TM Series

Communication Manual MWA-TMC1-V2.1-EN

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This user manual contains information about the product and its proper use,
and should be kept in a place where it will be easy to access.

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Contents

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Manual Guide

- Please familiarize yourself with the information in this manual before using the product.
- This manual provides detailed information on the product's features. It does not offer any guarantee concerning matters beyond the scope of this manual.
- This manual may not be edited or reproduced in either part or whole without permission.
- This manual is not provided as part of the product package. Please visit our website (www.autonics.com) to download a copy.
- The manual's content may vary depending on changes to the product's software and other unforeseen developments within Autonics, and is subject to change without prior notice. Upgrade notice is provided through our homepage.
- We contrived to describe this manual more easily and correctly. However, if there are any corrections or questions, please notify us these on our website.

Manual Symbols

Failure to follow instructions can result in serious injury or death.

Failure to follow instructions can lead to a minor injury or product damage.

Supplementary information for a particular feature.

An example of the concerned feature's use.

Important information of the concerned feature's use.

1. Modbus RTU Protocol

Modbus is an industrial protocol developed in 1979 for serial communication between devices. Its functionality has gradually expanded to allow implementation in TCP/IP and UDP environments, and it is now widely used for simple, stable, and efficient communication in various network environments. This protocol has become the standard communication method in industrial automation systems, SCADA (Supervisory Control and Data Acquisition systems), and other industrial networks.

Modbus RTU transmits data in a continuous binary format, making it more efficient and faster than ASCII transmission. The frame structure does not clearly distinguish the start and end, but defines the start and end by leaving a silent interval (3.5 character times) between frames.

For more detailed information about Modbus protocol, refer to the documentation provided by the developer.

1.1. Function Code Frame Structure

1.1.1. 01 (0x01) Read Coil Status

Reads the ON/OFF status of output (0X reference, coil) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x01 (Read Coil Status)
Starting address	2-byte	Starting address of the coil to be read
Quantity of coils	2-byte	Number of coils
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of coils		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x01 (Read Coil Status)
Byte count	1-byte	Number of bytes in the returned data
Coil status	**N**-byte	The status of the requested coils is represented. Each coil's status is represented by 1 bit, and 8 coil statuses are grouped into 1 byte. • N = number of coils / 8 • If the remainder is not zero when divided by 8: N = N + 1
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Coil status	CRC check	
1-byte	1-byte	1-byte	**N** × byte	Low	High
				1-byte	1-byte
CRC-16					

1.1.2. 02 (0x02) Read Input Status

Reads the ON/OFF status of input (1X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x02 (Read Input Status)
Starting address	2-byte	Starting address of the input to be read
Quantity of inputs	2-byte	Number of inputs
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of inputs		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x02 (Read Input Status)
Byte count	1-byte	Number of bytes in the returned data
Input status	**N**-byte	The status of the requested inputs is represented. Each input's status is represented by 1 bit, and 8 input statuses are grouped into 1 byte. • N = number of inputs / 8 • If the remainder is not zero when divided by 8: N = N + 1
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Input status	CRC check	
1-byte	1-byte	1-byte	**N** × byte	Low	High
				1-byte	1-byte
CRC-16					

1.1.3. 03 (0x03) Read Holding Registers

Reads the binary data of holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x03 (Read Holding Registers)
Starting address	2-byte	Starting address of the first register to be read
Quantity of registers	2-byte	Number of registers
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x03 (Read Holding Registers)
Byte count	1-byte	Number of bytes in the returned data (Number of registers read × 2-byte)
Register value	**N** × 2-byte	The values of the requested registers are represented. Each register is represented by 2 bytes. • N is determined by the number of requested registers.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Register value		CRC check	
1-byte	1-byte	1-byte	High	Low	Low	High
			1-byte	**1-byte**	1-byte	1-byte
CRC-16						

1.1.4. 04 (0x04) Read Input Registers

Reads the binary data of input registers (3X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x04 (Read Input Registers)
Starting address	2-byte	Starting address of the first input register to be read
Quantity of input registers	2-byte	Number of input registers
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Starting address		Quantity of input registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x04 (Read Input Registers)
Byte count	1-byte	Number of bytes in the returned data (Number of registers read × 2-byte)
Register value	**N** × 2-byte	The values of the requested input registers are represented. Each register is represented by 2 bytes. • N is determined by the number of requested registers.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Byte count	Register value		CRC check	
1-byte	1-byte	1-byte	High	Low	Low	High
			1-byte	**1-byte**	1-byte	1-byte
CRC-16						

1.1.5. 05 (0x05) Force Single Coil

Forces a single coil (0X reference) to either ON (0xFF00) or OFF (0x0000) status in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x05 (Force Single Coil)
Coil address	2-byte	Address of the coil to be forced
Force data	2-byte	Sets or resets the coil. (0xFF00 = ON, 0x0000 = OFF)
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Coil address		Force data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x05 (Force Single Coil)
Coil address	2-byte	Address of the coil that was forced
Force data	2-byte	The status of the coil is represented. (0xFF00 = ON, 0x0000 = OFF)
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Coil address		Force data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

1.1.6. 06 (0x06) Preset Single Register

Writes the binary data to a single holding register (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x06 (Preset Single Register)
Register address	2-byte	Address of the register to be preset
Preset data	2-byte	Value to be preset
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave address	Function code	Register address		Preset data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x06 (Preset Single Register)
Register address	2-byte	Address of the register that was preset
Preset data	2-byte	Value preset to the register
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Register address		Preset data		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

1.1.7. 16 (0x10) Preset Multiple Registers

Writes the binary data continuously to multiple holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x10 (Preset Multiple Registers)
Starting address	2-byte	Starting address of the first register to be preset
Quantity of registers	2-byte	Number of registers to be preset
Byte count	1-byte	Number of bytes for the register values to be preset (Number of registers to be preset × 2-byte)
Register values	**N** × 2-byte	The values of the registers to be preset are represented. • N is determined by the number of registers to be preset.
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a request frame

Slave addr.	Func. code	Starting addr.		Quantity of registers		Byte count	Register values		CRC check	
1-byte	1-byte	High	Low	High	Low	1-byte	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte		**1-byte**	**1-byte**	1-byte	1-byte
CRC-16										

Response frame (slave)

Frame element	Data size	Description
Slave address	1-byte	Address of the slave device
Function code	1-byte	0x10 (Preset Multiple Registers)
Starting address	2-byte	Starting address of the first register that was preset
Quantity of registers	2-byte	Number of registers that were preset
CRC check	2-byte	Adds a CRC-16 checksum at the end of the frame to verify data integrity.

Example of a response frame

Slave address	Function code	Starting address		Quantity of registers		CRC check	
1-byte	1-byte	High	Low	High	Low	Low	High
		1-byte	1-byte	1-byte	1-byte	1-byte	1-byte
CRC-16							

Except when downloading parameters with predefined minimum, maximum, or default values based on the input specifications in the PC loader program, it is recommended to use Preset Single Register rather than Preset Multiple Registers when connecting to external devices such as PLCs or graphic panels.

1.2. Exception Handling

In case of a communication error, the slave device sets the highest bit of the received function code to 1 in its response. It then sends only the exception code, without including any data related to the original request.

Exception response frame

Slave address	Function code + 0x80	Exception code	CRC check
1-byte	1-byte	1-byte	2-byte
CRC-16			

Exception codes

Exception code	Code name	Description
01	ILLEGAL FUNCTION	If the command is not supported.
02	ILLEGAL DATA ADDRESS	If the requested data address is invalid. (e.g. The data address does not exist or the address range is incorrect.)
03	ILLEGAL DATA VALUE	If the requested data value is invalid. (e.g. The data value is out of the allowable range.)
04	SLAVE DEVICE FAILURE	If the parameter is locked, communication write is prohibited, or the command cannot be processed correctly.
06	SLAVE DEVICE BUSY	If the device is in a state where it cannot execute the requested command.

