Paperless Recorder

VGR-B100

Communication Function Operation Manual

RKC INSTRUMENT INC.

WXPVM70mnAR002E
January, 2021(Rev.8)

Thank you for purchasing this RKC product. In order to achieve maximum performance and ensure proper operation of your new instrument, carefully read all the instructions in this manual. Please place the manual in a convenient location for easy reference.

NOTICE

- This manual assumes that the reader has a fundamental knowledge of the principles of electricity, process control, computer technology and communications.
- The figures, diagrams and numeric values used in this manual are only for purpose of illustration.
- RKC is not responsible for any damage or injury that is caused as a result of using this instrument, instrument failure or indirect damage.
- RKC is not responsible for any damage and/or injury resulting from the use of instruments made by imitating this instrument.
- Periodic maintenance is required for safe and proper operation of this instrument. Some components have a limited service life, or characteristics that change over time.
- Every effort has been made to ensure accuracy of all information contained herein. RKC makes no warranty expressed or implied, with respect to the accuracy of the information. The information in this manual is subject to change without prior notice.
- No portion of this document may be reprinted, modified, copied, transmitted, digitized, stored, processed or retrieved through any mechanical, electronic, optical or other means without prior written approval from RKC.

⚠ Warning

- An external protection device must be installed if failure of this instrument could result in damage to the instrument, equipment or injury to personnel.
- All wiring must be completed before power is turned on to prevent electric shock, fire or damage to instrument and equipment.
- This instrument must be used in accordance with the specifications to prevent fire or damage to instrument and equipment.
- This instrument is not intended for use in locations subject to flammable or explosive gases.
- Do not touch high-voltage connections such as power supply terminals, etc. to avoid electric shock.
- RKC is not responsible if this instrument is repaired, modified or disassembled by other than factory-approved personnel. Malfunction can occur and warranty is void under these conditions.

⚠ CAUTION

- This product is intended for use with industrial machines, test and measuring equipment.
  (It is not designed for use with medical equipment and nuclear energy.)
- This is a Class A instrument. In a domestic environment, this instrument may cause radio interference, in which case the user may be required to take additional measures.
- Be sure to provide an appropriate surge control circuit respectively for the following:
  - If input/output or signal lines within the building are longer than 30 meters.
  - If input/output or signal lines leave the building, regardless the length.
- This instrument is designed for installation in an enclosed instrumentation panel. All high-voltage connections such as power supply terminals must be enclosed in the instrumentation panel to avoid electric shock by operating personnel.
- All precautions described in this manual should be taken to avoid damage to the instrument or equipment.
- All wiring must be in accordance with local codes and regulations.
- All wiring must be completed before power is turned on to prevent electric shock, instrument failure, or incorrect action.
  The power must be turned off before repairing work for input break and output failure including replacement of sensor, contactor or SSR, and all wiring must be completed before power is turned on again.
- To prevent instrument damage or failure, protect the power line and the input/output lines from high currents with a protection device such as fuse, circuit breaker, etc.
- Prevent metal fragments or lead wire scraps from falling inside instrument case to avoid electric shock, fire or malfunction.
- Firmly tighten each terminal screw to avoid electric shock, fire or malfunction.
- For proper operation of this instrument, provide adequate ventilation for heat dispensation.
- Do not connect wires to unused terminals as this will interfere with proper operation of the instrument.
- Turn off the power supply before cleaning the instrument.
- Do not use a volatile solvent such as paint thinner to clean the instrument. Deformation or discoloration will occur. Use a soft, dry cloth to remove stains from the instrument.
- To avoid damage to instrument display, do not rub with an abrasive material or push front panel with a hard object.
- This instrument is intended to be used under the following environmental conditions.

Installation features:	Indoor
Altitude:	2000 m or less
Ambient temperature:	0-50 °C
Ambient humidity:	20-80 %RH (Non-condensing)
Overvoltage category:	Category II
Allowable pollution degree:	Pollution degree 2

- When installing this instrument, put on a protective gear such as safety shoes, helmet, etc. for your safety.
- Do not put your foot on the installed instrument or get on it, because it is dangerous.
- Only our serviceman or persons authorized by RKC are allowed to remove and take the inner module, the main unit and printed circuit boards apart.

FOR PROPER DISPOSAL

When disposing of each part used for this instrument, always follows the procedure for disposing of industrial wastes stipulated by the respective local community.

SYMBOLS USED ON THE INSTRUMENT

The symbols below are used on this instrument for the cautioning information.

This shows “Caution for handling”.
This symbol is used on the parts need to reference the instruction manual for saving human body and the instrument.

This shows “Protective grounding”.
Be sure to provide protective grounding prior to operate this instrument.

This shows “Risk of electric shock”.
This symbol is used on the parts, which has a risk of electric shock.

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1.Introduction

1.1 About communication protocols

This device has Modbus protocols.

The Modbus protocols are communication protocols developed by Modicon Inc. (AEG Schneider Automation International S.A.S) for PLC, which are described in the document of protocol specifications (PI-MBUS-300 Rev.J). For the Modbus protocol specifications, see the document. This document contains the Modbus protocols' function codes and data content, which can be mainly used for this device.

1.2 Outline of Ethernet communication functions

Via the Ethernet communication, the following functions are available.

(1) FTP server

Use of the attached data viewer software allows the recorded data saved in the SD card attached to the recorder to be loaded.

(2) Web server

The recorder's measurement values, the status of the warning occurrences, recording start/stop status and other statuses can be easily checked on the computer browser. (Use the Internet Explorer as the browser.)

(3) Modbus TCP function

By communicating with devices such as PCs, PLCs, etc., the measurement values and other data can be sent and received.

(4) SNTP client

Through the network, the time data is received from the SNTP server on a regular basis to correct the recorder's time.

1.3 RS-485 (option)

The communication through RS-485 (option) is available. The protocol is Modbus RTU.

1.4 Preparation

Press the MENU button on the main recorder unit and touch [System] key > [Comm.] key to display the settings menu for communications. Following the operation manual of the main recorder unit, complete the settings.

(For details about the PAPERLESS RECORDER OPERATION MANUAL(WXPVM70mnAR01E), see section 8.7.)

1.5 Modbus RTU protocol

Items	Specifications
Transfer mode	RTU
Communication speed	9600,19200,38400 bit/sec
Parity	None/Even/Odd
Data length	8 bits
Stop bit	1 bit/2 bits
Slave address	1 to 247 ("0" must not be set)
Interface	RS-485

1.6 Modbus TCP protocol

The communication through Ethernet is available. The protocol is Modbus TCP.

1.7 Addition of new items and map version

Due to the version upgrade of the main unit, the content of the Modbus map may be changed.
If any change is applied to the Modbus map, the version of the Modbus map (address 30025) is also updated in addition to the version of the main unit.

The setting items newly added can be used in the supported version or later. (See the table below.)
Refer item 2"READ AND WRITE OF DATA " for map detail.

Recorder version	Map version	Description	Remarks
Version 1.00 to 1.13	01	Initial release	The hold register is read only. Non writable.
Version 1.20 to 1.21	02	Addition of writing processing to the hold register	
		Hold register 40104 setting value saving	
		Hold register 40105 integration reset function	
		Hold register 40111 SNTP update function	
		Hold register 40112 to 40113	Support of parameter saving and loading
		Hold register 46860 LCD warning recovery	
Version 1.30 to 1.42	03	Hold register 45561 to 45569 DI function	"U2" selection items have been added.
		Hold register 45901 to 45906	Auto switch function of the displayed group and the elapsed time count function have been added.
Version 1.50 to 1.60	04	Hold register 40284 input channel Scale No. 41484 calculating channel Scale No.	
Version 2.00 or later	05	Hold register 47001 Product data No. 47003 to 47017 Product data strings	

[Caution]

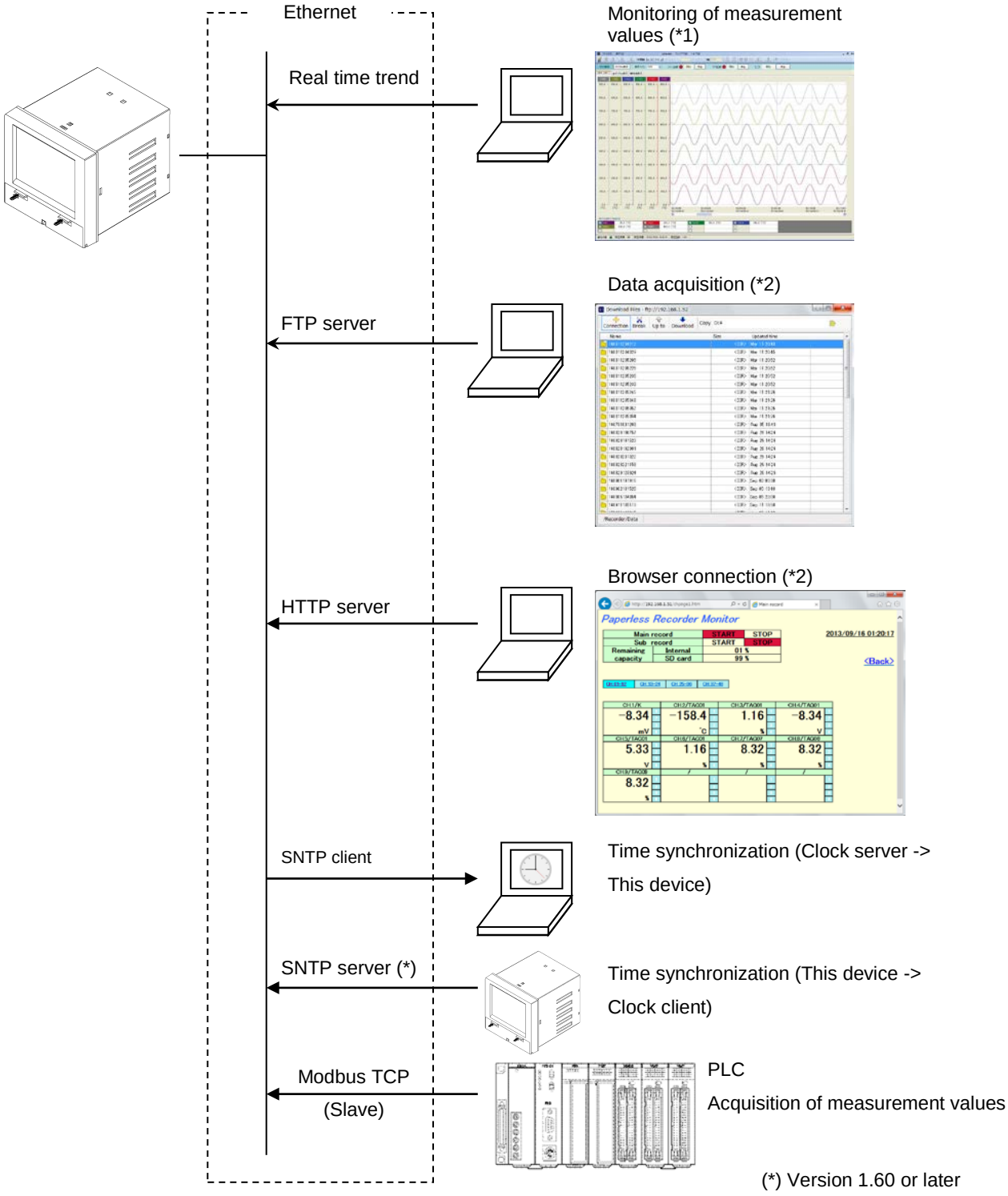
The older versions do not support the functions added in the new version. If the function attempts to perform writing or reading operation against the newly added addresses, the operation may not work properly.

1.8 Types of communication connection structures

The communication functions of this device allow communications with various devices.

1.8.1 Ethernet connection

Connect with this device via Ethernet. Real time monitoring for the measurement values (*1), acquisition of the measured files (*2), Web access, clock synchronization or other operations using the attached software are supported. For details about (*1) and (*2), see the operation manual of the DATA VIEWER INSTRUCTION MANUAL (WXPVM70mnAR101E).

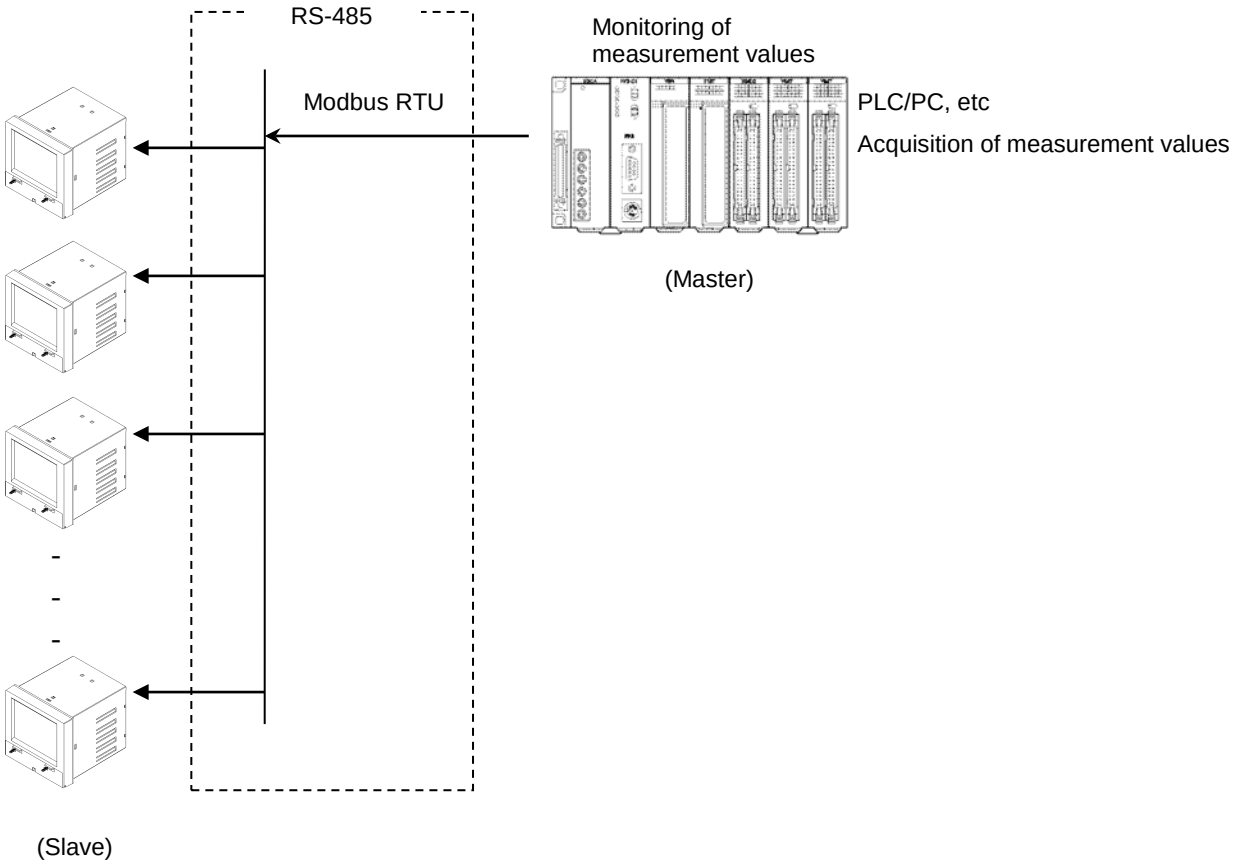


(*) Version 1.60 or later

1.8.2 RS-485 connection (Slave)

Connect with this device via RS-485. Through the connection with this device from devices such as PLC or PC, measurement value acquisition, starting of recording, or other operations can be carried out. In this case, only one master device can be used. Up to 48 units of this device can be connected as slave devices.

To use this function, the RS-485 option is required for this device. The RS-485 slave is exclusive with Section 1.8.3 “RS-485 connection (Master: remote AI) (Version 1.50 or later)”and Section 1.8.4 “RS-485 connection (Master: general-purpose connection) (Version 1.60 or later)”. These settings can be switched through the setting.



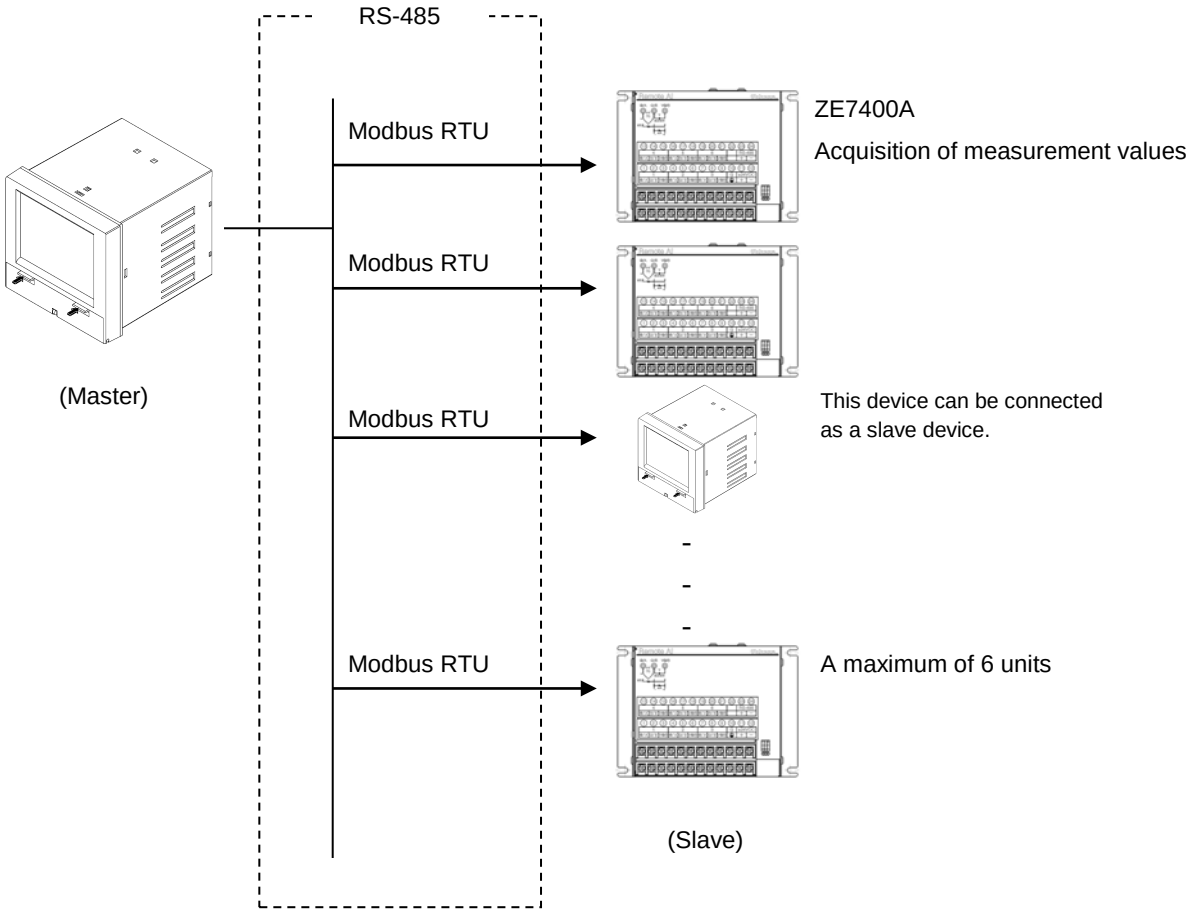
1.8.3 RS-485 connection (Master: remote AI) (Version 1.50 or later)

Use RS-485 to connect the separately-sold "ZE7400A remote AI unit" or this device as a slave. With one unit of this device as a master, up to six units of ZE7400A or this device can be connected under it. The measurement data can be collected and calculated on the master. The data obtained can be assigned to the calculating channels of the main unit.

To use this function, the RS-485 option is required for this device. The RS-485 master (remote AI) is exclusive with the RS485 slave and RS-485 master (general). These settings can be switched through the setting.

The RS-485 master (remote AI) is exclusive with Section 1.8.2 “RS-485 connection (Slave)”and Section 1.8.4 “RS-485 connection (Master: general-purpose connection) (Version 1.60 or later)”. These settings can be switched through the setting.

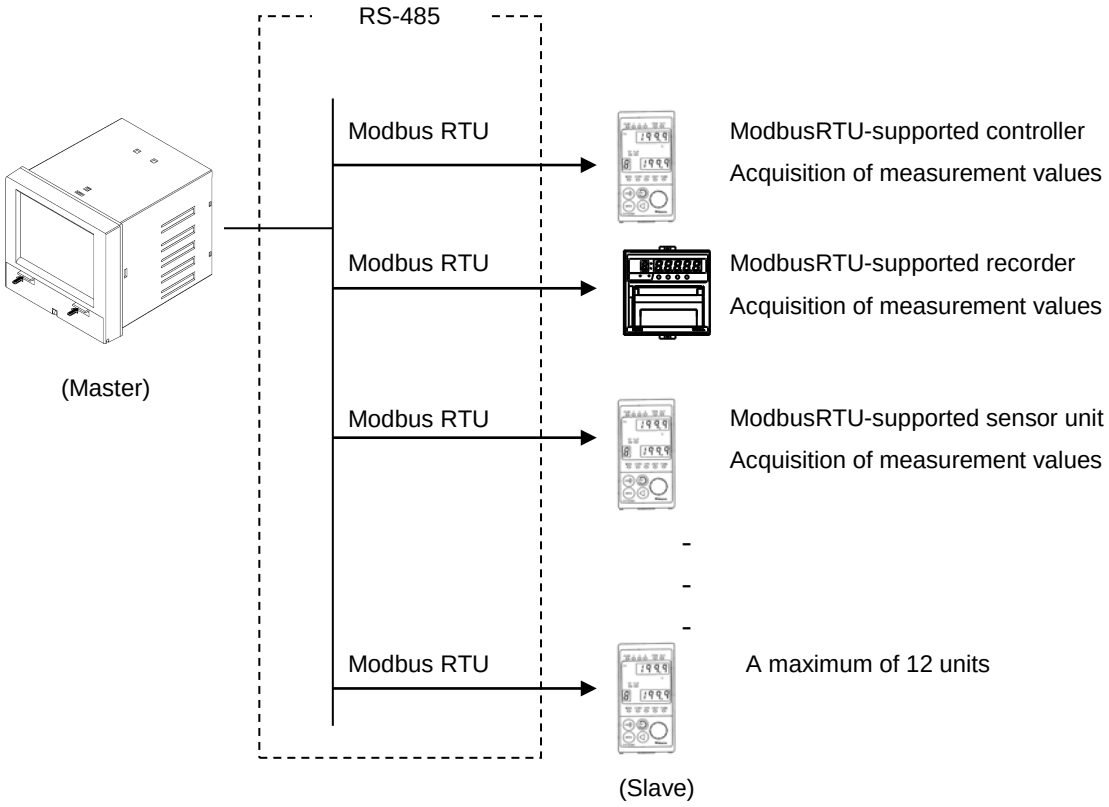
For details about how to connect and set the remote AI, see the operation manual of the separately-sold product.



1.8.4 RS-485 connection (master: general-purpose connection)-Read function (Ver1.60 or later)

With RS-485, data can be obtained and recorded from the ModbusRTU-supported general-purpose devices. With this device as the master, a maximum of 12 supported devices can be connected under it. The data to be obtained are specified individually on this device side. The data obtained can be assigned to the calculating channels of the main unit.
This function can also be used in combination with Section 1.8.5 "RS-485 connection (master: general-purpose connection)-Write function (Ver2.20 or later)".

To use this function, the RS-485 option is required for this device. The RS-485 master (general) is exclusive with Section 1.8.2 “RS-485 connection (Slave)”and Section 1.8.3 “RS-485 connection (Master: remote AI) (Version 1.50 or later)”. These settings can be switched through the setting.



