7.1List of Parameters”. Check each logging element that has been set.	
57458	E072h	4	R	Current value for Logging measuring data (Integrated value data) 2		
57460	E074h	4	R	Current value for Logging measuring data (Integrated value data) 3		
57462	E076h	4	R	Current value for Logging measuring data (Integrated value data) 4		
57464	E078h	4	R	Current value for Logging measuring data (Integrated value data) 5		
57466	E07Ah	2	R	Current value for Logging measuring data (Data other than integrated value) 1		
57467	E07Bh	2	R	Current value for Logging measuring data (Data other than integrated value) 2		
57468	E07Ch	2	R	Current value for Logging measuring data (Data other than integrated value) 3		
57469	E07Dh	2	R	Current value for Logging measuring data (Data other than integrated value) 4		
57470	E07Eh	2	R	Current value for Logging measuring data (Data other than integrated value) 5		
57471	E07Fh	2	R	Current value for Logging measuring data (Data other than integrated value) 6		
57472	E080h	2	R	Current value for Logging measuring data (Data other than integrated value) 7		
57473	E081h	2	R	Current value for Logging measuring data (Data other than integrated value) 8		
57474	E082h	2	R	Current value for Logging measuring data (Data other than integrated value) 9		
57475	E083h	2	R	Current value for Logging measuring data (Data other than integrated value) 10		
57476	E084h	2	R	Current value for Logging measuring data (Data other than integrated value) 11		
57477	E085h	2	R	Current value for Logging measuring data (Data other than integrated value) 12		
57478	E086h	2	R	Current value for Logging measuring data (Data other than integrated value) 13		
57479	E087h	2	R	Current value for Logging measuring data (Data other than integrated value) 14		
57480	E088h	2	R	Current value for Logging measuring data (Data other than integrated value) 15		

(4) Alarm data

This register is used to read out the alarm element and time data when an alarm occurrence / retention / cancelation event occurs.

The latest 100 records are stored in the order in which each event occurred. (Note that if an event occurs when the main unit's time data is changed, the data is stored in the order of occurrence, not in the order of time.)

(a) Alarm data register

Register Address		Byte	R/W	Register name	RANGE	Unit
Dec.	Hex.	Count				
57600	E100h	2	R	Alarm information data (latest)	Refer to (i)	-
57601	E101h	2	R	Alarm time (Year,Month) (latest)	16h...99h+01h...12h	-
57602	E102h	2	R	Alarm time (Day,Hour) (latest)	01h...31h+00h...23h	-
57603	E103h	2	R	Alarm time (Minute,Second) (latest)	00h...59h+00h...59h	-
57604	E104h	2	R	Alarm information data (latest - 1)	Refer to (i)	-
57605	E105h	2	R	Alarm time (Year,Month) (latest - 1)	16h...99h+01h...12h	-
57606	E106h	2	R	Alarm time (Day,Hour) (latest - 1)	01h...31h+00h...23h	-
57607	E107h	2	R	Alarm time (Minute,Second) (latest - 1)	00h...59h+00h...59h	-
...		-
(Note1)	(Note1)	2	R	Alarm information data (latest - n)	Refer to (i)	-
(Note1)	(Note1)	2	R	Alarm time (Year,Month) (latest - n)	16h...99h+01h...12h	-
(Note1)	(Note1)	2	R	Alarm time (Day,Hour) (latest - n)	01h...31h+00h...23h	-
(Note1)	(Note1)	2	R	Alarm time (Minute,Second) (latest - n)	00h...59h+00h...59h	-
...		-
57996	E28Ch	2	R	Alarm information data (latest - 99)	Refer to (i)	-
57997	E28Dh	2	R	Alarm time (Year,Month) (latest - 99)	16h...99h+01h...12h	-
57998	E28Eh	2	R	Alarm time (Day,Hour) (latest - 99)	01h...31h+00h...23h	-
57999	E28Fh	2	R	Alarm time (Minute,Second) (latest - 99)	00h...59h+00h...59h	-

Note.1: Refer to the folloing for calculating the register address.

Register name	Register address		Remarks
	Dec.	Hex.	
Alarm information data (latest - n)	57600 + 4 x n	E100h + 4 x n	n= 0 to 99
Alarm time (Year,Month) (latest - n)	57601 + 4 x n	E101h + 4 x n	
Alarm time (Day,Hour) (latest - n)	57602 + 4 x n	E102h + 4 x n	
Alarm time (Minute,Second) (latest - n)	57603 + 4 x n	E103h + 4 x n	

(i) Alarm information data

The alarm information data includes items when an alarm event occurs and the elements of the target alarm. The higher-order byte is the alarm event item, and the lower-order byte is the alarm element.

● Alarm event (higher-order byte)

Data (Higher-order byte)	Alarm event
00h	- (Alarm not set, etc)
01h	Alarm occurrence
02h	Alarm cancellation
03h	Alarm retention

● Alarm element (lower-order byte)

Refer to "7.2(20) Upper/Lower limit alarm item/value".

If there are multiple phases for alarm monitoring, alarm events are stored for each phase. (The alarm element cannot be used to identify the phase.)

(ii) Example

If the latest alarm (power upper limit alarm) occurs at the current time on December 23, 2019, a.m.4: 56: 7, the monitor data will be as follows.

Register Address		Byte	R/W	Register Name	Data(Hex) *1
Dec.	Hex.	Count			
57600	E100h	2	R	Alarm information data (latest)	01 15
57601	E101h	2	R	Alarm time (Year,Month) (latest)	19 12
57602	E102h	2	R	Alarm time (Day,Hour) (latest)	23 04
57603	E103h	2	R	Alarm time (Minute,Second) (latest)	56 07

*1 Data of logging unit present time are BCD code.

(5) Max/Min value occurrence time

One record of the time data when the maximum or minimum value is updated is stored for each element. For the registers, refer to the maximum value / minimum value occurrence time registers described in the following chapters.

- 7.1(2) Instantaneous Value / Maximum Value / Minimum Value Registers (0x0300)
- 7.1(14) Harmonics Current r.m.s. Maximum Registers (0x0F00)
- 7.1(15) Harmonics Voltage (L-N) THD/ Distortion ratio Maximum Registers (0x1000)
- 7.1(16) Harmonics Voltage (L-L) THD/ Distortion ratio Maximum Registers (0x1100)

(6) System log data

This register is used to read time data when an event such as a setting change occurs.

The latest 100 records are stored in the order in which each event occurred. (Note that if an event occurs when the time data of the main unit is changed, the data is stored in the order of occurrence, not in the order of time.)

(a) System log data register

Register Address		Byte Count	R/W	Register name	RANGE	Unit
Dec.	Hex.					
58112	E300h	2	R	System log data (event) (latest)	Refer to (4)(a)(i)	-
58113	E301h	2	R	System log data (Year,Month) (latest)	16h...99h+01h...12h	-
58114	E302h	2	R	System log data (Day,Hour) (latest)	01h...31h+00h...23h	-
58115	E303h	2	R	System log data (Minute,Second) (latest)	00h...59h+00h...59h	-
58116	E304h	2	R	System log data (event) (latest - 1)	Refer to (4)(a)(i)	-
58117	E305h	2	R	System log data (Year,Month) (latest - 1)	16h...99h+01h...12h	-
58118	E306h	2	R	System log data (Day,Hour) (latest - 1)	01h...31h+00h...23h	-
58119	E307h	2	R	System log data (Minute,Second) (latest - 1)	00h...59h+00h...59h	-
...		-
(Note1)	(Note1)	2	R	System log data (event) (latest - n)	Refer to (4)(a)(i)	-
(Note1)	(Note1)	2	R	System log data (Year,Month) (latest - n)	16h...99h+01h...12h	-
(Note1)	(Note1)	2	R	System log data (Day,Hour) (latest - n)	01h...31h+00h...23h	-
(Note1)	(Note1)	2	R	System log data (Minute,Second) (latest - n)	00h...59h+00h...59h	-
...		-
58508	E48Ch	2	R	System log data (event) (latest - 99)	Refer to (4)(a)(i)	-
58509	E48Dh	2	R	System log data (Year,Month) (latest - 99)	16h...99h+01h...12h	-
58510	E48Eh	2	R	System log data (Day,Hour) (latest - 99)	01h...31h+00h...23h	-
58551	E48Fh	2	R	System log data (Minute,Second) (latest - 99)	00h...59h+00h...59h	-

Note.1: Refer to the folloing for calculating the register address.

Register name	Register address		Remarks
	Dec.	Hex.	
System log data (event) (latest - n)	58112 + 4 x n	E300h + 4 x n	n= 0 to 99
System log data (Year,Month) (latest - n)	58113 + 4 x n	E301h + 4 x n	
System log data (Day,Hour) (latest - n)	58114 + 4 x n	E302h + 4 x n	
System log data (Minute,Second) (latest - n)	58115 + 4 x n	E303h + 4 x n	

(i) Event for System log data

The following table lists events for system log and its corresponding data.

Data		Events	Remarks
Dec.	Hex.		
0	0000h	- (No system log)	
1301	0515h	Start-up	
1302	0516h	Current time setting was changed..	Time after change is stored as log data
1303	0517h	Built-in logging data was cleared.	
1304	0518h	Setting of the ME96 main unit was changed..	Applies changes to settings other than those related to built-in logging.
1305	0519h	Built-in logging function ON / OFF setting was changed.	
1306	051Ah	Built-in logging element pattern setting was changed.	
1307	051Bh	Built-in logging cycle setting was changed.	
1308	051Ch	Measurement element for LP00 of built-in logging element pattern setting was changed.	
1309	051Dh	Optional pulg-in module of ME96 was changed.	
1901	076Dh	RTC error of ME96 main unit was notified.	

8. Test Function Mode

ME96 has the test function mode which the fixed values are replied if there is no input. It is available to check the communication to PLC.

8.1 ME96SSH/SSR/SSE/SSHA/SSRA/SSEA/SSHB/SSRB/SSEB-MB

(1) Shift to Test Mode

Operation of ME96 is necessary. At first, shifts to the setting value confirmation mode from the operation mode. And then, select "9" of menu number, and shifts to the test menu screen. And then, select "1" of menu number, and shifts to the test mode. (For details, refer to each user's manual)

(2) How to Test

In the test mode, you need to appear values which wanted to monitor on the screen of ME96. For example, if you want to monitor the active power, you need to appear the active power on the screen of ME96.

(a) Replied Data

Values displayed on the screen of ME96 can be monitored by MODBUS communication. Measurement elements not displayed on the screen are zero (only power factor is 1.000). When DI1 to DI3 are used, it is also possible to monitor the digital input status.

(b) Display screen

In the same as the operating mode, items are displayed when making settings such as those for the display pattern. Maximum and minimum values can be displayed. (Cyclic function is invalid.)

(c) Button Operations

Button	Operation
[DISPLAY]	Switch the measurement screen.
[PHASE]	Switch phase display. Switch between the harmonic RMS value and distortion ratio. (Available on the harmonics display screen)
[MAXMIN]	Enter/Exit the Max/Min value screen.
[+], [-]	Switch the item expressed with the bar graph. Switch the harmonic degree. (Available on the harmonics display screen)
[+][+] for 2 seconds	Change the units such as Wh, varh, and VAh.
[SET]	Test mode is finished and back to test menu screen.

* In details of valid operation, please refer each user's manuals.

(3) Restrictions

Registers of "7.4 Specifications of built-in logging data" do not support this test function mode.

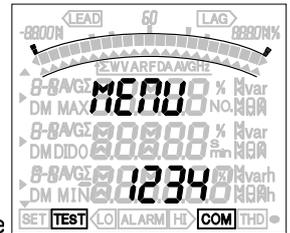
8.2 ME96NSR-MB

(1) How to Test

To test, it is necessary to operate the basic device.
Operate as follows.

- ① At the state of power failure, turn on the power supply while pressing the **DISPLAY** of basic device.
- ② After display on the right is shown, operate the normal communication.
- ③ Data shown in the next section is replied.

When the test is finished, turn off the power supply.



(2) Reply Data

The reply data at test function mode is shown in next page and on.

The reply data takes the value of primary side, but the data of table 8.1 describes the
It is necessary to convert to the value of primary side using the VT ratio and CT ratio.

(Example) At three phase 3-wire, VT: 6600 V / 110 V, CT: 100 A / 5 A

- Phase 1 current (Inst.) = reply data(secondary side) × CT ratio.
= 4.11 A × 100 A / 5 A = 82.2 A
- 1-2 voltage (Inst.) = reply data(secondary side) × VT ratio.
= 101.1 V × 6600 V / 110 V = 6066 V
- Total active power (Inst.) = reply data(secondary side) × VT ratio × CT ratio.
= 1041 W × 6600 V / 110 V × 100 A / 5 A = 1249.2 kW

(3) Table 8.1 Reply Data

(a) Setup Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(secondary side)		
							3P4W	3P3W _2CT	3P3W _3CT
Dec.	Hex.								
512	0200h	2	R/W	Phase Wiring	Refer to 7.2(1)		-	-	-
513	0201h	4	R/W	Primary voltage (L-L)	Refer to 7.2(2)	V	-	-	-
515	0203h	4	R/W	Primary voltage (L-N)	Refer to 7.2(3)	×0.1 V	-	-	-
517	0205h	4	R/W	Secondary voltage (L-N)	Refer to 7.2(4)	×0.1 V	-	-	-
519	0207h	4	R/W	Primary current	Refer to 7.2(5)	×0.1 A	-	-	-
521	0209h	2	R	Reserved	0		-	-	-
522	020Ah	2	R/W	Time constant for DA	Refer to 7.2(7)	s	-	-	-
523	020Bh	2	R/W	16 bits Set/Reset register	Refer to 7.2(12)		Note3	Note3	Note3
524	020Ch	2	R	16 bits monitor 1	Refer to 7.2(14)		Note1	Note1	Note1
594	0252h	2	R	16 bits monitor 2	Refer to 7.2(13)		Note2	Note2	Note2

Note1: b5 and b8 become ON(1). And, b0 to b4 of digital inputs are reflected to the present state.

Note2: b7, b12 to b15 become ON(1).

Note3:When you read this register, b4,b5 of digital output are reflected to the present state of contact.

(Contact=open ⇒ "0" Contact=close ⇒ "1")

(b) Instantaneous Value Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT
768	0300h	2	R	Phase 1 current	0 to 32767	A	4.11 A	4.11 A	4.11 A
769	0301h	2	R	Phase 2 current	0 to 32767	A	4.21 A	4.51 A	4.21 A
770	0302h	2	R	Phase 3 current	0 to 32767	A	4.61 A	4.61 A	4.61 A
771	0303h	2	R	Neutral current	0 to 32767	A	4.51 A	-	-
772	0304h	2	R	Average value current	0 to 32767	A	4.31 A	4.41 A	4.31 A
773	0305h	2	R	Phase 1 current demand	0 to 32767	A	4.11 A	4.11 A	4.11 A
774	0306h	2	R	Phase 2 current demand	0 to 32767	A	4.21 A	4.51 A	4.21 A
775	0307h	2	R	Phase 3 current demand	0 to 32767	A	4.61 A	4.61 A	4.61 A
776	0308h	2	R	Neutral current demand	0 to 32767	A	4.51 A	-	-
777	0309h	2	R	Average value current demand	0 to 32767	A	4.31 A	4.41 A	4.31 A
778	030Ah	2	R	Voltage V12	0 to 32767	V	171.1 V	101.1 V	101.1 V
779	030Bh	2	R	Voltage V23	0 to 32767	V	172.1 V	106.1 V	106.1 V
780	030Ch	2	R	Voltage V31	0 to 32767	V	176.1 V	176.1 V	176.1 V
781	030Dh	2	R	Average value voltage (L-L)	0 to 32767	V	173.1 V	127.8 V	127.8 V
782	030Eh	2	R	Voltage V1N	0 to 32767	V	101.1 V	-	-
783	030Fh	2	R	Voltage V2N	0 to 32767	V	102.1 V	-	-
784	0310h	2	R	Voltage V3N	0 to 32767	V	106.1 V	-	-
785	0311h	2	R	Average value voltage (L-N)	0 to 32767	V	103.1 V	-	-
786	0312h	2	R	Phase 1 power factor	-500 to +1000 to 500	×0.1%	81.1%	-	-
787	0313h	2	R	Phase 2 power factor	-500 to +1000 to 500	×0.1%	82.1%	-	-
788	0314h	2	R	Phase 3 power factor	-500 to +1000 to 500	×0.1%	83.1%	-	-
789	0315h	2	R	Σ Power factor	-500 to +1000 to 500	×0.1%	84.1%	84.1%	84.1%
790	0316h	2	R	Frequency	445 to 999	×0.1 Hz	50.0 Hz	50.0 Hz	50.0 Hz
791	0317h	2	R	Phase 1 active power	-16383 to 16383	kW	1011 W	-	-
792	0318h	2	R	Phase 2 active power	-16383 to 16383	kW	1021 W	-	-
793	0319h	2	R	Phase 3 active power	-16383 to 16383	kW	1031 W	-	-
794	031Ah	2	R	Σ Active power	-16383 to 16383	kW	1041 W	1041 W	1041 W
795	031Bh	2	R	Reserved	0		-	-	-
796	031Ch	2	R	Reserved	0		-	-	-
797	031Dh	2	R	Reserved	0		-	-	-
798	031Eh	2	R	Reserved	0		-	-	-
799	031Fh	2	R	Phase 1 reactive power	-16383 to 16383	kvar	711 var	-	-
800	0320h	2	R	Phase 2 reactive power	-16383 to 16383	kvar	721 var	-	-
801	0321h	2	R	Phase 3 reactive power	-16383 to 16383	kvar	731 var	-	-
802	0322h	2	R	Σ Reactive power	-16383 to 16383	kvar	741 var	741 var	741 var
803	0323h	2	R	Phase 1 apparent power	-16383 to 16383	kVA	1211 VA	-	-
804	0324h	2	R	Phase 2 apparent power	-16383 to 16383	kVA	1221 VA	-	-
805	0325h	2	R	Phase 3 apparent power	-16383 to 16383	kVA	1231 VA	-	-
806	0326h	2	R	Σ Apparent power	-16383 to 16383	kVA	1241 VA	-	-
807	0327h	2	R	Reserved	0		-	-	-
808	0328h	2	R	Reserved	0		-	-	-
809	0329h	2	R	Reserved	0		-	-	-
810	032Ah	2	R	Reserved	0		-	-	-
811	032Bh	2	R	Reserved	0		-	-	-

(c) Maximum Value Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT
812	032Ch	2	R	Phase 1 current	Max. 0 to 32767	A	4.12 A	4.12 A	4.12 A
813	032Dh	2	R	Phase 2 current	Max. 0 to 32767	A	4.22 A	4.52 A	4.22 A
814	032Eh	2	R	Phase 3 current	Max. 0 to 32767	A	4.62 A	4.62 A	4.62 A
815	032Fh	2	R	Neutral current	Max. 0 to 32767	A	4.52 A	-	-
816	0330h	2	R	Average value current	Max. 0 to 32767	A	4.32 A	4.42 A	4.32 A
817	0331h	2	R	Phase 1 current demand	Max. 0 to 32767	A	4.12 A	4.12 A	4.12 A
818	0332h	2	R	Phase 2 current demand	Max. 0 to 32767	A	4.22 A	4.52 A	4.22 A
819	0333h	2	R	Phase 3 current demand	Max. 0 to 32767	A	4.62 A	4.62 A	4.62 A
820	0334h	2	R	Neutral current demand	Max. 0 to 32767	A	4.52 A	-	-
821	0335h	2	R	Average value current demand	Max. 0 to 32767	A	4.32 A	4.42 A	4.32 A
822	0336h	2	R	Reserved	0		-	-	-
823	0337h	2	R	Voltage V12	Max. 0 to 32767	V	171.2 V	101.2 V	101.2 V
824	0338h	2	R	Voltage V23	Max. 0 to 32767	V	172.2 V	106.2 V	106.2 V
825	0339h	2	R	Voltage V31	Max. 0 to 32767	V	176.2 V	176.2 V	176.2 V
826	033Ah	2	R	Average value voltage(L-L)	Max. 0 to 32767	V	173.2 V	127.9 V	127.9 V
827	033Bh	2	R	Reserved	0		-	-	-
828	033Ch	2	R	Voltage V1N	Max. 0 to 32767	V	101.2 V	-	-
829	033Dh	2	R	Voltage V2N	Max. 0 to 32767	V	102.2 V	-	-
830	033Eh	2	R	Voltage V3N	Max. 0 to 32767	V	106.2 V	-	-
831	033Fh	2	R	Average value voltage(L-N)	Max. 0 to 32767	V	103.2 V	-	-
832	0340h	2	R	Reserved	0		-	-	-
833	0341h	2	R	Phase 1 power factor	Max. -500 to +1000 to 500	×0.1%	81.0%	-	-
834	0342h	2	R	Phase 2 power factor	Max. -500 to +1000 to 500	×0.1%	81.9%	-	-
835	0343h	2	R	Phase 3 power factor	Max. -500 to +1000 to 500	×0.1%	83.0%	-	-
836	0344h	2	R	Σ Power factor	Max. -500 to +1000 to 500	×0.1%	84.0%	84.0%	84.0%
837	0345h	2	R	Frequency	Max. 445 to 999	×0.1Hz	51.0 Hz	51.0 Hz	51.0 Hz
838	0346h	2	R	Phase 1 active power	Max. -16383 to 16383	kW	1012 W	-	-
839	0347h	2	R	Phase 2 active power	Max. -16383 to 16383	kW	1022 W	-	-
840	0348h	2	R	Phase 3 active power	Max. -16383 to 16383	kW	1032 W	-	-
841	0349h	2	R	Σ Active power	Max. -16383 to 16383	kW	1042 W	1042 W	1042 W
842	034Ah	2	R	Reserved	0		-	-	-
843	034Bh	2	R	Reserved	0		-	-	-
844	034Ch	2	R	Reserved	0		-	-	-
845	034Dh	2	R	Reserved	0		-	-	-
846	034Eh	2	R	Phase 1 reactive power	Max. -16383 to 16383	kvar	712 var	-	-
847	034Fh	2	R	Phase 2 reactive power	Max. -16383 to 16383	kvar	722 var	-	-
848	0350h	2	R	Phase 3 reactive power	Max. -16383 to 16383	kvar	732 var	-	-
849	0351h	2	R	Σ Reactive power	Max. -16383 to 16383	kvar	742 var	742 var	742 var
850	0352h	2	R	Phase 1 apparent power	Max. -16383 to 16383	kVA	1212 VA	-	-
851	0353h	2	R	Phase 2 apparent power	Max. -16383 to 16383	kVA	1222 VA	-	-
852	0354h	2	R	Phase 3 apparent power	Max. -16383 to 16383	kVA	1232 VA	-	-
853	0355h	2	R	Σ Apparent power	Max. -16383 to 16383	kVA	1242 VA	-	-
854	0356h	2	R	Reserved	0		-	-	-
855	0357h	2	R	Reserved	0		-	-	-
856	0358h	2	R	Reserved	0		-	-	-
857	0359h	2	R	Reserved	0		-	-	-