2. Modbus ASCII Protocol

Modbus is an industrial protocol developed in 1979 for serial communication between devices. Its functionality has gradually expanded to allow implementation in TCP/IP and UDP environments, and it is now widely used for simple, stable, and efficient communication in various network environments. This protocol has become the standard communication method in industrial automation systems, SCADA (Supervisory Control and Data Acquisition systems), and other industrial networks.

Modbus ASCII converts each byte into ASCII code for transmission, which improves data readability but reduces transmission efficiency and speed. The frame structure uses a start character (':') and an end character (CRLF) to clearly distinguish each frame.

For more detailed information about Modbus protocol, refer to the documentation provided by the developer.

2.1. Function Code Frame Structure

2.1.1. 01 (0x01) Read Coil Status

Reads the ON/OFF status of output (0X reference, coil) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x01 (Read Coil Status)
Starting address	4-char	Starting address of the coil to be read
Quantity of coils	4-char	Number of coils
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Starting address	Quantity of coils	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x01 (Read Coil Status)
Byte count	2-char	Number of bytes in the returned data
Coil status	**N**-char	The status of the requested coils is represented. Each coil's status is represented by 1 bit, and 8 coil statuses are grouped into 1 byte. • Final data size (ASCII characters): N × 2 • N = number of coils / 8 • If the remainder is not zero when divided by 8: N = N + 1
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Byte count	Coil status	LRC check	End
1-char	2-char	2-char	2-char	**N**-char	2-char	2-char
:	LRC					CRLF

2.1.2. 02 (0x02) Read Input Status

Reads the ON/OFF status of input (1X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x02 (Read Input Status)
Starting address	4-char	Starting address of the input to be read
Quantity of inputs	4-char	Number of inputs
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Starting address	Quantity of inputs	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x02 (Read Input Status)
Byte count	2-char	Number of bytes in the returned data
Input status	**N**-char	The status of the requested inputs is represented. Each input's status is represented by 1 bit, and 8 input statuses are grouped into 1 byte. • Final data size (ASCII characters): N × 2 • N = number of inputs / 8 • If the remainder is not zero when divided by 8: N = N + 1
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Byte count	Input status	LRC check	End
1-char	2-char	2-char	2-char	**N**-char	2-char	2-char
:	LRC					CRLF

2.1.3. 03 (0x03) Read Holding Registers

Reads the binary data of holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x03 (Read Holding Registers)
Starting address	4-char	Starting address of the first register to be read
Quantity of registers	4-char	Number of registers
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Starting address	Quantity of registers	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x03 (Read Holding Registers)
Byte count	2-char	Number of bytes in the returned data (Number of registers read × 2-byte)
Register values	**N**-char	The values of the requested registers are represented. Each register is converted into 4 ASCII characters before transmission. • N = (The value of byte count) × 2
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Byte count	Register values	LRC check	End
1-char	2-char	2-char	2-char	**N**-char	2-char	2-char
:	LRC					CRLF

2.1.4. 04 (0x04) Read Input Registers

Reads the binary data of input registers (3X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x04 (Read Input Registers)
Starting address	4-char	Starting address of the first input register to be read
Quantity of registers	4-char	Number of input registers
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Starting address	Quantity of registers	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x04 (Read Input Registers)
Byte count	2-char	Number of bytes in the returned data (Number of registers read × 2-byte)
Register values	**N**-char	The values of the requested registers are represented. Each register is converted into 4 ASCII characters before transmission. • N = (The value of byte count) × 2
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Byte count	Register values	LRC check	End
1-char	2-char	2-char	2-char	**N**-char	2-char	2-char
:	LRC					CRLF

2.1.5. 05 (0x05) Force Single Coil

Forces a single coil (0X reference) to either ON (0xFF00) or OFF (0x0000) status in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x05 (Force Single Coil)
Coil address	4-char	Address of the coil to be forced
Force data	4-char	Sets or resets the coil. (0xFF00 = ON, 0x0000 = OFF)
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Coil address	Force data	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x05 (Force Single Coil)
Coil address	4-char	Address of the coil that was forced
Force data	4-char	The status of the coil is represented. (0xFF00 = ON, 0x0000 = OFF)
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Coil address	Force data	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

2.1.6. 06 (0x06) Preset Single Register

Writes the binary data to a single holding register (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x06 (Preset Single Register)
Register address	4-char	Address of the register to be preset
Preset data	4-char	Value to be preset
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Register address	Preset data	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x06 (Preset Single Register)
Register address	4-char	Address of the register that was preset
Preset data	4-char	Value preset to the register
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Register address	Preset data	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

2.1.7. 16 (0x10) Preset Multiple Registers

Writes the binary data continuously to multiple holding registers (4X reference) in the slave device.

Request frame (master)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x10 (Preset Multiple Registers)
Starting address	4-char	Starting address of the first register to be preset
Quantity of registers	4-char	Number of registers to be preset
Byte count	2-char	Number of bytes for the register values to be preset (Number of registers to be preset × 2-byte)
Register values	**N**-char	The values of the requested registers are represented. Each register is converted into 4 ASCII characters before transmission. • N = (The value of byte count) × 2
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a request frame

Start	Slave address	Function code	Starting address	Quantity of registers	Byte count	Register values	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	**N**-char	2-char	2-char
:	LRC							CRLF

Response frame (slave)

Frame element	Data size	Description
Start	1-char	: (Colon, 0x3A)
Slave address	2-char	Address of the slave device
Function code	2-char	0x10 (Preset Multiple Registers)
Starting address	4-char	Starting address of the first register that was preset
Quantity of registers	4-char	Number of registers that were preset
LRC check	2-char	Adds an LRC checksum at the end of the frame to verify data integrity.
End	2-char	CR + LF (0x0D + 0x0A)

Example of a response frame

Start	Slave address	Function code	Starting address	Quantity of registers	LRC check	End
1-char	2-char	2-char	4-char	4-char	2-char	2-char
:	LRC					CRLF

Except when downloading parameters with predefined minimum, maximum, or default values based on the input specifications in the PC loader program, it is recommended to use Preset Single Register rather than Preset Multiple Registers when connecting to external devices such as PLCs or graphic panels.

2.2. Exception Handling

In case of a communication error, the slave device sets the highest bit of the received function code to 1 in its response. It then sends only the exception code, without including any data related to the original request.

Exception response frame

Start	Slave address	Function code + 0x80	Exception code	LRC check	End
1-char	2-char	2-char	2-char	2-char	2-char
:	LRC				CRLF

Exception codes

Exception code	Code name	Description
01	ILLEGAL FUNCTION	If the command is not supported.
02	ILLEGAL DATA ADDRESS	If the requested data address is invalid. (e.g. The data address does not exist or the address range is incorrect.)
03	ILLEGAL DATA VALUE	If the requested data value is invalid. (e.g. The data value is out of the allowable range.)
04	SLAVE DEVICE FAILURE	If the parameter is locked, communication write is prohibited, or the command cannot be processed correctly.
06	SLAVE DEVICE BUSY	If the device is in a state where it cannot execute the requested command.

3. Modbus Mapping Table

Parameter Addresses of TM2 series and those of TM4 series are different.