1.8.5 RS-485 connection (master: general-purpose connection)-Write function (Ver2.20 or later)

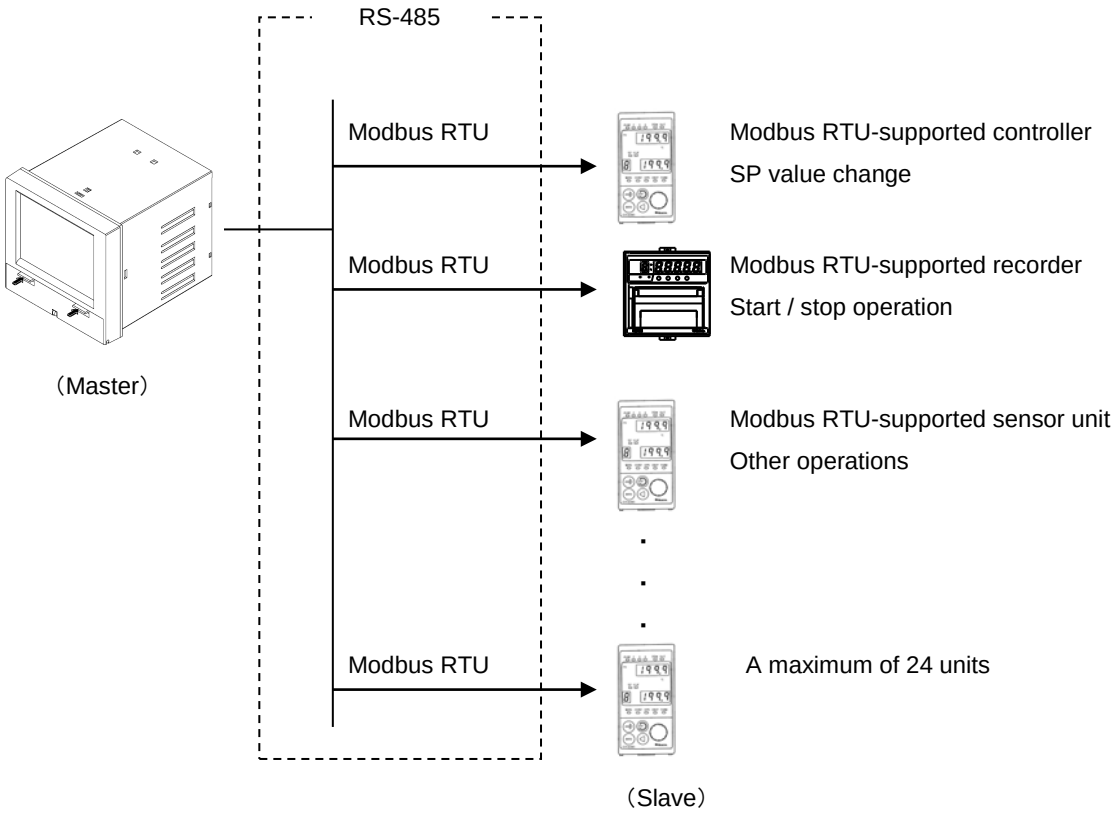
You can use RS-485 to write data to a general-purpose device that supports Modbus RTU. With this device as the master, a maximum of 24 supported devices can be connected under it. The data to be obtained are specified individually on this device side. The data that can be written are constants (set by the attached PC software "Parameter Loader") and measured values for each channel.

This device has 3 writing functions.

- ・Cyclic writing : Data is periodically written to the slave devices . (up to 12 devices).
- ・Display writing : Data can be written to the slave device at any time using the buttons on the screen. (Up to 8 buttons can be set)
- ・Event writing : Data is written to the slave device triggered by the FUNC key, alarm occurred/ cleared, and DI ON / OFF. (Up to 24 events can be set)

To use this function, the RS-485 option is required for this device. The RS-485 master (general) is exclusive with Section 1.8.2 “RS-485 connection (Slave)”and Section 1.8.3 “RS-485 connection (Master: remote AI) (Version 1.50 or later)”. These settings can be switched through the setting. This function can also be used in combination with Section 1.8.4 "RS-485 connection (master: general-purpose connection)-Read function (Ver1.60 or later)".

Ex.1) Periodically write the temperature information acquired by this device to the slave device.
Ex.2) Operate the start / stop of the slave device by operating the screen of this device or the FUNC key.
Ex.3) Operate the slave device by using the alarm or DI input of this device as a trigger.



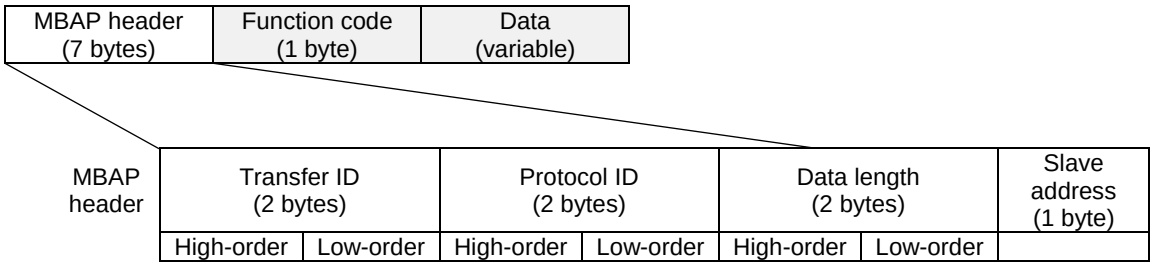
2. Modbus slave function

2.1 Communication Protocol (Modbus TCP or Modbus RTU)

This product supports two types of Modbus protocols: Modbus TCP protocol that works on Ethernet and Modbus RTU that works on RS-485.

Shown below are the differences between these two protocols. The function code and data sections are the same, but there are differences in the header and error check sections.

Modbus TCP



[MBAP header]

	Function
Transfer ID	The ID for data recognition. The same ID will return in every response.
Protocol ID	Fixed to 0.
Data length	The sum of the lengths of the slave address, function code, and data sections.
Slave address	Indicates the slave address. (It is used, for example, to convert between Modbus TCP and Modbus RTU.)

Modbus RTU

Slave address (1 byte)	Function code (1 byte)	Data (variable)	CRC (2 bytes)

2.2 Function code

The function code that can be used with this equipment is as follows.

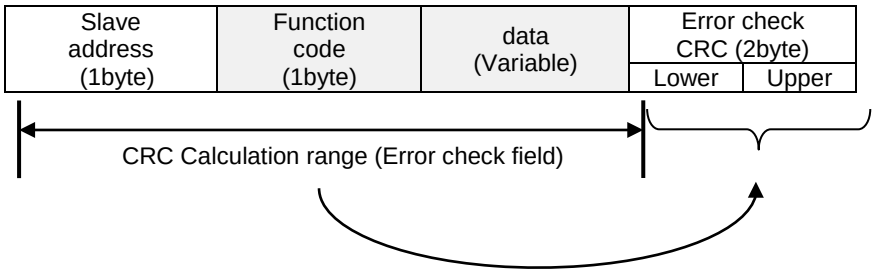
Code	Function	Maximum data length	Modbus original function (reference)
03H	Reading of the setting data	123 words	Holding register content reading
04H	Reading of content of input register	123 words	Reading of content of input register
06H	Writing of data	1 words	Holding register content writing
10H	Writing of data(continuous)	Fixed 20 words	Holding register content writing (only product data)

2.3 Error check (CRC calculation)

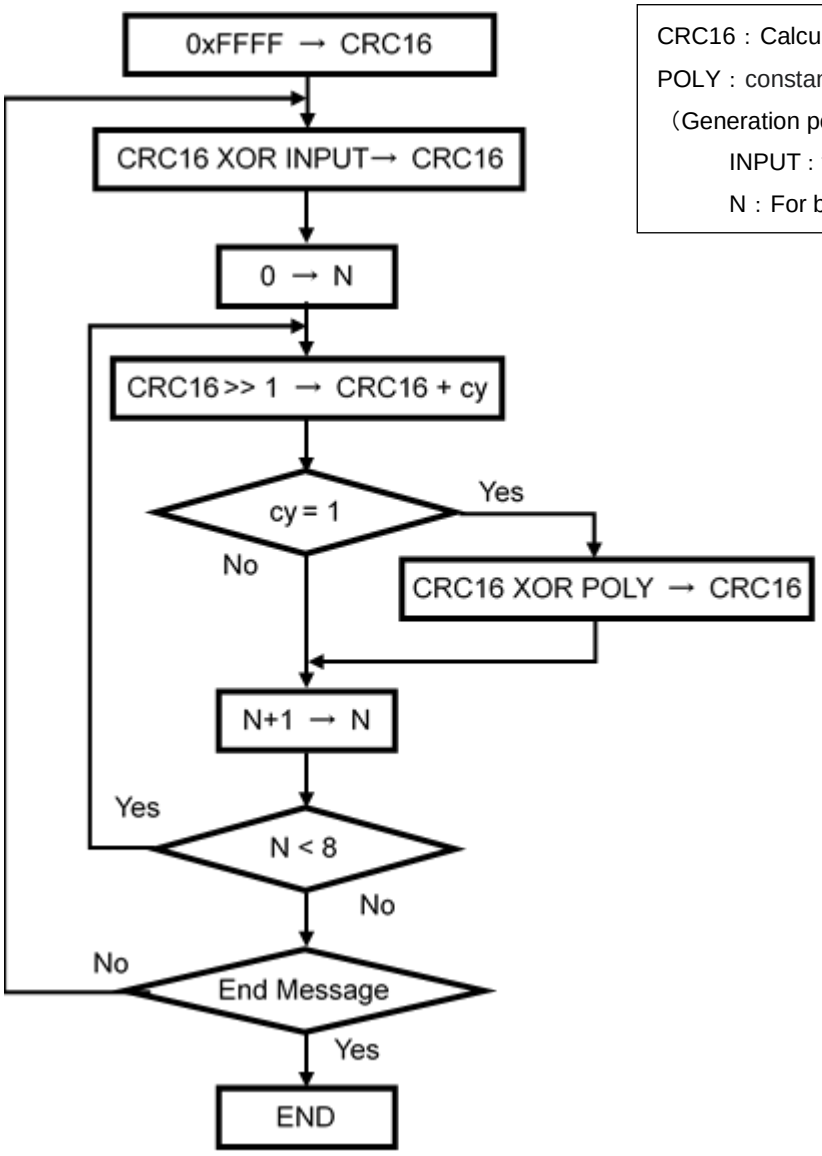
Error checking uses a 2-byte cyclic redundancy check (CRC-16).

The range from the slave address to the data is used as the error check field, and the result is output in the order of lower and upper at the end of the transmission data.

［Modbus RTU Transmission format］



［Calculation algorithm］



CRC16：Calculated data

POLY：constant polynomial＝ 0xA001

（Generation polynomial=$1 + x_2 + x_{15} + x_{16}$）

INPUT：transmission data（BYTE per）

N：For byte counting

[Sample source]

```
public UInt16 calc_crc16(byte[] buf, int len)
{
    UInt16 crc16 = 0xFFFF;
    for (int cnt = 0; cnt < len; n++)
    {
            crc16 ^= (UInt16)buf[cnt];
            for (int n = 0; n < 8; n++)
            {
                    if ((crc16 & 0x0001) != 0)
                    {
                            crc16 >>= 1;
                            crc16 ^= 0xA001;
                    }
                    else
                    {
                            crc16 >>= 1;
                    }
            }
    }
    return crc16;
}
```

Environmen : : Visual Studio C #

2.4 Error Response

In accordance with the communication protocol for the pertinent function code, if an error occurs during command transmission, an error response is returned in the fixed format described in this section.

■ Example of slave response (function code = 06H, command error = 10H)

Component	Data length		Data
	TCP	RTU	
MBAP header (only for Modbus TCP)	7	-	-
Slave address (only for Modbus RTU)	-	1	-
Function code + 80H	1	1	86H
Error code	1	1	10H
Error check (only for Modbus RTU)	-	2	CRC
Total number of bytes	9	5	-

● Error codes and their occurrence conditions

Error code	Description	Occurrence condition(s)
01H	Invalid function code	An unsupported function code is specified.
02H	Invalid register address	The relative address range exceeds "9999."
03H	Invalid number of registers	- The length of the accessed data is "0" or the sum of the relative address and data length exceeds the limit. - It is assumed that two or more function codes, each executable for one area, are involved. - Data longer than 2 words is specified for a one-time write command. - The data length exceeds 123 words.
04H	Device error	The received data is shorter than the predefined data length.
10H	Command error	An attempt at a write over an area exceeding the writable range.

2.5 Reading of input register area

It is an area only for reading. The starting address of the read data (relative address) and the number of data (Every one word = two bytes) are specified.
Function code: 04H

■ Example of transmitting master(starting address=0032H, data length=2words)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	04H
Data	Relative start address (high-order)	1	1	00H
	Relative start address (low-order)	1	1	32H
	Read data count (high-order)	1	1	00H
	Read data count (low-order)	1	1	02H
Error check		-	2	CRC (16 bits)
Total number of bytes		12	8	

■Example of slave's responding (starting address=0032H, data length =2words)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	04H
Data	Number of data bytes	1	1	04H
	Data 1 (high-order)	1	1	00H
	Data 1 (low-order)	1	1	09H
	Data 2 (high-order)	1	1	00H
	Data 2 (low-order)	1	1	0AH
Error check		-	2	CRC (16 bits)
Total number of bytes		13	9	

【Input register area map】Function code: 04H

Address	Relative address (HEX)	Item	Array	Content	Remarks
30001	0	Production number	1	ASCII	
30002	1	Production number	2	ASCII	
30003	2	Production number	3	ASCII	
30004	3	Production number	4	ASCII	
30005	4	Production number	5	ASCII	
30006	5	Production number	6	ASCII	
30007	6	Production number	7	ASCII	
30008	7	Production number	8	ASCII	
30009	8	Software version	1	ASCII	
30010	9	Software version	2	ASCII	
30011	A	Software version	3	ASCII	
30012	B	Software version	4	ASCII	
30013	C	Software version	5	ASCII	
30014	D	Software version	6	ASCII	
30015	E	Software version	7	ASCII	
30016	F	Software version	8	ASCII	
30017	10	Software version	9	ASCII	
30018	11	Software version	10	ASCII	
30019	12	Software version	11	ASCII	
30020	13	Software version	12	ASCII	
30021	14	Software version	13	ASCII	
30022	15	Software version	14	ASCII	
30023	16	Software version	15	ASCII	
30024	17	Software version	16	ASCII	
30025	18	Modbus Map version	1	Binary	※ Refer item 1.7
30026	19	Reserve	1		
30027	1A	Reserve	2		
30028	1B	Reserve	3		
30029	1C	Reserve	4		
30030	1D	Reserve	5		
30031	1E	Reserve	6		
30032	1F	Reserve	7		
30033	20	Reserve	8		
30034	21	Reserve	9		
30035	22	Reserve	10		
30036	23	MAC address	1		
30037	24	MAC address	2		
30038	25	MAC address	3		
30039	26	Reserve			
30040	27	Reserve			
30041	28	Reserve			
30042	29	Reserve			
30043	2A	Reserve			
30044	2B	Reserve			
30045	2C	Reserve			
30046	2D	Reserve			
30047	2E	Reserve			
30048	2F	Reserve			
30049	30	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30050	31	Reserve			
30051	32	Year		0～99	
30052	33	Month		1～12	
30053	34	Day		1～31	
30054	35	Hour		0～24	
30055	36	Minute		0～59	
30056	37	Second		0～59	
30057	38	State of internal memory remainder		0～1000	Unit: % (one digit after the decimal point)
30058	39	SD card connection		0～1	0:Unconnection 1: Connection
30059	3A	SD card remainder capacity		0～1000	Unit: % (one digit after the decimal point)
30060	3B	State of record		0～1	0:Record stop 1: Record start
30061	3C	State of subrecord		0～1	0:Record stop 1: Record start
30062	3D	State of battery		0～1	0:Normality 1: Abnormality
30063	3E	Reserve			
30064	3F	Reserve			
30065	40	Reserve			
30066	41	Reserve			
30067	42	Reserve			
30068	43	Reserve			
30069	44	Reserve			
30070	45	Reserve			
30071	46	Reserve			
30072	47	Reserve			
30073	48	Reserve			
30074	49	Reserve			
30075	4A	Reserve			
30076	4B	Reserve			
30077	4C	Reserve			
30078	4D	Reserve			
30079	4E	Reserve			
30080	4F	Reserve			
30081	50	Reserve			
30082	51	Reserve			
30083	52	Reserve			
30084	53	Reserve			
30085	54	Reserve			
30086	55	Reserve			
30087	56	Reserve			
30088	57	Reserve			
30089	58	Reserve			
30090	59	Reserve			
30091	5A	Reserve			
30092	5B	Reserve			
30093	5C	Reserve			
30094	5D	Reserve			
30095	5E	Reserve			
30096	5F	Reserve			
30097	60	Reserve			
30098	61	Reserve			
30099	62	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30100	63	Reserve			
30101	64	Measurements	CH01	-32000～32000	
30102	65	Measurements	CH02	-32000～32000	
30103	66	Measurements	CH03	-32000～32000	
30104	67	Measurements	CH04	-32000～32000	
30105	68	Measurements	CH05	-32000～32000	
30106	69	Measurements	CH06	-32000～32000	
30107	6A	Measurements	CH07	-32000～32000	
30108	6B	Measurements	CH08	-32000～32000	
30109	6C	Measurements	CH09	-32000～32000	
30110	6D	Measurements	CH10	-32000～32000	
30111	6E	Measurements	CH11	-32000～32000	
30112	6F	Measurements	CH12	-32000～32000	
30113	70	Measurements	CH13	-32000～32000	
30114	71	Measurements	CH14	-32000～32000	
30115	72	Measurements	CH15	-32000～32000	
30116	73	Measurements	CH16	-32000～32000	
30117	74	Measurements	CH17	-32000～32000	
30118	75	Measurements	CH18	-32000～32000	
30119	76	Measurements	CH19	-32000～32000	
30120	77	Measurements	CH20	-32000～32000	
30121	78	Measurements	CH21	-32000～32000	
30122	79	Measurements	CH22	-32000～32000	
30123	7A	Measurements	CH23	-32000～32000	
30124	7B	Measurements	CH24	-32000～32000	
30125	7C	Measurements	CH25	-32000～32000	
30126	7D	Measurements	CH26	-32000～32000	
30127	7E	Measurements	CH27	-32000～32000	
30128	7F	Measurements	CH28	-32000～32000	
30129	80	Measurements	CH29	-32000～32000	
30130	81	Measurements	CH30	-32000～32000	
30131	82	Measurements	CH31	-32000～32000	
30132	83	Measurements	CH32	-32000～32000	
30133	84	Measurements	CH33	-32000～32000	
30134	85	Measurements	CH34	-32000～32000	
30135	86	Measurements	CH35	-32000～32000	
30136	87	Measurements	CH36	-32000～32000	
30137	88	Measurements	CH37	-32000～32000	
30138	89	Measurements	CH38	-32000～32000	
30139	8A	Measurements	CH39	-32000～32000	
30140	8B	Measurements	CH40	-32000～32000	
30141	8C	Measurements	CH41	-32000～32000	
30142	8D	Measurements	CH42	-32000～32000	
30143	8E	Measurements	CH43	-32000～32000	
30144	8F	Measurements	CH44	-32000～32000	
30145	90	Measurements	CH45	-32000～32000	
30146	91	Measurements	CH46	-32000～32000	
30147	92	Measurements	CH47	-32000～32000	
30148	93	Measurements	CH48	-32000～32000	
30149	94	Reserve			
30150	95	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30151	96	Reserve			
30152	97	Reserve			
30153	98	Reserve			
30154	99	Reserve			
30155	9A	Reserve			
30156	9B	Reserve			
30157	9C	Reserve			
30158	9D	Reserve			
30159	9E	Reserve			
30160	9F	Reserve			
30161	A0	Reserve			
30162	A1	Reserve			
30163	A2	Reserve			
30164	A3	Reserve			
30165	A4	Reserve			
30166	A5	Reserve			
30167	A6	Reserve			
30168	A7	Reserve			
30169	A8	Reserve			
30170	A9	Reserve			
30171	AA	Reserve			
30172	AB	Reserve			
30173	AC	Reserve			
30174	AD	Reserve			
30175	AE	Reserve			
30176	AF	Reserve			
30177	B0	Reserve			
30178	B1	Reserve			
30179	B2	Reserve			
30180	B3	Reserve			
30181	B4	Reserve			
30182	B5	Reserve			
30183	B6	Reserve			
30184	B7	Reserve			
30185	B8	Reserve			
30186	B9	Reserve			
30187	BA	Reserve			
30188	BB	Reserve			
30189	BC	Reserve			
30190	BD	Reserve			
30191	BE	Reserve			
30192	BF	Reserve			
30193	C0	Reserve			
30194	C1	Reserve			
30195	C2	Reserve			
30196	C3	Reserve			
30197	C4	Reserve			
30198	C5	Reserve			
30199	C6	Reserve			
30200	C7	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30201	C8	State of channel	CH01	Bit watch (Details are the following)	
30202	C9	State of channel	CH02	00bit: Alarm1 1= generation 0= release	
30203	CA	State of channel	CH03	01bit: Alarm1 1= generation 0= release	
30204	CB	State of channel	CH04	02bit: Alarm1 1= generation 0= release	
30205	CC	State of channel	CH05	03bit: Alarm1 1= generation 0= release	
30206	CD	State of channel	CH06	08bit：H over 1= generation 0= release	
30207	CE	State of channel	CH07	09bit：L over 1= generation 0= release	
30208	CF	State of channel	CH08	10bit：Burnout 1= generation 0= release	
30209	D0	State of channel	CH09	11bit：Fault 1= generation 0= release	
30210	D1	State of channel	CH10	12bit：AD abnormal 1= generation 0= release	
30211	D2	State of channel	CH11		
30212	D3	State of channel	CH12		
30213	D4	State of channel	CH13		
30214	D5	State of channel	CH14		
30215	D6	State of channel	CH15		
30216	D7	State of channel	CH16		
30217	D8	State of channel	CH17		
30218	D9	State of channel	CH18		
30219	DA	State of channel	CH19		
30220	DB	State of channel	CH20		
30221	DC	State of channel	CH21		
30222	DD	State of channel	CH22		
30223	DE	State of channel	CH23		
30224	DF	State of channel	CH24		
30225	E0	State of channel	CH25		
30226	E1	State of channel	CH26		
30227	E2	State of channel	CH27		
30228	E3	State of channel	CH28		
30229	E4	State of channel	CH29		
30230	E5	State of channel	CH30		
30231	E6	State of channel	CH31		
30232	E7	State of channel	CH32		
30233	E8	State of channel	CH33		
30234	E9	State of channel	CH34		
30235	EA	State of channel	CH35		
30236	EB	State of channel	CH36		
30237	EC	State of channel	CH37		
30238	ED	State of channel	CH38		
30239	EE	State of channel	CH39		
30240	EF	State of channel	CH40		
30241	F0	State of channel	CH41		
30242	F1	State of channel	CH42		
30243	F2	State of channel	CH43		
30244	F3	State of channel	CH44		
30245	F4	State of channel	CH45		
30246	F5	State of channel	CH46		
30247	F6	State of channel	CH47		
30248	F7	State of channel	CH48		
30249	F8	Reserve			
30250	F9	Reserve			
30251	FA	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30252	FB	Reserve			
30253	FC	Reserve			
30254	FD	Reserve			
30255	FE	Reserve			
30256	FF	Reserve			
30257	100	Reserve			
30258	101	Reserve			
30259	102	Reserve			
30260	103	Reserve			
30261	104	Reserve			
30262	105	Reserve			
30263	106	Reserve			
30264	107	Reserve			
30265	108	Reserve			
30266	109	Reserve			
30267	10A	Reserve			
30268	10B	Reserve			
30269	10C	Reserve			
30270	10D	Reserve			
30271	10E	Reserve			
30272	10F	Reserve			
30273	110	Reserve			
30274	111	Reserve			
30275	112	Reserve			
30276	113	Reserve			
30277	114	Reserve			
30278	115	Reserve			
30279	116	Reserve			
30280	117	Reserve			
30281	118	Reserve			
30282	119	Reserve			
30283	11A	Reserve			
30284	11B	Reserve			
30285	11C	Reserve			
30286	11D	Reserve			
30287	11E	Reserve			
30288	11F	Reserve			
30289	120	Reserve			
30290	121	Reserve			
30291	122	Reserve			
30292	123	Reserve			
30293	124	Reserve			
30294	125	Reserve			
30295	126	Reserve			
30296	127	Reserve			
30297	128	Reserve			
30298	129	Reserve			
30299	12A	Reserve			
30300	12B	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30301	12C	Decimal point position	CH01	0～4	
30302	12D	Decimal point position	CH02	0～4	
30303	12E	Decimal point position	CH03	0～4	
30304	12F	Decimal point position	CH04	0～4	
30305	130	Decimal point position	CH05	0～4	
30306	131	Decimal point position	CH06	0～4	
30307	132	Decimal point position	CH07	0～4	
30308	133	Decimal point position	CH08	0～4	
30309	134	Decimal point position	CH09	0～4	
30310	135	Decimal point position	CH10	0～4	
30311	136	Decimal point position	CH11	0～4	
30312	137	Decimal point position	CH12	0～4	
30313	138	Decimal point position	CH13	0～4	
30314	139	Decimal point position	CH14	0～4	
30315	13A	Decimal point position	CH15	0～4	
30316	13B	Decimal point position	CH16	0～4	
30317	13C	Decimal point position	CH17	0～4	
30318	13D	Decimal point position	CH18	0～4	
30319	13E	Decimal point position	CH19	0～4	
30320	13F	Decimal point position	CH20	0～4	
30321	140	Decimal point position	CH21	0～4	
30322	141	Decimal point position	CH22	0～4	
30323	142	Decimal point position	CH23	0～4	
30324	143	Decimal point position	CH24	0～4	
30325	144	Decimal point position	CH25	0～4	
30326	145	Decimal point position	CH26	0～4	
30327	146	Decimal point position	CH27	0～4	
30328	147	Decimal point position	CH28	0～4	
30329	148	Decimal point position	CH29	0～4	
30330	149	Decimal point position	CH30	0～4	
30331	14A	Decimal point position	CH31	0～4	
30332	14B	Decimal point position	CH32	0～4	
30333	14C	Decimal point position	CH33	0～4	
30334	14D	Decimal point position	CH34	0～4	
30335	14E	Decimal point position	CH35	0～4	
30336	14F	Decimal point position	CH36	0～4	
30337	150	Decimal point position	CH37	0～4	
30338	151	Decimal point position	CH38	0～4	
30339	152	Decimal point position	CH39	0～4	
30340	153	Decimal point position	CH40	0～4	
30341	154	Decimal point position	CH41	0～4	
30342	155	Decimal point position	CH42	0～4	
30343	156	Decimal point position	CH43	0～4	
30344	157	Decimal point position	CH44	0～4	
30345	158	Decimal point position	CH45	0～4	
30346	159	Decimal point position	CH46	0～4	
30347	15A	Decimal point position	CH47	0～4	
30348	15B	Decimal point position	CH48	0～4	
30349	15C	Reserve			
30350	15D	Reserve			
30351	15E	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
30352	15F	Reserve			
30353	160	Reserve			
30354	161	Reserve			
30355	162	Reserve			
30356	163	Reserve			
30357	164	Reserve			
30358	165	Reserve			
30359	166	Reserve			
30360	167	Reserve			
30361	168	Reserve			
30362	169	Reserve			
30363	16A	Reserve			
30364	16B	Reserve			
30365	16C	Reserve			
30366	16D	Reserve			
30367	16E	Reserve			
30368	16F	Reserve			
30369	170	Reserve			
30370	171	Reserve			
30371	172	Reserve			
30372	173	Reserve			
30373	174	Reserve			
30374	175	Reserve			
30375	176	Reserve			
30376	177	Reserve			
30377	178	Reserve			
30378	179	Reserve			
30379	17A	Reserve			
30380	17B	Reserve			
30381	17C	Reserve			
30382	17D	Reserve			
30383	17E	Reserve			
30384	17F	Reserve			
30385	180	Reserve			
30386	181	Reserve			
30387	182	Reserve			
30388	183	Reserve			
30389	184	Reserve			
30390	185	Reserve			
30391	186	Reserve			
30392	187	Reserve			
30393	188	Reserve			
30394	189	Reserve			
30395	18A	Reserve			
30396	18B	Reserve			
30397	18C	Reserve			
30398	18D	Reserve			
30399	18E	Reserve			
30400	18F	Reserve			
30401	190	Unit (1/4)	CH01		
30402	191	Unit (2/4)	CH01		