(d) Minimum Value Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT
858	035Ah	2	R	Phase 1 current	Min. 0 to 32767	A	4.10 A	4.10 A	4.10 A
859	035Bh	2	R	Phase 2 current	Min. 0 to 32767	A	4.20 A	4.50 A	4.20 A
860	035Ch	2	R	Phase 3 current	Min. 0 to 32767	A	4.60 A	4.60 A	4.60 A
861	035Dh	2	R	Neutral current	Min. 0 to 32767	A	4.50 A	-	-
862	035Eh	2	R	Average value current	Min. 0 to 32767	A	4.30 A	4.40 A	4.30 A
863	035Fh	2	R	Phase 1 current demand	Min. 0 to 32767	A	4.10 A	4.10 A	4.10 A
864	0360h	2	R	Phase 2 current demand	Min. 0 to 32767	A	4.20 A	4.50 A	4.20 A
865	0361h	2	R	Phase 3 current demand	Min. 0 to 32767	A	4.60 A	4.60 A	4.60 A
866	0362h	2	R	Neutral current demand	Min. 0 to 32767	A	4.50 A	-	-
867	0363h	2	R	Average value curret demand	Min. 0 to 32767	A	4.30 A	4.40 A	4.30 A
868	0364h	2	R	Voltage V12	Min. 0 to 32767	V	171.0 V	101.0 V	101.0 V
869	0365h	2	R	Voltage V23	Min. 0 to 32767	V	172.0 V	106.0 V	106.0 V
870	0366h	2	R	Voltage V31	Min. 0 to 32767	V	176.0 V	176.0 V	176.0 V
871	0367h	2	R	Average value voltage(L-L)	Min. 0 to 32767	V	173.0 V	127.7 V	127.7 V
872	0368h	2	R	Voltage V1N	Min. 0 to 32767	V	101.0 V	-	-
873	0369h	2	R	Voltage V2N	Min. 0 to 32767	V	102.0 V	-	-
874	036Ah	2	R	Voltage V3N	Min. 0 to 32767	V	106.0 V	-	-
875	036Bh	2	R	Average value voltage(L-N)	Min. 0 to 32767	V	103.0 V	-	-
876	036Ch	2	R	Phase 1 power factor	Min. -500 to +1000 to 500	×0.1%	81.2%	-	-
877	036Dh	2	R	Phase 2 power factor	Min. -500 to +1000 to 500	×0.1%	82.2%	-	-
878	036Eh	2	R	Phase 3 power factor	Min. -500 to +1000 to 500	×0.1%	83.2%	-	-
879	036Fh	2	R	Σ Power factor	Min. -500 to +1000 to 500	×0.1%	84.2%	84.2%	84.2%
880	0370h	2	R	Frequency	Min. 445 to 999	×0.1Hz	49.0 Hz	49.0 Hz	49.0 Hz
881	0371h	2	R	Phase 1 active power	Min. -16383 to 16383	kW	1010 W	-	-
882	0372h	2	R	Phase 2 active power	Min. -16383 to 16383	kW	1020 W	-	-
883	0373h	2	R	Phase 3 active power	Min. -16383 to 16383	kW	1030 W	-	-
884	0374h	2	R	Σ Active power	Min. -16383 to 16383	kW	1040 W	1040 W	1040 W
885	0375h	2	R	Reserved	0		-	-	-
886	0376h	2	R	Reserved	0		-	-	-
887	0377h	2	R	Reserved	0		-	-	-
888	0378h	2	R	Reserved	0		-	-	-
889	0379h	2	R	Phase 1 reactive power	Min. -16383 to 16383	kvar	710 var	-	-
890	037Ah	2	R	Phase 2 reactive power	Min. -16383 to 16383	kvar	720 var	-	-
891	037Bh	2	R	Phase 3 reactive power	Min. -16383 to 16383	kvar	730 var	-	-
892	037Ch	2	R	Σ Reactive power	Min. -16383 to 16383	kvar	740 var	740 var	740 var
893	037Dh	2	R	Phase 1 apparent power	Min. -16383 to 16383	kVA	1210 VA	-	-
894	037Eh	2	R	Phase 2 apparent power	Min. -16383 to 16383	kVA	1220 VA	-	-
895	037Fh	2	R	Phase 3 apparent power	Min. -16383 to 16383	kVA	1230 VA	-	-
896	0380h	2	R	Σ Apparent power	Min. -16383 to 16383	kVA	1240 VA	-	-
897	0381h	2	R	Reserved	0		-	-	-
898	0382h	2	R	Reserved	0		-	-	-

(e) Counting of Energy Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(Note1)		
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT
1280	0500h	2	R	Active energy	import	kWh	666	666	666
1281	0501h	2	R				1000 or more	666	666
1282	0502h	2	R	Active energy	export	kWh	555	555	555
1283	0503h	2	R				1000 or more	555	555
1284	0504h	2	R	Reactive energy	import LAG	kvarh	444	444	444
1285	0505h	2	R				1000 or more	444	444
1286	0506h	2	R	Reactive energy	export LAG	kvarh	333	333	333
1287	0507h	2	R				1000 or more	333	333
1288	0508h	2	R	Reactive energy	import LEAD	kvarh	222	222	222
1289	0509h	2	R				1000 or more	222	222
1290	050Ah	2	R	Reactive energy	export LEAD	kvarh	111	111	111
1291	050Bh	2	R				1000 or more	111	111
1292	050Ch	2	R	Extended active energy	import	kWh	666	666	666
1293	050Dh	2	R				1000 or more	666	666
1294	050Eh	2	R	Extended active energy	export	kWh	555	555	555
1295	050Fh	2	R				1000 or more	555	555
1296	0510h	2	R	Extended reactive energy	import LAG	kvarh	444	444	444
1297	0511h	2	R				1000 or more	444	444
1298	0512h	2	R	Extended reactive energy	export LAG	kvarh	333	333	333
1299	0513h	2	R				1000 or more	333	333
1300	0514h	2	R	Extended reactive energy	import LEAD	kvarh	222	222	222
1301	0515h	2	R				1000 or more	222	222
1302	0516h	2	R	Extended reactive energy	export LEAD	kvarh	111	111	111
1303	0517h	2	R				1000 or more	111	111
1304	0518h	4	R/W	Active energy	import	kWh	666666	666666	666666
1306	051Ah	4	R/W	Active energy	export	kWh	555555	555555	555555
1308	051Ch	4	R/W	Reactive energy	import LAG	kvarh	444444	444444	444444
1310	051Eh	4	R/W	Reactive energy	export LAG	kvarh	333333	333333	333333
1312	0520h	4	R/W	Reactive energy	import LEAD	kvarh	222222	222222	222222
1314	0522h	4	R/W	Reactive energy	export LEAD	kvarh	111111	111111	111111
1316	0524h	4	R	Extended active energy	import	kWh	666666	666666	666666
1318	0526h	4	R	Extended active energy	export	kWh	555555	555555	555555
1320	0528h	4	R	Extended reactive energy	import LAG	kvarh	444444	444444	444444
1322	052Ah	4	R	Extended reactive energy	export LAG	kvarh	333333	333333	333333
1324	052Ch	4	R	Extended reactive energy	import LEAD	kvarh	222222	222222	222222
1326	052Eh	4	R	Extended reactive energy	export LEAD	kvarh	111111	111111	111111

Note1. Counting values reply values of primary side.

(f) Alarm Value Register

Address		byte count	R/W	Register Name	RANGE ※2	Unit	Reply data(secondary side)		
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT
1536	0600h	4	R/W	Current demand upper limit	0 to 4000000	×0.01 A	-	-	-
1538	0602h	4	R/W	Voltage(L-N) upper limit	0 to 75000000	×0.01 V	-	-	-
1540	0604h	4	R/W	Current upper limit	0 to 4000000	×0.01 A	-	-	-
1542	0606h	4	R/W	Power factor upper limit	-500 to +1000 to 500	×0.1%	-	-	-
1544	0608h	4	R/W	Frequency upper limit	445 to 665	×0.1 Hz	-	-	-
1546	060Ah	4	R/W	Harmonics current upper limit	0 to 1000	×0.1%	-	-	-
1548	060Ch	4	R/W	THD voltage upper limit	0 to 200	×0.1%	-	-	-
1550	060Eh	4	R	Reserved	0		-	-	-
1552	0610h	4	R/W	Active power upper limit	-1638300000 to 1638300000	W	-	-	-
1554	0612h	4	R/W	Reactive power upper limit	-1638300000 to 1638300000	var	-	-	-
1556	0614h	4	R/W	Current demand lower limit	0 to 4000000	×0.01 A	-	-	-
1558	0616h	4	R/W	Voltage(L-N) lower limit	0 to 75000000	×0.01 V	-	-	-
1560	0618h	4	R/W	Current lower limit	0 to 4000000	×0.01 A	-	-	-
1562	061Ah	4	R/W	Power factor lower limit	-500 to +1000 to 500	×0.1%	-	-	-
1564	061Ch	4	R/W	Frequency lower limit	445 to 665	×0.1 Hz	-	-	-
1566	061Eh	4	R	Reserved	0		-	-	-
1568	0620h	4	R/W	Active power lower limit	-1638300000 to 1638300000	W	-	-	-
1570	0622h	4	R/W	Reactive power lower limit	-1638300000 to 1638300000	var	-	-	-
1572	0624h	4	R/W	Neutral current demand lower limit	0 to 4000000	×0.01 A	-	-	-
1574	0626h	4	R/W	Neutral current lower limit	0 to 4000000	×0.01 A	-	-	-
1576	0628h	4	R/W	Neutral harmonics current lower limit	0 to 1000	×0.1%	-	-	-
1578	062Ah	4	R/W	Voltage(L-L) upper limit	0 to 75000000	×0.01 V	-	-	-
1580	062Ch	4	R/W	Voltage(L-L) lower limit	0 to 75000000	×0.01 V	-	-	-

(g) Harmonics Value Register

Address		byte count	R/W	Register Name		RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.							3P4W	3P3W 2CT	3P3W 3CT
1792	0700h	2	R	Harmonics value V1N	Total	0 to 32767	V	78.9 V	-	-
1793	0701h	2	R	Harmonics value V2N	Total	0 to 32767	V	73.2 V	-	-
1794	0702h	2	R	Harmonics value V3N	Total	0 to 32767	V	79.3 V	-	-
1795	0703h	2	R	Harmonics value V1N	1st	0 to 32767	V	91.1 V	-	-
1796	0704h	2	R	Harmonics value V2N	1st	0 to 32767	V	91.2 V	-	-
1797	0705h	2	R	Harmonics value V3N	1st	0 to 32767	V	91.3 V	-	-
1798	0706h	2	R	Harmonics value V1N	3rd	0 to 32767	V	36.1 V	-	-
1799	0707h	2	R	Harmonics value V2N	3rd	0 to 32767	V	36.2 V	-	-
1800	0708h	2	R	Harmonics value V3N	3rd	0 to 32767	V	35.9 V	-	-
1801	0709h	2	R	Harmonics value V1N	5th	0 to 32767	V	35.1 V	-	-
1802	070Ah	2	R	Harmonics value V2N	5th	0 to 32767	V	16.8 V	-	-
1803	070Bh	2	R	Harmonics value V3N	5th	0 to 32767	V	34.9 V	-	-
1804	070Ch	2	R	Harmonics value V1N	7th	0 to 32767	V	34.1 V	-	-
1805	070Dh	2	R	Harmonics value V2N	7th	0 to 32767	V	34.2 V	-	-
1806	070Eh	2	R	Harmonics value V3N	7th	0 to 32767	V	34.3 V	-	-
1807	070Fh	2	R	Harmonics value V1N	9th	0 to 32767	V	33.1 V	-	-
1808	0710h	2	R	Harmonics value V2N	9th	0 to 32767	V	33.2 V	-	-
1809	0711h	2	R	Harmonics value V3N	9th	0 to 32767	V	33.3 V	-	-
1810	0712h	2	R	Harmonics value V1N	11th	0 to 32767	V	32.1 V	-	-
1811	0713h	2	R	Harmonics value V2N	11th	0 to 32767	V	32.2 V	-	-
1812	0714h	2	R	Harmonics value V3N	11th	0 to 32767	V	32.3 V	-	-
1813	0715h	2	R	Harmonics value V1N	13th	0 to 32767	V	20.1 V	-	-
1814	0716h	2	R	Harmonics value V2N	13th	0 to 32767	V	21.2 V	-	-
1815	0717h	2	R	Harmonics value V3N	13th	0 to 32767	V	21.3 V	-	-
2048	0800h	2	R	Harmonics value V12	Total	0 to 32767	V	-	78.9 V	78.9 V
2049	0801h	2	R	Harmonics value V23	Total	0 to 32767	V	-	79.3 V	79.3 V
2050	0802h	2	R	Reserved		0		-	-	-
2051	0803h	2	R	Harmonics value V12	1st	0 to 32767	V	-	91.1 V	91.1 V
2052	0804h	2	R	Harmonics value V23	1st	0 to 32767	V	-	91.3 V	91.3 V
2053	0805h	2	R	Reserved		0		-	-	-
2054	0806h	2	R	Harmonics value V12	3rd	0 to 32767	V	-	36.1 V	36.1 V
2055	0807h	2	R	Harmonics value V23	3rd	0 to 32767	V	-	35.9 V	35.9 V
2056	0808h	2	R	Reserved		0		-	-	-
2057	0809h	2	R	Harmonics value V12	5th	0 to 32767	V	-	35.1 V	35.1 V
2058	080Ah	2	R	Harmonics value V23	5th	0 to 32767	V	-	34.9 V	34.9 V
2059	080Bh	2	R	Reserved		0		-	-	-
2060	080Ch	2	R	Harmonics value V12	7th	0 to 32767	V	-	34.1 V	34.1 V
2061	080Dh	2	R	Harmonics value V23	7th	0 to 32767	V	-	34.3 V	34.3 V
2062	080Eh	2	R	Reserved		0		-	-	-
2063	080Fh	2	R	Harmonics value V12	9th	0 to 32767	V	-	33.1 V	33.1 V
2064	0810h	2	R	Harmonics value V23	9th	0 to 32767	V	-	33.3 V	33.3 V
2065	0811h	2	R	Reserved		0		-	-	-
2066	0812h	2	R	Harmonics value V12	11th	0 to 32767	V	-	32.1 V	32.1 V
2067	0813h	2	R	Harmonics value V23	11th	0 to 32767	V	-	32.3 V	32.3 V
2068	0814h	2	R	Reserved		0		-	-	-
2069	0815h	2	R	Harmonics value V12	13th	0 to 32767	V	-	20.1 V	20.1 V
2070	0816h	2	R	Harmonics value V23	13th	0 to 32767	V	-	21.3 V	21.3 V
2071	0817h	2	R	Reserved		0		-	-	-

Harmonics Value Register

Address		byte count	R/W	Register Name		RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.							3P4W	3P3W 2CT	3P3W 3CT
2304	0900h	2	R	Harmonics value I1	Total	0 to 32767	A	3.15 A	3.15 A	3.15 A
2305	0901h	2	R	Harmonics value I2	Total	0 to 32767	A	3.07 A	2.92 A	3.07 A
2306	0902h	2	R	Harmonics value I3	Total	0 to 32767	A	2.99 A	2.99 A	2.99 A
2307	0903h	2	R	Harmonics value IN	Total	0 to 32767	A	2.92 A	-	-
2308	0904h	2	R	Harmonics value I1	1st	0 to 32767	A	3.71 A	3.71 A	3.71 A
2309	0905h	2	R	Harmonics value I2	1st	0 to 32767	A	3.72 A	3.75 A	3.72 A
2310	0906h	2	R	Harmonics value I3	1st	0 to 32767	A	3.73 A	3.73 A	3.73 A
2311	0907h	2	R	Harmonics value IN	1st	0 to 32767	A	3.75 A	-	-
2312	0908h	2	R	Harmonics value I1	3rd	0 to 32767	A	1.63 A	1.63 A	1.63 A
2313	0909h	2	R	Harmonics value I2	3rd	0 to 32767	A	1.60 A	1.54 A	1.60 A
2314	090Ah	2	R	Harmonics value I3	3rd	0 to 32767	A	1.57 A	1.57 A	1.57 A
2315	090Bh	2	R	Harmonics value IN	3rd	0 to 32767	A	1.54 A	-	-
2316	090Ch	2	R	Harmonics value I1	5th	0 to 32767	A	1.48 A	1.48 A	1.48 A
2317	090Dh	2	R	Harmonics value I2	5th	0 to 32767	A	1.45 A	1.39 A	1.45 A
2318	090Eh	2	R	Harmonics value I3	5th	0 to 32767	A	1.42 A	1.42 A	1.42 A
2319	090Fh	2	R	Harmonics value IN	5th	0 to 32767	A	1.39 A	-	-
2320	0910h	2	R	Harmonics value I1	7th	0 to 32767	A	1.34 A	1.34 A	1.34 A
2321	0911h	2	R	Harmonics value I2	7th	0 to 32767	A	1.30 A	1.24 A	1.30 A
2322	0912h	2	R	Harmonics value I3	7th	0 to 32767	A	1.27 A	1.27 A	1.27 A
2323	0913h	2	R	Harmonics value IN	7th	0 to 32767	A	1.24 A	-	-
2324	0914h	2	R	Harmonics value I1	9th	0 to 32767	A	1.19 A	1.19 A	1.19 A
2325	0915h	2	R	Harmonics value I2	9th	0 to 32767	A	1.15 A	1.09 A	1.15 A
2326	0916h	2	R	Harmonics value I3	9th	0 to 32767	A	1.12 A	1.12 A	1.12 A
2327	0917h	2	R	Harmonics value IN	9th	0 to 32767	A	1.09 A	-	-
2328	0918h	2	R	Harmonics value I1	11th	0 to 32767	A	1.04 A	1.04 A	1.04 A
2329	0919h	2	R	Harmonics value I2	11th	0 to 32767	A	1.00 A	0.94 A	1.00 A
2330	091Ah	2	R	Harmonics value I3	11th	0 to 32767	A	0.97 A	0.97 A	0.97 A
2331	091Bh	2	R	Harmonics value IN	11th	0 to 32767	A	0.94 A	-	-
2332	091Ch	2	R	Harmonics value I1	13th	0 to 32767	A	0.89 A	0.89 A	0.89 A
2333	091Dh	2	R	Harmonics value I2	13th	0 to 32767	A	0.86 A	0.79 A	0.86 A
2334	091Eh	2	R	Harmonics value I3	13th	0 to 32767	A	0.82 A	0.82 A	0.82 A
2335	091Fh	2	R	Harmonics value IN	13th	0 to 32767	A	0.79 A	-	-
2560	0A00h	2	R	THD V1N	Total	0 to 1000	×0.1%	86.6%	-	-
2561	0A01h	2	R	THD V2N	Total	0 to 1000	×0.1%	80.2%	-	-
2562	0A02h	2	R	THD V3N	Total	0 to 1000	×0.1%	86.9%	-	-
2563	0A03h	2	R	Harmonic distortion V1N	3rd	0 to 1000	×0.1%	39.6%	-	-
2564	0A04h	2	R	Harmonic distortion V2N	3rd	0 to 1000	×0.1%	39.7%	-	-
2565	0A05h	2	R	Harmonic distortion V3N	3rd	0 to 1000	×0.1%	39.3%	-	-
2566	0A06h	2	R	Harmonic distortion V1N	5th	0 to 1000	×0.1%	38.5%	-	-
2567	0A07h	2	R	Harmonic distortion V2N	5th	0 to 1000	×0.1%	18.4%	-	-
2568	0A08h	2	R	Harmonic distortion V3N	5th	0 to 1000	×0.1%	38.2%	-	-
2569	0A09h	2	R	Harmonic distortion V1N	7th	0 to 1000	×0.1%	37.4%	-	-
2570	0A0Ah	2	R	Harmonic distortion V2N	7th	0 to 1000	×0.1%	37.5%	-	-
2571	0A0Bh	2	R	Harmonic distortion V3N	7th	0 to 1000	×0.1%	37.6%	-	-
2572	0A0Ch	2	R	Harmonic distortion V1N	9th	0 to 1000	×0.1%	36.3%	-	-
2573	0A0Dh	2	R	Harmonic distortion V2N	9th	0 to 1000	×0.1%	36.4%	-	-
2574	0A0Eh	2	R	Harmonic distortion V3N	9th	0 to 1000	×0.1%	36.5%	-	-
2575	0A0Fh	2	R	Harmonic distortion V1N	11th	0 to 1000	×0.1%	35.2%	-	-
2576	0A10h	2	R	Harmonic distortion V2N	11th	0 to 1000	×0.1%	35.3%	-	-
2577	0A11h	2	R	Harmonic distortion V3N	11th	0 to 1000	×0.1%	35.4%	-	-
2578	0A12h	2	R	Harmonic distortion V1N	13th	0 to 1000	×0.1%	22.1%	-	-
2579	0A13h	2	R	Harmonic distortion V2N	13th	0 to 1000	×0.1%	23.2%	-	-
2580	0A14h	2	R	Harmonic distortion V3N	13th	0 to 1000	×0.1%	23.3%	-	-

