

RS485 (ModBus RTU Mode)

Protocol of ModBus RTU Mode

The Modbus RTU protocol is used for communication in the JX-50. The data format and error check method is defined in the Modbus protocol. The half duplex query and respond mode is adopted in the Modbus protocol. There is only one master device in the communication net. The others are slave devices, waiting for the query of the master.

Transmission mode. The mode of transmission defines the data structure within a frame and the rules used to transmit data. The mode is defined in the following which is compatible with Modbus RTU Mode*.

Start Bit: 1 bit
Data bits: 8 bits
Parity: no parity
Stop bit: 1 bit
Error checking: CRC check

Framing

Address	Function	Data	Check
8-Bits	8-Bits	N x 8-Bits	16-Bits

Address: The address field of a message frame contains eight bits. Valid slave device addresses are in the range of 1~247 decimal. A master addresses a slave by placing the slave address in the address field of the message. When the slave ends its response, it places its own address in this address field of the response to let the master know which slave is responding.

Function: The function code field of a message frame contains eight bits. Valid codes are in the range of 1~255 decimal. When a message is sent from a master to a slave device the function code field tells the slave what kind of action to perform.

Code	Meaning	Action
01	Read Relay Output Status	Obtain current status of Relay Output
02	Read Digit Input (DI) Status	Obtain current status of Digit Input
03	Read Data	Obtain current binary value in one or more registers
05	Control Relay Output	Force Relay to a state of on or off
16	Preset Multiple-Registers	Place specific binary values into a series of consecutive Multiple-Registers

Data: The data field is constructed using sets of two hexadecimal digits, in the range of 00 to FF hexadecimal. The data field of messages sent from a master to slave devices contains additional information which the slave must use to take the action defined by the function code. This can include items like discrete and register addresses, the quantity of items to be handled, and the count of actual data bytes in the field. For example, if the master requests a slave to read a group of holding registers (function code 03); the data field specifies the starting register and how many registers are to be read. If the master writes to a group of registers in the slave (function code 10 hexadecimal), the data field specifies the starting register, how many registers to write, the count of data bytes to follow in the data field, and the data to be written into the registers.

If no error occurs, the data field of a response from a slave to a master contains the data requested. If an error occurs, the field contains an exception code that the master application can use to determine the next action to be taken. The data field can be nonexistent (of zero length) in certain kinds of messages.

Error Check: Messages include an error's checking field that is based on a Cyclical Redundancy Check (CRC) method. The CRC field checks the contents of the entire message. It is applied regardless of any parity check method used for the individual characters of the message. The CRC field is two bytes, containing a 16bit binary value. The CRC value is calculated by the transmitting device, which appends the CRC to the message.

The receiving device recalculates a CRC during receipt of the message, and compares the calculated value to the actual value it received in the CRC field. If the two values are not equal, an error results. The CRC is started by first preloading a 16-bit register to all 1's. Then a process begins of applying successive 8-bit bytes of the message to the current contents of the register. Only the eight bits of data in each character are used for generating the CRC. Start and stop bits, and the parity bit, do not apply to the CRC. During generation of the CRC, each 8-bit character is exclusive ORed with the register contents. Then the result is shifted in the direction of the least significant bit (LSB), with a zero filled into the most significant bit (MSB) position. The LSB is extracted and examined. If the LSB was a 1, the register is then exclusive ORed with a preset, fixed value. If the LSB was a 0, no exclusive OR takes place. This process is repeated until eight shifts have been performed. After the last (eighth) shift, the next 8-bit bytes exclusive ORed with the register current value and the process repeats for eight more shifts as described above. The final contents of the register, after all the bytes of the message have been applied, is the CRC value. When the CRC is appended to the message, the low-order byte is appended first, followed by the high-order byte.

Format of communication

Add	Fun	Data start reg hi	Data start reg lo	Data #of regs hi	Data #of regs lo	CRC16 hi	CRC16 lo
06H	03H	00H	00H	00H	21H	84H	65H

Addr: address of slave device

Fun: function code

Data start reg hi: start register address high byte

Data start reg lo: start register address low byte

Data #of reg hi: number of register high byte

Data #of reg lo: number of register low byte

CRC16 Hi: CRC high byte

CRC16 Lo: CRC low byte

1. Read Status of Relay (Function Code 01): This function code is used to read status of relay.

1=On

0=Off

There are 2 Relays in JX series. The Address of each Relay is

Relay1=0000H,

Relay2=0001H.

The following query is to read Relay Status of the device Number 17.

Query

Add	Fun	Relay start reg hi	Relay start reg lo	Relay #of regs hi	Relay #of regs lo	CRC16 hi	CRC16 lo
11H	01H	00H	00H	00H	02H	BFH	5BH

Response

The JX response includes the JX address, function code, quantity of data byte, the data, and error checking. An example response to read the status of Relay1 and Relay2 is shown as following.

The status of Relay1 and Relay2 is responding to the last 2 bit of the data.

Relay1: bit0 Relay2: bit1

Add	Fun	Byte Count	Data	CRC hi	CRC lo
11H	01H	01H	02H	D4H	89H

The content of the data is,

7	6	5	4	3	2	1	0
0	0	0	0	0	0	1	0

MSB

LSB

Relay1 = OFF (LSB),

Relay2=ON (Left to LSB)

2. Read the Status of DI (Function Code 02): This function code is used to read status.

1=On

0=Off

There are 4 DIs in JX series. The Address of each DI is

DI1=0000H,

DI2=0001H,

DI3=0002H,

DI4=0003H.

The following query is to read the 4 DI Status of the device Number 17.

Query

Add	Fun	DI start addr hi	DI start addr lo	DI num hi	DI num lo	CRC16 hi	CRC16 lo
11H	02H	00H	00H	00H	04H	7BH	59H

Response

The JX response includes the JX address, function code, quantity of data characters, the data characters, and error checking. An example response tread the status of 4 DIs is shown as following.

The status of each is responding to the last 4 bit of the data.

DI1: bit0 DI2: bit1 DI3: bit2 DI4: bit3

Add	Fun	Byte Count	Data	CRC 16 hi	CRC 16 lo
11H	02H	01H	03H	E5H	49H

The content of the data is,

7	6	5	4	3	2	1	0
0	0	0	0	0	0	1	1

MSB

LSB

DI1=On DI2=On DI3=Off DI4=Off

3. Read Data (Function Code 03)

Query

This function allows the master to obtain the measurement results of JX series.

An example as following to read the 3 measured data (F, V1 and V2) from slave device number 17, the data address of F is 0130H, V1 is 0131H and V2 is 0132H.

