OP561-V01

# selec MRJ4M-QUAD

Operating Instructions

## SPECIFICATIONS

**DISPLAY**
Liquid crystal display with backlight
1 line, 4 digits and 2 line, 7 digits per line to show electrical Parameters

**LCD INDICATIONS**
⇌ - Communication in progress

**LED INDICATIONS**
**INT -** Integration of energy

**WIRING INPUT**
3 Ø - 4 wire, 1 Ø - 2 wire

**RATED INPUT VOLTAGE**
60 to 300V AC, 104 to 520V AC

**FREQUENCY RANGE**
45-65 Hz

**NO. OF CHANNEL**
4 Channel( 3 Ø) ; 12 Channel(1 Ø)

**CT PRIMARY (For All Channel)**
1A to 10,000A (Programmable for any Value)

**CT SECONDARY**
330mV

**PT PRIMARY**
100V to 10kV (Programmable for any value)

**PT SECONDARY**
100 to 500V AC (L-L)(Programmable for any value)

**DISPLAY UPDATE TIME**
1sec for all parameters

**DISPLAY SCROLLING**
Automatic / Manual

**POWER CONSUMPTION**
Less than 8VA

**ENVIRONMENTAL CONDITIONS**
- Indoor use
- Altitude of up to 2000 meters
- Pollution degree II

Temperature : Operating : -10°C to 55°C
Storage : -20°C to 75°C
Humidity : Up to 85% non-condensing

**MOUNTING**
Din Rail mounting

**WEIGHT**
290gms

## ORDER CODE INFORMATION

| Product | Supply | Certification |
|---|---|---|
| | Self Supplied(V1,N) | CE |
| MRJ4M-QUAD | 60 to 300V AC, 50/60Hz | ■ |

## SERIAL COMMUNICATION

| | |
|---|---|
| **Interface standard and protocol** | RS485 AND MODBUS RTU |
| **Communication address** | 1 to 255 |
| **Transmission mode** | Half duplex |
| **Data types** | Float and Integer |
| **Transmission distance** | 500 Metre maximum |
| **Transmission speed** | 300, 600,1200, 2400, 4800, 9600,19200 (in bps) |
| **Parity** | None, Odd, Even |
| **Stop bits** | 1 or 2 |

## RESOLUTION

| PT Ratio x CT Ratio | kWh | INT |
|---|---|---|
| <15 | 0.01K | 0.001K |
| <150 | 0.1K | 0.01K |
| <1500 | 1K | 0.1K |
| <15000 | 0.01M | 1K |
| <150000 | 0.1M | 0.01M |
| ≤1000000 | 1M | 0.1M |

**NOTE :** 1) For Voltage, Power, resolution is automatically adjusted
2) For Power Factor, resolution is 0.01

## ACCURACY :

| Measurement | Accuracy |
|---|---|
| Voltage $V_{L-N}$ | \| 0.5 \| of full range |
| Voltage $V_{L-L}$ | \| 0.5 \| of full range |
| Current | \| 0.5 \| of full range |
| Frequency For L-N Voltage >20V, For L-L Voltage >35V | \| 0.1 \| of full range |
| Active Power | \| 1.0 \| of full range |
| Reactive Power | \| 1.0 \| of full range |
| Apparent Power | \| 1.0 \| of full range |
| Power Factor | ±0.01 of full range |
| Active Energy | \| 1.0 \| of full range |
| Reactive Energy | \| 1.0 \| of full range |
| Apparent Energy | \| 1.0 \| of full range |

## ⚠ SAFETY PRECAUTIONS

All safety related codifications, symbols and instructions that appear in this operating manual or on the equipment must be strictly followed to ensure the safety of the operating personnel as well as the instrument.

If the equipment is not used in a manner specified by the manufacturer it might impair the protection provided by the equipment.

- Do not use the equipment if there is any mechanical damage.
- Ensure that the equipment is supplied with correct voltage.

**⚠ CAUTION :**

1. Read complete instructions prior to installation and operation of the unit.
2. Risk of electric shock.
3. The equipment in its installed state must not come in close proximity to any heating sources, oils, steam, caustic vapors or other unwanted process by products.

## WIRING GUIDELINES

**⚠ WARNING :**

1. To prevent the risk of electric shock, power supply to the equipment must be kept OFF while doing the wiring arrangement.
2. Wiring shall be done strictly according to the terminal layout. Confirm that all connections are correct.
3. Use lugged terminals.
4. To reduce electromagnetic interference use of wires with adequate ratings and twists of the same in equal size shall be made with shortest connections.
5. Layout of connecting cables shall be away from any internal EMI source.
6. Copper cable should be used ( Stranded or Single core cable ).
7. Before attempting work on device, ensure absence of voltages using appropriate voltage detection device.

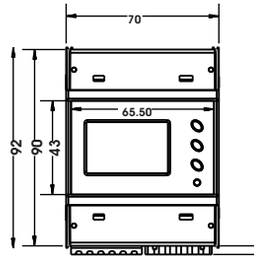
## INSTALLATION GUIDELINES

**⚠ CAUTION :**

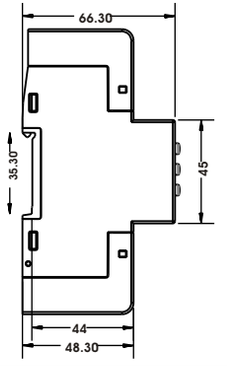
1. Conductors must not come in contact with the internal circuitry of the equipment or else it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
2. Circuit breaker or mains switch must be installed between power source and supply terminals to facilitate power 'ON' or 'OFF' function. However this switch or breaker must be installed in a convenient position normally accessible to the operator.
3. Before disconnecting the secondary of the external current transformer from the equipment, make sure that the current transformer is short circuited to avoid risk of electrical shock and injury.
4. The equipment shall not be installed in environmental conditions other than those mentioned in this manual.
5. The equipment does not have a built-in-type fuse. Installation of external fuse of rating 275V AC / 0.5Amp for electrical circuitry / battery is highly recommended.