Address	Relative address (HEX)	Item	Array	Content	Remarks
30403	192	Unit (3/4)	CH01		
30404	193	Unit (4/4)	CH01		
30405	194	Unit (1/4)	CH02		
30406	195	Unit (2/4)	CH02		
30407	196	Unit (3/4)	CH02		
30408	197	Unit (4/4)	CH02		
30409	198	Unit (1/4)	CH03		
30410	199	Unit (2/4)	CH03		
30411	19A	Unit (3/4)	CH03		
30412	19B	Unit (4/4)	CH03		
30413	19C	Unit (1/4)	CH04		
30414	19D	Unit (2/4)	CH04		
30415	19E	Unit (3/4)	CH04		
30416	19F	Unit (4/4)	CH04		
30417	1A0	Unit (1/4)	CH05		
30418	1A1	Unit (2/4)	CH05		
30419	1A2	Unit (3/4)	CH05		
30420	1A3	Unit (4/4)	CH05		
30421	1A4	Unit (1/4)	CH06		
30422	1A5	Unit (2/4)	CH06		
30423	1A6	Unit (3/4)	CH06		
30424	1A7	Unit (4/4)	CH06		
30425	1A8	Unit (1/4)	CH07		
30426	1A9	Unit (2/4)	CH07		
30427	1AA	Unit (3/4)	CH07		
30428	1AB	Unit (4/4)	CH07		
30429	1AC	Unit (1/4)	CH08		
30430	1AD	Unit (2/4)	CH08		
30431	1AE	Unit (3/4)	CH08		
30432	1AF	Unit (4/4)	CH08		
30433	1B0	Unit (1/4)	CH09		
30434	1B1	Unit (2/4)	CH09		
30435	1B2	Unit (3/4)	CH09		
30436	1B3	Unit (4/4)	CH09		
30437	1B4	Unit (1/4)	CH10		
30438	1B5	Unit (2/4)	CH10		
30439	1B6	Unit (3/4)	CH10		
30440	1B7	Unit (4/4)	CH10		
30441	1B8	Unit (1/4)	CH11		
30442	1B9	Unit (2/4)	CH11		
30443	1BA	Unit (3/4)	CH11		
30444	1BB	Unit (4/4)	CH11		
30445	1BC	Unit (1/4)	CH12		
30446	1BD	Unit (2/4)	CH12		
30447	1BE	Unit (3/4)	CH12		
30448	1BF	Unit (4/4)	CH12		
30449	1C0	Unit (1/4)	CH13		
30450	1C1	Unit (2/4)	CH13		
30451	1C2	Unit (3/4)	CH13		
30452	1C3	Unit (4/4)	CH13		

Address	Relative address (HEX)	Item	Array	Content	Remarks
30453	1C4	Unit (1/4)	CH14		
30454	1C5	Unit (2/4)	CH14		
30455	1C6	Unit (3/4)	CH14		
30456	1C7	Unit (4/4)	CH14		
30457	1C8	Unit (1/4)	CH15		
30458	1C9	Unit (2/4)	CH15		
30459	1CA	Unit (3/4)	CH15		
30460	1CB	Unit (4/4)	CH15		
30461	1CC	Unit (1/4)	CH16		
30462	1CD	Unit (2/4)	CH16		
30463	1CE	Unit (3/4)	CH16		
30464	1CF	Unit (4/4)	CH16		
30465	1D0	Unit (1/4)	CH17		
30466	1D1	Unit (2/4)	CH17		
30467	1D2	Unit (3/4)	CH17		
30468	1D3	Unit (4/4)	CH17		
30469	1D4	Unit (1/4)	CH18		
30470	1D5	Unit (2/4)	CH18		
30471	1D6	Unit (3/4)	CH18		
30472	1D7	Unit (4/4)	CH18		
30473	1D8	Unit (1/4)	CH19		
30474	1D9	Unit (2/4)	CH19		
30475	1DA	Unit (3/4)	CH19		
30476	1DB	Unit (4/4)	CH19		
30477	1DC	Unit (1/4)	CH20		
30478	1DD	Unit (2/4)	CH20		
30479	1DE	Unit (3/4)	CH20		
30480	1DF	Unit (4/4)	CH20		
30481	1E0	Unit (1/4)	CH21		
30482	1E1	Unit (2/4)	CH21		
30483	1E2	Unit(3/4)	CH21		
30484	1E3	Unit(4/4)	CH21		
30485	1E4	Unit(1/4)	CH22		
30486	1E5	Unit(2/4)	CH22		
30487	1E6	Unit(3/4)	CH22		
30488	1E7	Unit(4/4)	CH22		
30489	1E8	Unit(1/4)	CH23		
30490	1E9	Unit(2/4)	CH23		
30491	1EA	Unit(3/4)	CH23		
30492	1EB	Unit(4/4)	CH23		
30493	1EC	Unit(1/4)	CH24		
30494	1ED	Unit(2/4)	CH24		
30495	1EE	Unit(3/4)	CH24		
30496	1EF	Unit(4/4)	CH24		
30497	1F0	Unit(1/4)	CH25		
30498	1F1	Unit(2/4)	CH25		
30499	1F2	Unit(3/4)	CH25		
30500	1F3	Unit(4/4)	CH25		
30501	1F4	Unit(1/4)	CH26		
30502	1F5	Unit(2/4)	CH26		

Address	Relative address (HEX)	Item	Array	Content	Remarks
30503	1F6	Unit(3/4)	CH26		
30504	1F7	Unit(4/4)	CH26		
30505	1F8	Unit(1/4)	CH27		
30506	1F9	Unit(2/4)	CH27		
30507	1FA	Unit(3/4)	CH27		
30508	1FB	Unit(4/4)	CH27		
30509	1FC	Unit(1/4)	CH28		
30510	1FD	Unit(2/4)	CH28		
30511	1FE	Unit(3/4)	CH28		
30512	1FF	Unit(4/4)	CH28		
30513	200	Unit(1/4)	CH29		
30514	201	Unit(2/4)	CH29		
30515	202	Unit(3/4)	CH29		
30516	203	Unit(4/4)	CH29		
30517	204	Unit(1/4)	CH30		
30518	205	Unit(2/4)	CH30		
30519	206	Unit(3/4)	CH30		
30520	207	Unit(4/4)	CH30		
30521	208	Unit(1/4)	CH31		
30522	209	Unit(2/4)	CH31		
30523	20A	Unit(3/4)	CH31		
30524	20B	Unit(4/4)	CH31		
30525	20C	Unit(1/4)	CH32		
30526	20D	Unit(2/4)	CH32		
30527	20E	Unit(3/4)	CH32		
30528	20F	Unit(4/4)	CH32		
30529	210	Unit(1/4)	CH33		
30530	211	Unit(2/4)	CH33		
30531	212	Unit(3/4)	CH33		
30532	213	Unit(4/4)	CH33		
30533	214	Unit(1/4)	CH34		
30534	215	Unit(2/4)	CH34		
30535	216	Unit(3/4)	CH34		
30536	217	Unit(4/4)	CH34		
30537	218	Unit(1/4)	CH35		
30538	219	Unit(2/4)	CH35		
30539	21A	Unit(3/4)	CH35		
30540	21B	Unit(4/4)	CH35		
30541	21C	Unit(1/4)	CH36		
30542	21D	Unit(2/4)	CH36		
30543	21E	Unit(3/4)	CH36		
30544	21F	Unit(4/4)	CH36		
30545	220	Unit(1/4)	CH37		
30546	221	Unit(2/4)	CH37		
30547	222	Unit(3/4)	CH37		
30548	223	Unit(4/4)	CH37		
30549	224	Unit(1/4)	CH38		
30550	225	Unit(2/4)	CH38		
30551	226	Unit(3/4)	CH38		
30552	227	Unit(4/4)	CH38		

Address	Relative address (HEX)	Item	Array	Content	Remarks
30553	228	Unit(1/4)	CH39		
30554	229	Unit(2/4)	CH39		
30555	22A	Unit(3/4)	CH39		
30556	22B	Unit(4/4)	CH39		
30557	22C	Unit(1/4)	CH40		
30558	22D	Unit(2/4)	CH40		
30559	22E	Unit(3/4)	CH40		
30560	22F	Unit(4/4)	CH40		
30561	230	Unit(1/4)	CH41		
30562	231	Unit(2/4)	CH41		
30563	232	Unit(3/4)	CH41		
30564	233	Unit(4/4)	CH41		
30565	234	Unit(1/4)	CH42		
30566	235	Unit(2/4)	CH42		
30567	236	Unit(3/4)	CH42		
30568	237	Unit(4/4)	CH42		
30569	238	Unit(1/4)	CH43		
30570	239	Unit(2/4)	CH43		
30571	23A	Unit(3/4)	CH43		
30572	23B	Unit(4/4)	CH43		
30573	23C	Unit(1/4)	CH44		
30574	23D	Unit(2/4)	CH44		
30575	23E	Unit(3/4)	CH44		
30576	23F	Unit(4/4)	CH44		
30577	240	Unit(1/4)	CH45		
30578	241	Unit(2/4)	CH45		
30579	242	Unit(3/4)	CH45		
30580	243	Unit(4/4)	CH45		
30581	244	Unit(1/4)	CH46		
30582	245	Unit(2/4)	CH46		
30583	246	Unit(3/4)	CH46		
30584	247	Unit(4/4)	CH46		
30585	248	Unit(1/4)	CH47		
30586	249	Unit(2/4)	CH47		
30587	24A	Unit(3/4)	CH47		
30588	24B	Unit(4/4)	CH47		
30589	24C	Unit(1/4)	CH48		
30590	24D	Unit(2/4)	CH48		
30591	24E	Unit(3/4)	CH48		
30592	24F	Unit(4/4)	CH48		
30593	250	Reserve			
・・・	・・・	・・・			
39000	2327	Reserve			

2.6 Read and write of holding register area

It is an area for reading and writing. The starting address of the read data (relative address) and the number of data (Every one word = two bytes) are specified.
Refer item 2.6 ”Other setting range” for item of “※”.

Data of addresses 40201H to 46999H are parameter data and system data. In order to reflect this change in the recorder, it is necessary to issue address 40104H "save set value" command separately.

[Caution]

If you change the parameter data or the system data and change the setting by key operation on the recorder side before executing the “save set value” command, the setting change by communication may not be updated properly.
Please do not execute setting change by communication and setting change by key operation at the same time.

Function code (Reading): 03H

■ Example of transmitting master(starting address=00C8H, data length=2words)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	03H
Data	Relative start address (high-order)	1	1	00H
	Relative start address (low-order)	1	1	C8H
	Read data count (high-order)	1	1	00H
	Read data count (low-order)	1	1	02H
Error check		-	2	CRC (16 bits)
Total number of bytes		12	8	

■Example of slave's responding (starting address=0032H, data length =2words)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	03H
Data	Number of data bytes	1	1	04H
	Data 1 (high-order)	1	1	00H
	Data 1 (low-order)	1	1	05H
	Data 2 (high-order)	1	1	00H
	Data 2 (low-order)	1	1	00H
Error check		-	2	CRC (16 bits)
Total number of bytes		13	9	

Function code (Writing): 06H

■ Example of transmitting master(starting address=00C8H, data =5)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	06H
Data	Relative start address (high-order)	1	1	00H
	Relative start address (low-order)	1	1	C8H
	Write data (high-order)	1	1	00H
	Write data (low-order)	1	1	05H
Error check		-	2	CRC (16 bits)
Total number of bytes		12	8	

■Example of slave's responding (starting address=00C8H, data =5)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	06H
Data	Relative start address (high-order)	1	1	00H
	Relative start address (low-order)	1	1	C8H
	Write data (high-order)	1	1	00H
	Write data (low-order)	1	1	05H
Error check		-	2	CRC (16 bits)
Total number of bytes		12	8	8

Function code (continuous writes): 10H

* It is used only when registering production information.

■ Example of master transmission (with a start address of 1b58H and a data count of 20)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	10H
Data	Relative start address (high-order)	1	1	1bH
	Relative start address (low-order)	1	1	58H
	Write data count (high-order)	1	1	00H
	Write data count (low-order)	1	1	14H
	Number of data bytes	1	1	28H
	Data 00 (high-order)	1	1	00H
	Data 00 (low-order)	1	1	00H
	Data 01 (high-order)	1	1	31H
	Data 01 (low-order)	1	1	32H
	Data 02 (high-order)	1	1	33H
	Data 02 (low-order)	1	1	34H
	...			
	Data 16 (high-order)	1	1	30H
	Data 16 (low-order)	1	1	30H
	Data 17 (high-order)	1	1	00H
	Data 17 (low-order)	1	1	00H
	Data 18 (high-order)	1	1	00H
	Data 18 (low-order)	1	1	00H
	Data 19 (high-order)	1	1	00H
	Data 19 (low-order)	1	1	00H
Error check		-	2	CRC (16 bits)
Total number of bytes		53	49	

■ Example of slave response (with a start address of 1b58H and a data count of 20)

Component		Data length		Data
		TCP	RTU	
MBAP header (only for Modbus TCP)		7	-	-
Slave address		-	1	-
Function code		1	1	10H
Data	Relative start address (high-order)	1	1	1bH
	Relative start address (low-order)	1	1	58H
	Write data count (high-order)	1	1	00H
	Write data count (low-order)	1	1	14H
Error check		-	2	CRC (16 bits)
Total number of bytes		12	8	

【Holding register area map】Function code: 03H, 06H

Address	Relative address (HEX)	Item	Array	Content	Remarks
		Communication channel			
40001	0	1-value of input	0-01	-32000～32000	
40002	1	2-value of input	0-02	-32000～32000	
40003	2	3-value of input	0-03	-32000～32000	
40004	3	4-value of input	0-04	-32000～32000	
40005	4	5-value of input	0-05	-32000～32000	
40006	5	6-value of input	0-06	-32000～32000	
40007	6	7-value of input	0-07	-32000～32000	
40008	7	8-value of input	0-08	-32000～32000	
40009	8	9-value of input	0-09	-32000～32000	
40010	9	10-value of input	0-10	-32000～32000	
40011	A	11-value of input	0-11	-32000～32000	
40012	B	12-value of input	0-12	-32000～32000	
40013	C	13-value of input	0-13	-32000～32000	
40014	D	13-value of input	0-14	-32000～32000	
40015	E	15-value of input	0-15	-32000～32000	
40016	F	16-value of input	0-16	-32000～32000	
40017	10	17-value of input	0-17	-32000～32000	
40018	11	18-value of input	0-18	-32000～32000	
40019	12	19-value of input	0-19	-32000～32000	
40020	13	20-value of input	0-20	-32000～32000	
40021	14	21-value of input	0-21	-32000～32000	
40022	15	22-value of input	0-22	-32000～32000	
40023	16	23-value of input	0-23	-32000～32000	
40024	17	24-value of input	0-24	-32000～32000	
40025	18	25-value of input	0-25	-32000～32000	
40026	19	26-value of input	0-26	-32000～32000	
40027	1A	27-value of input	0-27	-32000～32000	
40028	1B	28-value of input	0-28	-32000～32000	
40029	1C	29-value of input	0-29	-32000～32000	
40030	1D	30-value of input	0-30	-32000～32000	
40031	1E	31-value of input	0-31	-32000～32000	
40032	1F	32-value of input	0-32	-32000～32000	
40033	20	33-value of input	0-33	-32000～32000	
40034	21	34-value of input	0-34	-32000～32000	
40035	22	35-value of input	0-35	-32000～32000	
40036	23	36-value of input	0-36	-32000～32000	
		Communication channel			
40037	24	1-position of decimal point	0-01	0～4	
40038	25	2-position of decimal point	0-02	0～4	
40039	26	3-position of decimal point	0-03	0～4	
40040	27	4-position of decimal point	0-04	0～4	
40041	28	5-position of decimal point	0-05	0～4	
40042	29	6-position of decimal point	0-06	0～4	
40043	2A	7-position of decimal point	0-07	0～4	
40044	2B	8-position of decimal point	0-08	0～4	
40045	2C	9-position of decimal point	0-09	0～4	
40046	2D	10-position of decimal point	0-10	0～4	
40047	2E	11-position of decimal point	0-11	0～4	

Address	Relative address (HEX)	Item	Array	Content	Remarks
40048	2F	12-position of decimal point	0-12	0～4	
40049	30	13-position of decimal point	0-13	0～4	
40050	31	14-position of decimal point	0-14	0～4	
40051	32	15-position of decimal point	0-15	0～4	
40052	33	16-position of decimal point	0-16	0～4	
40053	34	17-position of decimal point	0-17	0～4	
40054	35	18-position of decimal point	0-18	0～4	
40055	36	19-position of decimal point	0-19	0～4	
40056	37	20-position of decimal point	0-20	0～4	
40057	38	21-position of decimal point	0-21	0～4	
40058	39	22-position of decimal point	0-22	0～4	
40059	3A	23-position of decimal point	0-23	0～4	
40060	3B	24-position of decimal point	0-24	0～4	
40061	3C	25-position of decimal point	0-25	0～4	
40062	3D	26-position of decimal point	0-26	0～4	
40063	3E	27-position of decimal point	0-27	0～4	
40064	3F	28-position of decimal point	0-28	0～4	
40065	40	29-position of decimal point	0-29	0～4	
40066	41	30-position of decimal point	0-30	0～4	
40067	42	31-position of decimal point	0-31	0～4	
40068	43	32-position of decimal point	0-32	0～4	
40069	44	33-position of decimal point	0-33	0～4	
40070	45	34-position of decimal point	0-34	0～4	
40071	46	35-position of decimal point	0-35	0～4	
40072	47	36-position of decimal point	0-36	0～4	
40073	48	Reserve			
40074	49	Reserve			
40075	4A	Reserve			
40076	4B	Reserve			
40077	4C	Reserve			
40078	4D	Reserve			
40079	4E	Reserve			
40080	4F	Reserve			
40081	50	Reserve			
40082	51	Reserve			
40083	52	Reserve			
40084	53	Reserve			
40085	54	Reserve			
40086	55	Reserve			
40087	56	Reserve			
40088	57	Reserve			
40089	58	Reserve			
40090	59	Reserve			
40091	5A	Reserve			
40092	5B	Reserve			
40093	5C	Reserve			
40094	5D	Reserve			
40095	5E	Reserve			
40096	5F	Reserve			
40097	60	Reserve			
40098	61	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
40099	62	Reserve			
40100	63	Reserve			
40101	64	Record start/stop		AA01：start AA00：stop	Invalid except the left "DI" is selected when invalid.
40102	65	Sub record start/stop		AA01：Start AA00：Stop	Invalid except the left When assigned to the Func key.
40103	66	LCD ON/OFF		AA01：ON	Invalid except the left According to the recorder set.
40104	67	Set value preservation		AA01：preservation	Invalid except the left
40105	68	Addition reset		AA01：Reset	※It supports after the map version 02. (Refer item 1.7)
40106	69	Reserve			
40107	6A	Reserve			
40108	6B	Reserve			
40109	6C	Reserve			
40110	6D	Reserve			
40111	6E	SNTP manual calibration		AA01：Calibration	※9 Refer item 2.4
40112	6F	Pram save (Recorder → SD)		AA01：Save	※10 Refer item 2.4
40113	70	Pram load (SD → Recorder)		AA01：Load	※11 Refer item 2.4
40114	71	Reserve			※About an address 40104, 40105,
40115	72	Reserve			40111～40113,
40116	73	Reserve			it supports after the map version 02.
40117	74	Reserve			
40118	75	Reserve			
40119	76	Reserve			
40120	77	Reserve			
40121	78	Reserve			
40122	79	Reserve			
40123	7A	Reserve			
40124	7B	Reserve			
40125	7C	Reserve			
40126	7D	Reserve			
40127	7E	Reserve			
40128	7F	Reserve			
40129	80	Reserve			
40130	81	Reserve			
40131	82	Reserve			
40132	83	Reserve			
40133	84	Reserve			
40134	85	Reserve			
40135	86	Reserve			
40136	87	Reserve			
40137	88	Reserve			
40138	89	Reserve			
40139	8A	Reserve			
40140	8B	Reserve			
40141	8C	Reserve			
40142	8D	Reserve			
40143	8E	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
40144	8F	Reserve			
40145	90	Reserve			
40146	91	Reserve			
40147	92	Reserve			
40148	93	Reserve			
40149	94	Reserve			
40150	95	Reserve			
40151	96	Reserve			
40152	97	Reserve			
40153	98	Reserve			
40154	99	Reserve			
40155	9A	Reserve			
40156	9B	Reserve			
40157	9C	Reserve			
40158	9D	Reserve			
40159	9E	Reserve			
40160	9F	Reserve			
40161	A0	Reserve			
40162	A1	Reserve			
40163	A2	Reserve			
40164	A3	Reserve			
40165	A4	Reserve			
40166	A5	Reserve			
40167	A6	Reserve			
40168	A7	Reserve			
40169	A8	Reserve			
40170	A9	Reserve			
40171	AA	Reserve			
40172	AB	Reserve			
40173	AC	Reserve			
40174	AD	Reserve			
40175	AE	Reserve			
40176	AF	Reserve			
40177	B0	Reserve			
40178	B1	Reserve			
40179	B2	Reserve			
40180	B3	Reserve			
40181	B4	Reserve			
40182	B5	Reserve			
40183	B6	Reserve			
40184	B7	Reserve			
40185	B8	Reserve			
40186	B9	Reserve			
40187	BA	Reserve			
40188	BB	Reserve			
40189	BC	Reserve			
40190	BD	Reserve			
40191	BE	Reserve			
40192	BF	Reserve			
40193	C0	Reserve			
40194	C1	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
40195	C2	Reserve			
40196	C3	Reserve			
40197	C4	Reserve			
40198	C5	Reserve			
40199	C6	Reserve			
40200	C7	Reserve			
40201	C8	Input type	CH01	0～33	Input channel ※1 Refer item 2.4
40202	C9	Burnout		0～1	0:OFF 1:ON
40203	CA	RJC		0～2	0:OFF 1:Internal 2:Assignment CH
40204	CB	RJC channel		0～47	0:CH01 47:CH48
40205	CC	Measurement range (L)		Depends on range	※1 Refer item 2.4
40206	CD	Measurement range (H)		Depends on range	※1 Refer item 2.4
40207	CE	Scaling		0～2	0:OFF 1:ON 2:Square root ON
40208	CF	Scaling range (L)		-32000～32000	
40209	D0	Scaling range (H)		-32000～32000	
40210	D1	Decimal point position		0～4	Decimal point when the Scaling ON
40211	D2	Unit (1/4)		ASCII	Unit when the Scaling ON
40212	D3	Unit (2/4)		ASCII	
40213	D4	Unit (3/4)		ASCII	
40214	D5	Unit (4/4)		ASCII	
40215	D6	Tag (1/4)		ASCII	
40216	D7	Tag (2/4)		ASCII	
40217	D8	Tag (3/4)		ASCII	
40218	D9	Tag (4/4)		ASCII	
40219	DA	Description (01/26)		ASCII	
40220	DB	Description (02/26)		ASCII	
40221	DC	Description (03/26)		ASCII	
40222	DD	Description (04/26)		ASCII	
40223	DE	Description (05/26)		ASCII	
40224	DF	Description (06/26)		ASCII	
40225	E0	Description (07/26)		ASCII	
40226	E1	Description (08/26)		ASCII	
40227	E2	Description (09/26)		ASCII	
40228	E3	Description (10/26)		ASCII	
40229	E4	Description (11/26)		ASCII	
40230	E5	Description (12/26)		ASCII	
40231	E6	Description (13/26)		ASCII	
40232	E7	Description (14/26)		ASCII	
40233	E8	Description (15/26)		ASCII	
40234	E9	Description (16/26)		ASCII	
40235	EA	Description (17/26)		ASCII	
40236	EB	Description (18/26)		ASCII	
40237	EC	Description (19/26)		ASCII	
40238	ED	Description (20/26)		ASCII	
40239	EE	Description (21/26)		ASCII	
40240	EF	Description (22/26)		ASCII	
40241	F0	Description (23/26)		ASCII	
40242	F1	Description (24/26)		ASCII	
40243	F2	Description (25/26)		ASCII	
40244	F3	Description (26/26)		ASCII	
40245	F4	Display Color		0～15	※2 Refer item 2.4

