**MECHANICAL INSTALLATION**

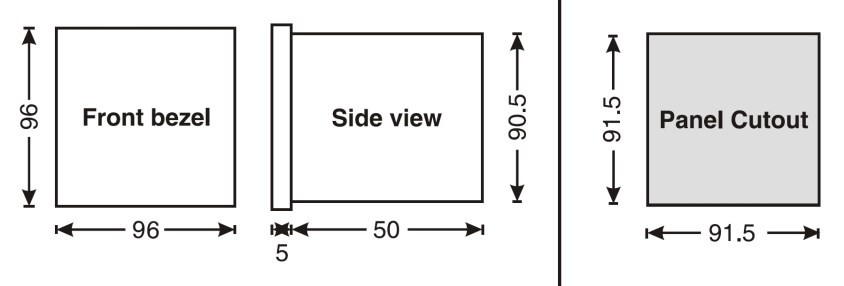
For installing the meter



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| **SERIAL COMMUNICATION** | |
| **Interface Standard and protocol** | RS485 & Modbus RTU |
| **Communication address** | 1 to 255 |
| **Transmission Mode** | Half duplex |
| **Data types** | Float and Integer |
| **Transmission distance** | 500 Meter maximum |
| **Transmission speed** | 300, 600, 1200, 2400, 4800  9600 19200 (bps) |
| **Parity** | None, Odd, Even |
| **Stop bits** | 1 or 2 |
| **Response time** | 100mS |

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| **RESOLUTION FOR CT RATING** | |
| **CT Rating** | **KWh** |
| 160A | 0.1K |
| 250A | 0.1K |
| 400A | 0.1K |
| 800A | 1K |

1. Prepare the panel cut out with the dimensions as shown below.



**Meter Outline**

**Dimensions (In mm)**

**Panel Cut-out**

**Dimensions (In mm)**

**SAFETY PRECAUTIONS**

**DISPLAY**

**SPECIFICATIONS**

Liquid crystal display with backlight

4 line, 4 digits per line to show electrical Parameters 5th line, 8 digits to show energy

Bar graph for current indication as a % of CT rating

**LCD INDICATIONS**

* Integration of energy
* Unit is in configuration menu
* Communication in progress
* Maximum & Minimum Demand of Power

**WIRING INPUT**

3.Ø - 4 wire, 1.Ø - 2 wire

**RATED INPUT VOLTAGE**

100 TO 240Vac (L-N); 173-415Vac (L-L)

**FREQUENCY RANGE**

45-65Hz

**CT PRIMARY**

5A to 10000A (Programmable for any value)

**CT SECONDARY**

330mV

**PT PRIMARY**

100 to 500KVac (Programmable for any value)

**PT SECONDARY**

100 to 500Vac (Programmable for any value)

**DISPLAY UPDATE TIME**

1 Second for parameters

**DISPLAY SCROLLING**

Automatic / Manual

**AUXILIARY**

Self supplied

**TEMPERATURE**

Operating : 0 to 50°C

Storage : -20 to 75°C

**HUMIDITY**

85% non-condensing

**MOUNTING**

Panel mounting, front panel to IP65

**WEIGHT**

230gms

**OUTPUT**

Pulsed Output : Voltage range External 24VDC max

Current capacity : 100mA

**INSTALATION CATEGORY**

Category III

|  |  |
| --- | --- |
| **ACCURACY** | |
| **Measurement** | **Accuracy** |
| Voltage V L-N | ±0.5% of Full Scale |
| Voltage V L-L | ±0.5% of Full Scale |
| Current | ±0.5% of Full Scale |
| Frequency | ±0.1% of Full Scale For L-N Voltage >20V For L-L Voltage >35V |
| Active Power | Class 0.5 |
| Reactive Power | Class 1.0 |
| Apparent Power | Class 1.0 |
| Power Factor | ±0.1% |
| Active Energy | Class 1.0 |
| Reactive Energy | Class 2.0 |
| Apparent Energy | Class 2.0 |
| MAX / Min Active Power | 1% |
| MAX / MIN Reactive Power | 1% |
| MAX Apparent Power | 1% |