3.1. Read Coils (Func: 01) / Write Single Coil (Func: 05)

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
000001 (0000)	000001 (0000)	CH1 RUN / STOP	CH1 control output RUN / STOP 0: RUN, 1: STOP	0
000002 (0001)	000002 (0001)	CH1 Auto-Tuning Execute	CH1 Auto-Tuning ON / OFF 0: OFF, 1: ON	0
000003 (0002)	000003 (0002)	CH2 RUN / STOP	CH2 control output RUN / STOP 0: RUN, 1: STOP	0
000004 (0003)	000004 (0003)	CH2 Auto-Tuning Execute	CH2 Auto-Tuning ON / OFF 0: OFF, 1: ON	0
-	000005 (0004)	CH3 RUN / STOP	CH3 control output RUN / STOP 0: RUN, 1: STOP	0
-	000006 (0005)	CH3 Auto-Tuning Execute	CH3 Auto-Tuning ON / OFF 0: OFF, 1: ON	0
-	000007 (0006)	CH4 RUN / STOP	CH4 control output RUN / STOP 0: RUN, 1: STOP	0
-	000008 (0007)	CH4 Auto-Tuning Execute	CH4 Auto-Tuning ON / OFF 0: OFF, 1: ON	0
000009 (0008) to 000100 (0063)	000009 (0008) to 000050 (0031)	Reserved		

3.2. Read Inputs Status (Func: 02)

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
100001 (0000)	100001 (0000)	-	CH1 LED (OUT) 0: OFF, 1: ON	-
100002 (0001)	100002 (0001)	-	CH2 LED (OUT) 0: OFF, 1: ON	-
-	100003 (0002)	-	CH3 LED (OUT) 0: OFF, 1: ON	-
-	100004 (0003)	-	CH4 LED (OUT) 0: OFF, 1: ON	-
100005 (0004)	-	-	AL1 LED 0: OFF, 1: ON	-
100006 (0005)	-	-	AL2 LED 0: OFF, 1: ON	-
100007 (0006)	-	-	AL3 LED 0: OFF, 1: ON	-
100008 (0007)	-	-	AL4 LED 0: OFF, 1: ON	-
100009 (0008)	-	-	Digital input 1 (DI-1) 0: OFF, 1: ON	-
100010 (0009)	-	-	Digital input 2 (DI-2) 0: OFF, 1: ON	-
100011 (000A) to 100100 (0063)	100011 (000A) to 100050 (0031)	Reserved		

3.3. Read Input Registers (Func: 04)

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
300001 (0000) to 300100 (0063)	300001 (0000) to 300100 (0063)	Reserved		
300101 (0064)	300101 (0064)	-	Product number H	-
300102 (0065)	300102 (0065)	-	Product number L	-
300103 (0066)	300103 (0066)	-	Hardware version	-
300104 (0067)	300104 (0067)	-	Software version	-
300105 (0068)	300105 (0068)	-	Model name 1	'□□'
300106 (0069)	300106 (0069)	-	Model name 2	'□□'
300107 (006A)	300107 (006A)	-	Model name 3	'□□'
300108 (006B)	300108 (006B)	-	Model name 4	'□□'
300109 (006C)	300109 (006C)	-	Model name 5	''
300110 (006D)	300110 (006D)	-	Model name 6	''
300111 (006E)	300111 (006E)	-	Model name 7	''
300112 (006F)	300112 (006F)	-	Model name 8	''
300113 (0070)	300113 (0070)	-	Model name 9	''
300114 (0071)	300114 (0071)	-	Model name 10	''
300115 (0072)	300115 (0072)	Reserved		
300116 (0073)	300116 (0073)	Reserved		
300117 (0074)	300117 (0074)	Reserved		
300118 (0075)	300118 (0075)	-	Coil status Start Address	0000
300119 (0076)	300119 (0076)	-	Coil status Quantity	0
300120 (0077)	300120 (0077)	-	Input status Start Address	0000
300121 (0078)	300121 (0078)	-	Input status Quantity	0
300122 (0079)	300122 (0079)	-	Holding Register Start Address	0000
300123 (007A)	300123 (007A)	-	Holding Register Quantity	0
300124 (007B)	300124 (007B)	-	Input Register Start Address	0000
300125 (007C)	300125 (007C)	-	Input Register Quantity	0
300126 (007D)	300126 (007D)	-	Channel Quantity	0
300127 (007E) to 300200 (00C7)	300127 (007E) to 300200 (00C7)	Reserved		

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
301001 (03E8)	301001 (03E8)	CH1 Present Value	Present value (PV) [Present value] Input range of each sensor °C / °F [Error] 31000: OPEN 30000: HHHH -30000: LLLL	-
301002 (03E9)	301002 (03E9)	CH1 Dot	Sensor decimal point position 0: 0, 1: 0.0	0
301003 (03EA)	301003 (03EA)	CH1 Unit	Sensor temperature unit 0: °C, 1: °F	0
301004 (03EB)	301004 (03EB)	CH1 Set Value	Set value (SV) SV Low Limit to SV High Limit °C / °F	0
301005 (03EC)	301005 (03EC)	CH1 Heating_MV	Heating MV 0.0 to 100.0 %	-
301006 (03ED)	301006 (03ED)	CH1 Cooling_MV	Cooling MV 0.0 to 100.0 %	-
301007 (03EE) to 301012 (03F3)	301007 (03EE) to 301012 (03F3)	CH2 Parameter	Same as above CH1	
-	301013 (03F4) to 301018 (03F9)	CH3 Parameter	Same as above CH1	
-	301019 (03FA) to 301024 (03FF)	CH4 Parameter	Same as above CH1	
301025 (0400)	-	Indicator	Refer to 301025 (0400) bit data configuration - TM2	-
-	301025 (0400)	Indicator	Refer to 301025 (0400) bit data configuration - TM4	-
301026 (0401)	301026 (0401)	Unit Address	Communication address 01 to 31	01
301027 (0402)	-	CT1_Heater Current	CT1 Heater current monitoring 0.0 to 50.0 A	-
301028 (0403)	-	CT2_Heater Current	CT2 Heater current monitoring 0.0 to 50.0 A	-

301025 (0400) bit data configuration - TM2

Bit	Description	Set range
0	CH1 LED (OUT)	0: OFF, 1: ON
1	CH2 LED (OUT)	0: OFF, 1: ON
2	-	0 fixed
3	-	0 fixed
4	AL1 LED	0: OFF, 1: ON
5	AL2 LED	0: OFF, 1: ON
6	AL3 LED	0: OFF, 1: ON
7	AL4 LED	0: OFF, 1: ON
8	Digital input 1 ON	0: OFF, 1: ON
9	Digital input 2 ON	0: OFF, 1: ON

301025 (0400) bit data configuration - TM4

Bit	Description	Set range
0	CH1 LED (OUT)	0: OFF, 1: ON
1	CH2 LED (OUT)	0: OFF, 1: ON
2	CH3 LED (OUT)	0: OFF, 1: ON
3	CH4 LED (OUT)	0: OFF, 1: ON

3.4. Read Holding Register (Func: 03) / Write Single Register (Func: 06) / Write Multiple Registers (Func: 16)

3.4.1. Monitoring / Manual control setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400001 (0000)	400001 (0000)	CH1 SV	Set value SV Low Limit to SV High Limit °C / °F	0
400002 (0001)	400002 (0001)	CH1 Heating_MV	Heating MV 0.0 to 100.0 %	-
400003 (0002)	400003 (0002)	CH1 Cooling_MV	Cooling MV 0.0 to 100.0 %	-
400004 (0003)	400004 (0003)	CH1 Auto-Manual Control	Auto / Manual control 0: AUTO 1: MANUAL	0
400005 (0004) to 400050 (0031)	400005 (0004) to 400050 (0031)	CH1 Reserved		
401001 (03E8) to 401050 (0419)	401001 (03E8) to 401050 (0419)	CH2 Parameter	Same as above CH1	
-	402001 (07D0) to 402050 (0801)	CH3 Parameter	Same as above CH1	
-	403001 (0BB8) to 403050 (0BE9)	CH4 Parameter	Same as above CH1	