Address	Relative address (HEX)	Item	Array	Content	Remarks
40246	F5	Scale generation	CH01	0	Now unused
40247	F6	Scaling range (L)		-32000～32000	The position is the decimal point changeable.
40248	F7	Scaling range (H)		-32000～32000	The position is the decimal point changeable.
40249	F8	Scaling file (01/16)		ASCII	Now unused
40250	F9	Scaling file name (02/16)		ASCII	
40251	FA	Scaling file name (03/16)		ASCII	
40252	FB	Scaling file name (04/16)		ASCII	
40253	FC	Scaling file name (05/16)		ASCII	
40254	FD	Scaling file name (06/16)		ASCII	
40255	FE	Scaling file name (07/16)		ASCII	
40256	FF	Scaling file name (08/16)		ASCII	
40257	100	Scaling file name (09/16)		ASCII	
40258	101	Scaling file name (10/16)		ASCII	
40259	102	Scaling file name (11/16)		ASCII	
40260	103	Scaling file name (12/16)		ASCII	
40261	104	Scaling file name (13/16)		ASCII	
40262	105	Scaling file name (14/16)		ASCII	
40263	106	Scaling file name (15/16)		ASCII	
40264	107	Scaling file name (16/16)		ASCII	
40265	108	Partition		0～20	
40266	109	Alarm1 action		0～3	0:OFF 1:HI 2:LOW 3:Fault
40267	10A	Alarm1 DO No.		0～16	0:Common 1～6:Relay 7～12:Transistor 16:OFF
40268	10B	Alarm1 set value		-32000～32000	The position is the decimal point changeable.
40269	10C	Alarm2 action		0～3	
40270	10D	Alarm2 DO No.		0～16	
40271	10E	Alarm2 set value		-32000～32000	
40272	10F	Alarm3 action		0～3	
40273	110	Alarm3 DO No.		0～16	
40274	111	Alarm3 set value		-32000～32000	
40275	112	Alarm4 action		0～3	
40276	113	Alarm4 DO No.		0～16	
40277	114	Alarm4 set value		-32000～32000	
40278	115	Hysteresis		0～1000(%)	One digit at decimal point position fixation.
40279	116	Delay		0～3600(sec)	Zero digit at decimal point position fixation.
40280	117	Input filter		0～99(sec)	
40281	118	Record type		0～3	0:OFF 1:Max/Min 2:Average 3:Instant value
40282	119	Offset		-32000～32000	The position is the decimal point changeable.
40283	11A	Gain		-32000～32000	Two digit at decimal point position fixation
40284	11B	Scale No.		0～2	0:Scale No.1 1:Scale No.2 2:Scale No.3
40285	11C	Reserve			
40286	11D	Reserve			
40287	11E	Reserve			
40288	11F	Reserve			
40289	120	Reserve			
40290	121	Reserve			
40291	122	Reserve			

Address	Relative address (HEX)	Item	Array	Content	Remarks
40292	123	Reserve			
40293	124	Reserve			
40294	125	Reserve			
40295	126	Reserve			
40296	127	Reserve			
40297	128	Reserve			
40298	129	Reserve			
40299	12A	Reserve			
40300	12B	Reserve			
40301	12C	Input type	CH02	Input channel	The same composition as CH1
40401	190	Input type	CH03	Input channel	
40501	1F4	Input type	CH04	Input channel	
40601	258	Input type	CH05	Input channel	
40701	2BC	Input type	CH06	Input channel	
40801	320	Input type	CH07	Input channel	
40901	384	Input type	CH08	Input channel	
41001	3E8	Input type	CH09	Input channel	
41101	44C	Input type	CH10	Input channel	
41201	4B0	Input type	CH11	Input channel	
41301	514	Input type	CH12	Input channel	
41401	578	Input type (Input CH only)	CH13	Calc. channel	Calc. channel – parameter
41402	579	Reserve			
41403	57A	Reserve			
41404	57B	Reserve			
41405	57C	Reserve			
41406	57D	Reserve			
41407	57E	Reserve			
41408	57F	Reserve			
41409	580	Reserve			
41410	581	Decimal point position		0～4	Decimal point when the Scaling ON
41411	582	Unit (1/4)		ASCII	Unit when the Scaling ON
41412	583	Unit (2/4)		ASCII	
41413	584	Unit (3/4)		ASCII	
41414	585	Unit (4/4)		ASCII	
41415	586	Tag (1/4)		ASCII	
41416	587	Tag (2/4)		ASCII	
41417	588	Tag (3/4)		ASCII	
41418	589	Tag (4/4)		ASCII	
41419	58A	Description (01/26)		ASCII	
41420	58B	Description (02/26)		ASCII	
41421	58C	Description (03/26)		ASCII	
41422	58D	Description (04/26)		ASCII	
41423	58E	Description (05/26)		ASCII	
41424	58F	Description (06/26)	CH13	ASCII	
41425	590	Description (07/26)		ASCII	
41426	591	Description (08/26)		ASCII	
41427	592	Description (09/26)		ASCII	
41428	593	Description (10/26)		ASCII	
41429	594	Description (11/26)		ASCII	
41430	595	Description (12/26)		ASCII	

Address	Relative address (HEX)	Item	Array	Content	Remarks
41431	596	Description (13/26)		ASCII	
41432	597	Description (14/26)		ASCII	
41433	598	Description (15/26)		ASCII	
41434	599	Description (16/26)		ASCII	
41435	59A	Description (17/26)		ASCII	
41436	59B	Description (18/26)		ASCII	
41437	59C	Description (19/26)		ASCII	
41438	59D	Description (20/26)		ASCII	
41439	59E	Description (21/26)		ASCII	
41440	59F	Description (22/26)		ASCII	
41441	5A0	Description (23/26)		ASCII	
41442	5A1	Description (24/26)		ASCII	
41443	5A2	Description (25/26)		ASCII	
41444	5A3	Description (26/26)		ASCII	
41445	5A4	Display Color		0～15	※2 Refer item 2.4
41446	5A5	Scale generation		0	Now unused
41447	5A6	Scaling range (L)		-32000～32000	The position is the decimal point changeable.
41448	5A7	Scaling range (H)		-32000～32000	The position is the decimal point changeable.
41449	5A8	Scaling file name (01/16)		ASCII	Now unused
41450	5A9	Scaling file name (02/16)		ASCII	
41451	5AA	Scaling file name (03/16)		ASCII	
41452	5AB	Scaling file name (04/16)		ASCII	
41453	5AC	Scaling file name (05/16)		ASCII	
41454	5AD	Scaling file name (06/16)		ASCII	
41455	5AE	Scaling file name (07/16)		ASCII	
41456	5AF	Scaling file name (08/16)		ASCII	
41457	5B0	Scaling file name (09/16)		ASCII	
41458	5B1	Scaling file name (10/16)		ASCII	
41459	5B2	Scaling file name (11/16)		ASCII	
41460	5B3	Scaling file name (12/16)		ASCII	
41461	5B4	Scaling file name (13/16)		ASCII	
41462	5B5	Scaling file name (14/16)		ASCII	
41463	5B6	Scaling file name (15/16)		ASCII	
41464	5B7	Scaling file name (16/16)		ASCII	
41465	5B8	Partition		0～20	
41466	5B9	Alarm1 action		0～3	0:OFF 1:HI 2:LOW 3:Fault
41467	5BA	Alarm1 DO No.		0～16	0:Common 1～6:Relay 7～12:Transistor 16:OFF
41468	5BB	Alarm1 set value		-32000～32000	The position is the decimal point changeable.
41469	5BC	Alarm2 action		0～3	
41470	5BD	Alarm2 DO No.		0～16	
41471	5BE	Alarm2 set value		-32000～32000	
41472	5BF	Alarm3 action	CH13	0～3	
41473	5C0	Alarm3 DO No.		0～16	
41474	5C1	Alarm3 set value		-32000～32000	
41475	5C2	Alarm4 action		0～3	
41476	5C3	Alarm4 DO No.		0～16	
41477	5C4	Alarm4 set value		-32000～32000	
41478	5C5	Hysteresis		0～1000(%)	One digit at decimal point position fixation.

Address	Relative address (HEX)	Item	Array	Content	Remarks
41479	5C6	Delay		0～3600(sec)	Zero digit at decimal point position fixation.
41480	5C7	Input filter		0～99(sec)	
41481	5C8	Record type		0～3	0:OFF 1:Max/Min 2:Average 3:Instant value
41482	5C9	Offset		-32000～32000	The position is the decimal point changeable.
41483	5CA	Gain		-32000～32000	Two digit at decimal point position fixation
41484	5CB	Scale No.		0～2	0:Scale No.1 1:Scale No.2 2:Scale No.3
41485	5CC	Reserve			
41486	5CD	Reserve			
41487	5CE	Reserve			
41488	5CF	Reserve			
41489	5D0	Reserve			
41490	5D1	Reserve			
41491	5D2	Reserve			
41492	5D3	Reserve			
41493	5D4	Reserve			
41494	5D5	Reserve			
41495	5D6	Reserve			
41496	5D7	Reserve			
41497	5D8	Reserve			
41498	5D9	Reserve			
41499	5DA	Reserve			
41500	5DB	Reserve			
41501	5DC	Input type(Input CH only)	CH14		The same composition as CH13
41601	640	Input type(Input CH only)	CH15		
41701	6A4	Input type(Input CH only)	CH16		
41801	708	Input type(Input CH only)	CH17		
41901	76C	Input type(Input CH only)	CH18		
42001	7D0	Input type(Input CH only)	CH19		
42101	834	Input type(Input CH only)	CH20		
42201	898	Input type(Input CH only)	CH21		
42301	8FC	Input type(Input CH only)	CH22		
42401	960	Input type(Input CH only)	CH23		
42501	9C4	Input type(Input CH only)	CH24		
42601	A28	Input type(Input CH only)	CH25		
42701	A8C	Input type(Input CH only)	CH26		
42801	AF0	Input type(Input CH only)	CH27		
42901	B54	Input type(Input CH only)	CH28		
43001	BB8	Input type(Input CH only)	CH29		
43101	C1C	Input type(Input CH only)	CH30		
43201	C80	Input type(Input CH only)	CH31		
43301	CE4	Input type(Input CH only)	CH32		
43401	D48	Input type(Input CH only)	CH33		
43501	DAC	Input type(Input CH only)	CH34		
43601	E10	Input type(Input CH only)	CH35		
43701	E74	Input type(Input CH only)	CH36		
43801	ED8	Input type(Input CH only)	CH37		
43901	F3C	Input type(Input CH only)	CH38		
44001	FA0	Input type(Input CH only)	CH39		

Address	Relative address (HEX)	Item	Array	Content	Remarks
44101	1004	Input type(Input CH only)	CH40		The same composition as CH13
44201	1068	Input type(Input CH only)	CH41		
44301	10CC	Input type(Input CH only)	CH42		
44401	1130	Input type(Input CH only)	CH43		
44501	1194	Input type(Input CH only)	CH44		
44601	11F8	Input type(Input CH only)	CH45		
44701	125C	Input type(Input CH only)	CH46		
44801	12C0	Input type(Input CH only)	CH47		
44901	1324	Input type(Input CH only)	CH48		
45001	1388	Display name (1/12)	Group01	ASCII	Group setting
45002	1389	Display name (2/12)		ASCII	
45003	138A	Display name (3/12)		ASCII	
45004	138B	Display name (4/12)		ASCII	
45005	138C	Display name (5/12)		ASCII	
45006	138D	Display name (6/12)		ASCII	
45007	138E	Display name (7/12)		ASCII	
45008	138F	Display name (8/12)		ASCII	
45009	1390	Display name (9/12)		ASCII	
45010	1391	Display name (10/12)		ASCII	
45011	1392	Display name (11/12)		ASCII	
45012	1393	Display name (12/12)		ASCII	
45013	1394	Tag disp set		0～1	0:Channel No. 1:TAG 0:OFF 1:ON
45014	1395	Display ON/OFF		0～1	※Group1,7(Sub) is always ON.
45015	1396	Horizontal trend ON/OFF		0～1	0:OFF 1:ON
45016	1397	Vertical trend ON/OFF		0～1	0:OFF 1:ON
45017	1398	Bar graph ON/OFF		0～1	0:OFF 1:ON
45018	1399	Digital display ON/OFF		0～1	0:OFF 1:ON
45019	139A	Display channel (01/12)		0～48	0:OFF ※3 Refer item 2.4
45020	139B	Display channel (02/12)			
45021	139C	Display channel (03/12)			
45022	139D	Display channel (04/12)			
45023	139E	Display channel 05/12)			
45024	139F	Display channel (06/12)			
45025	13A0	Display channel (07/12)			
45026	13A1	Display channel (08/12)			
45027	13A2	Display channel (09/12)			
45028	13A3	Display channel (10/12)			
45029	13A4	Display channel (11/12)			
45030	13A5	Display channel (12/12)			
45031	13A6	Display name (1/12)	Group02		The same composition as Group1
45061	13C4	Display name (1/12)	Group03		
45091	13E2	Display name (1/12)	Group04		
45121	1400	Display name (1/12)	Group05		The same composition as Group1
45151	141E	Display name (1/12)	Group06		
45181	143C	Display name (1/12)	SubGroup		
45211	145A	Record Cycle－Main		2～18	Record setting ※4 Refer item 2.4
45212	145B	File record cycle－Main		1～5	※5 Refer item 2.4
45213	145C	File superscription		0～1	0:OFF 1:ON
45214	145D	Record Cycle－Sub		1～18	※4 Refer item 2.4
45215	145E	Pre-record. －Sub		0～1	0:OFF 1:ON

Address	Relative address (HEX)	Item	Array	Content	Remarks
45216	145F	Record timing－Sub		0～4	※6 Refer item 2.4
45217	1460	DI No.		1～9	When “Record timing-sub” DI select
45218	1461	Reserve			
45219	1462	Reserve			
45220	1463	Schedule record ON/OFF		0～1	0:OFF 1:ON
45221	1464	Start time－Hour		0～23	local time
45222	1465	Start time－Minute		0～59	
45223	1466	Start time－Second		0～59	
45224	1467	End time－Hour		0～23	
45225	1468	End time－Minute		0～59	
45226	1469	End time－Second		0～59	
45227	146A	A day of the week－Sunday		0～1	0:OFF 1:ON
45228	146B	A day of the week－Monday		0～1	0:OFF 1:ON
45229	146C	A day of the week－Tuesday		0～1	0:OFF 1:ON
45230	146D	A day of the week－Wednesday		0～1	0:OFF 1:ON
45231	146E	A day of the week－Thursday		0～1	0:OFF 1:ON
45232	146F	A day of the week－Friday		0～1	0:OFF 1:ON
45233	1470	A day of the week－Saturday		0～1	0:OFF 1:ON
45234	1471	Reserve			
45241	1478	Message timing	Mes01	0～5	Message setting 0:OFF 1:Func key 2:Alarm occurred 3:Alarm cleared 4:DI ON 5:DI OFF
45242	1479	DI No./channel No.		DI No.:0～8 CH No.:0～47	Timing = DI select 0:DI1 8:DI9 Timing = Alarm 0:CH01 47:CH48
45243	147A	Alarm No.		0～3	Timing = Alarm 0:Alarm1 3:Alarm4
45244	147B	Message (1/8)		ASCII	
45245	147C	Message (2/8)		ASCII	
45246	147D	Message (3/8)		ASCII	
45247	147E	Message (4/8)		ASCII	
45248	147F	Message (5/8)		ASCII	
45249	1480	Message (6/8)		ASCII	
45250	1481	Message (7/8)		ASCII	
45251	1482	Message (8/8)		ASCII	
45252	1483	Reserve			
45253	1484	Reserve			
45254	1485	Reserve			
45255	1486	Reserve			
45256	1487	Reserve			
45257	1488	Message timing	Mes02	0～5	The same composition as Mes01
45273	1498	Message timing	Mes03	0～5	
45289	14A8	Message timing	Mes04	0～5	
45305	14B8	Message timing	Mes05	0～5	
45321	14C8	Message timing	Mes06	0～5	
45337	14D8	Message timing	Mes07	0～5	
45353	14E8	Message timing	Mes08	0～5	
45369	14F8	Message timing	Mes09	0～5	
45385	1508	Message timing	Mes10	0～5	
45401	1518	Message timing	Mes11	0～5	
45417	1528	Message timing	Mes12	0～5	
45433	1538	Message timing	Mes13	0～5	
45449	1548	Message timing	Mes14	0～5	

Address	Relative address (HEX)	Item	Array	Content	Remarks
45465	1558	Message timing	Mes15	0～5	The same composition as Mes01
45481	1568	Message timing	Mes16	0～5	
45497	1578	Message timing	Mes17	0～5	
45513	1588	Message timing	Mes18	0～5	
45529	1598	Message timing	Mes19	0～5	
45545	15A8	Message timing	Mes20	0～5	
45561	15B8	DI function	DI01	0～4	0:OFF 1:Record ON/OFF 2:LCD ON/OFF 3:U1 4:U2 ※4: About an “U2”, it supports after the map version 03. (Refer item 1.7)
45562	15B9	DI function	DI02	0～4	
45563	15BA	DI function	DI03	0～4	
45564	15BB	DI function	DI04	0～4	
45565	15BC	DI function	DI05	0～4	
45566	15BD	DI function	DI06	0～4	
45567	15BE	DI function	DI07	0～4	
45568	15BF	DI function	DI08	0～4	
45569	15C0	DI function	DI09	0～4	
45570	15C1	Reserve			
45571	15C2	Reserve			
45572	15C3	Reserve			
45573	15C4	Reserve			
45574	15C5	Reserve			
45575	15C6	Reserve			
45576	15C7	Reserve			
45577	15C8	Reserve			
45578	15C9	Reserve			
45579	15CA	Reserve			
45580	15CB	Reserve			
45581	15CC	User Unit(1/4)	1	ASCII	Read Only
45582	15CD	User Unit (2/4)		ASCII	
45583	15CE	User Unit(3/4)		ASCII	
45584	15CF	User Unit(4/4)		ASCII	
45585	15D0	User Unit(1/4)	2	ASCII	
45589	15D4	User Unit(1/4)	3	ASCII	
45593	15D8	User Unit(1/4)	4	ASCII	
45597	15DC	User Unit(1/4)	5	ASCII	
45601	15E0	User Unit(1/4)	6	ASCII	
45605	15E4	User Unit(1/4)	7	ASCII	
45609	15E8	User Unit(1/4)	8	ASCII	
45613	15EC	User Unit(1/4)	9	ASCII	
45617	15F0	User Unit(1/4)	10	ASCII	
45621	15F4	User Unit(1/4)	11	ASCII	
45625	15F8	User Unit(1/4)	12	ASCII	
45629	15FC	User Unit(1/4)	13	ASCII	
45633	1600	User Unit(1/4)	14	ASCII	
45637	1604	User Unit(1/4)	15	ASCII	
45641	1608	User Unit(1/4)	16	ASCII	
45645	160C	User Unit(1/4)	17	ASCII	
45649	1610	User Unit(1/4)	18	ASCII	
45653	1614	User Unit(1/4)	19	ASCII	
45657	1618	User Unit(1/4)	20	ASCII	

Address	Relative address (HEX)	Item	Array	Content	Remarks
45661 -	161C -	Reserve			
45901	170C	Auto display group		0～1	0:OFF 1:ON
				0～4	0:5 sec 1:10 sec 2:15 sec
45902	170D	Change cycle			3:30 sec 4:60 sec
45903	170E	Progress time		0～1	0:OFF 1:ON
45904	170F	Condition		0～2	0:Record 1:Alarm 2:DI
				DI No. :0～8	Condition=DI 0:DI1 8:DI9
45905	1710	DI No. / CH No.		CH No. :0～48	Condition=Alarm 0:All 1:CH01 48:CH48
				0～4	Condition=Alarm 0:All
45906	1711	Alarm No.			1:Alarm1 4:Alarm4
45907	1712	Reserve			※About an address 45901～45906,
・・・	・・・	・・・			it supports after the map version 03.
46000	176F	Reserve			
46001	1770	IP address (01/03)		ASCII	System ※7 Refer item 2.4
46002	1771	IP address (02/03)		ASCII	
46003	1772	IP address (03/03)			Reserve treatment
46004	1773	Subnet mask (01/03)		ASCII	※7 Refer item 2.4
46005	1774	Subnet mask (02/03)		ASCII	
46006	1775	Subnet mask (03/03)			Reserve treatment
46007	1776	Default gateway (01/03)		ASCII	※7 Refer item 2.4
46008	1777	Default gateway (02/03)		ASCII	
46009	1778	Default gateway (03/03)			Reserve treatment
46010	1779	DNS server address (01/03)		ASCII	※7 Refer item 2.4
46011	177A	DNS server address (02/03)		ASCII	
46012	177B	DNS server address (03/03)			Reserve treatment
46013	177C	Keep alive ON/OFF		0～1	0:OFF 1:OFF
46014	177D	Keep alive Cycle		1～240(min)	
46015	177E	Reserve			
46016	177F				
46017	1780				
46018	1781				
46019	1782				
46020	1783				
46021	1784	SNTP ON/OFF		0～1	0:OFF 1:ON
46022	1785	Proofreading cycle at time		1～200(hour)	
46023	1786	Operation when SNTP power supply is turned on ON/OFF		0～1	0:OFF 1:ON
46024	1787	Time zone		0～30	※8 Refer item 2.4
46025	1788	SNTP server address (01/16)		ASCII	
46026	1789	SNTP server address (02/16)		ASCII	
46027	178A	SNTP server address (03/16)		ASCII	
46028	178B	SNTP server address (04/16)		ASCII	
46029	178C	SNTP server address (05/16)		ASCII	
46030	178D	SNTP server address (06/16)		ASCII	
46031	178E	SNTP server address (07/16)		ASCII	
46032	178F	SNTP server address (08/16)		ASCII	
46033	1790	SNTP server address (09/16)		ASCII	
46034	1791	SNTP server address (10/16)		ASCII	
46035	1792	SNTP server address (11/16)		ASCII	
46036	1793	SNTP server address (12/16)		ASCII	
46037	1794	SNTP server address (13/16)		ASCII	