Harmonics Value Register

Address		byte count	R/W	Register Name	RANGE	Unit	Reply data(secondary side)			
Dec.	Hex.						3P4W	3P3W 2CT	3P3W 3CT	
2816	0B00h	2	R	THD V12	Total	0 to 1000	×0.1%	-	86.6%	86.6%
2817	0B01h	2	R	THD V23	Total	0 to 1000	×0.1%	-	86.9%	86.9%
2818	0B02h	2	R	Reserved		0		-	-	-
2819	0B03h	2	R	Harmonic distortion V12	3rd	0 to 1000	×0.1%	-	39.6%	39.6%
2820	0B04h	2	R	Harmonic distortion V23	3rd	0 to 1000	×0.1%	-	39.3%	39.3%
2821	0B05h	2	R	Reserved		0		-	-	-
2822	0B06h	2	R	Harmonic distortion V12	5th	0 to 1000	×0.1%	-	38.5%	38.5%
2823	0B07h	2	R	Harmonic distortion V23	5th	0 to 1000	×0.1%	-	38.2%	38.2%
2824	0B08h	2	R	Reserved		0		-	-	-
2825	0B09h	2	R	Harmonic distortion V12	7th	0 to 1000	×0.1%	-	37.4%	37.4%
2826	0B0Ah	2	R	Harmonic distortion V23	7th	0 to 1000	×0.1%	-	37.6%	37.6%
2827	0B0Bh	2	R	Reserved		0		-	-	-
2828	0B0Ch	2	R	Harmonic distortion V12	9th	0 to 1000	×0.1%	-	36.3%	36.3%
2829	0B0Dh	2	R	Harmonic distortion V23	9th	0 to 1000	×0.1%	-	36.5%	36.5%
2830	0B0Eh	2	R	Reserved		0		-	-	-
2831	0B0Fh	2	R	Harmonic distortion V12	11th	0 to 1000	×0.1%	-	35.2%	35.2%
2832	0B10h	2	R	Harmonic distortion V23	11th	0 to 1000	×0.1%	-	35.4%	35.4%
2833	0B11h	2	R	Reserved		0		-	-	-
2834	0B12h	2	R	Harmonic distortion V12	13th	0 to 1000	×0.1%	-	22.1%	22.1%
2835	0B13h	2	R	Harmonic distortion V23	13th	0 to 1000	×0.1%	-	23.3%	23.3%
2836	0B14h	2	R	Reserved		0		-	-	-
3072	0C00h	2	R	THD I1	Total	0 to 1000	×0.1%	84.9%	84.9%	84.9%
3073	0C01h	2	R	THD I2	Total	0 to 1000	×0.1%	82.5%	77.9%	82.5%
3074	0C02h	2	R	THD I3	Total	0 to 1000	×0.1%	80.3%	80.3%	80.3%
3075	0C03h	2	R	THD IN	Total	0 to 1000	×0.1%	77.9%	-	-
3076	0C04h	2	R	Harmonic distortion I1	3rd	0 to 1000	×0.1%	43.9%	43.9%	43.9%
3077	0C05h	2	R	Harmonic distortion I2	3rd	0 to 1000	×0.1%	43.0%	41.1%	43.0%
3078	0C06h	2	R	Harmonic distortion I3	3rd	0 to 1000	×0.1%	42.1%	42.1%	42.1%
3079	0C07h	2	R	Harmonic distortion IN	3rd	0 to 1000	×0.1%	41.1%	-	-
3080	0C08h	2	R	Harmonic distortion I1	5th	0 to 1000	×0.1%	39.9%	39.9%	39.9%
3081	0C09h	2	R	Harmonic distortion I2	5th	0 to 1000	×0.1%	39.0%	37.1%	39.0%
3082	0C0Ah	2	R	Harmonic distortion I3	5th	0 to 1000	×0.1%	38.1%	38.1%	38.1%
3083	0C0Bh	2	R	Harmonic distortion IN	5th	0 to 1000	×0.1%	37.1%	-	-
3084	0C0Ch	2	R	Harmonic distortion I1	7th	0 to 1000	×0.1%	36.1%	36.1%	36.1%
3085	0C0Dh	2	R	Harmonic distortion I2	7th	0 to 1000	×0.1%	34.9%	33.1%	34.9%
3086	0C0Eh	2	R	Harmonic distortion I3	7th	0 to 1000	×0.1%	34.0%	34.0%	34.0%
3087	0C0Fh	2	R	Harmonic distortion IN	7th	0 to 1000	×0.1%	33.1%	-	-
3088	0C10h	2	R	Harmonic distortion I1	9th	0 to 1000	×0.1%	32.1%	32.1%	32.1%
3089	0C11h	2	R	Harmonic distortion I2	9th	0 to 1000	×0.1%	30.9%	29.1%	30.9%
3090	0C12h	2	R	Harmonic distortion I3	9th	0 to 1000	×0.1%	30.0%	30.0%	30.0%
3091	0C13h	2	R	Harmonic distortion IN	9th	0 to 1000	×0.1%	29.1%	-	-
3092	0C14h	2	R	Harmonic distortion I1	11th	0 to 1000	×0.1%	28.0%	28.0%	28.0%
3093	0C15h	2	R	Harmonic distortion I2	11th	0 to 1000	×0.1%	26.9%	25.1%	26.9%
3094	0C16h	2	R	Harmonic distortion I3	11th	0 to 1000	×0.1%	26.0%	26.0%	26.0%
3095	0C17h	2	R	Harmonic distortion IN	11th	0 to 1000	×0.1%	25.1%	-	-
3096	0C18h	2	R	Harmonic distortion I1	13th	0 to 1000	×0.1%	24.0%	24.0%	24.0%
3097	0C19h	2	R	Harmonic distortion I2	13th	0 to 1000	×0.1%	23.1%	21.1%	23.1%
3098	0C1Ah	2	R	Harmonic distortion I3	13th	0 to 1000	×0.1%	22.0%	22.0%	22.0%
3099	0C1Bh	2	R	Harmonic distortion IN	13th	0 to 1000	×0.1%	21.1%	-	-

(h) Harmonics Maximum Value Register

Address		byte count	R/W	Register Name			RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.								3P4W	3P3W 2CT	3P3W 3CT
3328	0D00h	2	R	Reserved			0		-	-	-
3329	0D01h	2	R	Harmonics value V(L-N)	1st	Max.	0 to 32767	V	91.8 V	-	-
3330	0D02h	2	R	Reserved			0		-	-	-
3331	0D03h	2	R	Reserved			0		-	-	-
3332	0D04h	2	R	Reserved			0		-	-	-
3333	0D05h	2	R	Reserved			0		-	-	-
3334	0D06h	2	R	Reserved			0		-	-	-
3335	0D07h	2	R	Reserved			0		-	-	-
3584	0E00h	2	R	Reserved			0		-	-	-
3585	0E01h	2	R	Harmonics value V(L-L)	1st	Max.	0 to 32767	V	-	91.8 V	91.8 V
3586	0E02h	2	R	Reserved			0		-	-	-
3587	0E03h	2	R	Reserved			0		-	-	-
3588	0E04h	2	R	Reserved			0		-	-	-
3589	0E05h	2	R	Reserved			0		-	-	-
3590	0E06h	2	R	Reserved			0		-	-	-
3591	0E07h	2	R	Reserved			0		-	-	-
3840	0F00h	2	R	Harmonics value current	Total	Max.	0 to 32767	A	3.48 A	3.51 A	3.48 A
3841	0F01h	2	R	Harmonics value current	1st	Max.	0 to 32767	A	3.76 A	3.77 A	3.76 A
3842	0F02h	2	R	Harmonics value current	3rd	Max.	0 to 32767	A	1.66 A	1.67 A	1.66 A
3843	0F03h	2	R	Harmonics value current	5th	Max.	0 to 32767	A	1.56 A	1.58 A	1.56 A
3844	0F04h	2	R	Harmonics value current	7th	Max.	0 to 32767	A	1.46 A	1.47 A	1.46 A
3845	0F05h	2	R	Harmonics value current	9th	Max.	0 to 32767	A	1.36 A	1.37 A	1.36 A
3846	0F06h	2	R	Harmonics value current	11th	Max.	0 to 32767	A	1.26 A	1.28 A	1.26 A
3847	0F07h	2	R	Harmonics value current	13th	Max.	0 to 32767	A	1.16 A	1.17 A	1.16 A
3848	0F08h	2	R	Reserved			0		-	-	-
3849	0F09h	2	R	Reserved			0		-	-	-
3850	0F0Ah	2	R	Reserved			0		-	-	-
3851	0F0Bh	2	R	Reserved			0		-	-	-
3852	0F0Ch	2	R	Reserved			0		-	-	-
3853	0F0Dh	2	R	Reserved			0		-	-	-
3854	0F0Eh	2	R	Reserved			0		-	-	-
3855	0F0Fh	2	R	Harmonics value neutral current	Total	Max.	0 to 32767	A	3.51 A	-	-
3856	0F10h	2	R	Reserved			0		-	-	-
3857	0F11h	2	R	Reserved			0		-	-	-
3858	0F12h	2	R	Reserved			0		-	-	-
3859	0F13h	2	R	Harmonics value neutral current	1st	Max.	0 to 32767	A	3.77 A	-	-
3860	0F14h	2	R	Reserved			0		-	-	-
3861	0F15h	2	R	Reserved			0		-	-	-
3862	0F16h	2	R	Reserved			0		-	-	-
3863	0F17h	2	R	Harmonics value neutral current	3rd	Max.	0 to 32767	A	1.67 A	-	-
3864	0F18h	2	R	Reserved			0		-	-	-
3865	0F19h	2	R	Reserved			0		-	-	-
3866	0F1Ah	2	R	Reserved			0		-	-	-
3867	0F1Bh	2	R	Harmonics value neutral current	5th	Max.	0 to 32767	A	1.58 A	-	-
3868	0F1Ch	2	R	Reserved			0		-	-	-
3869	0F1Dh	2	R	Reserved			0		-	-	-
3870	0F1Eh	2	R	Reserved			0		-	-	-
3871	0F1Fh	2	R	Harmonics value neutral current	7th	Max.	0 to 32767	A	1.47 A	-	-
3872	0F20h	2	R	Reserved			0		-	-	-
3873	0F21h	2	R	Reserved			0		-	-	-
3874	0F22h	2	R	Reserved			0		-	-	-
3875	0F23h	2	R	Harmonics value neutral current	9th	Max.	0 to 32767	A	1.37 A	-	-
3876	0F24h	2	R	Reserved			0		-	-	-
3877	0F25h	2	R	Reserved			0		-	-	-
3878	0F26h	2	R	Reserved			0		-	-	-
3879	0F27h	2	R	Harmonics value neutral current	11th	Max.	0 to 32767	A	1.28 A	-	-
3880	0F28h	2	R	Reserved			0		-	-	-
3881	0F29h	2	R	Reserved			0		-	-	-
3882	0F2Ah	2	R	Reserved			0		-	-	-
3883	0F2Bh	2	R	Harmonics value neutral current	13th	Max.	0 to 32767	A	1.17 A	-	-

Harmonics Maximum Value Register

Address		byte count	R/W	Register Name			RANGE	Unit	Reply data(secondary side)		
Dec.	Hex.								3P4W	3P3W 2CT	3P3W 3CT
4096	1000h	2	R	THD voltage	Total	Max.	0 to 1000	×0.1%	91.7%	-	-
4097	1001h	2	R	Harmonic distortion voltage(L-N)	3rd	Max.	0 to 1000	×0.1%	40.1%	-	-
4098	1002h	2	R	Harmonic distortion voltage(L-N)	5th	Max.	0 to 1000	×0.1%	39.1%	-	-
4099	1003h	2	R	Harmonic distortion voltage(L-N)	7th	Max.	0 to 1000	×0.1%	37.9%	-	-
4100	1004h	2	R	Harmonic distortion voltage(L-N)	9th	Max.	0 to 1000	×0.1%	36.8%	-	-
4101	1005h	2	R	Harmonic distortion voltage(L-N)	11th	Max.	0 to 1000	×0.1%	35.7%	-	-
4102	1006h	2	R	Harmonic distortion voltage(L-N)	13th	Max.	0 to 1000	×0.1%	34.6%	-	-
4352	1100h	2	R	THD voltage	Total	Max.	0 to 1000	×0.1%	-	91.7%	91.7%
4353	1101h	2	R	Harmonic distortion voltage(L-L)	3rd	Max.	0 to 1000	×0.1%	-	40.1%	40.1%
4354	1102h	2	R	Harmonic distortion voltage(L-L)	5th	Max.	0 to 1000	×0.1%	-	39.1%	39.1%
4355	1103h	2	R	Harmonic distortion voltage(L-L)	7th	Max.	0 to 1000	×0.1%	-	37.9%	37.9%
4356	1104h	2	R	Harmonic distortion voltage(L-L)	9th	Max.	0 to 1000	×0.1%	-	36.8%	36.8%
4357	1105h	2	R	Harmonic distortion voltage(L-L)	11th	Max.	0 to 1000	×0.1%	-	35.7%	35.7%
4358	1106h	2	R	Harmonic distortion voltage(L-L)	13th	Max.	0 to 1000	×0.1%	-	34.6%	34.6%
4608	1200h	2	R	Reserved			0		-	-	-
4609	1201h	2	R	Reserved			0		-	-	-
4610	1202h	2	R	Reserved			0		-	-	-
4611	1203h	2	R	Reserved			0		-	-	-
4612	1204h	2	R	Reserved			0		-	-	-
4613	1205h	2	R	Reserved			0		-	-	-
4614	1206h	2	R	Reserved			0		-	-	-

9. Sample program for the programmable controllers (Reference information)

This chapter explains the sample program for the programmable controllers, the MELSEC-Q series QJ71MB91 MODBUS interface module (hereinafter referred to as QJ71MB91) and the communication adapter for MELSEC-F PLC: FX3U-485ADP-MB.

Section 8.1 explains the sample program for QJ71MB91 with MELSEC-Q PLC.

Section 8.2 explains the sample program for FX3U-485ADP-MB with MELSEC-F PLC.

9.1 Sample program for QJ71MB91

This section explains the sample program (setting example) for sample program for QJ71MB91 with MELSEC-Q PLC.

Section 8.1.1 explains the configuration process for QJ71MB91 with MELSEC-Q PLC.

Section 8.1.2 explains the sample program of the reading data from two ME96.

Please refer to the following manual for QJ71MB91.

Manual Name	Manual No.
MODBUS Interface Module User's Manual	SH-080578ENG (13JR86)

9.1.1 Configuration process example for QJ71MB91

(1) Setting for MODBUS communication

Set the operation mode, transmission speeds, transmission settings and station numbers in the intelligent function module switch.

Set the procedure (a) or (b).

Procedure (a) : Example of use the GX Works2

Procedure (b) : Example of use the switch setting of "PLC parameter"

(a) Setting procedure: Example of use the GX Works2

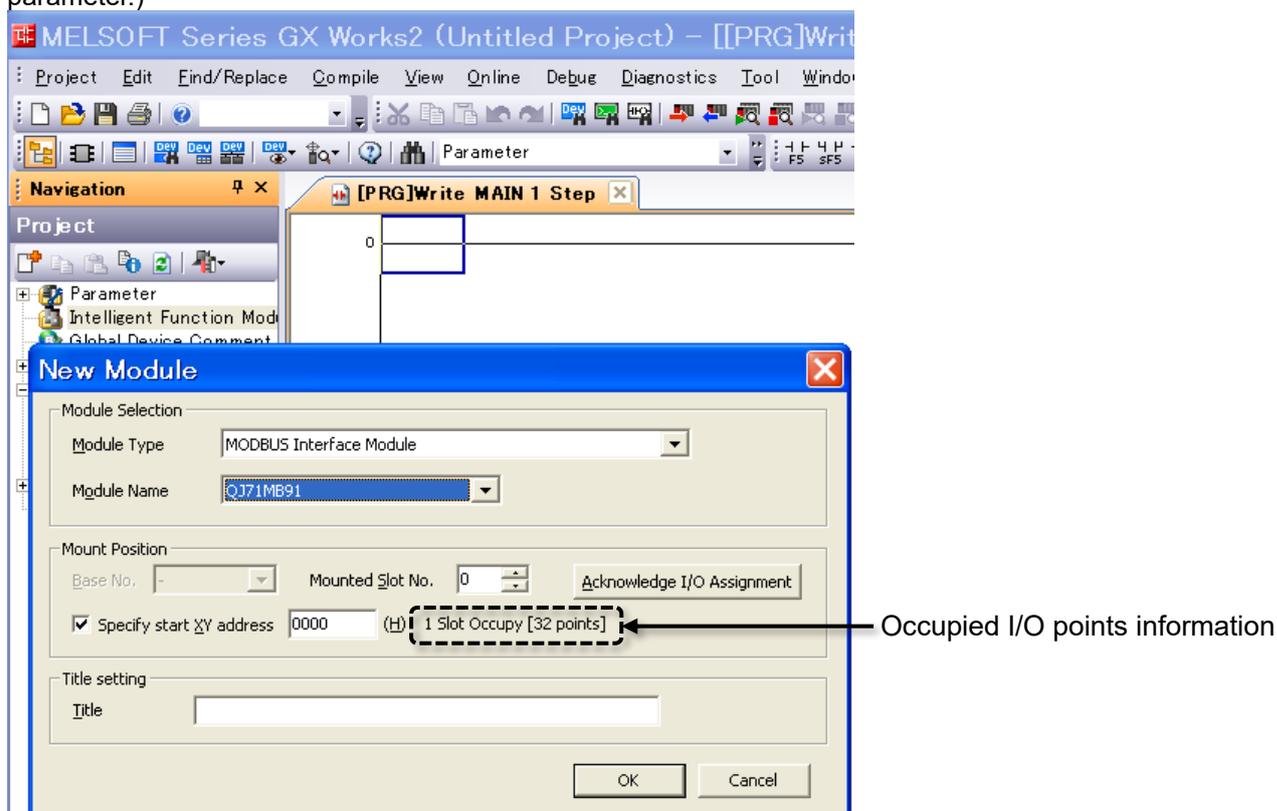
This section explains the setting procedure of use the intelligent function module switch with GX Works2.

(i) Adding intelligent Adding intelligent function module data

Add the intelligent function module data to the project being edited.

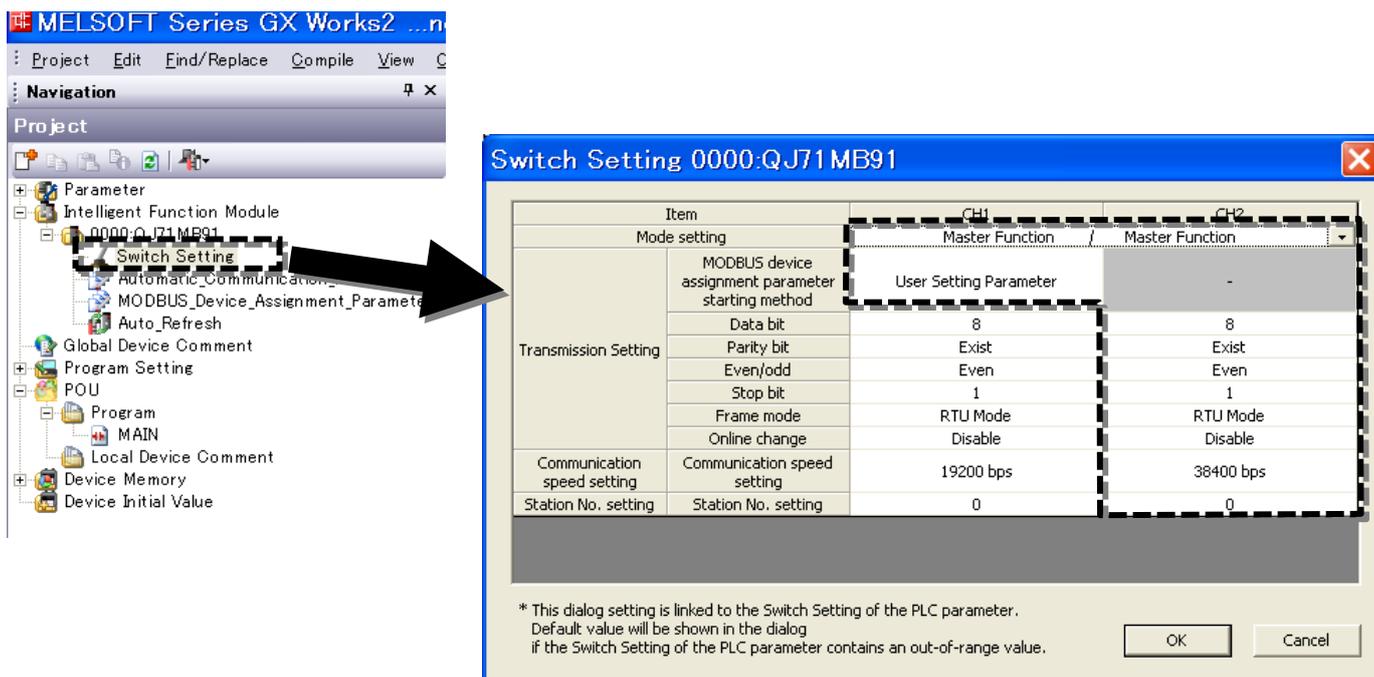
Select [Project] ⇒ [Intelligent Function Module] ⇒ [New Module].

(A module can be added by clicking the [New Module] button on the <<I/O Assignment>> tab of the PLC parameter.)



Item	Description	Setting value
Module Selection	—	—
Module type	Select the type of the intelligent function module to be added.	MODBUS Interface Unit
Module model	Select the model of the intelligent function module to be added.	QJ71MB91
Mount Position	—	—
Base No.	Specify the base number where the intelligent function module is mounted.	-
Mounted Slot No.	Set the slot number of the intelligent function module.	0
Specify Start XY Address	Set the start XY address of the intelligent function module.	0000
Occupied I/O points information	Display the number of occupied slots and the number of occupied I/O points of the module selected for "Module Name".	
Title Setting	—	—
Title	Set the title. (The number of applicable characters is 32)	(Blank)

- (ii) Switch setting of intelligent function module
 Edit the switch setting of the intelligent function module.
 Select Project view ⇒ “Intelligent Function Module” ⇒ “(QJ71MB91)” ⇒ “Switch Setting”



Item	Description	Setting value	Remark
Mode setting	Set the operation mode of the QJ71MB91	Master function / Master function	CH2 should be set the Master function.
Transmission setting	—	—	—
MODBUS device assignment parameter starting method	When "Start with the default parameters" is set, the module is started with the parameters assigned by default. When "Start with the user-set parameters" is set, the module is started with the sequenc program or the MODBUS device assignment parameters set on the intelligent function unit.	Start with the user-set parameters.	"Start with the user-set parameters" should be set.
Data bit	Set data bits.	8	Set the same value of ME96 setting.
Parity bit presence	Specify whether parity bit is present or not.	Present	
Even/odd parity	Set even or odd parity. This setting is valid only when "Parity bit presence" is set to "Present".	Even	
Stop bit	Set the stop bit.	1	
Frame mode	Set the frame mode.	RTU mode	Set "RTU mode" , same as frame mode of ME96.
Online change	Set whether to enable or disable data writing to the RUN-status programmable controller CPU by a request message from the master. This setting is valid only when the slave function is set for the channel.	Disable	-
Communication speed setting	Set the Communication speed.	38400 bps	Set the same value of ME96 setting.
CH1, 2 station No. setting	Set slave station No. of the QJ71MB91. For the master function, set 0.	0	-

*Use the CH2 side RS-422/485 interface.

(b) Setting procedure: Example of use the switch setting of “PLC parameter”

This section explains the setting procedure of use the intelligent function module switch with GX Developer.

(i) Setting procedure

1) Start the GX Developer. Double-click “PLC parameter” in the project window of GX Developer.

2) Click the “I/O assignment” tab to display the I/O assignment setting screen.

Set the following th the slot where the QJ71MB91 is mounted.