3.4.2. Control operation group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400101 (0064)	400051 (0032)	CH1 RUN / STOP	control output RUN / STOP 0: RUN, 1: STOP	0
400102 (0065)	400052 (0033)	CH1 Multi SV No	Multi SV No 0: SV-0, 1: SV-1, 2: SV-2, 3: SV-3	0
400103 (0066)	400053 (0034)	CH1 SV-0	SV-0 Set value SV Low Limit to SV High Limit °C / °F	0
400104 (0067)	400054 (0035)	CH1 SV-1	SV-1 Set value SV Low Limit to SV High Limit °C / °F	0
400105 (0068)	400055 (0036)	CH1 SV-2	SV-2 Set value SV Low Limit to SV High Limit °C / °F	0
400106 (0069)	400056 (0037)	CH1 SV-3	SV-3 Set value SV Low Limit to SV High Limit °C / °F	0
400107 (006A) to 400200 (00C7)	400057 (0038) to 400100 (0063)	CH1 Reserved		
401101 (044C) to 401200 (04AF)	401051 (041A) to 401100 (044B)	CH2 Parameter	Same as above CH1	
-	402051 (0802) to 402100 (0833)	CH3 Parameter	Same as above CH1	
-	403051 (0BEA) to 403100 (0C1B)	CH4 Parameter	Same as above CH1	

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400201 (00C8)	400101 (0064)	CH1 Auto-Tuning Execute	Auto-Tuning ON / OFF 0: OFF, 1: ON	0
400202 (00C9)	400102 (0065)	CH1 Heating_Proportional Band	Heating proportional band 0.1 to 999.9 °C	10.0
400203 (00CA)	400103 (0066)	CH1 Cooling_Proportional Band	Cooling proportional band 0.1 to 999.9 °C	10.0

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400204 (00CB)	400104 (0067)	CH1 Heating_Integral Time	Heating integral time 0 to 9999 sec	0
400205 (00CC)	400105 (0068)	CH1 Cooling_Integral Time	Cooling integral time 0 to 9999 sec	0
400206 (00CD)	400106 (0069)	CH1 Heating_Derivation Time	Heating derivation time 0 to 9999 sec	0
400207 (00CE)	400107 (006A)	CH1 Cooling_Derivation Time	Cooling derivation time 0 to 9999 sec	0
400208 (00CF)	400108 (006B)	CH1 Dead_Overlap band	Heating-Cooling, Dead_Overlap band [Temp.H] -999 to 999 [Temp.L] -9999 to 9999 (-999.9 to 999.9) °C/°F	0
400209 (00D0)	400109 (006C)	CH1 Manual Reset	In proportional control mode, Manual reset 0.0 to 100.0 %	50.0
400210 (00D1)	400110 (006D)	CH1 Heating_ON Hysteresis	Heating Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	2
400211 (00D2)	400111 (006E)	CH1 Heating_OFF Offset	Heating OFF Offset 0 to 100 (H) digit 0.0 to 100.0 (L) digit	0
400212 (00D3)	400112 (006F)	CH1 Cooling_ON Hysteresis	Cooling Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	2
400213 (00D4)	400113 (0070)	CH1 Cooling_OFF Offset	Cooling OFF Offset 0 to 100 (H) digit 0.0 to 100.0 (L) digit	0

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400214 (00D5)	400114 (0071)	CH1 MV Low Limit	MV (MV) low limit [Heating, Cooling] 0.0 to MV High Limit - 0.1 % [Heating & Cooling] -100.0 to 0.0 %	[Heating, Cooling] 0.0 [Heating & Cooling] -100.0
400215 (00D6)	400115 (0072)	CH1 MV High Limit	MV (MV) high limit [Heating, Cooling] MV Low Limit + 0.1 % to 100.0 % [Heating & Cooling] 0.0 to 100.0 %	100.0
400216 (00D7)	400116 (0073)	CH1 Ramp_Up Rate	Ramp up rate 0 (OFF) to 9999 °C / °F / Digit	0 (OFF)
400217 (00D8)	400117 (0074)	CH1 Ramp_Down Rate	Ramp down rate 0 (OFF) to 9999 °C / °F / Digit	0 (OFF)
400218 (00D9)	400118 (0075)	CH1 Ramp Time Unit	Ramp time unit 0: SEC, 1: MIN, 2: HOUR	1
400219 (00DA) to 400300 (012B)	400119 (00DA) to 400150 (0095)	CH1 Reserved		
401201 (04B0) to 401300 (0513)	401101 (044C) to 401150 (047D)	CH2 Parameter	Same as above CH1	
-	402101 (0834) to 402150 (0865)	CH3 Parameter	Same as above CH1	
-	403101 (0C1C) to 403150 (0C4D)	CH4 Parameter	Same as above CH1	

3.4.3. Initial setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400301 (012C)	400151 (0096)	CH1 Input Type	Input type 0: K (CA).H to 26: NI12 Refer to 'Input type' of TM Series user manual.	0
400302 (012D)	400152 (0097)	CH1 Unit	Sensor temperature unit 0: °C, 1: °F	0
400303 (012E)	400153 (0098)	CH1 Input Bias	Input bias -999 to 999 (H) digit -999.9 to 999.9 (L) digit	0
400304 (012F)	400154 (0099)	CH1 Digital Filter	Input digital filter 0.1 to 120.0 sec	0.1
400305 (0130)	400155 (009A)	CH1 SV Low Limit	SV low limit Min. value of input type to SV High Limit -1 Digit °C / °F	-200
400306 (0131)	400156 (009B)	CH1 SV High Limit	SV high limit SV Low Limit + 1 Digit to Max. value of input type °C / °F	1350
400307 (0132)	400157 (009C)	CH1 Operating Type	Control output operation mode 0: Heating 1: Cooling 2: Heating & Cooling	0
4002308 (0133)	400158 (009D)	CH1 Control Method	Temperature control method [Heating, Cooling] 0: PID 1: ONOFF [Heating & Cooling] 0: PID-PID 1: PID-ONOFF 2: ONOFF-PID 3: ONOFF-ONOFF	0
400309 (0134)	400159 (009E)	CH1 Auto-Tuning Mode	Auto-tuning mode 0: TUN1, 1: TUN2	0
400310 (0135)	400160 (009F)	CH1 Heating_Control Time	Heating control cycle 0.1 to 120.0 sec	20.0 (Relay) 2.0 (SSR)

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400311 (0136)	400161 (00A0)	CH1 Cooling_Control Time	Cooling control cycle 0.1 to 120.0 sec	20.0 (Relay) 2.0 (SSR)
400312 (0137)	-	CH1 Output (SSR_Curr) Type	Control output type 0: SSR, 1: CURRENT	1
400313 (0138)	-	CH1 Current Output Range	Current output range 0: 4-20 mA, 1: 0-20 mA	0
400314 (0139) to 400400 (0189)	400162 (00A1) to 400200 (00C7)	CH1 Reserved		
401301 (0514) to 401400 (0577)	401151 (047E) to 401200 (04AF)	CH2 Parameter	Same as above CH1	
-	402151 (0866) to 402200 (0897)	CH3 Parameter	Same as above CH1	
-	403151 (0C4E) to 403200 (0C7F)	CH4 Parameter	Same as above CH1	

3.4.4. Control setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400401 (0190)	400201 (00C8)	CH1 Multi SV	Multi SV 0: 1EA, 1: 2EA, 2: 4EA	0
400402 (0191)	400202 (00C9)	CH1 Initial Manual MV	Initial MV mode for manual control 0: AUTO-MV, 1: PRESET-MV	0
400403 (0192)	400203 (00CA)	CH1 Preset Manual MV	Initial MV for manual control [Heating, Cooling] 0.0 to 100.0 % [Heating & Cooling] -100.0 (Cool) to 100.0 (Heat) %	0.0
400404 (0193)	400204 (00CB)	CH1 Sensor Error MV	MV for sensor error [Heating, Cooling] • PID: 0.0 to 100.0 % • ON/OFF: 0.0 (OFF) / 100.0 (ON) % [Heating & Cooling] • PID: -100.0 (Cool) to 100.0 (Heat) % • ON/OFF: -100.0 (Cool ON) / 0.0 (OFF) / 100.0 (Heat ON) %	0.0
400405 (0194)	400205 (00CC)	CH1 Stop MV	MV for control stop [Heating, Cooling] • PID: 0.0 to 100.0 % • ON/OFF: 0.0 (OFF) / 100.0 (ON) % [Heating & Cooling] • PID: -100.0 (Cool) to 100.0 (Heat) % • ON/OFF: -100.0 (Cool ON) / 0.0 (OFF) / 100.0 (Heat ON) %	0.0
400406 (0195)	400206 (00CD)	CH1 Stop AlarmOut	Alarm output for control stop 0: CONTINUE, 1: OFF	0
400407 (0196) to 400500 (01F3)	400207 (00CE) to 400250 (00F9)	CH1 Reserved		
401401 (0578) to 401500 (05DB)	401201 (04B0) to 401250 (04E1)	CH2 Parameter	Same as above CH1	

