

# SG2V3 ModBus Protocol

(V type: RS485 port)

Series: SG2 V type  
Version: V06

|   |   |            |
|---|---|------------|
| A | C | D          |
|   |   | 2011-01-02 |

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    PWM Preset value (19xxH) ..... 26

    AS (ADD-Subtract) Preset value (1AxxH~1CxxH) ..... 27

    MD (Multiply-Divide) Preset value (1DxxH~1FxxH) ..... 27

    PID Preset value (20xxH) ..... 27

    MX (Data multiplexer) Preset value (21xxH~24xxH) ..... 28

    AR (Analog ram control) Preset value (25xxH) ..... 29

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**1. Communication Data Frame**

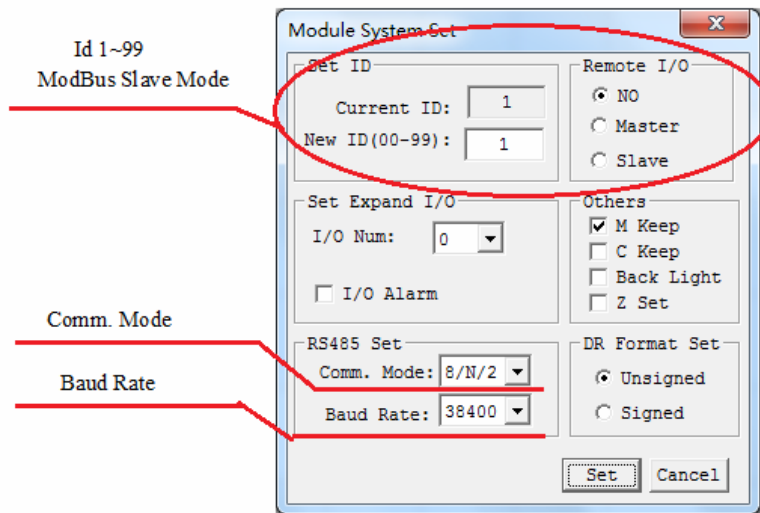
SG2 series PLC can be communication controlled by the PC or other controller with the communication protocol, ModBus RTU slave Mode, via RS485.

**1.1 Communication parameter**

SG2 provides different communication parameter to satisfy your needs. And there are two ways to set that parameter.

1. Setting communication parameter via SG2 Client.

- ◆ Insert the plastic connector end of the programming cable into the SG2 smart relay. Connect the opposite end of the cable to an RS232 serial port on the computer.
- ◆ In SG2 Client Soft Select Operation>>Module System Set, to open the dialog box as show below.

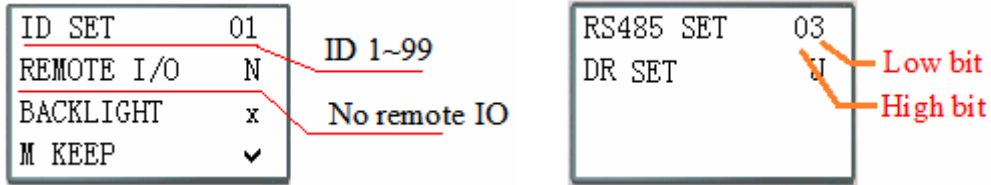


- ◆ As the illustration show, you can set Communication Mode and Baud Rate.
- ◆ In the table below, list the options which you can choose from.

|            |            |                                     |
|------------|------------|-------------------------------------|
| Comm. Mode | 8/N/2      | Data 8bit, No Parity, 2 Stop bit.   |
|            | 8/E/1      | Data 8bit, Even Parity, 1 Stop bit. |
|            | 8/O/1      | Data 8bit, Odd Parity, 1 Stop bit.  |
|            | 8/N/1      | Data 8bit, No Parity, 1 Stop bit.   |
| Baud Rate. | 4800 bps   |                                     |
|            | 9600 bps   |                                     |
|            | 19200 bps  |                                     |
|            | 38400 bps  |                                     |
|            | 57600 bps  |                                     |
|            | 115200 bps |                                     |

2. Set communication format and Baud Rate on SG2.

- ◆ Press ESC to enter main menu.
- ◆ Press UP/DOWN to choose SET menu, and press OK to enter it.
- ◆ Press UP/DOWN makes the LCD to display the options as show below.



- ◆ System setting is N Remote I/O and ID SET isn't 0.
- ◆ Changing high bit would set Comm. Mode; changing low bit would set Baud Rate.

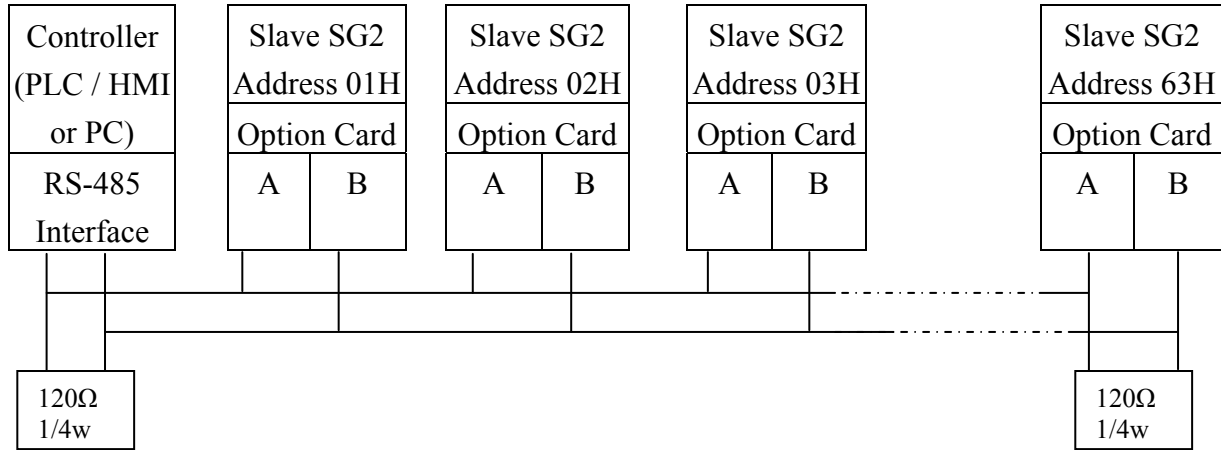
| Content  | Data | meaning                                   |
|----------|------|---|
| High bit | 0    | 8/N/2 Data 8bit, No Parity, 2 Stop bit.   |
|          | 1    | 8/E/1 Data 8bit, Even Parity, 1 Stop bit. |
|          | 2    | 8/O/1 Data 8bit, Odd Parity, 1 Stop bit.  |
|          | 3    | 8/N/1 Data 8bit, No Parity, 1 Stop bit.   |
| Low bit  | 0    | 4800 bps                                  |
|          | 1    | 9600 bps                                  |
|          | 2    | 19200 bps                                 |
|          | 3    | 38400 bps                                 |
|          | 4    | 57600 bps                                 |
|          | 5    | 115200 bps                                |

3. SG2 RS485 port default communication parameter as table show below:

|                      |           |
|----------------------|-----------|
| Baud rate            | 38400bps  |
| Data bit             | 8         |
| Stop bit             | 2         |
| Parity               | No        |
| Frame length maximum | 128 bytes |

- ◆ SG2 V2 RS485 port communication parameter as table show above.
- ◆ The communication parameter setting takes effect after power up again.

**1.2 Hardware Installation**



\*It is necessary to connect the terminal impedance (120Ω, 1/4W) at both ends of the communication wire.

**1.3 Data frame for RTU Mode**

MASTER (PLC etc.) send request to SLAVE, whereas SLAVE response to MASTER. The signal receiving is illustrated here. The data length is varied with the command (Function).

|                 |                 |
|-----------------|-----------------|
| SLAVE Address   | 1byte           |
| Function Code   | 1byte           |
| DATA            | nbyte           |
| CRC16 CHECK     | 2byte           |
| Signal Interval | Signal Interval |

\*\* The interval should be maintained at 10ms between command signal and request.

**1.4 Slave Address**

- 00H : Broadcast to all the drivers
- 01H : to the No.01 Driver
- 0FH : to the No.15 Driver
- 10H : to the No.16 Driver
- and so on....., Max to No.99(63H)

**1.5 Function Code**

- 01H: Read coils
- 03H: Read registers
- 05H: Write single coil
- 06H: Write single register
- 08H: Diagnostic
- 10H: Write multiple registers

## 2. CMS (Checksum and time-out definition)

### 2.1 CRC CHECK:

CRC check code is from Slave Address to end of the data. The calculation method is illustrated as follow:

- (1) Load a 16-bit register with FFFF hex (all 1's). Call this the CRC register.
- (2) Exclusive OR the first 8-bit byte of the message with the low-order byte of the 16-bit CRC register, putting the result in the CRC register.
- (3) Shift the CRC register one bit to the right (toward the LSB), Zero-filling the MSB, Extract and examines the LSB.
- (4) (If the LSB was 0): Repeat Steps (3) (another shift) (If the LSB was 1): Exclusive OR the CRC register with the polynomial value A001 hex (1010 0000 0000 0001).
- (5) Repeat Steps (3) and (4) until 8 shifts been performed. When this is done, a complete 8-bit byte will be processed.
- (6) Repeat Steps (2) through (5) for next 8-bit byte of the message, Continue doing this until all bytes have been processed. The final content of the CRC register is the CRC value. Placing the CRC into the message: When the 16-bit CRC (2 8-bit bytes) is transmitted in the message, the low-order byte will be transmitted first, followed by the high-order byte, For example, if the CRC value is 1241 hex, the CRC-16 (Low) put the 41h, the CRC-16 (Hi) put the 12h.

