

## Delta Protocol Definition



| General Information             |                                                                                                                                  |
|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------|
| Baud Rate                       | 9600/19200(Default)/38400bps                                                                                                     |
| Parity                          | None                                                                                                                             |
| Data Bits                       | 8                                                                                                                                |
| Stop Bits                       | 1                                                                                                                                |
| Addresses Mode                  | PLC Addresses Mode (Base 1)                                                                                                      |
| Support Model                   | M6A/M8A/M10A/M15A/M15A_220/M20A/M20A_220/M30A/M30A_230/M50A/M50A_260/M88H/M70A_260/M100_210/M100_280/M125HV/M250HV/DP350U/DP225U |
| Model not support current shunt | M6A/M8A/M10A/M15A/M20A/M30A/M50A/M100_210                                                                                        |
| Model not support IV-Curve      | M6A/M8A/M10A/M15A/M20A/M30A/M50A                                                                                                 |

## Version History

| Date        | Version | Changes                                                                                                  | Editor   |
|-------------|---------|----------------------------------------------------------------------------------------------------------|----------|
| Nov-06-2025 | V01.35  | Modify:<br>Q(V) range description                                                                        | Richard  |
| Jul-08-2025 | V01.34  | Modify:<br>Const. Q Percent 24/7 Range 100-> 75                                                          | Richard  |
| Feb-19-2025 | V01.33  | Add :<br>Cosphi(U) Setting                                                                               | Richard  |
| Jun-03-2024 | V01.32  | Add :<br>Modbus message format description (Coil & multiple)                                             | Richard  |
| Apr-25-2024 | V01.31  | Add :support model<br>M350HV,M225HV                                                                      | Richard  |
| Aug-18-2023 | V01.30  | Modify:<br>Rename VI-Curve to IV-Curve                                                                   | Richard  |
| Jun-13-2023 | V01.29  | Add<br>Constant Voltage                                                                                  | Richard  |
| Jan-10-2023 | V01.28  | Add:<br>FRT,P(F)                                                                                         | Richard  |
| Jan-06-2023 | V01.27  | Add:<br>Cosphi Of U,Q of P, Extend Cos( $\phi$ ) of P Control                                            | Richard  |
| May-27-2022 | V01.26  | Modify:<br>Terms of the temperature registers                                                            | Roy      |
| Mar-16-2022 | V01.25  | Modify:<br>Arc detect address                                                                            | Roy      |
| Nov-11-2021 | V01.24  | Modify:<br>Scale factor descriptor by EMEA Hsin Chen (third)                                             | Roy      |
| Oct-21-2021 | V01.23  | Add : support model<br>M15A_220,M20A_220,M30A_230,M50A_260,M100_280                                      | Roy      |
| Oct-10-2021 | V01.22  | Modify:<br>Scale factor descriptor by EMEA Hsin Chen (second)                                            | Roy      |
| Sep-28-2021 | V01.21  | Modify:<br>Scale factor descriptor by EMEA Hsin Chen (first)                                             | Roy      |
| Jul-14-2021 | V01.20  | Add:<br>ARC address                                                                                      | Roy      |
| Jun-21-2021 | V01.19  | Modify:<br>FW version address                                                                            | Roy      |
| Aug-18-2020 | V01.18  | Add:<br>DC7~12                                                                                           | Roy      |
| Jul-10-2020 | V01.17  | Add:<br>VI Curve Operation Flag bit 9:<br>Procedure_NoString_ForceDone<br>Modify:<br>General Information | Roy      |
| Mar-27-2020 | V01.16  | Add:<br>Model M100_210<br>F51, F52                                                                       | Roy      |
| Nov-18-2019 | V01.15  | Add:<br>Event time                                                                                       | Roy      |
| Nov-7-2019  | V01.14  | Modify:<br>Voltage-1-Line, Voltage-2-Line, Voltage-3-Line address                                        | Roy      |
| Oct-23-2019 | V01.13  | Add:<br>Model M70A260                                                                                    | Roy      |
| Aug-26-2019 | V01.12  | Add:<br>P(U)<br>Reactive night mode<br>Q of Pac 24/7                                                     | Roy      |
| Aug-01-2019 | V01.11  | Modify TEMPERATURE INFORMATION<br>Add Inverter State CHECK_PV_POWER                                      | Roy      |
| Apr-03-2019 | V01.10  | Add:<br>VI-Curve<br>Extend_Reclosure_time                                                                | Roy      |
| Aug-23-2018 | V01.09  | Add:<br>External Control                                                                                 | ChihChun |
| Jun-05-2018 | V01.08  | Modify:                                                                                                  | ChihChun |

|             |        |                                                                                                                |          |
|-------------|--------|----------------------------------------------------------------------------------------------------------------|----------|
|             |        | Modbus Message Format                                                                                          |          |
| May-11-2018 | V01.07 | Add:<br>Q(t),<br>Derating Log<br>Modify:<br>Q(P)_Lower_Limit 24/7,<br>Q(P)_Upper_Limit 24/7,<br>DC Information | ChihChun |
| Mar-22-2018 | V01.06 | Add:<br>CONSTANT COSPHI,<br>COSPHI(P),<br>CONSTANT Q,<br>Q(V)                                                  | ChihChun |
| Mar-14-2018 | V01.05 | Modify:<br>Today Energy,<br>EVENT CODE TABLE,<br>Insulation Mode                                               | ChihChun |
| Dec-5-2017  | V01.04 | Add:<br>REACTIVE POWER CONTROL,<br>YEAR ENERGY LOG,<br>POWER QUALITY INFORMATION<br>Modify:<br>SCALE FACTOR    | ChihChun |
| May-18-2017 | V01.03 | Add:<br>Ramp Rate,<br>P(F),<br>Fixed CosPhi,<br>Q(U),<br>Fixed Q                                               | ChihChun |
| May-10-2017 | V01.02 | Update description of Scale Factor                                                                             | ChihChun |
| May-09-2017 | V01.01 | Update Menu                                                                                                    | ChihChun |
| Apr-07-2017 | V01.00 | First draft                                                                                                    | ChihChun |

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## 1. Message Format

| Address | Function Code | Data       | Error Check |
|---------|---------------|------------|-------------|
| 1 byte  | 1 bytes       | <=252 byte | 2 bytes     |

### 1.1 Address

PCS ID=1~254 (Default : 1)(By Modbus definition, 0 is for broadcast only)

### 1.2 Function Code

0x03: Read Holding Register

0x04: Read Input Register

0x06: Write Single Register

0x05: Write Single Coil

0x06: Write Single Register

0x10: Write Multiple Registers

### 1.3 Data

Information received from target

### 1.4 Error Check

CRC

## 2. MODBUS Message Format

### 2.1 Read Holding Registers ( 0x03 )

INQUIRY : Computer→ PCS

| Address | Function Code | Data                |                     |                    |                    | Error Check    |                |
|---------|---------------|---------------------|---------------------|--------------------|--------------------|----------------|----------------|
| 1~254   | 0x03          | Starting Address HI | Starting Address LO | No of Registers HI | No of Registers LO | Error Check LO | Error Check HI |

RESPONSE : PCS → Computer

| Address | Function Code | Data       |         |         |         |         |       | Error Check    |                |
|---------|---------------|------------|---------|---------|---------|---------|-------|----------------|----------------|
| 1~254   | 0x03          | Byte Count | Data HI | Data LO | Data HI | Data LO | ..... | Error Check LO | Error Check HI |

ERROR: PCS→ Computer

| Address | Function Code | Data                         |  |  |  | Error Check    |                |
|---------|---------------|------------------------------|--|--|--|----------------|----------------|
| 1~254   | 0x83          | 0x01 or 0x02 or 0x03 or 0x04 |  |  |  | Error Check LO | Error Check HI |

PS. starting Address : 0x0000 to 0xFFFF

No of Registers : 1 to 125 (0x7D)

### 2.2 Read Input Registers ( 0x04 )

INQUIRY : Computer→ PCS

| Address | Function Code | Data                |                     |                    |                    | Error Check    |                |
|---------|---------------|---------------------|---------------------|--------------------|--------------------|----------------|----------------|
| 1~254   | 0x04          | Starting Address HI | Starting Address LO | No of Registers HI | No of Registers LO | Error Check LO | Error Check HI |

RESPONSE : PCS→ Computer

| Address | Function Code | Data       |         |         |         |         |       | Error Check    |                |
|---------|---------------|------------|---------|---------|---------|---------|-------|----------------|----------------|
| 1~254   | 0x04          | Byte Count | Data HI | Data LO | Data HI | Data LO | ..... | Error Check LO | Error Check HI |

ERROR: PCS→ Computer

| Address | Function Code | Data                         |  |  |  | Error Check    |                |
|---------|---------------|------------------------------|--|--|--|----------------|----------------|
| 1~254   | 0x84          | 0x01 or 0x02 or 0x03 or 0x04 |  |  |  | Error Check LO | Error Check HI |

PS. starting Address : 0x0000 to 0xFFFF

No of Registers : 1 to 125 (0x7D)

## 2.3 Write Single Coil ( 0x05 )

INQUIRY : Computer→ PCS

| Address | Function Code | Data               |                    |                  |                  | Error Check       |                   |
|---------|---------------|--------------------|--------------------|------------------|------------------|-------------------|-------------------|
| 1~254   | 0x05          | Coil Address<br>HI | Coil Address<br>LO | Write Data<br>HI | Write Data<br>LO | Error Check<br>LO | Error Check<br>HI |

RESPONSE : PCS → Computer

| Address | Function Code | Data               |                    |                  |                  | Error Check       |                   |
|---------|---------------|--------------------|--------------------|------------------|------------------|-------------------|-------------------|
| 1~254   | 0x05          | Coil Address<br>HI | Coil Address<br>LO | Write Data<br>HI | Write Data<br>LO | Error Check<br>LO | Error Check<br>HI |

ERROR: PCS → Computer

| Address | Function Code | Data                         |  |  |  | Error Check       |                   |
|---------|---------------|------------------------------|--|--|--|-------------------|-------------------|
| 1~254   | 0x85          | 0x01 or 0x02 or 0x03 or 0x04 |  |  |  | Error Check<br>LO | Error Check<br>HI |

PS. Coil Address : 0x0000 to 0xFFFF

Write Data : 0x0000 or 0xFF00

## 2.4 Write Single Register ( 0x06 )

INQUIRY : Computer → PCS

| Address | Function Code | Data                   |                        |                  |                  | Error Check       |                   |
|---------|---------------|------------------------|------------------------|------------------|------------------|-------------------|-------------------|
| 1~254   | 0x06          | Register Address<br>HI | Register Address<br>LO | Write Data<br>HI | Write Data<br>HI | Error Check<br>LO | Error Check<br>HI |

RESPONSE : PCS→ computer

| Address | Function Code | Data                   |                        |                  |                  | Error Check       |                   |
|---------|---------------|------------------------|------------------------|------------------|------------------|-------------------|-------------------|
| 1~254   | 0x06          | Register Address<br>HI | Register Address<br>LO | Write Data<br>HI | Write Data<br>HI | Error Check<br>LO | Error Check<br>HI |

ERROR: PCS→ computer

| Address | Function Code | Data                         |  |  |  | Error Check       |                   |
|---------|---------------|------------------------------|--|--|--|-------------------|-------------------|
| 1~254   | 0x86          | 0x01 or 0x02 or 0x03 or 0x04 |  |  |  | Error Check<br>LO | Error Check<br>HI |

PS. Register Address : 0x0000 to 0xFFFF

Write Data : 0x0000 or 0xFFFF

## 2.5 Write Multiple Registers ( 0x10 )

INQUIRY : Computer → PCS

| Address | Function Code | Data                   |                        |                      |                      |            |                |       | Error Check       |                   |
|---------|---------------|------------------------|------------------------|----------------------|----------------------|------------|----------------|-------|-------------------|-------------------|
| 1~254   | 0x10          | Starting Address<br>HI | Starting Address<br>LO | No of Register<br>HI | No of Register<br>LO | Byte Count | Register Value | ..... | Error Check<br>LO | Error Check<br>HI |

RESPONSE : PCS → Computer

| Address | Function Code | Data                   |                        |                       |                       | Error Check       |                   |
|---------|---------------|------------------------|------------------------|-----------------------|-----------------------|-------------------|-------------------|
| 1~254   | 0x10          | Starting Address<br>HI | Starting Address<br>LO | No of Registers<br>HI | No of Registers<br>LO | Error Check<br>LO | Error Check<br>HI |

ERROR : PCS → Computer

| Address | Function Code | Data                         | Error Check       |                   |
|---------|---------------|------------------------------|-------------------|-------------------|
| 1~254   | 0x90          | 0x01 or 0x02 or 0x03 or 0x04 | Error Check<br>LO | Error Check<br>HI |

PS. starting Address : 0x0000 to 0xFFFF

No of Registers : 0x0001 to 0x0078

### 3. Memory Map ~ Read Only (Input Registers)

#### <SYSTEM INFORMATION>

| Old Address<br>(Hex)                                | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command                | Unit     | Description                    |
|-----------------------------------------------------|----------------------|-------------------------|-------------------------|------------------------|----------|--------------------------------|
| 408                                                 | 1032                 | N/A                     | N/A                     | Inverter ID            | N/A      | RS485 ID                       |
| 409                                                 | 1033                 | 318                     | 792                     | Year                   | 1 Year   | Refer to below                 |
| 40A                                                 | 1034                 | 319                     | 793                     | Month                  | 1 Month  |                                |
| 40B                                                 | 1035                 | 31A                     | 794                     | Date                   | 1 Day    |                                |
| 40C                                                 | 1036                 | 324                     | 804                     | Hour                   | 1 Hour   |                                |
| 40D                                                 | 1037                 | 325                     | 805                     | Minute                 | 1 Minute |                                |
| 40E                                                 | 1038                 | 326                     | 806                     | Second                 | 1 Second |                                |
| For example, if received the following information. |                      |                         |                         |                        |          |                                |
| Addr                                                | 1033                 | 1034                    | 1035                    | 1036                   | 1037     | 1038                           |
| Data                                                | 2017                 | 4                       | 7                       | 15                     | 50       | 40                             |
| The inverter's time is 2017/04/07-15:50:40.         |                      |                         |                         |                        |          |                                |
| 410                                                 | 1040                 | A005                    | 40965                   | FW1(DSP)<br>Revision   | N/A      | ex : 0x0A0B => Ver10.11        |
| 411                                                 | 1041                 | A006                    | 40966                   | FW1(DSP)<br>Date       | N/A      | ex : 0x082D =><br>Year08Week45 |
| 412                                                 | 1042                 | A007                    | 40967                   | FW2(RED)<br>Revision   | N/A      | ex : 0x0A0B => Ver10.11        |
| 413                                                 | 1043                 | A008                    | 40968                   | FW2(RED)<br>Date       | N/A      | ex : 0x082D =><br>Year08Week45 |
| 414                                                 | 1044                 | A003                    | 40963                   | FW3(COMM)<br>Revision  | N/A      | ex : 0x0A0B => Ver10.11        |
| 415                                                 | 1045                 | A004                    | 40964                   | FW3(COMM)<br>Date      | N/A      | ex : 0x082D =><br>Year08Week45 |
| 416                                                 | 1046                 | A009                    | 40969                   | FW4(ARC)<br>Revision   | N/A      | ex : 0x0A0B => Ver10.11        |
| 417                                                 | 1047                 | A00A                    | 40970                   | FW4(ARC)<br>Date       | N/A      | ex : 0x082D =><br>Year08Week45 |
| N/A                                                 | N/A                  | A00B                    | 40971                   | FW5(CS)<br>Revision    | N/A      | ex : 0x0A0B => Ver10.11        |
| N/A                                                 | N/A                  | A00C                    | 40972                   | FW5(CS)<br>Date        | N/A      | ex : 0x082D =><br>Year08Week45 |
| 470                                                 | 1136                 | A00F                    | 40975                   | Serial number<br>0,1   | N/A      | (Refer to below)               |
| 471                                                 | 1137                 | A010                    | 40976                   | Serial number<br>2,3   | N/A      |                                |
| 472                                                 | 1138                 | A011                    | 40977                   | Serial number<br>4,5   | N/A      |                                |
| 473                                                 | 1139                 | A012                    | 40978                   | Serial number<br>6,7   | N/A      |                                |
| 474                                                 | 1140                 | A013                    | 40979                   | Serial number<br>8,9   | N/A      |                                |
| 475                                                 | 1141                 | A014                    | 40980                   | Serial number<br>10,11 | N/A      |                                |
| 476                                                 | 1142                 | A015                    | 40981                   | Serial number<br>12,13 | N/A      |                                |
| 477                                                 | 1143                 | A016                    | 40982                   | Serial number<br>14,15 | N/A      |                                |

Following ASCII code, If received the following information.

| Addr | 1136   | 1137   | 1138   | 1139   | 1140   | 1141   | 1142   | 1143   |
|------|--------|--------|--------|--------|--------|--------|--------|--------|
| Data | 0x5745 | 0x3039 | 0x3530 | 0x3030 | 0x3031 | 0x0000 | 0x0000 | 0x0000 |
|      | W      | E      | 0      | 9      | 5      | 0      | 0      | 0      |
|      |        |        |        |        |        |        |        |        |

The serial number of the inverter is: WE09500001.

|     |      |     |     |                    |     |                |
|-----|------|-----|-----|--------------------|-----|----------------|
| 490 | 1168 | N/A | N/A | Installation Year  | N/A | Refer to below |
| 491 | 1169 | N/A | N/A | Installation Month | N/A |                |
| 492 | 1170 | N/A | N/A | Installation Date  | N/A |                |

For example, if received the following information.

| Addr | 1168 | 1169 | 1170 |
|------|------|------|------|
| Data | 2017 | 3    | 4    |

The inverter is installed at 2017/03/04.