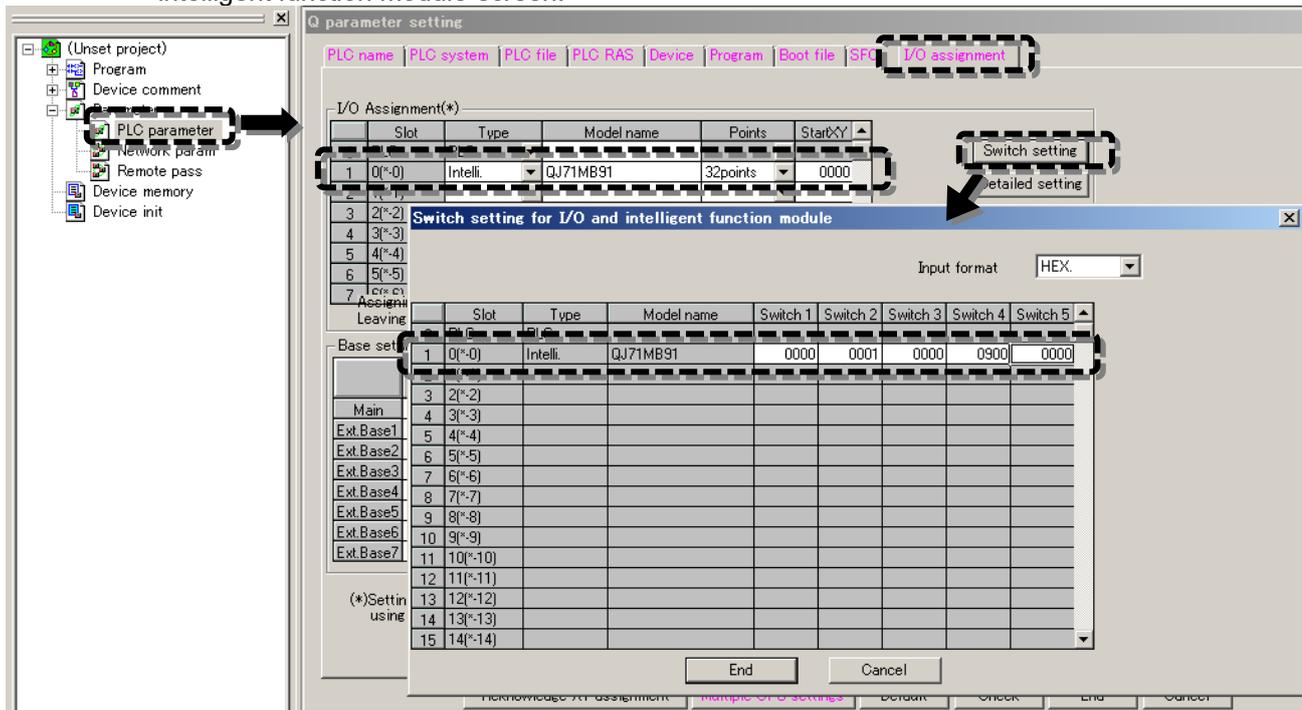
Type : Select “Intelli”

Module name : Enter the model name of the module.

Points : Select 32 points.

Start XY : 0000 (Enter the QJ71MB91 head input/output numbers.)

3) Click the I/O assignment setting screen [Switch setting] button to display the “Switch setting for I/O and intelligent function module”screen.



Item	Description	Setting		Details																																								
		Value	Description																																									
Switch 1	Mode setting	0000h	Master function	Set the mode setting of CH1 (RS-232C)																																								
Switch 2	CH1 Communication speed/transmission setting	0001h	Start with the user-set parameters (CH Common)	Set the transmission setting and MODBUS device assignment parameter starting method. * When using the automatic communication function, set ON(1) for b0.																																								
Switch 3	Mode setting	0000h	Master function	Set the mode setting of CH2 (RS-422/485)																																								
Switch 4	CH2 Communication speed/transmission setting	0900h	Data bit:8 Parity bit:Present Even/odd parity:Even Stop bit:1 Online change:Disable Speed: 38400bps	<table border="1"> <thead> <tr> <th>Bit</th> <th>Item</th> <th>OFF(0)</th> <th>ON(1)</th> </tr> </thead> <tbody> <tr> <td>b0</td> <td>-</td> <td colspan="2">Fixed to OFF</td> </tr> <tr> <td>b1</td> <td>Data bit</td> <td>8</td> <td>7</td> </tr> <tr> <td>b2</td> <td>Parity bit</td> <td>Present</td> <td>Not Present</td> </tr> <tr> <td>b3</td> <td>Even/odd parity</td> <td>Even</td> <td>Odd</td> </tr> <tr> <td>b4</td> <td>Stop bit</td> <td>1</td> <td>2</td> </tr> <tr> <td>b5</td> <td>Frame mode</td> <td>RTU mode</td> <td>ASCII mode</td> </tr> <tr> <td>b6</td> <td>Online change</td> <td>Disable</td> <td>Enable</td> </tr> <tr> <td>b7</td> <td>-</td> <td colspan="2">Fixed to OFF</td> </tr> <tr> <td>b8 to b15</td> <td>Communication speed</td> <td colspan="2">2400 bps :03h 4800 bps :04h 9600 bps :05h 19200 bps :07h 38400 bps :09h</td> </tr> </tbody> </table> <p>* Set the same value of ME96 setting.</p>	Bit	Item	OFF(0)	ON(1)	b0	-	Fixed to OFF		b1	Data bit	8	7	b2	Parity bit	Present	Not Present	b3	Even/odd parity	Even	Odd	b4	Stop bit	1	2	b5	Frame mode	RTU mode	ASCII mode	b6	Online change	Disable	Enable	b7	-	Fixed to OFF		b8 to b15	Communication speed	2400 bps :03h 4800 bps :04h 9600 bps :05h 19200 bps :07h 38400 bps :09h	
Bit	Item	OFF(0)	ON(1)																																									
b0	-	Fixed to OFF																																										
b1	Data bit	8	7																																									
b2	Parity bit	Present	Not Present																																									
b3	Even/odd parity	Even	Odd																																									
b4	Stop bit	1	2																																									
b5	Frame mode	RTU mode	ASCII mode																																									
b6	Online change	Disable	Enable																																									
b7	-	Fixed to OFF																																										
b8 to b15	Communication speed	2400 bps :03h 4800 bps :04h 9600 bps :05h 19200 bps :07h 38400 bps :09h																																										
Switch 5	CH1,2 station No. setting	0000h	b0 to b7: CH1 side b8 to b15: CH2 side	For the master fanchon, set 00h.																																								

*Set the CH2 side RS-422/485 interface.

(2) MODBUS communication example

In case of reading/writing the MODBUS devices with the QJ71MB91 operated as a master, the master function includes the following two functions.

(a) : Automatic communication function

(b) : Communication using dedicated instruction

(a) Automatic communication function

By setting the automatic communication parameters, ME96 data can be automatically read from or written to the slaves at the specified intervals using the QJ71MB91 buffer memory.

Up to 32 automatic communication parameters can be set for each channel.

Set the automatic communication parameters when using the automatic communication function with the QJ71MB91 operated as a master.

(b) Automatic communication parameter

Address (for CH2)	Parameter name	Setting range	Details
0380h to 0381h (896 to 897)	Setting parameter existence	00000000h: Disabled 00000001h: Enabled	Set whether to enable or disable the automatic communication parameters
0382h (898)	Target station No	1 to 247: Slave station No.	Specify a slave to which request messages are sent.
0383h (899)	Request interval timer value	0: Upon reception of a reply message from a slave, immediately issues the next request message. 2 to 65535: The time from when the QJ71MB91 sends a request message until it sends the next request message (Set time = set value 10 ms)	The Request interval timer represents the interval between any successive request message transmissions in the automatic communication function. The time from when the QJ71MB91 sends a request message until it sends the next request message is measured.
0384h (900)	Response monitoring timer value/Broadcast delay value	0 : 30 seconds 2 to 65535: Response monitoring timer (Set time = set value 10 ms)	The Response monitoring timer is used to monitor the time from when the QJ71MB91 sends a response message until it receives a response message from the slave.
0385h (901)	Type specification of the target MODBUS device	0000h: Not specified 0500h: Read holding registers 0005h: Write multiple registers	0500h is for the read holding registers. 0005h is for the write multiple registers.
0386h (902)	Read setting	Head buffer memory address	0000h: None 2000h to 2FFFh: CH2 read data storage area
0387h (903)		Target MODBUS device head number	Refer to section 7 .1.
0388h (904)		Access points	0 to 125
0389h (905)	Write setting	Head buffer memory address	0000h: None 4000h to 4FFFh: CH2 write data storage area
038Ah (906)		Target MODBUS device head number	Refer to section 7 .1.
038Bh (907)		Access points	0 to 123
038Ch to 04FFh (908 to 1279)	Automatic communication Parameter 2 to 32	(Same as in automatic communication parameter 1)	

(c) Automatic communication parameter setting (Example of GX Works2)

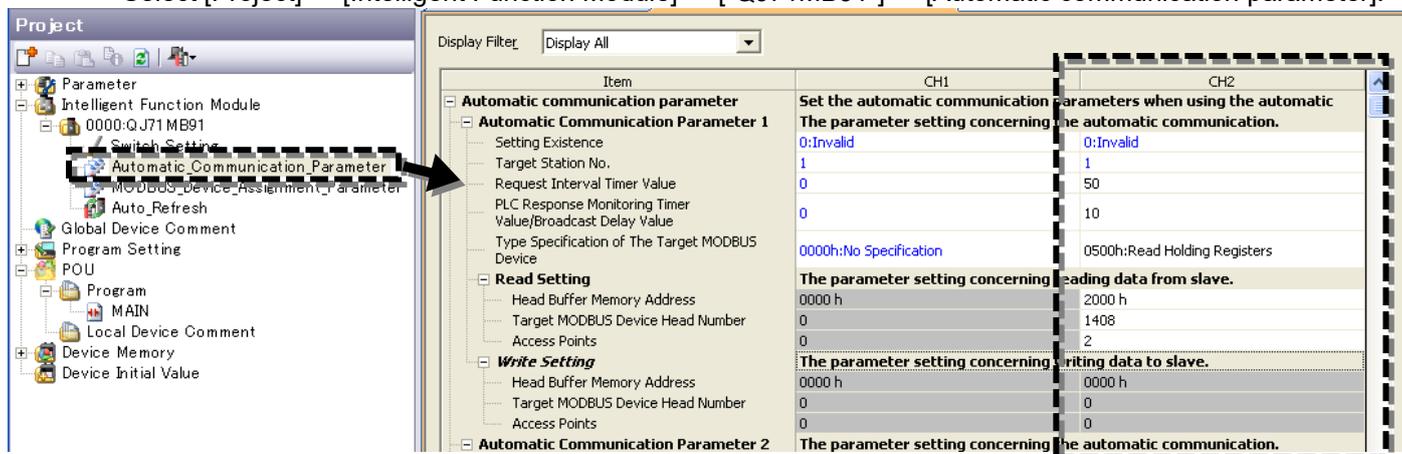
(i) Automatic communication parameter of the intelligent function module

Set the automatic communication parameters when using the automatic communication function with the QJ71MB91 operated as a master.

Up to 32 automatic communication parameters can be set for each channel.

Set the automatic communication parameters of the intelligent function module in GX Works2.

Select [Project]⇒ [Intelligent Function Module]⇒ [“QJ71MB91”]⇒ [Automatic communication parameter].



Item	Description	Setting value	Remark
Setting parameter existence	Set whether to enable or disable the automatic communication parameters	1: Enabled	-
Target station No	Specify a slave to which request messages are sent.	1	Specify the address of ME96.
Request interval timer value	The Request interval timer represents the interval between any successive request message transmissions in the automatic communication function.	50 (500 ms)	0: Upon reception of a reply message from a slave, immediately issues the next request message. 2 to 65535: The time from when the QJ71MB91 sends a request message until it sends the next request message (Set time = set value 10 ms)
Response monitoring timer value/Broadcast delay value	The Response monitoring timer is used to monitor the time from when the QJ71MB91 sends a response message until it receives a response message from the slave.	10 (100 ms)	0 : 30 seconds 2 to 65535: Response monitoring timer (Set time = set value 10 ms)
Type specification of the target MODBUS device	Specify the types of the read/write target MODBUS devices.	0500h: Read holding registers	0500h is for the read holding registers (03h). 0005h is for the write multiple registers (10h).
Read setting	-	-	Specify in case of reading.
Head buffer memory address	Specify the head address of the buffer memory where the data read from the slave are stored.	2000h	The data read from ME96 are stored to the buffer memory 2000h and later.
Target MODBUS device head number	Specify the head number of the read target MODBUS device.	1408 (Note1)	Set "1408" in case of Active energy (import) (unit: kWh fixed). Change it according to the reading data.
Access points	Set the number of points to be read from the MODBUS device.	2	Set "2" in case of Active energy (import) (unit: kWh fixed). Change it according to the reading data.
Write setting	-	-	Specify in case of writing (setting).
Head buffer memory address	Specify the head address of the buffer memory where the data written to the slave are stored.	-	Specify the head address of the buffer memory where the setting data for ME96 are stored.
Target MODBUS device head number	Specify the head number of the write target MODBUS device.	-	-
Access points	Set the number of points to be written to the MODBUS device.	-	-

*Set the CH2 side RS-422/485 interface.

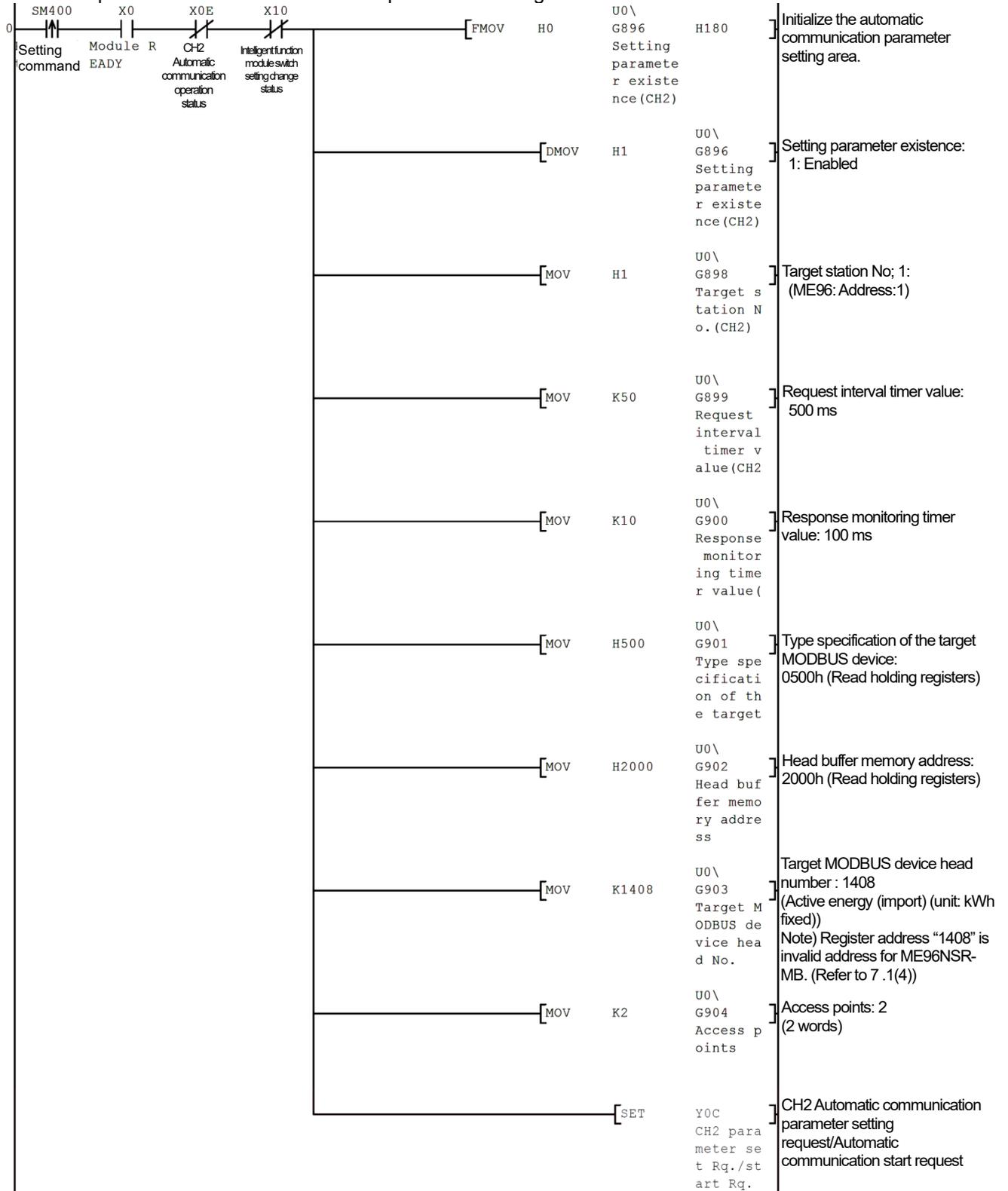
Note1: Register address "1408" is invalid address for ME96NSR-MB. (Refer to 7.1(4))

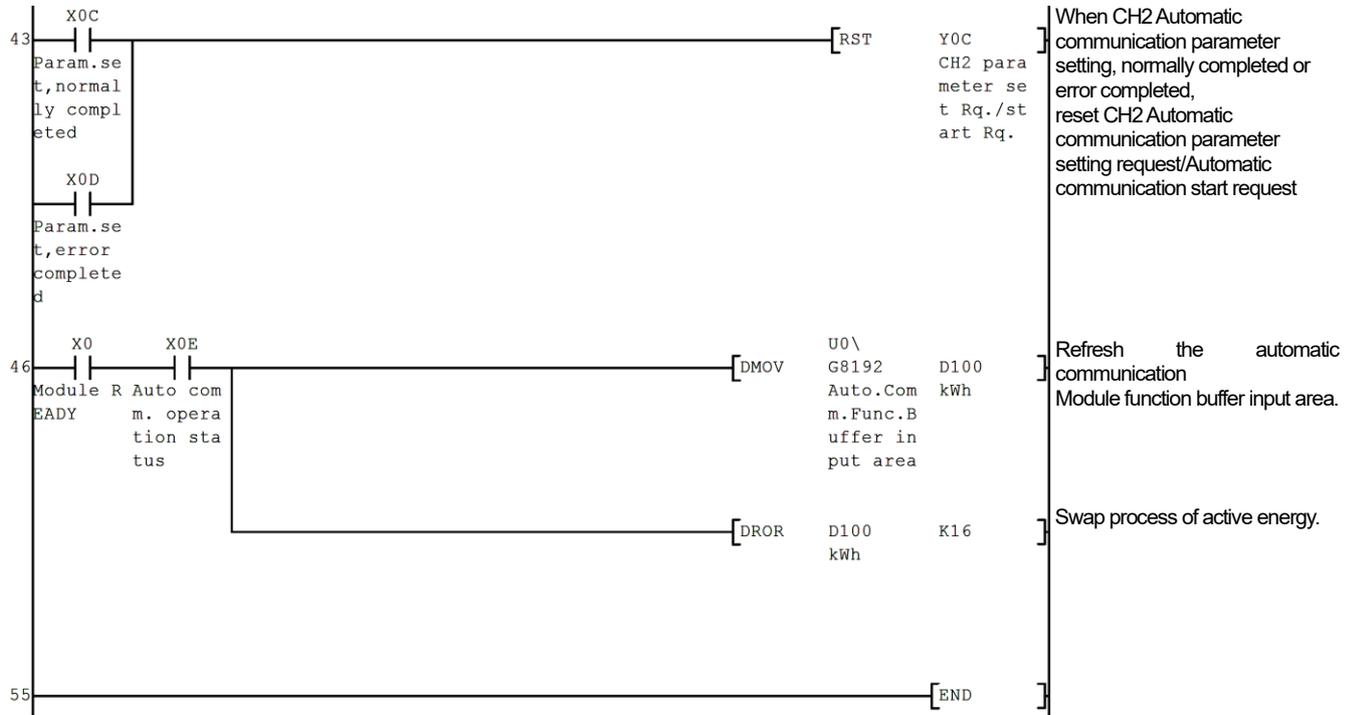
(d) Automatic communication parameter setting (Example of with wequence program)

Set the automatic communication parameters with sequence program as follows.

- 1) Store parameters in the Automatic communication parameter area of the buffer memory (address: 0200H to 037FH / 0380H to 04FFH).
- 2) Turn ON the Automatic communication parameter setting request/Automatic communication start request (Y4/YC).

An example of automatic communication parameter setting is shown below.



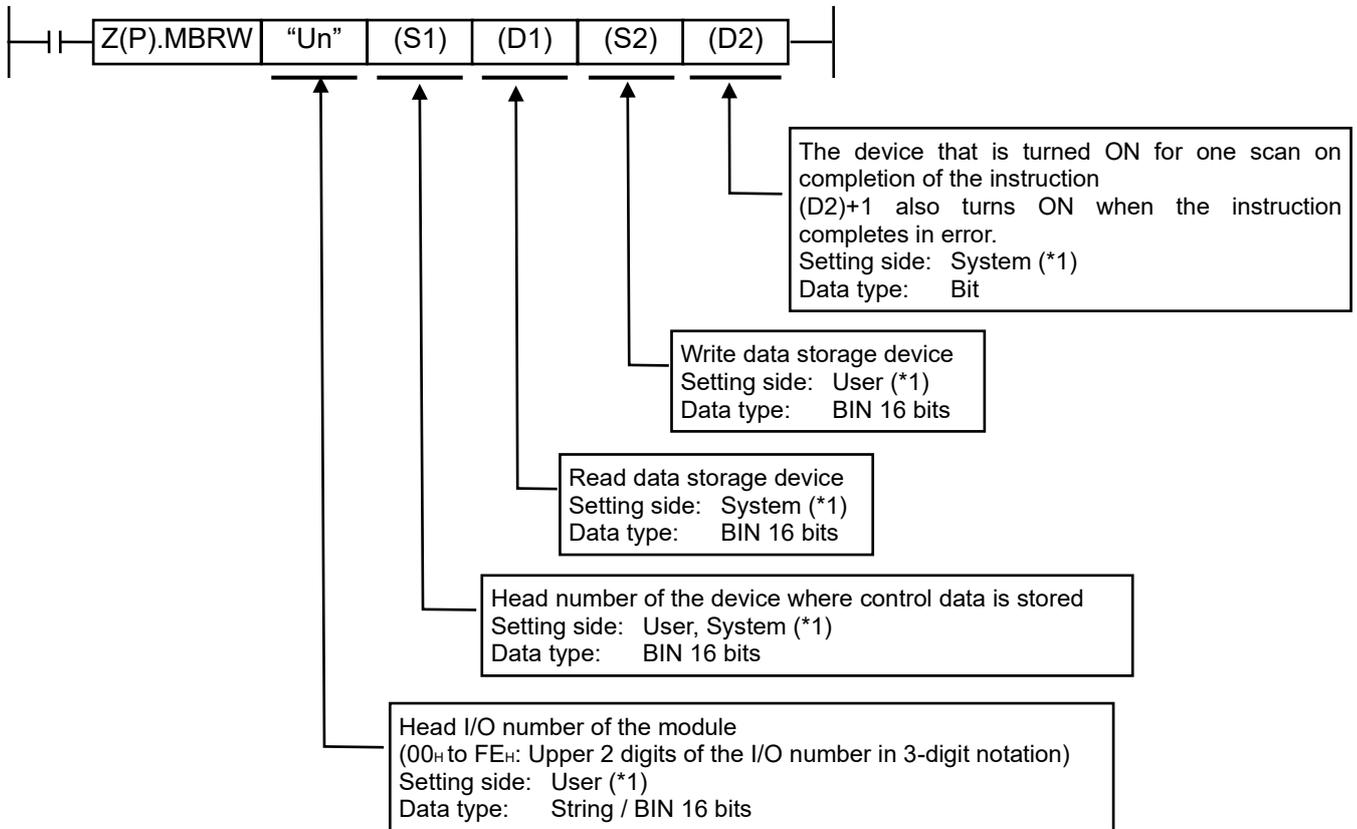


(e) Communication by dedicated instructions

The dedicated instructions make programming easy for use of the intelligent function module functions. Dedicated instructions can be used to make communication from sequence programs at any timing.