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| **RESOLUTION** | | |
| **PT Ratio x CT Ratio** | **KWh / KVAh / KVArh** | **Pulse** |
| <15 | 0.01K | 0.01K |
| <150 | 0.1K | 0.1K |
| <1500 | 1K | 1K |
| <15000 | 0.01M | 0.01M |
| <150000 | 0.1M | 0.1M |
| ≥1500000 | 1M | 1M |

### NOTE: 1) For Voltage, Current, Power, resolution is automatically adjusted.

2) For Power Factor resolution is 0.001

3)  Blink every 5 seconds, if a load is connected to at least 1 of the 3 phases

All safety related codifications, symbols and instructions that appear in this operation 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 the manner specified by the manufacturer it might impair the protection provided by the equipment.

**CAUTION**



Read the instructions prior to installation and operation of the unit.

## CAUTION

Risk of electrical shock

**WIRING GUIDELINES**



## CAUTION

**INSTALLATION GUIDELINES**

1. This equipment, being of a built-in-type, normally becomes a part of a main control panel and in case the terminals do not remain accessible to the end user after installation and internal wire.
2. Conductors must not come into contact with the internal circuitry of the equipment or it may lead to a safety hazard that may in turn endanger life or cause electrical shock to the operator.
3. Protection & disconnection means must be installed between power source and supply terminals to facilitate power ‘ON’ or ‘OFF’ function & must be installed in a con- venient position normally accessible to the operator.

## CAUTION

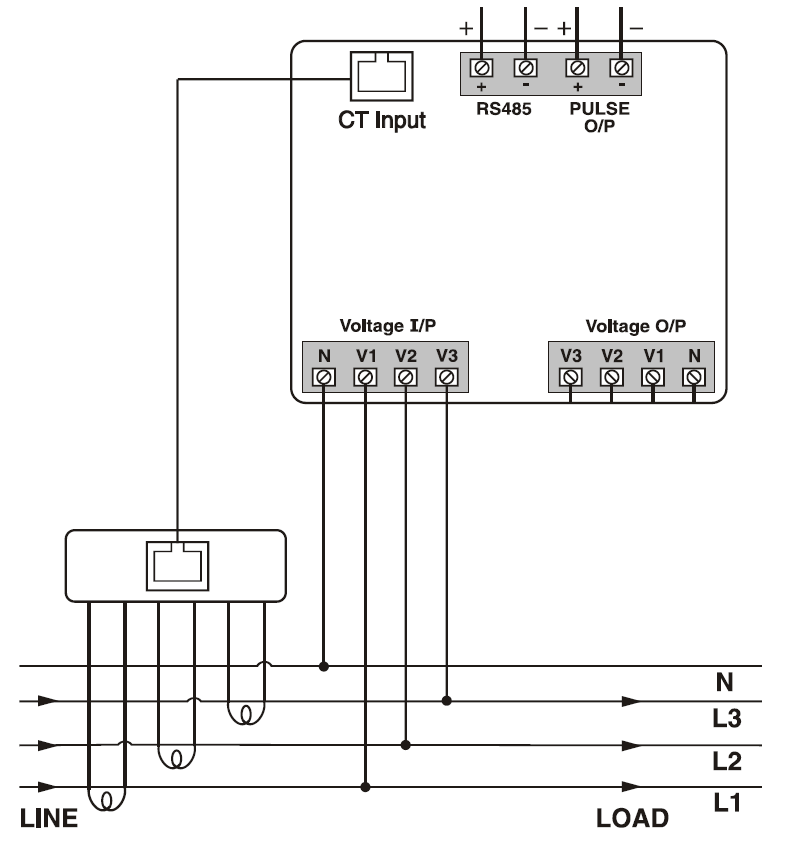
The equipment shall not be installed in environmental conditions other that those mentioned in this manual

1. Push the meter into the panel cut-out. Secure the meter in its place by fitting the clamp from the rear side. Fit clamps on both sides in diagonally opposite location for optimum fitting.
2. For proper sealing, tighten the screws evenly with required torque.
3. Recommended conductor cross section = 1.5mm2. Screw clamps tightening torque = 0.1N-m

 **CAUTION**

The equipment in its installed state must not co in close proximity to any heating sources, caustic vapour, oil, steam or other unwanted process by-products.