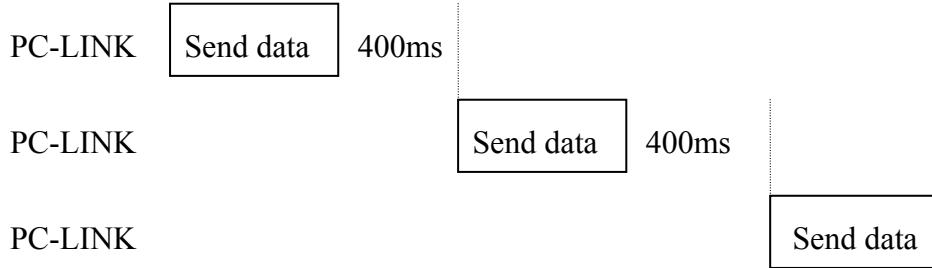
### ● CRC calculation application program

```

UWORD ch_sum ( UBYTE long , UBYTE *rxdbuff ) {
    BYTE i = 0;
    UWORD wkg = 0xFFFF;
    while ( long-- ) {
        wkg ^= rxdbuff++;
        for ( i = 0 ; i < 8; i++ ) {
            if ( wkg & 0x0001 ) {
                wkg = ( wkg >> 1 ) ^ 0xa001;
            }
            else {
                wkg = wkg >> 1;
            }
        }
    }
    return( wkg );
}

```

**2.2 TIME-OUT (400ms) & RETRY (max. : 2 times)**



**3. Command**

**3.1 01H Read Coils**

This function code is used to read from 1 to 960 contiguous statuses of coils in a remote device.

| PC → PLC          |      |     | PLC→PC(OK)          |                     |     | PLC→PC(ERROR)  |        |     |
|-------------------|------|-----|---------------------|---------------------|-----|----------------|--------|-----|
| SLAVE Address     | 01 H |     | SLAVE Address       | 01H                 |     | SLAVE Address  | 01H    |     |
| Function Code     | 01H  |     | Function Code       | 01H                 |     | Function Code  | 81H    |     |
| Starting Address  | High | 05H | Byte count          | 02H                 |     | Exception Code | 51H    |     |
|                   | Low  | 40H |                     | Outputs status M8~1 | 45H |                | CRC-16 | Low |
| Quantity of coils | High | 00H | Outputs status MF~9 | 34H                 |     | High           |        | ACH |
|                   | Low  | 10H | CRC-16              | Low                 | 8AH |                |        |     |
| CRC-16            | Low  | 3CH |                     | High                | BBH |                |        |     |
|                   | High | DEH |                     |                     |     |                |        |     |

\*: User set the start address equal multiple of 10H, and quantity of coils also equal multiple of 10H (read word coil status).

Sample: M8~1=45H (01000101B), coil M8~M1 status is OFF-ON-OFF-OFF, OFF-ON-OFF-ON;

**3.2 03H Read Registers**

This function code is used to read the contents of from 1 to approx. 61 contiguous block of holding registers in a remote device.

| PC → PLC           |        |     | PLC→PC(OK)    |                    |  | PLC→PC(ERROR)  |             |     |
|--------------------|--------|-----|---------------|--------------------|--|----------------|-------------|-----|
| SLAVE Address      | 01H    |     | SLAVE Address | 01H                |  | SLAVE Address  | 01H         |     |
| Function Code      | 03H    |     | Function Code | 03H                |  | Function Code  | 83H         |     |
| *Register Address  | (High) | 00H | Data (byte)   | 26H                |  | Exception Code | 52H         |     |
|                    | (Low)  | 00H |               | *Send out the data |  |                | CRC-16 (Lo) | C0H |
| Data Length ( Hi ) | 00H    |     | CRC-16 (Lo)   | ?                  |  | CRC-16 (Hi)    |             | CDH |
| Data Length ( Lo ) | 13H    |     | CRC-16 (Hi)   | ?                  |  |                |             |     |
| CRC-16 (Lo)        | 04H    |     |               |                    |  |                |             |     |
| CRC-16 (Hi)        | 07H    |     |               |                    |  |                |             |     |



### 3.3 05H Write Single Coil

This function code is used to write a single output to either ON or OFF in a remote device.

| PC → PLC      |      |     | PLC→PC(OK)    |      |     | PLC→PC(ERROR)  |        |     |
|---------------|------|-----|---------------|------|-----|----------------|--------|-----|
| SLAVE Address |      | 01H | SLAVE Address |      | 01H | SLAVE Address  |        | 01H |
| Function Code |      | 05H | Function Code |      | 05H | Function Code  |        | 85H |
| Coil Address  | High | 05H | Coil Address  | High | 05H | Exception Code | 52H    |     |
|               | Low  | 02H |               | Low  | 02H |                | CRC-16 | Low |
| Coil Value    | High | FFH | Coil Value    | High | FFH | High           |        | 6DH |
|               | Low  | 00H |               | Low  | 00H |                |        |     |
| CRC-16        | Low  | 2DH | CRC-16        | Low  | 2DH |                |        |     |
|               | High | 36H |               | High | 36H |                |        |     |

A value of 0xFF00 requests the coil to be ON.

A value of 0x0000 requests the coil to be OFF.

### 3.4 06H Write single Register

This function code is used to write a single holding register in a remote device.

| PC → PLC          |        |      | PLC→PC(OK)        |      |     | PLC→PC(ERROR)  |             |     |
|-------------------|--------|------|-------------------|------|-----|----------------|-------------|-----|
| SLAVE Address     |        | 01 H | SLAVE Address     |      | 01H | SLAVE Address  |             | 01H |
| Function Code     |        | 06H  | Function Code     |      | 06H | Function Code  |             | 86H |
| *Register Address | (High) | 01H  | *Register Address | High | 01H | Exception Code | 52H         |     |
|                   | (Low)  | 02H  |                   | Low  | 02H |                | CRC-16 (Lo) | C3H |
| Write Data        | High   | 17H  | Write Data        | High | 17H | CRC-16 (Hi)    |             | 9DH |
|                   | Low    | 70H  |                   | Low  | 70H |                |             |     |
| CRC-16 (Lo)       |        | 27H  | CRC-16 (Lo)       |      | 27H |                |             |     |
| CRC-16 (Hi)       |        | E2H  | CRC-16 (Hi)       |      | E2H |                |             |     |

### 3.5 08H Diagnostic

The function code 08 provides a series of tests for checking the communication system between a client (Master) device and a server (Slave), or for checking various internal error conditions within a server.

Sub-Function 00: Return Query Data

| PC → PLC      |      |      | PLC→PC(OK)    |      |     | PLC→PC(ERROR)  |        |      |
|---------------|------|------|---------------|------|-----|----------------|--------|------|
| Address       |      | 01 H | Address       |      | 01H | Address        |        | 01H  |
| Function Code |      | 08H  | Function Code |      | 08H | Function Code  |        | 88H  |
| Sub Function  | High | 00H  | Sub Function  | High | 00H | Exception Code | 51H    |      |
|               | Low  | 00H  |               | Low  | 00H |                | CRC-16 | High |
| DATA          | High | A5H  | DATA          | High | A5H | Low            |        | FCH  |
|               | Low  | 37H  |               | Low  | 37H |                |        |      |
| CRC-16        | High | DAH  | CRC-16        | High | DAH |                |        |      |
|               | Low  | 8DH  |               | Low  | 8DH |                |        |      |

Data is a random word.

**3.6 10H Write multiple Registers**

This function code is used to write a block of contiguous registers (1 to approx. 59 registers) in a remote device.

|                    |        |     |
|--------------------|--------|-----|
| Address            | 01H    |     |
| Function Code      | 10H    |     |
| *Register          | (High) | 00H |
| Address            | (Low)  | 00H |
| Data Length ( Hi ) | 00H    |     |
| Data Length ( Lo ) | 13H    |     |
| Byte counters      | 26H    |     |
| Send out the data  |        |     |
| CRC-16 (Lo)        | ?      |     |
| CRC-16 (Hi)        | ?      |     |

|                    |        |     |
|--------------------|--------|-----|
| Address            | 01H    |     |
| Function Code      | 10H    |     |
| *Register          | (High) | 00H |
| Address            | (Low)  | 00H |
| Data Length ( Hi ) | 00H    |     |
| Data Length ( Lo ) | 13H    |     |
| CRC-16 (Lo)        | 81H    |     |
| CRC-16 (Hi)        | C4H    |     |

|                |     |  |
|----------------|-----|--|
| Address        | 01H |  |
| Function Code  | 90H |  |
| Exception Code | 52H |  |
| CRC-16 (Lo)    | ACH |  |
| CRC-16 (Hi)    | 3DH |  |

**3.7 Exception Code**

Under communication linking, the controller responses the Exception Code and send Function Code add 80H to main system if there is error happened.

| Exception Code | Description   |
|----------------|---|
| 51             | Frame error (Function Code error, Register Encoding error, Data Quantity Error) |
| 52             | Run mode and command disable  |
| 53             | Secret mode and command disable   |
| 54             | Data value over rang  |
| 55             | Reserved  |
| 56             | Reserved  |
| 57             | SG2 the other error   |
| 58             | Commands do not match SG2 edit mode   |
| 59             | Reserved  |