### <GENERAL INVERTER INFORMATION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command          | Unit        | Description                                                                                |
|-------------------|-------------------|-------------------|-------------------|------------------|-------------|--------------------------------------------------------------------------------------------|
| 430               | 1072              | D000              | 53248             | Today Energy     | Refer below | 1072:Low Word                                                                              |
| 431               | 1073              | D001              | 53249             |                  |             | 1073:High Word                                                                             |
| 432               | 1074              | D002              | 53250             | Today Runtime    | 1s          | 1074:Low Word                                                                              |
| 433               | 1075              | D003              | 53251             |                  |             | 1075:High Word                                                                             |
| 434               | 1076              | D004              | 53252             | Life Energy      | ※           | 1076:Low Word                                                                              |
| 435               | 1077              | D005              | 53253             |                  |             | 1077:High Word                                                                             |
| 436               | 1078              | D006              | 53254             | Life Runtime     | 1s          | 1078:Low Word                                                                              |
| 437               | 1079              | D007              | 53255             |                  |             | 1079:High Word                                                                             |
| 418               | 1048              | D008              | 53256             | Inverter State   | N/A         | 0: Standby(Check DC)<br>1: Countdown<br>2: On<br>3: No DC<br>4: Alarm<br>8: CHECK_PV_POWER |
| 419               | 1049              | D00A              | 53257             | Reconnected Time | 1s          | Current inverter countdown timer                                                           |

Unit of Today Energy:

For Old address (1072, 1072): Follow Scale Factor

For New address (53248, 53249), if the value of Scale Factor is not 0, then follow Scale Factor. Otherwise, follow the rule below:

Read value from IR:40962, then follow rule below to decide unit:

If the value of IR: 40962 is...

0~999:

Unit of IR(53248, 53249) is 1Wh.

1000~9999:

Unit of IR(53248, 53249) is 10Wh.

※: Follow Scale factor

### <LEAKAGE INFORMATION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command        | Unit  | Description                                  |
|-------------------|-------------------|-------------------|-------------------|----------------|-------|----------------------------------------------|
| N/A               | N/A               | D028              | 53288             | R1 Leakage     | 1kohm | 0xFFFF: Invalid                              |
| N/A               | N/A               | D02C              | 53292             | R2 Leakage     | 1kohm |                                              |
| N/A               | N/A               | D100              | 53504             | Max R1 Leakage | 1kohm | Daily Maximum and minimum<br>0xFFFF: Invalid |
| N/A               | N/A               | D101              | 53505             | Min R1 Leakage | 1kohm |                                              |
| N/A               | N/A               | D102              | 53506             | Max R2 Leakage | 1kohm |                                              |
| N/A               | N/A               | D103              | 53507             | Min R2 Leakage | 1kohm |                                              |

### <TEMPERATURE INFORMATION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                          | Unit | Description |
|-------------------|-------------------|-------------------|-------------------|----------------------------------|------|-------------|
| 438               | 1080              | D00B              | 53259             | Interior Temperature             | 1°C  |             |
| 439               | 1081              | D00C              | 53260             | Boost Module 1 Temperature       | 1°C  |             |
| 43A               | 1082              | D00D              | 53261             | Boost Module 2 Temperature       | 1°C  |             |
| 43B               | 1083              | D00E              | 53262             | Inverter Module Temperature      | 1°C  |             |
| 480               | 1152              | D049              | 53321             | Max. Interior Temperature        | 1°C  |             |
| 481               | 1153              | D04A              | 53322             | Max. Boost Module 1 Temperature  | 1°C  |             |
| 482               | 1154              | D04B              | 53323             | Max. Boost Module 2 Temperature  | 1°C  |             |
| 483               | 1155              | D04C              | 53324             | Max. Inverter Module Temperature | 1°C  |             |
| N/A               | N/A               | D053              | 53331             | Min. Interior Temperature        | 1°C  |             |
| N/A               | N/A               | D054              | 53332             | Min. Boost Module 1 Temperature  | 1°C  |             |
| N/A               | N/A               | D055              | 53333             | Min. Boost Module 2 Temperature  | 1°C  |             |
| N/A               | N/A               | D056              | 53334             | Min. Inverter Module Temperature | 1°C  |             |

# <CURRENT SHUNT INFORMATION>

| Old Address<br>(Hex) | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command  | Unit | Description                  |
|----------------------|----------------------|-------------------------|-------------------------|----------|------|------------------------------|
| N/A                  | N/A                  | D210                    | 53776                   | String1  | ※    | Current Value of<br>String1  |
| N/A                  | N/A                  | D211                    | 53777                   | String2  | ※    | Current Value of<br>String2  |
| N/A                  | N/A                  | D212                    | 53778                   | String3  | ※    | Current Value of<br>String3  |
| N/A                  | N/A                  | D213                    | 53779                   | String4  | ※    | Current Value of<br>String4  |
| N/A                  | N/A                  | D214                    | 53780                   | String5  | ※    | Current Value of<br>String5  |
| N/A                  | N/A                  | D215                    | 53781                   | String6  | ※    | Current Value of<br>String6  |
| N/A                  | N/A                  | D216                    | 53782                   | String7  | ※    | Current Value of<br>String7  |
| N/A                  | N/A                  | D217                    | 53783                   | String8  | ※    | Current Value of<br>String8  |
| N/A                  | N/A                  | D218                    | 53784                   | String9  | ※    | Current Value of<br>String9  |
| N/A                  | N/A                  | D219                    | 53785                   | String10 | ※    | Current Value of<br>String10 |
| N/A                  | N/A                  | D21A                    | 53786                   | String11 | ※    | Current Value of<br>String11 |
| N/A                  | N/A                  | D21B                    | 53787                   | String12 | ※    | Current Value of<br>String12 |
| N/A                  | N/A                  | D21C                    | 53788                   | String13 | ※    | Current Value of<br>String13 |
| N/A                  | N/A                  | D21D                    | 53789                   | String14 | ※    | Current Value of<br>String14 |
| N/A                  | N/A                  | D21E                    | 53790                   | String15 | ※    | Current Value of<br>String15 |
| N/A                  | N/A                  | D21F                    | 53791                   | String16 | ※    | Current Value of<br>String16 |
| N/A                  | N/A                  | D220                    | 53792                   | String17 | ※    | Current Value of<br>String17 |
| N/A                  | N/A                  | D221                    | 53793                   | String18 | ※    | Current Value of<br>String18 |
| N/A                  | N/A                  | D222                    | 53794                   | String19 | ※    | Current Value of<br>String19 |
| N/A                  | N/A                  | D223                    | 53795                   | String20 | ※    | Current Value of<br>String20 |
| N/A                  | N/A                  | D224                    | 53796                   | String21 | ※    | Current Value of<br>String21 |
| N/A                  | N/A                  | D225                    | 53797                   | String22 | ※    | Current Value of<br>String22 |
| N/A                  | N/A                  | D226                    | 53798                   | String23 | ※    | Current Value of<br>String23 |
| N/A                  | N/A                  | D227                    | 53799                   | String24 | ※    | Current Value of<br>String24 |
| N/A                  | N/A                  | D228                    | 53800                   | String25 | ※    | Current Value of<br>String25 |
| N/A                  | N/A                  | D229                    | 53801                   | String26 | ※    | Current Value of<br>String26 |

|     |     |      |       |          |   |                           |
|-----|-----|------|-------|----------|---|---------------------------|
| N/A | N/A | D22A | 53802 | String27 | ✖ | Current Value of String27 |
| N/A | N/A | D22B | 53803 | String28 | ✖ | Current Value of String28 |
| N/A | N/A | D22C | 53804 | String29 | ✖ | Current Value of String29 |
| N/A | N/A | D22D | 53805 | String30 | ✖ | Current Value of String30 |
| N/A | N/A | D22E | 53806 | String31 | ✖ | Current Value of String31 |
| N/A | N/A | D22F | 53807 | String32 | ✖ | Current Value of String32 |
| N/A | N/A | D230 | 53808 | String33 | ✖ | Current Value of String33 |
| N/A | N/A | D231 | 53809 | String34 | ✖ | Current Value of String34 |
| N/A | N/A | D232 | 53810 | String35 | ✖ | Current Value of String35 |
| N/A | N/A | D233 | 53811 | String36 | ✖ | Current Value of String36 |
| N/A | N/A | D234 | 53812 | String37 | ✖ | Current Value of String37 |
| N/A | N/A | D235 | 53813 | String38 | ✖ | Current Value of String38 |
| N/A | N/A | D236 | 53814 | String39 | ✖ | Current Value of String39 |
| N/A | N/A | D237 | 53815 | String40 | ✖ | Current Value of String40 |
| N/A | N/A | D238 | 53816 | String41 | ✖ | Current Value of String41 |
| N/A | N/A | D239 | 53817 | String42 | ✖ | Current Value of String42 |
| N/A | N/A | D23A | 53818 | String43 | ✖ | Current Value of String43 |
| N/A | N/A | D23B | 53819 | String44 | ✖ | Current Value of String44 |
| N/A | N/A | D23C | 53820 | String45 | ✖ | Current Value of String45 |
| N/A | N/A | D23D | 53821 | String46 | ✖ | Current Value of String46 |
| N/A | N/A | D23E | 53822 | String47 | ✖ | Current Value of String47 |
| N/A | N/A | D23F | 53823 | String48 | ✖ | Current Value of String48 |
| N/A | N/A | D240 | 53824 | String49 | ✖ | Current Value of String49 |
| N/A | N/A | D241 | 53825 | String50 | ✖ | Current Value of String50 |
| N/A | N/A | D242 | 53826 | String51 | ✖ | Current Value of String51 |
| N/A | N/A | D243 | 53827 | String52 | ✖ | Current Value of String52 |
| N/A | N/A | D244 | 53828 | String53 | ✖ | Current Value of String53 |
| N/A | N/A | D245 | 53829 | String54 | ✖ | Current Value of String54 |
| N/A | N/A | D246 | 53830 | String55 | ✖ | Current Value of String55 |

|     |     |      |       |          |   |                           |
|-----|-----|------|-------|----------|---|---------------------------|
| N/A | N/A | D247 | 53831 | String56 | ※ | Current Value of String56 |
| N/A | N/A | D248 | 53832 | String57 | ※ | Current Value of String57 |
| N/A | N/A | D249 | 53833 | String58 | ※ | Current Value of String58 |
| N/A | N/A | D24A | 53834 | String59 | ※ | Current Value of String59 |
| N/A | N/A | D24B | 53835 | String60 | ※ | Current Value of String60 |
| N/A | N/A | D24C | 53836 | String61 | ※ | Current Value of String61 |
| N/A | N/A | D24D | 53837 | String62 | ※ | Current Value of String62 |
| N/A | N/A | D24E | 53838 | String63 | ※ | Current Value of String63 |
| N/A | N/A | D24F | 53839 | String64 | ※ | Current Value of String64 |

※: Follow Scale factor

#### <EVENT LIST>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit | Description      |
|-------------------|-------------------|-------------------|-------------------|-----------------------|------|------------------|
| N/A               | N/A               | 440               | 1088              | Event Index (HR: 801) | N/A  | (Refer to below) |
| N/A               | N/A               | 441               | 1089              | Event (index*10+0)    | N/A  |                  |
| N/A               | N/A               | 442               | 1090              | Event (index*10+1)    | N/A  |                  |
| N/A               | N/A               | 443               | 1091              | Event (index*10+2)    | N/A  |                  |
| N/A               | N/A               | 444               | 1092              | Event (index*10+3)    | N/A  |                  |
| N/A               | N/A               | 445               | 1093              | Event (index*10+4)    | N/A  |                  |
| N/A               | N/A               | 446               | 1094              | Event (index*10+5)    | N/A  |                  |
| N/A               | N/A               | 447               | 1095              | Event (index*10+6)    | N/A  |                  |
| N/A               | N/A               | 448               | 1096              | Event (index*10+7)    | N/A  |                  |
| N/A               | N/A               | 449               | 1097              | Event (index*10+8)    | N/A  |                  |
| N/A               | N/A               | 44A               | 1098              | Event (index*10+9)    | N/A  |                  |

(IR: 1088)

This shall be assigned via Holding Registers (801) first when reading the events.

The event index is the page index.

For current design in PV inverter the maximum event is 30, so the index is from 0 to 2.

If the index is equal to 0, the event with index from 0 to 9 will be reported.

If the index is equal to 1, the event with index from 10 to 19 will be reported, and so on.

Error code refer to APPENDIX C

# <EVENT Time>

| Address (Hex) | Address (Dec) | Command              | Unit | Description                                                                                         |
|---------------|---------------|----------------------|------|-----------------------------------------------------------------------------------------------------|
| 4A0           | 1184          | Event time (index+0) | Sec  | 1184: Low word,<br>1185:High Word.<br>The cumulative seconds from 1970<br>0xFFFFFFFF: Not available |
| 4A1           | 1185          |                      |      |                                                                                                     |
| 4A2           | 1186          | Event time (index+1) | Sec  |                                                                                                     |
| 4A3           | 1187          |                      |      |                                                                                                     |
| 4A4           | 1188          | Event time (index+2) | Sec  |                                                                                                     |
| 4A5           | 1189          |                      |      |                                                                                                     |
| 4A6           | 1190          | Event time (index+3) | Sec  |                                                                                                     |
| 4A7           | 1191          |                      |      |                                                                                                     |
| 4A8           | 1192          | Event time (index+4) | Sec  |                                                                                                     |
| 4A9           | 1193          |                      |      |                                                                                                     |
| 4AA           | 1194          | Event time (index+5) | Sec  |                                                                                                     |
| 4AB           | 1195          |                      |      |                                                                                                     |
| 4AC           | 1196          | Event time (index+6) | Sec  |                                                                                                     |
| 4AD           | 1197          |                      |      |                                                                                                     |
| 4AE           | 1198          | Event time (index+7) | Sec  |                                                                                                     |
| 4AF           | 1199          |                      |      |                                                                                                     |
| 4B0           | 1200          | Event time (index+8) | Sec  |                                                                                                     |
| 4B1           | 1201          |                      |      |                                                                                                     |
| 4B2           | 1202          | Event time (index+9) | Sec  |                                                                                                     |
| 4B3           | 1203          |                      |      |                                                                                                     |

(IR: 1088)

This shall be assigned via Holding Registers (801) first when reading the events.

The event index is the page index.

For current design in PV inverter the maximum event is 30, so the index is from 0 to 2.

If the index is equal to 0, the event with index from 0 to 9 will be reported.

If the index is equal to 1, the event with index from 10 to 19 will be reported, and so on.

Error code refer to APPENDIX C

## <SCALE FACTOR>

| Old Address<br>(Hex) | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command      | Unit | Description      |
|----------------------|----------------------|-------------------------|-------------------------|--------------|------|------------------|
| N/A                  | N/A                  | A023                    | 40995                   | Scale Factor | N/A  | (Refer to below) |

### <Important!>

**If received "Illegal Data Address" while accessing this address.**

**Use default scale of Monitoring software. Otherwise, refer to the following instruction.**

### Default Scale Factor (when bit0 = 0x01, regardless the other bits):

#### Single phase inverter:

DC current = 0.01A / Power = 1W / Energy = 1Wh / AC current = 0.01A / Voltage = 0.1V

#### Three phase inverter:

DC current = 0.01A / Power = 1W / Energy = 10Wh / AC current = 0.01A / Voltage = 0.1V

#### bit0: Default

(0x00 = Disable default; 0x01 = Enable default)

#### bit1 ~ bit2: DC current

(0x00 = default ; 0x01 = 0.01A ; 0x02 = 0.1A ; 0x03 = 1.0A)

#### bit3 ~ bit5: Power (W, var, VA) / Quarter (W → Wh)

(0x00 = default ; 0x01 = 0.1W ; 0x02 = 1W ; 0x03 = 10W ; 0x04 = 100W ; 0x05 = 1000W)

#### bit6 ~ bit9: Energy

(0x00 = default ; 0x01 = 1mWh ; 0x02 = 10mWh ; 0x03 = 100mWh ; 0x04 = 1Wh ;  
0x05 = 10Wh ; 0x06 = 100Wh ; 0x07 = 1000Wh)

#### bit10 ~ bit11: AC current

(0x00 = default ; 0x01 = 0.01A ; 0x02 = 0.1A ; 0x03 = 1.0A)

#### bit12 ~ bit13: AC/DC Voltage

(0x00 = default ; 0x01 = 0.01V ; 0x02 = 0.1V ; 0x03 = 1.0V)

#### bit14~15 : reserved

#### P.S.

- bit6 ~ bit9, except "Quarter Energy".
- bit3 ~ bit5 "Quarter Energy" follow the scale factor of power, Quarter energy default : 1Wh

#### Example1:

When a three phase inverter received: 0000000110010011

As bit 0 = 1, this inverter use all default scale (ignore all the other bits):

0.01A / 1W / 10Wh / 0.01A / 0.1V

#### Example2:

When a three phase inverter received: 0000000110011100

We could separate it into several part: 00 00 00 0110 011 10 0

As bit 0 = 0 -> Disable the default scale.