## EMC Guidelines

1. Use input power cable with shortest connections.
2. Layout of connecting cables shall be away from any internal EMI source.

**TERMINAL CONNECTIONS**

**ONLINE PAGE DESCRIPTION**

There are 6 dedicated keys labelled as V, I, VAF, PF, P, E. Use these

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| **KEY PRESS** | **ONLINE PAGE DESCRIPTION** |
| Press “E” | **The first screen.** Displays import active energy of first phase.  **The second screen.** Displays import active energy of second phase.  **The third screen.** Displays import active energy of third phase.  **The fourth screen.** Displays export active energy of first phase.  **The fifth screen.** Displays export active energy of second phase.  **The sixth screen.** Displays export active energy of third phase.  **The seventh screen.** Displays total import active energy of three phase.  **The eighth screen.** Displays total export active energy of three phase.  **The ninth screen.** Displays total net active energy of three phase.  **The tenth screen.** Displays import reactive energy of first phase.  **The eleventh screen.** Displays import reactive energy of second phase.  **The twelfth screen.** Displays import reactive energy of third phase.  **The thirteenth screen.** Displays export reactive energy of first phase.  **The fourteenth screen.** Displays export reactive energy of second phase.  **The fifteenth screen.** Displays export reactive energy of third phase.  **The sixteenth screen.** Displays total import reactive energy of three phase.  **The seventeenth screen.** Displays total export reactive energy of three phase.  **The eighteenth screen.** Displays total net reactive energy of three phase.  **The nineteenth screen.** Displays apparent energy of first phase.  **The twentieth screen.** Displays apparent energy of second phase.  **The twenty first screen.** Displays apparent energy of third phase.  **The twenty second screen.** Displays total net apparent energy of three phase.  **The twenty third screen.** Displays hours run. |
| **Note :** For 1.Ø - 2W network, all pages will be the as 3.Ø - 4W only selected phase parameters will be displayed. | |

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| **Config. Page** | **Function** | **Rangeor Selection** | **Factory Setting** |
| 16.08 | Page Sequence 8 | Page8of21 | 8 |
| 16.09 | Page Sequence 9 | Page9of21 | 9 |
| 16.10 | Page Sequence 10 | Page10of21 | 10 |
| 16.11 | Page Sequence 11 | Page11of21 | 11 |
| 16.12 | Page Sequence 12 | Page12of21 | 12 |
| 16.13 | Page Sequence 13 | Page13of21 | 13 |
| 16.14 | Page Sequence 14 | Page14of21 | 14 |
| 16.15 | Page Sequence 15 | Page15of21 | 15 |
| 16.16 | Page Sequence 16 | Page16of21 | 16 |
| 16.17 | Page Sequence 17 | Page17of21 | 17 |
| 16.18 | Page Sequence 18 | Page18of21 | 18 |
| 16.19 | Page Sequence 19 | Page19of21 | 19 |
| 16.20 | Page Sequence 20 | Page20of21 | 20 |
| 16.21 | Page Sequence 21 | Page21of21 | 21 |
| 17.0 | Pulse Length | 00.01-99.99 | 0.10 |
| 18.0 | Pulse Duration | 0.1-2.0 | 0.1 |
| 19.0 | Factory Default | No/Yes | No |
| 20.0 | Reset Energy and Max Demand | No/Yes | No |
| \*20.1 | Password | 0001-9999 | 1001 |
| 20.01 | Reset Active Energy | No/Yes | No |
| 20.02 | Reset Reactive Energy | No/Yes | No |
| 20.03 | Reset Apparent Energy | No/Yes | No |
| 20.04 | Reset Max Power | No/Yes | No |
| 20.05 | Reset Run Hour | No/Yes | No |