Add	Fun	Data start addr hi	Data start addr lo	Data #of regs hi	Data #of regs lo	CRC16 hi	CRC16 lo
11H	03H	01H	30H	00H	03H	06H	A8H

Response

The JX response includes the JX address, function code, quantity of data byte, data, and error checking.

An example response to read F, V1 and V2(F=1388H (50.00Hz), V1=03E7H (99.9V), V2=03E9H (100.1V) is shown as following

Add	Fun	Byte Count	Data 1 Hi	Data 1 Lo	Data 2 Hi	Data 2 Lo	Data 3 Hi	Data 3 Lo	CRC16 hi	CRC16 lo
11H	03H	06H	13H	88H	03H	E7H	03H	E9H	7FH	04H

4. Control Relay (Function Code 05)

Query

This message forces a single Relay either on or off. Any switch relay that exists in the JX can be forced to be either status (on or off). The address of Relays starts at 0000H (Relay1=0000H, Relay2=0001H). The data value FF00H will set the Relay on and the value 0000H will turn it off; all other values are illegal and will not affect that relay.

The example below is a request to the device number 17 to turn on Relay1.

Add	Fun	DO addr hi	DO addr lo	Value hi	Value lo	CRC16 hi	CRC16 lo
11H	05H	00H	00H	FFH	00H	8EH	AAH

Response

The normal response to the command request is to retransmit the message as received after the Relay status has been altered.

Add	Fun	Relay addr hi	Relay addr lo	Value hi	Value lo	CRC16 hi	CRC16 lo
11H	05H	00H	00H	FFH	00H	8EH	AAH

5. Preset / Reset Multi-Register(Function Code 16)

Query

Function 16 allows the user to modify the contents of a Multi-Register. Any Register that exists within the JX can have its contents changed by this message.

The example below is a request to a device number 17 to Preset Ep_imp(17807783.3KWH), while its Hex Value 0A9D4089H. Ep_imp data address is 0156H and 0157H.

Add	Fun	Data Start addr hi	Data Start addr lo	Data regs Hi	Data regs Lo	Byte Count	Value Hi	Value Lo	Value Hi	Value lo	CRC 16 Hi	CRC 16 Lo
11H	10H	01H	56H	00H	02H	04H	0AH	9DH	40H	89H	4DH	B9H

Response

The normal response to a preset Multi-Register request includes the JX address, function code, data start register, the number of registers, and error checking.

Add	Fun	Data Start addr hi	Data Start addr lo	Data regs Hi	Data regs Lo	CRC 16 Hi	CRC 16 Lo
11H	10H	01H	56H	00H	02H	A2H	B4H

JX-50 ADDRESS TABLE **Address number are Hexadecimal

Name	Address	Range	Explanation	Initial	Write/Read	Note
JX Parameter Setting			Function 03 Read; Function 16 Presetting			
Pass Word	0100h	0~9999	Pass Word		R/W	
Address	0101h	1~247	Device address of RS485 Communication		R/W	
Baud Rate	0102h	600~38400	Baud Rate of RS485 Communication		R/W	
Wiring of Voltage Input	0103h	0~2	Voltage Input Wiring Mode 0: 3LN, 1: 2LN, 2: 2LL		R/W	
Wiring of Current Input	0104h	0~2	Current Input Wiring Mode 0: 3CT, 1: 1CT, 2: 2CT		R/W	
Primary of PT	0105h* (Hi Word)	100~500000	Primary Value of PT		R/W	
	0106h* (Lo Word)		Primary Value of PT		R/W	
Secondary of PT	0107h	100~400	Secondary Value of PT		R/W	
Primary of CT	0108h	5~10000	Primary Value of CT		R/W	
DO Mode	0109h	0~1	Digit output mode 0: Pulse Output 1: Alarm Output		R/W	
DO1 vs. Energy pulse o/p	010Ah	0~8	Energy Parameter Number associated with DO1. Please refer to the page 19/40 of manual.		R/W	
DO2 vs. Energy pulse o/p	010Bh	0~8	Energy Parameter Number associated with DO2. Please refer to the page 19/40 of manual.		R/W	
Pulse Width	010Ch	1~50	Pulse Width		R/W	
Pulse Rate	010Dh	1~6000	Pulse Rate		R/W	
RO1 mode selection	010Eh	0~1	Relay1 Energized Mode 0: Latch 1: Momentary		R/W	
	010Fh	50~3000	Relay1 Pulse Width		R/W	
RO2 mode	0110h	0~1	Relay2 Energized Mode		R/W	