4. Register Address

4.1 00xxH: Coil Status Address (word)

| Register Address | Data Length | Usable Comm.      | Content |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------|-------------|-------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                  |             |                   | F       | E   | D   | C   | B   | A   | 9   | 8   | 7   | 6   | 5   | 4   | 3   | 2   | 1   | 0   |     |
| 0000H            | 1           | 03H<br>06H<br>10H | R10     | R0F | R0E | R0D | R0C | R0B | R0A | R09 | R08 | R07 | R06 | R05 | R04 | R03 | R02 | R01 |     |
| 0001H            | 1           |                   | G10     | G0F | G0E | G0D | G0C | G0B | G0A | G09 | G08 | G07 | G06 | G05 | G04 | G03 | G02 | G01 |     |
| 0002H            | 1           |                   | T10     | T0F | T0E | T0D | T0C | T0B | T0A | T09 | T08 | T07 | T06 | T05 | T04 | T03 | T02 | T01 |     |
| 0003H            | 1           |                   | C10     | C0F | C0E | C0D | C0C | C0B | C0A | C09 | C08 | C07 | C06 | C05 | C04 | C03 | C02 | C01 |     |
| 0004H            | 1           |                   | M10     | M0F | M0E | M0D | M0C | M0B | M0A | M09 | M08 | M07 | M06 | M05 | M04 | M03 | M02 | M01 |     |
| 0005H            | 1           |                   | Z04     | Z03 | Z02 | Z01 | I0C | I0B | I0A | I09 | I08 | I07 | I06 | I05 | I04 | I03 | I02 | I01 |     |
| 0006H            | 1           |                   | -       | -   | -   | -   | X0C | X0B | X0A | X09 | X08 | X07 | X06 | X05 | X04 | X03 | X02 | X01 |     |
| 0007H            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | -   | Q08 | Q07 | Q06 | Q05 | Q04 | Q03 | Q02 | Q01 |     |
| 0008H            | 1           |                   | -       | -   | -   | -   | Y0C | Y0B | Y0A | Y09 | Y08 | Y07 | Y06 | Y05 | Y04 | Y03 | Y02 | Y01 |     |
| 0009H            | 1           |                   | N10     | N0F | N0E | N0D | N0C | N0B | N0A | N09 | N08 | N07 | N06 | N05 | N04 | N03 | N02 | N01 |     |
| 000AH            | 1           |                   | H10     | H0F | H0E | H0D | H0C | H0B | H0A | H09 | H08 | H07 | H06 | H05 | H04 | H03 | H02 | H01 |     |
| 000BH            | 1           |                   | W10     | W0F | W0E | W0D | W0C | W0B | W0A | W09 | W08 | W07 | W06 | W05 | W04 | W03 | W02 | W01 |     |
| 000CH            | 1           |                   | W20     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | W11 |     |
| 000DH            | 1           |                   | W30     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | W21 |     |
| 000EH            | 1           |                   | W40     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | W31 |     |
| 000FH            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | P02 | P01 | L08 | L07 | L06 | L05 | L04 | L03 | L02 | L01 |
| 0010H            | 1           | 03H<br>(Only FBD) | B16     | B15 | B14 | B13 | B12 | B11 | B10 | B09 | B08 | B07 | B06 | B05 | B04 | B03 | B02 | B01 |     |
| 0011H            | 1           |                   | B32     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B17 |
| 0012H            | 1           |                   | B48     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B33 |
| 0013H            | 1           |                   | B64     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B49 |
| 0014H            | 1           |                   | B80     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B65 |
| 0015H            | 1           |                   | B96     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B81 |
| 0016H            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | B99 | B98 | B97 |

Z can't be written.

R10, G10, T10, C10, M10, N10, H10, P02 only effective on SG2V3.

4.2 01xxH: Control register Address

| Register Address | Data Length | Usable Comm. | Content                  |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |
|------------------|-------------|--------------|--------------------------|---|---|---|---|---|---|---|----|---|---|---|---|---|---|---|
|                  |             |              | F                        | E | D | C | B | A | 9 | 8 | 7  | 6 | 5 | 4 | 3 | 2 | 1 | 0 |
| 0100H            | 1           | 03H          | 00                       |   |   |   |   |   |   |   | S1 |   |   |   |   |   |   |   |
|                  |             | 06H          | RUN / STOP : S1 = 0 STOP |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |
|                  |             | 10H          | S1 = 1 RUN               |   |   |   |   |   |   |   |    |   |   |   |   |   |   |   |

|       |   |                   |  |   |    |    |    |    |    |    |            |    |    |   |   |   |    |    |
|-------|---|-------------------|--|---|----|----|----|----|----|----|------------|----|----|---|---|---|----|----|
| 0101H | 1 | 03H               | BRAND ID   |   |    |    |    |    |    |    | GENIE MODE |    |    |   |   |   |    |    |
|       |   |                   | GENIE MODE (Hex) Only V-Type model<br>30=20VR-D,                   70=20VR-12D<br>34=20VT-D,                   74=20VT-12D   |   |    |    |    |    |    |    |            |    |    |   |   |   |    |    |
| 0102H | 1 | 03H<br>06H<br>10H | A  | Z | I1 | I0 | L3 | L2 | L1 | L0 | -          | S1 | S2 | B | - | - | D1 | D0 |
|       |   |                   | STATUS1:<br>A: alarm at expand I/O No. unmatched<br>=0: alarm<br>=1: don't alarm<br>Z: Z set<br>=0: Z disable<br>=1: Z enable<br>I1I0: expand I/O No.(0~3)<br>L3 L2 L1 L0: language<br>=1 : English<br>=2 : French<br>=3 : Spanish<br>=4 : Italian<br>=5 : German<br>=6 : Portugal<br>=7 : Chinese<br>B: Backlight on/off<br>=0 : auto on/off<br>=1 : always on<br>s1:Power down retain(M coil)<br>=1 : unretain<br>=0 : retain<br>S2:run/stop retain(Counter current value)<br>=1 : retain<br>=0 : unretain<br>D1D0 :Data communication mode<br>=0 : data link<br>=1 : remote I/O master<br>=2 : remote I/O slave |   |    |    |    |    |    |    |            |    |    |   |   |   |    |    |

|       |   | PA         | Error code   |
|-------|---|------------|--|
| 0103H | 1 | 03H        | STATUS2 (PA,Error)<br>Error code:<br>0 = OK<br>1 = ROM error<br>2 = RAM error<br>3 = EEPROM error<br>4 = Program error<br>5 = Program logic error<br>6 = Watchdog error<br>7 = Expand error<br>8 = Communication error<br>9 = RTC error<br>PA: 0 = PASSWORD OFF<br>1 = PASSWORD ON |
| 0104H | 1 | 03H<br>10H | A01 Gain value   |
| 0105H | 1 |            | A01 Offset value   |
| 0106H | 1 |            | A02 Gain value   |
| 0107H | 1 |            | A02 Offset value   |
| 0108H | 1 |            | A03 Gain value   |
| 0109H | 1 |            | A03 Offset value   |
| 010AH | 1 |            | A04 Gain value   |
| 010BH | 1 |            | A04 Offset value   |
| 0110H | 1 | 06H        | 0  |
|       |   | 10H        | 1  |
|       |   |            | CLEAR CODE   |
| 0120H | 1 | 03H<br>10H | A01 Gain value   |
| 0121H | 1 |            | A01 Offset value   |
| 0122H | 1 |            | A02 Gain value   |
| 0123H | 1 |            | A02 Offset value   |
| 0124H | 1 |            | A03 Gain value   |
| 0125H | 1 |            | A03 Offset value   |
| 0126H | 1 |            | A04 Gain value   |
| 0127H | 1 |            | A04 Offset value   |
| 0128H | 1 |            | A05 Gain value   |
| 0129H | 1 |            | A05 Offset value   |

|       |   |            |   |  |
|-------|---|------------|---|--|
| 012AH | 1 | 03H<br>10H | A06 Gain value  |  |
| 012BH | 1 |            | A06 Offset value  |  |
| 012CH | 1 |            | A07 Gain value  |  |
| 012DH | 1 |            | A07 Offset value  |  |
| 012EH | 1 |            | A08 Gain value  |  |
| 012FH | 1 |            | A08 Offset value  |  |
|       |   |            | Analog configure: Note:<br>GAIN = (0~999)    OFFSET = (-50~50) (complement) |  |

- Warning : change control register, data save to flash. (flash memory endurance 10k cycles).

4.3 02xxH: Current value Address

| Register Address             | Data Length | Usable Comm. | Content                 | Remark                        |  |
|------------------------------|-------------|--------------|-------------------------|-------------------------------|--|
| <b>Timer Current value</b>   |             |              |                         |                               |  |
| 0200H                        | 1           | 03H          | Timer01 current value   | Scale:<br>00000~09999         |  |
| 0201H                        | 1           |              | Timer02 current value   |                               |  |
| .....                        | .....       |              | .....                   |                               |  |
| 020EH                        | 1           |              | Timer0F current value   |                               |  |
| <b>Counter Current value</b> |             |              |                         |                               |  |
| 0210H                        | 2           | 03H          | Counter01 current value | *1<br>Scale:<br>000000~999999 |  |
| 0211H                        | 2           |              | Counter02 current value |                               |  |
| .....                        | .....       |              | .....                   |                               |  |
| 021EH                        | 2           |              | Counter0F current value |                               |  |
| <b>RTC Current value</b>     |             |              |                         |                               |  |
| 0220H                        | 1           | 03H<br>10H   | Current Year            | Current Moon                  | Scale:<br>Year:00~99<br>Month:01~12<br>Day:01~31<br>Week:00~06<br>Hour:00~23<br>Minute:00~59<br>Second:00~59 |
| 0221H                        | 1           |              | Current Day             | Current Week                  |  |
| 0222H                        | 1           |              | Current Hour            | Current Minute                |  |
| 0223H                        | 1           |              | Current Second          | 00                            |  |
| 0224H                        | 1           |              | 00                      | Current Year                  |  |
| 0225H                        | 1           |              | 00                      | Current Moon                  |  |
| 0226H                        | 1           |              | 00                      | Current Day                   |  |
| 0227H                        | 1           |              | 00                      | Current Week                  |  |
| 0228H                        | 1           |              | 00                      | Current Hour                  |  |
| 0229H                        | 1           |              | 00                      | Current Minute                |  |
| 022AH                        | 1           |              | 00                      | Current Second                |  |

| ANALOG Current value |    |     |                      |                        |  |
|----------------------|----|-----|----------------------|------------------------|--|
| 0230H                | 1  | 03H | A01 Current Value    |                        | Scale:<br>0000~0999                                  |
| 0231H                | 1  |     | A02 Current Value    |                        |  |
| 0232H                | 1  |     | A03 Current Value    |                        |  |
| 0233H                | 1  |     | A04 Current Value    |                        |  |
| 0234H                | 1  |     | A05 Current Value    |                        |  |
| 0235H                | 1  |     | A06 Current Value    |                        |  |
| 0236H                | 1  |     | A07 Current Value    |                        |  |
| 0237H                | 1  |     | A08 Current Value    |                        |  |
| PWM current value    |    |     |                      |                        |  |
| 0260H                | 3H | 03H | 00                   | PWM current Run number | Scale:<br>P01 PWM mode<br>PW: 0~32767<br>PT: 1~32767 |
|                      |    |     | P01 Current PW Value |                        |  |
|                      |    |     | P01 Current PT Value |                        |  |

**4.4 03xxH: User character Address (Chinese lattice)**

| Register Address | Data Length | Usable Comm. | Content     | Remark |
|------------------|-------------|--------------|-------------|--------|
| 0300H            | 10H         | 03H<br>10H   | Character5  |        |
| 0301H            | 10H         |              | Character6  |        |
| .....            | .....       |              | .....       |        |
| 033BH            | 10H         |              | Character64 |        |

- Warning : change user character, data save to flash. (flash memory endurance 10k cycles).