Bit 1~2 = 2 -> 0.1A for DC current

Bit 3~5 = 3 -> 10W for power

Bit 6~9 = 6 -> 100Wh for energy

Bit10~11 = 0 -> use default scale, 0.01A for AC current

Bit 12~13 = 0 -> use default scale, 0.1V for voltage

# <DAILY ENERGY LOG>

| Old Address<br>(Hex) | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command                 | Unit | Description                       |
|----------------------|----------------------|-------------------------|-------------------------|-------------------------|------|-----------------------------------|
| 800                  | 2048                 | N/A                     | N/A                     | Day-0 Wh<br>(Today)     | ✖    | 2048: Low word<br>2049: High Word |
| 801                  | 2049                 | N/A                     | N/A                     |                         |      |                                   |
| 802                  | 2050                 | N/A                     | N/A                     | Day-1 Wh<br>(Yesterday) | ✖    |                                   |
| 803                  | 2051                 | N/A                     | N/A                     |                         |      |                                   |
| 804                  | 2052                 | N/A                     | N/A                     | Day-2 Wh                | ✖    |                                   |
| 805                  | 2053                 | N/A                     | N/A                     |                         |      |                                   |
| 806                  | 2054                 | N/A                     | N/A                     | Day-3 Wh                | ✖    |                                   |
| 807                  | 2055                 | N/A                     | N/A                     |                         |      |                                   |
| 808                  | 2056                 | N/A                     | N/A                     | Day-4 Wh                | ✖    |                                   |
| 809                  | 2057                 | N/A                     | N/A                     |                         |      |                                   |
| 80A                  | 2058                 | N/A                     | N/A                     | Day-5 Wh                | ✖    |                                   |
| 80B                  | 2059                 | N/A                     | N/A                     |                         |      |                                   |
| 80C                  | 2060                 | N/A                     | N/A                     | Day-6 Wh                | ✖    |                                   |
| 80D                  | 2061                 | N/A                     | N/A                     |                         |      |                                   |
| 80E                  | 2062                 | N/A                     | N/A                     | Day-7 Wh                | ✖    |                                   |
| 80F                  | 2063                 | N/A                     | N/A                     |                         |      |                                   |
| 810                  | 2064                 | N/A                     | N/A                     | Day-8 Wh                | ✖    |                                   |
| 811                  | 2065                 | N/A                     | N/A                     |                         |      |                                   |
| 812                  | 2066                 | N/A                     | N/A                     | Day-9 Wh                | ✖    |                                   |
| 813                  | 2067                 | N/A                     | N/A                     |                         |      |                                   |
| 814                  | 2068                 | N/A                     | N/A                     | Day-10 Wh               | ✖    |                                   |
| 815                  | 2069                 | N/A                     | N/A                     |                         |      |                                   |
| 816                  | 2070                 | N/A                     | N/A                     | Day-11 Wh               | ✖    |                                   |
| 817                  | 2071                 | N/A                     | N/A                     |                         |      |                                   |
| 818                  | 2072                 | N/A                     | N/A                     | Day-12 Wh               | ✖    |                                   |
| 819                  | 2073                 | N/A                     | N/A                     |                         |      |                                   |
| 81A                  | 2074                 | N/A                     | N/A                     | Day-13 Wh               | ✖    |                                   |
| 81B                  | 2075                 | N/A                     | N/A                     |                         |      |                                   |
| 81C                  | 2076                 | N/A                     | N/A                     | Day-14 Wh               | ✖    |                                   |
| 81D                  | 2077                 | N/A                     | N/A                     |                         |      |                                   |
| 81E                  | 2078                 | N/A                     | N/A                     | Day-15 Wh               | ✖    |                                   |
| 81F                  | 2079                 | N/A                     | N/A                     |                         |      |                                   |
| 820                  | 2080                 | N/A                     | N/A                     | Day-16 Wh               | ✖    |                                   |
| 821                  | 2081                 | N/A                     | N/A                     |                         |      |                                   |
| 822                  | 2082                 | N/A                     | N/A                     | Day-17 Wh               | ✖    |                                   |
| 823                  | 2083                 | N/A                     | N/A                     |                         |      |                                   |
| 824                  | 2084                 | N/A                     | N/A                     | Day-18 Wh               | ✖    |                                   |
| 825                  | 2085                 | N/A                     | N/A                     |                         |      |                                   |
| 826                  | 2086                 | N/A                     | N/A                     | Day-19 Wh               | ✖    |                                   |
| 827                  | 2087                 | N/A                     | N/A                     |                         |      |                                   |
| 828                  | 2088                 | N/A                     | N/A                     | Day-20 Wh               | ✖    |                                   |
| 829                  | 2089                 | N/A                     | N/A                     |                         |      |                                   |
| 82A                  | 2090                 | N/A                     | N/A                     | Day-21 Wh               | ✖    |                                   |
| 82B                  | 2091                 | N/A                     | N/A                     |                         |      |                                   |
| 82C                  | 2092                 | N/A                     | N/A                     | Day-22 Wh               | ✖    |                                   |
| 82D                  | 2093                 | N/A                     | N/A                     |                         |      |                                   |
| 82E                  | 2094                 | N/A                     | N/A                     | Day-23 Wh               | ✖    |                                   |
| 82F                  | 2095                 | N/A                     | N/A                     |                         |      |                                   |

|     |      |     |     |           |   |  |
|-----|------|-----|-----|-----------|---|--|
| 830 | 2096 | N/A | N/A | Day-24 Wh | ✖ |  |
| 831 | 2097 | N/A | N/A |           |   |  |
| 832 | 2098 | N/A | N/A | Day-25 Wh | ✖ |  |
| 833 | 2099 | N/A | N/A |           |   |  |
| 834 | 2100 | N/A | N/A | Day-26 Wh | ✖ |  |
| 835 | 2101 | N/A | N/A |           |   |  |
| 836 | 2102 | N/A | N/A | Day-27 Wh | ✖ |  |
| 837 | 2103 | N/A | N/A |           |   |  |
| 838 | 2104 | N/A | N/A | Day-28 Wh | ✖ |  |
| 839 | 2105 | N/A | N/A |           |   |  |
| 83A | 2106 | N/A | N/A | Day-29 Wh | ✖ |  |
| 83B | 2107 | N/A | N/A |           |   |  |
| 83C | 2108 | N/A | N/A | Day-30 Wh | ✖ |  |
| 83D | 2109 | N/A | N/A |           |   |  |
| 83E | 2110 | N/A | N/A | Day-31 Wh | ✖ |  |
| 83F | 2111 | N/A | N/A |           |   |  |

✖: Follow Scale factor (if scale = 0 then unit 1 Wh)

#### <MONTH ENERGY LOG>

| Old Address<br>(Hex) | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command                       | Unit | Description                     |
|----------------------|----------------------|-------------------------|-------------------------|-------------------------------|------|---------------------------------|
| 840                  | 2112                 | N/A                     | N/A                     | Month-0 Wh<br>(Current Month) | ✖    | 2112:Low Word<br>2113:High Word |
| 841                  | 2113                 | N/A                     | N/A                     |                               |      |                                 |
| 842                  | 2114                 | N/A                     | N/A                     | Month-1 Wh<br>(Last Month)    | ✖    |                                 |
| 843                  | 2115                 | N/A                     | N/A                     |                               |      |                                 |
| 844                  | 2116                 | N/A                     | N/A                     | Month-2 Wh                    | ✖    |                                 |
| 845                  | 2117                 | N/A                     | N/A                     |                               |      |                                 |
| 846                  | 2118                 | N/A                     | N/A                     | Month-3 Wh                    | ✖    |                                 |
| 847                  | 2119                 | N/A                     | N/A                     |                               |      |                                 |
| 848                  | 2120                 | N/A                     | N/A                     | Month-4 Wh                    | ✖    |                                 |
| 849                  | 2121                 | N/A                     | N/A                     |                               |      |                                 |
| 84A                  | 2122                 | N/A                     | N/A                     | Month-5 Wh                    | ✖    |                                 |
| 84B                  | 2123                 | N/A                     | N/A                     |                               |      |                                 |
| 84C                  | 2124                 | N/A                     | N/A                     | Month-6 Wh                    | ✖    |                                 |
| 84D                  | 2125                 | N/A                     | N/A                     |                               |      |                                 |
| 84E                  | 2126                 | N/A                     | N/A                     | Month-7 Wh                    | ✖    |                                 |
| 84F                  | 2127                 | N/A                     | N/A                     |                               |      |                                 |
| 850                  | 2128                 | N/A                     | N/A                     | Month-8 Wh                    | ✖    |                                 |
| 851                  | 2129                 | N/A                     | N/A                     |                               |      |                                 |
| 852                  | 2130                 | N/A                     | N/A                     | Month-9 Wh                    | ✖    |                                 |
| 853                  | 2131                 | N/A                     | N/A                     |                               |      |                                 |
| 854                  | 2132                 | N/A                     | N/A                     | Month-10 Wh                   | ✖    |                                 |
| 855                  | 2133                 | N/A                     | N/A                     |                               |      |                                 |
| 856                  | 2134                 | N/A                     | N/A                     | Month-11 Wh                   | ✖    |                                 |
| 857                  | 2135                 | N/A                     | N/A                     |                               |      |                                 |
| 858                  | 2136                 | N/A                     | N/A                     | Month-12 Wh                   | ✖    |                                 |
| 859                  | 2137                 | N/A                     | N/A                     |                               |      |                                 |
| 85A                  | 2138                 | N/A                     | N/A                     | Month-13 Wh                   | ✖    |                                 |
| 85B                  | 2139                 | N/A                     | N/A                     |                               |      |                                 |

|     |      |     |     |             |   |  |
|-----|------|-----|-----|-------------|---|--|
| 85C | 2140 | N/A | N/A | Month-14 Wh | ※ |  |
| 85D | 2141 | N/A | N/A |             |   |  |
| 85E | 2142 | N/A | N/A | Month-15 Wh | ※ |  |
| 85F | 2143 | N/A | N/A |             |   |  |
| 860 | 2144 | N/A | N/A | Month-16 Wh | ※ |  |
| 861 | 2145 | N/A | N/A |             |   |  |
| 862 | 2146 | N/A | N/A | Month-17 Wh | ※ |  |
| 863 | 2147 | N/A | N/A |             |   |  |
| 864 | 2148 | N/A | N/A | Month-18 Wh | ※ |  |
| 865 | 2149 | N/A | N/A |             |   |  |
| 866 | 2150 | N/A | N/A | Month-19 Wh | ※ |  |
| 867 | 2151 | N/A | N/A |             |   |  |
| 868 | 2152 | N/A | N/A | Month-20 Wh | ※ |  |
| 869 | 2153 | N/A | N/A |             |   |  |
| 86A | 2154 | N/A | N/A | Month-21 Wh | ※ |  |
| 86B | 2155 | N/A | N/A |             |   |  |
| 86C | 2156 | N/A | N/A | Month-22 Wh | ※ |  |
| 86D | 2157 | N/A | N/A |             |   |  |
| 86E | 2158 | N/A | N/A | Month-23 Wh | ※ |  |
| 86F | 2159 | N/A | N/A |             |   |  |

※: Follow Scale factor (if scale = 0 then unit 1Wh)

#### <YEAR ENERGY LOG>

| Old Address<br>(Hex) | Old Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command                     | Unit | Description                     |
|----------------------|----------------------|-------------------------|-------------------------|-----------------------------|------|---------------------------------|
| 9C0                  | 2496                 | N/A                     | N/A                     | Year-0 Wh<br>(Current Year) | ※    | 2496:Low Word<br>2497:High Word |
| 9C1                  | 2497                 | N/A                     | N/A                     |                             |      |                                 |
| 9C2                  | 2498                 | N/A                     | N/A                     | Year-1 Wh<br>(Last Year)    | ※    |                                 |
| 9C3                  | 2499                 | N/A                     | N/A                     |                             |      |                                 |
| 9C4                  | 2500                 | N/A                     | N/A                     | Year-2 Wh                   | ※    |                                 |
| 9C5                  | 2501                 | N/A                     | N/A                     |                             |      |                                 |
| 9C6                  | 2502                 | N/A                     | N/A                     | Year-3 Wh                   | ※    |                                 |
| 9C7                  | 2503                 | N/A                     | N/A                     |                             |      |                                 |
| 9C8                  | 2504                 | N/A                     | N/A                     | Year-4 Wh                   | ※    |                                 |
| 9C9                  | 2505                 | N/A                     | N/A                     |                             |      |                                 |
| 9CA                  | 2506                 | N/A                     | N/A                     | Year-5 Wh                   | ※    |                                 |
| 9CB                  | 2507                 | N/A                     | N/A                     |                             |      |                                 |
| 9CC                  | 2508                 | N/A                     | N/A                     | Year-6 Wh                   | ※    |                                 |
| 9CD                  | 2509                 | N/A                     | N/A                     |                             |      |                                 |
| 9CE                  | 2510                 | N/A                     | N/A                     | Year-7 Wh                   | ※    |                                 |
| 9CF                  | 2511                 | N/A                     | N/A                     |                             |      |                                 |
| 9D0                  | 2512                 | N/A                     | N/A                     | Year-8 Wh                   | ※    |                                 |
| 9D1                  | 2513                 | N/A                     | N/A                     |                             |      |                                 |
| 9D2                  | 2514                 | N/A                     | N/A                     | Year-9 Wh                   | ※    |                                 |
| 9D3                  | 2515                 | N/A                     | N/A                     |                             |      |                                 |
| 9D4                  | 2516                 | N/A                     | N/A                     | Year-10 Wh                  | ※    |                                 |
| 9D5                  | 2517                 | N/A                     | N/A                     |                             |      |                                 |
| 9D6                  | 2518                 | N/A                     | N/A                     | Year-11 Wh                  | ※    |                                 |
| 9D7                  | 2519                 | N/A                     | N/A                     |                             |      |                                 |

|     |      |     |     |            |   |  |
|-----|------|-----|-----|------------|---|--|
| 9D8 | 2520 | N/A | N/A | Year-12 Wh | ✖ |  |
| 9D9 | 2521 | N/A | N/A |            |   |  |
| 9DA | 2522 | N/A | N/A | Year-13 Wh | ✖ |  |
| 9DB | 2523 | N/A | N/A |            |   |  |
| 9DC | 2524 | N/A | N/A | Year-14 Wh | ✖ |  |
| 9DD | 2525 | N/A | N/A |            |   |  |
| 9DE | 2526 | N/A | N/A | Year-15 Wh | ✖ |  |
| 9DF | 2527 | N/A | N/A |            |   |  |
| 9E0 | 2528 | N/A | N/A | Year-16 Wh | ✖ |  |
| 9E1 | 2529 | N/A | N/A |            |   |  |
| 9E2 | 2530 | N/A | N/A | Year-17 Wh | ✖ |  |
| 9E3 | 2531 | N/A | N/A |            |   |  |
| 9E4 | 2532 | N/A | N/A | Year-18 Wh | ✖ |  |
| 9E5 | 2533 | N/A | N/A |            |   |  |
| 9E6 | 2534 | N/A | N/A | Year-19 Wh | ✖ |  |
| 9E7 | 2535 | N/A | N/A |            |   |  |

✖: Follow Scale factor (if scale = 0 then unit 1 Wh)

### <QUARTER ENERGY LOG>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                 | Unit | Description |
|-------------------|-------------------|-------------------|-------------------|-------------------------|------|-------------|
| 870               | 2160              | N/A               | N/A               | Quarter-0 (00:00~00:15) | ✖    |             |
| 871               | 2161              | N/A               | N/A               | Quarter-1 (00:15~00:30) | ✖    |             |
| 872               | 2162              | N/A               | N/A               | Quarter-2 (00:30~00:45) | ✖    |             |
| 873               | 2163              | N/A               | N/A               | Quarter-3               | ✖    |             |
| 874               | 2164              | N/A               | N/A               | Quarter-4               | ✖    |             |
| 875               | 2165              | N/A               | N/A               | Quarter-5               | ✖    |             |
| 876               | 2166              | N/A               | N/A               | Quarter-6               | ✖    |             |
| 877               | 2167              | N/A               | N/A               | Quarter-7               | ✖    |             |
| 878               | 2168              | N/A               | N/A               | Quarter-8               | ✖    |             |
| 879               | 2169              | N/A               | N/A               | Quarter-9               | ✖    |             |
| 87A               | 2170              | N/A               | N/A               | Quarter-10              | ✖    |             |
| 87B               | 2171              | N/A               | N/A               | Quarter-11              | ✖    |             |
| 87C               | 2172              | N/A               | N/A               | Quarter-12              | ✖    |             |
| 87D               | 2173              | N/A               | N/A               | Quarter-13              | ✖    |             |
| 87E               | 2174              | N/A               | N/A               | Quarter-14              | ✖    |             |
| 87F               | 2175              | N/A               | N/A               | Quarter-15              | ✖    |             |
| 880               | 2176              | N/A               | N/A               | Quarter-16              | ✖    |             |
| 881               | 2177              | N/A               | N/A               | Quarter-17              | ✖    |             |
| 882               | 2178              | N/A               | N/A               | Quarter-18              | ✖    |             |
| 883               | 2179              | N/A               | N/A               | Quarter-19              | ✖    |             |
| 884               | 2180              | N/A               | N/A               | Quarter-20              | ✖    |             |
| 885               | 2181              | N/A               | N/A               | Quarter-21              | ✖    |             |
| 886               | 2182              | N/A               | N/A               | Quarter-22              | ✖    |             |
| 887               | 2183              | N/A               | N/A               | Quarter-23              | ✖    |             |
| 888               | 2184              | N/A               | N/A               | Quarter-24              | ✖    |             |
| 889               | 2185              | N/A               | N/A               | Quarter-25              | ✖    |             |