## DIMENSIONS ( All dimensions in mm )

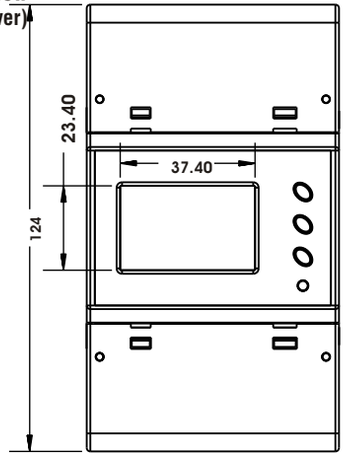
**Front View**




**Side View**




**Front View (With Cover)**

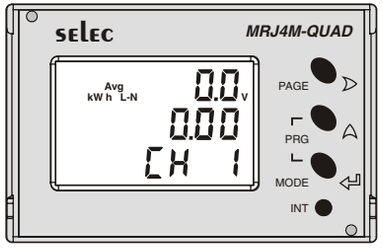



**NOTE :** Measuring current input should be connect with external CT only.

## CHANNEL DESCRIPTION

| Group | 12 Channel Meter | 4 Channel Meter |
|---|---|---|
| Gr 1 | CH1, CH2, CH3 | 1st, 2nd and 3rd phase of CH1 |
| Gr 2 | CH4, CH5, CH6 | 1st, 2nd and 3rd phase of CH2 |
| Gr 3 | CH7, CH8, CH9 | 1st, 2nd and 3rd phase of CH3 |
| Gr 4 | CH10, CH11, CH12 | 1st, 2nd and 3rd phase of CH4 |

## FRONT PANEL DESCRIPTION




## ONLINE PAGE DESCRIPTION

There are 2 dedicated key labeled as (PAGE ) and PRG with symbols marked as ⮞ and ⮝ to read meter parameters.

At power ON meter displays average line to neural voltage at first line and energy at 2nd line in auto mode.

### ONLINE PAGE DESCRIPTION FOR 4 CHANNEL 3P4W

| FIRST KEY (⮞) PRESS | SECOND KEY (⮝) PRESS | DESCRIPTION |
|---|---|---|
| Press (⮞) key (1st Time) | —— | Displays average line to neutral voltage and CH 1 Active Energy. |
| | 1st time | Displays average line to neutral voltage and CH 2 Active Energy. |
| | 2nd time | Displays average line to neutral voltage and CH 3 Active Energy. |
| | 3rd time | Displays average line to neutral voltage and CH 4 Active Energy. |
| | 4th time | Displays average line to neutral voltage and total Active Energy of all channel. |
| Press (⮞) key (2nd Time) | —— | Displays line to neutral voltage of CH 1. |
| | 1st time | Displays line to neutral voltage of CH 2. |
| | 2nd time | Displays line to neutral voltage of CH 3. |
| | 3rd time | Displays line to neutral voltage of CH 4. |
| Press (⮞) key (3rd Time) | —— | Displays line to line voltage of CH 1. |
| | 1st time | Displays line to line voltage of CH 2. |
| | 2nd time | Displays line to line voltage of CH 3. |
| | 3rd time | Displays line to line voltage of CH 4. |
| Press (⮞) key (4th Time) | —— | Displays current of CH 1. |
| | 1st time | Displays current of CH 2. |
| | 2nd time | Displays current of CH 3. |
| | 3rd time | Displays current of CH 4. |
| Press (⮞) key (5th Time) | —— | Displays CH 1 Power Factor and frequency. |
| | 1st time | Displays CH 2 Power Factor and frequency. |
| | 2nd time | Displays CH 3 Power Factor and frequency. |
| | 3rd time | Displays CH 4 Power Factor and frequency. |
| Press (⮞) key (6th Time) | —— | Displays average line to neutral voltage and CH 1 Reactive Energy. |
| | 1st time | Displays average line to neutral voltage and CH 2 Reactive Energy. |
| | 2nd time | Displays average line to neutral voltage and CH 3 Reactive Energy. |
| | 3rd time | Displays average line to neutral voltage and CH 4 Reactive Energy. |
| | 4th time | Displays average line to neutral voltage and total Reactive Energy of all channel. |
| Press (⮞) key (7th Time) | —— | Displays average line to neutral voltage and CH 1 Apparent Energy. |
| | 1st time | Displays average line to neutral voltage and CH 2 Apparent Energy. |
| | 2nd time | Displays average line to neutral voltage and CH 3 Apparent Energy. |
| | 3rd time | Displays average line to neutral voltage and CH 4 Apparent Energy. |
| | 4th time | Displays average line to neutral voltage and total Apparent Energy off all channel. |
| Press (⮞) key (8th Time) | —— | Displays Active Power of CH 1. |
| | 1st time | Displays Active Power of CH 2. |
| | 2nd time | Displays Active Power of CH 3. |
| | 3rd time | Displays Active Power of CH 4. |
| Press (⮞) key (9th Time) | —— | Displays Reactive Power of CH 1. |
| | 1st time | Displays Reactive Power of CH 2. |
| | 2nd time | Displays Reactive Power of CH 3. |
| | 3rd time | Displays Reactive Power of CH 4. |
| Press (⮞) key (10th Time) | —— | Displays Apparent Power of CH 1. |
| | 1st time | Displays Apparent Power of CH 2. |
| | 2nd time | Displays Apparent Power of CH 3. |
| | 3rd time | Displays Apparent Power of CH 4. |

### CT MOUNTING DESCRIPTION

1)For CT mounting first go to the current page as per the requirement CH1,CH2,CH3,CH4.