**4.5 04xxH: Preset value Address**

| Register Address     | Data Length | Usable Comm. | Content                | Remark                |
|----------------------|-------------|--------------|------------------------|-----------------------|
| Timer Preset value   |             |              |                        |                       |
| 0400H                | 1H          | 03H<br>10H   | Timer01 preset value   | Scale:<br>00000~09999 |
| 0401H                | 1H          |              | Timer02 preset value   |                       |
| .....                | .....       |              | .....                  |                       |
| 040EH                | 1H          |              | Timer0F preset value   |                       |
| Counter Preset value |             |              |                        |                       |
| 0410H                | 2H/5H       | 03H<br>10H   | Counter01 preset value | *2                    |
| 0411H                | 2H/5H       |              | Counter02 preset value |                       |
| .....                | .....       |              | .....                  |                       |
| 041EH                | 2H/5H       |              | Counter0F preset value |                       |

| RTC Preset value    |       |            |                       |                  |
|---------------------|-------|------------|-----------------------|------------------|
| 0420H               | 3H    | 03H<br>10H | RTC01 preset value    | <u>*3</u>        |
| 0421H               | 3H    |            | RTC02 preset value    |                  |
| .....               | ..... |            | .....                 |                  |
| 042EH               | 3H    |            | RTC0F preset value    |                  |
| ANALOG Preset value |       |            |                       |                  |
| 0430H               | 1H    | 03H<br>10H | ANALOG01 preset value | Scale:<br>0~9999 |
| 0431H               | 1H    |            | ANALOG02 preset value |                  |
| .....               | ..... |            | .....                 |                  |
| 043EH               | 1H    |            | ANALOG0F preset value |                  |
| PWM Preset value    |       |            |                       |                  |
| 0460H               | 10H   | 03H<br>10H | PWM01 preset value    | <u>*4</u>        |

- Warning : change preset value, data save to flash. (flash memory endurance 10k cycles).

**4.6 05xxH: Coils Address (bit)**

| Register Address | Data Length              | Usable Comm.              | Content          | Remark                       |
|------------------|--------------------------|---------------------------|------------------|------------------------------|
| 0500H~050FH      | 10H<br>(Read)            | 01H<br>05H                | R01~R10          |                              |
| 0510H~051FH      |                          |                           | G01~G10          |                              |
| 0520H~052FH      |                          |                           | T01~T10          |                              |
| 0530H~053FH      |                          |                           | C01~C10          |                              |
| 0540H~054FH      |                          |                           | M01~M10          |                              |
| 0550H~055FH      |                          |                           | I01~I0C, Z01~Z04 | Z01~Z04<br>can't be written; |
| 0560H~056FH      |                          |                           | X01~X0C          | 056CH~056FH,<br>reserved;    |
| 0570H~057FH      |                          |                           | Q01~Q08          | 0578H~057FH,<br>reserved;    |
| 0580H~058FH      |                          |                           | Y01~Y0C          | 058CH~058FH,<br>reserved;    |
| 0590H~059FH      |                          |                           | N01~N10          |                              |
| 05A0H~05AFH      |                          |                           | 10H<br>(Read)    | 01H<br>05H                   |
| 05B0H~05BFH      | W01~W16                  |                           |                  |                              |
| 05C0H~05CFH      | W17~W32                  |                           |                  |                              |
| 05D0H~05DFH      | W33~W48                  |                           |                  |                              |
| 05E0H~05EFH      | W49~W64                  |                           |                  |                              |
| 05F0H~05FFH      | L01~L08, P01~P02,<br>S01 | 05FBH~05FFH,<br>reserved; |                  |                              |



\*: 01H: user set the start address equal multiple of 10H, and quantity of coils also equal multiple of 10H (01H: read word coil status).

Z can't be written. Reserved address can't be written.

R10, G10, T10, C10, M10, N10, H10, P02 only effective on SG2V3.

**4.7 06xxH: Coil Status Address (word) for V3 type only**

| Register Address | Data Length | Usable Comm.      | Content |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|------------------|-------------|-------------------|---------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
|                  |             |                   | F       | E   | D   | C   | B   | A   | 9   | 8   | 7   | 6   | 5   | 4   | 3   | 2   | 1   | 0   |
| 0600H            | 1           | 03H<br>06H<br>10H | R10     | R0F | R0E | R0D | R0C | R0B | R0A | R09 | R08 | R07 | R06 | R05 | R04 | R03 | R02 | R01 |
| 0601H            | 1           |                   | -       | R1F | R1E | R1D | R1C | R1B | R1A | R19 | R18 | R17 | R16 | R15 | R14 | R13 | R12 | R11 |
| 0602H            | 1           |                   | G10     | G0F | G0E | G0D | G0C | G0B | G0A | G09 | G08 | G07 | G06 | G05 | G04 | G03 | G02 | G01 |
| 0603H            | 1           |                   | -       | G1F | G1E | G1D | G1C | G1B | G1A | G19 | G18 | G17 | G16 | G15 | G14 | G13 | G12 | G11 |
| 0604H            | 1           |                   | T10     | T0F | T0E | T0D | T0C | T0B | T0A | T09 | T08 | T07 | T06 | T05 | T04 | T03 | T02 | T01 |
| 0605H            | 1           |                   | -       | T1F | T1E | T1D | T1C | T1B | T1A | T19 | T18 | T17 | T16 | T15 | T14 | T13 | T12 | T11 |
| 0606H            | 1           |                   | C10     | C0F | C0E | C0D | C0C | C0B | C0A | C09 | C08 | C07 | C06 | C05 | C04 | C03 | C02 | C01 |
| 0607H            | 1           |                   | -       | C1F | C1E | C1D | C1C | C1B | C1A | C19 | C18 | C17 | C16 | C15 | C14 | C13 | C12 | C11 |
| 0608H            | 1           |                   | M10     | M0F | M0E | M0D | M0C | M0B | M0A | M09 | M08 | M07 | M06 | M05 | M04 | M03 | M02 | M01 |
| 0609H            | 1           |                   | M20     | M1F | M1E | M1D | M1C | M1B | M1A | M19 | M18 | M17 | M16 | M15 | M14 | M13 | M12 | M11 |
| 060AH            | 1           |                   | M30     | M2F | M2E | M2D | M2C | M2B | M2A | M29 | M28 | M27 | M26 | M25 | M24 | M23 | M22 | M21 |
| 060BH            | 1           |                   | -       | M3F | M3E | M3D | M3C | M3B | M3A | M39 | M38 | M37 | M36 | M35 | M34 | M33 | M32 | M31 |
| 060CH            | 1           |                   | N10     | N0F | N0E | N0D | N0C | N0B | N0A | N09 | N08 | N07 | N06 | N05 | N04 | N03 | N02 | N01 |
| 060DH            | 1           |                   | N20     | N1F | N1E | N1D | N1C | N1B | N1A | N19 | N18 | N17 | N16 | N15 | N14 | N13 | N12 | N11 |
| 060EH            | 1           |                   | N30     | N2F | N2E | N2D | N2C | N2B | N2A | N29 | N28 | N27 | N26 | N25 | N24 | N23 | N22 | N21 |
| 060FH            | 1           |                   | -       | N3F | N3E | N3D | N3C | N3B | N3A | N39 | N38 | N37 | N36 | N35 | N34 | N33 | N32 | N31 |
| 0610H            | 1           |                   | -       | -   | -   | -   | I0C | I0B | I0A | I09 | I08 | I07 | I06 | I05 | I04 | I03 | I02 | I01 |
| 0611H            | 1           |                   | -       | -   | -   | -   | X0C | X0B | X0A | X09 | X08 | X07 | X06 | X05 | X04 | X03 | X02 | X01 |
| 0612H            | 1           |                   | -       | -   | -   | -   | Y0C | Y0B | Y0A | Y09 | Y08 | Y07 | Y06 | Y05 | Y04 | Y03 | Y02 | Y1  |
| 0613H            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | Q08 | Q07 | Q06 | Q05 | Q04 | Q03 | Q02 | Q01 |     |
| 0614H            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | Z04 | Z03 | Z02 | Z01 |
| 0615H            | 1           |                   | H10     | H0F | H0E | H0D | H0C | H0B | H0A | H09 | H08 | H07 | H06 | H05 | H04 | H03 | H02 | H01 |
| 0616H            | 1           |                   | -       | H1F | H1E | H1D | H1C | H1B | H1A | H19 | H18 | H17 | H16 | H15 | H14 | H13 | H12 | H11 |
| 0617H            | 1           |                   | -       | -   | -   | -   | -   | -   | -   | -   | L08 | L07 | L06 | L05 | L04 | L03 | L02 | L01 |
| 0618H            | 1           | -                 | -       | -   | -   | -   | -   | -   | -   | -   | -   | -   | -   | S01 | P02 | P01 |     |     |
| 0619H            | 1           | W10               | W0F     | W0E | W0D | W0C | W0B | W0A | W09 | W08 | W07 | W06 | W05 | W04 | W03 | W02 | W01 |     |
| 061AH            | 1           | W20               | W1F     | W1E | W1D | W1C | W1B | W1A | W19 | W18 | W17 | W16 | W15 | W14 | W13 | W12 | W11 |     |
| 061BH            | 1           | W30               | W2F     | W2E | W2D | W2C | W2B | W2A | W29 | W28 | W27 | W26 | W25 | W24 | W23 | W22 | W21 |     |
| 061CH            | 1           | W40               | W3F     | W3E | W3D | W3C | W3B | W3A | W39 | W38 | W37 | W36 | W35 | W34 | W33 | W32 | W31 |     |
| 0620H            | 1           | 03H               | B16     | B15 | B14 | B13 | B12 | B11 | B10 | B09 | B08 | B07 | B06 | B05 | B04 | B03 | B02 | B01 |
| 0621H            | 1           | (Only             | B32     |     |     |     |     |     |     |     |     |     |     |     |     |     |     | B17 |

|       |   |                      |      |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      |      |
|-------|---|----------------------|------|---|---|---|---|---|---|---|---|---|---|---|---|---|---|------|------|------|
| 0622H | 1 | 03H<br>(Only<br>FBD) | B48  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      | B33  |      |
| 0623H | 1 |                      | B64  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B49  |
| 0624H | 1 |                      | B80  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B65  |
| 0625H | 1 |                      | B96  |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B81  |
| 0626H | 1 |                      | B112 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B97  |
| 0627H | 1 |                      | B128 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B113 |
| 0628H | 1 |                      | B144 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B129 |
| 0629H | 1 |                      | B160 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B145 |
| 062AH | 1 |                      | B176 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B161 |
| 062BH | 1 |                      | B192 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B177 |
| 062CH | 1 |                      | B208 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B193 |
| 062DH | 1 |                      | B242 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B209 |
| 062EH | 1 |                      | B240 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B243 |
| 062FH | 1 |                      | B256 |   |   |   |   |   |   |   |   |   |   |   |   |   |   |      |      | B241 |
| 0630H | 1 |                      | -    | - | - | - | - | - | - | - | - | - | - | - | - | - | - | B260 | B259 | B257 |

Z can't be written.