selection			0: Latch 1: Momentary			
Name	Address	Range	Explanation	Initial	Write/Read	Note
	0111h	50~3000	Relay2 Pulse Width		R/W	
	0112h	0~120	LCD Back light Time		R/W	
	0113h	1~30	Demand Slid Window Time.		R/W	
	0114h	0~1	Reset maximum / minimum storage 1: Yes , 0: No		R/W	
Status Input (DI)			Function 02 Reading			
	0000h		DI1 status 1: ON , 0: OFF		R	
	0001h		DI2 status 1: ON , 0: OFF		R	
	0002h		DI3 status 1: ON , 0: OFF		R	Opti on-I/ O
	0003h		DI4 status 1: ON , 0: OFF		R	
Relay Statue and Control			Function 01 Reading; Function 05 Controlling			
	0000h		Relay1 status 1: ON , 0: OFF		R/W	Opti on-I/ O
	0001h		Relay2 status 1: ON , 0: OFF		R/W	
Power Measurements			Function 03 Read;			
Frequency	0130h	0~7000	Frequency F_r (the numerical value in register) The real physical value is $F = F_r / 100$		R	
V_1	0131h	0~65535	Phase Voltage V_{1_r} (the numerical value in register) The real physical value is $V_1 = V_{1_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_2	0132h	0~65535	Phase Voltage V_{2_r} (the numerical value in register) The real physical value is $V_2 = V_{2_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_3	0133h	0~65535	Phase Voltage V_{3_r} (the numerical value in register) The real physical value is $V_3 = V_{3_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_{Inavg}	0134h	0~65535	Average Phase Voltage V_{Inavg_r} (the numerical value in register) The real physical value is $V_{Inavg} = V_{Inavg_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_{12}	0135h	0~65535	Line Voltage V_{12_r} (the numerical value in register) The real physical value is $V_{12} = V_{12_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_{23}	0136h	0~65535	Line Voltage V_{23_r} (the numerical value in register) The real physical value is $V_{23} = V_{23_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_{31}	0137h	0~65535	Line Voltage V_{31_r} (the numerical value in register) The real physical value is $V_{31} = V_{31_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
V_{llavg}	0138h	0~65535	Average Line Voltage V_{llavg_r} (the numerical value in register) The real physical value is $V_{llavg} = V_{llavg_r} \times (PT1/PT2) / 10$ (Unit: V)		R	
I_1	0139h	0~65535	Current I_{1_r} (the numerical value in register) The real physical value is $I_1 = I_{1_r} \times (CT1/5) / 1000$ (Unit: A)		R	
I_2	013Ah	0~65535	Current I_{2_r} (the numerical value in register)		R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
			The real physical value is $I_2 = I_{2_r} \times (CT1/5) / 1000$ (Unit: A)			
I₃	013Bh	0~65535	Current I _{3_r} (the numerical value in register) The real physical value is $I_3 = I_{3_r} \times (CT1/5) / 1000$ (Unit: A)		R	
I_{avg}	013Ch	0~65535	Average Current I _{avg_r} (the numerical value in register) The real physical value is $I_{avg} = I_{avg_r} \times (CT1/5) / 1000$ (Unit: A)		R	
I_n	013Dh	0~65535	Neutral Line Current I _{n_r} (the numerical value in register) The real physical value is $I_n = I_{n_r} \times (CT1/5) / 1000$ (Unit: A)		R	
P₁	013Eh	-32768~32767	Phase Active Power P _{1_r} (the numerical value in register) The real physical value is $P_1 = P_{1_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: W)		R	
P₂	013Fh	-32768~32767	Phase Active Power P _{2_r} (the numerical value in register) The real physical value is $P_2 = P_{2_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: W)		R	
P₃	0140h	-32768~32767	Phase Active Power P _{3_r} (the numerical value in register) The real physical value is $P_3 = P_{3_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: W)		R	
P_{sum}	0141h	-32768~32767	System Active Power P _{sum_r} (the numerical value in register) The real physical value is $P_{sum} = P_{sum_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: W)		R	
Q₁	0142h	-32768~32767	Phase Reactive Power Q _{1_r} (the numerical value in register) The real physical value is $Q_1 = Q_{1_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: Var)		R	
Q₂	0143h	-32768~32767	Phase Reactive Power Q _{2_r} (the numerical value in register) The real physical value is $Q_2 = Q_{2_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: Var)		R	
Q₃	0144h	-32768~32767	Phase Reactive Power Q _{3_r} (the numerical value in register) The real physical value is $Q_3 = Q_{3_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: Var)		R	
Q_{sum}	0145h	-32768~32767	System Reactive Power Q _{sum_r} (the numerical value in register) The real physical value is $Q_{sum} = Q_{sum_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: Var)		R	
S₁	0146h	0~65535	Phase Apparent Power S _{1_r} (the numerical value in register) The real physical value is $S_1 = S_{1_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: VA)		R	
S₂	0147h	0~65535	Phase Apparent Power S _{2_r} (the numerical value in register) The real physical value is $S_2 = S_{2_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: VA)		R	
S₃	0148h	0~65535	Phase Apparent Power S _{3_r} (the numerical value in register) The real physical value is $S_3 = S_{3_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: VA)		R	
S_{sum}	0149h	0~65535	System Apparent Power S _{sum_r} (the numerical value in register) The real physical value is $S_{sum} = S_{sum_r} \times (PT1/PT2) \times (CT1/5)$ (Unit: VA)		R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
PF1	014Ah	-1000~1000	Phase Power Factor PF1_r(the numerical value in register) The real physical value is PF1= PF1_r/1000		R	
PF2	014Bh	-1000~1000	Phase Power Factor PF2_r(the numerical value in register) The real physical value is PF2= PF2_r/1000		R	
PF3	014Ch	-1000~1000	Phase Power Factor PF3_r(the numerical value in register) The real physical value is PF3= PF3_r/1000		R	
PF	014Dh	-1000~1000	System Power Factor_r(the numerical value in register) The real physical value is PF= PF_r/1000		R	
Vunbl	014Eh	0~3000	Voltage Unbalance Factor Uunbl_r(the numerical value in register) Vunbl=(Uunbl_r/1000)×100%		R	
Iunbl	014Fh	0~3000	Current Unbalance Factor Iunbl_r(the numerical value in register) Iunbl=(Iunbl_r/1000)×100%		R	
Load Type	0150h	4Ch/43h/52h	Load Type (L/C/R) 4Ch: L 43h: C 52h: R		R	
Pmd	0151h	-32768~32767	Power Demand Pmd_r(the numerical value in register) The real physical value is Pmd= Pmd_r×(PT1/PT2)×(CT1/ 5) (Unit: W)		R	JX-52 only
Qmd	0152h	-32768~32767	Reactive power Demand Qmd_r(the numerical value in register) The real physical value is Qmd= Qmd_r×(PT1/PT2)×(CT1/ 5) (Unit: Var)		R	JX-52 only
Smd	0153h	0~65535	Apparent Power Demand Smd_r(the numerical value in register) The real physical value is Smd= Smd_r×(PT1/PT2)×(CT1/ 5) (Unit: VA)		R	JX-52 only
	0154h					
	0155h					
Energy Measurements			Function 03 Read; Function 16 Preset			
Imp Active Energy*	0156h* (Hi word)	0~99999999.9	Import Active Energy Ep_imp_r(the numerical value in register)		R/W	
	0157h* (Lo word)		Import Active Energy Ep_imp_r(the numerical value in register) The real physical value is Ep_imp= Ep_imp_r / 10 (Unit: KWh)		R/W	
Exp Active Energy *	0158h* (Hi word)	0~99999999.9	Export Active Energy Ep_exp_r(the numerical value in register)		R/W	
	0159h* (Lo word)		Export Active Energy Ep_exp_r(the numerical value in register) The real physical value is Ep_exp= Ep_exp_r / 10 (Unit: KWh)		R/W	
Imp Reactive Energy*	015Ah* (Hi word)	0~99999999.9	Import Reactive Energy Eq_imp_r(the numerical value in register)		R/W	
	015Bh* (Lo word)		Import Reactive Energy Eq_imp_r(the numerical value in register) The real physical value is Eq_imp= Eq_imp_r / 10 (Unit: Kvarh)		R/W	
Exp Reactive Energy *	015Ch* (Hi word)	0~99999999.9	Export Reactive Energy Eq_exp_r(the numerical value in register)		R/W	
	015Dh* (Lo word)		Export Reactive Energy Eq_exp_r(the numerical value in register) The real physical value is Eq_imp= Eq_imp_r / 10 (Unit: Kvarh)		R/W	