2)Press enter key for 3 sec to display CT mounting method: RHS/LHS/ is ok /not ok/ invalid .

3)Range for ok : if PF is in between of 0.8L to 0.8C
Range for not ok : if PF is not between of 0.8L to 0.8C
Range for invalid : if current is zero

**NOTE :** In 1P2W for 4 Channel meter all pages will be same as 3P4W only selected phase parameter will display.

### ONLINE PAGE DESCRIPTION FOR 12 CHANNEL 1P2W

| FIRST KEY (⮞) PRESS | SECOND KEY (⮝) PRESS | DESCRIPTION |
|---|---|---|
| Press (⮞) key (1st Time) | —— | Displays line to neutral voltage and CH 1 Active Energy. |
| | 1st time | Displays line to neutral voltage and CH 2 Active Energy. |
| | 2nd time | Displays line to neutral voltage and CH 3 Active Energy. |
| | 3rd time | Displays line to neutral voltage and CH 4 Active Energy. |
| | 4th time | Displays line to neutral voltage and CH 5 Active Energy. |
| | 5th time | Displays line to neutral voltage and CH 6 Active Energy. |
| | 6th time | Displays line to neutral voltage and CH 7 Active Energy. |
| | 7th time | Displays line to neutral voltage and CH 8 Active Energy. |
| | 8th time | Displays line to neutral voltage and CH 9 Active Energy. |
| | 9th time | Displays line to neutral voltage and CH 10 Active Energy. |
| | 10th time | Displays line to neutral voltage and CH 11 Active Energy. |
| | 11th time | Displays line to neutral voltage and CH 12 Active Energy. |
| | 12th time | Displays line to neutral voltage and Total Active Energy of all channel. |

### ONLINE PAGE DESCRIPTION FOR 12 CHANNEL 1P2W

| FIRST KEY (⮞) PRESS | SECOND KEY (⮝) PRESS | DESCRIPTION |
|---|---|---|
| Press (⮞) key (2nd Time) | —— | Displays line to neutral voltage of group 1. |
| | 1st time | Displays line to neutral voltage of group 2. |
| | 2nd time | Displays line to neutral voltage of group 3. |
| | 3rd time | Displays line to neutral voltage of group 4. |
| Press (⮞) key (3rd Time) | —— | Displays current of group 1. |
| | 1st time | Displays current of group 2. |
| | 2nd time | Displays current of group 3. |
| | 3rd time | Displays current of group 4. |
| Press (⮞) key (4th Time) | —— | Displays group 1 Power Factor and Frequency. |
| | 1st time | Displays group 2 Power Factor and Frequency. |
| | 2nd time | Displays group 3 Power Factor and Frequency. |
| | 3rd time | Displays group 4 Power Factor and Frequency. |
| Press (⮞) key (5th Time) | —— | Displays line to neutral voltage and CH 1 Reactive Energy. |
| | 1st time | Displays line to neutral voltage and CH 2 Reactive Energy. |
| | 2nd time | Displays line to neutral voltage and CH 3 Reactive Energy. |
| | 3rd time | Displays line to neutral voltage and CH 4 Reactive Energy. |
| | 4th time | Displays line to neutral voltage and CH 5 Reactive Energy. |
| | 5th time | Displays line to neutral voltage and CH 6 Reactive Energy. |
| | 6th time | Displays line to neutral voltage and CH 7 Reactive Energy. |
| | 7th time | Displays line to neutral voltage and CH 8 Reactive Energy. |
| | 8th time | Displays line to neutral voltage and CH 9 Reactive Energy. |
| | 9th time | Displays line to neutral voltage and CH 10 Reactive Energy. |

| FIRST KEY ( ⊳) PRESS | SECOND KEY (⩓) PRESS | DESCRIPTION |
|---|---|---|
| Press (⊳) key (5th Time) | | Displays line to neutral voltage and CH 11 Reactive Energy |
| | | Displays line to neutral voltage and CH 12 Reactive Energy |
| | | Displays line to neutral voltage and Total Reactive Energy of all channel. |
| Press (⊳) key (6th Time) | | Displays line to neutral voltage and CH 1 Apparent Energy. |
| | | Displays line to neutral voltage and CH 2 Apparent Energy. |
| | | Displays line to neutral voltage and CH 3 Apparent Energy. |
| | | Displays line to neutral voltage and CH 4 Apparent Energy. |
| | | Displays line to neutral voltage and CH 5 Apparent Energy. |
| | | Displays line to neutral voltage and CH 6 Apparent Energy. |
| | | Displays line to neutral voltage and CH 7 Apparent Energy. |
| | | Displays line to neutral voltage and CH 8 Apparent Energy. |
| | | Displays line to neutral voltage and CH 9 Apparent Energy. |
| | | Displays line to neutral voltage and CH 10 Apparent Energy. |
| | | Displays line to neutral voltage and CH 11 Apparent Energy. |
| | | Displays line to neutral voltage and CH 12 Apparent Energy. |
| | | Displays line to neutral voltage and Total Apparent Energy of all channel. |
| Press (⊳) key (7th Time) | | Displays Active Power of group 1. |
| | | Displays Active Power of group 2. |
| | | Displays Active Power of group 3. |
| | | Displays Active Power of group 4. |
| Press (⊳) key (8th Time) | | Displays Reactive Power of group 1. |
| | | Displays Reactive Power of group 2. |
| | | Displays Reactive Power of group 3. |
| | | Displays Reactive Power of group 4. |