4.8 07xxH: Control register Address for V3 type only

| Register Address | Data Length | Usable Comm.      | Content  |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |
|------------------|-------------|-------------------|--|---|----|----|----|----|----|----|------------------------|----|----|---|---|---|----|----|
|                  |             |                   | F  | E | D  | C  | B  | A  | 9  | 8  | 7                      | 6  | 5  | 4 | 3 | 2 | 1  | 0  |
| 0700H            | 1           | 03H               | 00   |   |    |    |    |    |    |    | S1                     |    |    |   |   |   |    |    |
|                  |             | 06H               | RUN / STOP : S1 = 0 STOP   |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |
|                  |             | 10H               | S1 = 1 RUN   |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |
| 0701H            | 1           | 03H               | BRAND ID   |   |    |    |    |    |    |    | GENIE MODE             |    |    |   |   |   |    |    |
|                  |             |                   | GENIE MODE (Hex) Only V-Type model   |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |
|                  |             |                   | 30=20VR-D, 70=20VR-12D   |   |    |    |    |    |    |    | 34=20VT-D, 74=20VT-12D |    |    |   |   |   |    |    |
| 0702H            | 1           | 03H<br>06H<br>10H | A  | Z | I1 | I0 | L3 | L2 | L1 | L0 | -                      | S1 | S2 | B | - | - | D1 | D0 |
|                  |             |                   | STATUS1:   |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |
|                  |             |                   | A: alarm at expand I/O No. unmatched<br>= 0: alarm<br>= 1: don't alarm<br>Z: Z set<br>= 0: Z disable<br>= 1: Z enable<br>I1I0: expand I/O No.(0~3) |   |    |    |    |    |    |    |                        |    |    |   |   |   |    |    |

|                         |            |     | <p>L3 L2 L1 L0: language</p> <p>=1 : English</p> <p>=2 : French</p> <p>=3 : Spanish</p> <p>=4 : Italian</p> <p>=5 : German</p> <p>=6 : Portugal</p> <p>=7 : Chinese</p> <p>B: Backlight on/off</p> <p>=0 : auto on/off</p> <p>=1 : always on</p> <p>s1:Power down retain(M coil)</p> <p>=1 : unretain</p> <p>=0 : retain</p> <p>S2:run/stop retain(Counter current value)</p> <p>=1 : retain</p> <p>=0 : unretain</p> <p>D1D0 :Data communication mode</p> <p>=0 : data link</p> <p>=1 : remote I/O master</p> <p>=2 : remote I/O slave</p>  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
|-------------------------|------------|-----|--|----|------------|--------------------|--|-------------|--|--------|--|---------------|--|---------------|--|------------------|--|-------------------|--|-------------------------|--|--------------------|--|------------------|--|-------------------------|--|---------------|--|----------------------|--|-----------------|--|
|                         |            |     | <table border="1"> <thead> <tr> <th>PA</th> <th>Error code</th> </tr> </thead> <tbody> <tr> <td colspan="2">STATUS2 (PA,Error)</td> </tr> <tr> <td colspan="2">Error code:</td> </tr> <tr> <td colspan="2">0 = OK</td> </tr> <tr> <td colspan="2">1 = ROM error</td> </tr> <tr> <td colspan="2">2 = Vpd error</td> </tr> <tr> <td colspan="2">3 = EEPROM error</td> </tr> <tr> <td colspan="2">4 = Program error</td> </tr> <tr> <td colspan="2">5 = Program logic error</td> </tr> <tr> <td colspan="2">6 = Watchdog error</td> </tr> <tr> <td colspan="2">7 = Expand error</td> </tr> <tr> <td colspan="2">8 = Communication error</td> </tr> <tr> <td colspan="2">9 = RTC error</td> </tr> <tr> <td colspan="2">PA: 0 = PASSWORD OFF</td> </tr> <tr> <td colspan="2">1 = PASSWORD ON</td> </tr> </tbody> </table> | PA | Error code | STATUS2 (PA,Error) |  | Error code: |  | 0 = OK |  | 1 = ROM error |  | 2 = Vpd error |  | 3 = EEPROM error |  | 4 = Program error |  | 5 = Program logic error |  | 6 = Watchdog error |  | 7 = Expand error |  | 8 = Communication error |  | 9 = RTC error |  | PA: 0 = PASSWORD OFF |  | 1 = PASSWORD ON |  |
| PA                      | Error code |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| STATUS2 (PA,Error)      |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| Error code:             |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 0 = OK                  |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 1 = ROM error           |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 2 = Vpd error           |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 3 = EEPROM error        |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 4 = Program error       |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 5 = Program logic error |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 6 = Watchdog error      |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 7 = Expand error        |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 8 = Communication error |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 9 = RTC error           |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| PA: 0 = PASSWORD OFF    |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 1 = PASSWORD ON         |            |     |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |
| 0703H                   | 1          | 03H |  |    |            |                    |  |             |  |        |  |               |  |               |  |                  |  |                   |  |                         |  |                    |  |                  |  |                         |  |               |  |                      |  |                 |  |

|       |   |  |                  |   |
|-------|---|--|------------------|---|
| 0704H | 1 | 03H<br>10H   | A01 Gain value   |   |
| 0705H | 1 |  | A01 Offset value |   |
| 0706H | 1 |  | A02 Gain value   |   |
| 0707H | 1 |  | A02 Offset value |   |
| 0708H | 1 |  | A03 Gain value   |   |
| 0709H | 1 |  | A03 Offset value |   |
| 070AH | 1 |  | A04 Gain value   |   |
| 070BH | 1 |  | A04 Offset value |   |
|       |   |  |                  |   |
| 0710H | 1 | 06H  | 0                | 1 |
|       |   | 10H  | CLEAR CODE       |   |
|       |   |  |                  |   |
| 0720H | 1 | 03H<br>10H   | A01 Gain value   |   |
| 0721H | 1 |  | A01 Offset value |   |
| 0722H | 1 |  | A02 Gain value   |   |
| 0723H | 1 |  | A02 Offset value |   |
| 0724H | 1 |  | A03 Gain value   |   |
| 0725H | 1 |  | A03 Offset value |   |
| 0726H | 1 |  | A04 Gain value   |   |
| 0727H | 1 |  | A04 Offset value |   |
| 0728H | 1 |  | A05 Gain value   |   |
| 0729H | 1 |  | A05 Offset value |   |
| 072AH | 1 |  | A06 Gain value   |   |
| 072BH | 1 |  | A06 Offset value |   |
| 072CH | 1 |  | A07 Gain value   |   |
| 072DH | 1 |  | A07 Offset value |   |
| 072EH | 1 |  | A08 Gain value   |   |
| 072FH | 1 |  | A08 Offset value |   |
|       |   | Analog configure:<br>Note: GAIN = (0~999) OFFSET = (-50~50) (complement) |                  |   |

- Warning : change control register, data save to flash. (flash memory endurance 10k cycles).

4.9 08xxH~11xxH: Current value Address for V3 type only

| Register Address                                     | Data Length | Usable Comm. | Content                       |                             | Remark                  |
|--|-------------|--------------|-------------------------------|-----------------------------|-------------------------|
| <b>Timer Current value (08xxH)</b>                   |             |              |                               |                             |                         |
| 0800H  | 1H          | 03H          | Timer01 current value         |                             | Scale:<br>00000~09999   |
| 0801H  | 1H          |              | Timer02 current value         |                             |                         |
| .....  | .....       |              | .....                         |                             |                         |
| 081EH  | 1H          |              | Timer1F current value         |                             | Only FBD mode           |
| 081FH  | 1H          |              | Timer20 current value         |                             |                         |
| .....  | .....       |              | .....                         |                             |                         |
| 08F9H  | 1H          |              | TimerFA current value         |                             |                         |
| <b>Counter Current value (09xxH~0AxxH)</b>           |             |              |                               |                             |                         |
| 0900H  | 1H          | 03H          | C01 current Value middle byte | C01 current Value Low byte  | Scale:<br>000000~999999 |
| 0901H  | 1H          | 03H          | 00                            | C01 current Value High byte |                         |
| 0902H  | 1H          |              | C02 current Value middle byte | C02 current Value Low byte  |                         |
| 0903H  | 1H          |              | 00                            | C02 current Value High byte |                         |
| .....  | .....       |              | .....                         |                             |                         |
| 093CH  | 1H          |              | C1F current Value middle byte | C1F current Value Low byte  |                         |
| 093DH  | 1H          |              | 00                            | C1F current Value High byte |                         |
| 093EH  | 1H          |              | C20 current Value middle byte | C20 current Value Low byte  |                         |
| 093FH  | 1H          |              | 00                            | C20 current Value High byte |                         |
| .....  | .....       |              | .....                         |                             |                         |
| 0AF2H  | 1H          |              | CFA current Value middle byte | CFA current Value Low byte  | Only FBD mode           |
| 0AF3H  | 1H          | 00           | CFA current Value High byte   |                             |                         |
| <b>(0BxxH) RTC, Analog, PWM, AT,AQ Current value</b> |             |              |                               |                             |                         |