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
-	402201 (0898) to 402250 (08C9)	CH3 Parameter	Same as above CH1	
-	403201 (0C80) to 403250 (0CB1)	CH4 Parameter	Same as above CH1	

3.4.5. Alarm output setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400501 (01F4)	-	Alarm1 Target Ch	Alarm output 1 target CH 0: CH1, 1: CH2, 2: CH1 or CH2, 3: CH1 and CH2	0
400502 (01F5)	-	Alarm1 Mode	Alarm output 1 operation mode 0: OFF, 1: AL-1, 2: AL-2, 3: AL-3, 4: AL-4, 5: AL-5, 6: AL-6, 7: LBA, 8: SBA, 9: HBA	1
400503 (01F6)	-	Alarm1 Type	Alarm output 1 option 0: AL-A, 1: AL-B, 2: AL-C, 3: AL-D, 4: AL-E, 5: AL-F	0
400504 (01F7)	-	Alarm1 Low_Ch1	Alarm output 1 Ch1 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400505 (01F8)	-	Alarm1 High_Ch1	Alarm output 1 Ch1 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400506 (01F9)	-	Alarm1 Low_Ch2	Alarm output 1 Ch2 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400507 (01FA)	-	Alarm1 High_Ch2	Alarm output 1 Ch2 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400508 (01FB)	-	Alarm1 Hysteresis Ch1	Alarm output 1 Ch1 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400509 (01FC)	-	Alarm1 Hysteresis Ch2	Alarm output 1 Ch2 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400510 (01FD)	-	Alarm1 NO / NC	Alarm output 1 contact type 0: NO, 1: NC	0
400511 (01FE)	-	Alarm1 ON Delay Time	Alarm output 1 ON delay time 0 to 3600 sec	0

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400512 (01FF)	-	Alarm1 OFF Delay Time	Alarm output 1 OFF delay time 0 to 3600 sec	0
400513 (0200)	-	LBA1 Time Ch1	LBA1 Ch1 monitoring time 0 to 9999 sec	0
400514 (0201)	-	Reserved		
400515 (0202)	-	LBA1 Band Ch1	LBA1 Ch1 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400516 (0203)	-	LBA1 Time Ch2	LBA1 Ch2 monitoring time 0 to 9999 sec	0
400517 (0204)	-	Reserved		
400518 (0205)	-	LBA1 Band Ch2	LBA1 Ch2 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400519 (0206)	-	Alarm2 Target Ch	Alarm output 2 target CH 0: CH1, 1: CH2, 2: CH1 or CH2, 4: CH1 and CH2	1
400520 (0207)	-	Alarm2 Mode	Alarm output 2 operation mode 0: OFF, 1: AL-1, 2: AL-2, 3: AL-3, 4: AL-4, 5: AL-5, 6: AL-6, 7: LBA, 8: SBA, 9: HBA	2
400521 (0208)	-	Alarm2 Type	Alarm output 2 option 0: AL-A 1: AL-B 2: AL-C 3: AL-D 4: AL-E 5: AL-F	1
400522 (0209)	-	Alarm2 Low_Ch1	Alarm output 2 Ch1 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400523 (020A)	-	Alarm2 High_Ch1	Alarm output 2 Ch1 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400524 (020B)	-	Alarm2 Low_Ch2	Alarm output 2 Ch2 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400525 (020C)	-	Alarm2 High_Ch2	Alarm output 2 Ch2 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400526 (020D)	-	Alarm2 Hysteresis Ch1	Alarm output 2 Ch1 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400527 (020E)	-	Alarm2 Hysteresis Ch2	Alarm output 2 Ch2 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400528 (020F)	-	Alarm2 NO / NC	Alarm output 2 contact type 0: NO, 1: NC	0
400529 (0210)	-	Alarm2 ON Delay Time	Alarm output 2 ON delay time 0 to 3600 sec	0
400530 (0211)	-	Alarm2 OFF Delay Time	Alarm output 2 OFF delay time 0 to 3600 sec	0
400531 (0212)	-	LBA2 Time Ch1	LBA2 Ch1 monitoring time 0 to 9999 sec	0
400532 (0213)	-	Reserved		
400533 (0214)	-	LBA2 Band Ch1	LBA2 Ch1 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400534 (0215)	-	LBA2 Time Ch2	LBA2 Ch2 monitoring time 0 to 9999 sec	0
400535 (0216)	-	Reserved		
400536 (0217)	-	LBA2 Band Ch2	LBA2 Ch2 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400537 (0218)	-	Alarm3 Target Ch	Alarm output 3 target CH 0: CH1, 1: CH2, 2: CH1 or CH2, 4: CH1 and CH2	0
400358 (0219)	-	Alarm3 Mode	Alarm output 3 operation mode 0: OFF, 1: AL-1, 2: AL-2, 3: AL-3, 4: AL-4, 5: AL-5, 6: AL-6, 7: LBA, 8: SBA, 9: HBA	1

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400539 (021A)	-	Alarm3 Type	Alarm output 3 option 0: AL-A, 1: AL-B, 2: AL-C, 3: AL-D, 4: AL-E, 5: AL-F	0
400540 (021B)	-	Alarm3 Low_Ch1	Alarm output 3 Ch1 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400541 (021C)	-	Alarm3 High_Ch1	Alarm output 3 Ch1 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400542 (021D)	-	Alarm3 Low_Ch2	Alarm output 3 Ch2 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400543 (021E)	-	Alarm3 High_Ch2	Alarm output 3 Ch2 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400544 (021F)	-	Alarm3 Hysteresis Ch1	Alarm output 3 Ch1 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400545 (0220)	-	Alarm3 Hysteresis Ch2	Alarm output 3 Ch2 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400546 (0221)	-	Alarm3 NO / NC	Alarm output 3 contact type 0: NO 1: NC	0
400547 (0222)	-	Alarm3 ON Delay Time	Alarm output 3 ON delay time 0 to 3600 sec	0
400548 (0223)	-	Alarm3 OFF Delay Time	Alarm output 3 OFF delay time 0 to 3600 sec	0
400549 (0224)	-	LBA3 Time Ch1	LBA3 Ch1 monitoring time 0 to 9999 sec	0
400550 (0225)	-	Reserved		
400551 (0226)	-	LBA3 Band Ch1	LBA3 Ch1 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400552 (0227)	-	LBA3 Time Ch2	LBA3 Ch2 monitoring time 0 to 9999 sec	0
400553 (0228)	-	Reserved		
400554 (0229)	-	LBA3 Band Ch2	LBA3 Ch2 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400555 (022A)	-	Alarm4 Target Ch	Alarm output 4 target CH 0: CH1, 1: CH2, 2: CH1 or CH2, 4: CH1 and CH2	1
400556 (022B)	-	Alarm4 Mode	Alarm output 4 operation mode 0: OFF, 1: AL-1, 2: AL-2, 3: AL-3, 4: AL-4, 5: AL-5, 6: AL-6, 7: LBA, 8: SBA, 9: HBA	2
400557 (022C)	-	Alarm4 Type	Alarm output 4 option 0: AL-A, 1: AL-B, 2: AL-C, 3: AL-D, 4: AL-E, 5: AL-F	0
400558 (022D)	-	Alarm4 Low_Ch1	Alarm output 4 Ch1 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400559 (022E)	-	Alarm4 High_Ch1	Alarm output 4 Ch1 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400560 (022F)	-	Alarm4 Low_Ch2	Alarm output 4 Ch2 low limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400561 (0230)	-	Alarm4 High_Ch2	Alarm output 4 Ch2 high limit [Deviation alarm] -F.S to F.S [Absolute value alarm] Within sensor input range	1550
400562 (0231)	-	Alarm4 Hysteresis Ch1	Alarm output 4 Ch1 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400563 (0232)	-	Alarm4 Hysteresis Ch2	Alarm output 4 Ch2 Hysteresis 1 to 100 (H) digit 0.1 to 100.0 (L) digit	1
400564 (0233)	-	Alarm4 NO / NC	Alarm output 4 contact type 0: NO, 1: NC	0
400565 (0234)	-	Alarm4 ON Delay Time	Alarm output 4 ON delay time 0 to 3600 sec	0
400566 (0235)	-	Alarm4 OFF Delay Time	Alarm output 4 OFF delay time 0 to 3600 sec	0
400567 (0236)	-	LBA4 Time Ch1 LBA4 Ch1 monitoring time	0 to 9999 sec	0
400568 (0237)	-	Reserved		
400569 (0238)	-	LBA4 Band Ch1	LBA4 Ch1 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3
400570 (0239)	-	LBA4 Time Ch2	LBA4 Ch2 monitoring time 0 to 9999 sec	0
400571 (023A)	-	Reserved		
400572 (023B)	-	LBA4 Band Ch2	LBA4 Ch2 detection band 0 to 999 (H) °C / °F 0.0 to 999.9 (L) °C / °F	3