(i) Z(P).MBRW instruction

This instruction allows reading or writing of MODBUS device data to a slave.



*1 The setting side is as described below.

- User : Data are set by the user before dedicated instruction execution.
- System: The programmable controller CPU stores the result of dedicated instruction execution.

(ii) Control data

Control data of the MBRW instruction.

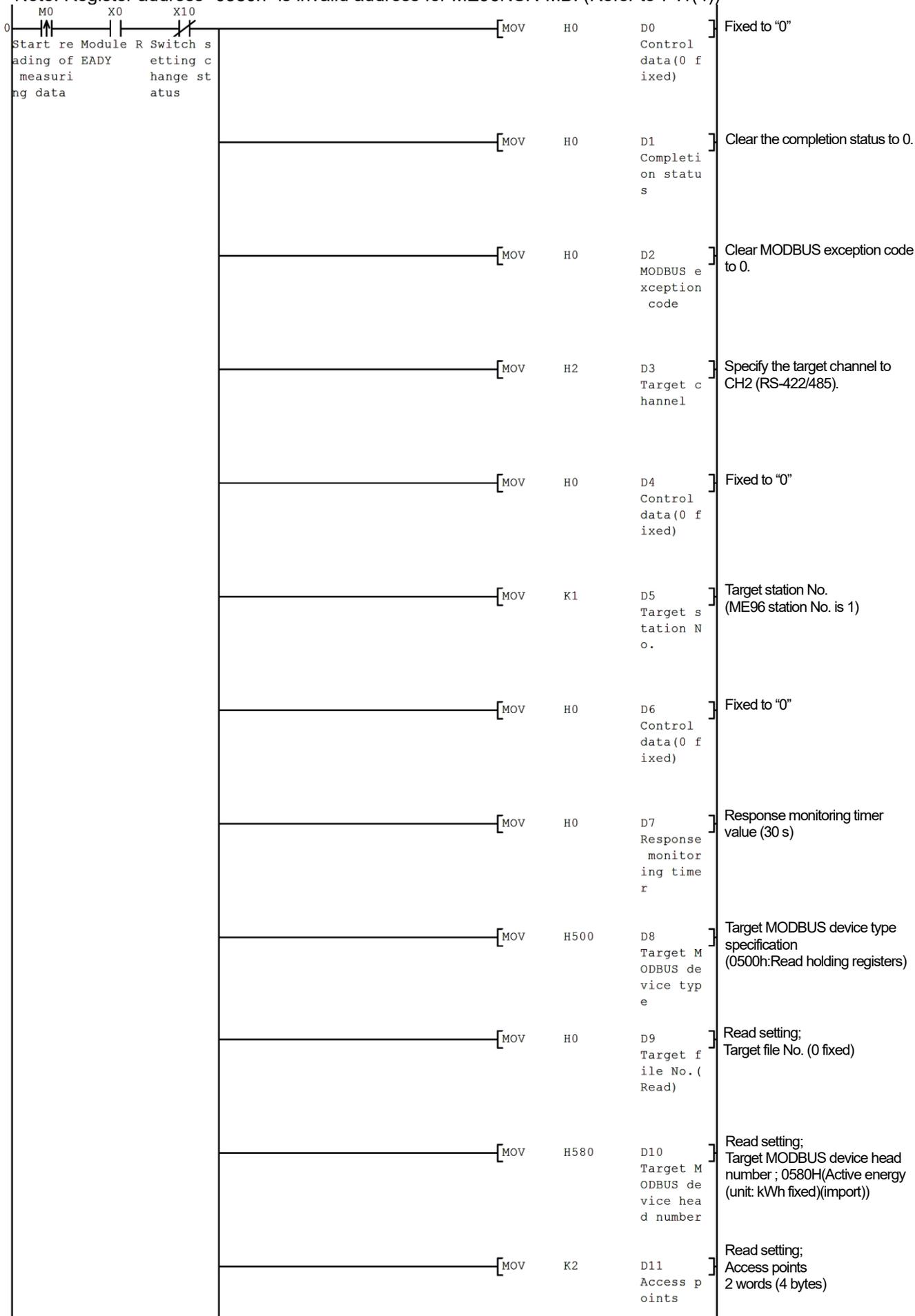
Device	Item	Setting data	Setting range	Setting side *1
(S1)+0	-	Specify 0.	0	User
(S1)+1	Completion status	The status of the instruction completion is stored. 0 : Normal completion Other than 0: Error completion (QJ71MB91 error code)	-	System
(S1)+2	MODBUS exception code	An exception code from a slave (ME96) is stored. 0 : Slave (ME96) processing normally completed Other than 0: Slave processing completed in error (exception code)	-	System
(S1)+3	Channel	Specify the target channel. 1: RS-232 2: RS-422/485	1,2	User
(S1)+4	-	Specify 0.	0	User
(S1)+5	Target station No.	Specify the station number of the target slave. 1 to 247 : Target slave (ME96) station number	1 to 247	User
(S1)+6	-	Specify 0.	0	User
(S1)+7	Response monitoring timer value/Broadcast delay value	Specify the time for monitoring a response from the target device (slave). (Unit: 10 ms) 0 :30 seconds 2 to 65535: Set value (Response monitoring timer value = set value x 10 ms)	0, 2 to 65535	User
(S1)+8	Type specification of the target MODBUS device	Specify the type of the read/write target MODBUS device.	0500h: Read holding registers 0005h: Write multiple registers	User
(S1)+9	Target file number	Specify a file number when the target MODBUS device is the extended file register.	0	User
(S1)+10	Target MODBUS device head number	Specify the head number of the read target MODBUS device. Specify the lower 5 digits of the device head number. The device head number is specified as "(Actual device number) - 1". (Example) Specify "768" when accessing registers 400769.	Refer to section 7 .1.	User
(S1)+11	Access points	Set the read points of the MODBUS device.	1 to 125	User
(S1)+12	Read data storage size	Set the word size of the read data stored in the argument (D1) and later fields.	-	System
(S1)+13	Target file number	Specify a file number when the target MODBUS device is the extended file register.	0	User
(S1)+14	Target MODBUS device head number	Specify the head number of the write target MODBUS device. Specify the lower 5 digits of the device head number. The device head number is specified as "(Actual device number) - 1". (Example) Specify "512" when accessing Holding registers 400513.	Refer to section 7 .1.	User
(S1)+15	Access points	Set the read points of the MODBUS device.	1 to 123	User
(S1)+16	Write data storage size	Set the word size of the write data stored in the argument (S2) and later fields. Set "1" for the case of read only.	1 to 125	User

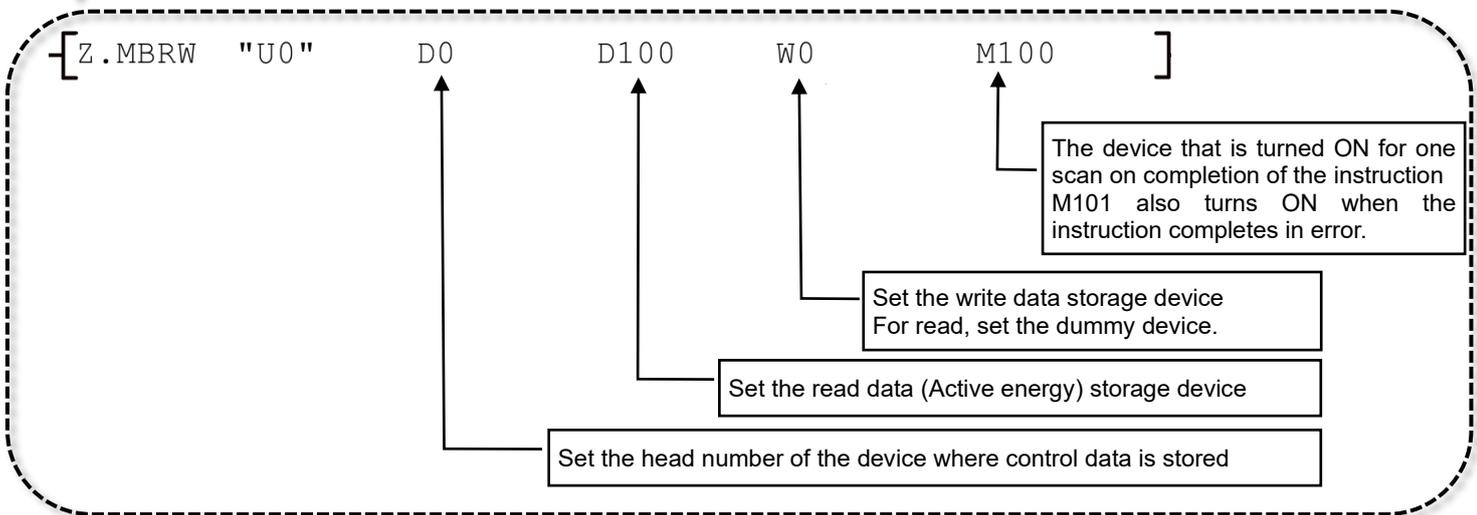
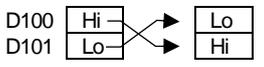
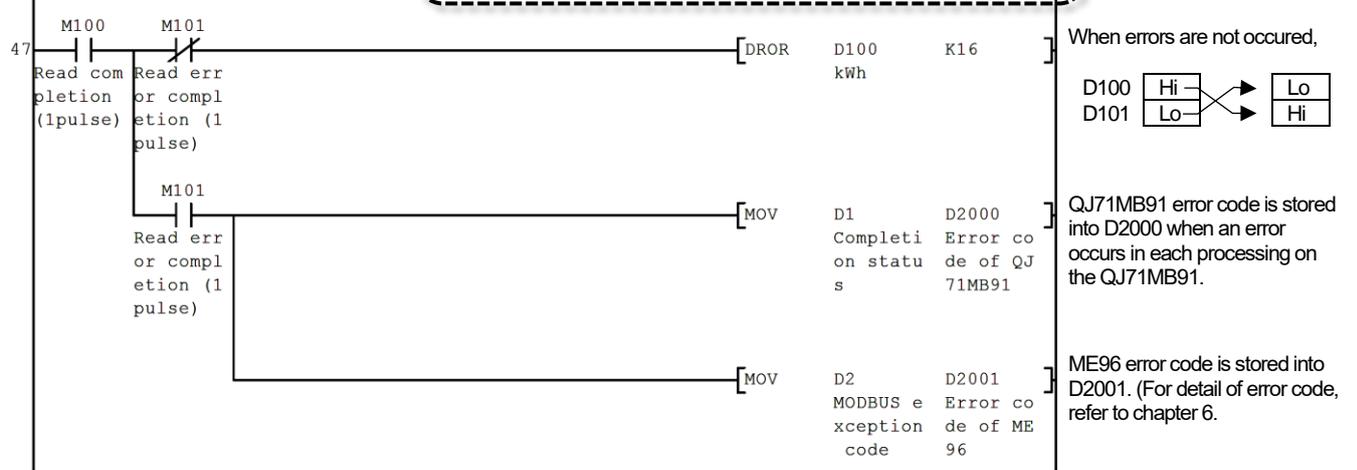
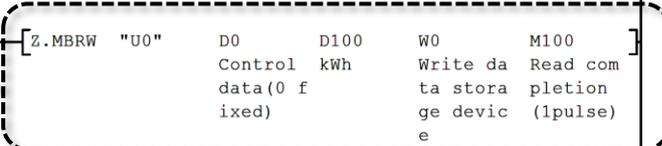
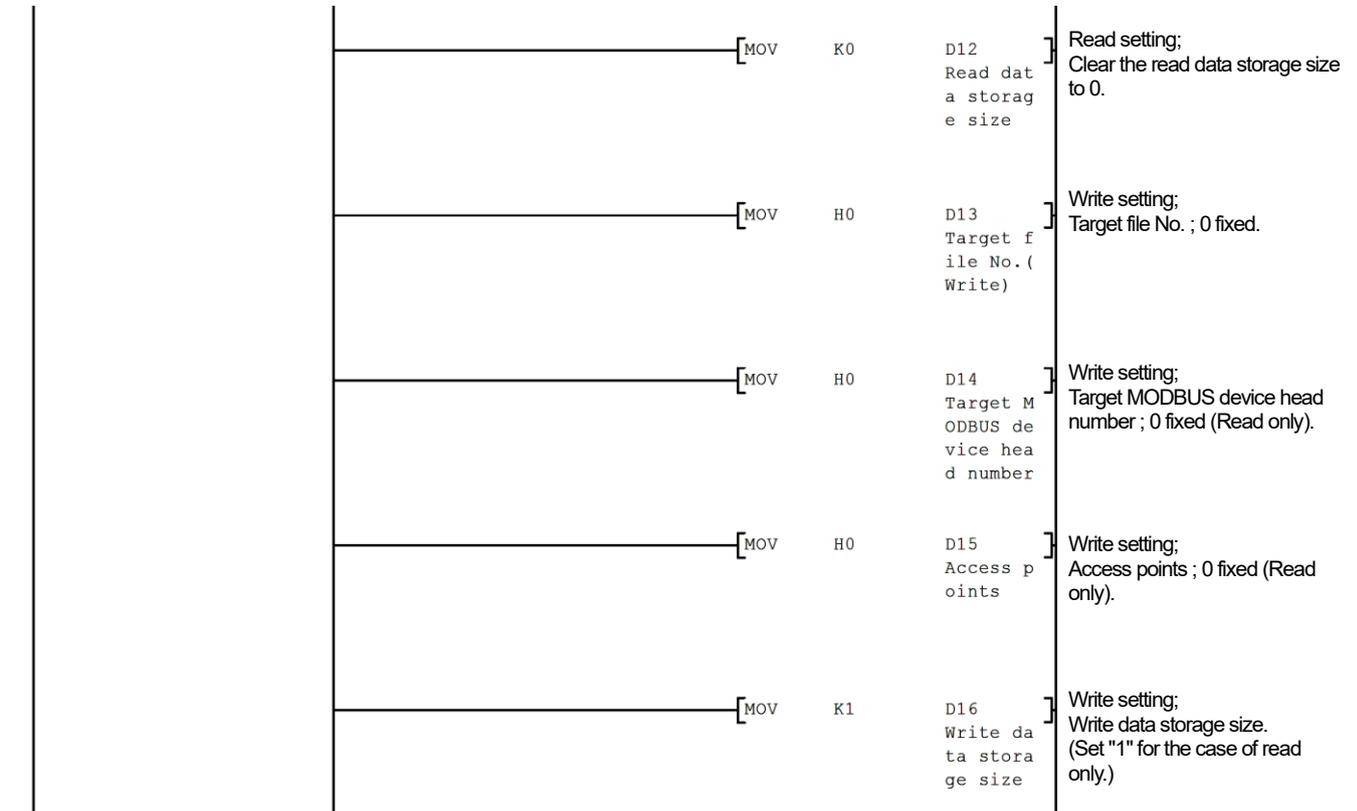
*1 The setting side is as described below.

- User : Data are set by the user before dedicated instruction execution.
- System: The programmable controller CPU stores the result of dedicated instruction execution.

(iii) Example for reading of Active energy (unit: kWh fixed)(import) (Register address 0580h)

Note: Register address "0580h" is invalid address for ME96NSR-MB. (Refer to 7.1(4))





9.1.2 Program example for reading multiple measuring data from two devices with QJ71MB91

When applying the program examples introduced in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.

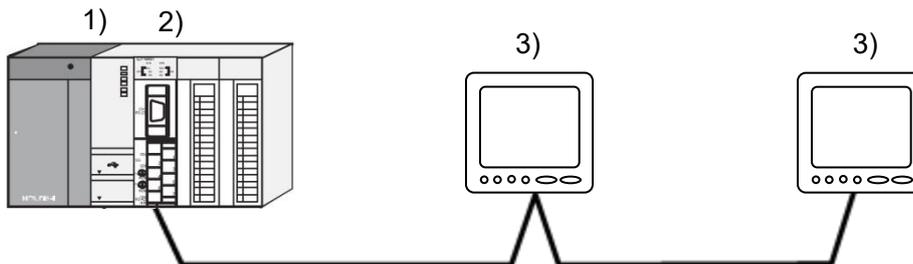
(1) Program details

This sample program is for reading the following measuring data from two ME96.

- Active energy (unit: kWh fixed) (imported) (Resister address: 0580h) (Note1)
- Phase 1 current, Phase 2 current, Phase 3 current (Resister address: 0300h to 0302h)
- Voltage V12, Voltage V23, Voltage V31 (Resister address: 030Ah to 030Ch)
- Σ Active power (Resister address: 031Ah)
- Σ Power factor (Resister address: 0315h)

Note1: Register address "0580h" is invalid address for ME96NSR-MB. (Refer to 7 .1(4))

(2) System configuration



No.	Devices	Description
1	MELSEC-Q series programmable controller	Use the base unit, power supply module and programmable controller CPU.
2	QJ71MB91	MODBUS interface module. The QJ71MB91 is to be mounted in slot 0 of the base unit with the head I/O number set to "00H". Use the CH2 (RS-422/485) interface as a master.
3	ME96	Multi-Measuring instrument. MODBUS slaves. (Address: 1,2)

(a) Setting of ME96

Item	Setting value
Communication speed	38400 bps
Even/odd parity	Even
Stop bit	1

(3) Sample program (Transmission setting)

This section explains the transmission setting as below.

(a) : Example of use the GX Works2

(b) : Example of use the switch setting of PLC parameter

(a) Setting procedure: Example of use the GX Works2

Item		CH1	CH2
Mode setting		Master Function	Master Function
Transmission Setting	MODBUS device assignment parameter starting method	User Setting Parameter	-
	Data bit	8	8
	Parity bit	Exist	Exist
	Even/odd	Even	Even
	Stop bit	1	1
	Frame mode	RTU Mode	RTU Mode
	Online change	Disable	Disable
Communication speed setting	Communication speed setting	19200 bps	38400 bps
Station No. setting	Station No. setting	0	0

* This dialog setting is linked to the Switch Setting of the PLC parameter.
 Default value will be shown in the dialog
 if the Switch Setting of the PLC parameter contains an out-of-range value.

OK Cancel

(b) Setting procedure: Example of use the switch setting of PLC parameter

Input Format:

Slot	Type	Model Name	Switch1	Switch2	Switch3	Switch4	Switch5
0	PLC	PLC					
1	0(*-0)	Intelligent	QJ71MB91	0000	0701	0000	0900 0000
2	1(*-1)						
3	2(*-2)						
4	3(*-3)						
5	4(*-4)						
6	5(*-5)						
7	6(*-6)						
8	7(*-7)						
9	8(*-8)						
10	9(*-9)						
11	10(*-10)						
12	11(*-11)						
13	12(*-12)						
14	13(*-13)						
15	14(*-14)						

If you use Intelligent Function Module, able to set each module with pulldown format by following function.
 - Switch Setting of Intelligent Function Module in project tree.

End Cancel

(4) Relevant devices of sample program

Below table shows the devices used by sample program.

Device	Description	Remark
I/O signals		
X0	Module READY ON : Accessible OFF : Inaccessible	The following I/O signal assignment is based on the case where the start I/O No. of the QJ71MB91 is "0000" (installed to slot 0 of the main base unit).
X0C	CH2 Automatic communication parameter setting, normally completed ON : Normally completed OFF : -	
X0D	CH2 Automatic communication parameter setting, error completed ON : Error completed OFF : -	
X0E	CH2 Automatic communication operation status ON : Operating OFF : Stopped	
X10	Intelligent function module switch setting change status ON : Setting being changed OFF : Setting not changed	
Y0C	CH2 Automatic communication parameter setting request/automatic communication start request ON : Being requested OFF : Not requested	
Relay devices		
B0 to B9	Automatic communication operation status OFF: Operating normally/automatic communication parameter not set/automatic communication function stopped ON: Automatic communication error occurred	The devices set by auto refresh setting as an automatic communication operation status storage area.
M0	Data read command for ME96 (Address 1). ON: Process dedicated instruction. (Turn ON every hour on the hour.)	
M1	Data read command for ME96 (Address 2). ON: Process dedicated instruction. (Turn ON every hour on the hour.)	
M100	The device that is turned ON for one scan on completion of the data read command for ME96 (Address 1).	
M101	The device that is turned ON when the data read command for ME96 (Address 1) completes in error.	
M110	The device that is turned ON for one scan on completion of the data read command for ME96 (Address 2).	
M111	The device that is turned ON when the data read command for ME96 (Address 2) completes in error.	
Buffer memories		
U0#g3106.0 to U0#g3106.3	Area stored automatic communication operation status 0: Operating normally/automatic communication parameter not set/automatic communication function stopped 1: Automatic communication error occurred	
Data registers		
D0 to D26	Read data from the ME96.	Data read from ME96 are stored.
D100 to D116	Controll data of the dedicated instruction.	
D117	Clock data (minutes)	
D2000 to D2003	Error code when the dedicated instruction is used.	

Device	Description	Remark	
Measuring data			
D200,D201	ME96 (Address1)	Measuring data read from ME96 (Address1) are stored.	
D202			Active energy (unit: kWh fixed) (imported)
D203			Phase 1 current
D204			Phase 2 current
D205			Phase 3 current
D206			Voltage V12
D207			Voltage V23
D208			Voltage V31
D209			Σ Active power
D209			Σ Power factor
D210,D211	ME96 (Address2)	Measuring data read from ME96 (Address2) are stored.	
D212			Active energy (unit: kWh fixed) (imported)
D213			Phase 1 current
D214			Phase 2 current
D215			Phase 3 current
D216			Voltage V12
D217			Voltage V23
D218			Voltage V31
D218			Σ Active power
D209			Σ Power factor

(5) Sample program

(a) Communication using the automatic communication function (Setting with GX Works2)

This section explains the setting example of the automatic communication parameter to add the QJ71MB91 to the data of the intelligent function module in GX Works2 for the settings.