| RTC Current value (0B0xH)                     |    |            |                               |                                |  |                         |
|---|----|------------|-------------------------------|--------------------------------|--|-------------------------|
| 0B00H   | 1  | 03H<br>10H | Current Year                  | Current Moon                   | Scale:<br>Year:00~99<br>Month:01~12<br>Day:01~31<br>Week:00~06<br>Hour:00~23<br>Minute:00~59<br>Second:00~59 |                         |
| 0B01H   | 1  |            | Current Day                   | Current Week                   |  |                         |
| 0B02H   | 1  |            | Current Hour                  | Current Minute                 |  |                         |
| 0B03H   | 1  |            | Current Second                | 00                             |  |                         |
| 0B04H   | 1  |            | 00                            | Current Year                   |  |                         |
| 0B05H   | 1  |            | 00                            | Current Moon                   |  |                         |
| 0B06H   | 1  |            | 00                            | Current Day                    |  |                         |
| 0B07H   | 1  |            | 00                            | Current Week                   |  |                         |
| 0B08H   | 1  |            | 00                            | Current Hour                   |  |                         |
| 0B09H   | 1  |            | 00                            | Current Minute                 |  |                         |
| 0B0AH   | 1  | 00         | Current Second                |                                |  |                         |
| ANALOG Current value (0B1xH)                  |    |            |                               |                                |  |                         |
| 0B10H   | 1H | 03H        | A01 Current Value             |                                | Scale:<br>0000~0999  |                         |
| 0B11H   | 1H |            | A02 Current Value             |                                |  |                         |
| 0B12H   | 1H |            | A03 Current Value             |                                |  |                         |
| 0B13H   | 1H |            | A04 Current Value             |                                |  |                         |
| 0B14H   | 1H | 03H        | A05 Current Value             |                                |  |                         |
| 0B15H   | 1H |            | A06 Current Value             |                                |  |                         |
| 0B16H   | 1H |            | A07 Current Value             |                                |  |                         |
| 0B17H   | 1H |            | A08 Current Value             |                                |  |                         |
| PWM Current value (0B2xH)                     |    |            |                               |                                |  |                         |
| 0B20H   | 1H | 03H        | 00                            | P01 PWM current<br>Run number  | P01: mode1<br>PWM mode   |                         |
| 0B21H   | 1H |            | P01 current PW value(0~32767) |                                |  |                         |
| 0B22H   | 1H |            | P01 current PT value(1~32767) |                                |  |                         |
| 0B20H   | 1H |            | 03H                           | 00                             | 00   | P01: mode2<br>PLSY mode |
| 0B21H   | 1H |            |                               | PLSY frequency(0001~1000)      |  |                         |
| 0B22H   | 1H |            |                               | PLSY pulse number(00000~32767) |  |                         |
| 0B23H   | 1H |            | 03H                           | 00                             | P02 PWM current<br>Run number  | P02: only<br>PWM mode   |
| 0B24H   | 1H |            |                               | P02 current PW value(0~32767)  |  |                         |
| 0B25H   | 1H |            |                               | P02 current PT value(1~32767)  |  |                         |
|   |    |            |                               |                                |  |                         |
| AT (Analog Temperature) Current value (0B3xH) |    |            |                               |                                |  |                         |
| 0B30H   | 1H | 03H        | AT01 Current Value            |                                | Scale:<br>-1000~6000   |                         |
| 0B31H   | 1H |            | AT02 Current Value            |                                |  |                         |
| 0B32H   | 1H |            | AT03 Current Value            |                                |  |                         |
| 0B33H   | 1H |            | AT04 Current Value            |                                |  |                         |

| <b>AQ (Analog Output) Current value (0B4xH)</b>    |       |     |                     |   |
|--|-------|-----|---------------------|---|
| 0B40H  | 1H    | 03H | AQ01 Current Value  | Scale:<br>Voltage mode:<br>0~1000<br>Current mode:<br>0~500 |
| 0B41H  | 1H    |     | AQ02 Current Value  |   |
| 0B42H  | 1H    |     | AQ03 Current Value  |   |
| 0B43H  | 1H    |     | AQ04 Current Value  |   |
| <b>AS (ADD-Subtract) Current value (0CxxH)</b>     |       |     |                     |   |
| 0C00H  | 1H    | 03H | AS01 Current Value  | Scale:<br>-32768~32767                                      |
| 0C01H  | 1H    |     | AS02 Current Value  |   |
| .....  | ..... |     | .....               |   |
| 0C1EH  | 1H    |     | AS1F Current Value  |   |
| 0C1FH  | 1H    | 03H | AS20 Current Value  | Only FBD mode   |
| .....  | ..... |     | .....               |   |
| 0CF9H  | 1H    |     | ASFA Current Value  |   |
| <b>MD (Multiply-Divide) Current value (0DxxH)</b>  |       |     |                     |   |
| 0D00H  | 1H    | 03H | MD01 Current Value  | Scale:<br>-32768~32767                                      |
| 0D01H  | 1H    |     | MD02 Current Value  |   |
| .....  | ..... |     | .....               |   |
| 0D1EH  | 1H    | 03H | MD1F Current Value  | Only FBD mode   |
| 0D1FH  | 1H    |     | MD20 Current Value  |   |
| .....  | ..... |     | .....               |   |
| 0DF9H  | 1H    |     | M DFA Current Value |   |
| <b>PID (PID control) Current value (0ExxH)</b>     |       |     |                     |   |
| 0E00H  | 1H    | 03H | PID01 Current Value | Scale:<br>-32768~32767                                      |
| 0E01H  | 1H    |     | PID02 Current Value |   |
| .....  | ..... |     | .....               |   |
| 0E0EH  | 1H    |     | PID0F Current Value |   |
| 0E0FH  | 1H    | 03H | PID10 Current Value | Only FBD mode   |
| .....  | ..... |     | .....               |   |
| 0E1DH  | 1H    |     | PID1E Current Value |   |
| <b>MX (Data multiplexer) Current value (0FxxH)</b> |       |     |                     |   |
| 0F00H  | 1H    | 03H | MX01 Current Value  | Scale:<br>-32768~32767                                      |
| 0F01H  | 1H    |     | MX02 Current Value  |   |
| .....  | ..... |     | .....               |   |
| 0F1EH  | 1H    |     | MX1F Current Value  |   |
| 0F1FH  | 1H    | 03H | MX20 Current Value  | Only FBD mode   |
| .....  | ..... |     | .....               |   |
| 0FF9H  | 1H    |     | MXFA Current Value  |   |
|  |       |     |                     |   |

| AR (Analog ram control) Current value (10xxH) |       |                   |                    |   |
|---|-------|-------------------|--------------------|---|
| 1000H   | 1H    | 03H               | AR01 Current Value | Scale:<br>0~32767   |
| 1001H   | 1H    |                   | AR02 Current Value |   |
| .....   | ..... |                   | .....              |   |
| 100EH   | 1H    |                   | AR0F Current Value | Only FBD mode   |
| 100FH   | 1H    |                   | AR10 Current Value |   |
| .....   | ..... |                   | .....              |   |
| 101DH   | 1H    |                   | AR1E Current Value |   |
| DR (Data register) Current value (11xxH)      |       |                   |                    |   |
| 1100H   | 1H    | 03H<br>06H<br>10H | DR01 Current Value | Scale:<br>Signed:<br>-32768~32767<br>Unsigned:<br>0~65535 |
| 1101H   | 1H    |                   | DR02 Current Value |   |
| .....   | ..... |                   | .....              |   |
| 11EFH   | 1H    |                   | DRF0 Current Value |   |



4.10 12xxH~27xxH: Preset value Address for V3 type only

| Register Address                          | Data Length | Usable Comm.      | Content                         |                               | Remark                       |    |
|---|-------------|-------------------|---------------------------------|-------------------------------|------------------------------|----|
| <b>Timer Preset value (12xxH)</b>         |             |                   |                                 |                               |                              |    |
| 1200H                                     | 1H          | 03H               | Timer01 preset value            |                               | Scale:<br>00000~09999        |    |
| 1201H                                     | 1H          |                   | Timer02 preset value            |                               |                              |    |
| .....                                     | .....       |                   | .....                           |                               |                              |    |
| 121EH                                     | 1H          | 06H               | Timer1F preset value            |                               | Only FBD mode                |    |
| 121FH                                     | 1H          | 10H               | Timer20 preset value            |                               |                              |    |
| .....                                     | .....       |                   | .....                           |                               |                              |    |
| 12F9H                                     | 1H          |                   | TimerFA preset value            |                               |                              |    |
| <b>Counter Preset value (13xxH~14xxH)</b> |             |                   |                                 |                               |                              |    |
| 1300H                                     | 1H          | 03H<br>06H<br>10H | C01 preset Value<br>middle byte | C01 preset Value<br>Low byte  | Scale:<br>000000~999999      |    |
| 1301H                                     | 1H          |                   | 00                              | C01 preset Value<br>High byte |                              |    |
| .....                                     | .....       |                   | .....                           |                               |                              |    |
| 133CH                                     | 1H          |                   | C1F preset Value<br>middle byte | C1F preset Value<br>Low byte  | Can't read or<br>write mode8 |    |
| 133DH                                     | 1H          |                   | 00                              | C1F preset Value<br>High byte |                              |    |
| 133EH                                     | 1H          |                   | C20 preset Value<br>middle byte | C20 preset Value<br>Low byte  | Only FBD mode                |    |
| 133FH                                     | 1H          |                   | 00                              | C20 preset Value<br>High byte |                              |    |
| .....                                     | .....       |                   | .....                           |                               |                              |    |
| 14F2H                                     | 1H          |                   | CFA preset Value<br>middle byte | CFA preset Value<br>Low byte  |                              |    |
| 14F3H                                     | 1H          |                   | 00                              | CFA preset Value<br>High byte |                              |    |
| <b>RTC Preset value (15xxH~17xxH)</b>     |             |                   |                                 |                               |                              |    |
| 1500H                                     | 1H          |                   | 03H                             | RTC01 preset Value            |                              | *3 |
| 1501H                                     | 1H          |                   |                                 |                               |                              |    |
| 1502H                                     | 1H          | .....             |                                 |                               |                              |    |
| .....                                     | .....       | 06H               |                                 |                               |                              |    |
| 155AH                                     | 1H          | 10H               | RTC1F preset Value              |                               |                              |    |
| 155BH                                     | 1H          |                   |                                 |                               |                              |    |
| 155CH                                     | 1H          |                   |                                 |                               |                              |    |