| FIRST KEY (⊳) PRESS | SECOND KEY (⩓) PRESS | DESCRIPTION |
|---|---|---|
| Press (⊳) key (9th Time) | —— | Displays Apparent Power of group 1. |
| | 1st time | Displays Apparent Power of group 2. |
| | 2nd time | Displays Apparent Power of group 3. |
| | 3rd time | Displays Apparent Power of group 4. |

## SERIAL NUMBER DESCRIPTION

Press ⩓ key for 10sec. to display 8 digit serial number only for 10sec. at 2nd and 3rd line of display

## AUTO / MANUAL PAGE MODE DESCRIPTION :

Press First key for 3sec. to toggle between Automatic and Manual mode.
**Note :** By default unit operates in automatic mode.
In automatic mode online pages scroll automatically at the rate of 5 sec. per page.
In automatic mode when any key is pressed, unit temporarily switches to manual mode and the appropriate page is displayed, also if any key is not pressed for 5sec., unit resumes automatic mode.

## CONFIGURATION

There are 3 dedicated key with symbols marked as ⊳, ⩓ and ⏎. Use these 3 key to enter into configuration / change setting.
**Note :** The settings should be done by a professional, after going through this users manual and after having understood the application situation.
For the configuration setting mode :

- Use ⩓ and ⏎ for 3 sec. to enter or exit from config mode
- Use ⊳ shift key to move cursor left or right by one digit each time. After last digit of display cursor shift at 1st digit of display.
- Use ⩓ increment key for increasing the parameter value.
- Use ⏎ key to save the setting and move on to next page
- Use ⩓ and ⊳ keys to go back to previous page.

| Config. page. | Function | Range or Selection | Factory Setting |
|---|---|---|---|
| | Password | 0000 to 9998 | 1000 |
| 1 | Change Password | No / Yes | No |
| 1.1 | New Password | 0000 to 9998 | 0000 |
| 2 | No of Channel | 4 CH / 12 CH | 4 CH |
| 3 | Network Selection | | 3P4W |
| | For 4 Channel | 3P4W, 1P2W-P1, 1P2W-P2, 1P2W-P3. | |
| | For 12 Channel | 1P2W | |
| 4 | CT Secondary | 1 | 1 |
| | For 4 Channel | | |
| 5 | CT Primary CH 1 | 1 to 10000 | 1 |
| 6 | CT Primary CH 2 | 1 to 10000 | 1 |
| 7 | CT Primary CH 3 | 1 to 10000 | 1 |
| 8 | CT Primary CH 4 | 1 to 10000 | 1 |
| | For 12 Channel | | |
| 5 | CT Primary Gr 1 | 1 to 10000 | 1 |
| 6 | CT Primary Gr 2 | 1 to 10000 | 1 |
| 7 | CT Primary Gr 3 | 1 to 10000 | 1 |
| 8 | CT Primary Gr 4 | 1 to 10000 | 1 |
| 9 | L1 CT mounting | RHS/LHS | RHS |
| 10 | L2 CT mounting | RHS/LHS | RHS |
| 11 | L3 CT mounting | RHS/LHS | RHS |
| 12 | L4 CT mounting | RHS/LHS | RHS |
| 13 | PT Secondary | 100 to 500 | 350 |
| 14 | PT primary | 100 to 10000 | 350 |
| 15 | Slave Id | 1 to 255 | 1 |
| 16 | Baud Rate | 300, 600, 1200, 2400, 4800, 9600 and 19200 | 9600 |
| 17 | Parity | None, Odd, Even | None |
| 18 | Stop Bit | 1 to 2 | 1 |
| 19 | Backlight | 0000 to 7200 | 0000 |
| 20 | Factory Default | No / Yes | No |

| Config. page. | Function | Range or Selection | Factory Setting |
|---|---|---|---|
| 21 | Reset Energy | No / Yes | No |
| 21.1 | Password | 0001 to 9999 | 1001 |
| 21.2 | Reset Kwh | | None |
| | For 4 Channel | CH 1, CH 2, CH 3, CH 4 None and All | |
| | For 12 Channel | CH 1, CH 2, CH 3, CH 4, CH 5, CH 6, CH 7, CH 8, CH 9, CH 10, CH 11, CH 12 None and All | |
| 21.3 | Reset Kvarh | | None |
| | For 4 Channel | CH 1, CH 2, CH 3, CH 4 None and All | |
| | For 12 Channel | CH 1, CH 2, CH 3, CH 4, CH 5, CH 6, CH 7, CH 8, CH 9, CH 10, CH 11, CH 12 None and All | |
| 21.4 | Reset Kvah | | None |
| | For 4 Channel | CH 1, CH 2, CH 3, CH 4 None and All | |
| | For 12 Channel | CH 1, CH 2, CH 3, CH 4, CH 5, CH 6, CH 7, CH 8, CH 9, CH 10, CH 11, CH 12 None and All | |

For resetting energy parameters user will be prompted the password. If correct password is entered, the user will be able to reset all energy parameters. This password will be value which will be greater than the configuration password by 1.