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| **CONFIGURATION** |
| There are 6 dedicated keys with symbols marked as use these 6 keys to enter into configuration  menu or the change the settings. |
| 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 + keys for 3 seconds to enter or exit from the configuration menu. * Use or keys to move curser left or right by one digit each time. * Use or keys for increasing or decreasing parameter values. * Use key to go back to the previous page. * Use key to save the setting and move on to the next page. |

keys to read meter parameters.  Simply press these keys to read the parameters.



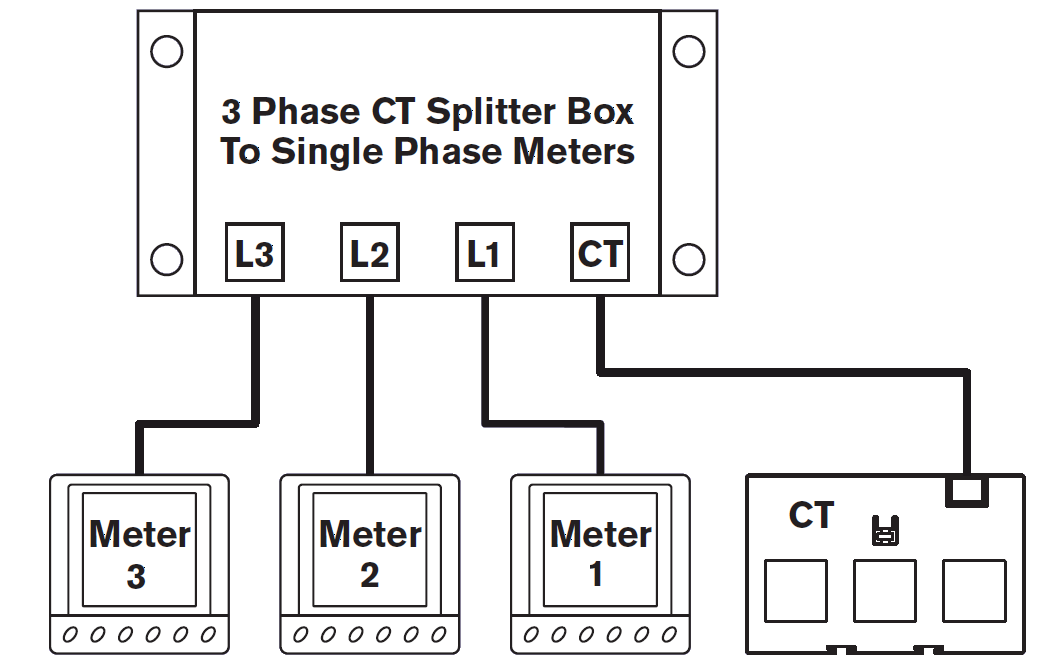


\* For resetting energy parameters user will be prompted for password. If correct password is entered, the user will be able to reset all energy parameters. The password is 1 digit more that the 1st password .