3.4.6. Digital input setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400573 (024C)	-	Digital Input 1 Func	Digital input terminal 1 function 0: OFF, 1: STOP, 2: AL-RESET, 3: MANUAL, 4: MULTI-SV	0
400574 (024D)	-	Digital Input 2 Func	Digital input terminal 2 function 0: OFF, 1: STOP, 2: AL-RESET, 3: MANUAL, 4: MULTI-SV	0
400575 (024E)	-	Digital Input 1 Ch	Digital input terminal 1 target CH 0: CH1, 1: CH2	0
400576 (024F)	-	Digital Input 2 Ch	Digital input terminal 2 target CH 0: CH1, 1: CH2	1
400577 (0250) to 400600 (0257)	-	Reserved		

3.4.7. Communication setting group

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400601 (0258)	400301 (012C)	Baudrate	Baudrate 0: 2400, 1: 4800, 2: 9600 3: 19200, 4: 38400, 5: 57600 6: 115200 bps	2
400602 (0259)	400302 (012D)	Parity Bit	Comm. parity bit 0: NONE, 1: EVEN, 2: ODD	0
400603 (025A)	400303 (012E)	Stop Bit	Comm. stop bit 0: 1, 1: 2	1
400604 (025B)	400304 (012F)	Response Waiting Time	Comm. response waiting time 5 to 99 ms	20
400605 (025C)	400305 (0130)	Communication Write	Comm. write enable/disable 0: ENABLE, 1: DISABLE	0
400606 (025D)	400306 (0131)	Parameter Initialize	Parameter reset 0: NO, 1: YES	0

No (Address) TM2	No (Address) TM4	Parameter	Description	Default
400607 (025E)	400307 (0132)	Communication Protocol	Communication Protocol 0:RTU, 1:ASCII	0
400608 (025F) to 400700 (02BB)	400308 (0133) to 400350 (015D)	Reserved		

3.5. User group

This function is used for setting frequently used parameters quickly and easily by registering to user group. User parameter group can have up to 30 parameters.

3.5.1. User group address - Using parameter setting

For User group order assignment address, refer to **3.5.1.1, "TM2 User group order assignment address"**, **3.5.1.2, "TM4 User group order assignment address"**

No (Address) TM2	No (Address) TM4	Parameter	Description	Set range	Default
450001(C350)	450001(C350)	User group - 01 unit address		Parameter address	0
450002(C351)	450002(C351)	User group - 02 unit address		Parameter address	0
450003(C352)	450003(C352)	User group - 03 unit address		Parameter address	0
450004(C353)	450004(C353)	User group - 04 unit address		Parameter address	0
450005(C354)	450005(C354)	User group - 05 unit address		Parameter address	0
450006(C355)	450006(C355)	User group - 06 unit address		Parameter address	0
450007(C356)	450007(C356)	User group - 07 unit address		Parameter address	0
450008(C357)	450008(C357)	User group - 08 unit address		Parameter address	0
450009(C358)	450009(C358)	User group - 09 unit address		Parameter address	0
450010(C359)	450010(C359)	User group - 10 unit address		Parameter address	0
450011(C35A)	450011(C35A)	User group - 11 unit address		Parameter address	0
450012(C35B)	450012(C35B)	User group - 12 unit address		Parameter address	0
450013(C35C)	450013(C35C)	User group - 13 unit address		Parameter address	0

No (Address) TM2	No (Address) TM4	Parameter	Description	Set range	Default
450014(C35D)	450014(C35D)	User group - 14 unit address		Parameter address	0
450015(C35E)	450015(C35E)	User group - 15 unit address		Parameter address	0
450016(C35F)	450016(C35F)	User group - 16 unit address		Parameter address	0
450017(C360)	450017(C360)	User group - 17 unit address		Parameter address	0
450018(C361)	450018(C361)	User group - 18 unit address		Parameter address	0
450019(C362)	450019(C362)	User group - 19 unit address		Parameter address	0
450020(C363)	450020(C363)	User group - 20 unit address		Parameter address	0
450021(C364)	450021(C364)	User group - 21 unit address		Parameter address	0
450022(C365)	450022(C365)	User group - 22 unit address		Parameter address	0
450023(C366)	450023(C366)	User group - 23 unit address		Parameter address	0
450024(C367)	450024(C367)	User group - 24 unit address		Parameter address	0
450025(C368)	450025(C368)	User group - 25 unit address		Parameter address	0
450026(C369)	450026(C369)	User group - 26 unit address		Parameter address	0
450027(C36A)	450027(C36A)	User group - 27 unit address		Parameter address	0
450028(C36B)	450028(C36B)	User group - 28 unit address		Parameter address	0
450029(C36C)	450029(C36C)	User group - 29 unit address		Parameter address	0
450030(C36D)	450030(C36D)	User group - 30 unit address		Parameter address	0

3.5.1.1. TM2 User group order assignment address

Input Registers (Func 04, R)

No(Address) Decimal	No(Address) Hex(0x)	Parameter
31001	7919	CH1 Present Value
31002	791A	CH1 Dot
31003	791B	CH1 Unit
31004	791C	CH1 Set Value
31005	791D	CH1 Heating_MV
31006	791E	CH1 Cooling_MV
31007 to 31012	791F to 7924	CH2 Parameter - Same as above CH1
31025	7931	Indicator (Bit)
31027	7931	CT1 Heater Current
31028	7932	CT2 Heater Current

Holding Registers (Func 03/06/16, R/W)