## MODBUS REGISTER ADDRESSES LIST

**Readable parameters for 4 Channel Meter : [ Length (Register) : 2 ; Data Structure : Float ]**

| ADDRESS | HEX ADDRESS | PARAMETER |
|---|---|---|
| 30000 | 0x00 | 1st Phase line to neutral voltage of CH 1 |
| 30002 | 0x02 | 2nd Phase line to neutral voltage of CH 1 |
| 30004 | 0x04 | 3rd Phase line to neutral voltage of CH 1 |
| 30006 | 0x06 | Average line to neutral voltage of CH 1 |
| 30008 | 0x08 | 1st Phase line to line voltage of CH 1 |
| 30010 | 0x0A | 2nd Phase line to line voltage of CH 1 |
| 30012 | 0x0C | 3rd Phase line to line voltage of CH 1 |
| 30014 | 0x0E | Average line to line voltage of CH 1 |
| 30016 | 0x10 | 1st Phase current of CH 1 |
| 30018 | 0x12 | 2nd Phase current of CH 1 |
| 30020 | 0x14 | 3rd Phase current of CH 1 |
| 30022 | 0x16 | Average current of CH 1 |
| 30024 | 0x18 | Frequency |
| 30026 | 0x1A | 1st Phase Active Power of CH 1 |
| 30028 | 0x1C | 2nd Phase Active Power of CH 1 |
| 30030 | 0x1E | 3rd Phase Active Power of CH 1 |
| 30032 | 0x20 | Total Active Power of CH 1 |
| 30034 | 0x22 | 1st Phase Reactive Power of CH 1 |
| 30036 | 0x24 | 2nd Phase Reactive Power of CH 1 |
| 30038 | 0x26 | 3rd Phase Reactive Power of CH 1 |
| 30040 | 0x28 | Total Reactive Power of CH 1 |
| 30042 | 0x2A | 1st Phase Apparent Power of CH 1 |
| 30044 | 0x2C | 2nd Phase Apparent Power of CH 1 |
| 30046 | 0x2E | 3rd Phase Apparent Power of CH 1 |
| 30048 | 0x30 | Total Apparent Power of CH 1 |
| 30050 | 0x32 | 1st Phase Power Factor of CH 1 |
| 30052 | 0x34 | 2nd Phase Power Factor of CH 1 |
| 30054 | 0x36 | 3rd Phase Power Factor of CH 1 |
| 30056 | 0x38 | Average Power Factor of CH 1 |
| 30058 | 0x3A | 1st Phase Active Energy of CH 1 |
| 30060 | 0x3C | 2nd Phase Active Energy of CH 1 |
| 30062 | 0x3E | 3rd Phase Active Energy of CH 1 |
| 30064 | 0x40 | Total Active Energy of CH 1 |
| 30066 | 0x42 | 1st Phase Reactive Energy of CH 1 |
| 30068 | 0x44 | 2nd Phase Reactive Energy of CH 1 |
| 30070 | 0x46 | 3rd Phase Reactive Energy of CH 1 |
| 30072 | 0x48 | Total Reactive Energy of CH 1 |
| 30074 | 0x4A | 1st Phase Apparent Energy of CH 1 |

| ADDRESS | HEX ADDRESS | PARAMETER |
|---|---|---|
| 30076 | 0x4C | 2nd Phase Apparent Energy of CH 1 |
| 30078 | 0x4E | 3rd Phase Apparent Energy of CH 1 |
| 30080 | 0x50 | Total Apparent Energy of CH 1 |
| 30082 | 0x52 | 1st Phase line to neutral voltage of CH 2 |
| 30084 | 0x54 | 2nd Phase line to neutral voltage of CH 2 |
| 30086 | 0x56 | 3rd Phase line to neutral voltage of CH 2 |
| 30088 | 0x58 | Average line to neutral voltage of CH 2 |
| 30090 | 0x5A | 1st Phase line to line voltage of CH 2 |
| 30092 | 0x5C | 2nd Phase line to line voltage of CH 2 |
| 30094 | 0x5E | 3rd Phase line to line voltage of CH 2 |
| 30096 | 0x60 | Average line to line voltage of CH 2 |
| 30098 | 0x62 | 1st Phase current of CH 2 |
| 30100 | 0x64 | 2nd Phase current of CH 2 |
| 30102 | 0x66 | 3rd Phase current of CH 2 |
| 30104 | 0x68 | Average current of CH 2 |
| 30106 | 0x6A | Frequency |
| 30108 | 0x6C | 1st Phase Active Power of CH 2 |
| 30110 | 0x6E | 2nd Phase Active Power of CH 2 |
| 30112 | 0x70 | 3rd Phase Active Power of CH 2 |
| 30114 | 0x72 | Total Active Power of CH 2 |
| 30116 | 0x74 | 1st Phase Reactive Power of CH 2 |
| 30118 | 0x76 | 2nd Phase Reactive Power of CH 2 |
| 30120 | 0x78 | 3rd Phase Reactive Power of CH 2 |
| 30122 | 0x7A | Total Reactive Power of CH 2 |
| 30124 | 0x7C | 1st Phase Apparent Power of CH 2 |
| 30126 | 0x7E | 2nd Phase Apparent Power of CH 2 |
| 30128 | 0x80 | 3rd Phase Apparent Power of CH 2 |
| 30130 | 0x82 | Total Apparent Power of CH 2 |
| 30132 | 0x84 | 1st Phase Power Factor of CH 2 |
| 30134 | 0x86 | 2nd Phase Power Factor of CH 2 |
| 30136 | 0x88 | 3rd Phase Power Factor of CH 2 |
| 30138 | 0x8A | Average Power Factor of CH 2 |
| 30140 | 0x8C | 1st Phase Active Energy of CH 2 |
| 30142 | 0x8E | 2nd Phase Active Energy of CH 2 |
| 30144 | 0x90 | 3rd Phase Active Energy of CH 2 |
| 30146 | 0x92 | Total Active Energy of CH 2 |
| 30148 | 0x94 | 1st Phase Reactive Energy of CH 2 |
| 30150 | 0x96 | 2nd Phase Reactive Energy of CH 2 |