(i) Automatic communication parameter setting

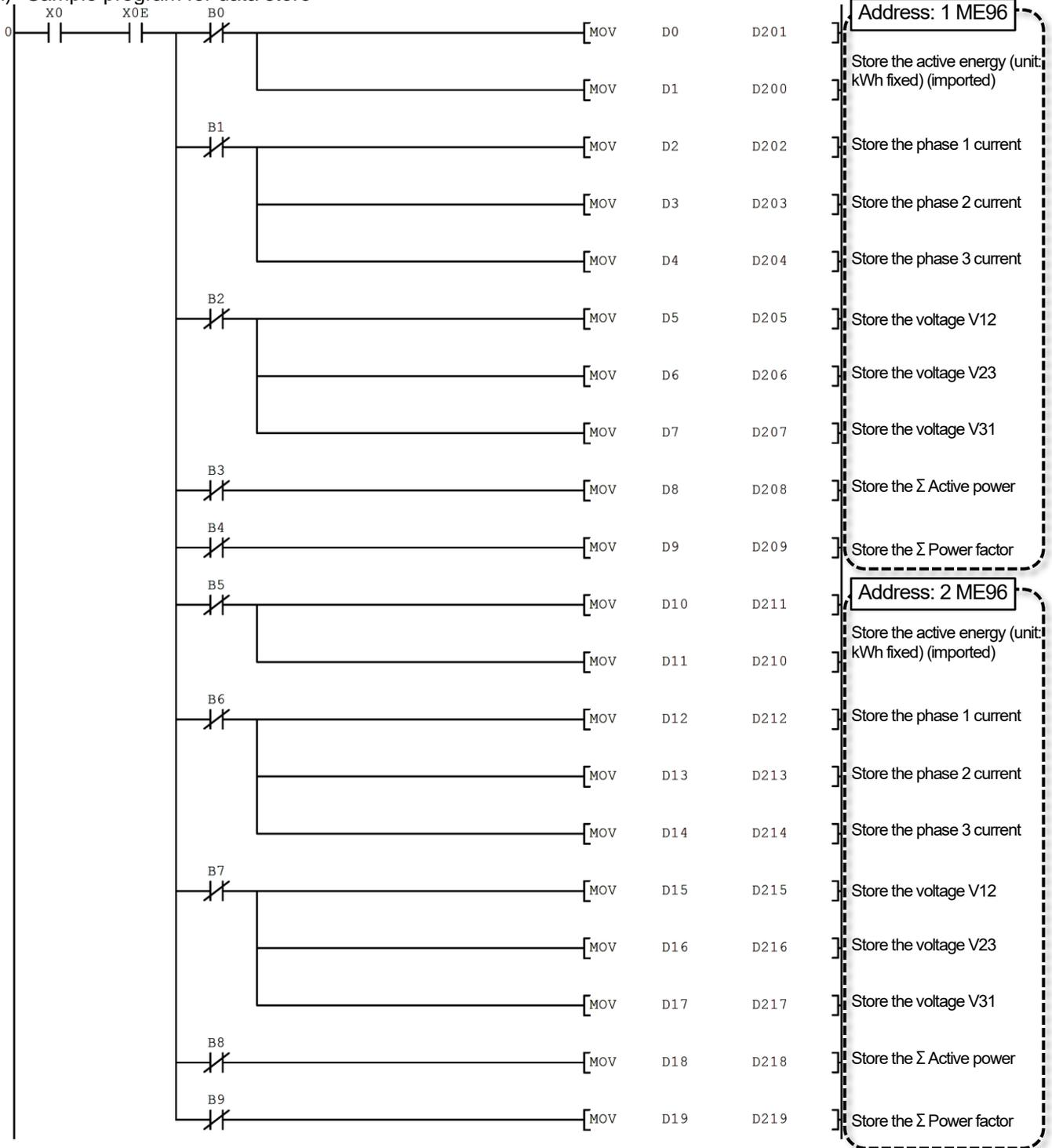
Setting Item	Automatic communication parameter setting										Remark	
	Param; 1	Param; 2	Param; 3	Param; 4	Param; 5	Param; 6	Param; 7	Param; 8	Param; 9	Param; 10		
Setting parameter existence	1										Enabled	
Target station No.	1					2						
Request interval timer value	0											
Response monitoring timer value	0											
Type specification of the target MODBUS device	0500h										Read holding registers	
Read Setting	Head buffer memory address	2000h	2002h	2005h	2008h	2009h	2010h	2012h	2015h	2018h	2019h	
	Target MODBUS device head number	1408 (Wh) *1	768 (A1, A2, A3)	778 (V12, V23, V31)	794 (W)	789 (PF)	1408 (Wh) *1	768 (A1, A2, A3)	778 (V12, V23, V31)	794 (W)	789 (PF)	
	Access points	2	3	3	1	1	2	3	3	1	1	
Write Setting	Head buffer memory address	0										Read only
	Target MODBUS device head number	0										
	Access points	0										

*1: Register address "1408" is invalid address for ME96NSR-MB. (Refer to 7.1(4))

(ii) Auto refresh setting setting

Item	CH1	CH2
Transfer to PLC	The data of the buffer memory is transmitted to the specified device.	
Auto Communication Function Buffer Input Area		D0 (0,20)
Auto Communication Function Operation Status Storage Area (Parameter 1 to 32)		B0
<i>User Setting Area (Input)</i>		
Transfer to Intelligent Function Module	The data of the specified device is transmitted to the buffer memory.	
Auto Communication Function Buffer Output Area		
<i>User Setting Area (Output)</i>		

(iii) Sample program for data store



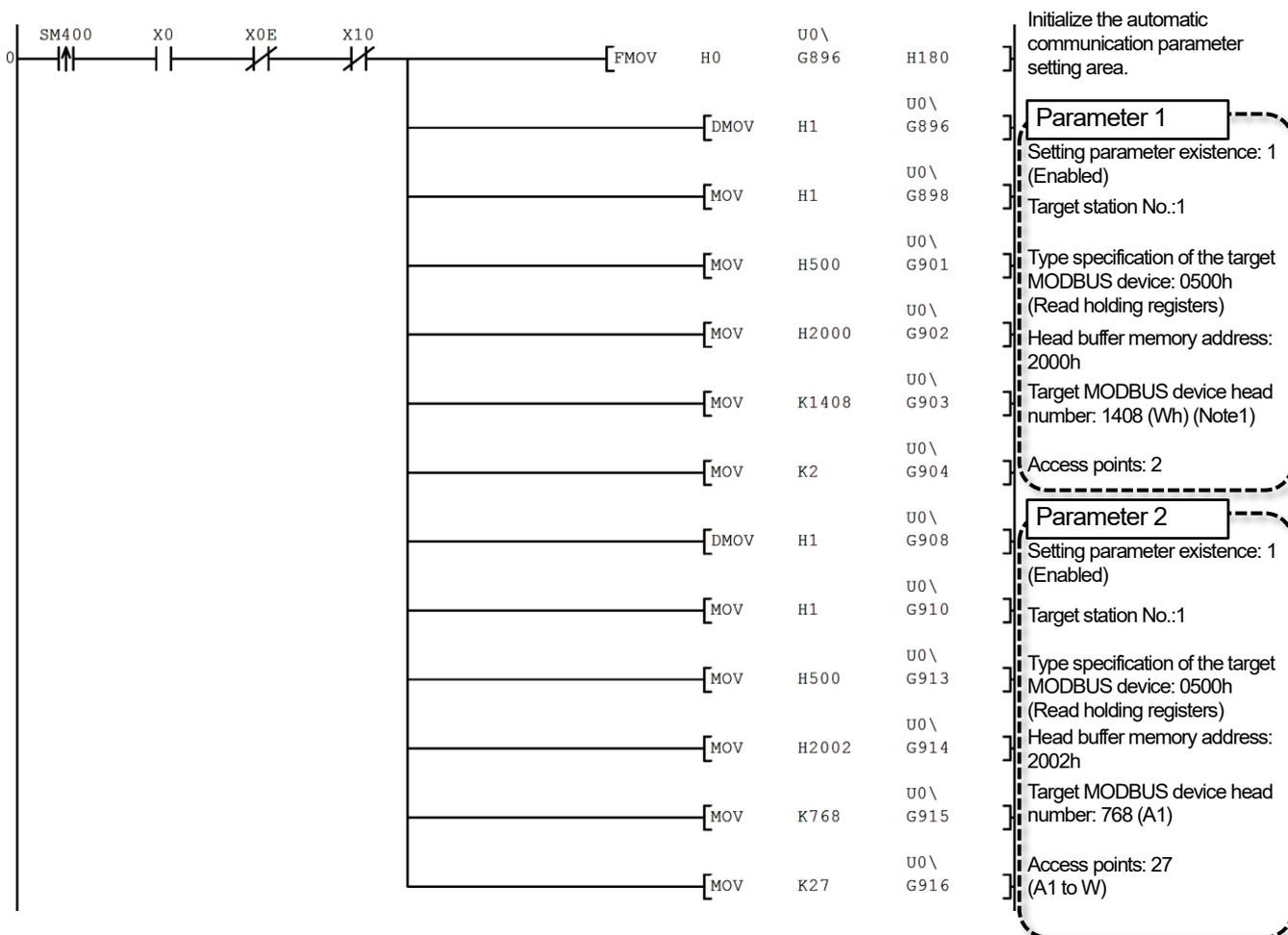
(b) Communication using the automatic communication function (Using sequence program)

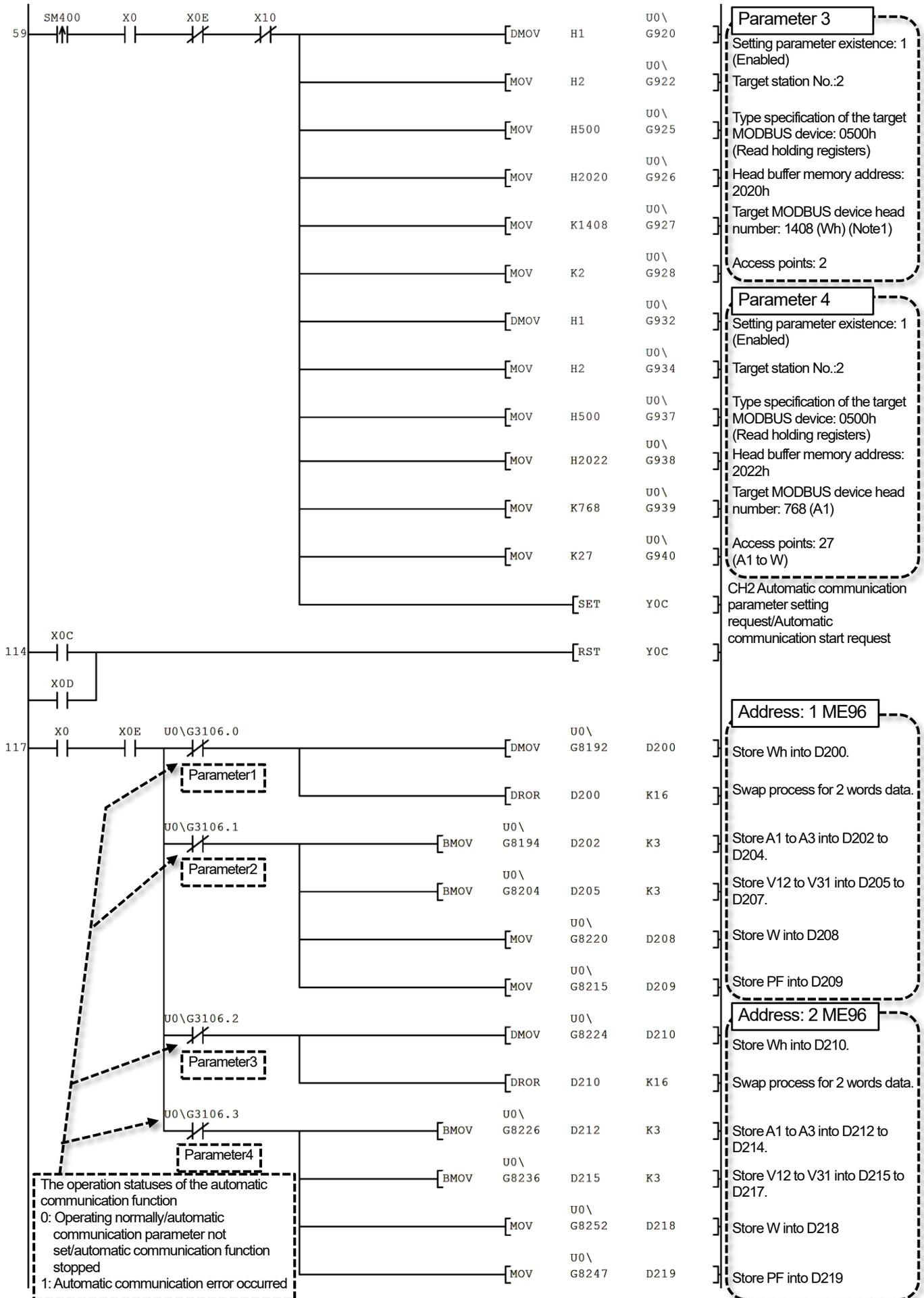
This section explains the setting example of the automatic communication parameter to set the parameters by a sequence program.

(i) Automatic communication parameter setting

Setting Item		Automatic communication parameter setting				Remark
		Param; 1	Param; 2	Param; 3	Param; 4	
Setting parameter existence		1				Enabled
Target station No.		1		2		
Request interval timer value		0				
Response monitoring timer value		0				
Type specification of the target MODBUS device		0500h				Read holding registers
Read Setting	Head buffer memory address	2000h	2002h	2030h	2032h	
	Target MODBUS device head number	1408 (Wh) (Note1)	768(A1) to 794(W)	1408 (Wh) (Note1)	768(A1) to 794(W)	
	Access points	2	27	2	27	
Write Setting	Head buffer memory address	0				Read only
	Target MODBUS device head number	0				
	Access points	0				

Note1) Register address "1408" is invalid address for ME96NSR-MB. (Refer to 7.1(4))





Note1: Register address "1408" is invalid address for ME96NSR-MB. (Refer to 7.1(4))

- (c) Communication using the automatic communication function (With GX Works2) and the dedicated instruction
 This section explains the setting example of the automatic communication parameter and the dedicated instruction at the same channel to set the parameters and programs.

Data read by the automatic communication function are shown below.

- Phase 1 current, Phase 2 current, Phase 3 current
- Voltage V12, Voltage V23, Voltage V31
- Σ Active power
- Σ Power factor

Data read by the dedicated instruction is shown below.

- Active energy (unit: kWh fixed) (imported)

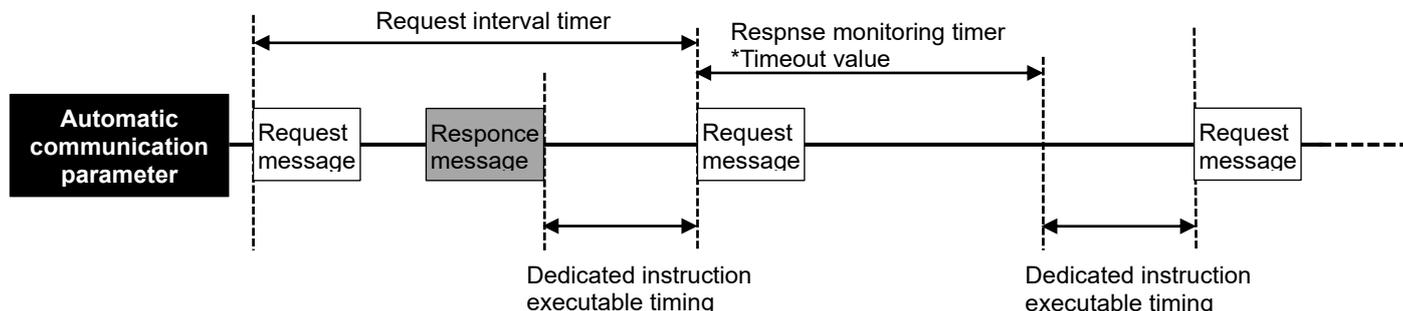
(i) Automatic communication parameter setting

Setting Item		Automatic communication parameter setting								Remark
		Param; 1	Param; 2	Param; 3	Param; 4	Param; 5	Param; 6	Param; 7	Param; 8	
Setting parameter existence		1								Enabled
Target station No.		1				2				
Request interval timer value		0			9		0		9	*1
Response monitoring timer value		0			3		0		3	*1
Type specification of the target MODBUS device		0500h								Read holding registers
Read Setting	Head buffer memory address	2000h	2003h	2006h	2007h	2008h	200Bh	200Eh	200Fh	
	Target MODBUS device head number	768 (A1, A2, A3)	778 (V12, V23, V31)	794 (W)	789 (PF)	768 (A1, A2, A3)	778 (V12, V23, V31)	794 (W)	789 (PF)	
	Access points	3	3	1	1	3	3	1	1	
Write Setting	Head buffer memory address	0								Read only
	Target MODBUS device head number	0								
	Access points	0								

*1: When the automatic communication function and the dedicated instruction are used on the same channel, the dedicated instructions can be executed at the timing shown below.

Set appropriate automatic communication parameters and create a proper sequence program so that the dedicated instruction can be executed in the right timing.

At above table, the interval timer values of "Param; 4" and "Param; 8" are set to ensure the timing for dedicated instruction execution.



Automatic communication parameter;1 to 4
(ME96:Address 1)

Item	CH2
Automatic communication parameter	Set the automatic communication
Automatic Communication Parameter 1	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	1
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	2000 h
Target MODBUS Device Head Number	768
Access Points	3
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 2	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	1
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	2003 h
Target MODBUS Device Head Number	778
Access Points	3
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 3	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	1
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	2006 h
Target MODBUS Device Head Number	794
Access Points	1
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 4	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	1
Request Interval Timer Value	9
PLC Response Monitoring Timer Value/Broadcast Delay Value	3
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	2007 h
Target MODBUS Device Head Number	789
Access Points	1
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0

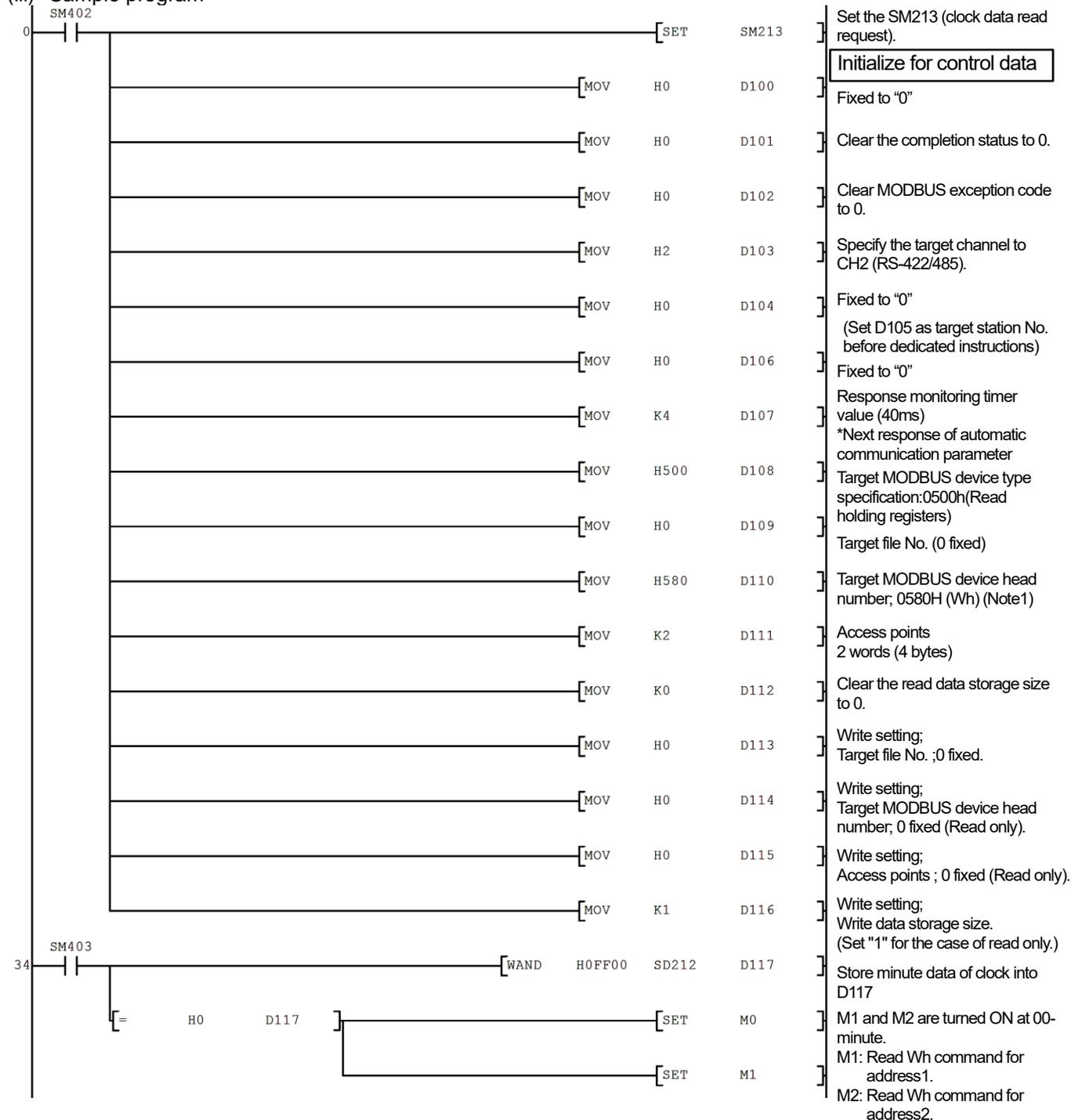
Automatic communication parameter;5 to 8
(ME96:Address 2)

Item	CH2
Automatic Communication Parameter 5	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	2
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	2008 h
Target MODBUS Device Head Number	768
Access Points	3
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 6	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	2
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	200B h
Target MODBUS Device Head Number	778
Access Points	3
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 7	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	2
Request Interval Timer Value	0
PLC Response Monitoring Timer Value/Broadcast Delay Value	0
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	200E h
Target MODBUS Device Head Number	794
Access Points	1
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 8	The parameter setting concerning
Setting Existence	1:Valid
Target Station No.	2
Request Interval Timer Value	9
PLC Response Monitoring Timer Value/Broadcast Delay Value	3
Type Specification of The Target MODBUS Device	0500h:Read Holding Registers
Read Setting	The parameter setting concerning
Head Buffer Memory Address	200F h
Target MODBUS Device Head Number	789
Access Points	1
Write Setting	The parameter setting concerning
Head Buffer Memory Address	0000 h
Target MODBUS Device Head Number	0
Access Points	0
Automatic Communication Parameter 9	The parameter setting concerning