|                                    |       |                   |  |  |
|------------------------------------|-------|-------------------|--|--|
| 155DH                              | 1H    | 03H<br>06H<br>10H | RTC20 preset Value   | Only FBD mode  |
| 155EH                              | 1H    |                   |  |  |
| 155FH                              | 1H    |                   |  |  |
| .....                              | ..... |                   | .....  |  |
| 17EBH                              | 1H    |                   |  |  |
| 17ECH                              | 1H    |                   |  |  |
| 17EDH                              | 1H    |                   | RTCFA preset Value   |  |
| <b>Analog Preset value (18xxH)</b> |       |                   |  |  |
| 1800H                              | 1H    | 03H<br>06H<br>10H | Analog01 comparative preset value                                  | Scale:<br>00000~09999  |
| .....                              | ..... |                   | .....  |  |
| 181EH                              | 1H    |                   | Analog1F comparative preset value                                  |  |
| 181FH                              | 1H    |                   | Analog20 comparative preset value                                  | Only FBD mode  |
| .....                              | ..... |                   | .....  |  |
| 18F9H                              | 1H    |                   | AnalogFA comparative preset value                                  |  |
| <b>PWM Preset value (19xxH)</b>    |       |                   |  |  |
| 1900H                              | 1H    | 03H<br>06H<br>10H | P01 PWM mode PW1 preset value<br>(or PLSY mode frequency value)    | Scale:<br>P01~P02 PWM mode<br>PW1~8: 0~32767<br>PT1~8: 1~32767<br>P01 PLSY mode<br>frequency:<br>0001~1000<br>pulse number:<br>00000~32767 |
| 1901H                              | 1H    |                   | P01 PWM mode PT1 preset value<br>(or PLSY mode pulse number value) |  |
| 1902H                              | 1H    |                   | P01 PWM mode PW2 preset value<br>(or PLSY mode 0)                  |  |
| 1903H                              | 1H    |                   | P01 PWM mode PT2 preset value<br>(or PLSY mode 0)                  |  |
| .....                              | ..... |                   | .....  |  |
| 190EH                              | 1H    |                   | P01 PWM mode PW8 preset value<br>(or PLSY mode 0)                  |  |
| 190FH                              | 1H    |                   | P01 PWM mode PT8 preset value<br>(or PLSY mode 0)                  |  |
| 1910H                              | 1H    |                   | P02 PWM mode PW1 preset value                                      |  |
| 1911H                              | 1H    |                   | P02 PWM mode PT1 preset value                                      |  |
| 1912H                              | 1H    |                   | P02 PWM mode PW2 preset value                                      |  |
| 1913H                              | 1H    |                   | P02 PWM mode PT2 preset value                                      |  |
| .....                              | ..... |                   | .....  |  |
| 191CH                              | 1H    |                   | P02 PWM mode PW7 preset value                                      |  |
| 191DH                              | 1H    |                   | P02 PWM mode PT7 preset value                                      |  |
| 191EH                              | 1H    |                   | P02 PWM mode PW8 preset value                                      |  |
| 191FH                              | 1H    |                   | P02 PWM mode PT8 preset value                                      |  |

| AS (ADD-Subtract) Preset value (1AxxH~1CxxH)    |       |                   |                      |  |               |
|---|-------|-------------------|----------------------|--|---------------|
| 1A00H   | 1H    | 03H<br>06H<br>10H | AS01 V1 preset value | Scale:<br>V1:-32768~32767<br>V2:-32768~32767<br>V3:-32768~32767                                      |               |
| 1A01H   | 1H    |                   | AS01 V2 preset value |  |               |
| 1A02H   | 1H    |                   | AS01 V3 preset value |  |               |
| .....   | ..... |                   | .....                |  |               |
| 1A5AH   | 1H    |                   | AS1F V1 preset value |  |               |
| 1A5BH   | 1H    |                   | AS1F V2 preset value |  |               |
| 1A5CH   | 1H    |                   | AS1F V3 preset value |  |               |
| 1A5DH   | 1H    |                   | AS20 V1 preset value |  | Only FBD mode |
| 1A5EH   | 1H    |                   | AS20 V2 preset value |  |               |
| 1A5FH   | 1H    |                   | AS20 V3 preset value |  |               |
| .....   | ..... |                   | .....                |  |               |
| 1CEBH   | 1H    |                   | ASFA V1 preset value |  |               |
| 1CECH   | 1H    |                   | ASFA V2 preset value |  |               |
| 1CEDH   | 1H    |                   | ASFA V3 preset value |  |               |
| MD (Multiply-Divide) Preset value (1DxxH~1FxxH) |       |                   |                      |  |               |
| 1D00H   | 1H    | 03H<br>06H<br>10H | MD01 V1 preset value | Scale:<br>V1:-32768~32767<br>V2:-32768~32767<br>V3:-32768~32767                                      |               |
| 1D01H   | 1H    |                   | MD01 V2 preset value |  |               |
| 1D02H   | 1H    |                   | MD01 V3 preset value |  |               |
| .....   | ..... |                   | .....                |  |               |
| 1D5AH   | 1H    |                   | MD1F V1 preset value |  |               |
| 1D5BH   | 1H    |                   | MD1F V2 preset value |  |               |
| 1D5CH   | 1H    |                   | MD1F V3 preset value |  |               |
| 1D5DH   | 1H    |                   | MD20 V1 preset value |  | Only FBD mode |
| 1D5EH   | 1H    |                   | MD20 V2 preset value |  |               |
| 1D5FH   | 1H    |                   | MD20 V3 preset value |  |               |
| .....   | ..... |                   | .....                |  |               |
| 1FEBH   | 1H    |                   | MDFA V1 preset value |  |               |
| 1FECH   | 1H    |                   | MDFA V2 preset value |  |               |
| 1FEDH   | 1H    |                   | MDFA V3 preset value |  |               |
| PID Preset value (20xxH)                        |       |                   |                      |  |               |
| 2000H   | 1H    | 03H<br>06H<br>10H | PI01 SV preset value | Scale:<br>SV:-32768~32767<br>PV:-32768~32767<br>Ts:1~32767<br>Kp:1~32767<br>Ti:1~32767<br>Td:1~32767 |               |
| 2001H   | 1H    |                   | PI01 PV preset value |  |               |
| 2002H   | 1H    |                   | PI01 Ts preset value |  |               |
| 2003H   | 1H    |                   | PI01 Kp preset value |  |               |
| 2004H   | 1H    |                   | PI01 Ti preset value |  |               |
| 2005H   | 1H    |                   | PI01 Td preset value |  |               |
| .....   | ..... |                   | .....                |  |               |

|   |       |     |                      |                 |
|---|-------|-----|----------------------|-----------------|
| 2054H   | 1H    |     | PI0F SV preset value |                 |
| 2055H   | 1H    |     | PI0F PV preset value |                 |
| 2056H   | 1H    |     | PI0F Ts preset value |                 |
| 2057H   | 1H    |     | PI0F Kp preset value |                 |
| 2058H   | 1H    |     | PI0F Ti preset value |                 |
| 2059H   | 1H    |     | PI0F Td preset value |                 |
| 205AH   | 1H    |     | PI10 SV preset value |                 |
| 205BH   | 1H    |     | PI10 PV preset value |                 |
| 205CH   | 1H    | 03H | PI10 Ts preset value |                 |
| 205DH   | 1H    | 06H | PI10 Kp preset value |                 |
| 205EH   | 1H    | 10H | PI10 Ti preset value |                 |
| 205FH   | 1H    |     | PI10 Td preset value |                 |
| .....   | ..... |     | .....                | Only FBD mode   |
| 20AEH   | 1H    |     | PI1E SV preset value |                 |
| 20AFH   | 1H    |     | PI1E PV preset value |                 |
| 20B0H   | 1H    |     | PI1E Ts preset value |                 |
| 20B1H   | 1H    |     | PI1E Kp preset value |                 |
| 20B2H   | 1H    |     | PI1E Ti preset value |                 |
| 20B3H   | 1H    |     | PI1E Td preset value |                 |
| <b>MX (Data multiplexer) Preset value (21xxH~24xxH)</b> |       |     |                      |                 |
| 2100H   | 1H    |     | MX01 V1 preset value |                 |
| 2101H   | 1H    |     | MX01 V2 preset value |                 |
| 2102H   | 1H    |     | MX01 V3 preset value | Scale:          |
| 2103H   | 1H    |     | MX01 V4 preset value | V1:-32768~32767 |
| .....   | ..... |     | .....                | V2:-32768~32767 |
| 2178H   | 1H    |     | MX1F V1 preset value | V3:-32768~32767 |
| 2179H   | 1H    |     | MX1F V2 preset value | V4:-32768~32767 |
| 217AH   | 1H    |     | MX1F V3 preset value |                 |
| 217BH   | 1H    | 03H | MX1F V4 preset value |                 |
| 217CH   | 1H    | 06H | MX20 V1 preset value |                 |
| 217DH   | 1H    | 10H | MX20 V2 preset value |                 |
| 217EH   | 1H    |     | MX20 V3 preset value |                 |
| 217FH   | 1H    |     | MX20 V4 preset value |                 |
| .....   | ..... |     | .....                | Only FBD mode   |
| 24E4H   | 1H    |     | MXFA V1 preset value |                 |
| 24E5H   | 1H    |     | MXFA V2 preset value |                 |
| 24E6H   | 1H    |     | MXFA V3 preset value |                 |
| 24E7H   | 1H    |     | MXFA V4 preset value |                 |