|     |      |     |     |            |   |  |
|-----|------|-----|-----|------------|---|--|
| 88A | 2186 | N/A | N/A | Quarter-26 | ※ |  |
| 88B | 2187 | N/A | N/A | Quarter-27 | ※ |  |
| 88C | 2188 | N/A | N/A | Quarter-28 | ※ |  |
| 88D | 2189 | N/A | N/A | Quarter-29 | ※ |  |
| 88E | 2190 | N/A | N/A | Quarter-30 | ※ |  |
| 88F | 2191 | N/A | N/A | Quarter-31 | ※ |  |
| 890 | 2192 | N/A | N/A | Quarter-32 | ※ |  |
| 891 | 2193 | N/A | N/A | Quarter-33 | ※ |  |
| 892 | 2194 | N/A | N/A | Quarter-34 | ※ |  |
| 893 | 2195 | N/A | N/A | Quarter-35 | ※ |  |
| 894 | 2196 | N/A | N/A | Quarter-36 | ※ |  |
| 895 | 2197 | N/A | N/A | Quarter-37 | ※ |  |
| 896 | 2198 | N/A | N/A | Quarter-38 | ※ |  |
| 897 | 2199 | N/A | N/A | Quarter-39 | ※ |  |
| 898 | 2200 | N/A | N/A | Quarter-40 | ※ |  |
| 899 | 2201 | N/A | N/A | Quarter-41 | ※ |  |
| 89A | 2202 | N/A | N/A | Quarter-42 | ※ |  |
| 89B | 2203 | N/A | N/A | Quarter-43 | ※ |  |
| 89C | 2204 | N/A | N/A | Quarter-44 | ※ |  |
| 89D | 2205 | N/A | N/A | Quarter-45 | ※ |  |
| 89E | 2206 | N/A | N/A | Quarter-46 | ※ |  |
| 89F | 2207 | N/A | N/A | Quarter-47 | ※ |  |
| 8A0 | 2208 | N/A | N/A | Quarter-48 | ※ |  |
| 8A1 | 2209 | N/A | N/A | Quarter-49 | ※ |  |
| 8A2 | 2210 | N/A | N/A | Quarter-50 | ※ |  |
| 8A3 | 2211 | N/A | N/A | Quarter-51 | ※ |  |
| 8A4 | 2212 | N/A | N/A | Quarter-52 | ※ |  |
| 8A5 | 2213 | N/A | N/A | Quarter-53 | ※ |  |
| 8A6 | 2214 | N/A | N/A | Quarter-54 | ※ |  |
| 8A7 | 2215 | N/A | N/A | Quarter-55 | ※ |  |
| 8A8 | 2216 | N/A | N/A | Quarter-56 | ※ |  |
| 8A9 | 2217 | N/A | N/A | Quarter-57 | ※ |  |
| 8AA | 2218 | N/A | N/A | Quarter-58 | ※ |  |
| 8AB | 2219 | N/A | N/A | Quarter-59 | ※ |  |
| 8AC | 2220 | N/A | N/A | Quarter-60 | ※ |  |
| 8AD | 2221 | N/A | N/A | Quarter-61 | ※ |  |
| 8AE | 2222 | N/A | N/A | Quarter-62 | ※ |  |
| 8AF | 2223 | N/A | N/A | Quarter-63 | ※ |  |
| 8B0 | 2224 | N/A | N/A | Quarter-64 | ※ |  |
| 8B1 | 2225 | N/A | N/A | Quarter-65 | ※ |  |
| 8B2 | 2226 | N/A | N/A | Quarter-66 | ※ |  |
| 8B3 | 2227 | N/A | N/A | Quarter-67 | ※ |  |
| 8B4 | 2228 | N/A | N/A | Quarter-68 | ※ |  |
| 8B5 | 2229 | N/A | N/A | Quarter-69 | ※ |  |
| 8B6 | 2230 | N/A | N/A | Quarter-70 | ※ |  |
| 8B7 | 2231 | N/A | N/A | Quarter-71 | ※ |  |
| 8B8 | 2232 | N/A | N/A | Quarter-72 | ※ |  |
| 8B9 | 2233 | N/A | N/A | Quarter-73 | ※ |  |
| 8BA | 2234 | N/A | N/A | Quarter-74 | ※ |  |
| 8BB | 2235 | N/A | N/A | Quarter-75 | ※ |  |

|     |      |     |     |                             |   |  |
|-----|------|-----|-----|-----------------------------|---|--|
| 8BC | 2236 | N/A | N/A | Quarter-76                  | ※ |  |
| 8BD | 2237 | N/A | N/A | Quarter-77                  | ※ |  |
| 8BE | 2238 | N/A | N/A | Quarter-78                  | ※ |  |
| 8BF | 2239 | N/A | N/A | Quarter-79                  | ※ |  |
| 8C0 | 2240 | N/A | N/A | Quarter-80                  | ※ |  |
| 8C1 | 2241 | N/A | N/A | Quarter-81                  | ※ |  |
| 8C2 | 2242 | N/A | N/A | Quarter-82                  | ※ |  |
| 8C3 | 2243 | N/A | N/A | Quarter-83                  | ※ |  |
| 8C4 | 2244 | N/A | N/A | Quarter-84                  | ※ |  |
| 8C5 | 2245 | N/A | N/A | Quarter-85                  | ※ |  |
| 8C6 | 2246 | N/A | N/A | Quarter-86                  | ※ |  |
| 8C7 | 2247 | N/A | N/A | Quarter-87                  | ※ |  |
| 8C8 | 2248 | N/A | N/A | Quarter-88                  | ※ |  |
| 8C9 | 2249 | N/A | N/A | Quarter-89                  | ※ |  |
| 8CA | 2250 | N/A | N/A | Quarter-90                  | ※ |  |
| 8CB | 2251 | N/A | N/A | Quarter-91                  | ※ |  |
| 8CC | 2252 | N/A | N/A | Quarter-92                  | ※ |  |
| 8CD | 2253 | N/A | N/A | Quarter-93                  | ※ |  |
| 8CE | 2254 | N/A | N/A | Quarter-94<br>(23:30~23:45) | ※ |  |
| 8CF | 2255 | N/A | N/A | Quarter-95<br>(23:45~24:00) | ※ |  |

※: Follow Scale factor

# <CURRENT EVENT - EVENT LIST>

| Old Address (Hex)                                                                                                                                                                             | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                  | Unit | Description               |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|--------------------------|------|---------------------------|
| These addresses use bit-mapping. Every single bit represents a single event.<br>If an event is occurred, then its corresponding bit will be set to 1.<br>Otherwise, the bit will be set to 0. |                   |                   |                   |                          |      |                           |
| C00                                                                                                                                                                                           | 3072              | N/A               | N/A               | Current event - Error0   | N/A  | Error 15 ~ Error 00       |
| C01                                                                                                                                                                                           | 3073              | N/A               | N/A               | Current event - Error1   | N/A  | Error 31 ~ Error 16       |
| C02                                                                                                                                                                                           | 3074              | N/A               | N/A               | Current event - Error2   | N/A  | Error 47 ~ Error 32       |
| C03                                                                                                                                                                                           | 3075              | N/A               | N/A               | Current event - Error3   | N/A  | Error 63 ~ Error 48       |
| C04                                                                                                                                                                                           | 3076              | N/A               | N/A               | Current event - Error4   | N/A  | Error 79 ~ Error 64       |
| C05                                                                                                                                                                                           | 3077              | N/A               | N/A               | Current event - Error5   | N/A  | Error 95 ~ Error 80       |
| C06                                                                                                                                                                                           | 3078              | N/A               | N/A               | Current event - Error6   | N/A  | Error 111 ~ Error 96      |
| C07                                                                                                                                                                                           | 3079              | N/A               | N/A               | Current event - Error7   | N/A  | Error 127 ~ Error 112     |
| C08                                                                                                                                                                                           | 3080              | N/A               | N/A               | Current event - Error8   | N/A  | Error 143 ~ Error 128     |
| C09                                                                                                                                                                                           | 3081              | N/A               | N/A               | Current event - Error9   | N/A  | Error 159 ~ Error 144     |
| C0A                                                                                                                                                                                           | 3082              | N/A               | N/A               | Current event - Error10  | N/A  | Error 174 ~ Error 160     |
| C0B                                                                                                                                                                                           | 3083              | N/A               | N/A               | Current event - Error11  | N/A  | Error 191 ~ Error 176     |
| C0C                                                                                                                                                                                           | 3084              | N/A               | N/A               | Current event - Error12  | N/A  | Error 207 ~ Error 192     |
| C0D                                                                                                                                                                                           | 3085              | N/A               | N/A               | Current event - Error13  | N/A  | Error 223 ~ Error 208     |
| C0E                                                                                                                                                                                           | 3086              | N/A               | N/A               | Current event - Error14  | N/A  | Error 239 ~ Error 224     |
| C0F                                                                                                                                                                                           | 3087              | N/A               | N/A               | Current event - Error15  | N/A  | Error 255 ~ Error 240     |
| C10                                                                                                                                                                                           | 3088              | N/A               | N/A               | Current event - Warning0 | N/A  | Warning 15 ~ Warning 00   |
| C11                                                                                                                                                                                           | 3089              | N/A               | N/A               | Current event - Warning1 | N/A  | Warning 31 ~ Warning 16   |
| C12                                                                                                                                                                                           | 3090              | N/A               | N/A               | Current event - Warning2 | N/A  | Warning 47 ~ Warning 32   |
| C13                                                                                                                                                                                           | 3091              | N/A               | N/A               | Current event - Warning3 | N/A  | Warning 63 ~ Warning 48   |
| C14                                                                                                                                                                                           | 3092              | N/A               | N/A               | Current event - Warning4 | N/A  | Warning 79 ~ Warning 64   |
| C15                                                                                                                                                                                           | 3093              | N/A               | N/A               | Current event - Warning5 | N/A  | Warning 95 ~ Warning 80   |
| C16                                                                                                                                                                                           | 3094              | N/A               | N/A               | Current event - Warning6 | N/A  | Warning 111 ~ Warning 96  |
| C17                                                                                                                                                                                           | 3095              | N/A               | N/A               | Current event - Warning7 | N/A  | Warning 127 ~ Warning 112 |
| C18                                                                                                                                                                                           | 3096              | N/A               | N/A               | Current event - Warning8 | N/A  | Warning 143 ~ Warning 128 |

|     |      |     |     |                           |     |                           |
|-----|------|-----|-----|---------------------------|-----|---------------------------|
| C19 | 3097 | N/A | N/A | Current event - Warning9  | N/A | Warning 159 ~ Warning 144 |
| C1A | 3098 | N/A | N/A | Current event - Warning10 | N/A | Warning 174 ~ Warning 160 |
| C1B | 3099 | N/A | N/A | Current event - Warning11 | N/A | Warning 191 ~ Warning 176 |
| C1C | 3100 | N/A | N/A | Current event - Warning12 | N/A | Warning 207 ~ Warning 192 |
| C1D | 3101 | N/A | N/A | Current event - Warning13 | N/A | Warning 223 ~ Warning 208 |
| C1E | 3102 | N/A | N/A | Current event - Warning14 | N/A | Warning 239 ~ Warning 224 |
| C1F | 3103 | N/A | N/A | Current event - Warning15 | N/A | Warning 255 ~ Warning 240 |
| C20 | 3104 | N/A | N/A | Current event - Fault0    | N/A | Fault 15 ~ Fault 00       |
| C21 | 3105 | N/A | N/A | Current event - Fault1    | N/A | Fault 31 ~ Fault 16       |
| C22 | 3106 | N/A | N/A | Current event - Fault2    | N/A | Fault 47 ~ Fault 32       |
| C23 | 3107 | N/A | N/A | Current event - Fault3    | N/A | Fault 63 ~ Fault 48       |
| C24 | 3108 | N/A | N/A | Current event - Fault4    | N/A | Fault 79 ~ Fault 64       |
| C25 | 3109 | N/A | N/A | Current event - Fault5    | N/A | Fault 95 ~ Fault 80       |
| C26 | 3110 | N/A | N/A | Current event - Fault6    | N/A | Fault 111 ~ Fault 96      |
| C27 | 3111 | N/A | N/A | Current event - Fault7    | N/A | Fault 127 ~ Fault 112     |
| C28 | 3112 | N/A | N/A | Current event - Fault8    | N/A | Fault 143 ~ Fault 128     |
| C29 | 3113 | N/A | N/A | Current event - Fault9    | N/A | Fault 159 ~ Fault 144     |
| C2A | 3114 | N/A | N/A | Current event - Fault10   | N/A | Fault 174 ~ Fault 160     |
| C2B | 3115 | N/A | N/A | Current event - Fault11   | N/A | Fault 191 ~ Fault 176     |
| C2C | 3116 | N/A | N/A | Current event - Fault12   | N/A | Fault 207 ~ Fault 192     |
| C2D | 3117 | N/A | N/A | Current event - Fault13   | N/A | Fault 223 ~ Fault 208     |
| C2E | 3118 | N/A | N/A | Current event - Fault14   | N/A | Fault 239 ~ Fault 224     |
| C2F | 3119 | N/A | N/A | Current event - Fault15   | N/A | Fault 255 ~ Fault 240     |

See below for example

※Example: If address 3072 replies with **0100011000010001**

**0 1 0 0 0 1 1 0 0 0 0 1 0 0 0 1**  
**E15, E14, E13, E12, E11, E10, E9, E8, E7, E6, E5, E4, E3, E2, E1, E0**

We can get the information that Error 14, Error 10, Error 9, Error 4 and Error 0 are now occurring.  
 For description of every error code, refer to APPENDIX C.

### <CURRENT EVENT - FAN FAIL>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command             | Unit | Description   |
|-------------------|-------------------|-------------------|-------------------|---------------------|------|---------------|
| D031              | 53297             | N/A               | N/A               | Int Fan Fail group1 | N/A  | Fan15 ~ Fan00 |
| D032              | 53298             | N/A               | N/A               | Int Fan Fail group2 | N/A  | Fan31 ~ Fan16 |
| D033              | 53299             | N/A               | N/A               | Ext Fan Fail group1 | N/A  | Fan15 ~ Fan00 |
| D034              | 53330             | N/A               | N/A               | Ext Fan Fail group2 | N/A  | Fan31 ~ Fan16 |

See below for example

※Example: If address 53297 replies with **0100 1000 0000 0010**

<sup>0</sup> <sup>1</sup> <sup>0</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup>  
 Fan15 Fan14 Fan13 Fan12 Fan11 Fan10 Fan09 Fan08 Fan07 Fan06 Fan05 Fan04 Fan03 Fan02 Fan01 Fan00

We can get the information that Internal Fan14, Fan11 and Fan01 are failed.

### <CURRENT EVENT - CURRENT SHUNT>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit | Description    |
|-------------------|-------------------|-------------------|-------------------|-----------------------|------|----------------|
| D035              | 53301             | N/A               | N/A               | String warning group1 | N/A  | String 16 ~ 01 |
| D036              | 53302             | N/A               | N/A               | String warning group2 | N/A  | String 32 ~ 17 |
| D037              | 53303             | N/A               | N/A               | String warning group3 | N/A  | String 48 ~ 33 |
| D038              | 53304             | N/A               | N/A               | String warning group4 | N/A  | String 64 ~ 49 |

See below for example

※Example: If address 53301 replies with **0010 0001 0001 0100**

<sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup> <sup>0</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup> <sup>1</sup> <sup>0</sup>  
 Str16 Str15 Str14 Str13 Str12 Str11 Str10 Str09 Str08 Str07 Str06 Str05 Str04 Str03 Str02 Str01

We can get the information that String13, String08, String04 and String02 are failed.

