■ Modbus RTU composition (protocal)

※ Precaution

- This product allows the communication data format to be changed to Float or Integer.
- For Function 0x01, Function 0x02, and part of Function 0x04, the transmitted and received data format is Integer.
- For Function 0x03, Function 0x04, Function 0x06, and Function 0x10, the default data format for both transmission and reception is Integer. (Please refer to the Remarks section in each Function Table for Request and Response.)
- If you want to change the communication data format (Float or Integer), please refer to the Usage Example, (See Page 29.)

1) Func 0x01 : Read Coils

- You can monitor and control the ON/OFF status of the product's inputs and outputs.

• Request (Int)

Slave ID	Command			Number of registers	CRC16	
		High Byte	Low Byte	N (units)	Low Byte	High Byte
1BYTE	0X01	1BYTE	1BYTE	2BYTE	1BYTE	1BYTE

• Response (Int)

Slave ID	Command	Number of Data	Data	~	CRC16	
					Low Byte	High Byte
1BYTE	0X01	n BYTE	n BYTE		1BYTE	1BYTE

* n = N / 8
* If the remainder of N ÷ 8 is not 0, then n = n + 1.

• Register Map

NO	Address	Read/Write	Category	Explanation	ETC
-	-	-	-	-	-

2) Func 0x02 : Read Discrete Inputs

-You can check the ON/OFF status of the product's inputs and outputs.

• Request(Int)

Slave ID	Command	Start Address		Number of registers	CRC16	
		High Byte	Low Byte	N (units)	Low Byte	High Byte
1BYTE	0X01	1BYTE	1BYTE	2BYTE	1BYTE	1BYTE

• Response(Int)

Slave ID	Command	Number of Data	Data	~	CRC16	
					Low Byte	High Byte
1BYTE	0X02	n BYTE	n BYTE		1BYTE	1BYTE

* n = N / 8
* If the remainder of N ÷ 8 is not 0, then set n = n + 1.

• Register Map

NO	Address	Read/Write	Category	Explanation	ETC
20001	0000	Read	Temp. Control Output	0 : ON / 1 : OFF	Bit0(Int)

3) Func 0x03 : Read Holding Registers
-You can check the product's internal setting values.

• Request(Int)

Slave ID	Command	Start Address		Number of Data		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X03	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Response(Float)

Slave ID	Command	Number of Data	Data 1				Data(N)	CRC16	
			Byte	Byte	Byte	Byte	~	Low Byte	High Byte
1BYTE	0X03	(4*N) BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE

• Response(Int)

Slave ID	Command	Number of Data	Data 1		Data(N)	CRC16	
			High Byte	Low Byte	~	Low Byte	High Byte
1BYTE	0X03	(2*N) BYTE	1BYTE	1BYTE		1BYTE	1BYTE

4) Func 0x06 : Write Single Register

- You can change the product's internal setting values individually (one at a time).
- When communication is performed normally, the Request and Response codes are displayed as the same value.

• Request(Float)

Slave ID	Command	Start Address		Data				CRC16	
		High Byte	Low Byte	Byte	Byte	Byte	Byte	Low Byte	High Byte
1BYTE	0X06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Response(Float)

Slave ID	Command	Start Address		Data				CRC16	
		High Byte	Low Byte	Byte	Byte	Byte	Byte	Low Byte	High Byte
1BYTE	0X06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Request(Int)

Slave ID	Command	Start Address		Data		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Response(Int)

Slave ID	Command	Start Address		Data		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X06	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

5) Func 0x10 : Write Multiple Registers

- You can change the product's internal setting values consecutively.
- If an error occurs in even one data item during a consecutive change attempt, none of the values will be applied.