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
40001	9C41	CH1 SV	CH1 Monitoring
40002	9C42	CH1 Heating_MV	CH1 Monitoring
40003	9C43	CH1 Cooling_MV	CH1 Monitoring
40004	9C44	CH1 Auto-Manual Control	CH1 Monitoring
41001 to 41004	A029 to A02C	CH2 Parameter - Same as above CH1	CH2 Monitoring
40101	9CA5	CH1 RUN_STOP	CH1 Control Operation
40102	9CA6	CH1 Multi SV No	CH1 Control Operation
40103	9CA7	CH1 SV-0 Setting Value	CH1 Control Operation
40104	9CA8	CH1 SV-1 Setting Value	CH1 Control Operation
40105	9CA9	CH1 SV-2 Setting Value	CH1 Control Operation
40106	9CAA	CH1 SV-3 Setting Value	CH1 Control Operation
41101 to 41106	A08D to A092	CH2 Parameter - Same as above CH1	CH2 Control Operation
40201	9D09	CH1 Auto-Tuning Execute	CH1 Control Operation
40202	9D0A	CH1 Heating_ Proportinal Band	CH1 Control Operation
40203	9D0B	CH1 Cooling_ Proportinal Band	CH1 Control Operation
40204	9D0C	CH1 Heating_Integral Time	CH1 Control Operation
40205	9D0D	CH1 Cooling_Integral Time	CH1 Control Operation
40206	9D0E	CH1 Heating_Derivation Time	CH1 Control Operation
40207	9D0F	CH1 Cooling_Derivation Time	CH1 Control Operation
40208	9D10	CH1 Dead_Overlap band	CH1 Control Operation
40209	9D11	CH1 Manual Reset	CH1 Control Operation
40210	9D12	CH1 Heating_ON Hysteresis	CH1 Control Operation
40211	9D13	CH1 Heating_OFF Offset	CH1 Control Operation
40212	9D14	CH1 Cooling_ON Hysteresis	CH1 Control Operation
40213	9D15	CH1 Cooling_OFF Offset	CH1 Control Operation
40214	9D16	CH1 MV Low Limit	CH1 Control Operation
40215	9D17	CH1 MV High Limit	CH1 Control Operation
40216	9D18	CH1 Ramp_Up Rate	CH1 Control Operation
40217	9D19	CH1 Ramp_Down Rate	CH1 Control Operation
40218	9D1A	CH1 Ramp Time Unit	CH1 Control Operation

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
41201 to 41218	A0F1 to A102	CH2 Parameter - Same as above CH1	CH2 Control Operation
40301	9D6D	CH1 Input Type	CH1 Initial Setting
40302	9D6E	CH1 Unit	CH1 Initial Setting
40303	9D6F	CH1 Input Bias	CH1 Initial Setting
40304	9D70	CH1 Input Digital Filter	CH1 Initial Setting
40305	9D71	CH1 SV Low Limit	CH1 Initial Setting
40306	9D72	CH1 SV High Limit	CH1 Initial Setting
40307	9D73	CH1 Operating Type	CH1 Initial Setting
40308	9D74	CH1 Control Method	CH1 Initial Setting
40309	9D75	CH1 Auto-Tuning Type	CH1 Initial Setting
40310	9D76	CH1 Heating_Control Time	CH1 Initial Setting
40311	9D77	CH1 Cooling_Control Time	CH1 Initial Setting
40312	9D78	CH1 Output(SSR_Curr) Type	CH1 Initial Setting
40313	9D79	CH1 Current Output Range	CH1 Initial Setting
41301 to 41313	A155 to A161	CH2 Parameter - Same as above CH1	CH2 Initial Setting
40401	9DD1	CH1 Multi SV	CH1 Control Setting
40402	9DD2	CH1 Initial Manual MV	CH1 Control Setting
40403	9DD3	CH1 Preset Manual MV	CH1 Control Setting
40404	9DD4	CH1 Sensor Error MV	CH1 Control Setting
40405	9DD5	CH1 Stop MV	CH1 Control Setting
40406	9DD6	CH1 Stop AlarmOut	CH1 Control Setting
41401 to 41406	A1B9 to A1BE	CH2 Parameter - Same as above CH1	CH2 Control Setting
40501	9E35	Alarm1 Target CH	Alarm1 Alarm output
40502	9E36	Alarm1 Mode	Alarm1 Alarm output
40503	9E37	Alarm1 Type	Alarm1 Alarm output
40504	9E38	Alarm1 Low_Ch1	Alarm1 Alarm output
40505	9E39	Alarm1 High_Ch1	Alarm1 Alarm output
40506	9E3A	Alarm1 Low_Ch2	Alarm1 Alarm output
40507	9E3B	Alarm1 High_Ch2	Alarm1 Alarm output
40508	9E3C	Alarm1 Hysteresis_Ch1	Alarm1 Alarm output
40509	9E3D	Alarm1 Hysteresis_Ch2	Alarm1 Alarm output

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
40510	9E3E	Alarm1 NO/NC	Alarm1 Alarm output
40511	9E3F	Alarm1 ON Delay Time	Alarm1 Alarm output
40512	9E40	Alarm1 OFF Delay Time	Alarm1 Alarm output
40513	9E41	LBA1 Time_ Ch1	Alarm1 Alarm output
40514	9E42	LBA1 Set Level_Ch1	Alarm1 Alarm output
40515	9E43	LBA1 Band_ Ch1	Alarm1 Alarm output
40516	9E44	LBA1 Time_ Ch2	Alarm1 Alarm output
40517	9E45	LBA1 Set Level_Ch2	Alarm1 Alarm output
40518	9E46	LBA1 Band_ Ch2	Alarm1 Alarm output
40519 to 40536	9E47 to 9E58	Alarm2 Parameter - Same as above Alarm1	Alarm2 Alarm output
40537 to 40554	9E59 to 9E6A	Alarm3 Parameter - Same as above Alarm1	Alarm3 Alarm output
40555 to 40572	9E6B to 9E7C	Alarm4 Parameter - Same as above Alarm1	Alarm4 Alarm output
40573	9E7D	Digital Input 1 Func	Digital Input Setting
40574	9E7E	Digital Input 2 Func	Digital Input Setting
40575	9E7F	Digital Input 1_Ch	Digital Input Setting
40576	9E80	Digital Input 2_Ch	Digital Input Setting
40601	9E99	Bit Per Second	Communication Setting(Common)
40602	9E9A	Parity Bit	Communication Setting(Common)
40603	9E9B	Stop Bit	Communication Setting(Common)
40604	9E9C	Response Waiting Time	Communication Setting(Common)
40605	9E9D	Communication Write	Communication Setting(Common)
40606	9E9E	Parameter Initialize	Communication Setting(Common)
40607	9E9F	Communication Protocol	Communication Setting(Common)

3.5.1.2. TM4 User group order assignment address

Input Registers (Func 04, R)

No(Address) Decimal	No(Address) Hex(0x)	Parameter
31001	7919	CH1 Present Value
31002	791A	CH1 Dot
31003	791B	CH1 Unit
31004	791C	CH1 Set Value
31005	791D	CH1 Heating_MV
31006	791E	CH1 Cooling_MV
31007 to 31012	791F to 7924	CH2 Parametr - Same as above CH1
31013 to 31018	7925 to 792A	CH3 Parametr - Same as above CH1
31019 to 31024	792B to 7930	CH4 Parametr - Same as above CH1
31025	7931	Indicator (Bit)

Holding Registers (Func 03/06/16, R/W)