Address	Relative address (HEX)	Item	Array	Content	Remarks
46038	1795	SNTP server address (14/16)		ASCII	
46039	1796	SNTP server address (15/16)		ASCII	
46040	1797	SNTP server address (16/16)		ASCII	
46041	1798	FTP user(01/16)	User01	ASCII	Read only
46042	1799	FTP user(02/16)		ASCII	
46043	179A	FTP user (03/16)		ASCII	
46044	179B	FTP user (04/16)		ASCII	
46045	179C	FTP user (05/16)		ASCII	
46046	179D	FTP user (06/16)		ASCII	
46047	179E	FTP user (07/16)		ASCII	
46048	179F	FTP user (08/16)		ASCII	
46049	17A0	FTP user (09/16)		ASCII	
46050	17A1	FTP user (10/16)		ASCII	
46051	17A2	FTP user (11/16)		ASCII	
46052	17A3	FTP user (12/16)		ASCII	
46053	17A4	FTP user (13/16)		ASCII	
46054	17A5	FTP user (14/16)		ASCII	
46055	17A6	FTP user (15/16)		ASCII	
46056	17A7	FTP user (16/16)		ASCII	
46057	17A8	Password (01/16)		ASCII	Read only
46058	17A9	Password (02/16)		ASCII	
46059	17AA	Password (03/16)		ASCII	
46060	17AB	Password (04/16)		ASCII	
46061	17AC	Password (05/16)		ASCII	
46062	17AD	Password (06/16)		ASCII	
46063	17AE	Password (07/16)		ASCII	
46064	17AF	Password (08/16)		ASCII	
46065	17B0	Password (09/16)		ASCII	
46066	17B1	Password (10/16)		ASCII	
46067	17B2	Password (11/16)		ASCII	
46068	17B3	Password (12/16)		ASCII	
46069	17B4	Password (13/16)		ASCII	
46070	17B5	Password (14/16)		ASCII	
46071	17B6	Password (15/16)		ASCII	
46072	17B7	Password (16/16)		ASCII	
46073	17B8	Level		0～1	Read only 0:Administrator 1:User
46074	17B9	Reserve			
46075	17BA	Reserve			
46076	17BB	Reserve			
46077	17BC	Reserve			
46078	17BD	Reserve			
46079	17BE	Reserve			
46080	17BF	Reserve			
46081	17C0	FTP user	User 02		The same composition as User01
46121	17E8	FTP user	User 03		
46161	1810	FTP user	User 04		
46201	1838	FTP user	User 05		
46241	1860	FTP user	User 06		
46281	1888	FTP user	User 07		
46321	18B0	FTP user	User 08		
46361	18D8	FTP user	User 09		

Address	Relative address (HEX)	Item	Array	Content	Remarks
46401	1900	FTP user	User 10		The same composition as User01
46441	1928	FTP user	User 11		
46481	1950	FTP user	User 12		
46521	1978	FTP user	User 13		
46561	19A0	FTP user	User 14		
46601	19C8	FTP user	User 15		
46641	19F0	FTP user	User 16		
46681	1A18	FTP user	User 17		
46721	1A40	FTP user	User 18		
46761	1A68	FTP user	User 19		
46801	1A90	FTP user	User 20		
46841	1AB8	Modbus Ope. mode		0～1	Modbus 0:Modbus TCP(Ethernet) 1:Modbus RTU(RS-485)
46842	1AB9	Station No		0～247	0 is not connected
46843	1ABA	ModbusTCP Timeout		1～240 (min)	
46844	1ABB	Reserve			
46845	1ABC	Reserve			
46846	1ABD	Reserve			
46847	1ABE	RS-485 Parity		0～2	0:Even, 1:Odd, 2:None
46848	1ABF	Reserve			
46849	1AC0	Reserve			
46850	1AC1	Reserve			
46851	1AC2	LCD Off time		0～60 (min)	Other setting
46852	1AC3	LCD active brightness		2～5	
46853	1AC4	LCD sleep brightness		0～4	
46854	1AC5	Func key setting		0～4	0:OFF 1:Change display 2:Capture 3:Message 4:Addition reset
46855	1AC6	File format		0～1	0:Binary 1:Binary＋CSV
46856	1AC7	Operation mode		0～1	0:Normal 1:Advanced
46857	1AC8				
46858	1AC9				
46859	1ACA				
46860	1ACB	Alarm Recovery		0～1	0:OFF 1:ON ※It supports after the map version 02. (Refer item 1.7)
46861	1ACC	Jump menu(01/08)			Read only
46862	1ACD	Jump menu (02/08)			
46863	1ACE	Jump menu (03/08)			
46864	1ACF	Jump menu (04/08)			
46865	1AD0	Jump menu (05/08)			
46866	1AD1	Jump menu (06/08)			
46867	1AD2	Jump menu (07/08)			
46868	1AD3	Jump menu (08/08)			
46869 ・・・	1AD4 ・・・	Reserve ・・・			

Address	Relative address (HEX)	Item	Array	Content	Remarks
・・・	・・・	・・・			
47000	1B57	Reserve			
47001	1B58	Product data No.		0000H ～007H	Func code=10H, 20word only
47002	1B59	Reserve		Reserve	
47003	1B5A	Product data Strings(1/15)		ASCII	
47004	1B5B	Product data Strings(2/15)		ASCII	
47005	1B5C	Product data Strings(3/15)		ASCII	
47006	1B5D	Product data Strings(4/15)		ASCII	
47007	1B5E	Product data Strings(5/15)		ASCII	
47008	1B5F	Product data Strings(6/15)		ASCII	
47009	1B60	Product data Strings(7/15)		ASCII	
47010	1B61	Product data Strings(8/15)		ASCII	
47011	1B62	Product data Strings(9/15)		ASCII	
47012	1B63	Product data Strings(10/15)		ASCII	
47013	1B64	Product data Strings(11/15)		ASCII	
47014	1B65	Product data Strings(12/15)		ASCII	
47015	1B66	Product data Strings(13/15)		ASCII	
47016	1B67	Product data Strings(14/15)		ASCII	
47017	1B68	Product data Strings(15/15)		ASCII	
47018	1B69	Reserve			
47019	1B6A	Reserve			
47020	1B6B	Reserve			
・・・	・・・	・・・			
49964	26EB	Reserve			

2.7 Other setting range

The setting range for each item in the case of the holding register writing is explained.

※1 Input type, Measurement range

Data No.	Input type		Measurement range ※
0	DC voltage	±10mV	(-10.00 to 10.00)
1		0-20mv	(0.00 to 20.00)
2		0-50mV	(0.00 to 50.00)
3		±0.2V	(-0.200 to 0.200)
4		±1V	(-1.000 to 1.000)
5		±10V	(-10.00 to 10.00)
6		0-5V	(-0.000 to 5.000)
7	DC current	4-20mA	(4.00 to 20.00)
8	TC	B	(0.0 to 1820.0)
9	(Unit:℃)	R1	(0.0 to 1760.0)
10	(Au-Fe is K)	R2	(0.0 to 1200.0)
11		S	(0.0 to 1760.0)
12		K1	(-200.0 to 1370.0)
13		K2	(-200.0 to 600.0)
14		K3	(-200.0 to 300.0)
15		E1	(-200.0 to 800.0)
16		E2	(-200.0 to 300.0)
17		E3	(-200.0 to 150.0)
18		J1	(-200.0 to 1100.0)
19		J2	(-200.0 to 400.0)
20		J3	(-200.0 to 200.0)
21		T1	(-200.0 to 400.0)
22		T2	(-200.0 to 400.0)
23		C	(0.0 to 2320.0)
24		Au-Fe	(1.0 to 300.0)
25		N	(0.0 to 1300.0)
26		PR40-20	(0.0 to 1880.0)
27		PL2	(0.0 to 1390.0)
28		U	(-200.0 to 400.0)
29		L	(-200.0 to 900.0)
30	RTD	Pt100-1	(-200.0 to 650.0)
31	(Unit:℃)	Pt100-2	(-200.0 to 200.0)
32		JPt100-1	(-200.0 to 630.0)
33		JPt100-2	(-200.0 to 200.0)

※ It depends for a measurement range on an “Input type”. Moreover, the measurement range is the value without the decimal point. (±10.00mV → -1000～1000)

※2 Display color

Data No.	Display color
0	Red
1	Green
2	Blue
3	Purple
4	Yellow
5	Aqua
6	Maroon
7	Lime

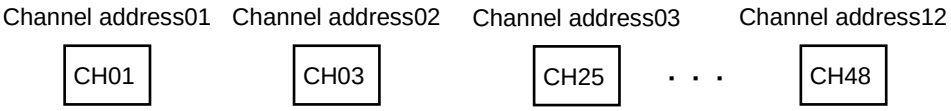
Data No.	Display color
8	Navy
9	Fuchsia
10	Teal
11	Olive
12	Gray
13	Khaki
14	Brown
15	Orange

※3 Display channel

The setting range of display channels(01/12)～(12/12)(Following “Channel address” : Relative address 139A～13A5(Group01)) are “0～48”.

“Data No.1～48” is equivalent to “CH01～CH48”. 0 is "display OFF" indicates.

One “CH No.” can be set up to one “Channel address”.

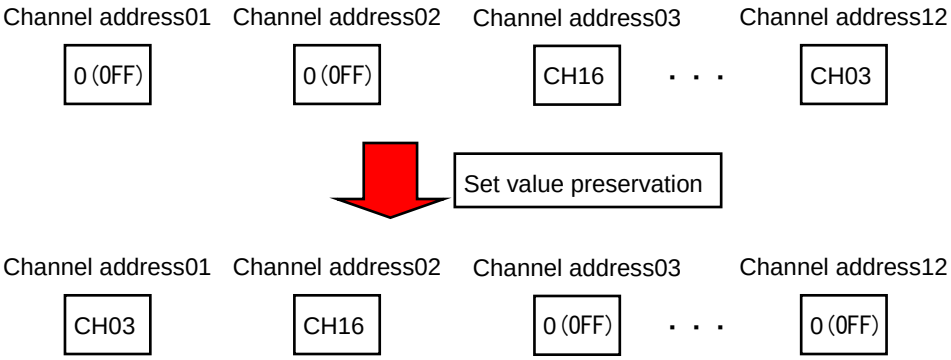


The CH No., "Channel address 01" does not need to register in order from.

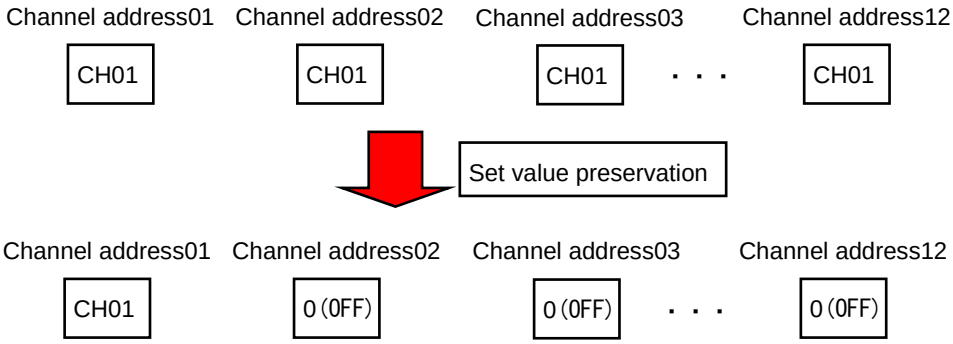
Earlier data is overwritten when data are written in the "Channel address" to which "Channel No." is set.

Moreover, when a channel is set up and "Set value preservation (Relative address 0067→AA01)" is executed, channel settings are aligned in ascending order.

(Refer item 2.3 for “Set value preservation”.)



The same “CH No., each “Channel address” when set to, “CH No.” is only one set.



※4 Record cycle

Data No.	Record cycle
1	100ms (Sub record only)
2	1sec
3	2sec
4	3sec
5	5sec
6	10sec
7	15sec
8	20sec
9	30sec
10	1min
11	2min
12	3min
13	5min
14	10min
15	15min
16	20min
17	30min
18	60min

※5 File record cycle

The "File record cycle" depends on the "Record cycle".

Data No.	File record cycle	Record cycle
1	1 hour	100ms～5sec
2	1 hour, 1 day	10sec～1min
3	1 hour, 1 day, 1 week	2min～3min
4	1 hour, 1 day, 1 week, 1 month	5min～30min
5	1 hour, 1 day, 1 week, 1 month, 1 year	60min

※6 Sub record timing

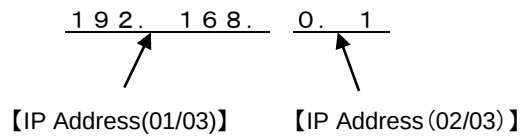
System Settings “Device / Other” ⇒ “FUNC key” is “OFF” only when you can choose “1:Func key”.
(Refer item 7.20 or 8.15 of Paperless Recorder Manual (WXPVM70mnAR001E) for details.)

Data No.	Sub record timing
0	OFF
1	Func key
2	Alarm
3	DI
4	Sync.

※7 IP Address, Subnet Mask, Default GW, DNS address

“IP Address (01/03)” and “IP address (02/03)” is a pair. (“IP Address (03/03)” is not used.)

Ex) IP Address set “192.168.0.1”.



Enter the IP address by HEX.

192(DEC) = C0(HEX)、168(DEC) = A8(HEX) ⇒【IP Address(01/03)】 : C0A8

0(DEC) = 00(HEX)、1(DEC) = 01(HEX) ⇒【IP Address(02/03)】 : 0001

※8 Time zone (UTC)

Data No.	Time zone (UTC)
0	-12:00
1	-11:00
2	-10:00
3	-09:00
4	-08:00
5	-07:00
6	-06:00
7	-05:00
8	-04:00
9	-03:00
10	-02:00
11	-01:00
12	+00:00
13	+01:00
14	+02:00
15	+03:00

Data No.	Time zone (UTC)
16	+04:00
17	+05:00
18	+06:00
19	+07:00
20	+08:00
21	+09:00
22	+10:00
23	+11:00
24	+12:00
25	+13:00
26	+14:00
27	+04:30
28	+05:45
29	+05:30
30	+09:30

※9 SNTP manual calibration

Time is calibrated by SNTP function. (Only record stop)

The result of SNTP manual calibration can get by reading the same address "006E." (Status response value)

● The check on a Modbus protocol

①Data receive only "0000H" or "AA01H". (The other command becomes a command error.)

②When data is "0000H", "0000H" is set as a status response value.
(Manual calibration is not started.)

③Calibrate when data is "AA01H", and the following conditions are satisfied.

- The last status response value = 0000H
- "SNTP function" of System is "ON".
- Main record is not started.

Manual calibration is started. A status response value becomes "5500H".

※ Setting of SNTP uses what is beforehand set up by the recorder.
(Refer item 8.8 of Paperless Recorder Manual for SNTP function.)

● The status response after a SNTP manual calibration reception.

A status response is as follows. (A communication state continues for a maximum of 30 seconds.)

5500H = Now communicating
5501H = Calibration success
5510H = Link down
5511H = DNS error
5512H = Address error
5513H = Time out
0000H = SNTP reception preparation completion (When 0000H is received.)

※ In order to check completion of action, please wait until a status response becomes except for "5500H" or "0000H".

※10 Parameter save (Recorder → SD)

The current parameter and system state is saved to an SD card.

The result of save of parameter can get by reading the same address "006F". (Status response value)

(A file name is "modprm.dps" fixation. Keep the file of a same name from existing on an SD card.

Moreover, it becomes an error if a file already exists. Please save after deleting a file previously.)

● The check on a Modbus protocol

①Data receive only "0000H" or "AA01H". (The other command becomes a command error.)

②When data is "0000H", "0000H" is set as a status response value.(Save of parameter is not started.)

③Save the parameter when data is "AA01H", and the following conditions are satisfied.

・The last status response value of parameter read = 0000H

・The last status response value of parameter write = 0000H

・The SD card is inserted.

Save of parameter is started. A status response value becomes "5500H".

● The status response after a save of parameter.

A status response is as follows.

5500H = Now writing

5501H = Writing success

5510H = A file already exists.

5511H = File writing error

0000H = "Write of parameter" preparation completion

※ In order to check completion of action, please wait until a status response becomes except for "5500H" or "0000H".

※11 Parameter load (SD → Recorder)

A parameter file (DPS file) is written to recorder from a host computer by FTP, and it is read with a recorder.(A file name is "modprm.dps" fixation.)

The result of read of parameter can get by reading the same address "0070." (Status response value)

● The check on a Modbus protocol

①Data receive only "0000H" or "AA01H". (The other command becomes a command error.)

②When data is "0000H", "0000H" is set as a status response value.(Read of parameter is not started.)

③Read of parameter when data is "AA01H", and the following conditions are satisfied.

・The last status response value of parameter read = 0000H

・The last status response value of parameter write = 0000H

・The SD card is inserted.

・Main record is not started.

Read of parameter is started. A status response value becomes "5500H".

● The status response after a read of parameter.

A status response is as follows.

5500H = Now reading

5501H = Reading success

5510H = A file already exists.

5511H = File reading error

0000H = "Read of parameter" preparation completion

※ In order to check completion of action, please wait until a status response becomes except for "5500H" or "0000H".

3. Modbus master - Read function -

3.1 Overview

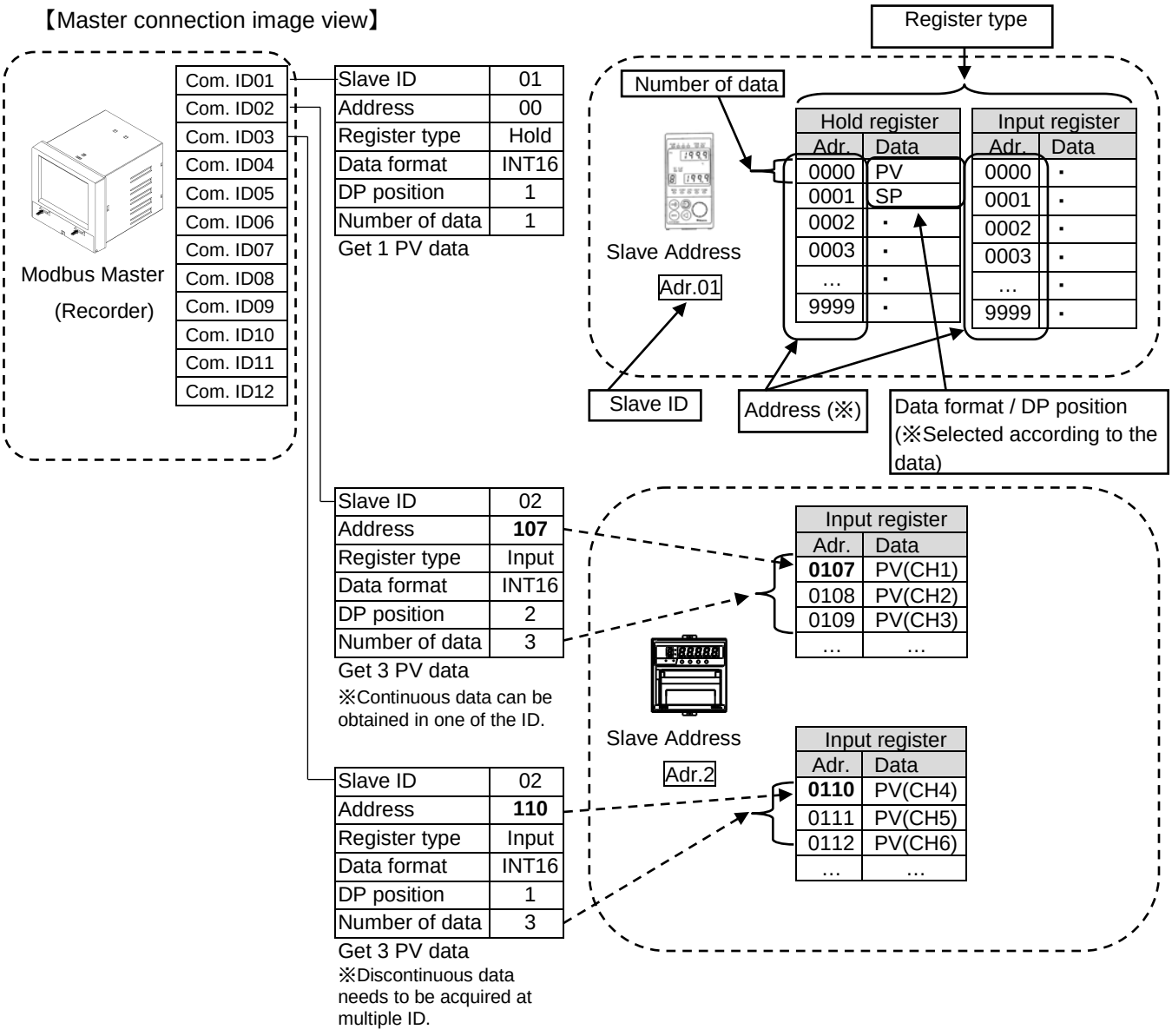
This is the function for obtaining data from a general-purpose device supporting ModbusRTU such as ModbusRTU-supported controller, ModbusRTU-supported sensor and recording the data on this device. With this device as the master, a maximum of 12 supported devices can be connected under it. The data to be obtained are specified individually on this device side. The data obtained can be assigned to the calculating channels of the main unit.

With communication IDs, a maximum of 12 slave connection destinations can be selected. By setting the slave ID (station number), Modbus address, register type, data type and data count for each ID in accordance with the slave device's specifications, this device obtains data from the slave devices with a fixed interval (1/2/5 seconds) and stores the data inside it. If the data to be obtained are sequential, a maximum of 16 data can be obtained with a single ID.
If the data are not sequential or the register types are different, acquire the data with multiple IDs.

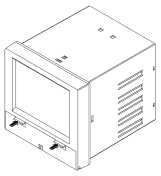
For the slave devices, the following parameters are set from this device side.

Item	Name	Range	Remarks
01	Communication ID	01 to 12	
02	Slave ID (Station number)	0 to 247	0 means "Disabled", If 0 is set, communications do not occur.
03	Address	0 to 9999	Relative address
04	Register type	Input/hold	ModbusRTU's function code Func04/03 can be set.
05	Data format	INT16 UINT16 INT32(BIG/LITTLE) UINT32(BIG/LITTLE) FLOAT(BIG/LITTLE)	1 word 1 word 2 words 2 words 2 words
06	Decimal point position	0 to 4	Disabled when FLOAT is set
07	Number of data	1 to 16	Number of data received sequentially

【Master connection image view】



【Modbus master - calculating channel allocation image】



Modbus Master
(Recorder)

［Allocation List］

Cal. CH	fomula	Remarks
13	MID01:01	PV
14	MID02:01	PV(CH1)
15	MID02:02	PV(CH2)
16	MID02:03	PV(CH3)
17	MID03:01	PV(CH4)
18	MID03:02	PV(CH5)
19	MID03:03	PV(CH6)
20	-	-
21	-	-
22	-	
23	-	
…	-	
48	-	

［Communication ID - Data No.］

Com. ID Data No.	Com. ID01	Com. ID02	Com. ID03	…	Com. ID12
01	**PV**	**PV(CH1)**	**PV(CH4)**	-	-
02	-	**PV(CH2)**	**PV(CH5)**	-	-
03	-	**PV(CH3)**	**PV(CH6)**	-	-
04	-	-	-	-	-
05	-	-	-	-	-
06	-	-	-	-	-
07	-	-	-	-	-
08	-	-	-	-	-
09	-	-	-	-	-
10	-	-	-	-	-
11	-	-	-	-	-
12	-	-	-	-	-
13	-	-	-	-	-
14	-	-	-	-	-
15	-	-	-	-	-
16	-	-	-	-	-

3.2 Procedure of the recording data from slave devices

This section describes the procedures from connecting to slave devices until displaying screens and recording data, using the Modbus master function of this device. Note that some of the procedures can be done only using the parameter loader.

Item	Description	Slave	Main unit	Loader	Remarks
1	Check the communication specifications of the slave devices and make settings so that each device has the same setting. - Communication speed. - Parity - Stop bit	Yes	-	-	
2	Wiring Carry out wiring for the RS-485 communications following the manuals of the slave devices and the description about wiring of the main unit.				
3	Set the slave devices' IDs (station numbers). Each slave device must have a unique ID number other than 0.	Yes	-	-	
4	From the Modbus maps of the slave devices, check the address of the data to be obtained.	Yes	-	-	The data which can be acquired are the input register (FuncCode=04H) and the hold register (FuncCode=03H). Other coils such as bit data can not be acquired.
5	Enable "Remote AI" on the engineering settings. Main unit: MENU button > System key > Engineering key > Remote AI key Loader: Display > Engineering((Not required after Ver.2.20))	-	Yes	Yes	See section 3.3.
6	Set the operation mode of this device to "Advanced". Main unit: MENU button > System key > Device/Other > Mode Loader: Device/Other > Operation mode	—	Yes	Yes	* With this setting, it is possible to set items 8 and 9 on the main unit.
7	Set the communication settings of this device. - Communication speed. - Parity - Stop bit Main unit: MENU button > System key> Comm. key > Modbus1 key Loader: Communication setting 2	-	Yes	Yes	See section 3.4.
8	Carry out the Modbus settings. - Modbus communication type ... "ModbusTCP+RTU" - Master/slave ... Master mode (General-purpose) - Auto retry - Acquisition interval Main unit: MENU button > System key > Comm. key > Modbus2 key Loader: Communication setting 2	-	Yes	Yes	See section 3.5. After the settings are completed, the main unit must be rebooted.
9	Carry out the Modbus mater settings (for connecting with slave devices). Up to 12 types of settings are enabled. - Communication ID - Slave ID - Address - Register type - Type - Decimal point position - Number of data	-	Yes	Yes	See section 3.6.