<DC INFORMATION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit | Description |
|-------------------|-------------------|-------------------|-------------------|-----------------------|------|-------------|
| N/A               | N/A               | B000              | 45056             | Total Power           | ※    |             |
| N/A               | N/A               | B001              | 45057             | Input1 DC voltage     | ※    |             |
| N/A               | N/A               | B002              | 45058             | Input1 DC current     | ※    |             |
| N/A               | N/A               | B003              | 45059             | Input1 DC wattage     | ※    |             |
| N/A               | N/A               | B004              | 45060             | Input2 DC voltage     | ※    |             |
| N/A               | N/A               | B005              | 45061             | Input2 DC current     | ※    |             |
| N/A               | N/A               | B006              | 45062             | Input2 DC wattage     | ※    |             |
| N/A               | N/A               | B007              | 45063             | Input3 DC voltage     | ※    |             |
| N/A               | N/A               | B008              | 45064             | Input3 DC current     | ※    |             |
| N/A               | N/A               | B009              | 45065             | Input3 DC wattage     | ※    |             |
| N/A               | N/A               | B00A              | 45066             | Input4 DC voltage     | ※    |             |
| N/A               | N/A               | B00B              | 45067             | Input4 DC current     | ※    |             |
| N/A               | N/A               | B00C              | 45068             | Input4 DC wattage     | ※    |             |
| N/A               | N/A               | B00D              | 45069             | Input5 DC voltage     | ※    |             |
| N/A               | N/A               | B00E              | 45070             | Input5 DC current     | ※    |             |
| N/A               | N/A               | B00F              | 45071             | Input5 DC wattage     | ※    |             |
| N/A               | N/A               | B010              | 45072             | Input6 DC voltage     | ※    |             |
| N/A               | N/A               | B011              | 45073             | Input6 DC current     | ※    |             |
| N/A               | N/A               | B012              | 45074             | Input6 DC wattage     | ※    |             |
| N/A               | N/A               | B013              | 45075             | Max Input1 DC voltage | ※    |             |
| N/A               | N/A               | B014              | 45076             | Max Input1 DC current | ※    |             |
| N/A               | N/A               | B015              | 45077             | Max Input1 DC wattage | ※    |             |
| N/A               | N/A               | B016              | 45078             | Max Input2 DC voltage | ※    |             |
| N/A               | N/A               | B017              | 45079             | Max Input2 DC current | ※    |             |
| N/A               | N/A               | B018              | 45080             | Max Input2 DC wattage | ※    |             |
| N/A               | N/A               | B019              | 45081             | Max Input3 DC voltage | ※    |             |
| N/A               | N/A               | B01A              | 45082             | Max Input3 DC current | ※    |             |

|     |     |      |       |                       |   |  |
|-----|-----|------|-------|-----------------------|---|--|
| N/A | N/A | B01B | 45083 | Max Input3 DC wattage | ※ |  |
| N/A | N/A | B01C | 45084 | Max Input4 DC voltage | ※ |  |
| N/A | N/A | B01D | 45085 | Max Input4 DC current | ※ |  |
| N/A | N/A | B01E | 45086 | Max Input4 DC wattage | ※ |  |
| N/A | N/A | B01F | 45087 | Max Input5 DC voltage | ※ |  |
| N/A | N/A | B020 | 45088 | Max Input5 DC current | ※ |  |
| N/A | N/A | B021 | 45089 | Max Input5 DC wattage | ※ |  |
| N/A | N/A | B022 | 45090 | Max Input6 DC voltage | ※ |  |
| N/A | N/A | B023 | 45091 | Max Input6 DC current | ※ |  |
| N/A | N/A | B024 | 45092 | Max Input6 DC wattage | ※ |  |
| N/A | N/A | B025 | 45093 | Input7 DC voltage     | ※ |  |
| N/A | N/A | B026 | 45094 | Input7 DC current     | ※ |  |
| N/A | N/A | B027 | 45095 | Input7 DC wattage     | ※ |  |
| N/A | N/A | B028 | 45096 | Input8 DC voltage     | ※ |  |
| N/A | N/A | B029 | 45097 | Input8 DC current     | ※ |  |
| N/A | N/A | B02A | 45098 | Input8 DC wattage     | ※ |  |
| N/A | N/A | B02B | 45099 | Input9 DC voltage     | ※ |  |
| N/A | N/A | B02C | 45100 | Input9 DC current     | ※ |  |
| N/A | N/A | B02D | 45101 | Input9 DC wattage     | ※ |  |
| N/A | N/A | B02E | 45102 | Input10 DC voltage    | ※ |  |
| N/A | N/A | B02F | 45103 | Input10 DC current    | ※ |  |
| N/A | N/A | B030 | 45104 | Input10 DC wattage    | ※ |  |
| N/A | N/A | B031 | 45105 | Input11 DC voltage    | ※ |  |
| N/A | N/A | B032 | 45106 | Input11 DC current    | ※ |  |
| N/A | N/A | B033 | 45107 | Input11 DC wattage    | ※ |  |
| N/A | N/A | B034 | 45108 | Input12 DC voltage    | ※ |  |
| N/A | N/A | B035 | 45109 | Input12 DC current    | ※ |  |
| N/A | N/A | B036 | 45110 | Input12 DC wattage    | ※ |  |
| N/A | N/A | B037 | 45111 | Max Input7 DC voltage | ※ |  |

|     |     |      |       |                        |   |  |
|-----|-----|------|-------|------------------------|---|--|
| N/A | N/A | B038 | 45112 | Max Input7 DC current  | ※ |  |
| N/A | N/A | B039 | 45113 | Max Input7 DC wattage  | ※ |  |
| N/A | N/A | B03A | 45114 | Max Input8 DC voltage  | ※ |  |
| N/A | N/A | B03B | 45115 | Max Input8 DC current  | ※ |  |
| N/A | N/A | B03C | 45116 | Max Input8 DC wattage  | ※ |  |
| N/A | N/A | B03D | 45117 | Max Input9 DC voltage  | ※ |  |
| N/A | N/A | B03E | 45118 | Max Input9 DC current  | ※ |  |
| N/A | N/A | B03F | 45119 | Max Input9 DC wattage  | ※ |  |
| N/A | N/A | B040 | 45120 | Max Input10 DC voltage | ※ |  |
| N/A | N/A | B041 | 45121 | Max Input10 DC current | ※ |  |
| N/A | N/A | B042 | 45122 | Max Input10 DC wattage | ※ |  |
| N/A | N/A | B043 | 45123 | Max Input11 DC voltage | ※ |  |
| N/A | N/A | B044 | 45124 | Max Input11 DC current | ※ |  |
| N/A | N/A | B045 | 45125 | Max Input11 DC wattage | ※ |  |
| N/A | N/A | B046 | 45126 | Max Input12 DC voltage | ※ |  |
| N/A | N/A | B047 | 45127 | Max Input12 DC current | ※ |  |
| N/A | N/A | B048 | 45128 | Max Input12 DC wattage | ※ |  |

※: Follow Scale factor

### <AC INFORMATION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                    | Unit   | Description |
|-------------------|-------------------|-------------------|-------------------|----------------------------|--------|-------------|
| N/A               | N/A               | C000              | 49152             | Total output power         | ※      |             |
| N/A               | N/A               | C001              | 49153             | Output1 AC voltage – Phase | ※      |             |
| N/A               | N/A               | C002              | 49154             | Output1 AC current         | ※      |             |
| N/A               | N/A               | C003              | 49155             | Output1 AC wattage         | ※      |             |
| N/A               | N/A               | C004              | 49156             | Output1 AC frequency       | 0.01Hz |             |
| N/A               | N/A               | C005              | 49157             | Output2 AC voltage – Phase | ※      |             |
| N/A               | N/A               | C006              | 49158             | Output2 AC current         | ※      |             |
| N/A               | N/A               | C007              | 49159             | Output2 AC wattage         | ※      |             |
| N/A               | N/A               | C008              | 49160             | Output2 AC frequency       | 0.01Hz |             |
| N/A               | N/A               | C009              | 49161             | Output3 AC voltage – Phase | ※      |             |
| N/A               | N/A               | C00A              | 49162             | Output3 AC current         | ※      |             |
| N/A               | N/A               | C00B              | 49163             | Output3 AC wattage         | ※      |             |
| N/A               | N/A               | C00C              | 49164             | Output3 AC frequency       | 0.01Hz |             |
| N/A               | N/A               | C01B              | 49179             | Output1 AC voltage – Line  | ※      |             |
| N/A               | N/A               | C01C              | 49180             | Output2 AC voltage – Line  | ※      |             |
| N/A               | N/A               | C01D              | 49181             | Output3 AC voltage – Line  | ※      |             |
| N/A               | N/A               | C03F              | 49215             | Max Output1 AC voltage     | ※      |             |
| N/A               | N/A               | C040              | 49216             | Max Output1 AC current     | ※      |             |
| N/A               | N/A               | C041              | 49217             | Max Output1 AC wattage     | ※      |             |
| N/A               | N/A               | C042              | 49218             | Max Output1 AC frequency   | 0.01Hz |             |
| N/A               | N/A               | C043              | 49219             | Max Output2 AC voltage     | ※      |             |
| N/A               | N/A               | C044              | 49220             | Max Output2 AC current     | ※      |             |
| N/A               | N/A               | C045              | 49221             | Max Output2 AC wattage     | ※      |             |
| N/A               | N/A               | C046              | 49222             | Max Output2 AC frequency   | 0.01Hz |             |
| N/A               | N/A               | C047              | 49223             | Max Output3 AC voltage     | ※      |             |

|     |     |      |       |                             |        |  |
|-----|-----|------|-------|-----------------------------|--------|--|
| N/A | N/A | C048 | 49224 | Max Output3<br>AC current   | ※      |  |
| N/A | N/A | C049 | 49225 | Max Output3<br>AC wattage   | ※      |  |
| N/A | N/A | C04A | 49226 | Max Output3<br>AC frequency | 0.01Hz |  |
| N/A | N/A | C031 | 49201 | Total apparent<br>power     | ※      |  |
| N/A | N/A | C032 | 49202 |                             |        |  |
| N/A | N/A | C033 | 49203 | Apparent<br>power 1         | ※      |  |
| N/A | N/A | C034 | 49204 | Apparent<br>power 2         | ※      |  |
| N/A | N/A | C035 | 49205 | Apparent<br>power 3         | ※      |  |

※: Follow Scale factor

#### <POWER QUALITY INFORMATION>

| Old<br>Address<br>(Hex) | Old<br>Address<br>(Dec) | New<br>Address<br>(Hex) | New<br>Address<br>(Dec) | Command             | Unit | Description                                    |
|-------------------------|-------------------------|-------------------------|-------------------------|---------------------|------|------------------------------------------------|
| N/A                     | N/A                     | C060                    | 49248                   | Q Sum               | ※    | Total reactive power                           |
| N/A                     | N/A                     | C061                    | 49249                   | CosPhi              | 0.01 | Power factor                                   |
| N/A                     | N/A                     | C062                    | 49250                   | Power<br>Efficiency | 0.1% | Efficiency of power<br>converting<br>(DC → AC) |

### <DERATING LOG INFORMATION-THERMAL>

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5240                                                                                                                                                                          | 21056         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5241                                                                                                                                                                          | 21057         |                               |             |
| 5242                                                                                                                                                                          | 21058         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5243                                                                                                                                                                          | 21059         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5244                                                                                                                                                                          | 21060         |                               |             |
| 5245                                                                                                                                                                          | 21061         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5246                                                                                                                                                                          | 21062         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5247                                                                                                                                                                          | 21063         |                               |             |
| 5248                                                                                                                                                                          | 21064         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5249                                                                                                                                                                          | 21065         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 525A                                                                                                                                                                          | 21066         |                               |             |
| 525B                                                                                                                                                                          | 21067         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

### <DERATING LOG INFORMATION-OPV >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5280                                                                                                                                                                          | 21120         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5281                                                                                                                                                                          | 21121         |                               |             |
| 5282                                                                                                                                                                          | 21122         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5283                                                                                                                                                                          | 21123         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5284                                                                                                                                                                          | 21124         |                               |             |
| 5285                                                                                                                                                                          | 21125         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5286                                                                                                                                                                          | 21126         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5287                                                                                                                                                                          | 21127         |                               |             |
| 5288                                                                                                                                                                          | 21128         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5289                                                                                                                                                                          | 21129         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 528A                                                                                                                                                                          | 21130         |                               |             |
| 528B                                                                                                                                                                          | 21131         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

#### <DERATING LOG INFORMATION-VIN >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 52C0                                                                                                                                                                          | 21184         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 52C1                                                                                                                                                                          | 21185         |                               |             |
| 52C2                                                                                                                                                                          | 21186         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 52C3                                                                                                                                                                          | 21187         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 52C4                                                                                                                                                                          | 21188         |                               |             |
| 52C5                                                                                                                                                                          | 21189         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 52C6                                                                                                                                                                          | 21190         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 52C7                                                                                                                                                                          | 21191         |                               |             |
| 52C8                                                                                                                                                                          | 21192         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 52C9                                                                                                                                                                          | 21193         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 52CA                                                                                                                                                                          | 21194         |                               |             |
| 52CB                                                                                                                                                                          | 21195         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

#### <DERATING LOG INFORMATION-OPV\_LO >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5300                                                                                                                                                                          | 21248         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5301                                                                                                                                                                          | 21249         |                               |             |
| 5302                                                                                                                                                                          | 21250         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5303                                                                                                                                                                          | 21251         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5304                                                                                                                                                                          | 21252         |                               |             |
| 5305                                                                                                                                                                          | 21253         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5306                                                                                                                                                                          | 21254         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5307                                                                                                                                                                          | 21255         |                               |             |
| 5308                                                                                                                                                                          | 21256         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5309                                                                                                                                                                          | 21257         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 530A                                                                                                                                                                          | 21258         |                               |             |
| 530B                                                                                                                                                                          | 21259         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

#### <DERATING LOG INFORMATION-PM >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5340                                                                                                                                                                          | 21312         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5341                                                                                                                                                                          | 21313         |                               |             |
| 5342                                                                                                                                                                          | 21314         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5343                                                                                                                                                                          | 21315         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5344                                                                                                                                                                          | 21316         |                               |             |
| 5345                                                                                                                                                                          | 21317         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5346                                                                                                                                                                          | 21318         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5347                                                                                                                                                                          | 21319         |                               |             |
| 5348                                                                                                                                                                          | 21320         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5349                                                                                                                                                                          | 21321         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 534A                                                                                                                                                                          | 21322         |                               |             |
| 534B                                                                                                                                                                          | 21323         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

#### <DERATING LOG INFORMATION-PF >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5380                                                                                                                                                                          | 21376         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5381                                                                                                                                                                          | 21377         |                               |             |
| 5382                                                                                                                                                                          | 21378         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5383                                                                                                                                                                          | 21379         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5384                                                                                                                                                                          | 21380         |                               |             |
| 5385                                                                                                                                                                          | 21381         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5386                                                                                                                                                                          | 21382         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5387                                                                                                                                                                          | 21383         |                               |             |
| 5388                                                                                                                                                                          | 21384         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5389                                                                                                                                                                          | 21385         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 538A                                                                                                                                                                          | 21386         |                               |             |
| 538B                                                                                                                                                                          | 21387         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

### <DERATING LOG INFORMATION-RampUp >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 53C0                                                                                                                                                                          | 21440         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 53C1                                                                                                                                                                          | 21441         |                               |             |
| 53C2                                                                                                                                                                          | 21442         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 53C3                                                                                                                                                                          | 21443         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 53C4                                                                                                                                                                          | 21444         |                               |             |
| 53C5                                                                                                                                                                          | 21445         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 53C6                                                                                                                                                                          | 21446         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 53C7                                                                                                                                                                          | 21447         |                               |             |
| 53C8                                                                                                                                                                          | 21448         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 53C9                                                                                                                                                                          | 21449         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 53CA                                                                                                                                                                          | 21450         |                               |             |
| 53CB                                                                                                                                                                          | 21451         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

### <DERATING LOG INFORMATION-Others >

| Address (Hex)                                                                                                                                                                 | Address (Dec) | Purpose                       | Description |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|-------------------------------|-------------|
| 5400                                                                                                                                                                          | 21504         | <i>Derating-Start time 0</i>  | Unit: 1Sec  |
| 5401                                                                                                                                                                          | 21505         |                               |             |
| 5402                                                                                                                                                                          | 21506         | <i>Derating-Add Up time 0</i> | Unit: 1Sec  |
| 5403                                                                                                                                                                          | 21507         | <i>Derating-Start time 1</i>  | Unit: 1Sec  |
| 5404                                                                                                                                                                          | 21508         |                               |             |
| 5405                                                                                                                                                                          | 21509         | <i>Derating-Add Up time 1</i> | Unit: 1Sec  |
| 5406                                                                                                                                                                          | 21510         | <i>Derating-Start time 2</i>  | Unit: 1Sec  |
| 5407                                                                                                                                                                          | 21511         |                               |             |
| 5408                                                                                                                                                                          | 21512         | <i>Derating-Add Up time 2</i> | Unit: 1Sec  |
| 5409                                                                                                                                                                          | 21513         | <i>Derating-Start time 3</i>  | Unit: 1Sec  |
| 540A                                                                                                                                                                          | 21514         |                               |             |
| 540B                                                                                                                                                                          | 21515         | <i>Derating-Add Up time 3</i> | Unit: 1Sec  |
| ※Derating-Start time n → RTC of derating event occur time<br>※Derating-Add Up time n → Length of derating event duration<br>※Both Start time & Add Up time are zero → Invalid |               |                               |             |

# <DERATING OCCUR FLAG>

| Address (Hex) | Address (Dec) | Purpose                             | Description                                                                                                                                                                                                                                                                                                                                                           |
|---------------|---------------|-------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 51FF          | 20991         | <i>Derating Records Occur Flags</i> | 0: Normal ; 1: Occur<br>Bit0 : Reserved<br>Bit1 : Derating Records for Thermal<br>Bit2 : Derating Records for OPV<br>Bit3 : Derating Records for Vin<br>Bit4 : Derating Records for OPV_Lo<br>Bit5 : Derating Records for PM<br>Bit6 : Derating Records for P(F)<br>Bit7 : Derating Records for Rampup<br>Bit8 : Derating Records for Others<br>Bit9 ~ Bit15 Reserved |

#### 4. Memory Map ~ Writable (Holding Register)

##### <GENERAL INVERTER SESETTING>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command   | Unit | Description                                                                  |
|-------------------|-------------------|-------------------|-------------------|-----------|------|------------------------------------------------------------------------------|
| 31D               | 797               | N/A               | N/A               | Country   | N/A  | Country ID                                                                   |
| 8343              | 33603             | N/A               | N/A               | EPO1      | N/A  | 0: Normal Close<br>1: Normal Open                                            |
| 8344              | 33604             | N/A               | N/A               | EPO2      | N/A  | 0: Normal Close<br>1: Normal Open                                            |
| 841D              | 33821             | N/A               | N/A               | Baud Rate | N/A  | Byte map:<br>0: 2400<br>1: 4800<br>2: 9600<br>3: 19200 (Default)<br>4: 38400 |

##### <ENERGYLOG INDEX>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit | Description  |
|-------------------|-------------------|-------------------|-------------------|-----------------------|------|--------------|
| 328               | 808               | N/A               | N/A               | Quarter KWh Log Index | N/A  | Range: 0~95  |
| 329               | 809               | N/A               | N/A               | Daily KWh Log Index   | N/A  | Range: 0~365 |
| 32A               | 810               | N/A               | N/A               | Monthly KWh Log Index | N/A  | Range: 0~239 |

##### <RTC TIME>

| Old Address (Hex)                                     | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                  | Unit | Description                        |
|-------------------------------------------------------|-------------------|-------------------|-------------------|--------------------------|------|------------------------------------|
| 310                                                   | 784               | N/A               | N/A               | High Word of RTC Seconds | 1s   | Seconds since Jan/01/1970 00:00:00 |
| 311                                                   | 785               | N/A               | N/A               | Low Word of RTC Seconds  | 1s   | Seconds since Jan/01/1970 00:00:00 |
| These two addresses must be written within 5 seconds. |                   |                   |                   |                          |      |                                    |