Name	Address	Range	Explanation	Initial	Write/Read	Note
Total Active Energy*	015Eh* (Hi word)	0~99999999.9	Active Energy Ep_total_r(the numerical value in register)		R/W	
	015Fh* (Lo word)		Active Energy Ep_total_r(the numerical value in register) The real physical value is Ep_total= Ep_total_r / 10 (Unit: KWh)		R/W	
Net Active Energy*	0160h* (Hi word)	0~99999999.9	Net Active Energy Ep_net_r(the numerical value in register)		R/W	
	0161h* (Lo word)		Net Active Energy Ep_net_r(the numerical value in register) The real physical value is Ep_net= Ep_net_r / 10 (Unit: KWh)		R/W	
Total Reactive Energy*	0162h* (Hi word)	0~99999999.9	Reactive Energy Eq_total_r(the numerical value in register)		R/W	
	0163h* (Lo word)		Reactive Energy Eq_total_r(the numerical value in register) The real physical value is Eq_total= Eq_total_r / 10 (Unit: Kvarh)		R/W	
Net Reactive Energy*	0164h* (Hi word)	0~99999999.9	Net Reactive Energy Eq_net_r(the numerical value in register)		R/W	
	0165h* (Lo word)		Net Reactive Energy Eq_net_r(the numerical value in register) The real physical value is Eq_net= Eq_net_r / 10 (Unit: KWh)		R/W	
	0166h				R/W	
	0167h				R/W	
Power Quality Measurements			Function 03 Read;			
THD_{V1}	0168h	0~10000	Total Harmonic Distortion of V ₁ or V ₁₂ , THD _{V1_r} (the numerical value in register) The real physical value is THD_{V1}= THD_{V1_r} / 10000×100%		R	
THD_{V2}	0169h	0~10000	Total Harmonic Distortion of V ₂ or V ₂₃ , THD _{V2_r} (the numerical value in register) The real physical value is THD_{V2}= THD_{V2_r} / 10000×100%		R	
THD_{V3}	016Ah	0~10000	Total Harmonic Distortion of V ₃ or V ₃₁ , THD _{V3_r} (the numerical value in register) The real physical value is THD_{V3}= THD_{V3_r} / 10000×100%		R	
THD_{V_avg}	016Bh	0~10000	Average Total Harmonic Distortion of Voltage, THD _{V_avg_r} (the numerical value in register) The real physical value is THD_{V_avg}= THD_{V_avg_r} / 10000×100%		R	
THD_{I1}	016Ch	0~10000	Total Harmonic Distortion of I ₁ , THD _{I1_r} (the numerical value in register) The real physical value is THD_{I1}= THD_{I1_r} / 10000×100%		R	
THD_{I2}	016Dh	0~10000	Total Harmonic Distortion of I ₂ , THD _{I2_r} (the numerical value in register) The real physical value is THD_{I2}= THD_{I2_r} / 10000×100%		R	
THD_{I3}	016Eh	0~10000	Total Harmonic Distortion of I ₃ , THD _{I3_r} (the numerical value in register) The real physical value is THD_{I3}= THD_{I3_r} / 10000×100%		R	
THD_{Iavg}	016Fh	0~10000	Total Harmonic Distortion of I _{avg} , THD _{Iavg_r} (the numerical value in register) The real physical value is THD_{Iavg}= THD_{Iavg_r} / 10000×100%		R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
IH _{V1}	0170h ~ 018DH	0~10000	Individual Harmonic of V ₁ or V ₁₂ (2nd to 31st), IH _{V1 r} (the numerical value in register) The real physical value is IH_{V1} = IH_{V1 r} / 10000×100%		R	JX-52 only
THD _{V1_O}	018Eh	0~10000	Total Odd Harmonic Distortion of V _{1 O} or V _{12 O} , THD _{V1 O r} (the numerical value in register) The real physical value is THD _{V1 O} = THD _{V1 O r} / 10000×100%		R	JX-52 only
THD _{V1_E}	018Fh	0~10000	Total Even Harmonic Distortion of V _{1 E} or V _{12 E} , THD _{V1 E r} (the numerical value in register) The real physical value is THD _{V1 E} = THD _{V1 E r} / 10000×100%		R	JX-52 only
CF _{V1}	0190h	0~65535	Crest factor of V ₁ or V ₁₂ , CF _{V1 r} (the numerical value in register) The real physical value is CF _{V1} = CF _{V1 r} / 1000		R	JX-52 only
THFF _{V1}	0191h	0~10000	Telephone interference factor of V ₁ or V ₁₂ , THFF _{V1 r} (the numerical value in register) The real physical value is THFF _{V1} = THFF _{V1 r} / 10000 ×100%		R	JX-52 only
IH _{V2}	0192h ~ 01AFh	0~10000	Individual Harmonic of V ₂ or V ₂₃ (2nd to 31st), IH _{V2 r} (the numerical value in register) The real physical value is IH _{V2} = IH _{V2 r} / 10000×100%		R	JX-52 only
THD _{V2_O}	01B0h	0~10000	Total Odd Harmonic Distortion of V _{2 O} or V _{23 O} , THD _{V2 O r} (the numerical value in register) The real physical value is THD _{V2 O} = THD _{V2 O r} / 10000×100%		R	JX-52 only
THD _{V2_E}	01B1h	0~10000	Total Even Harmonic Distortion of V _{2 E} or V _{23 E} , THD _{V2 E r} (the numerical value in register) The real physical value is THD _{V2 E} = THD _{V2 E r} / 10000×100%		R	JX-52 only
CF _{V2}	01B2h	0~65535	Crest factor of V ₂ or V ₂₃ , CF _{V2 r} (the numerical value in register) The real physical value is CF _{V2} = CF _{V2 r} / 1000		R	JX-52 only
THFF _{V2}	01B3h	0~10000	Telephone interference factor of V ₂ or V ₂₃ , THFF _{V2 r} (the numerical value in register) The real physical value is THFF _{V2} = THFF _{V2 r} / 10000 ×100%		R	JX-52 only
IH _{V3}	01B4h ~ 01D1h	0~10000	Individual Harmonic of V ₃ or V ₃₁ (2nd to 31st), IH _{V3 r} (the numerical value in register) The real physical value is IH _{V3} = IH _{V3 r} / 10000×100%		R	JX-52 only
THD _{V3_O}	01D2h	0~10000	Total Odd Harmonic Distortion of V _{3 O} or V _{31 O} , THD _{V3 O r} (the numerical value in register) The real physical value is THD _{V3 O} = THD _{V3 O r} / 10000×100%		R	JX-52 only
THD _{V3_E}	01D3h	0~10000	Total Even Harmonic Distortion of V _{3 E} or V _{31 E} , THD _{V3 E r} (the numerical value in register) The real physical value is THD _{V3 E} = THD _{V3 E r} / 10000×100%		R	JX-52 only
CF _{V3}	01D4h	0~65535	Crest factor of V ₃ or V ₃₁ , CF _{V3 r} (the numerical value in register) The real physical value is CF _{V3} = CF _{V3 r} / 1000		R	JX-52 only