| AR (Analog ram control) Preset value (25xxH) |       |     |                                 |
|--|-------|-----|---------------------------------|
| 2500H  | 1H    | 03H | AR01 LEVEL1 preset value(model) |
|  |       | 06H | AR01 Level0 preset value(mode2) |
| 2501H  | 1H    | 10H | AR01 LEVEL2 preset value(model) |
|  |       |     | AR01 Level1 preset value(mode2) |
| 2502H  | 1H    |     | AR01 MAXL preset value(model)   |
|  |       |     | AR01 Level2 preset value(mode2) |
| 2503H  | 1H    |     | AR01 StSp preset value(model)   |
|  |       |     | AR01 Level3 preset value(mode2) |
| 2504H  | 1H    |     | AR01 Rate preset value(model)   |
|  |       |     | AR01 MaxL preset value(mode2)   |
| 2505H  | 1H    |     | AR01 A preset value(model)      |
|  |       |     | AR01 Ta preset value(mode2)     |
| 2506H  | 1H    |     | AR01 B preset value(model)      |
|  |       |     | 00(mode2)                       |
| .....  | ..... |     | .....                           |
| 2564H  | 1H    |     | AR0F MAXL preset value(model)   |
|  |       |     | AR0F Level2 preset value(mode2) |
| 2565H  | 1H    |     | AR0F StSp preset value(model)   |
|  |       |     | AR0F Level3 preset value(mode2) |
| 2566H  | 1H    |     | AR0F Rate preset value(model)   |
|  |       |     | AR0F MaxL preset value(mode2)   |
| 2567H  | 1H    |     | AR0F A preset value(model)      |
|  |       |     | AR0F Ta preset value(mode2)     |
| 2568H  | 1H    |     | AR0F B preset value(model)      |
|  |       |     | 00(mode2)                       |
| 2569H  | 1H    |     | AR10 LEVEL1 preset value(model) |
|  |       |     | AR10 Level0 preset value(mode2) |
| 256AH  | 1H    |     | AR10 LEVEL2 preset value(model) |
|  |       |     | AR10 Level1 preset value(mode2) |
| 256BH  | 1H    |     | AR10 MAXL preset value(model)   |
|  |       |     | AR10 Level2 preset value(mode2) |
| 256CH  | 1H    |     | AR10 StSp preset value(model)   |
|  |       |     | AR10 Level3 preset value(mode2) |
| 256DH  | 1H    |     | AR10 Rate preset value(model)   |
|  |       |     | AR10 MaxL preset value(mode2)   |
| .....  | ..... |     | .....                           |

Scale:  
 Model:  
 LEVEL1:  
 -10000~20000  
 LEVEL2:  
 -10000~20000  
 MAXL:  
 -10000~20000  
 StSp:0~20000  
 Rate:0~10000  
 A:0~01000  
 B:-10000~10000  
 Mode2:  
 Level0~Level3,  
 MaxL:  
 0~32767  
 Ta:1~32767

Only FBD mode

|  |       |     |                                  |   |
|--|-------|-----|----------------------------------|---|
| 25CBH  | 1H    |     | AR1E LEVEL1 preset value(mode1)  |   |
|  |       |     | AR1E Level0 preset value(mode2)  |   |
| 25CCH  | 1H    |     | AR1E LEVEL2 preset value(mode1)  |   |
|  |       |     | AR1E Level11 preset value(mode2) |   |
| 25CDH  | 1H    |     | AR1E MAXL preset value(mode1)    |   |
|  |       |     | AR1E Level2 preset value(mode2)  |   |
| 25CEH  | 1H    |     | AR1E StSp preset value(mode1)    |   |
|  |       |     | AR1E Level3 preset value(mode2)  |   |
| 25CFH  | 1H    |     | AR1E Rate preset value(mode1)    |   |
|  |       |     | AR1E MaxL preset value(mode2)    |   |
| 25D0H  | 1H    |     | AR1E A preset value(mode1)       |   |
|  |       |     | AR1E Ta preset value(mode2)      |   |
| 25D1H  | 1H    |     | AR1E B preset value(mode1)       |   |
|  |       |     | 00(mode2)                        |   |
| <b>DR (Data register) Preset value (26xxH)</b> |       |     |                                  |   |
| 2600H  | 1H    |     | DR01 preset value                | Scale:<br>Signed:<br>-32768~32767<br>Unsigned:<br>0~65535   |
| 2601H  | 1H    | 03H | DR02 preset value                |   |
| .....  | ..... | 06H | .....                            |   |
| 26EFH  | 1H    | 10H | DRF0 preset value                |   |
| <b>AQ (Analog Output) Preset value (27xxH)</b> |       |     |                                  |   |
| 2700H  | 1H    |     | AQ01 preset value                | Scale:<br>Voltage mode:<br>0~1000<br>Current mode:<br>0~500 |
| 2701H  | 1H    | 03H | AQ02 preset value                |   |
| 2702H  | 1H    | 06H | AQ03 preset value                |   |
| 2703H  | 1H    | 10H | AQ04 preset value                |   |

- Warning : change preset value, data save to flash. (flash memory endurance 10k cycles).

## 4.11 2BxxH~2ExxH: Coils Address (bit) for V3 type only

| Register Address | Data Length   | Usable Comm.   | Content      | Remark  |
|------------------|---------------|----------------|--------------|---|
| 2B00H~2B1FH      | 10H<br>(Read) | 01H<br><br>05H | R01~R1F      | 2B1FH, reserved;                                    |
| 2B20H~2B3FH      |               |                | G01~G1F      | 2B3FH, reserved;                                    |
| 2B40H~2B5FH      |               |                | T01~T1F      | 2B5FH, reserved;                                    |
| 2B60H~2B7FH      |               |                | C01~C1F      | 2B7FH, reserved;                                    |
| 2B80H~2BBFH      |               |                | M01~M3F      | 2BBFH, reserved;                                    |
| 2BC0H~2BFFH      |               |                | N01~N3F      | 2BFFH, reserved;                                    |
| 2C00H~2C0FH      |               |                | I01~I0C      | 2C0CH~2C0FH, reserved;                              |
| 2C10H~2C1FH      |               |                | X01~X0C      | 2C1CH~2C1FH reserved;                               |
| 2C20H~2C2FH      |               |                | Y01~Y0C      | 2C2CH~2C2FH, reserved;                              |
| 2C30H~2C3FH      |               |                | Q01~Q08      | 2C38H~2C3FH, reserved;                              |
| 2C40H~2C4FH      |               |                | Z01~Z04      | Z01~Z04 can't be written;<br>2C44H~2C4FH, reserved; |
| 2C50H~2C6FH      |               |                | H01~H31      | 2C6FH, reserved;                                    |
| 2C70H~2C7FH      |               |                | L01~L08      | 2C78H~2C7FH, reserved;                              |
| 2C80H~2C8FH      |               |                | P01,P02 ,S01 | 2C83H~2C8FH, reserved;                              |
| 2C90H~2CCFH      |               |                | W01~W64      |   |
| 2D00H~2E0FH      |               |                | B001~B260    | 2E04H~2E0FH, reserved;<br>FBD only                  |

\*: 01H: user set the start address equal multiple of 10H, and quantity of coils also equal multiple of 10H (01H: read word coil status).

Z can't be written. Reserved address can't be written.

5. NOTE

5.1 Note 1: Counter current value

|  | Length | High bytes                        | Low bytes                       |
|--|--------|-----------------------------------|---------------------------------|
|  | 2H     | Counter current Value middle byte | Counter current Value Low byte  |
|  |        | 00                                | Counter current Value High byte |

Counter value: 0~999999(0~0F423FH)

5.2 Note 2: Counter Preset Value

|                  | Length | High bytes                           | Low bytes                          |
|------------------|--------|--------------------------------------|------------------------------------|
| Counter mode 1~7 | 2H     | Counter preset Value middle byte     | Counter preset Value Low byte      |
|                  |        | 00                                   | Counter preset Value High byte     |
| Counter mode 8   | 5H     | Interval time preset value           |                                    |
|                  |        | Counter ON preset Value middle byte  | Counter ON preset Value Low byte   |
|                  |        | 00                                   | Counter ON preset Value High byte  |
|                  |        | Counter OFF preset Value middle byte | Counter OFF preset Value Low byte  |
|                  |        | 00                                   | Counter OFF preset Value High byte |

Counter value: 0~999999(0~0F423FH);

5.3 Note 3: RTC Preset Value

|              | Length | High bytes        | Low bytes           |
|--------------|--------|-------------------|---------------------|
| RTC mode 1~2 | 3H     | Turn on week      | Turn off week       |
|              |        | Turn on hour      | Turn on minute      |
|              |        | Turn off hour     | Turn off minute     |
| RTC mode 3   | 3H     | Turn on year      | Turn off year       |
|              |        | Turn on month     | Turn on day         |
|              |        | Turn off month    | Turn off day        |
| RTC mode 4   | 3H     | 00                | Round time (week)   |
|              |        | Round time (hour) | Round time (minute) |
|              |        | 00                | Round time (second) |

Year: 00~99      Month: 01~12      Day: 01~31      Week: 00~06  
 Hour: 00~23      Minute: 00~59      Second: 00~59



**5.4 Note 4: PWM Preset Value**

| Length | High bytes | Low bytes        |
|--------|------------|------------------|
| 10H    |            | PW1 preset value |
|        |            | PT1 preset value |
|        |            | PW2 preset value |
|        |            | PT2 preset value |
|        |            | PW3 preset value |
|        |            | PT3 preset value |
|        |            | PW4 preset value |
|        |            | PT4 preset value |
|        |            | PW5 preset value |
|        |            | PT5 preset value |
|        |            | PW6 preset value |
|        |            | PT6 preset value |
|        |            | PW7 preset value |
|        |            | PT7 preset value |
|        |            | PW8 preset value |
|        |            | PT8 preset value |

PW: Pulse Width Value(00000~32767)

PT: Period Value(00001~32767)

**6. Which is important**

2006.07.05, add command : read or write analog set (A1~A8 gain + offset) .

2006.08.14, add write single coil status.

The protocol is applicable to SG2 which version about V1.7 (include V1.7).

2006-09-22, add RTC mode4 (V1.8) ;

2009-04-10, add SG2 V3 type;

2009-12-29, add data format description;

2010-06-18, V05, add AR mode2(V3.3);

2010-01-02, V06, add function, can write DR current value (V3.4) ;

Add dexcription : when writing function block preset value, maybe write flash (flash memory endurance 10k cycles).