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| **KEY PRESS** | **ONLINE PAGE DESCRIPTION** |
| Press “V” | **The first screen (Page 1).** Displays line to neutral voltage of three phases and average line to neutral voltage.  **The second screen (Page 2).** Displays line to line voltage of three phases and average line to line voltage.  **The third screen (Page 3).** Displays percentage harmonics line to neutral voltage of three phase and average percentage harmonic of line to neutral voltage.  **The fourth screen. (Page 4).** Displays percentage harmonics of line to line voltage of three phase and average percentage harmonic of line to line voltage.  **The fifth screen.** Press for 3 seconds. Displays phase sequence detection.  **Note:** In 1.Ø - 2W system only first, third and fifth pages will be available of selection phase. |
| Press “I” | **The first screen (Page 5).** Displays phase current of three phases and neutral current.  **The second screen (Page 6).** Displays phase maximum current demand of three phase and average current.  **The third screen (Page 7).** Displays percentage harmonics of current of three phase and average percentage harmonic of current.  **The fourth screen.** Press for 3 seconds. Displays current correction indication page. |
| Press “VAF” | **The first screen (Page 8).** Displays voltage, current, power factor of first phase and frequency.  **The second screen (Page 9).** Displays voltage, current, power factor of second phase and frequency.  **The third screen (Page 10).** Displays voltage, current, power factor of third phase and frequency.  **The fourth screen (Page 11).** Displays average value of voltage, current, power factor of three phases and frequency.  **Note:** In 1.Ø - 2W system only one screen will be available of selected phase. |
| Press “PF” | **The first screen (Page 12).** Displays power factor of three phase and average power factor. |
| Press “P” | **The first screen (Page 13).** Displays active power of three phase and total active power.  **The second screen (Page 14).** Displays reactive power of three phase and total reactive power.  **The third screen (Page 15).** Displays apparent power of three phase and total apparent power.  **The fourth screen (Page 16).** Displays active, reactive, apparent power and power factor of first phase.  **The fifth screen (Page 17).** Displays active, reactive, apparent power and power factor of second phase.  **The sixth screen (Page 18).** Displays active, reactive, apparent power and power factor of third phase.  **The seventh screen (Page 19).** Displays total active, reactive, apparent power and power factor of three phase. **The eighth screen (Page 20).** Displays maximum active, reactive, apparent power and power factor of three phase. **The ninth screen (Page 21).** Displays minimum active, reactive, apparent power and power factor of three phase. **Note:** In 1.Ø - 2W system only first, second, third eighth and ninth screen will be available also for 1.Ø - 2W-P1 fourth, 1.Ø - 2W-P2 fifth and 1.Ø - 2W-P3 sixth page will be available. |

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| **Config. Page** | **Function** | **Rangeor Selection** | **Factory Setting** |
|  | Password | 0000-9999 | 1000 |
| 1.0 | Change Password | No/Yes | No |
| 1.1 | New Password | 0000-9999 | 1000 |
| 2.0 | Network Selection | 3P4W  1P2W-P1  1P2W-P2  1P2W-P3 | 3P4W |
| 3.0 | CT Secondary | Pre-set | 5A |
| 4.0 | CT Primary | 5A to 10000A | 160A |
| 5.0 | PT Secondary | 173-415V | 350V |
| 6.0 | PT Primary | 100-500KV | 350V |
| 7.0 | Slave ID (Address) | 1-255 | 1 |
| 8.0 | Baud Rate | 300,600,  1200,4800,  9600&  19200 | 9600 |
| 9.0 | Parity | None,Even, Odd | None |
| 10.0 | Stop Bit | 1 or 2 | 1 |
| 11.0 | Back Light | 0-7200S | 0000 |
| 12.0 | Demand Interval Method | Sliding/Fixed | Sliding |
| 13.0 | Demand Interval Duration | 1-30 | 15 |
| 14.0 | Demand Interval Length | 1-30min | 1 |
| 15.0 | Max Page Automatic | 1-21 | 21 |
| 16 | Change Page Sequence | No/Yes | No |
| 16.01 | Page Sequence 1 | Page1of21 | 1 |
| 16.02 | Page Sequence 2 | Page2of21 | 2 |
| 16.03 | Page Sequence 3 | Page3of21 | 3 |
| 16.04 | Page Sequence 4 | Page4of21 | 4 |
| 16.05 | Page Sequence 5 | Page5of21 | 5 |
| 16.06 | Page Sequence 6 | Page6of21 | 6 |
| 16.07 | Page Sequence 7 | Page7of21 | 7 |