Name	Address	Range	Explanation	Initial	Write/Read	Note
THFF_{V3}	01D5h	0~10000	Telephone interference factor of V ₃ or V ₃₁ , THFF _{V3 r} (the numerical value in register) The real physical value is $THFF_{V3} = THFF_{V3 r} / 10000 \times 100\%$		R	JX-52 only
IH_{I1}	01D6h ~ 01F3h	0~10000	Individual Harmonic of I ₁ (2nd to 31st), IH _{I1 r} (the numerical value in register) The real physical value is $IH_{I1} = IH_{I1 r} / 10000 \times 100\%$		R	JX-52 only
THD_{I1_O}	01F4h	0~10000	Total Odd Harmonic Distortion of I _{1 O} , THD _{I1 O r} (the numerical value in register) The real physical value is $THD_{I1 O} = THD_{I1 O r} / 10000 \times 100\%$		R	JX-52 only
THD_{I1_E}	01F5h	0~10000	Total Even Harmonic Distortion of I _{1 E} , THD _{I1 E r} (the numerical value in register) The real physical value is $THD_{I1 E} = THD_{I1 E r} / 10000 \times 100\%$		R	JX-52 only
KF_{I1}	01F6h	0~65535	K factor of I ₁ , KF _{I1 r} (the numerical value in register) The real physical value is $KF_{I1} = KF_{I1 r} / 10$		R	JX-52 only
IH_{I2}	01F7h ~ 0214h	0~10000	Individual Harmonic of I ₂ (2nd to 31st), IH _{I2 r} (the numerical value in register) The real physical value is $IH_{I2} = IH_{I2 r} / 10000 \times 100\%$		R	JX-52 only
THD_{I2_O}	0215h	0~10000	Total Odd Harmonic Distortion of I _{2 O} , THD _{I2 O r} (the numerical value in register) The real physical value is $THD_{I2 O} = THD_{I2 O r} / 10000 \times 100\%$		R	JX-52 only
THD_{I2_E}	0216h	0~10000	Total Even Harmonic Distortion of I _{2 E} , THD _{I2 E r} (the numerical value in register) The real physical value is $THD_{I2 E} = THD_{I2 E r} / 10000 \times 100\%$		R	JX-52 only
KF_{I2}	0217h	0~65535	K factor of I ₂ , KF _{I2 r} (the numerical value in register) The real physical value is $KF_{I2} = KF_{I2 r} / 10$		R	JX-52 only
IH_{I3}	0218h ~ 0235h	0~10000	Individual Harmonic of I ₃ (2nd to 31st), IH _{I3 r} (the numerical value in register) The real physical value is $IH_{I3} = IH_{I3 r} / 10000 \times 100\%$		R	JX-52 only
THD_{I3_O}	0236h	0~10000	Total Odd Harmonic Distortion of I _{3 O} , THD _{I3 O r} (the numerical value in register) The real physical value is $THD_{I3 O} = THD_{I3 O r} / 10000 \times 100\%$		R	JX-52 only
THD_{I3_E}	0237h	0~10000	Total Even Harmonic Distortion of I _{3 E} , THD _{I3 E r} (the numerical value in register) The real physical value is $THD_{I3 E} = THD_{I3 E r} / 10000 \times 100\%$		R	JX-52 only
KF_{I3}	0238h	0~65535	K factor of I ₃ , KF _{I3 r} (the numerical value in register) The real physical value is $KF_{I3} = KF_{I3 r} / 10$		R	JX-52 only