| ADDRESS | HEX ADDRESS | PARAMETER |
|---|---|---|
| 30152 | 0x98 | 3rd Phase Reactive Energy of CH 2 |
| 30154 | 0x9A | Total Reactive Energy of CH 2 |
| 30156 | 0x9C | 1st Phase Apparent Energy of CH 2 |
| 30158 | 0x9E | 2nd Phase Apparent Energy of CH 2 |
| 30160 | 0xA0 | 3rd Phase Apparent Energy of CH 2 |
| 30162 | 0xA2 | Total Apparent Energy of CH 2 |
| 30164 | 0xA4 | 1st Phase line to neutral voltage of CH 3 |
| 30166 | 0xA6 | 2nd Phase line to neutral voltage of CH 3 |
| 30168 | 0xA8 | 3rd Phase line to neutral voltage of CH 3 |
| 30170 | 0xAA | Average line to neutral voltage of CH 3 |
| 30172 | 0xAC | 1st Phase line to line voltage of CH 3 |
| 30174 | 0xAE | 2nd Phase line to line voltage of CH 3 |
| 30176 | 0xB0 | 3rd Phase line to line voltage of CH 3 |
| 30178 | 0xB2 | Average line to line voltage of CH 3 |
| 30180 | 0xB4 | 1st Phase current of CH 3 |
| 30182 | 0xB6 | 2nd Phase current of CH 3 |
| 30184 | 0xB8 | 3rd Phase current of CH 3 |
| 30186 | 0xBA | Average current of CH 3 |
| 30188 | 0xBC | Frequency |
| 30190 | 0xBE | 1st Phase Active Power of CH 3 |
| 30192 | 0xC0 | 2nd Phase Active Power of CH 3 |
| 30194 | 0xC2 | 3rd Phase Active Power of CH 3 |
| 30196 | 0xC4 | Total Active Power of CH 3 |
| 30198 | 0xC6 | 1st Phase Reactive Power of CH 3 |
| 30200 | 0xC8 | 2nd Phase Reactive Power of CH 3 |
| 30202 | 0xCA | 3rd Phase Reactive Power of CH 3 |
| 30204 | 0xCC | Total Reactive Power of CH 3 |
| 30206 | 0xCE | 1st Phase Apparent Power of CH 3 |
| 30208 | 0xD0 | 2nd Phase Apparent Power of CH 3 |
| 30210 | 0xD2 | 3rd Phase Apparent Power of CH 3 |
| 30212 | 0xD4 | Total Apparent Power of CH 3 |
| 30214 | 0xD6 | 1st Phase Power Factor of CH 3 |
| 30216 | 0xD8 | 2nd Phase Power Factor of CH 3 |
| 30218 | 0xDA | 3rd Phase Power Factor of CH 3 |
| 30220 | 0xDC | Average Power Factor of CH 3 |
| 30222 | 0xDE | 1st Phase Active Energy of CH 3 |
| 30224 | 0xE0 | 2nd Phase Active Energy of CH 3 |
| 30226 | 0xE2 | 3rd Phase Active Energy of CH 3 |

| ADDRESS | HEX ADDRESS | PARAMETER |
|---|---|---|
| 30228 | 0xE4 | Total Active Energy of CH 3 |
| 30230 | 0xE6 | 1st Phase Reactive Energy of CH 3 |
| 30232 | 0xE8 | 2nd Phase Reactive Energy of CH 3 |
| 30234 | 0xEA | 3rd Phase Reactive Energy of CH 3 |
| 30236 | 0xEC | Total Reactive Energy of CH 3 |
| 30238 | 0xEE | 1st Phase Apparent Energy of CH 3 |
| 30240 | 0xF0 | 2nd Phase Apparent Energy of CH 3 |
| 30242 | 0xF2 | 3rd Phase Apparent Energy of CH 3 |
| 30244 | 0xF4 | Total Apparent Energy of CH 3 |
| 30246 | 0xF6 | 1st Phase line to neutral voltage of CH 4 |
| 30248 | 0xF8 | 2nd Phase line to neutral voltage of CH 4 |
| 30250 | 0xFA | 3rd Phase line to neutral voltage of CH 4 |
| 30252 | 0xFC | Average line to neutral voltage of CH 4 |
| 30254 | 0xFE | 1st Phase line to line voltage of CH 4 |
| 30256 | 0x100 | 2nd Phase line to line voltage of CH 4 |
| 30258 | 0x102 | 3rd Phase line to line voltage of CH 4 |
| 30260 | 0x104 | Average line to line voltage of CH 4 |
| 30262 | 0x106 | 1st Phase current of CH 4 |
| 30264 | 0x108 | 2nd Phase current of CH 4 |
| 30266 | 0x10A | 3rd Phase current of CH 4 |
| 30268 | 0x10C | Average current of CH 4 |
| 30270 | 0x10E | Frequency |
| 30272 | 0x110 | 1st Phase Active Power of CH 4 |
| 30274 | 0x112 | 2nd Phase Active Power of CH 4 |
| 30276 | 0x114 | 3rd Phase Active Power of CH 4 |
| 30278 | 0x116 | Total Active Power of CH 4 |
| 30280 | 0x118 | 1st Phase Reactive Power of CH 4 |
| 30282 | 0x11A | 2nd Phase Reactive Power of CH 4 |
| 30284 | 0x11C | 3rd Phase Reactive Power of CH 4 |
| 30286 | 0x11E | Total Reactive Power of CH 4 |
| 30288 | 0x120 | 1st Phase Apparent Power of CH 4 |
| 30290 | 0x122 | 2nd Phase Apparent Power of CH 4 |
| 30292 | 0x124 | 3rd Phase Apparent Power of CH 4 |
| 30294 | 0x126 | Total Apparent Power of CH 4 |
| 30296 | 0x128 | 1st Phase Power Factor of CH 4 |
| 30298 | 0x12A | 2nd Phase Power Factor of CH 4 |
| 30300 | 0x12C | 3rd Phase Power Factor of CH 4 |
| 30302 | 0x12E | Average Power Factor of CH 4 |