##### <EVENT INDEX>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command     | Unit | Description                          |
|-------------------|-------------------|-------------------|-------------------|-------------|------|--------------------------------------|
| 321               | 801               | N/A               | N/A               | Event Index | N/A  | Refer to: Section 3.<br><EVENT LIST> |

### <ARC Fault Lock>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command        | Unit | Description                                                                                                                                                                     |
|-------------------|-------------------|-------------------|-------------------|----------------|------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A               | N/A               | BD00              | 48384             | ARC Fault Lock | N/A  | <p>Read:<br/>Bit 0:<br/>0: Normal ; 1: Lock(Arc Fault Occurred)<br/>Bit 1 ~ Bit 15: Reserved</p> <p>Write:<br/>Bit 0:<br/>0: Undo ; 1: Release<br/>Bit 1 ~ Bit 15: Reserved</p> |

### <GRID SETTING - VOLTAGE>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                | Unit  | Description |
|-------------------|-------------------|-------------------|-------------------|------------------------|-------|-------------|
| 8310              | 33552             | BC00              | 48128             | Uac High off           | 0.1v  |             |
| 8311              | 33553             | BC01              | 48129             | Uac High off time      | 0.01s |             |
| 8312              | 33554             | BC02              | 48130             | Uac High on            | 0.1v  |             |
| 8316              | 33558             | BC03              | 48131             | Uac High off slow      | 0.1v  |             |
| 8317              | 33559             | BC04              | 48132             | Uac High off slow time | 0.01s |             |
| 8318              | 33560             | BC05              | 48133             | Uac High on slow       | 0.1v  |             |
| 8313              | 33555             | BC06              | 48134             | Uac Low off            | 0.1v  |             |
| 8314              | 33556             | BC07              | 48135             | Uac Low off time       | 0.01s |             |
| 8315              | 33557             | BC08              | 48136             | Uac Low on             | 0.1v  |             |
| 8319              | 33561             | BC09              | 48137             | Uac Low off slow       | 0.1v  |             |
| 831A              | 33562             | BC0A              | 48138             | Uac Low off slow time  | 0.01s |             |
| 831B              | 33563             | BC0B              | 48139             | Uac Low on slow        | 0.1v  |             |

# **<GRID SETTING - FREQUENCY>**

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                | Unit   | Description |
|-------------------|-------------------|-------------------|-------------------|------------------------|--------|-------------|
| 8320              | 33568             | BC0C              | 48140             | Fac High off           | 0.01Hz |             |
| 8321              | 33569             | BC0D              | 48141             | Fac High off time      | 0.01s  |             |
| 8322              | 33570             | BC0E              | 48142             | Fac High on            | 0.01Hz |             |
| 834A              | 33610             | BC0F              | 48143             | Fac High off slow      | 0.01Hz |             |
| 834B              | 33611             | BC10              | 48144             | Fac High off slow time | 0.01s  |             |
| 834C              | 33612             | BC11              | 48145             | Fac High on slow       | 0.01Hz |             |
| 8323              | 33571             | BC12              | 48146             | Fac Low off            | 0.01Hz |             |
| 8324              | 33572             | BC13              | 48147             | Fac Low off time       | 0.01s  |             |
| 8325              | 33573             | BC14              | 48148             | Fac Low on             | 0.01Hz |             |
| 834D              | 33613             | BC15              | 48149             | Fac Low off slow       | 0.01Hz |             |
| 834E              | 33614             | BC16              | 48150             | Fac Low off slow time  | 0.01s  |             |
| 834F              | 33615             | BC17              | 48151             | Fac Low on slow        | 0.01Hz |             |

### <GRID SETTING - CONNECTION>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit           | Description                                                                            |
|-------------------|-------------------|-------------------|-------------------|-----------------------|----------------|----------------------------------------------------------------------------------------|
| N/A               | N/A               | BC19              | 48153             | Extend Reclosure_time | 1s             | Range: 0~1800<br>Unit: 1s                                                              |
| 8333              | 33587             | BC1A              | 48154             | Reconnection Time     | 0.1s/<br>0.01s | For 33587<br>Range: 0~3000<br>Unit: 0.1s<br>For 48154<br>Range: 0~30000<br>Unit: 0.01s |

### <POWER LIMIT>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                  | Unit | Description                                           |
|-------------------|-------------------|-------------------|-------------------|--------------------------|------|-------------------------------------------------------|
| 31F               | 798               | BD80              | 48512             | Power Management Mode    | N/A  | Word map<br>0x0000 :Disable(Default)<br>0x0001 :Rated |
| 31F               | 799               | BD81              | 48513             | Power Management Percent | 1%   | Range: 0~100                                          |
| N/A               | N/A               | BD82              | 48514             | Active Power Slop        | 1s   | Range: 0~1200                                         |

### <P(V)>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command          | Unit | Description                |
|-------------------|-------------------|-------------------|-------------------|------------------|------|----------------------------|
| N/A               | N/A               | BDA0              | 48544             | P_V Mode         |      | P_V Mode<br>0: Off ; 1: On |
| N/A               | N/A               | BDA1              | 48545             | Recovery Time    | sec  | P_V Recovery Time          |
| N/A               | N/A               | BDA2              | 48546             | Lock-in Power    | 1%   | P_V Lock-in Power          |
| N/A               | N/A               | BDA3              | 48547             | Lock-out Power   | 1%   | P_V Lock-out Power         |
| N/A               | N/A               | BDA4              | 48548             | Lock-in Voltage  | 0.1V | P_V Lock-in Voltage        |
| N/A               | N/A               | BDA5              | 48549             | Lock-out Voltage | 0.1V | P_V Lock-out Voltage       |

### <P(F)>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command    | Unit | Description                                                                                      |
|-------------------|-------------------|-------------------|-------------------|------------|------|--------------------------------------------------------------------------------------------------|
| BE00              | 48640             | 350               | 848               | PROFR Mode |      | PROFR Mode<br>Word map<br>0xFFFF : Not available<br>0x0000 : Disable (default)<br>0x0001 : Rated |

|      |       |     |     |                       |        |                                                                               |
|------|-------|-----|-----|-----------------------|--------|-------------------------------------------------------------------------------|
|      |       |     |     |                       |        | 0x0002 : Actual                                                               |
| BE01 | 48641 | 351 | 849 | Gradient              | 1%     | PROFR Gradient Percentage                                                     |
| BE02 | 48642 | 352 | 850 | F_Start               | 0.01Hz | PROFR Fac Start                                                               |
| BE03 | 48643 | 353 | 851 | F_Stop                | 0.01Hz | PROFR Fac Stop (Read only)                                                    |
| BE04 | 48644 | 354 | 852 | F_Recovery            | 0.01Hz | PROFR Fac Rec                                                                 |
| BE05 | 48645 | 360 | 864 | Ramp_up               | 1%     | (P/Prated)%/min<br>Point : 0 ~ 6000 unit 1%<br>Power Rump Up                  |
| BE06 | 48646 | 361 | 865 | Recovery_Time         | 0.01s  | Power Ramp Up<br>Recover Time                                                 |
| BE07 | 48647 | 362 | 866 | Statism               | 0.1%   | Statism = 1 / (Gradient * Fn)                                                 |
| BE08 | 48648 | 363 | 867 | Active_Response_Delay | 0.01s  | PROFR Response Delay (0~120sec default: 0)                                    |
| BE09 | 48649 | N/A | N/A | F_LowGradient         | 1%     | PRUFR Gradient Percentage                                                     |
| BE0A | 48650 | N/A | N/A | F_LowStart            | 0.01Hz | PRUFR Fac Start                                                               |
| BE0B | 48651 | N/A | N/A | F_LowRecovery         | 0.01Hz | PRUFR Fac Rec                                                                 |
| BE0D | 48653 | N/A | N/A | PRUFR Mode            |        | PRUFR Mode<br>0x0000 : Disable (default)<br>0x0001 : Rated<br>0x0002 : Actual |
| BE0E | 48654 | N/A | N/A | PRUFR Recovery_Time   | 0.01s  | PRUFR Recover Time                                                            |

#### <FRT>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command        | Unit  | Description                                                                                                       |
|-------------------|-------------------|-------------------|-------------------|----------------|-------|-------------------------------------------------------------------------------------------------------------------|
| BF00              | 48896             | 355               | 853               | FRT_Mode       |       | Word map<br>0xFFFF : Not available<br>0x0000 : Disable<br>0x0001 : Enable<br>0x0002 : Enable (Limit Grid Support) |
| BF01              | 48897             | 356               | 854               | T1             | 0.01s | FRT Duration Time                                                                                                 |
| BF02              | 48898             | 357               | 855               | Vdrop          | 1%    | FRT Uac Fault Percent                                                                                             |
| BF03              | 48899             | 358               | 856               | V1             | 1%    | FRT Uac Recovery1 Percent                                                                                         |
| BF04              | 48900             | 359               | 857               | V <sub>L</sub> | 1%    | FRT Uac Recovery2 Percent                                                                                         |
| BF05              | 48901             | 35A               | 858               | T2             | 0.01s | FRT Fault T2 Time                                                                                                 |
| BF06              | 48902             | 35B               | 859               | T3             | 0.01s | FRT Fault T3 Time                                                                                                 |
| BF07              | 48903             | 35C               | 860               | V <sub>h</sub> | 1%    | FRT High Uac Recovery Percent                                                                                     |
| BF08              | 48904             | 35D               | 861               | K Factor       | 0.1   | FRT K Factor                                                                                                      |
| BF09              | 48905             | N/A               | N/A               | HV_Mode        |       | 0x0000 : Disable<br>0x0001 : Enable                                                                               |
| BF0A              | 48906             | N/A               | N/A               | HV_V1          | 1%    | FRT High Uac Recovery1 Percent                                                                                    |
| BF0B              | 48907             | N/A               | N/A               | HV_V2          | 1%    | FRT High Uac                                                                                                      |

|      |       |     |     |             |       |                      |
|------|-------|-----|-----|-------------|-------|----------------------|
|      |       |     |     |             |       | Recovery2 Percent    |
| BF0C | 48908 | N/A | N/A | HV_T1       | 0.01s | FRT HV Fault T1 Time |
| BF0D | 48909 | N/A | N/A | HV_T2       | 0.01s | FRT HV Fault T2 Time |
| BF0E | 48910 | N/A | N/A | HV_K Factor | 0.1   | FRT HV K Factor      |

## <INSTALL SETTING>

| Old Address (Hex)                                                                                                                                                                                                                                                                                                                                                                                                                                         | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit  | Description      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|-----------------------|-------|------------------|
| 833C                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 33596             | BC62              | 48226             | Insulation Mode       | N/A   | (Refer to below) |
| 8330                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 33584             | BC63              | 48227             | Insulation Resistance | 1kohm | (Refer to below) |
| <b>Insulation Mode</b><br>Word map<br>0xFFFF : Not available<br>Bit map for High byte<br>Bit map<br>bit 8: 0 - Enable<br>bit 9: 0 - Enable Negative<br>bit 10: 0 - Enable Positive<br>bit 11: 0 - Enable Only DC1 Enable<br>bit 12: 0 - Enable Only DC2 Enable<br>bit 13~15 Reserved.<br>Byte map for Low byte<br>0x00 : Disable<br>0x01 : Enable<br>0x02 : Negative Ground<br>0x03 : Positive Ground<br>0x04 : Only DC1 Enable<br>0x05 : Only DC2 Enable |                   |                   |                   |                       |       |                  |
| High byte: The higher 8 bits of this address.<br>Low byte: The lower 8 bits of this address.<br>Example:<br>11110000 00000010<br>High byte: "Only DC2 Enable" is disabled.<br>Low byte: Now using Negative Ground.                                                                                                                                                                                                                                        |                   |                   |                   |                       |       |                  |
| Example:<br>Change setting to Positive Ground, filling the following value:<br>00000000 00000011                                                                                                                                                                                                                                                                                                                                                          |                   |                   |                   |                       |       |                  |
| <b>Insulation Resistance</b><br>Allowed value:<br>M10A: <b>600, 1100, 1200</b><br>M15A: <b>400, 700, 1200</b><br>M20A: <b>300, 550, 1200</b><br>M30A: <b>300, 550, 1200</b><br>M50A: <b>150, 250, 1100</b><br>M66H: <b>150, 250, 1100</b><br>M88H: <b>150, 250, 1200</b><br>M50A / M50A260 / M70A260 / M100_210 / M100_280: <b>150, 250, 1100</b><br>M125HV / M250HV: <b>100</b>                                                                          |                   |                   |                   |                       |       |                  |

# <REACTIVE POWER CONTROL>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                        | Unit | Description                                                                                                                                                                                                                                                            |
|-------------------|-------------------|-------------------|-------------------|--------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| N/A               | N/A               | BE7D              | 48765             | Night Mode Control Selection 1 | N/A  | Bit map of bit 0 ~ 15(RO)<br>Bit map<br>bit 0: 0 - Cosphi Of U<br>bit 1: 0 - Q of P<br>bit 2: 0 - Extend Cos( $\varphi$ ) of P Control<br>bit 3: 0 - Q(P) 24/7<br>bit 4: 0 - Fixed Kvar 24/7<br>bit 5: 0 - Q(U) 24/7<br>bit 6: 0 - QofPac 24/7<br>bit 7 ~ 15: Reserved |
| N/A               | N/A               | BE7E              | 48766             | Night Mode Control Selection 0 | N/A  | Refer below<br>(As Control Low Selection 0)                                                                                                                                                                                                                            |
| N/A               | N/A               | BE7F              | 48767             | Control Low Selection 1        | N/A  | Bit map of bit 0 ~ 15(RO)<br>Bit map<br>bit 0: 0 - Cosphi Of U<br>bit 1: 0 - Q of P<br>bit 2: 0 - Extend Cos( $\varphi$ ) of P Control<br>bit 3: 0 - Q(P) 24/7<br>bit 4: 0 - Fixed Kvar 24/7<br>bit 5: 0 - Q(U) 24/7<br>bit 6: 0 - QofPac 24/7<br>bit 7 ~ 15: Reserved |
| N/A               | N/A               | BE80              | 48768             | Control Low Selection 0        | N/A  | Refer below                                                                                                                                                                                                                                                            |

## Word map

0xFFFF : Not available

## Bit map of bit 8 ~ 15

bit 8: 0 - Constant cos( $\varphi$ )

bit 9: 0 - Cos( $\varphi$ ) of P Control

bit 10: 0 - Constant Q

bit 11: 0 - Q of U Control (Curve A)

bit 12: 0 - Q(U) CEI-021 B (Curve B)

bit 13: 0 - Q of U Class B

bit 14: 0 - Q of U Class C

bit 15: 0 - Voltage suppression

## Byte map of bit 0 ~ 7

0x00 : Disable (Default)

0x01 : Constant cos( $\varphi$ )

0x02 : Cos( $\varphi$ ) of P Control

0x03 : Constant Q

0x04 : Q of U Control (Curve A)

0x05 : Q(U) CEI-021 B (Curve B)

0x06 : Q of U Class B

0x07 : Q of U Class C

0x08 : Voltage suppression

0x09 : Cosphi Of U

0x0A : Q of P  
 0x0B : Extend Cos( $\phi$ ) of P Control  
 0x0C : Q(P) 24/7  
 0x0D : Fixed Kvar 24/7  
 0x0E : Q(U) 24/7  
 0x0F : QofPac 24/7

**PS. If bit4~bit7 are all set 1 then only bit0~bit3 are valid.**

**ex. 0xF1 => Func = Constant cos( $\phi$ )**

**ex. 0x01 => Func = Constant cos( $\phi$ )**

**ex. 0x11 => Func = HR 0xBE7F, Bit8**

|     |     |      |       |                          |      |                                                                                                         |
|-----|-----|------|-------|--------------------------|------|---------------------------------------------------------------------------------------------------------|
| N/A | N/A | BE9E | 48798 | Q(T)<br>Mode 24/7        |      | 0: Disable<br>1: Enable<br>When enabled, control law selection is forced to be in Fixed Kvar 24/7 mode. |
| N/A | N/A | BE9F | 48799 | Const.<br>Q Percent 24/7 | 1%   | Fixed Kvar Percent 24/7<br>Range : (-75%~75%)                                                           |
| N/A | N/A | BEA0 | 48800 | Q(P)<br>Q Upper 24/7     | 1%   | KvarOfPower Q Upper 24/7<br>Range : (-44%~44%)                                                          |
| N/A | N/A | BEA1 | 48801 | Q(P)<br>Q Lower 24/7     | 1%   | KvarOfPower Q Lower 24/7<br>Range : (-44%~44%)                                                          |
| N/A | N/A | BEA2 | 48802 | Q(P)<br>Lower Limit 24/7 | 1%   | KvarOfPower PowerPercent Lower 24/7<br>Range : (0~100%)                                                 |
| N/A | N/A | BEA3 | 48803 | Q(P)<br>Upper Limit 24/7 | 1%   | KvarOfPower PowerPercent Upper 24/7<br>Range : (0~100%)                                                 |
| N/A | N/A | BEA4 | 48804 | Q(P)<br>Lockin V 24/7    | 0.1v | KvarOfPower_Lockin_V 24/7<br>Range : (80~120%) Vn                                                       |
| N/A | N/A | BEA5 | 48805 | Q(P)<br>Lockout V 24/7   | 0.1v | KvarOfPower Lockout V 24/7<br>Range : (80~120%) Vn                                                      |
| N/A | N/A | BEA6 | 48806 | Q(U)<br>Upper Limit 24/7 | 1%   | KvarOfUac KvarPercent Upper 24/7<br>Range : (-100%~100%)                                                |
| N/A | N/A | BEA7 | 48807 | Q(U)<br>Lower Limit 24/7 | 1%   | KvarOfUac KvarPercent Lower 24/7<br>Range : (-100%~100%)                                                |
| N/A | N/A | BEA8 | 48808 | Q(U)<br>Vmin 24/7        | 0.1v | KvarOfUac Vmin 24/7<br>Range : (80~115%) Vn                                                             |
| N/A | N/A | BEA9 | 48809 | Q(U)<br>Vmax 24/7        | 0.1v | KvarOfUac Vmax 24/7<br>Range : (80~115%) Vn                                                             |
| N/A | N/A | BEAA | 48810 | Q(U)<br>V1 24/7          | 0.1v | KvarOfUac V Lower 24/7<br>Range : (80~115%) Vn                                                          |
| N/A | N/A | BEAB | 48811 | Q(U)<br>V2 24/7          | 0.1v | KvarOfUac V Upper 24/7<br>Range : (80~115%) Vn                                                          |
| N/A | N/A | BEAC | 48812 | Q(U)<br>P Lock in 24/7   | 1%   | KvarOfUac Lockin PowerPercent 24/7<br>Range : (0~100%)                                                  |
| N/A | N/A | BEAD | 48813 | Q(U)<br>P lock out 24/7  | 1%   | KvarOfUac Lockout PowerPercent 24/7                                                                     |

|     |     |      |       |                     |        |                                                           |
|-----|-----|------|-------|---------------------|--------|-----------------------------------------------------------|
|     |     |      |       |                     |        | Range : (0~100%)                                          |
| N/A | N/A | BEAF | 48815 | Response Delay 24/7 | 0.01 s | ReactivePower<br>ResponseDelay 24/7<br>Range : (0~120sec) |