Max/Min Statistics Value with Time Stamps			Function 03 Read;			
Name	Address	Range	Explanation	Initial	Write/Read	Note
V_{1_max}	0239h	0~65535	V _{1_max}		R	JX-52 only
Year	023Ah	2000~2099	Time Stamp of V _{1_max}		R	
Month	023Bh	1~12			R	
Day	023Ch	1~31			R	
Hour	023Dh	0~23			R	
Minute	023Eh	0~59			R	
Second	023Fh	0~59			R	
V_{2_max}	0240h	0~65535	V _{2_max}		R	JX-52 only
Year	0241h	2000~2099	Time Stamp of V _{2_max}		R	
Month	0242h	1~12			R	
Day	0243h	1~31			R	
Hour	0244h	0~23			R	
Minute	0245h	0~59			R	
Second	0246h	0~59			R	
V_{3_max}	0247h	0~65535	V _{3_max}		R	JX-52 only
Year	0248h	2000~2099	Time Stamp of V _{3_max}		R	
Month	0249h	1~12			R	
Day	024Ah	1~31			R	
Hour	024Bh	0~23			R	
Minute	024Ch	0~59			R	
Second	024Dh	0~59			R	
V_{12_max}	024Eh	0~65535	V _{12_max}		R	JX-52 only
Year	024Fh	2000~2099	Time Stamp of V _{12_max}		R	
Month	0250h	1~12			R	
Day	0251h	1~31			R	
Hour	0252h	0~23			R	
Minute	0253h	0~59			R	
Second	0254h	0~59			R	
V_{23_max}	0255h	0~65535	V _{23_max}		R	JX-52 only
Year	0256h	2000~2099	Time Stamp of V _{23_max}		R	
Month	0257h	1~12			R	
Day	0258h	1~31			R	
Hour	0259h	0~23			R	
Minute	025Ah	0~59			R	
Second	025Bh	0~59			R	
V_{31_max}	025Ch	0~65535	V _{31_max}		R	JX-52 only
Year	025Dh	2000~2099	Time Stamp of V _{31_max}		R	
Month	025Eh	1~12			R	
Day	025Fh	1~31			R	
Hour	0260h	0~23			R	
Minute	0261h	0~59			R	
Second	0262h	0~59			R	
I_{1_max}	0263h	0~65535	I _{1_max}		R	JX-52 only
Year	0264h	2000~2099	Time Stamp of I _{1_max}		R	
Month	0265h	1~12			R	
Day	0266h	1~31			R	
Hour	0267h	0~23			R	
Minute	0268h	0~59			R	
Second	0269h	0~59			R	
I_{2_max}	026Ah	0~65535	I _{2_max}		R	JX-52 only
Year	026Bh	2000~2099	Time Stamp of I _{2_max}		R	
Month	026Ch	1~12			R	
Day	026Dh	1~31			R	
Hour	026Eh	0~23			R	
Minute	026Fh	0~59			R	
Second	0270h	0~59			R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
I_{3_max}	0271h	0~65535	I _{3_max}		R	JX-52 only
Year	0272h	2000~2099	Time Stamp of I _{3_max}		R	
Month	0273h	1~12			R	
Day	0274h	1~31			R	
Hour	0275h	0~23			R	
Minute	0276h	0~59			R	
Second	0277h	0~59			R	
P_{max}	0278h	-32768~32767	P _{max}		R	JX-52 only
Year	0279h	2000~2099	Time Stamp of P _{max}		R	
Month	027Ah	1~12			R	
Day	027Bh	1~31			R	
Hour	027Ch	0~23			R	
Minute	027Dh	0~59			R	
Second	027Eh	0~59			R	
Q_{max}	027Fh	-32768~32767	Q _{max}		R	JX-52 only
Year	0280h	2000~2099	Time Stamp of Q _{max}		R	
Month	0281h	1~12			R	
Day	0282h	1~31			R	
Hour	0283h	0~23			R	
Minute	0284h	0~59			R	
Second	0285h	0~59			R	
S_{max}	0286h	0~65535	S _{max}		R	JX-52 only
Year	0287h	2000~2099	Time Stamp of S _{max}		R	
Month	0288h	1~12			R	
Day	0289h	1~31			R	
Hour	028Ah	0~23			R	
Minute	028Bh	0~59			R	
Second	028Ch	0~59			R	
PF_{max}	028Dh	-1000~1000	PF _{max}		R	JX-52 only
Year	028Eh	2000~2099	Time Stamp of PF _{max}		R	
Month	028Fh	1~12			R	
Day	0290h	1~31			R	
Hour	0291h	0~23			R	
Minute	0292h	0~59			R	
Second	0293h	0~59			R	
F_{max}	0294h	0~7000	F _{max}		R	JX-52 only
Year	0295h	2000~2099	Time Stamp of F _{max}		R	
Month	0296h	1~12			R	
Day	0297h	1~31			R	
Hour	0298h	0~23			R	
Minute	0299h	0~59			R	
Second	029Ah	0~59			R	
P_{md_max}	029Bh	-32768~32767	P _{md_max} (Maximum Demand of Active Power)		R	JX-52 only
Year	029Ch	2000~2099	Time Stamp of P _{md_max}		R	
Month	029Dh	1~12			R	
Day	029Eh	1~31			R	
Hour	029Fh	0~23			R	
Minute	02A0h	0~59			R	
Second	02A1h	0~59			R	
Q_{md_max}	02A2h	-32768~32767	Q _{md_max} (Maximum Demand of Reactive Power)		R	JX-52 only
Year	02A3h	2000~2099	Time Stamp of Q _{md_max}		R	
Month	02A4h	1~12			R	
Day	02A5h	1~31			R	
Hour	02A6h	0~23			R	
Minute	02A7h	0~59			R	
Second	02A8h	0~59			R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
S_{md_max}	02A9h	0~65535	S _{md_max} (Maximum Demand of Apparent Power)		R	JX-52 only
Year	02AAh	2000~2099	Time Stamp of S _{md_max}		R	
Month	02ABh	1~12			R	
Day	02ACh	1~31			R	
Hour	02ADh	0~23			R	
Minute	02AEh	0~59			R	
Second	02AFh	0~59			R	
V_{1_min}	02B0h	0~65535	V _{1_min}		R	JX-52 only
Year	02B1h	2000~2099	Time Stamp of V _{1_min}		R	
Month	02B2h	1~12			R	
Day	02B3h	1~31			R	
Hour	02B4h	0~23			R	
Minute	02B5h	0~59			R	
Second	02B6h	0~59			R	
V_{2_min}	02B7h	0~65535	V _{2_min}		R	JX-52 only
Year	02B8h	2000~2099	Time Stamp of V _{2_min}		R	
Month	02B9h	1~12			R	
Day	02BAh	1~31			R	
Hour	02BBh	0~23			R	
Minute	02BCh	0~59			R	
Second	02BDh	0~59			R	
V_{3_min}	02BEh	0~65535	V _{3_min}		R	JX-52 only
Year	02BFh	2000~2099	Time Stamp of V _{3_min}		R	
Month	02C0h	1~12			R	
Day	02C1h	1~31			R	
Hour	02C2h	0~23			R	
Minute	02C3h	0~59			R	
Second	02C4h	0~59			R	
V_{12_min}	02C5h	0~65535	V _{12_min}		R	JX-52 only
Year	02C6h	2000~2099	Time Stamp of V _{12_min}		R	
Month	02C7h	1~12			R	
Day	02C8h	1~31			R	
Hour	02C9h	0~23			R	
Minute	02CAh	0~59			R	
Second	02CBh	0~59			R	
V_{23_min}	02CCh	0~65535	V _{23_min}		R	JX-52 only
Year	02CDh	2000~2099	Time Stamp of V _{23_min}		R	
Month	02CEh	1~12			R	
Day	02CFh	1~31			R	
Hour	02D0h	0~23			R	
Minute	02D1h	0~59			R	
Second	02D2h	0~59			R	
V_{31_min}	02D3h	0~65535	V _{31_min}		R	JX-52 only
Year	02D4h	2000~2099	Time Stamp of V _{31_min}		R	
Month	02D5h	1~12			R	
Day	02D6h	1~31			R	
Hour	02D7h	0~23			R	
Minute	02D8h	0~59			R	
Second	02D9h	0~59			R	
I_{1_min}	02DAh	0~65535	I _{1_min}		R	JX-52 only
Year	02DBh	2000~2099	Time Stamp of I _{1_min}		R	
Month	02DCh	1~12			R	
Day	02DDh	1~31			R	
Hour	02DEh	0~23			R	
Minute	02DFh	0~59			R	
Second	02E0h	0~59			R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
I_{2_min}	02E1h	0~65535	I _{2_min}		R	JX-52 only
Year	02E2h	2000~2099	Time Stamp of I _{2_min}		R	
Month	02E3h	1~12			R	
Day	02E4h	1~31			R	
Hour	02E5h	0~23			R	
Minute	02E6h	0~59			R	
Second	02E7h	0~59			R	
I_{3_min}	02E8h	0~65535	I _{3_min}		R	JX-52 only
Year	02E9h	2000~2099	Time Stamp of I _{3_min}		R	
Month	02EAh	1~12			R	
Day	02EBh	1~31			R	
Hour	02ECh	0~23			R	
Minute	02EDh	0~59			R	
Second	02EEh	0~59			R	
P_{min}	02EFh	-32768~32767	P _{min}		R	JX-52 only
Year	02F0h	2000~2099	Time Stamp of P _{min}		R	
Month	02F1h	1~12			R	
Day	02F2h	1~31			R	
Hour	02F3h	0~23			R	
Minute	02F4h	0~59			R	
Second	02F5h	0~59			R	
Q_{min}	02F6h	-32768~32767	Q _{min}		R	JX-52 only
Year	02F7h	2000~2099	Time Stamp of Q _{min}		R	
Month	02F8h	1~12			R	
Day	02F9h	1~31			R	
Hour	02FAh	0~23			R	
Minute	02FBh	0~59			R	
Second	02FCh	0~59			R	
S_{min}	02FDh	0~65535	S _{min}		R	JX-52 only
Year	02FEh	2000~2099	Time Stamp of S _{min}		R	
Month	02FFh	1~12			R	
Day	0300h	1~31			R	
Hour	0301h	0~23			R	
Minute	0302h	0~59			R	
Second	0303h	0~59			R	
PF_{min}	0304h	-1000~1000	PF _{min}		R	JX-52 only
Year	0305h	2000~2099	Time Stamp of PF _{min}		R	
Month	0306h	1~12			R	
Day	0307h	1~31			R	
Hour	0308h	0~23			R	
Minute	0309h	0~59			R	
Second	030Ah	0~59			R	
F_{min}	030Bh	0~7000	F _{min}		R	JX-52 only
Year	030Ch	2000~2099	Time Stamp of F _{min}		R	
Month	030Dh	1~12			R	
Day	030Eh	1~31			R	
Hour	030Fh	0~23			R	
Minute	0310h	0~59			R	
Second	0311h	0~59			R	
P_{md_min}	0312h	-32768~32767	P _{md_min} (Minimum Demand of Active Power)		R	JX-52 only
Year	0313h	2000~2099	Time Stamp of P _{md_min}		R	
Month	0314h	1~12			R	
Day	0315h	1~31			R	
Hour	0316h	0~23			R	
Minute	0317h	0~59			R	
Second	0318h	0~59			R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
Q_{md_min}	0319h	-32768~32767	Q _{md_min} (Minimum Demand of Reactive Power)		R	JX-52 only
Year	031Ah	2000~2099	Time Stamp of Q _{md_min}		R	
Month	031Bh	1~12			R	
Day	031Ch	1~31			R	
Hour	031Dh	0~23			R	
Minute	031Eh	0~59			R	
Second	031Fh	0~59			R	
S_{md_min}	0320h	0~65535	S _{md_min} (Minimum Demand of Apparent Power)		R	JX-52 only
Year	0321h	2000~2099	Time Stamp of S _{md_min}		R	
Month	0322h	1~12			R	
Day	0323h	1~31			R	
Hour	0324h	0~23			R	
Minute	0325h	0~59			R	
Second	0326h	0~59			R	
Date and Time table			Function 03 Read; Function 16 Presetting			
Year	032Ah	2000~2099			R/W	
Month	032Bh	1~12			R/W	
Day	032Ch	1~31			R/W	
Hour	032Dh	0~23			R/W	
Minute	032Eh	0~59			R/W	
Second	032Fh	0~59			R/W	
Alarm Parameter Register Setting			Function 03 Read; Function 16 Presetting			
Name	Address	Range	Explanation	Initial	Write/Read	Note
	0330h	0~8	9 condition inequalities enable Registers Bit0~8 corresponding to 1st~9th inequality		R/W	
	0331h	0~255	Time limit Register		R/W	
	0332h		Register associated DO1 with inequalities, Associated DO1 Bit0~8 corresponding to 1st~9th inequality 1: Yes 0: No		R/W	
	0333h		Register associated DO2 with inequalities, Associated DO2 Bit0~8 corresponding to 1st~9th inequality 1: Yes 0: No		R/W	
	0334h	0~34	Register associated 1st inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	0335h	0~1	Relation symbol selecting register, INEQU_sign1 0: < Low limit 1: > High limit		R/W	
	0336h	Related with variable	Limit value for 1st inequality, Ref1		R/W	
	0337h	0~34	Register associated 2nd inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	0338h	0~1	Relation symbol selecting register, INEQU_sign2 0: < Low limit 1: > High limit		R/W	
	0339h	Related with variable	Limit value for 2nd inequality, Ref2		R/W	
	033Ah	0~34	Register associated 3rd inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	033Bh	0~1	Relation symbol selecting register, INEQU_sign3 0: < Low limit 1: > High limit		R/W	