## MODBUS REGISTER ADDRESSES LIST

**Readable parameters for 4 Channel Meter : [ Length (Register) : 2 ; Data Structure : Float ]**

| ADDRESS | HEX ADDRESS | PARAMETER |
|---|---|---|
| 30304 | 0x130 | 1st Phase Active Energy of CH 4 |
| 30306 | 0x132 | 2nd Phase Active Energy of CH 4 |
| 30308 | 0x134 | 3rd Phase Active Energy of CH 4 |
| 30310 | 0x136 | Total Active Energy of CH 4 |
| 30312 | 0x138 | 1st Phase Reactive Energy of CH 4 |
| 30314 | 0x13A | 2nd Phase Reactive Energy of CH 4 |
| 30316 | 0x13C | 3rd Phase Reactive Energy of CH 4 |
| 30318 | 0x13E | Total Reactive Energy of CH 4 |
| 30320 | 0x140 | 1st Phase Apparent Energy of CH 4 |
| 30322 | 0x142 | 2nd Phase Apparent Energy of CH 4 |
| 30324 | 0x144 | 3rd Phase Apparent Energy of CH 4 |
| 30326 | 0x146 | Total Apparent Energy of CH 4 |
| 30328 | 0x148 | Serial No. (Data Structure : Hex) |
| 30330 | 0x14A | Total Active Energy of all channel. |
| 30332 | 0x14C | Total Reactive Energy of all channel. |
| 30334 | 0x14E | Total Apparent Energy of all channel. |

## MODBUS REGISTER ADDRESSES LIST

**Readable / Writable parameters from RID-480**

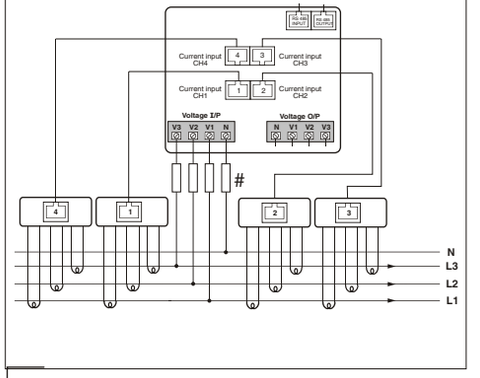
| Address | Hex Address | Parameter | Range | | Length (Register) | Data Structure |
|---|---|---|---|---|---|---|
| | | | **Min value** | **Max value** | | |
| 40000 | 0x00 | Password | 0 | 9998 | 1 | Integer |
| | | | **Value** | **Meaning** | | |
| 40001 | 0x01 | N/W selection | 0x0000 | 3P-4W | 1 | Integer |
| | | | 0x0001 | | 1 | Integer |
| | | | 0x0002 | 1P2W-P1 | 1 | Integer |
| | | | 0x0003 | 1P2W-P2 | 1 | Integer |
| | | | 0x0004 | 1P2W-P3 | 1 | Integer |
| | | (Valid only for 12 Channel meter) | 0x0005 | 1P2W | 1 | Integer |
| | | | **Min value** | **Max value** | | |
| 40002 | 0x02 | CT Secondary | 1 | 1 | 1 | Integer |
| 40003 | 0x03 | CT Primary CH1 (Gr 1 for 12 CH Meter) | 1 | 10000 | 1 | Integer |
| 40004 | 0x04 | CT Primary CH2 (Gr 2 for 12 CH Meter) | 1 | 10000 | 1 | Integer |
| 40005 | 0x05 | CT Primary CH3 (Gr 3 for 12 CH Meter) | 1 | 10000 | 1 | Integer |
| 40006 | 0x06 | CT Primary CH4 (Gr 4 for 12 CH Meter) | 1 | 10000 | 1 | Integer |
| 40007 | 0x07 | PT Secondary | 100 | 500 | 1 | Integer |
| 40008 | 0x08 | PT Primary | 100 | 10000 | 2 | Integer |
| 40010 | 0x0A | Slave ID | 1 | 255 | | |
| | | | **Value** | **Meaning** | | |
| 40011 | 0x0B | Baud Rate | 0x0000 | 300 | 1 | Integer |
| | | | 0x0001 | 600 | 1 | Integer |
| | | | 0x0002 | 1200 | 1 | Integer |
| | | | 0x0003 | 2400 | 1 | Integer |
| | | | 0x0004 | 4800 | 1 | Integer |
| | | | 0x0005 | 9600 | 1 | Integer |
| | | | 0x0006 | 19200 | 1 | Integer |
| 40012 | 0x0C | Parity | 0x0000 | None | 1 | Integer |
| | | | 0x0001 | Odd | 1 | Integer |
| | | | 0x0002 | Even | 1 | Integer |
| 40013 | 0x0D | Stop Bit | 0x0000 | 1 | 1 | Integer |
| | | | 0x0001 | 2 | 1 | Integer |
| | | | **Min value** | **Max value** | | |
| 40014 | 0x0E | Backlight | 0000 | 7200 | 1 | Integer |
| | | | **Value** | **Meaning** | | |
| 40015 | 0x0F | No of channel | 0x0000 | 4 channel | 1 | Integer |
| | | | 0x0001 | 12 channel | 1 | Integer |
| 40016 | 0x10 | Factory Default | 1 | To set factory setting range | 1 | Integer |
| 40017 | 0x11 | Reset Active Energy | 1 | CH 1 | 1 | Integer |