Item	Description	Slave	Main unit	Loader	Remarks
10	Check the status of communications. Check the status of communications with slave devices.	-	Yes	-	See section 3.7.
11	Assign to calculating channels Assign the data acquired to the corresponding channels, using the calculating formulas of the calculating channels. - ModbusCH [ID][No] Communication ID + Data No. - Decimal point position Match the position to the decimal point set for Modbus. - Record type As the initial status is "Record OFF" , select "Max/Min", "Instant value" or "Average". Loader: Calc CH - Calculating formula	-	No	Yes	Only the loader. For details about the screen, see section 3.8. A warning appears if the recording type is saved in the OFF status.
12	Register the calculating channels in the display group. - Group channel - - - Register the calculating channels assigned to the display group. Main unit: MENU button > Parameter key > Display key > Group CH key Loader: Display settings	-	Yes	Yes	For details about the loader screen, see section 3.8.
13	Return to the trend and check the measurement data.	-	Yes	No	

3.3 Enabling the Modbus master function

[Caution]

To use this device, the version number of the main unit needs to be 1.60 or later. For details about how to check the version number and operate the main unit, refer to the operation manual of the main unit (WXPVM70mnAR001E).

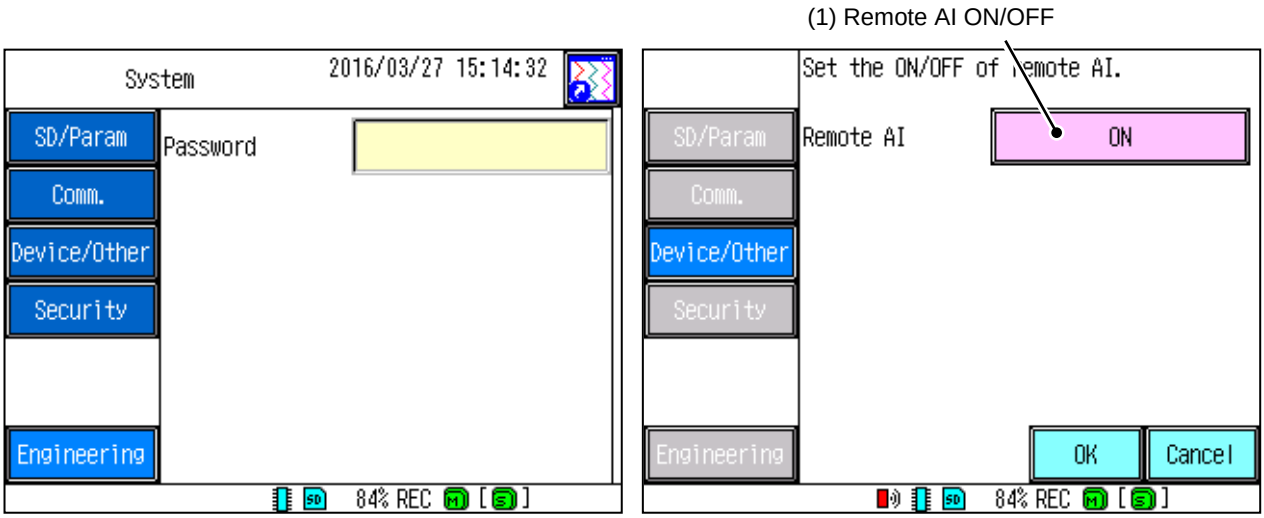
[Description]

To use the Modbus master functions, it is necessary to enable the remote AI/Modbus master functions of the main unit and the parameter loader attached as standard. (Disabled as default)

By "enabling" the settings, the setting items regarding the Modbus master are shown on the menu screen.

[Main unit settings]

Navigate to [Engineering] on the system setting screen and input "REMOTE" as the password. Select "Remote AI" to open the Remote AI ON/OFF screen. (The Modbus master is also enabled by making the same setting.)



(1)Remote AI/Modbus master ON/OFF

Set ON/OFF for the remote AI/Modbus master functions.

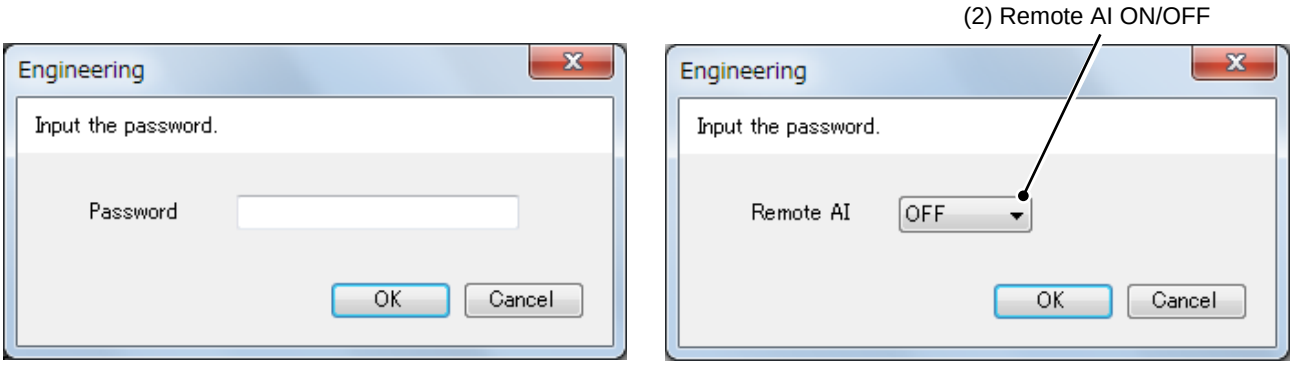
ON: Displays the setting items necessary for the remote AI/Modbus master functions on the menu.

OFF: Does not display the setting items necessary for the remote AI/Modbus master functions on the menu.

[Parameter loader] (* No operation required after Ver.2.20)

On the menu bar, select View > Engineering to open the remote AI ON/OFF screen.

* Input "REMOTE" as the password for Engineering. (The Modbus master is also enabled by making the same setting.)



(2)Remote AI/Modbus master ON/OFF

Set ON/OFF for the remote AI/Modbus master functions.

ON: Displays the setting items necessary for the remote AI functions on the menu.

OFF: Does not display the setting items necessary for the remote AI functions on the menu.

* For details about the setting items to be displayed, see section 8.3 Remote AI channel of “ZE7400A Remote AI Instruction Manual”.

3.4 SettingModbus1(RS485 communication setting, timeout, etc.)

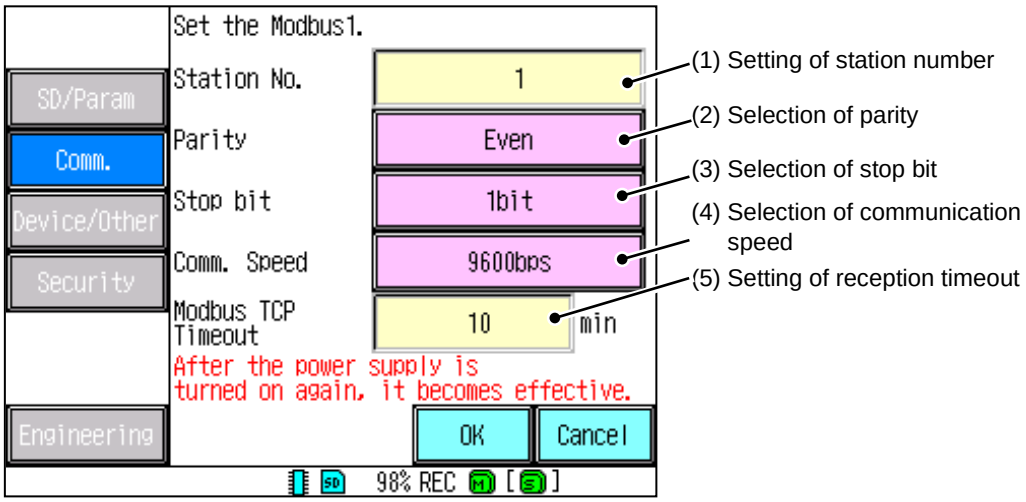
[Description]

Set the Modbus station number, reception timeout function, parity, stop bit and communication speed.

Note) No settings can be changed during the recording process. The power must be turned on again for this setting to take effect.

[Operation]

On the system setting screen, select Comm. key > Modbus1 key to open the Modbus1 setting screen.



(1) Setting of station number

Set the device address (station number). (0 to 247)

Input a station number on the numerical value input screen and then touch the OK key to set it.

Communications do not occur if "0" is input.

(Enabled only if the RS-485 option is implemented)

(2) Parity

Select "Even", "Odd" or "None" as the parity of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

(3) Stop bit

Select "1bit" or "2bit" as the stop bit of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

(4) Selection of communication speed

Select "9600bps", "19200bps" or "38400bps" as the communication speed of ModbusRTU.

(Enabled only if the RS-485 option is implemented)

(5) Setting of reception timeout

Set the reception timeout for the TCP communication. (1 to 240 minutes)

Input a timeout period on the numerical value input screen and touch the OK key to set it.

3.5 Setting Modbus2 (communication type)

[Description]

Set the Modbus communication type and master/slave operations. The setting items vary depending on the communication types and master/slave settings.

To set the Modbus master, perform the following operations.

-Set the operation mode setting to "Advanced" in the Mode of the system setting screen.

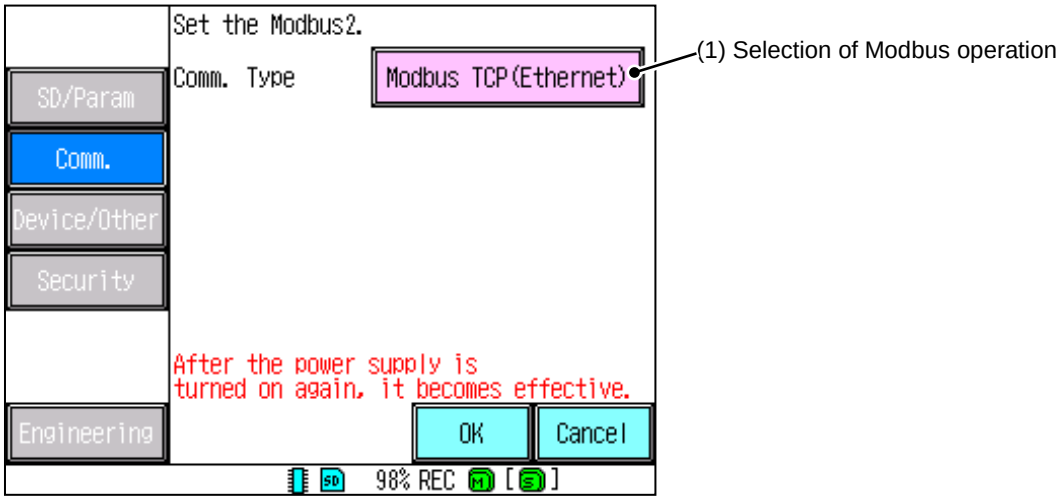
→By setting to “Advance”, all setting items will be displayed.

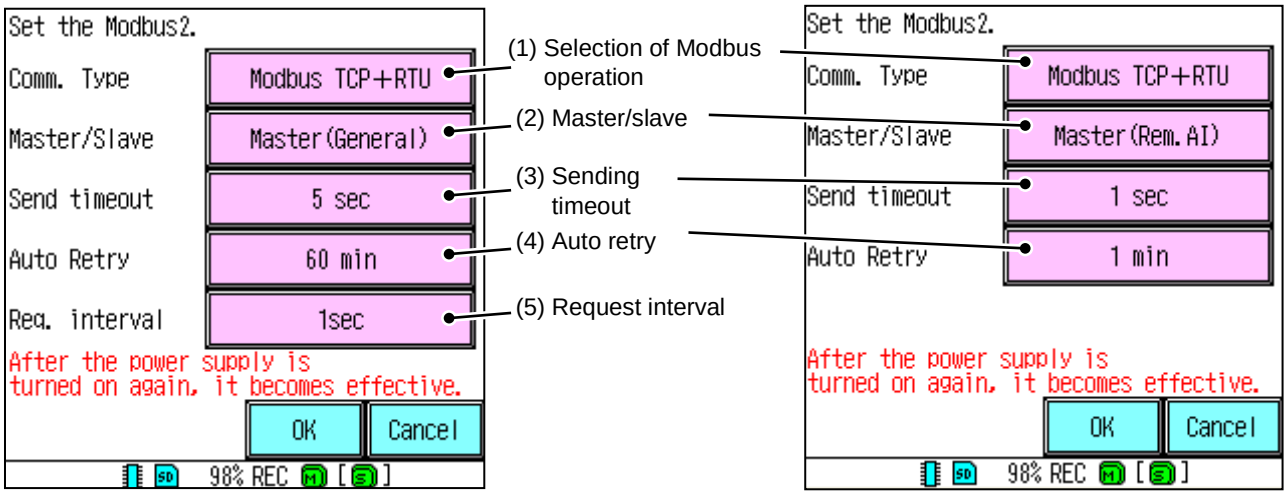
-Enter "REMOTE" in Engineering on the system setting screen to enable remote AI.

→ By enabling remote AI, the following setting items (2) to (5) will be displayed and can be set.

[Operation]

On the system setting screen, select Comm. key > Modbus2 key to open the Modbus2 setting screen.





(1) Selection of Modbus operation (* When changing the settings, turn on the power again.)

Select the Modbus operation.

Modbus TCP (Ethernet): Modbus TCP is used for communication protocols.
Only the slave can be selected for the operation.

Modbus TCP+RTU: Add RS-485 to the available communication protocols.
(Enabled only if the RS-485 option is implemented)
For this setting, additionally set the operation on the ModbusRTU side.

(2) Master/slave (* When changing the settings, turn on the power again.)

Set the ModbusRTU operation mode. This setting is possible only if the communication type is "ModbusTCP+RTU".

Slave: Works as the Modbus slave.

Master (General): Acts as the Modbus master and write or read values from the general-purpose ModbusRTU device.

Master (Rem. AI): Acts as the Modbus master and acquires the value from the separately-sold remote AI.

(3) Sending timeout

Set the timeout period for when the master is running. (1, 5 and 10 seconds)

If "no response" state after the elapse of the timeout occurs 3 times, disconnect the target slave devices from the connected network.

(4) Auto retry

Set the interval for attempting to reconnect with slave devices if connections with slave devices are lost while the master is running.

(1 minute, 5 minutes, 10 minutes, 30 minutes, 60 minutes and None)

Auto retry is not carried out if "None" is set.

Note) Generally, retrieval cannot be carried out while auto retry is being attempted. If the interval time for auto retry is too short, the retrieval cycle of other slave devices may be affected

(5) Request interval

Set the interval for communicating with slave devices while the master (general) is working. (1 second, 2 seconds, 5 seconds and 10 seconds)

"1 second" is a standard time. If the responses from the slave devices are slow or 1 second is insufficient due to a huge amount of the acquired data, the time for the interval can be extended.

This setting is used when using cyclic reading and cyclic writing.

3.6 Setting the cyclic reading (Modbus Master)

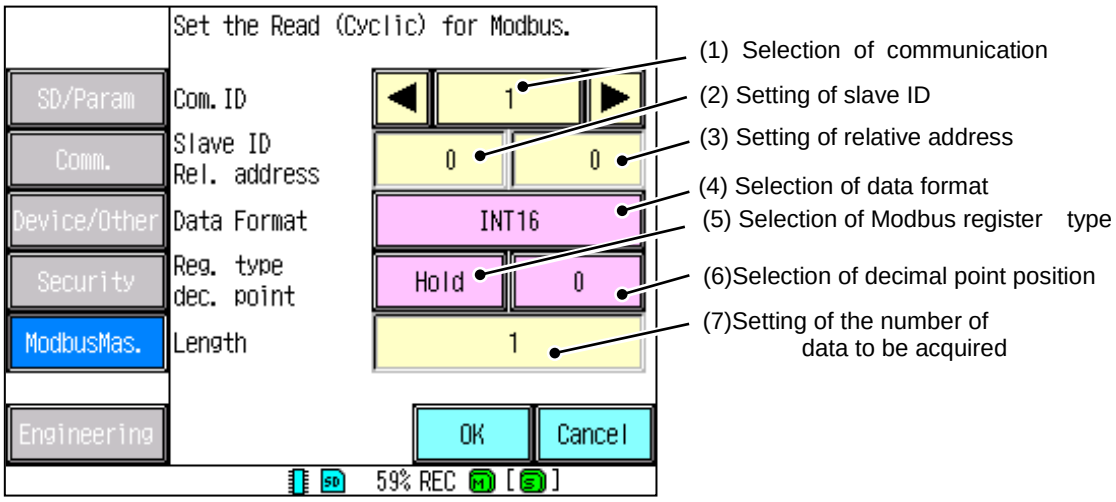
[Description]

Set this device as a Modbus RTU master to acquire data from a general-purpose slave device. It is displayed only when "Comm. Type" in Section 3.5 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Rd (Cyclic) key to open the Modbus cyclic read setting screen.



(1) Selection of communication ID

The Modbus master can acquire the data for up to 12 types of slaves. Select the ID for connection.

(2) Setting of slave ID

Set the slave ID for ModbusRTU. (0 to 247)

"0" refers to "Not connected". If the ID is 0, data acquisition is not carried out.

(3) Setting of relative address

Set the communication address of a slave device. (0 to 9999)

Acquire data from slave devices in combination of ⑤ “Modbus register type” and an address.

(4) Selection of data format

Select how the acquired data is handled.

INT16: Acquired as a signed 2-byte data (-32768 to 32767).

UINT16: Acquired as an unsigned 2-byte data (0 to 65535).

INT32 (BIG): Acquired as a signed 4-byte data (-2147483648 to 2147483647).
The data is recognized as a big endian.

INT32 (LITTLE): Acquired as a signed 4-byte data (-2147483648 to 2147483647).
The data is recognized as a little endian.

UINT32 (BIG): Acquired as an unsigned 4-byte data (0 to 4294967296).
The data is recognized as a big endian.

UINT32 (LITTLE): Acquired as an unsigned 4-byte data (0 to 4294967296).
The data is recognized as a little endian.

FLOAT(BIG): Recognized as a single precision floating point of IEEE754.
The data is recognized as a big endian.

FLOAT(LITTLE): Recognized as a single precision floating point of IEEE754.
The data is recognized as a little endian.

Note) The range which can be acquired in a data type selection is used as internal data. Note that the data which can be actually recorded is from -32000 to 32000 digits.

(5) Selection of Modbus register type

Select the Modbus register type.

Input register: The data is acquired from the input register. [Function code=04]

Hold register: The data is acquired from the hold register. [Function Code=03]

(6) Selection of decimal point position

Select the decimal point position of the data acquired.

The setting cannot be made if the data type is FLOAT.

Example) “Data: 12345 and Decimal point position: 2” is recognized internally as "123.45".

(7) Selection of the number of data

Set the number of data to be acquired from the starting address. (1 to 16)

Enabled if the data to be acquired are sequential.

If the addresses are not sequential or the register types are different even in the same slave device, acquire the data using multiple IDs.

3.7 Checking the cyclic read status

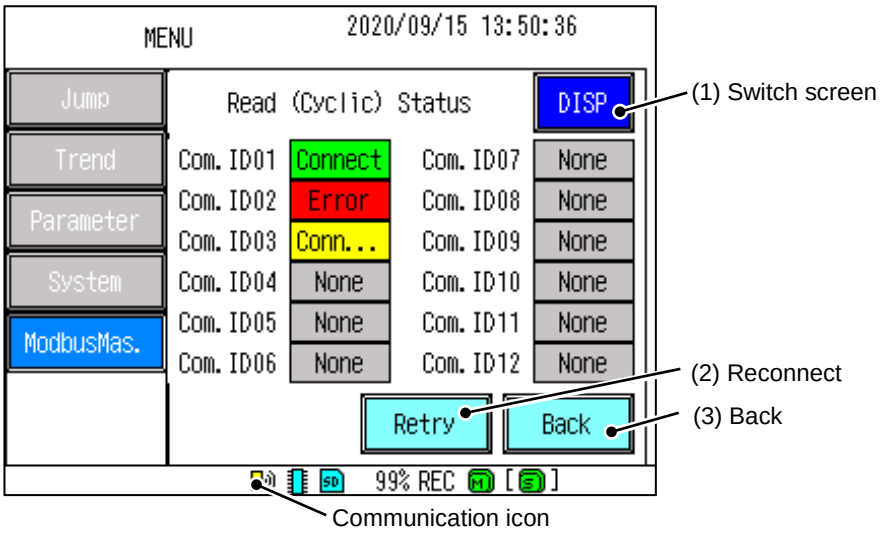
[Description]

This screen confirms the communication status of each communication ID set in the cyclic reading in Section 3.6.

Reconnection processing is possible on this screen. By checking the connection with the communication ID in which the communication error occurred and performing the reconnection process, the cyclic read communication with the purged slave device is resumed.

[Operation]

Touch the ModbusMas. key to display the cyclic read status screen.



The following information is displayed depending on the communication status of the Modbus master.

Connect: The communications with all the slave devices are normal. The icon is indicated in "green".

Conn...: The communications with the slave devices is being checked. Depending on the communication status, the status changes to "Connect:" or "Error". The icon is indicated in "yellow".

Error: Due to a communication error occurrence, communications are not established with a part or all of the slave devices. The icon is indicated in "red".

None: The communication ID is "disabled". The display will be "gray" and the icon will not be displayed.
(The slave ID in Section 3.6 is set to "0" and communication is not being performed.)

(1) Switch screen

Switch screens. Moves to the cyclic write status screen.

(2) Reconnect

If there is a slave device in the "error" state, communication retry can be performed.

(3) Back

Finish checking the communication status.

If there is a slave device with "error" status, reconnection can be attempted by touching and selecting Retry key .
(If "Auto Retry" is set, reconnection is attempted with a set interval. For details about auto retry, see section 3.6.)

When an error occurs, the details of the error is displayed with its ID in the "Ethernet log". Please check it if the error cannot be solved by the retry operation. (The Ethernet log can be checked by touching the GRPH key on the trend screen and then opening the "Event log" and touching DISP key on the displayed screen.)

【Error log to Ethernet log】

Message	Parameter	Description
Receive timeout CID:XX	XX：Communication ID No. 01～12	・This error occurs when three times consecutive times the situation where data can not be received after the time set by reception timeout after sending data from the master.
RcvErr CID:XX CRC,Data	XX：Communication ID No. 01～12	・This error occurs when the following error occurs three times consecutively on the data received from the device. 1) CRC error 2) Station numbers are different 3) Number of bytes received is less than Modbus regulation
RD err CID:XX ErrCD:YY	XX：Communication ID No. 01～12 YY：Err code (Decimal)	・This error occurs when the response from the device is an error response. ・The value obtained by ANDing 0x7F to the response code at that time is displayed in decimal.
RD err CID:XX FuncCD NG	XX：Communication ID No. 01～12	・This error occurs when the response function code is different from the specified function code.
RD err CID:XX RegNum NG	XX：Communication ID No. 01～12	・This error occurs when the number of response registers is different from the number of registers specified.
RD err CID:XX RegAdr NG	XX：Communication ID No. 01～12	・This error occurs when the number of response address is different from the number of address specified.
RcvErr CID:XX Reg:YY FLT	XX：Communication ID No. 01～12 YY：Register position	・This error occurs when the 32-bit float data acquired from the device is abnormal as a float value. ・The register position indicates which register occurred when multiple registers were specified.
Cycle TimeOver XX.XSec	XX.X：01.0 ～ 99.9 Sec	・This log is generated when the time to complete communication of all communication IDs registered three times in a row is longer than the time specified in the acquisition cycle. ・This log is generated only once until the state returns.
Cycle TimeOver Return	—	・This log is generated to show that it has recovered from the acquisition cycle over state.