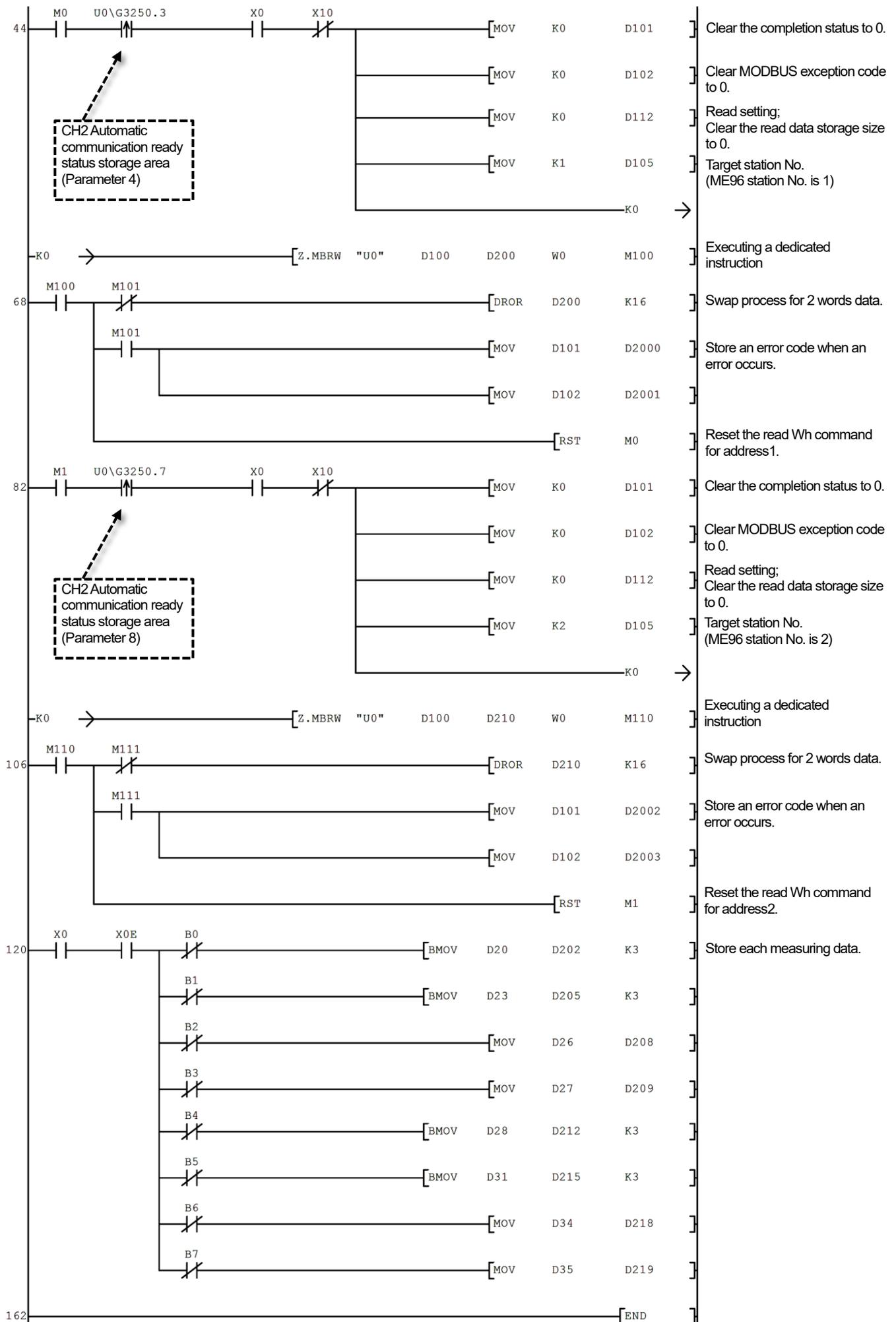
(ii) Auto refresh setting setting

Item	CH1	CH2
Transfer to PLC	The data of the buffer memory is transmitted to the specified device.	
Auto Communication Function Buffer Input		D20 (0,16)
Auto Communication Function Operation Status Storage Area (Parameter 1 to 32)		B0
User Setting Area (Input)		
Transfer to Intelligent Function Module	The data of the specified device is transmitted to the buffer memory.	
Auto Communication Function Buffer Output Area		
User Setting Area (Output)		

(iii) Sample program



Note1: Register address "0580h" is invalid address for ME96NSR-MB. (Refer to 7.1(4))



9.2 Sample program for FX3U-485ADP-MB

This section explains the sample program (setting example) for sample program for FX3U-485ADP-MB with MELSEC-F PLC.

Section 8.2.1 explains the configuration process for FX3U-485ADP-MB with MELSEC-F PLC.

Section 8.2.2 explains the sample program of the reading data from two ME96.

Please refer to the following manual for the communication adapter.

Manual Name	Manual No.
FX3S/FX3G/FX3GC/FX3U/FX3UC SERIES USER'S MANUAL - MODBUS Serial Communication Edition	JY997D26201 (09R626)

9.2.1 Configuration process example for FX3U-485ADP-MB

(1) Setting for MODBUS communication

This section explains the setting procedure of MODBUS communication with the communication adapter and FX3S/FX3G/FX3GC/FX3U/FX3UC series.

To initiate the setup, the PLC program must use the auxiliary relay M8411. When the PLC program contains the "LD M8411" instruction, it is then possible to configure the MODBUS functionality using MOV operations.

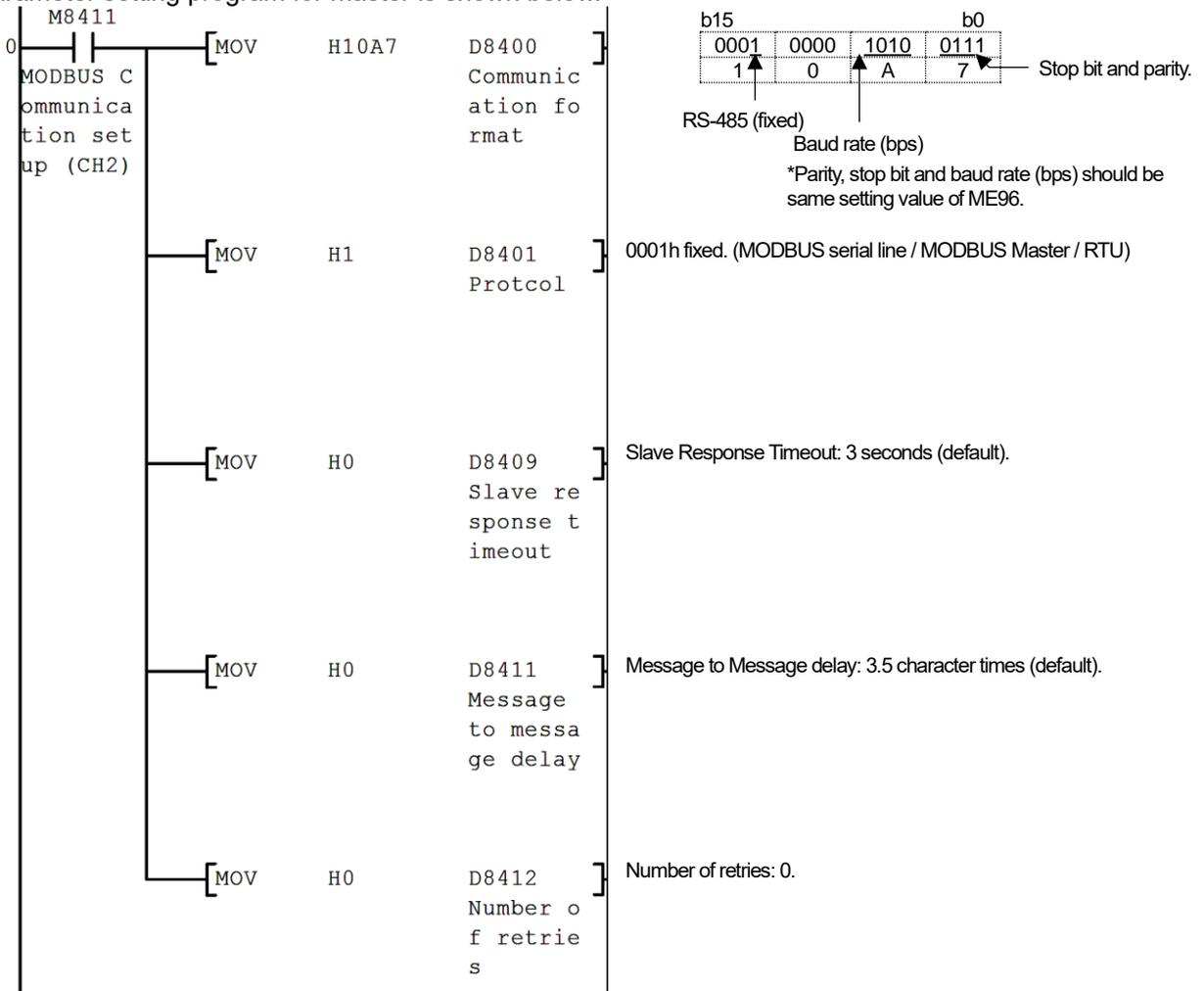
The communication parameters for MODBUS communication can be setup using the following program.

Device	Name	Description	Setting value												
D8400	Communication Format	This device sets the communication format.	10A7h : <table border="1"> <thead> <tr> <th>Name</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>Data length</td> <td>8-bit (fixed)</td> </tr> <tr> <td>Parity</td> <td>Even</td> </tr> <tr> <td>Stop bit</td> <td>1-bit</td> </tr> <tr> <td>Baud rate (bps)</td> <td>38400bps</td> </tr> <tr> <td>H/W type</td> <td>RS485</td> </tr> </tbody> </table>	Name	Contents	Data length	8-bit (fixed)	Parity	Even	Stop bit	1-bit	Baud rate (bps)	38400bps	H/W type	RS485
		Name		Contents											
		Data length		8-bit (fixed)											
		Parity		Even											
		Stop bit		1-bit											
		Baud rate (bps)		38400bps											
		H/W type		RS485											
		Bit No.		Name	Contents										
					0 (bit=OFF)	1 (bit=ON)									
		b0		Data length	7-bit	8-bit									
b1 b2	Parity	b2,b1 (0, 0):Not provided (0, 1):Odd (1, 1):Even													
b3	Stop bit	1-bit	2-bit												
b4 b5 b6 b7	Baud rate (bps)	b7 , b6 , b5 , b4 (0 , 1 , 1 , 0):2400 (0 , 1 , 1 , 1):4800 (1 , 0 , 0 , 0):9600 (1 , 0 , 0 , 1):19200 (1 , 0 , 1 , 0):38400													
b8-b11	Reserved	-													
b12	H/W type	RS232C	RS485												
b13- b15	Reserved	-													
*Parity, stop bit and baud rate (bps) should be same setting value of ME96.															
D8401	Protocol	Selection of the channel used, RTU or ASCII mode and Master or Slave identification.	0001h : <table border="1"> <thead> <tr> <th>Name</th> <th>Contents</th> </tr> </thead> <tbody> <tr> <td>Protocol selection</td> <td>MODBUS serial line</td> </tr> <tr> <td>Master/ slave setting</td> <td>MODBUS Master</td> </tr> <tr> <td>RTU/ASCII mode setting</td> <td>RTU</td> </tr> </tbody> </table>	Name	Contents	Protocol selection	MODBUS serial line	Master/ slave setting	MODBUS Master	RTU/ASCII mode setting	RTU				
		Name		Contents											
		Protocol selection		MODBUS serial line											
		Master/ slave setting		MODBUS Master											
		RTU/ASCII mode setting		RTU											
		Bit No.		Name	Contents										
					0 (bit=OFF)	1 (bit=ON)									
		b0		Protocol selection	Other communication protocol	MODBUS serial line									
b1-3	Not used	-													
b4	Master/ slave setting	MODBUS Master	MODBUS Slave												
b5-7	Not used	-													
b8	RTU/ASCII mode setting	RTU	ASCII												
b9-b15	Reserved	-													

Device	Name	Description	Setting value
D8409	Slave Response Timeout	After the master sends a request and no response is received from the slave within the specified time, the master will retry to send the message or terminate the processing of the command with a time out error depending on the setting of the "number of retries" (D8412). Valid values: 0 to 32767 [ms] 0 will default the timeout to 3 seconds	0000h (3 seconds)
D8411	Message to Message delay	This value defines the minimum waiting time between two messages. This time is used to detect the end of a message. Valid values: 0 to 16382 [ms] 0 will be interpreted as 3.5 character times according to the selected baud rate. If a value less than 3.5 character times is selected, the master will at least wait 3.5 character times.	0000h (3.5 character times)
D8412	Number of retries	In the situation where a slave does not respond within the set time by the Slave Response Timeout the master will try to retransmit the message a set number of retries before it terminates the command processing with a timeout error. Valid values: 0 to 20 [times] If a value of 20 or more is set the number of retries used by the master is set to 20.	0000h (0)

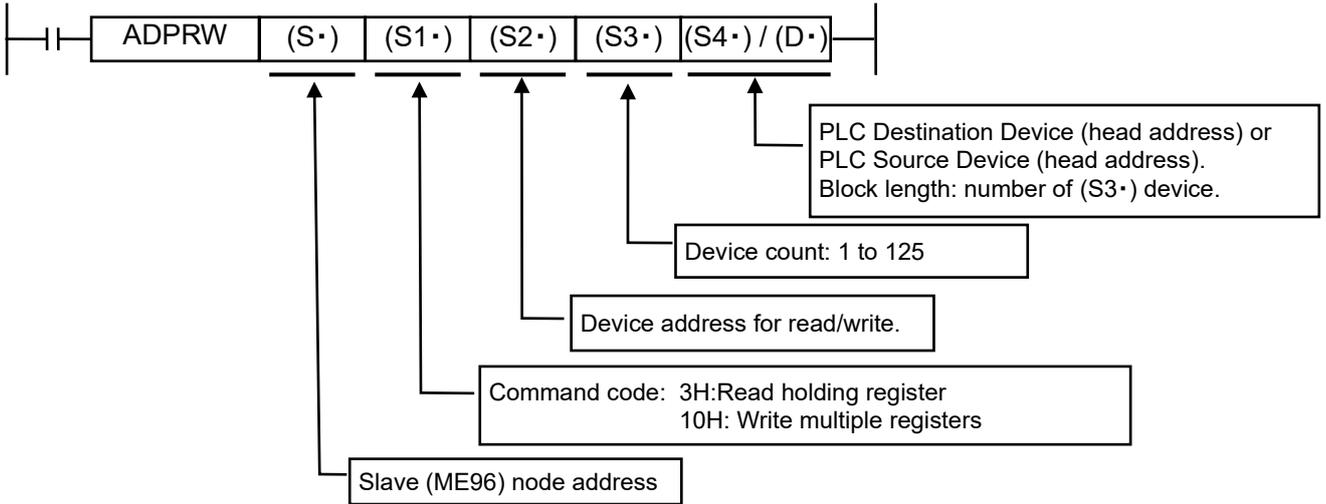
* Change the device number in case of use the Channel 2.

Parameter setting program for master is shown below.

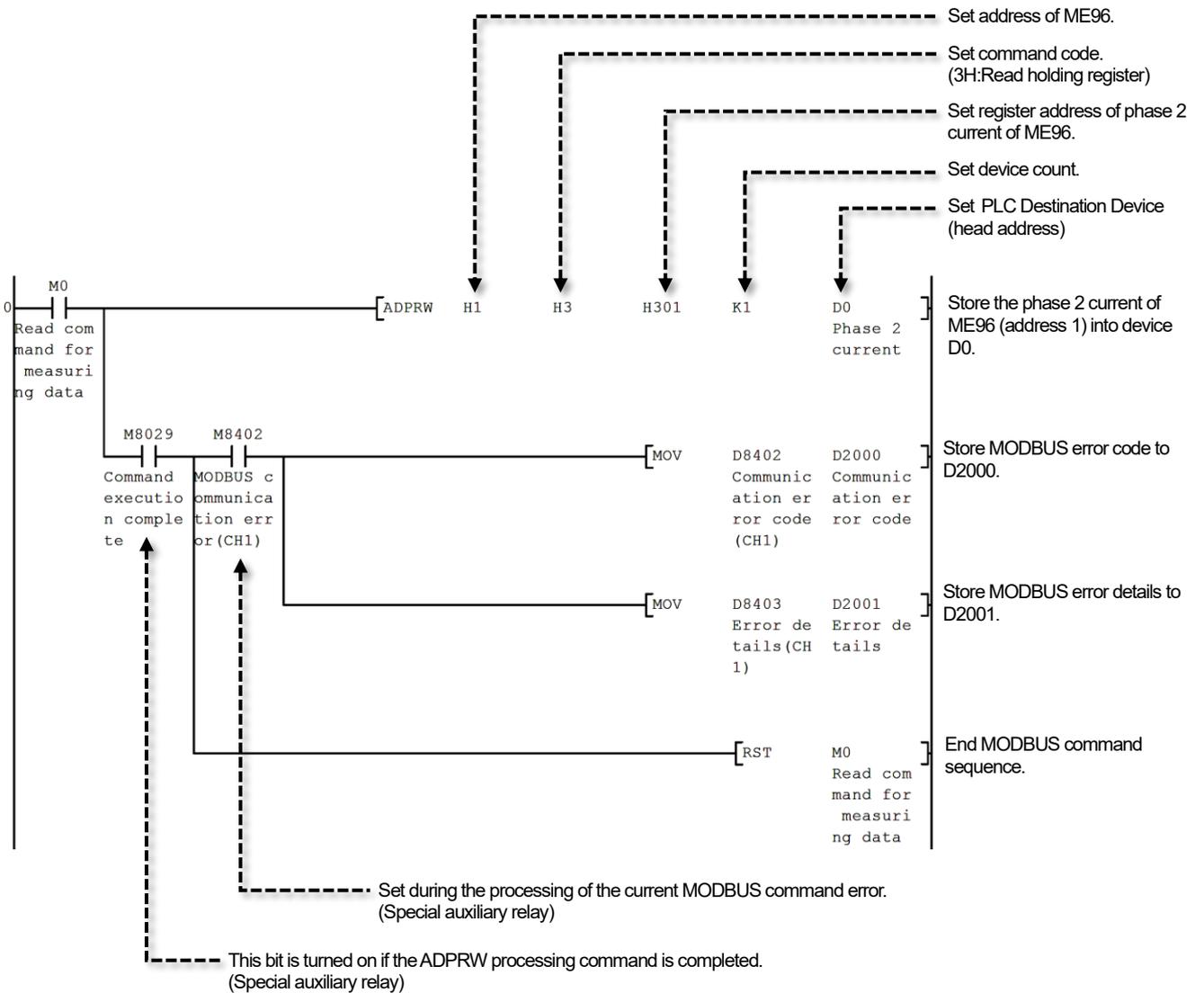


(2) Example for use of MODBUS read/write instruction (ADPRW)

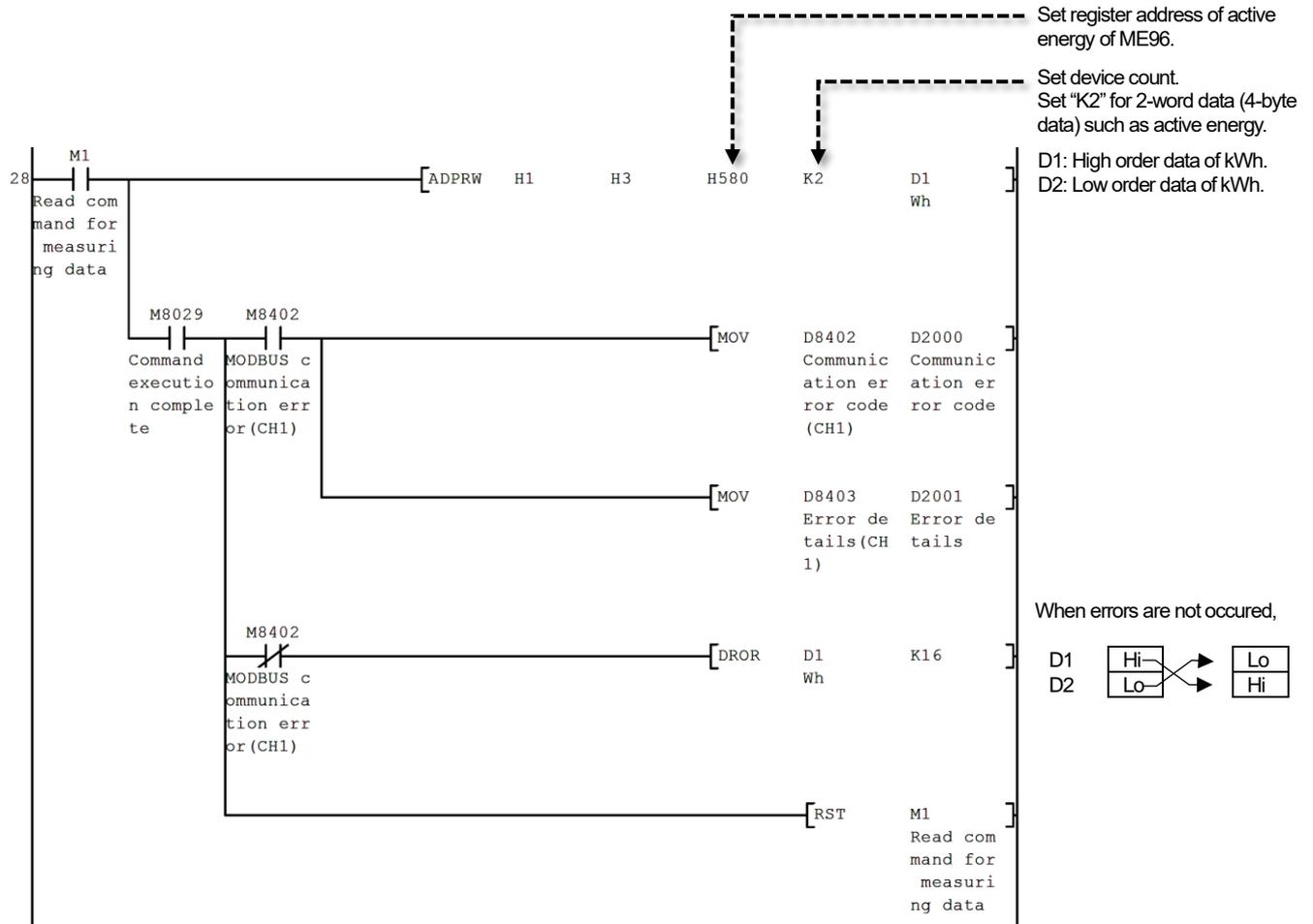
This instruction allows the MODBUS Master to communicate (read/write data) with its associated Slaves.