### <Cosphi(U)>

| Old Address (Hex)                                                        | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command               | Unit  | Description                                       |
|--------------------------------------------------------------------------|-------------------|-------------------|-------------------|-----------------------|-------|---------------------------------------------------|
| N/A                                                                      | N/A               | BEB1              | 48817             | cosphi(U)_Upper_Limit | 0.001 | cosphi(U)_Upper_Limit<br>Range: 1.000 ~ cap 0.800 |
| N/A                                                                      | N/A               | BEB2              | 48818             | cosphi(U)_Lower_Limit | 0.001 | cosphi(U)_Lower_Limit<br>Range: 1.000 ~ Ind 0.800 |
| N/A                                                                      | N/A               | BEB3              | 48819             | cosphi(U)_Vmin        | 0.1V  | cosphi(U)_Vmin<br>Range:0.8Vn~Vn                  |
| N/A                                                                      | N/A               | BEB4              | 48820             | cosphi(U)_Vmax        | 0.1V  | cosphi(U)_Vmax<br>Range:1.15Vn~Vn                 |
| N/A                                                                      | N/A               | BEB5              | 48821             | cosphi(U)_V1          | 0.1V  | cosphi(U)_Lower<br>Range:0.8Vn~Vn                 |
| N/A                                                                      | N/A               | BEB6              | 48822             | cosphi(U)_V2          | 0.1V  | cosphi(U)_Upper<br>Range:1.15Vn~Vn                |
| N/A                                                                      | N/A               | BEB7              | 48823             | cosphi(U)_P_Lock_in   | 1%    | cosphi(U)_P_Lock_in<br>Range: 0 ~ 100 %           |
| N/A                                                                      | N/A               | BEB8              | 48824             | cosphi(U)_P_Lock_out  | 1%    | cosphi(U)_P_Lock_out<br>Range: 0 ~ 10 %           |
| ※ Voltage setting should follow $V_{max} \geq V_2 \geq V_1 \geq V_{min}$ |                   |                   |                   |                       |       |                                                   |

### <Q of Pac 24/7>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                       | Unit | Description                                               |
|-------------------|-------------------|-------------------|-------------------|-------------------------------|------|-----------------------------------------------------------|
| N/A               | N/A               | BEE1              | 48865             | Q of Pac Percent Mode 24/7    |      | Q(P) Percent Mode<br>0: Rated<br>1 : Actual<br>Range: 0~1 |
| N/A               | N/A               | BEE2              | 48866             | Q of Pac No Of Set Point 24/7 |      | Q(P) No. of Set point<br>Range: 1~10                      |
| N/A               | N/A               | BEE3              | 48867             | Q of Pac P0 24/7              | 0.1% | Q(P) P0<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEE4              | 48868             | Q of Pac Q0 24/7              | 0.1% | Q(P) Q0<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEE5              | 48869             | Q of Pac P1 24/7              | 0.1% | Q(P) P1<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEE6              | 48870             | Q of Pac Q1 24/7              | 0.1% | Q(P) Q1<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEE7              | 48871             | Q of Pac P2 24/7              | 0.1% | Q(P) P2<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEE8              | 48872             | Q of Pac Q2 24/7              | 0.1% | Q(P) Q2<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEE9              | 48873             | Q of Pac P3 24/7              | 0.1% | Q(P) P3<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEEA              | 48874             | Q of Pac Q3 24/7              | 0.1% | Q(P) Q3<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEEB              | 48875             | Q of Pac P4 24/7              | 0.1% | Q(P) P4<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEEC              | 48876             | Q of Pac Q4 24/7              | 0.1% | Q(P) Q4<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEED              | 48877             | Q of Pac P5 24/7              | 0.1% | Q(P) P5<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEEE              | 48878             | Q of Pac Q5 24/7              | 0.1% | Q(P) Q5<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEEF              | 48879             | Q of Pac P6 24/7              | 0.1% | Q(P) P6<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEF0              | 48880             | Q of Pac Q6 24/7              | 0.1% | Q(P) Q6<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEF1              | 48881             | Q of Pac P7 24/7              | 0.1% | Q(P) P7<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEF2              | 48882             | Q of Pac Q7 24/7              | 0.1% | Q(P) Q7<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEF3              | 48883             | Q of Pac P8 24/7              | 0.1% | Q(P) P8<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEF4              | 48884             | Q of Pac Q8 24/7              | 0.1% | Q(P) Q8<br>Range: (-75.0~0 ; 0~75.0)                      |
| N/A               | N/A               | BEF5              | 48885             | Q of Pac P9 24/7              | 0.1% | Q(P) P9<br>Range: 0.0~100.0 %                             |
| N/A               | N/A               | BEF6              | 48886             | Q of Pac Q9 24/7              | 0.1% | Q(P) Q9<br>Range: (-75.0~0 ; 0~75.0)                      |

### <COSPHI(P)>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                 | Unit | Description      |
|-------------------|-------------------|-------------------|-------------------|-------------------------|------|------------------|
| N/A               | N/A               | BE92              | 33634             | CosPhi(P)<br>V Lock-in  | 0.1V | Range: 2300~2530 |
| N/A               | N/A               | BE93              | 33635             | CosPhi(P)<br>V Lock-out | 0.1V | RangeL 2070~2300 |

### <CONSTANT COSPHI>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command    | Unit | Description                               |
|-------------------|-------------------|-------------------|-------------------|------------|------|-------------------------------------------|
| N/A               | N/A               | BE81              | 48769             | Fix CosPhi | 1    | Range:<br>(Cap) -100~-80,<br>(Ind) 80~100 |

### <CONSTANT Q>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command | Unit | Description   |
|-------------------|-------------------|-------------------|-------------------|---------|------|---------------|
| N/A               | N/A               | BE90              | 48784             | Fix Q   | 1%   | Range: -63~63 |

### <Q(V)>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command        | Unit     | Description                              |
|-------------------|-------------------|-------------------|-------------------|----------------|----------|------------------------------------------|
| N/A               | N/A               | BE88              | 48776             | Qi Limit       | 1%       | Range: -63~63                            |
| N/A               | N/A               | BE89              | 48777             | Qs Limit       | 1%       | Range: -63~63                            |
| N/A               | N/A               | BE8A              | 48778             | V2i            | 0.1V     | Range:0.8Vn~1.15Vn<br>Depending on model |
| N/A               | N/A               | BE8B              | 48779             | V2s            | 0.1V     | Range:0.8Vn~1.15Vn<br>Depending on model |
| N/A               | N/A               | BE8C              | 48780             | V1i            | 0.1V     | Range:0.8Vn~1.15Vn<br>Depending on model |
| N/A               | N/A               | BE8D              | 48781             | V1s            | 0.1V     | Range:0.8Vn~1.15Vn<br>Depending on model |
| N/A               | N/A               | BE8F              | 48783             | Delay Time     | 0.01 sec | Range: 0~12000                           |
| N/A               | N/A               | BE94              | 48788             | Lock-in Power  | 1%       | Range: 10~100                            |
| N/A               | N/A               | BE95              | 48789             | Lock-out Power | 1%       | Range: 5~10                              |

### <EXTERNAL CONTROL>

| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command        | Unit | Description                                                                                      |
|-------------------|-------------------|-------------------|-------------------|----------------|------|--------------------------------------------------------------------------------------------------|
| N/A               | N/A               | BC1E              | 48158             | Remote control |      | Read:<br>bit 3: 0- Off; 1- On<br>Write:<br>ON : bit3 = 1, bit15 = 1<br>OFF : bit3 = 1, bit15 = 0 |

### <CONSTANT VOLTAGE>

| Old Address (Hex)                                                                                                                                                        | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command             | Unit | Description                             |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|-------------------|-------------------|---------------------|------|-----------------------------------------|
| N/A                                                                                                                                                                      | N/A               | 338               | 824               | Behavior No.        |      | 0x0000 BOOST                            |
| N/A                                                                                                                                                                      | N/A               | 339               | 825               | Behavior            |      | User OFF:0xFFFF<br>User IP VOLT :0x0400 |
| N/A                                                                                                                                                                      | N/A               | 33D               | 829               | Fixed Input Voltage | 0.1V | Range: 0~1000                           |
| ※Ex. Setup Constant Voltage<br>Behavior No. → 0x0000<br>Behavior → 0x0400<br>Fixed Input Voltage → 9600 (960V)<br><br>※Ex. Disable Constant Voltage<br>Behavior → 0xFFFF |                   |                   |                   |                     |      |                                         |

### <IV-Curve>

| Address (Hex) | Address (Dec) | Command                                        | Unit   | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|---------------|---------------|------------------------------------------------|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 9C00          | 39936         | Operation Flag                                 |        | bit 0: Enable (RW)<br>bit 1: WaitShuntAccept (RO)<br>bit 2: WaitTransFinish (RO)<br>bit 3: ReadCurrentFromShunt (RO)<br>bit 4: FinishRunDone (RO)<br>bit 5: ProcedureTimeoutRetry (RO)<br>bit 6: ProcedureTimeoutDone (RO)<br>bit 7: Procedure_EPO_ForceDone (RO)<br>bit 8: Procedure_NoDC_ForceDone (RO)<br>bit 9: Procedure_NoString_ForceDone (RO)<br>bit10~15: Reserved<br>PS. a. Bit0 change to 0 when Done<br>b. When write 1 to bit0 clear other operation flag & Voltage & Current |
| 9C01          | 39937         | String Number                                  | Set    | RO:<br>String number of this Module.                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| 9C02          | 39938         | Max voltage point                              | V      | RO:<br>"V-axis Number" of a String = 100,<br>Total I-axis number =<br>(String Number * "V-axis Number")                                                                                                                                                                                                                                                                                                                                                                                    |
| 9C03          | 39939         | Total I-axis Number Index auto increase number | n      | R/W:<br>Read a part of total I-axis auto increase number => X.<br>"Total I-axis Number Index" will auto increase X by read HR 0x9C03 after this read completed.<br>Default X: 0                                                                                                                                                                                                                                                                                                            |
| 9C04          | 39940         | Total I-axis Number Index                      | n      | R/W:<br>Read a part of Total I-axis number Index. Index will auto increase X after this read completed.<br>PS. Write HR 0x9C00 auto clear to 0                                                                                                                                                                                                                                                                                                                                             |
| 9C05          | 39941         | I-axis Value 0                                 | 0.01 A | Read a part of Total I-axis by Index.                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| ...           | ...           | .....                                          | ...    | .....                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| 9C36          | 39990         | I-axis Value 49                                | 0.01 A | Read a part of total I-axis by Index+49.                                                                                                                                                                                                                                                                                                                                                                                                                                                   |

## 5. Memory Map ~ Writable (Coil)

### <ARCING DETECT FUNCTION>

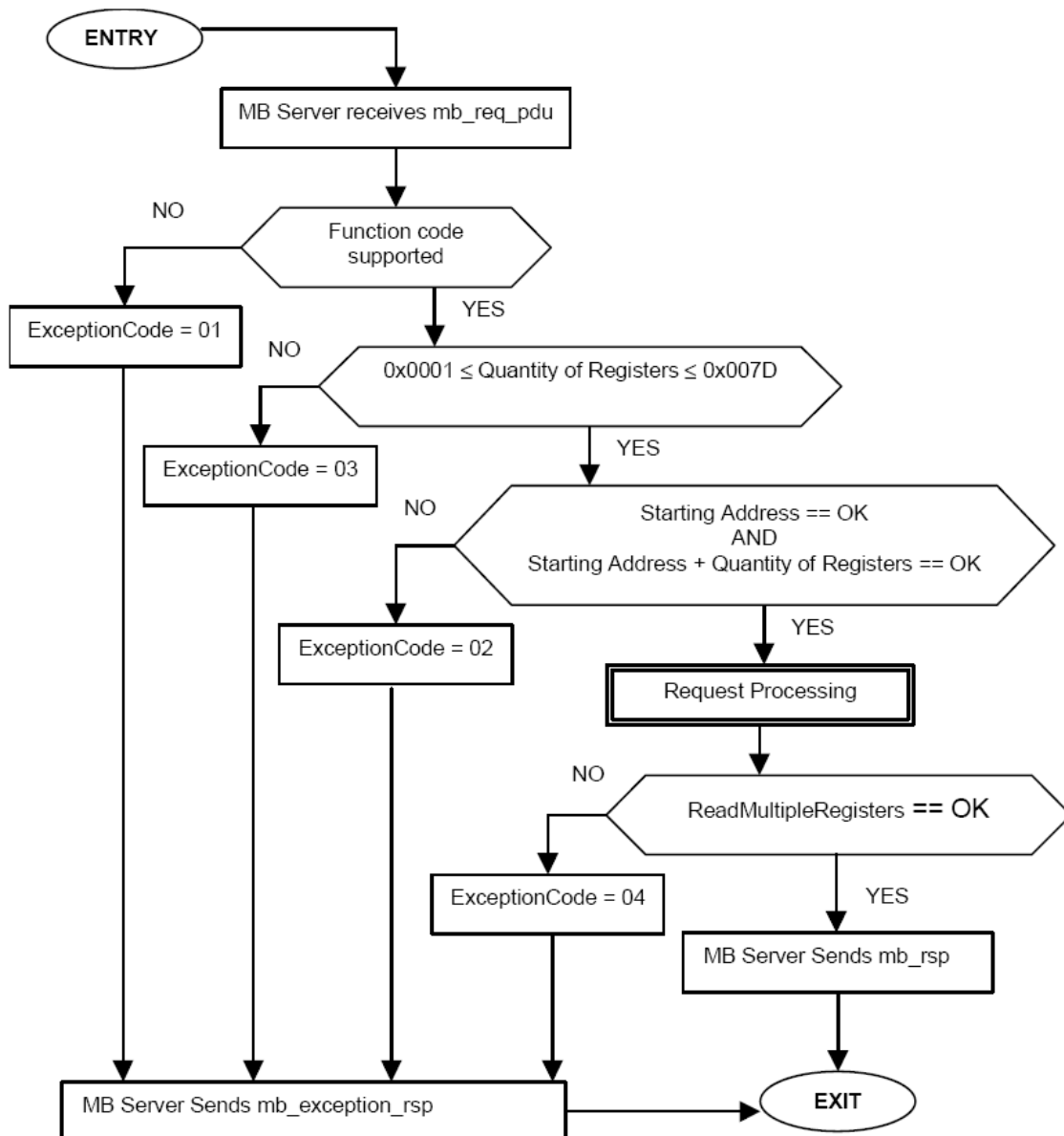
| Old Address (Hex) | Old Address (Dec) | New Address (Hex) | New Address (Dec) | Command                | Unit | Description     |
|-------------------|-------------------|-------------------|-------------------|------------------------|------|-----------------|
| N/A               | N/A               | 604C              | 24652             | Arcing Detect Function | N/A  | 0: Off<br>1: On |