## MODBUS REGISTER ADDRESSES LIST

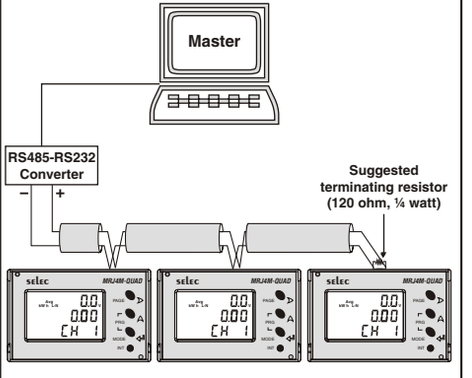
**NOTE : CHANNEL 5 to CHANNEL 12 are valid only for 12 CHANNEL Meter.**

| Address | Hex Address | Parameter | Range | | Length (Register) | Data Structure |
|---|---|---|---|---|---|---|
| | | | 2 | CH 2 | 1 | Integer |
| | | | 3 | CH 3 | 1 | Integer |
| | | | 4 | CH 4 | 1 | Integer |
| | | | 5 | CH 5 | 1 | Integer |
| | | | 6 | CH 6 | 1 | Integer |
| | | | 7 | CH 7 | 1 | Integer |
| | | | 8 | CH 8 | 1 | Integer |
| | | | 9 | CH 9 | 1 | Integer |
| | | | 10 | CH 10 | 1 | Integer |
| | | | 11 | CH 11 | 1 | Integer |
| | | | 12 | CH 12 | 1 | Integer |
| | | | 13 | Total Active Energy | 1 | Integer |
| 40018 | 0x12 | Reset Apparent Energy | 1 | CH 1 | 1 | Integer |
| | | | 2 | CH 2 | 1 | Integer |
| | | | 3 | CH 3 | 1 | Integer |
| | | | 4 | CH 4 | 1 | Integer |
| | | | 5 | CH 5 | 1 | Integer |
| | | | 6 | CH 6 | 1 | Integer |
| | | | 7 | CH 7 | 1 | Integer |
| | | | 8 | CH 8 | 1 | Integer |
| | | | 9 | CH 9 | 1 | Integer |
| | | | 10 | CH 10 | 1 | Integer |
| | | | 11 | CH 11 | 1 | Integer |
| | | | 12 | CH 12 | 1 | Integer |
| | | | 13 | Total Apparent Energy | 1 | Integer |
| 40019 | 0x13 | Reset Reactive Energy | 1 | CH 1 | 1 | Integer |
| | | | 2 | CH 2 | 1 | Integer |
| | | | 3 | CH 3 | 1 | Integer |
| | | | 4 | CH 4 | 1 | Integer |
| | | | 5 | CH 5 | 1 | Integer |
| | | | 6 | CH 6 | 1 | Integer |
| | | | 7 | CH 7 | 1 | Integer |
| | | | 8 | CH 8 | 1 | Integer |
| | | | 9 | CH 9 | 1 | Integer |
| | | | 10 | CH 10 | 1 | Integer |
| | | | 11 | CH 11 | 1 | Integer |
| | | | 12 | CH 12 | 1 | Integer |
| | | | 13 | Total Reactive Energy | 1 | Integer |

## TERMINAL CONNECTIONS



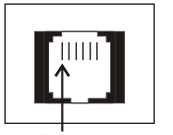

## CONNECTION DIAGRAM FOR COMMUNICATION




Contact sales for PC based monitoring software to communicate with the meters.

# All fuse types : 0.5A class CC UL type
0.5A fast acting 600V

## INTERNAL PINOUT FOR COMMUNICATION RS485 PORT




| PIN | DESCRIPTION |
|---|---|
| 1 | RS485+ (Slave) |
| 2 | — |
| 3 | — |
| 4 | — |
| 5 | — |
| 6 | RS485– (Slave) |

## ACCESSORIES (To be ordered separately)

| ORDER CODE | DESCRIPTION |
|---|---|
| **AC-USB-RS485-03** | USB to RS485 cable (6 pin jack for downloading) |
| **AC-USB-RS485-02** * | USB to RS485 cable (2 pin open wire) |
| **ACH-004** | RJ25 (6-pin) cable |
| **AC-IOEXP-02** | Port Expansion adapter |

**Note:** *Along with ACH-004 & AC-IOEXP-02 for networking

(Specifications subject to change as development is a continuous process.)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