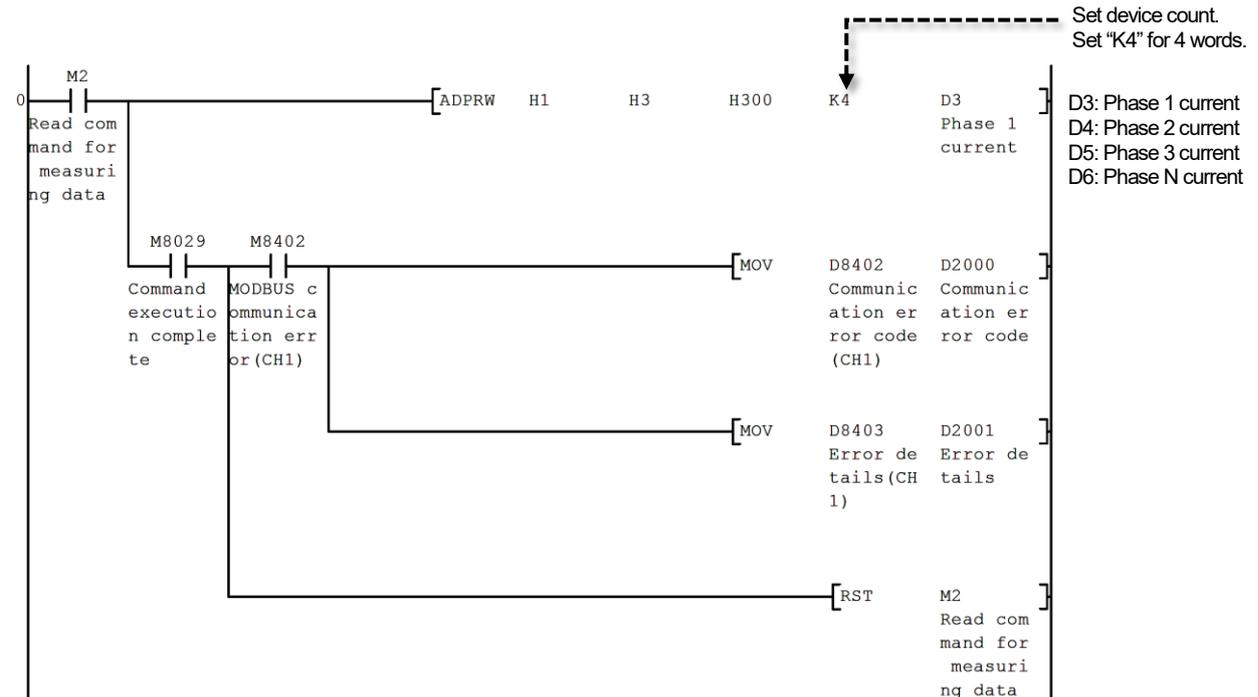
(a) Example of read phase 2 current (register address: 0301h) of ME96 (slave address: 1)



(b) Example of read active energy (unit: kWh fixed)(imported)(register address: 0580h) of ME96(slave address: 1)
 Note: Register address "0580h" is invalid address for ME96NSR-MB. (Refer to 7.1(4))



(c) Example of read from phase 1 current (register address: 0300h) to phase N current (register address: 0303h) of ME96 (slave address: 1)



9.2.2 Program example for reading multiple measuring data from two devices with FX3U-485ADP-MB
 When applying the program examples introduced in this manual to an actual system, ensure the applicability and confirm that it will not cause system control problems.

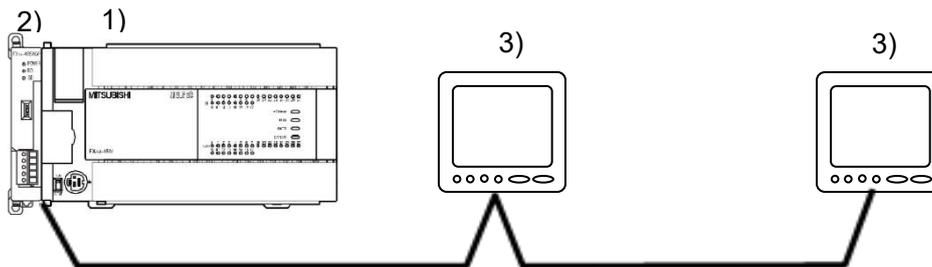
(1) Program details

This sample program is for reading the following measuring data from two ME96.

- Active energy (unit: kWh fixed) (imported) (Resister address: 0580Ah) (Note1)
- Phase 1 current, Phase 2 current, Phase 3 current (Resister address: 0300h to 0302h)
- Voltage V12, Voltage V23, Voltage V31 (Resister address: 030Ah to 030Ch)
- Σ Active power (Resister address: 031Ah)
- Σ Power factor (Resister address: 0315h)

Note1: Register address "0580h" is invalid address for ME96NSR-MB. (Refer to 7 .1(4))

(2) System configuration



No.	Devices	Description
1	FX PLC	PLCs main unit (FX3S/FX3G/FX3GC/FX3U/FX3UC Series) and expansion board are used. * Refer to user's manual about PLC communication type applicability and expansion board accordingly.
2	FX3U-485ADP-MB	MODBUS communication adapter. Use Channel 1 (CH1). Use as MODBUS master functions.
3	ME96	Multi-Measuring instrument. MODBUS slaves. (Address: 1,2)

(a) Setting of ME96

Item	Setting value
Communication speed	38400 bps
Even/odd parity	Even
Stop bit	1

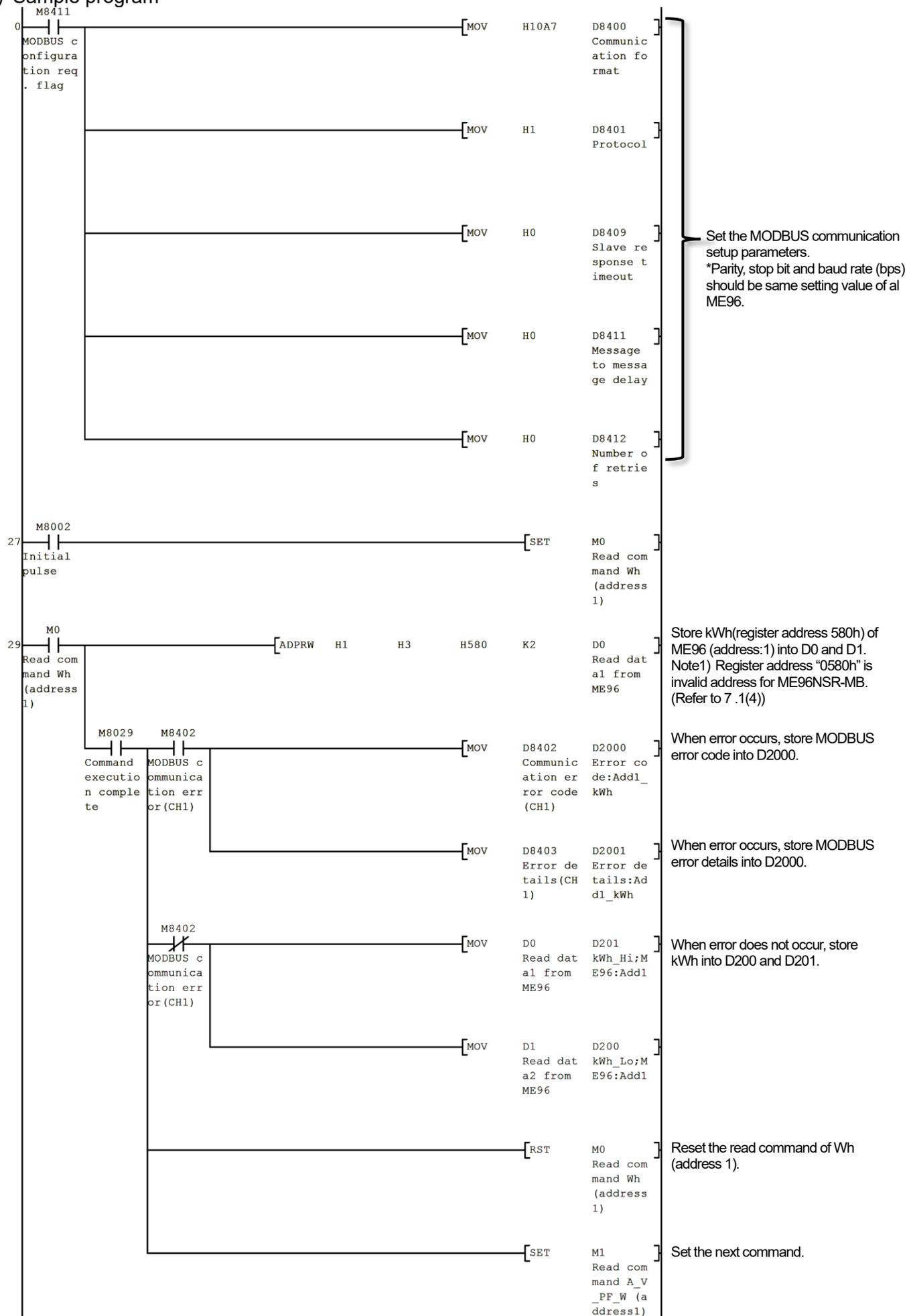
(3) Relevant devices of sample program

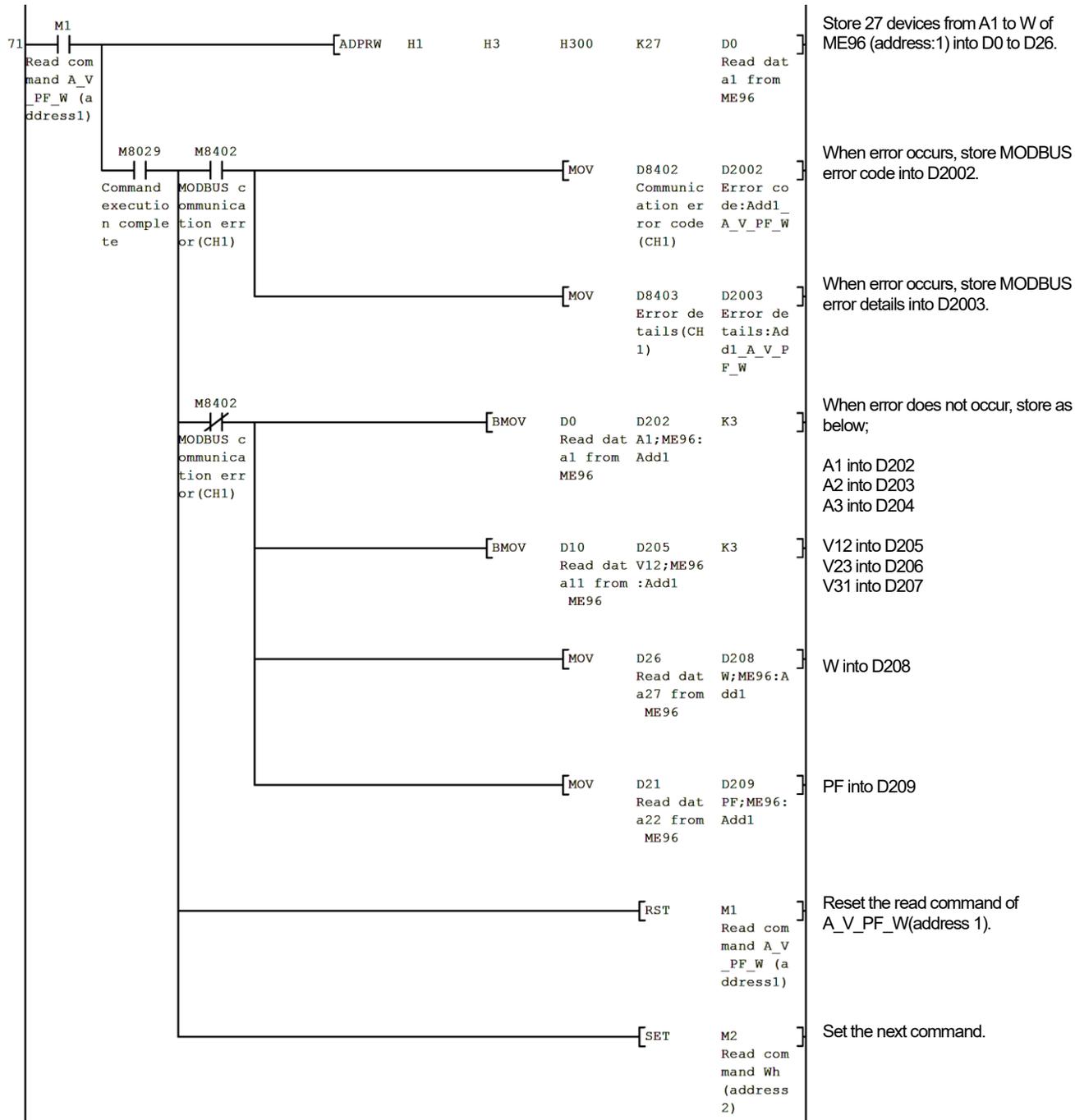
Below table shows the devices used by sample program.

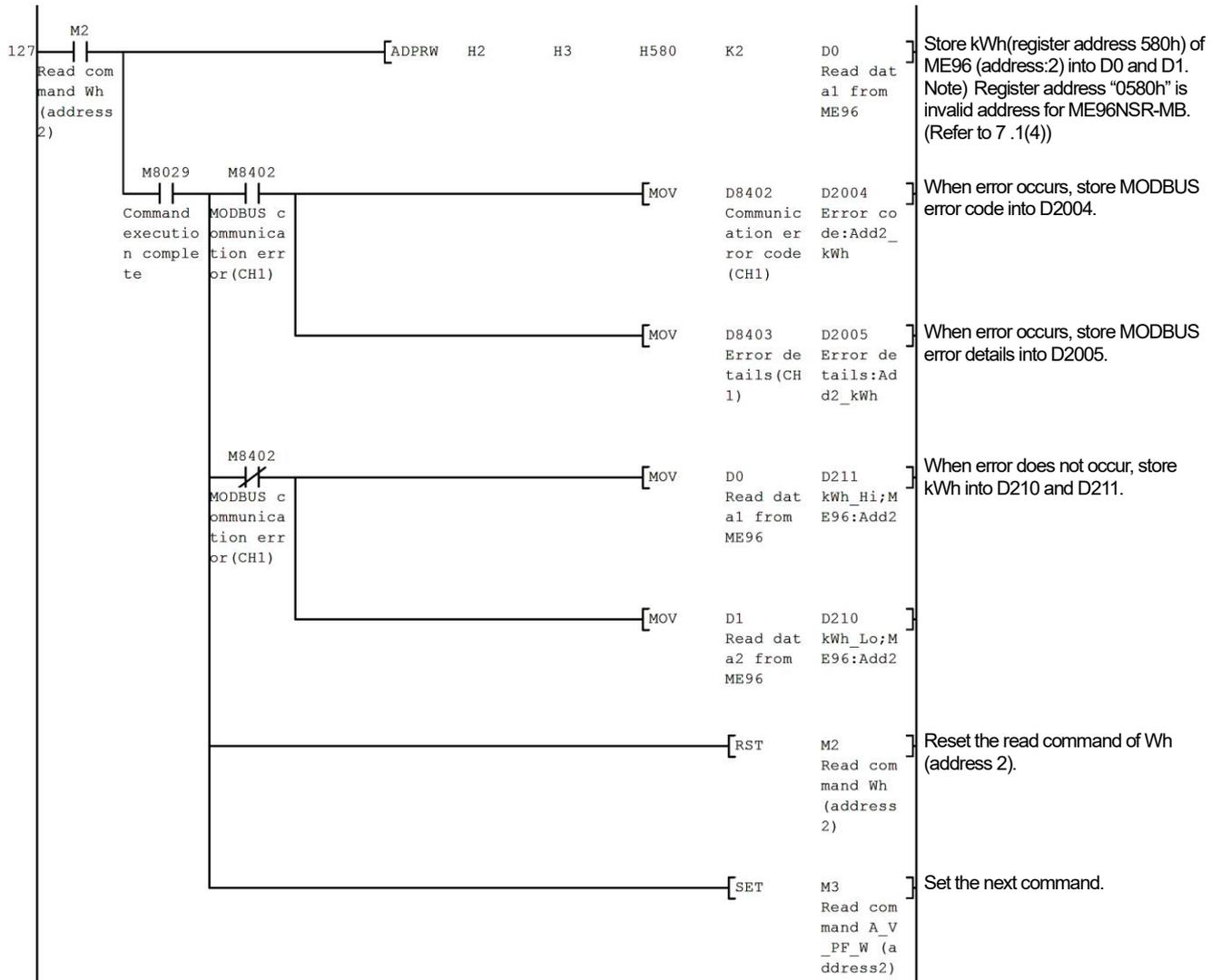
Device	Description	Remark	
Special auxiliary relays			
M8411	MODBUS configuration request flag	LD M8411 can be used to trigger a set of subsequent MOV commands that initialize the MODBUS function.	
M8029	Command execution complete	This bit is turned on if the processing of a MODBUS command is completed.	
M8402	MODBUS communication error	Set during the processing of the current MODBUS command error.	
M8002	Initial pulse	This relay turns ON and remains ON only momentarily when the PLC mode is changed from STOP to RUN.	
Special data registers			
D8400	Communication format	This device sets the communication format. Setting value: 10A7h 1: H/W type =RS485 (Fixed) 0: (Reserved) A: Baud rate = 38400 bps (Set as same setting of ME96) 7: Stop bit/parity/data length = 1-bit/Even/8-bit (Set as same setting of ME96)	
D8401	Protocol	Selection of the channel used, RTU or ASCII mode and Master or Slave identification. Setting value: 0001h = RTU/MODBUS Master (Fixed)	
D8409	Slave response timeout	After the master sends a request and no response is received from the slave within the specified time, the master will terminate the processing of the command with a time out error. Setting value: 0000h = 3 seconds. (Default value)	
D8411	Message to message delay	This value defines the minimum waiting time between two messages. This time is used to detect the end of a message. Setting value: 0000h = 3.5 character times. (Default value)	
D8412	Number of retries	In the situation where a slave does not respond within the set time by the Slave Response Timeout the master will try to retransmit the message a set number of retries before it terminates the command processing with a timeout error. Setting value: 0000h = 0 time.	
D8402	Communication error code	Current error code generated by the MODBUS function.	
D8403	Error details	Current error details.	
Auxiliary relays			
M0	Read Wh (Address 1)	Turn ON in case of read the measuring data of each ME96.	
M1	Read A_V_Pf_W (Address 1)		
M2	Read Wh (Address 2)		
M3	Read A_V_Pf_W (Address 2)		
Data registers			
D0 to D26	Read data from the ME96.	Data read from ME96 are stored.	
D200, D201	ME96 (Address1)	Measuring data read from ME96 (Address 1) are stored.	
D202			Active energy (unit: kWh fixed) (imported)
D203			Phase 1 current
D204			Phase 2 current
D205			Phase 3 current
D206			Voltage V12
D207			Voltage V23
D208			Voltage V31
D209			Σ Active power
D209			Σ Power factor
D210, D211	ME96 (Address2)	Measuring data read from ME96 (Address 2) are stored.	
D212			Active energy (unit: kWh fixed) (imported)
D213			Phase 1 current
D214			Phase 2 current
D215			Phase 3 current
D216			Voltage V12
D217			Voltage V23
D218			Voltage V31
D218			Σ Active power
D219			Σ Power factor

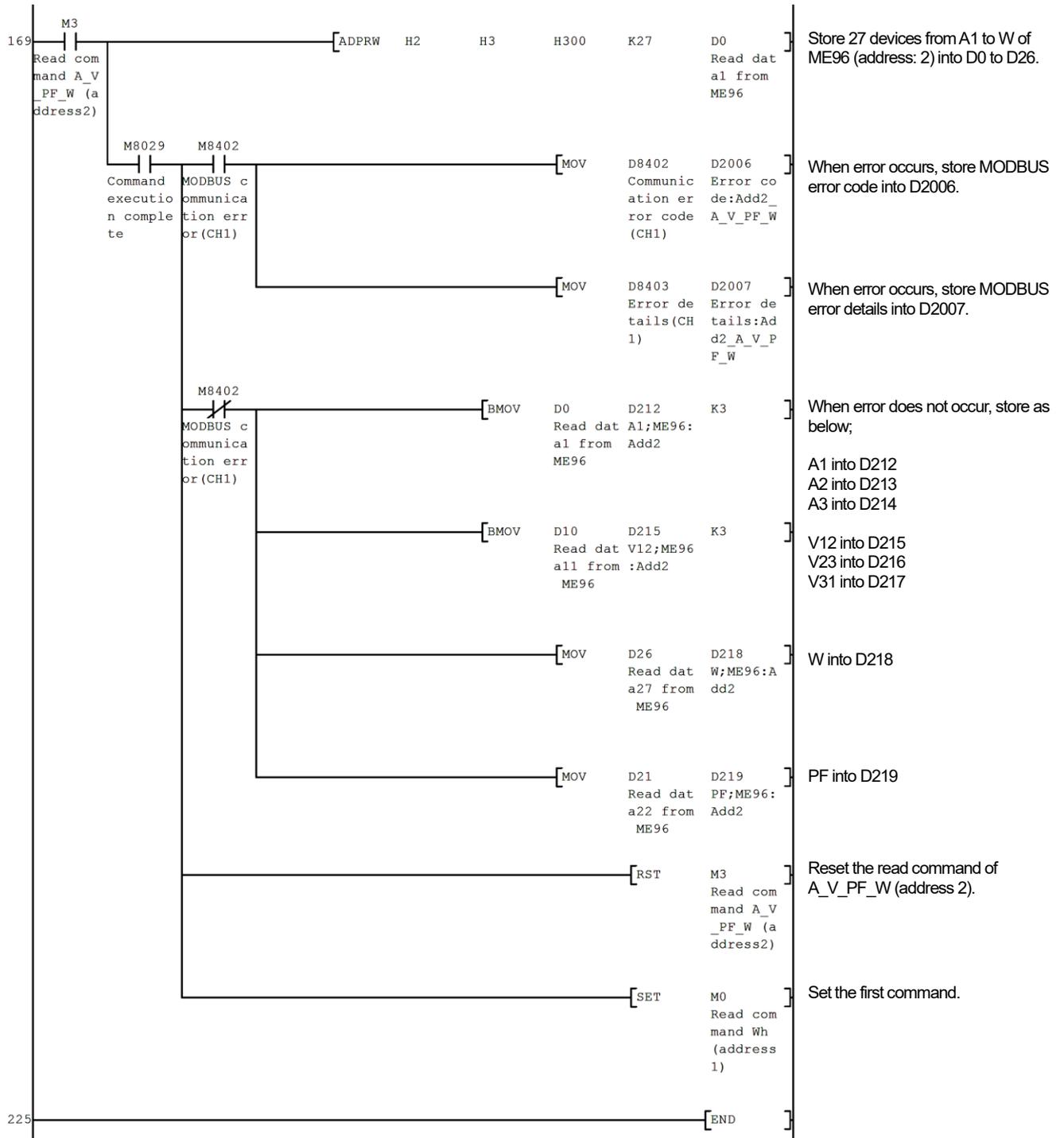
Device	Description	Remark
Data registers		
D2000	Communication error code (Read Wh (Address1))	Store the error code and error details generated bu the MODBUS function.
D2001	Error details (Read Wh (Address1))	
D2002	Communication error code (Read A_V_PF_W (Address1))	
D2003	Error details (Read A_V_PF_W (Address1))	
D2004	Communication error code (Read Wh (Address2))	
D2005	Error details (Read Wh (Address2))	
D2006	Communication error code (Read A_V_PF_W (Address2))	
D2007	Error details (Read A_V_PF_W (Address2))	

(4) Sample program









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