• Request(Float)

Slave ID	Command	Start Address		Number of registers		Number of Data	Data1				Data N	CRC16	
		High Byte	Low Byte	High Byte	Low Byte		Byte	Byte	Byte	Byte	~	Low Byte	High Byte
1BYTE	0X10	1BYTE	1BYTE	1BYTE	1BYTE	(4*N) BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE

• Response(Float)

Slave ID	Command	Start Address		Number of registers		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Request(Int)

Slave ID	Command	Start Address		Number of registers		Number of Data	Data1		Data N	CRC16	
		High Byte	Low Byte	High Byte	Low Byte		High Byte	Low Byte	~	Low Byte	High Byte
1BYTE	0X10	1BYTE	1BYTE	1BYTE	1BYTE	(2*N) BYTE	1BYTE	1BYTE		1BYTE	1BYTE

• Response(Int)

Slave ID	Command	Start Address		Number of registers		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X10	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Register Map

NO	Address	Read/Write	Category	Explanation	Unit	
40001	0000	Read/Write	Communication Data Format	0 : Float / 1 : Int		
40002	0001	Read/Write	Temperature Unit Setting	0 : ℃ / 1 : ℉		
40003	0002	Read/Write	Set Temperature	-55.0 ~ 99.9	℃	-550 ~ 999 (Int)
				-60 ~ 200	℉	
40004	0003	Read/Write	Output Function Selection	0 : COOL / 1 : HEAT		
40005	0004	Read/Write	Temperature Deviation Setting	0.1 ~ 25.0	℃	1 ~ 250 (Int)
				-1 ~ 100	℉	
40006	0005	Read/Write	Output Delay Time Setting	0 ~ 60	Min	
40007	0006	Read/Write		0 ~ 59	Sec	
40008	0007	Read/Write	Temperature Correction Setting	-10.0 ~ 10.0	℃	-100 ~ 100 (Int)
				-20 ~ 20	℉	
40009	0008	Read/Write	Communication Address Setting	1 ~ 99	Number	
40010	0009	Read/Write	Communication Rate Setting	0 : 1200 / 1 : 2400 / 2 : 4800 / 3 : 9600 / 4 : 19200	BPS	
40011	000A	Read/Write	Lock Setting	0 : Lock / 1 : Not Used		
40012	000B	Read/Write	System Setting	0 : Operation / 1 : Stop		

6) Func 0x04 : Read Input Registers
- You can check the product's current status values.

• Request(Int)

Slave ID	Command	Start Address		Number of Data		CRC16	
		High Byte	Low Byte	High Byte	Low Byte	Low Byte	High Byte
1BYTE	0X04	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE	1BYTE

• Response(Int)

Slave ID	Command	Number of Data	Data 1		Data (N)	CRC16	
			High Byte	Low Byte	~	Low Byte	High Byte
1BYTE	0X04	(2*N) BYTE	1BYTE	1BYTE		1BYTE	1BYTE

• Response(Float)

Slave ID	Command	Number of Data	Data 1				Data (N)	CRC16	
			Byte	Byte	Byte	Byte	~	Low Byte	High Byte
1BYTE	0X04	(4*N) BYTE	1BYTE	1BYTE	1BYTE	1BYTE		1BYTE	1BYTE

• Register Map

NO	Address	Read/Write	Category	Explanation	ETC
30001	0000	Read	Product Model Name	"DS"	ASCII
30002	0001	Read	Product Model Name	"FO"	ASCII
30003	0002	Read	Product Model Name	"X-"	ASCII
30004	0003	Read	Product Model Name	"XR"	ASCII
30005	0004	Read	Product Model Name	"10"	ASCII
30006	0005	Read	Product Model Name	Blank	ASCII

30007	0006	Read	Product Model Name	Blank	ASCII
30008	0007	Read	Product Model Name	Blank	ASCII
30009	0008	Read	Product Model Name	Blank	ASCII
30010	0009	Read	Product Model Name	Blank	ASCII
30011	000A	Read	Firmware Version	Integer Part	Int
30012	000B	Read	Firmware Version	Decimal Part	Int

30101	0064	Read	Present Temperature	-55.0 ~ 99.9	℃	-550 ~ 999 (Int)
				-60 ~ 200	℉	
30102	0065	Read	Temperature Unit	0 : ℃ / 1 : ℉		Bit0
			Temperature Control Output	0 : ON / 1 : OFF		Bit1
			Sensor open Error	0 : Error Occurred / 1 : Normal		Bit2
			Sensor Short Error	0 : Error Occurred / 1 : Normal		Bit3
			System Status	0 : ON / 1 : OFF		Bit4

※ This manual was produced using the Naver Nanum font.