## APPENDIX A : MODBUS Exception Responses

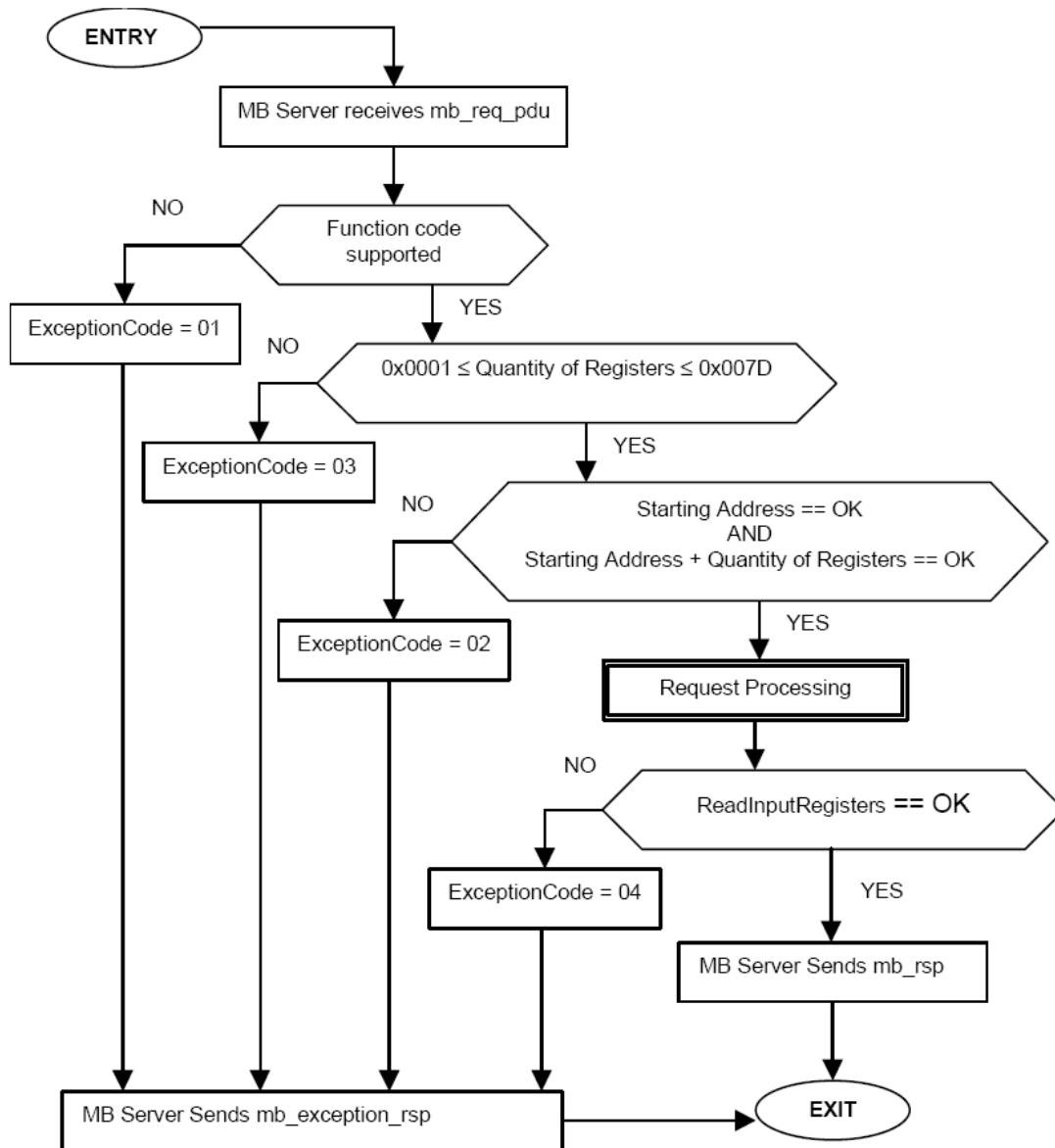
| MODBUS Exception Codes |                      |                                                                                                             |
|------------------------|----------------------|-------------------------------------------------------------------------------------------------------------|
| Code                   | Name                 | Meaning                                                                                                     |
| 01                     | ILLEGAL FUNCTION     | The function code received in the query is not an allowable action for the server (or slave).               |
| 02                     | ILLEGAL DATA ADDRESS | The data address received in the query is not an allowable address for the server (or slave).               |
| 03                     | ILLEGAL DATA VALUE   | A value contained in the query data field is not an allowable value for server (or slave).                  |
| 04                     | SLAVE DEVICE FAILURE | An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action. |

## APPENDIX B : Communications Transmission Process

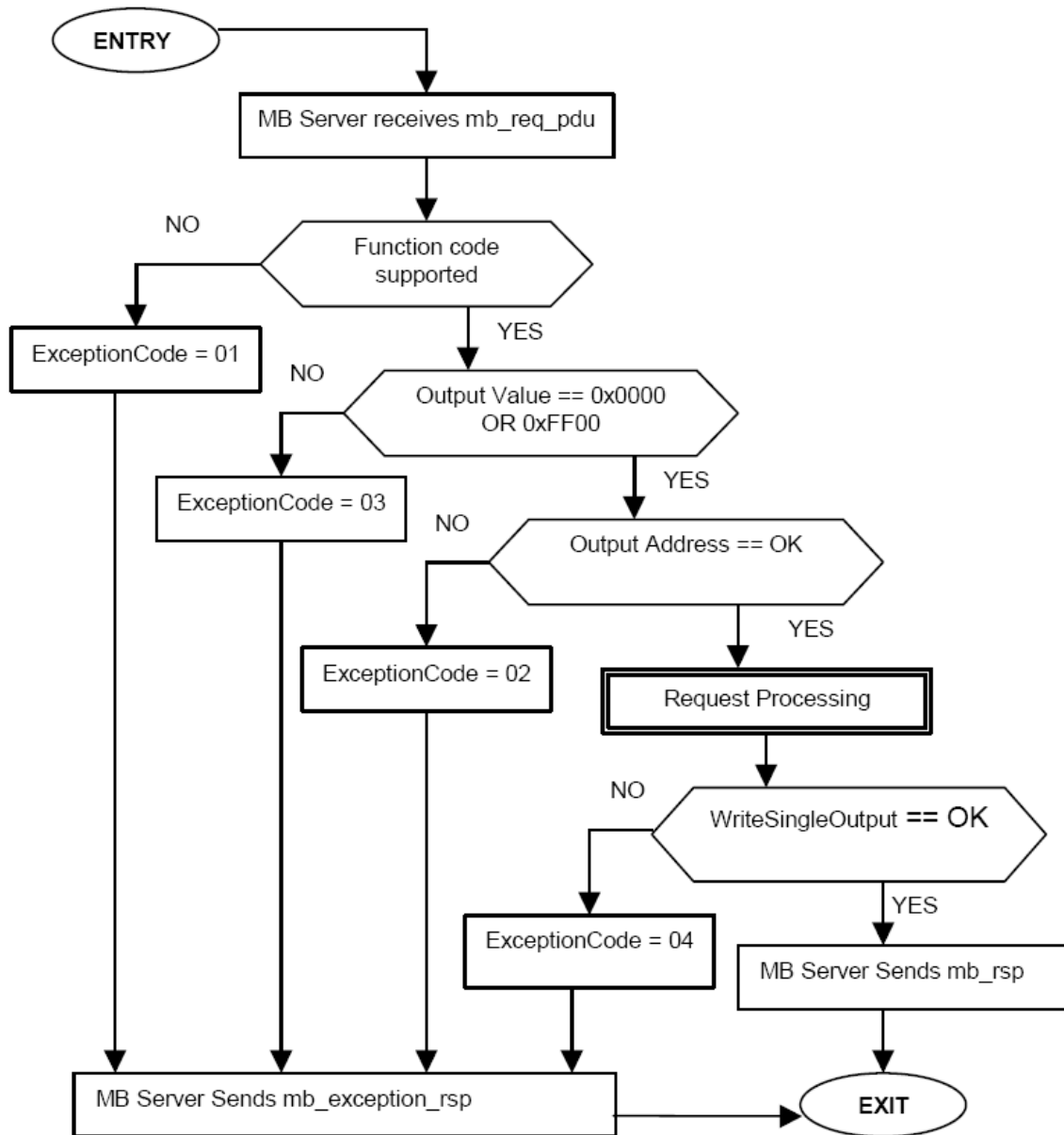
### i. Function 0x03 Read Holding Registers



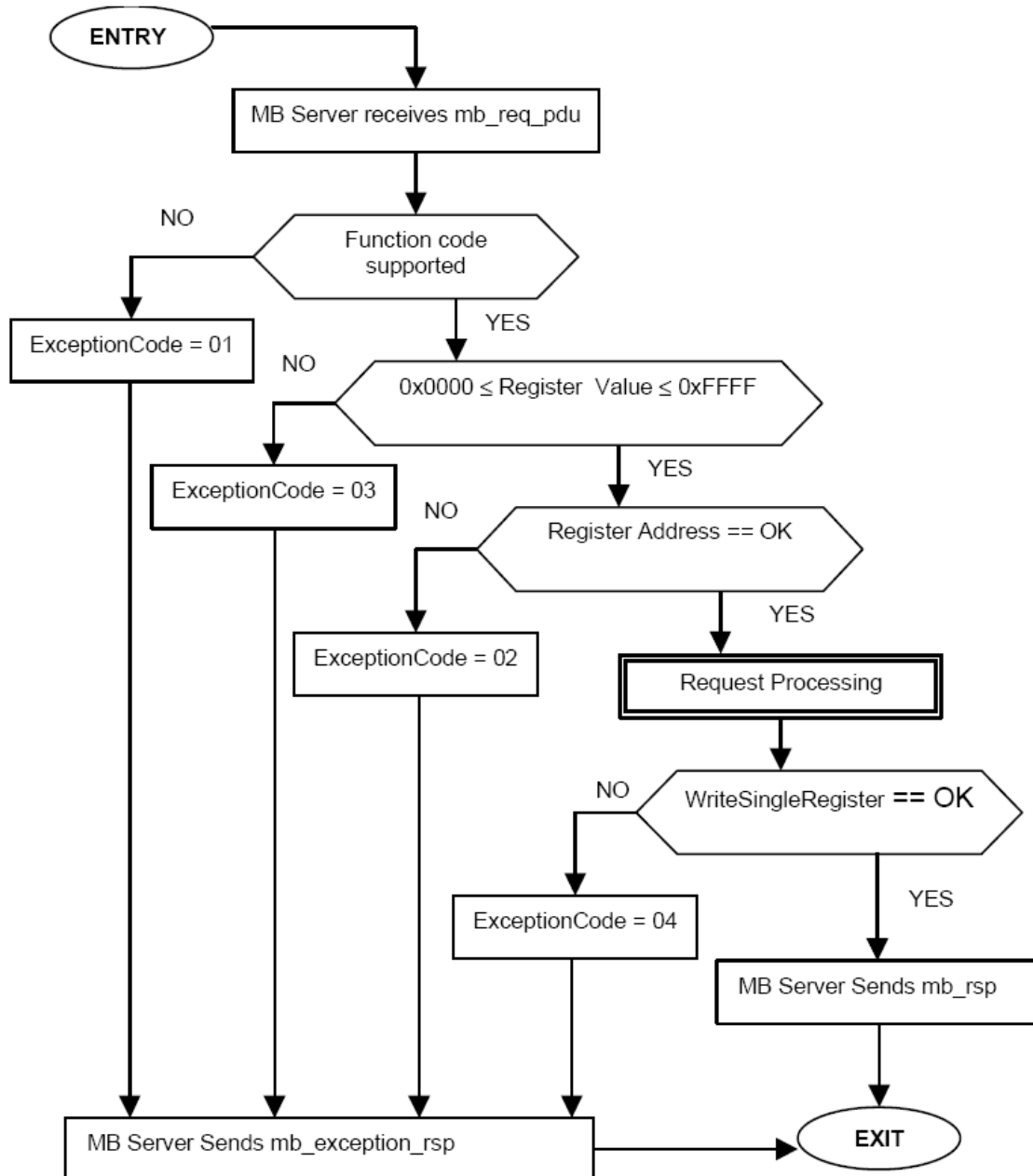
## ii. Function 0x04 Read Input Registers



iii. **Function 0x05 Write Single Coil**



#### iv. Function 0x06 Write Single Register



## APPENDIX C : EVENT CODE TABLE

| Fault |       |                                 |
|-------|-------|---------------------------------|
| Item  | Value | Description                     |
| F01   | 1     | DC Injection (R)                |
| F02   | 2     | DC Injection (S)                |
| F03   | 3     | DC Injection (T)                |
| F04   | 4     | DC Injection Total              |
| F05   | 5     | NTC OTP                         |
| F06   | 6     | NTC0 Circuit Fail               |
| F07   | 7     | NTC LTP                         |
| F08   | 8     | Ntc1 Circuit Fail               |
| F09   | 9     | Ntc2 Circuit Fail               |
| F10   | 10    | Ntc3 Circuit Fail               |
| F11   | 11    | Inverter Choke Over Temperature |
| F13   | 13    | Relay Open                      |
| F14   | 14    | Firmware Incompatibility        |
| F15   | 15    | DSP ADC Vgrid/Iout Fail         |
| F16   | 16    | ADC Vin/Vbus Fail               |
| F17   | 17    | ADC Iin/Iboost Fail             |
| F18   | 18    | Red. ADC Vgrid Fail             |
| F19   | 19    | ADC Iout_dc Fail                |
| F20   | 20    | Efficiency Abnormal             |
| F21   | 21    | Fan Fail                        |
| F22   | 22    | Internal Comm. Fault (Red.)     |
| F23   | 23    | Internal Comm. Fault (Dis.)     |
| F24   | 24    | RCMU Over Rating                |
| F25   | 25    | Insulation                      |
| F26   | 26    | Three Phase Current Unbalance   |
| F27   | 27    | RCMU Circuit Fail               |
| F28   | 28    | Relay Test Short                |
| F29   | 29    | Relay Test Open                 |
| F30   | 30    | Bus Unbalance                   |
| F31   | 31    | Bus P Over Voltage              |
| F32   | 32    | Bus P Under Voltage             |
| F33   | 33    | Bus N Over Voltage              |
| F34   | 34    | Bus N Under Voltage             |
| F35   | 35    | Bus Voltage Over Rating         |
| F36   | 36    | OOCF-Transient (R)              |
| F37   | 37    | OOCF(R)                         |
| F38   | 38    | OOCF-Transient (S)              |
| F39   | 39    | OOCF(S)                         |
| F40   | 40    | OOCF-Transient (T)              |
| F41   | 41    | OOCF(T)                         |
| F42   | 42    | CT sensor Fail (A)              |
| F43   | 43    | CT sensor Fail (B)              |
| F44   | 44    | CT sensor Fail (C)              |
| F45   | 45    | HW OOCF Circuit                 |
| F46   | 46    | Inverter Failure                |
| F47   | 47    | SA OVP                          |

|     |    |                          |
|-----|----|--------------------------|
| F48 | 48 | SA OPP                   |
| F50 | 50 | Zero Cross Circuit Fail  |
| F51 | 51 | Inv Circuit Fault        |
| F52 | 52 | Boost Circuit Fault      |
| F55 | 55 | Thermal Fuse Open        |
| F56 | 56 | Hardware Incompatibility |
| F57 | 57 | AC Aux-Power Fail        |
| F58 | 58 | Arc circuit fail         |
| F59 | 59 | Arc fault                |
| F60 | 60 | IOCP(PV1)                |
| F61 | 61 | IOCP(PV2)                |
| F70 | 70 | IOCP-Transient(PV1)      |
| F71 | 71 | IOCP-Transient(PV2)      |
| F74 | 74 | Ext Comm. Fail           |
| F76 | 76 | HW DC RLY                |
| F77 | 77 | External CT Fail         |

| Error |       |                                        |
|-------|-------|----------------------------------------|
| Item  | Value | Description                            |
| E01   | 129   | OFR                                    |
| E02   | 130   | UFR                                    |
| E03   | 131   | Anti Passive                           |
| E04   | 132   | Anti OFR                               |
| E05   | 133   | Anti UFR                               |
| E06   | 134   | Phase Jump                             |
| E07   | 135   | Grid Quality                           |
| E08   | 136   | Ac Connected Fail                      |
| E09   | 137   | No Grid                                |
| E10   | 138   | Under Voltage Range (R Phase)          |
| E11   | 139   | Over Voltage Range (R Phase)           |
| E12   | 140   | Over Transient Voltage Range(R Phase)  |
| E13   | 141   | Slow Over Voltage Range (R Phase)      |
| E14   | 142   | LN OVR                                 |
| E15   | 143   | Under Voltage Range (S Phase)          |
| E16   | 144   | Over Voltage Range (S Phase)           |
| E17   | 145   | Over Transient Voltage Range (S Phase) |
| E18   | 146   | Slow Over Voltage Range (S Phase)      |
| E19   | 147   | Frequency Abnormal                     |
| E20   | 148   | Under Voltage Range (T Phase)          |
| E21   | 149   | Over Voltage Range (T Phase)           |
| E22   | 150   | Over Transient Voltage Range (T Phase) |
| E23   | 151   | Slow Over Voltage Range (T Phase)      |
| E25   | 153   | EPO                                    |
| E26   | 154   | Slow Over Frequency Range              |
| E27   | 155   | Slow Under Frequency Range             |
| E28   | 156   | Slow Under Voltage Range               |
| E29   | 157   | PV Input Voltage Too High (Standalone) |
| E30   | 158   | String1 PV input voltage too high      |
| E31   | 159   | String2 PV input voltage too high      |
| E32   | 160   | L/N Reversed                           |
| E33   | 161   | AC Short                               |
| E34   | 162   | Insulation                             |

| Warning |       |                                                 |
|---------|-------|-------------------------------------------------|
| Item    | Value | Description                                     |
| W01     | 209   | Solar1 UVR                                      |
| W02     | 210   | Solar2 UVR                                      |
| W03     | 211   | Vst unstable                                    |
| W04     | 212   | PID Relay Fail                                  |
| W05     | 213   | PID Over Current Range                          |
| W07     | 215   | Derating                                        |
| W09     | 217   | HW FAN INT                                      |
| W10     | 218   | Door Opened                                     |
| W11     | 219   | Fan Fail                                        |
| W12     | 220   | String Bus Communication Fail                   |
| W13     | 221   | Transformer Communication Fail                  |
| W14     | 222   | EPO by User                                     |
| W15     | 223   | SPD                                             |
| W17     | 225   | DC surge                                        |
| W18     | 226   | AC surge                                        |
| W19     | 227   | DC Aux-Power Fail                               |
| W20     | 228   | Standalone UVR Stand-Alone night mode shut down |