3.8 Setting of calculating channels

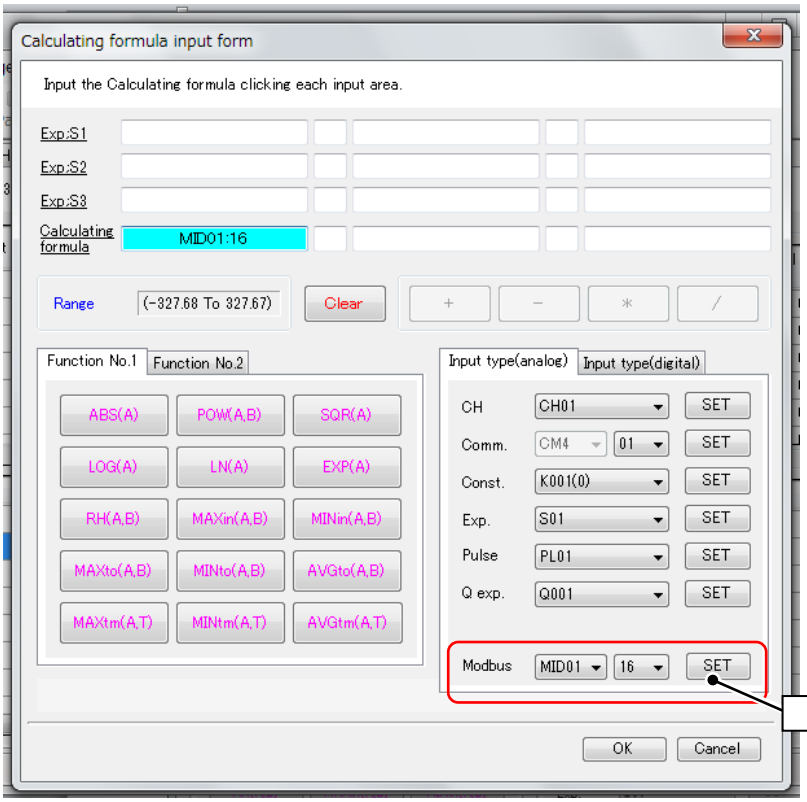
[Description]

By assigning the data acquired from slave devices to the calculating channels "CH13" to "CH48" on the master side, trend display and recording of the data can be carried out on this device.

* The setting of calculating channels can be done only from the parameter loader.
* For details about other setting items concerning the calculating channels, see the PARAMETER LOADER INSTRUCTION MANUAL (WXPVM70mnAR102E).

[Operation]

Select [Calculating formula] in the [Calc. CH] tab to open the calculating formula input form.



(1)Modbus (ID1 to 12: 01 to 16)

The communication ID set in section 3.6 is the ID for ModbusCH. For the numbers in the latter part, input the number you want to refer to from the data acquired with the ID. To acquire the 3rd data from the data acquired with the data count 8, set 3.

4. Modbus master –Write function-

4.1 Overview

This function is for sending and writing data to general-purpose devices that support Modbus RTU, such as controllers and sensors. With this device as the master, up to 24 compatible devices can be connected under it.

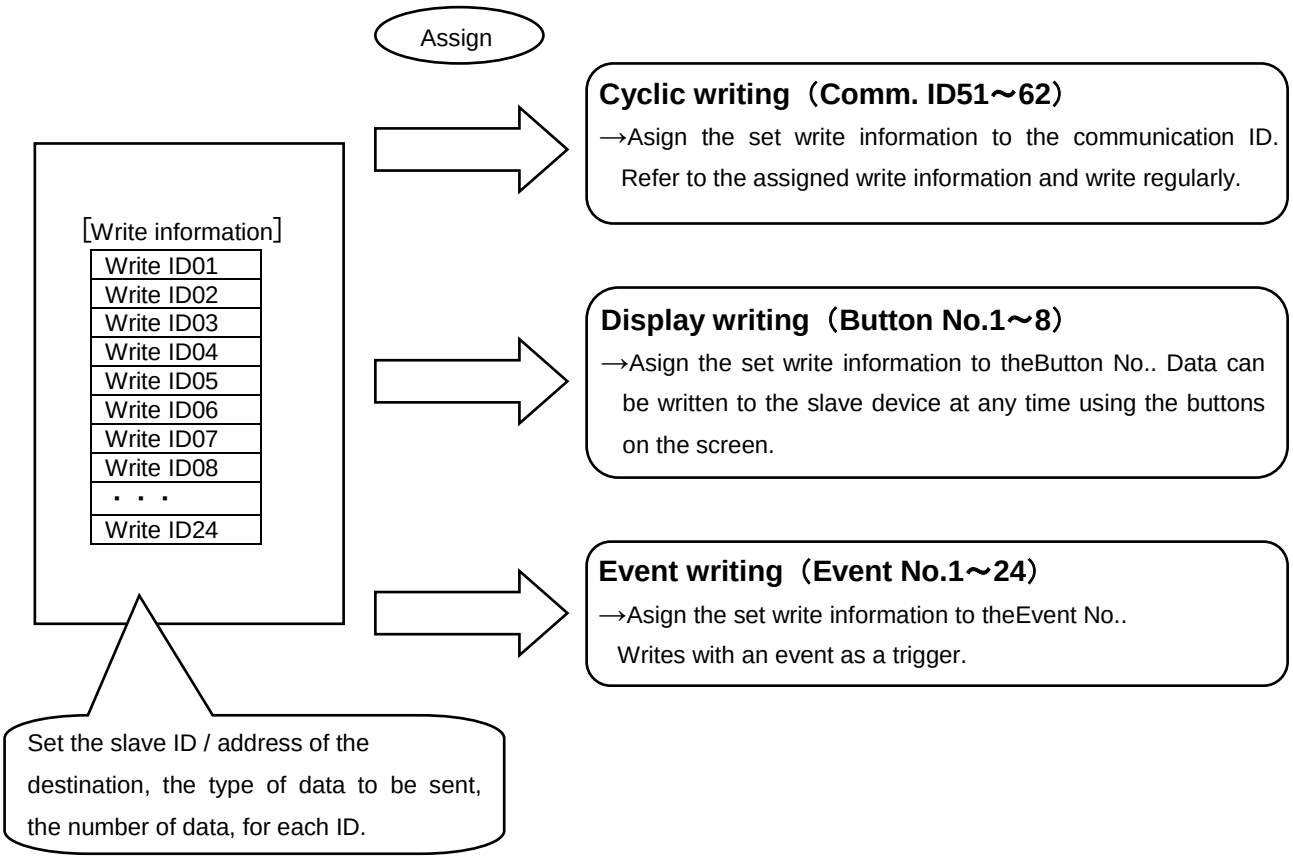
The type of data to be written and the timing to write the data are individually specified on the device side.

This device has 3 writing functions.

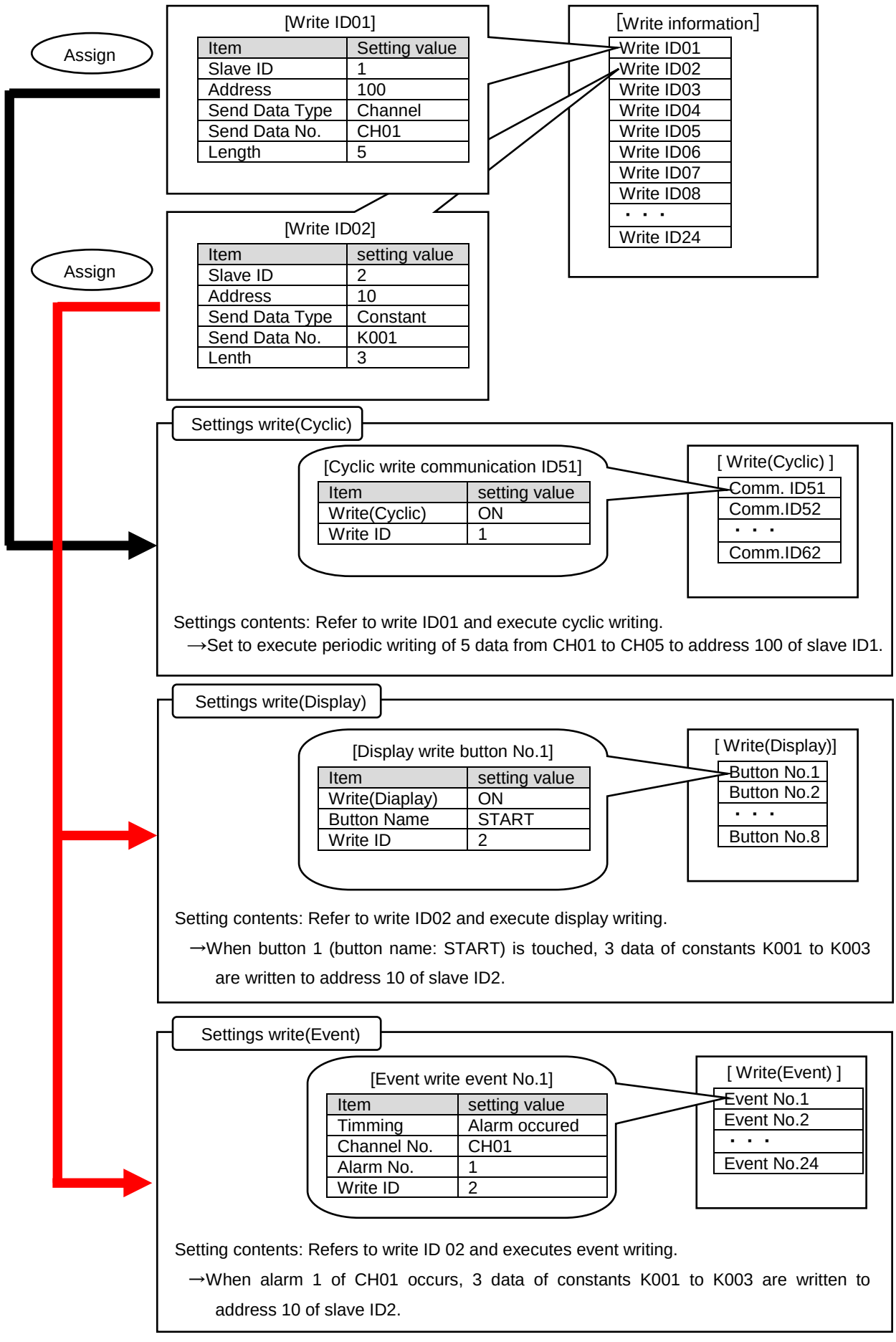
- Cyclic writing : Data is periodically written to the slave devices . (up to 12 devices).
- Display writing : Data can be written to the slave device at any time using the buttons on the screen. (Up to 8 buttons can be set)
- Event writing : Data is written to the slave device triggered by the FUNC key, alarm occurred/ cleared, and DI ON / OFF. (Up to 24 events can be set)

The setting schematic diagram of this function is shown below.

［Modbus master write function setting overview］



The outline of how to set various functions is shown on the next page.


Assign
[Write ID01]
Item
Setting value
Slave ID
1
Address
100
Send Data Type
Channel
Send Data No.
CH01
Length
5
[Write information]
Write ID01
Write ID02
Write ID03
Write ID04
Write ID05
Write ID06
Write ID07
Write ID08
・・・
Write ID24
Assign
[Write ID02]
Item
setting value
Slave ID
2
Address
10
Send Data Type
Constant
Send Data No.
K001
Lenth
3
Settings write(Cyclic)
[Cyclic write communication ID51]
Item
setting value
Write(Cyclic)
ON
Write ID
1
[Write(Cyclic)]
Comm. ID51
Comm.ID52
・・・
Comm.ID62
Settings contents: Refer to write ID01 and execute cyclic writing.
→Set to execute periodic writing of 5 data from CH01 to CH05 to address 100 of slave ID1.
Settings write(Display)
[Display write button No.1]
Item
setting value
Write(Diaplay)
ON
Button Name
START
Write ID
2
[Write(Display)]
Button No.1
Button No.2
・・・
Button No.8
Setting contents: Refer to write ID02 and execute display writing.
→When button 1 (button name: START) is touched, 3 data of constants K001 to K003 are written to address 10 of slave ID2.
Settings write(Event)
[Event write event No.1]
Item
setting value
Timming
Alarm occured
Channel No.
CH01
Alarm No.
1
Write ID
2
[Write(Event)]
Event No.1
Event No.2
・・・
Event No.24
Setting contents: Refers to write ID 02 and executes event writing.
→When alarm 1 of CH01 occurs, 3 data of constants K001 to K003 are written to address 10 of slave ID2.

4.2 Procedure for writing data to slave devices

This section describes the procedure for connecting to a slave device and performing various writes using the Modbus master function of this device. Please note that some procedures can only be performed with the parameter loader.

4.2.1 Common settings

Set the communication specifications in preparation for using the write function.

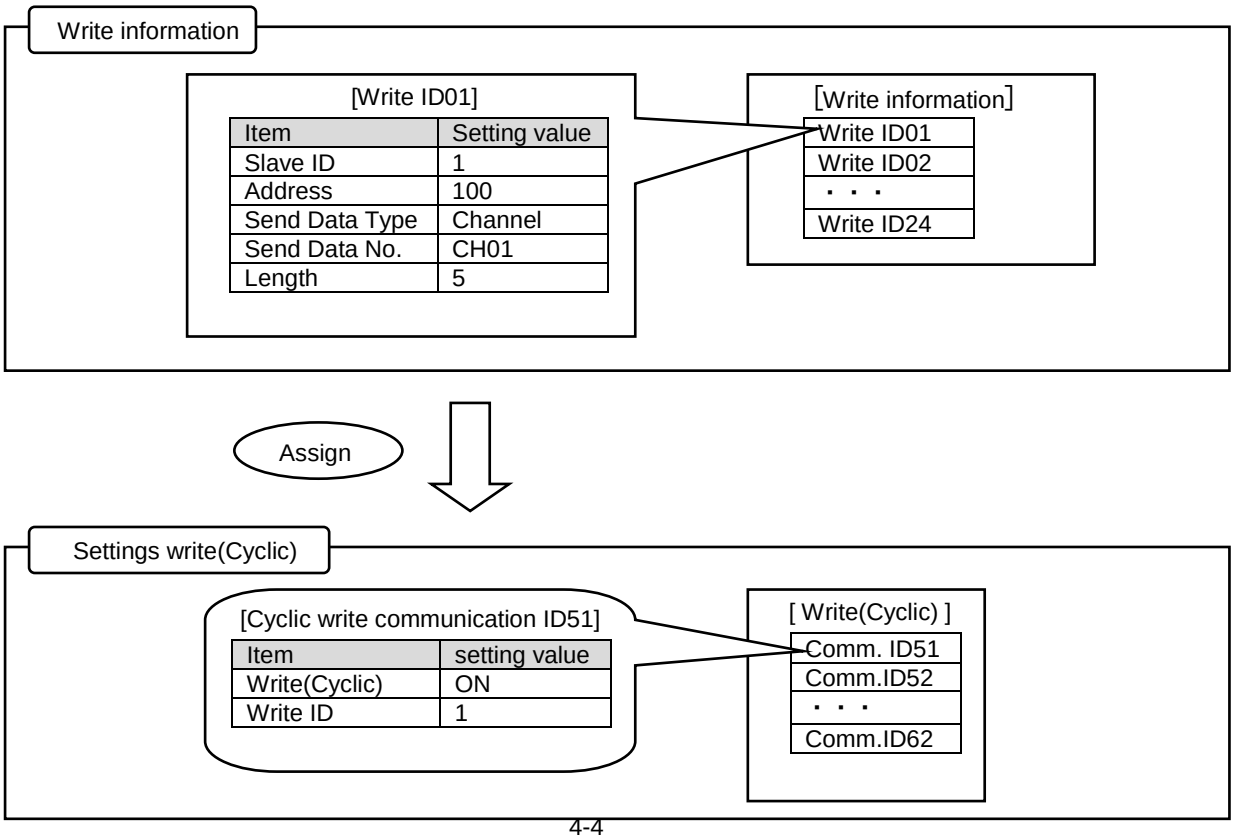
Item	Description	Slave	Main unit	Loader	Remarks
1	Check the communication specifications of the slave devices and make settings so that each device has the same setting. - Communication speed. - Parity - Stop bit	Yes	-	-	
2	Wiring Carry out wiring for the RS-485 communications following the manuals of the slave devices and the description about wiring of the main unit.				
3	Set the slave devices' IDs (station numbers). Each slave device must have a unique ID number other than 0.	Yes	-	-	
4	Check the Modbus map of the slave device and check the address of the data you want to write.	Yes	-	-	Writing is only for the hold register. Function Code is fixed at 10H. Other coils (bit data) etc. cannot be written.
5	Enable "Remote AI" on the engineering settings. Main unit: MENU button > System key > Engineering key > Remote AI key Loader: Display > Engineering((Not required after Ver.2.20))	-	Yes	Yes	See section 3.3.
6	Set the operation mode of this device to "Advanced". Main unit: MENU button > System key > Device/Other > Mode Loader: Device/Other > Operation mode	—	Yes	Yes	* With this setting, it is possible to set items 8 and 9 on the main unit.
7	Set the communication settings of this device. - Communication speed. - Parity - Stop bit Main unit: MENU button > System key> Comm. key > Modbus1 key Loader: Communication setting 2	-	Yes	Yes	See section 3.4.
8	Carry out the Modbus settings. - Modbus communication type ... "ModbusTCP+RTU" - Master/slave ... Master mode (General-purpose) - Auto retry - Acquisition interval Main unit: MENU button > System key > Comm. key > Modbus2 key Loader: Communication setting 2	-	Yes	Yes	See section 3.5. After the settings are completed, the main unit must be rebooted.

4.2.2 Settings write(Cyclic)

Set the cyclic writing.

Item	Description	Slave	Main unit	Loader	Remarks
1	Set the write cycle. ・Interval Main unit: MENU button > System key > Comm. key > Modbus2 key Loader: Communication setting 2	—	Yes	Yes	See section 3.5.
2	Set the write information. - Slave ID - Address - Send Data Type - Send Data No. - Length Main unit: MENU button > System key > ModbusMas key > Write param key Loader: Communication setting 3 > Write param	—	Yes	Yes	See section 4.3.
3	Set the constant table. (Required only when a constant is selected as the data type.) - Const table Parameter loader: Calc. CH → Const table	—	No	Yes	This can only be set in the parameter loader. See section 4.4.
4	Set cycliic writing. → Assign the write information (write ID) set in item 2. ・ ON / OFF ・ Write ID Main unit: MENU button > System key > ModbusMas key > Write(Cycle) Loader: Communication setting 3 → Write(Cycle)	—	Yes	Yes	

Setting example: Set periodic writing to send data (measured values of CH01 to CH05) from addresses 100 to 105 of slave ID1. (When assigning write ID 01 to communication ID 51)

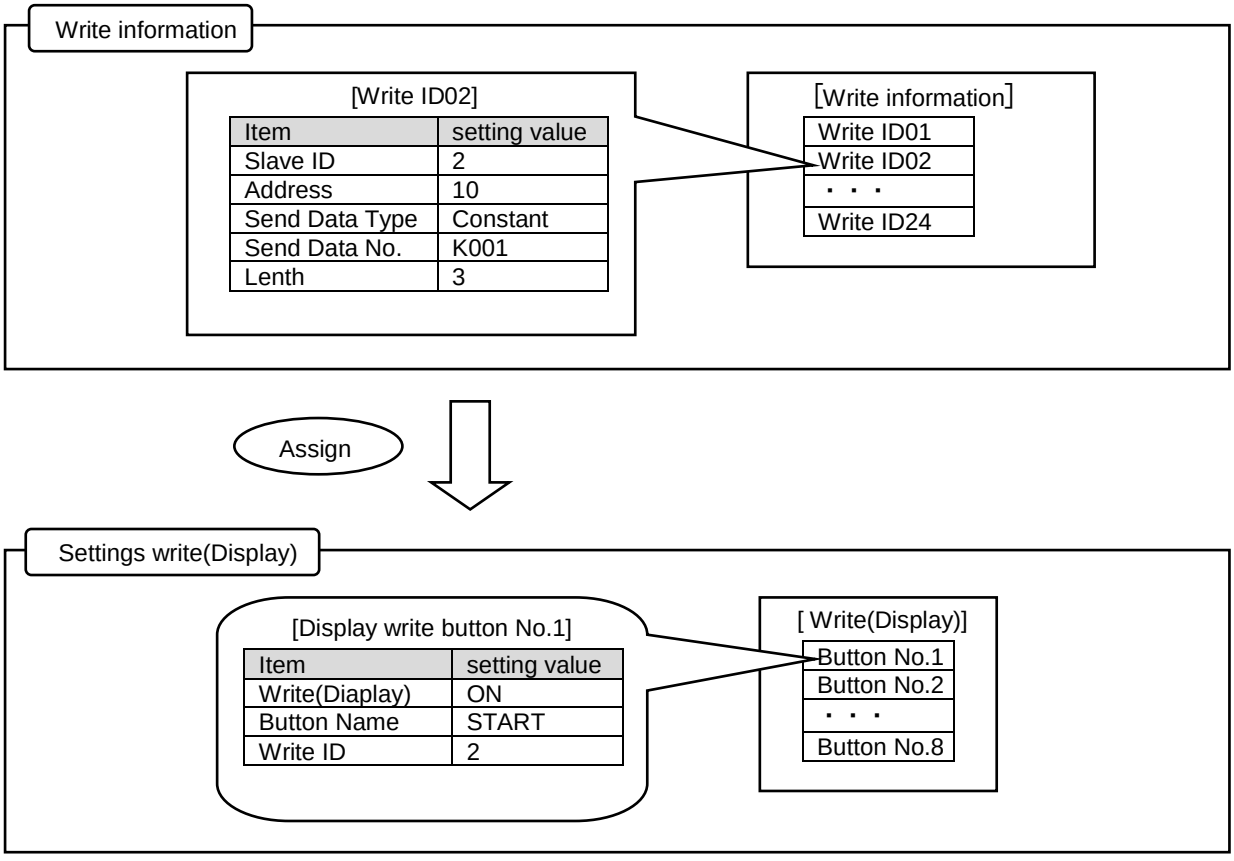


4.2.3 Settings write(Display)

Set display writing.

Item	Description	Slave	Main unit	Loader	Remarks
1	Set the write information. - Slave ID - Address - Send Data Type - Send Data No. - Length Main unit: MENU button > System key > ModbusMas key > Write param key Loader: Communication setting 3 > Write param	—	Yes	Yes	See section 4.3.
2	Set the constant table. (Required only when a constant is selected as the data type.) - Const table Parameter loader: Calc. CH → Const table	—	No	Yes	This can only be set in the parameter loader. See section 4.4.
3	Set display writing. → Assign the write information (write ID) set in item 2. - ON/ OFF - Button name - Write ID Main unit: MENU button > System key > ModbusMas key > Write(Display) Loader: Communication setting 3 → Write(Display)	—	Yes	Yes	

Setting example: Button 1 (Button name: START) Set to send 3 data (constants K001 to K003) to addresses 10 to 13 of slave ID2 when touched. (When assigning write ID 02 to button No. 1)

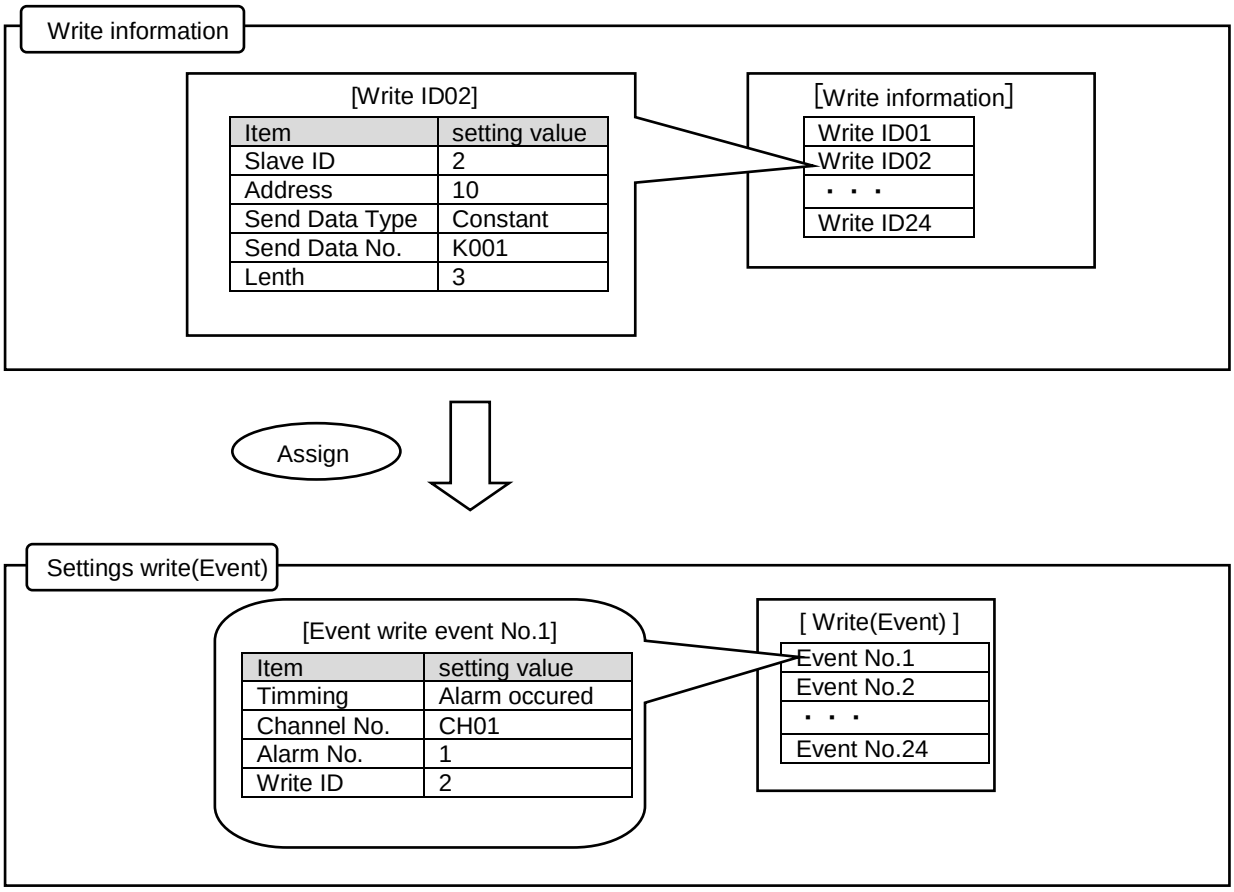


4.2.4 Settings write(Event)

Set event writing.