Name	Address	Range	Explanation	Initial	Write/Read	Note
	033Ch	Related with variable	Limit value for 3rd inequality, Ref3		R/W	
	033Dh	0~34	Register associated 4th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	033Eh	0~1	Relation symbol selecting register, INEQU_sign4 0:< Low limit 1:> High limit		R/W	
	033Fh	Related with variable	Limit value for 4th inequality, Ref4		R/W	
	0340h	0~34	Register associated 5th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	0341h	0~1	Relation symbol selecting register, INEQU_sign5 0:< Low limit 1:> High limit		R/W	
	0342h	Related with variable	Limit value for 5th inequality, Ref5		R/W	
	0343h	0~34	Register associated 5th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	0344h	0~1	Relation symbol selecting register, INEQU_sign6 0:< Low limit 1:> High limit		R/W	
	0345h	Related with variable	Limit value for 6th inequality, Ref6		R/W	
	0346h	0~34	Register associated 7th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	0347h	0~1	Relation symbol selecting register, INEQU_sign7 0:< Low limit 1:> High limit		R/W	
	0348h	Related with variable	Limit value for 7th inequality, Ref7		R/W	
	0349h	0~34	Register associated 7th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	034Ah	0~1	Relation symbol selecting register, INEQU_sign8 0:< Low limit 1:> High limit		R/W	
	034Bh	Related with variable	Limit value for 8th inequality, Ref8		R/W	
	034Ch	0~34	Register associated 7th inequality with one of the 34 variables. Please refer to the table 3.1 of Parameter		R/W	
	034Dh	0~1	Relation symbol selecting register, INEQU_sign9 0:< Low limit 1:> High limit		R/W	
	034Eh	Related with Parameter	Limit value for 9th inequality, Ref9		R/W	
Alarm Recording			Function 03 Read			
	0354h		Over limit Status of the 9 inequalities Bit0~8 corresponding to 1st ~9th inequality 0: No 1: Yes		R	
	0355h	0~34	Parameter Number of the 1st Alarm record		R	
	0356h	-32768~32767	Parameter Value of the 1st Alarm Record		R	
	0357h	2000~2099	Year of 1st Alarm Record		R	
	0358h	1~12	Month of 1st Alarm Record		R	
	0359h	1~31	date of 1st Alarm Record		R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
	035Ah	0~23	Hour of 1st Alarm Record		R	
	035Bh	0~59	Minute of 1st Alarm Record		R	
	035Ch	0~59	Second of 1st Alarm Record		R	
	035Dh	0~34	Parameter Number of the 2nd Alarm record		R	
	035Eh	-32768~32767	Parameter Value of the 2nd Alarm Record		R	
	035Fh	2000~2099	Year of 2nd Alarm Record		R	
	0360h	1~12	Month of 2nd Alarm Record		R	
	0361h	1~31	date of 2nd Alarm Record		R	
	0362h	0~23	Hour of 2nd Alarm Record		R	
	0363h	0~59	Minute of 2nd Alarm Record		R	
	0364h	0~59	Second of 2nd Alarm Record		R	
	0365h	0~34	Parameter Number of the 3rd Alarm record		R	
	0366h	-32768~32767	Parameter Value of the 3rd Alarm Record		R	
	0367h	2000~2099	Year of 3rd Alarm Record		R	
	0368h	1~12	Month of 3rd Alarm Record		R	
	0369h	1~31	date of 3rd Alarm Record		R	
	036Ah	0~23	Hour of 3rd Alarm Record		R	
	036Bh	0~59	Minute of 3rd Alarm Record		R	
	036Ch	0~59	Second of 3rd Alarm Record		R	
	036Dh	0~34	Parameter Number of the 4th Alarm record		R	
	036Eh	-32768~32767	Parameter Value of the 4th Alarm Record		R	
	036Fh	2000~2099	Year of 4th Alarm Record		R	
	0370h	1~12	Month of 4th Alarm Record		R	
	0371h	1~31	date of 4th Alarm Record		R	
	0372h	0~23	Hour of 4th Alarm Record		R	
	0373h	0~59	Minute of 4th Alarm Record		R	
	0374h	0~59	Second of 4th Alarm Record		R	
	0375h	0~34	Parameter Number of the 5th Alarm record		R	
	0376h	-32768~32767	Parameter Value of the 5th Alarm Record		R	
	0377h	2000~2099	Year of 5th Alarm Record		R	
	0378h	1~12	Month of 5th Alarm Record		R	
	0379h	1~31	date of 5th Alarm Record		R	
	037Ah	0~23	Hour of 5th Alarm Record		R	
	037Bh	0~59	Minute of 5th Alarm Record		R	
	037Ch	0~59	Second of 5th Alarm Record		R	
	037Dh	0~34	Parameter Number of the 6th Alarm record		R	
	037Eh	-32768~32767	Parameter Value of the 6th Alarm Record		R	
	037Fh	2000~2099	Year of 6th Alarm Record		R	
	0380h	1~12	Month of 6th Alarm Record		R	
	0381h	1~31	date of 6th Alarm Record		R	
	0382h	0~23	Hour of 6th Alarm Record		R	
	0383h	0~59	Minute of 6th Alarm Record		R	
	0384h	0~59	Second of 6th Alarm Record		R	
	0385h	0~34	Parameter Number of the 7th Alarm record		R	
	0386h	-32768~32767	Parameter Value of the 7th Alarm Record		R	
	0387h	2000~2099	Year of 7th Alarm Record		R	
	0388h	1~12	Month of 7th Alarm Record		R	
	0389h	1~31	date of 7th Alarm Record		R	
	038Ah	0~23	Hour of 7th Alarm Record		R	
	038Bh	0~59	Minute of 7th Alarm Record		R	
	038Ch	0~59	Second of 7th Alarm Record		R	
	038Dh	0~34	Parameter Number of the 8th Alarm record		R	
	038Eh	-32768~32767	Parameter Value of the 8th Alarm Record		R	
	038Fh	2000~2099	Year of 8th Alarm Record		R	
	0390h	1~12	Month of 8th Alarm Record		R	
	0391h	1~31	date of 8th Alarm Record		R	
	0392h	0~23	Hour of 8th Alarm Record		R	
	0393h	0~59	Minute of 8th Alarm Record		R	
	0394h	0~59	Second of 8th Alarm Record		R	