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
40001	9C41	CH1 SV	CH1 Monitoring
40002	9C42	CH1 Heating_MV	CH1 Monitoring
40003	9C43	CH1 Cooling_MV	CH1 Monitoring
40004	9C44	CH1 Auto-Manual Control	CH1 Monitoring
41001 to 41004	A029 to A02C	CH2 Parameter - Same as above CH1	CH2 Monitoring
42001 to 42004	A411 to A414	CH3 Parameter - Same as above CH1	CH3 Monitoring
43001 to 43004	A7F9 to A7FC	CH4 Parameter - Same as above CH1	CH4 Monitoring
40051	9C73	CH1 RUN_STOP	CH1 Control Operation
40052	9C74	CH1 Multi SV No	CH1 Control Operation
40053	9C75	CH1 SV-0 Setting Value	CH1 Control Operation
40054	9C76	CH1 SV-1 Setting Value	CH1 Control Operation
40055	9C77	CH1 SV-2 Setting Value	CH1 Control Operation
40056	9C78	CH1 SV-3 Setting Value	CH1 Control Operation
41051 to 41056	A05B to A060	CH2 Parameter - Same as above CH1	CH2 Control Operation
42051 to 42056	A443 to A448	CH3 Parameter - Same as above CH1	CH3 Control Operation
43051 to 43056	A82B to A830	CH4 Parameter - Same as above CH1	CH4 Control Operation
40101	9CA5	CH1 Auto-Tuning Execute	CH1 Control Operation
40102	9CA6	CH1 Heating_ Proportinal Band	CH1 Control Operation
40103	9CA7	CH1 Cooling_ Proportinal Band	CH1 Control Operation
40104	9CA8	CH1 Heating_Integral Time	CH1 Control Operation
40105	9CA9	CH1 Cooling_Integral Time	CH1 Control Operation
40106	9CAA	CH1 Heating_Derivation Time	CH1 Control Operation
40107	9CAB	CH1 Cooling_Derivation Time	CH1 Control Operation
40108	9CAC	CH1 Dead_Overlap band	CH1 Control Operation
40109	9CAD	CH1 Manual Reset	CH1 Control Operation
40110	9CAE	CH1 Heating_ON Hysteresis	CH1 Control Operation
40111	9CAF	CH1 Heating_OFF Offset	CH1 Control Operation

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
40112	9CB0	CH1 Cooling_ON Hysteresis	CH1 Control Operation
40113	9CB1	CH1 Cooling_OFF Offset	CH1 Control Operation
40114	9CB2	CH1 MV Low Limit	CH1 Control Operation
40115	9CB3	CH1 MV High Limit	CH1 Control Operation
40116	9CB4	CH1 Ramp_Up Rate	CH1 Control Operation
40117	9CB5	CH1 Ramp_Down Rate	CH1 Control Operation
40118	9CB6	CH1 Ramp Time Unit	CH1 Control Operation
41101 to 41118	A08D to A09E	CH2 Parameter - Same as above CH1	CH2 Control Operation
42101 to 42118	A475 to A486	CH2 Parameter - Same as above CH1	CH3 Control Operation
43101 to 43118	A85D to A86E	CH4 Parameter - Same as above CH1	CH4 Control Operation
40151	9CD7	CH1 Input Type	CH1 Initial Setting
40152	9CD8	CH1 Unit	CH1 Initial Setting
40153	9CD9	CH1 Input Bias	CH1 Initial Setting
40154	9CDA	CH1 Input Digital Filter	CH1 Initial Setting
40155	9CDB	CH1 SV Low Limit	CH1 Initial Setting
40156	9CDC	CH1 SV High Limit	CH1 Initial Setting
40157	9CDD	CH1 Operating Type	CH1 Initial Setting
40158	9CDE	CH1 Control Method	CH1 Initial Setting
40159	9CDF	CH1 Auto-Tuning Type	CH1 Initial Setting
40160	9CE0	CH1 Heating_Conrol Time	CH1 Initial Setting
40161	9CE1	CH1 Cooling_Conrol Time	CH1 Initial Setting
41151 to 41161	A0BF to A0C9	CH2 Parameter - Same as above CH1	CH2 Initial Setting
42151 to 42161	A4A7 to A4B1	CH3 Parameter - Same as above CH1	CH3 Initial Setting
43151 to 43161	A88F to A899	CH4 Parameter - Same as above CH1	CH4 Initial Setting
40201	9D09	CH1 Multi SV	CH1 Control Setting
40202	9D0A	CH1 Initial Manual MV	CH1 Control Setting
40203	9D0B	CH1 Preset Manual MV	CH1 Control Setting
40204	9D0C	CH1 Sensor Error MV	CH1 Control Setting

No(Address) Decimal	No(Address) Hex(0x)	Parameter	Category
40205	9D0D	CH1 Stop MV	CH1 Control Setting
40206	9D0E	CH1 Stop AlarmOut	CH1 Control Setting
41201 to 41206	A0F1 to A0F6	CH2 Parameter - Same as above CH1	CH2 Control Setting
42201 to 42206	A4D9 to A4DE	CH3 Parameter - Same as above CH1	CH3 Control Setting
43201 to 43206	A8C1 to A8C6	CH4 Parameter - Same as above CH1	CH4 Control Setting
40301	9D6D	Bit Per Second	Communication Setting(Common)
40302	9D6E	Parity Bit	Communication Setting(Common)
40303	9D6F	Stop Bit	Communication Setting(Common)
40304	9D70	Response Waiting Time	Communication Setting(Common)
40305	9D71	Communication Write	Communication Setting(Common)
40306	9D72	Parameter Initialize	Communication Setting(Common)
40307	9D73	Communication Protocol	Communication Setting(Common)

3.5.2. User group address - Parameter data setting

No (Address) TM2	No (Address) TM4	Parameter	Description	Set range	Default
450031(C36E)	450031(C36E)	User group - Set 01 parameter		Set range of using parameter	0
450032(C36F)	450032(C36F)	User group - Set 02 parameter		Set range of using parameter	0
450033(C370)	450033(C370)	User group - Set 03 parameter		Set range of using parameter	0
450034(C371)	450034(C371)	User group - Set 04 parameter		Set range of using parameter	0
450035(C372)	450035(C372)	User group - Set 05 parameter		Set range of using parameter	0
450036(C373)	450036(C373)	User group - Set 06 parameter		Set range of using parameter	0
450037(C374)	450037(C374)	User group - Set 07 parameter		Set range of using parameter	0
450038(C375)	450038(C375)	User group - Set 08 parameter		Set range of using parameter	0
450039(C376)	450039(C376)	User group - Set 09 parameter		Set range of using parameter	0
450040(C377)	450040(C377)	User group - Set 10 parameter		Set range of using parameter	0
450041(C378)	450041(C378)	User group - Set 11 parameter		Set range of using parameter	0
450042(C379)	450042(C379)	User group - Set 12 parameter		Set range of using parameter	0
450043(C37A)	450043(C37A)	User group - Set 13 parameter		Set range of using parameter	0
450044(C37B)	450044(C37B)	User group - Set 14 parameter		Set range of using parameter	0
450045(C37C)	450045(C37C)	User group - Set 15 parameter		Set range of using parameter	0
450046(C37D)	450046(C37D)	User group - Set 16 parameter		Set range of using parameter	0
450047(C37E)	450047(C37E)	User group - Set 17 parameter		Set range of using parameter	0

No (Address) TM2	No (Address) TM4	Parameter	Description	Set range	Default
450048(C37F)	450048(C37F)	User group - Set 18 parameter		Set range of using parameter	0
450049(C380)	450049(C380)	User group - Set 19 parameter		Set range of using parameter	0
450050(C381)	450050(C381)	User group - Set 20 parameter		Set range of using parameter	0
450051(C382)	450051(C382)	User group - Set 21 parameter		Set range of using parameter	0
450052(C383)	450052(C383)	User group - Set 22 parameter		Set range of using parameter	0
450053(C384)	450053(C384)	User group - Set 23 parameter		Set range of using parameter	0
450054(C385)	450054(C385)	User group - Set 24 parameter		Set range of using parameter	0
450055(C386)	450055(C386)	User group - Set 25 parameter		Set range of using parameter	0
450056(C387)	450056(C387)	User group - Set 26 parameter		Set range of using parameter	0
450057(C388)	450057(C388)	User group - Set 27 parameter		Set range of using parameter	0
450058(C389)	450058(C389)	User group - Set 28 parameter		Set range of using parameter	0
450059(C38A)	450059(C38A)	User group - Set 29 parameter		Set range of using parameter	0
450060(C38B)	450060(C38B)	User group - Set 30 parameter		Set range of using parameter	0

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Dimensions or specifications on this manual are subject to change and some models may be discontinued without notice.

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