Item	Description	Slave	Main unit	Loader	Remarks
1	Set the write information. - Slave ID - Address - Send Data Type - Send Data No. - Length Main unit: MENU button > System key > ModbusMas key > Write param key Loader: Communication setting 3 > Write param	—	Yes	Yes	See section 4.3.
2	Set the constant table. (Required only when a constant is selected as the data type.) - Const table Parameter loader: Calc. CH → Const table	—	No	Yes	This can only be set in the parameter loader. See section 4.4.
3	Set event writing. → Assign the write information (write ID) set in item 2. - Timming - Channel No./ DI No. - AlarmNo. - Write ID Main unit: MENU button > System key > ModbusMas key > Write(Event) Loader: Communication setting 3 → Write(Event)	—	Yes	Yes	See section 4.7.

Setting example: Set to send 3 data (constants K001 to K003) to addresses 10 to 13 of slave ID 2 when alarm 1 of CH01 occured. (When assigning write ID 02 to event No. 1)



4.3 Setting the Write Parameter (Modbus Master)

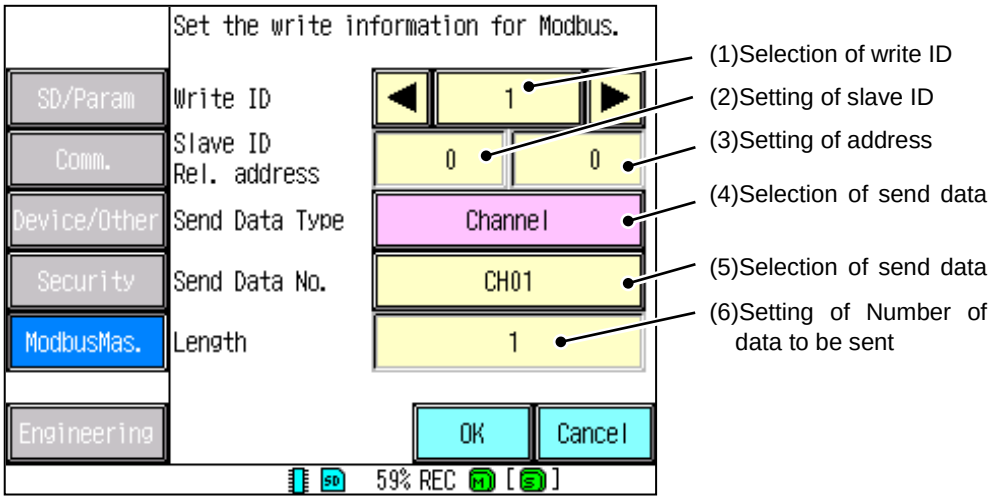
[Description]

Using this device as a Modbus RTU master, make basic settings for setting data in a general-purpose slave connection device. It is displayed only when "Comm. Type" in Section 3.5 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Write Param key to open the Modbus write information setting screen.



(1)Selection of write ID

It is possible to write data to up to 24 slave devices. Select the ID to be set. (1 - 24)

(2)Setting of slave ID

Sets the Modbus RTU slave ID. (0-247)

If it is 0, it is recognized as unconnected and no data writing operation is performed.

(3)Setting of address

Set the communication address of the slave device. (0-9999)

* The function code is fixed at "0x10".

(4)Selection of send data type

Select the type of data to be sent from "Channel" and "Constant".

Set together with the transmission data No. setting in (5).

Channel: The measured value of the selected channel No. is used as the send data.

Constant: The value in the constant table is used as the send data.

("Constant table" can be set from the attached PC software "Parameter Loader".)

(5)Selection of send data No.

The contents change depending on the setting of (4).

Channel: Select any channel number. (CH01-CH48)

Constants: Select any constant number. (K001-K100)

(6)Setting of Number of data to be sent

Set the number of data to be sent to the slave device.

Setting example 1）

Data send destination (device) : Slave device with slave ID 5

Data send destination (register) : Holding register

Data send destination (address) : 101-103

Send content : Measurement data of CH1 to 3 of this device

Setting items	Setting
Write ID	1(Any)
Slave ID	5
Address	101
Send data type	Channel
Send data No.	1
Length	3

Setting example 2）

Data send destination (device) : Slave device with slave ID 3

Data send destination (register) : Holding register

Data send destination (address) : 51-65

Send content : Constant K005-K015

Setting items	Setting
Write ID	2(Any)
Slave ID	3
Address	51
Send data type	Constant
Send data No.	5
Length	10

4.4 Setting the constant value

[Description]

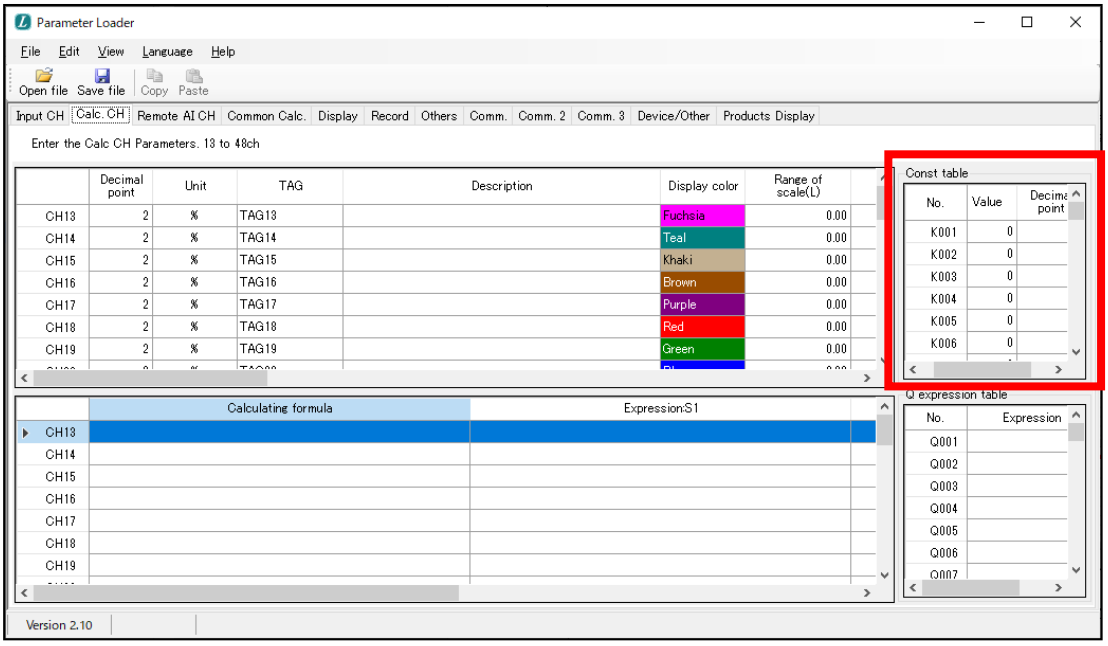
Set the constants used to set the write information in Section 4.3.

［注意］

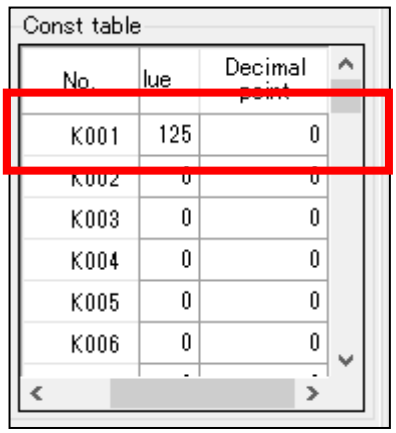
This setting can be set only with the attached PC software "Parameter Loader". It cannot be set on the main unit.

[Operation]

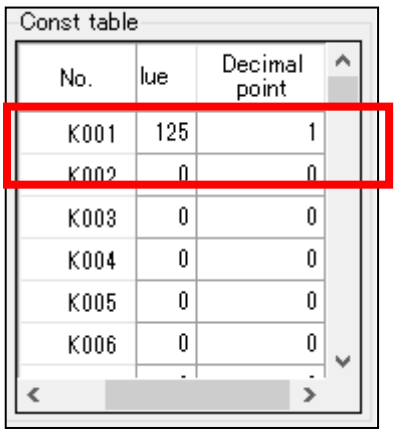
Set any value and decimal point position in [Constant Table] on the [Calc. CH] tab.



Setting example 1) Set "125" to the constant K001.



Setting example 2) Set "12.5" to the constant K001.



* In Modbus master writing, the decimal point value is not used. The "Value" of the constant table is used as it is.

4.5 Setting the cyclic writing

[Description]

Set the cyclic writing.

Use the writing information set in Section 4.3 as the information to be written.

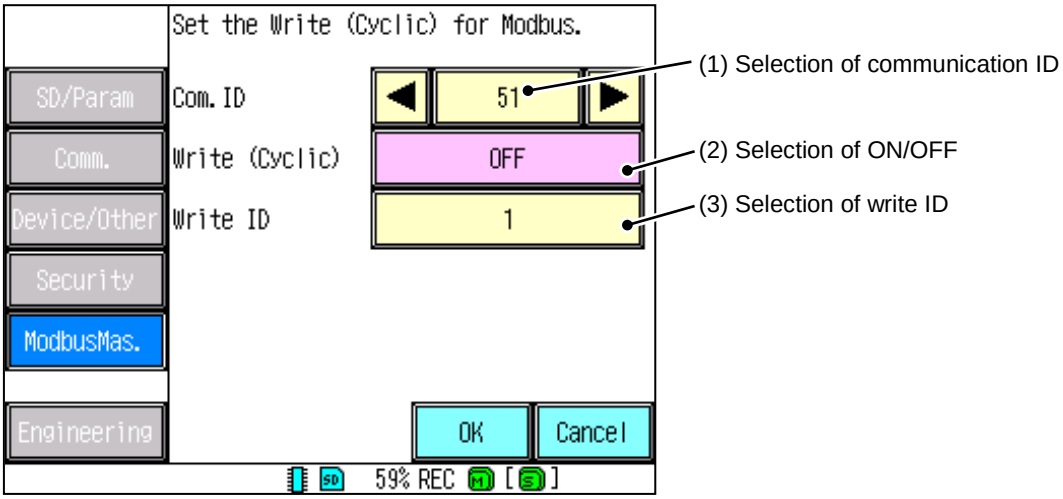
Refer to the write ID set in the write information in Section 4.3, and make the settings for cyclic data writing. It is displayed only when "Comm. Type" in Section 3.5 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

Cyclic writing is performed at the cycle set in "Req. interval" in Section 3.5. For the communication status of cyclic writing, refer to Section 4.7.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Cyclic) key to open the Modbus write cyclic setting screen.



(1) Selection of communication ID

Select the communication ID to be set. (51-62)

It is possible to periodically set data to up to 12 different slaves with communication IDs 51 to 62.

(2) Selection of ON/OFF

Set ON / OFF for the cyclic write operation of each communication ID.

(3) Selection of write ID

Select the write ID set in Section 4.3. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

4.6 Setting the display writing

[Description]

Set the display writing. Touching a button on the display executes the write operation.

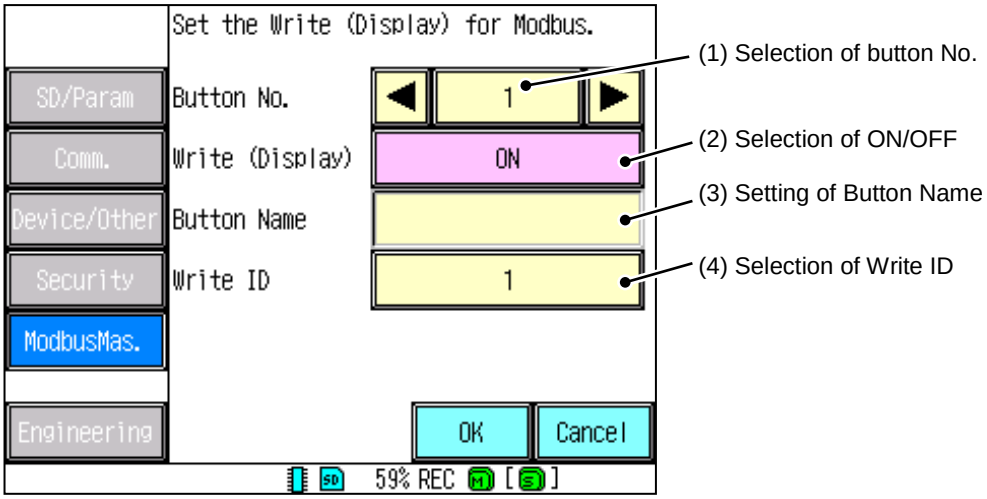
Use the writing information set in Section 4.3 as the information to be written.

It is displayed only when "Comm. Type" in Section 3.5 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)". The set button is displayed as described in Section 4.9 "Execute display writing", and the set writing is executed by touching the button.

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Display) key to open the Modbus write display setting screen.



(1) Selection of Button No.

Select the button No. to set. (1-8)

It is possible to set up to 8 buttons.

(2) Selection of ON/OFF

Set ON / OFF of each write button.

(3) Setting of Button Name

Set the name of the button displayed in Section 4.9.（Up to 8 characters can be registered.）

(4) Selection of write ID

Select the write ID set in Section 4.3. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

4.7 Setting the event writing

[Description]

Set the event writing.

Use the writing information set in Section 4.3 as the information to be written.

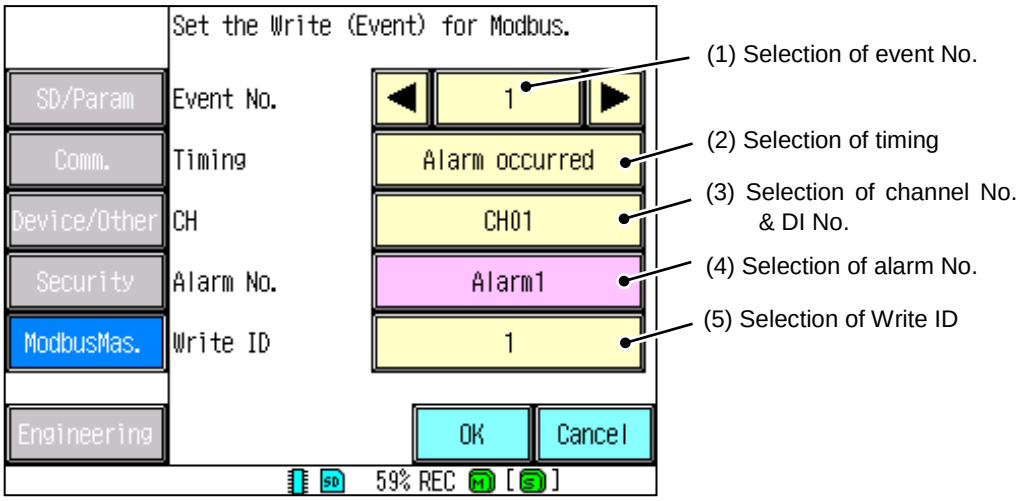
It is displayed only when "Comm. Type" in Section 3.5 is set to "Modbus TCP + RTU" and "Master / Slave" is set to "Master (General)".

When the event writing is successful, it is recorded in the communication log as "Write success Event No.1".

Note) No settings can be changed during the recording process.

[Operation]

On the system setting screen, select ModbusMas key ⇒ Wrt (Event) key to open the Modbus write event setting screen.



(1) Selection of event No.

Select the event No. to set. (1-24)

It is possible to set for up to 24 events.

(2) Selection of timing

Select when the event should occur.

OFF	: Event writing is not performed.
FUNC key	: Writes an event triggered by the FUNC key. (* When set to FUNC key, set the function setting of FUNC key in Section 8.17 to "Msg. & Event writing".)
Alarm occurred	: Writing is performed at the timing when the alarm of the set channel number and alarm number occurs.
Alarm cleared	: Writing is performed at the timing when the alarm of the set channel number and alarm number cleared.
DI ON	: Writing is performed when the set DI No. turns from OFF to ON.
DI OFF	: Writing is performed when the set DI No. turns from ON to OFF.

(3) Selection of channel No. & DI No.

Select the channel No. or DI No. (CH01-48) (DI1-9)

It is displayed only when the timing setting is "alarm occurred", "alarm cleared", "DI ON", "DI OFF".

(4) Selection of alarm No.

Select the alarm No. (1-4)

It is displayed only when the timing setting is "alarm occurred", "alarm cleared"

(5) Selection of Write ID

Select the write ID set in Section 4.3. (1-24)

Refer to the set write ID and decide the destination and the content of the send data.

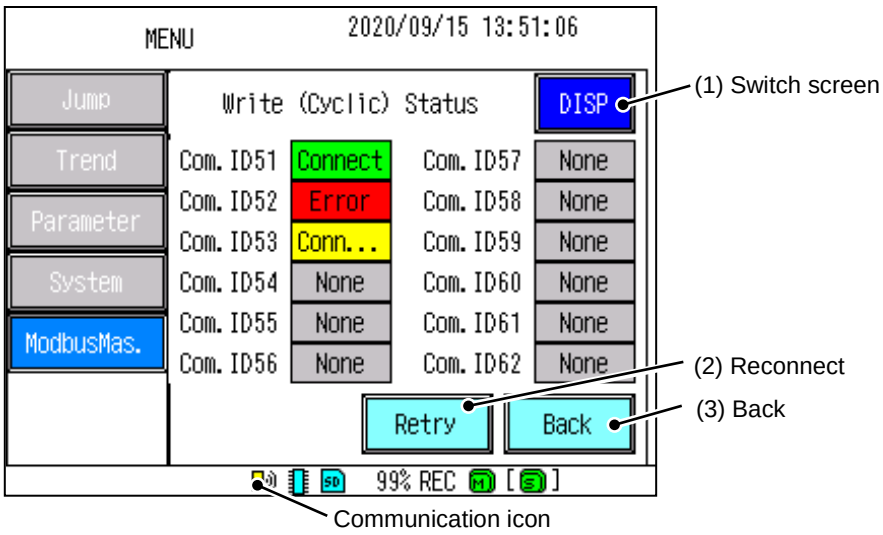
4.8 Checking the cyclic write status

[Description]

This is the screen to check the communication status of each communication ID set in "Write Param" in Section 4.3 and "Wrt(Cyclic)" in Section 4.5. Reconnection processing is possible on this screen. By checking the connection with the communication ID in which the communication error occurred and performing the reconnection process, the cyclic write communication with the purged slave device is resumed.

[Operation]

select ModbusMas key ⇒ DISP key to open the cyclic write status screen.



The following information is displayed depending on the communication status of the Modbus master.

Connect: The communications with all the slave devices are normal. The icon is indicated in "green".

Conn...: The communications with the slave devices is being checked. Depending on the communication status, the status changes to "Connect:" or "Error". The icon is indicated in "yellow".

Error: Due to a communication error occurrence, communications are not established with a part or all of the slave devices. The icon is indicated in "red".

None: The target communication ID for the cyclic writing in Section 4.5 is set to "OFF". The display will be "gray" and the icon will not be displayed.

(1) Switch screen

Switch screens. Move to display write execution.

(2) Reconnect

If there is a slave device in the "error" state, communication retry can be performed.

(3) Back

Finish checking the communication status.

If there is a slave device with "error" status, reconnection can be attempted by touching and selecting Retry key .
(If "Auto Retry" is set, reconnection is attempted with a set interval. For details about auto retry, see section 3.6.)

When an error occurs, the details of the error is displayed with its ID in the "Ethernet log". Please check it if the error cannot be solved by the retry operation. (The Ethernet log can be checked by touching the GRPH key on the trend screen and then opening the "Event log" and touching DISP key on the displayed screen.)

【Error log to Ethernet log】

Message	Parameter	Description
Receive timeout WID:XX	XX：Write ID No.01～24	・This error occurs when three times consecutive times the situation where data can not be received after the time set by reception timeout after sending data from the master.
RcvErr WID:XX CRC,Data	XX：Write ID No.01～24	・This error occurs when the following error occurs three times consecutively on the data received from the device. 1) CRC error 2) Station numbers are different 3) Number of bytes received is less than Modbus regulation
WRT err WID:XX ErrCD:YY	XX：Write ID No. 01～24 YY：Err code (Decimal)	・This error occurs when the response from the device is an error response. ・The value obtained by ANDing 0x7F to the response code at that time is displayed in decimal.
WRT err WID:XX FuncCD NG	XX：Write ID No.01～24	・This error occurs when the response function code is different from the specified function code.
WRT err WID:XX RegNum NG	XX：Write ID No.01～24	・This error occurs when the number of response registers is different from the number of registers specified.
WRT err WID:XX RegAdr NG	XX：Write ID No.01～24	・This error occurs when the number of response address is different from the number of address specified.

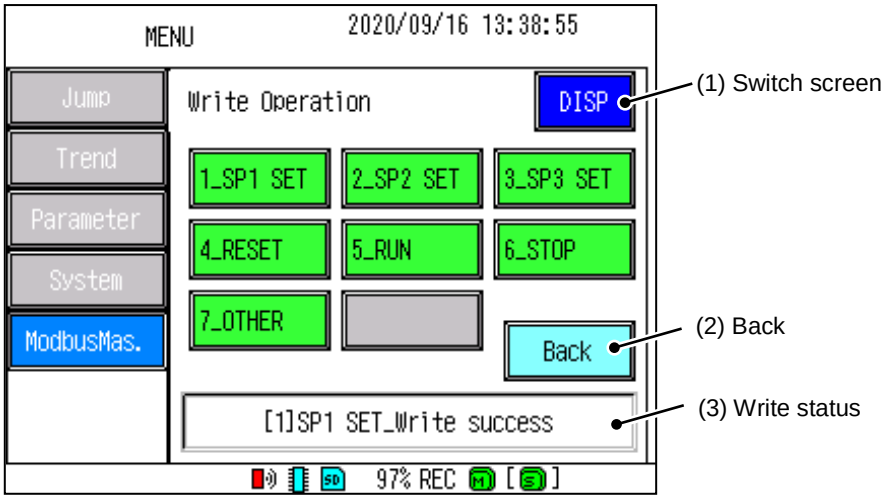
4.9 Execute display writing

[Description]

This screen is for sending data to each slave device using the buttons set in "Write Param" in Section 4.3 and "Wrt (Display)" in Section 4.6.

[Operation]

select ModbusMas key ⇒ DISP key to open the write execution screen.



On this screen, the button with the button name set in "Wrt (Display) " in Section 4.6 is displayed. (Up to 8 buttons)

By touching each button, the data of the write ID assigned to each button will be sent.

The disabled buttons will be grayed out.

(1) Switch screen

Switch screens. Move to cyclic read screen.

(2) Back

Finish checking the communication status.

(3) Write status

Displays the write status during or after communication is being executed.

[X]YYYYYYYY_Write success : This display indicates that the writing process to the slave device was successful.

[X]YYYYYYYY_ Writing… : This display indicates that writing to the slave device is in progress.

[X]YYYYYYYY_ Write timeout : This display indicates that the writing process to the slave device has failed.

（X: Button No.　　YYYYYYYY: Button Name）