Name	Address	Range	Explanation	Initial	Write/Read	Note
	0395h	0~34	Parameter Number of the 9th Alarm record		R	
	0396h	-32768~32767	Parameter Value of the 9th Alarm Record		R	
	0397h	2000~2099	Year of 9th Alarm Record		R	
	0398h	1~12	Month of 9th Alarm Record		R	
	0399h	1~31	date of 9th Alarm Record		R	
	039Ah	0~23	Hour of 9th Alarm Record		R	
	039Bh	0~59	Minute of 9th Alarm Record		R	
	039Ch	0~59	Second of 9th Alarm Record		R	
Phase angle recording				Function 03 Read		
The phase differences between voltage or Current and U_1 (or U_{12}) are recorded, The phase differences are used to tell the phase sequence						
	039Dh	0~3600	Phase difference V_1/V_2 (3P4W), Phase angle $\theta_{V_1 V_2_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_1 V_2} = \theta_{V_1 V_2_r} / 10$ (Degree)		R	
	039Eh	0~3600	Phase difference V_1/V_3 (3P4W), Phase angle $\theta_{V_1 V_3_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_1 V_3} = \theta_{V_1 V_3_r} / 10$ (Degree)		R	
	039Fh	0~3600	Phase difference V_1/I_1 (3P4W), Phase angle $\theta_{V_1 I_1_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_1 I_1} = \theta_{V_1 I_1_r} / 10$ (Degree)		R	
	03A0h	0~3600	Phase difference V_1/I_2 (3P4W), Phase angle $\theta_{V_1 I_2_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_1 I_2} = \theta_{V_1 I_2_r} / 10$ (Degree)		R	
	03A1h	0~3600	Phase difference V_1/I_3 (3P4W), Phase angle $\theta_{V_1 I_3_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_1 I_3} = \theta_{V_1 I_3_r} / 10$ (Degree)		R	
	03A2h	0~3600	Phase difference V_{12}/V_{23} (3P3W) , Phase angle $\theta_{V_{12} V_{23}_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_{12} V_{23}} = \theta_{V_{12} V_{23}_r} / 10$ (Degree)		R	
	03A3h	0~3600	Phase difference V_{12}/I_1 (3P3W) , Phase angle $\theta_{V_{12} I_1_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_{12} I_1} = \theta_{V_{12} I_1_r} / 10$ (Degree)		R	
	03A4h	0~3600	Phase difference V_{12}/I_3 (3P3W) , Phase angle $\theta_{V_{12} I_3_r}$ (the numerical value in register) The real physical value is Phase angle $\theta_{V_{12} I_3} = \theta_{V_{12} I_3_r} / 10$ (Degree)		R	