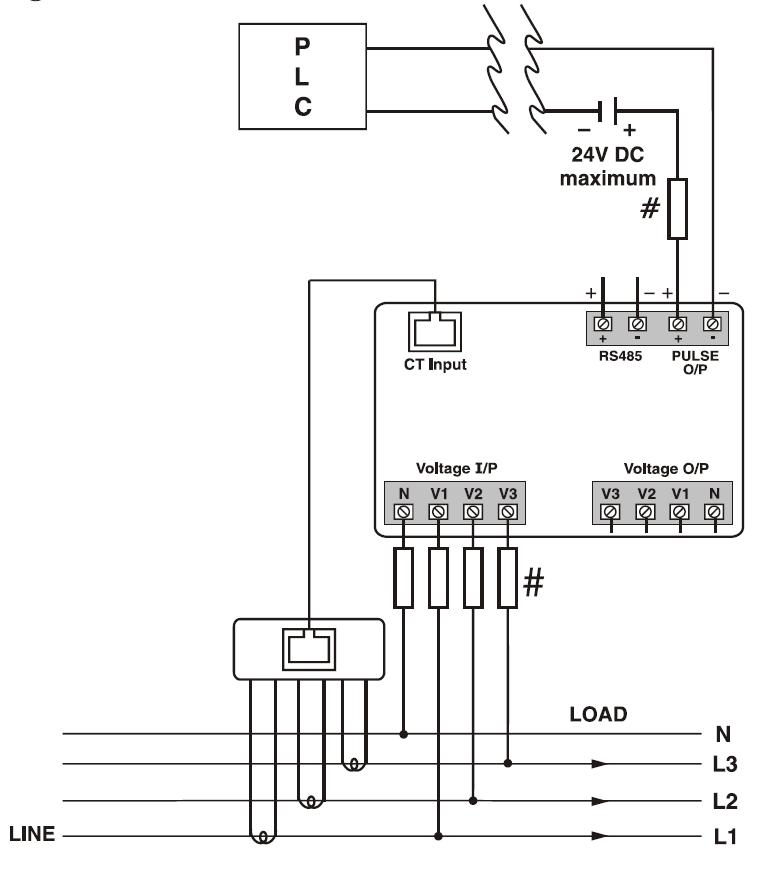
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| **SERIAL NUMBER DESCRIPTION** |
| Press PF key is pressed for 10 seconds then the 8 digit serial number will be displayed on the 5th line for 10 seconds |



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| **AUTOMATIC / MANUAL MODE DESCRIPTION** |
| Press E  key for 3 seconds 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 seconds per page.  In automatic mode when any key is pressed, unit temporarily switches to manual mode and the appropriate page is displayed, also if no key is pressed for 5 seconds the unit will return to automatic. |

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| **MODBUS REGISTER ADDRESSES LIST** | | | | | | | | | | | | | | |
| **Readable Parameters : [ Length (Register) : 2 : Data Structure : Float ]** | | | | | | | | | | | | | | |
| Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |
| 30000 | 0x00 | Voltage V1N | 30100 | 0x64 | KVArh1 (Import) | 30199 | 0xC7 | 30th Harmonic Voltage V1-N | 30299 | 0x12B | 20th Harmonic Voltage V3-N |
| 30002 | 0x02 | Voltage V2N | 30102 | 0x66 | KVArh2 (Import) | 30201 | 0xC9 | 1st Harmonic Voltage V2-N | 30301 | 0x12D | 21st Harmonic Voltage V3-N |
| 30004 | 0x04 | Voltage V3N | 30104 | 0x68 | KVArh3 (Import) | 30203 | 0xCB | 2nd Harmonic Voltage V2-N | 30303 | 0x12F | 22nd Harmonic Voltage V3-N |
| 30006 | 0x06 | Average Voltage LN | 30106 | 0x6A | KVArh1 (Export) | 30205 | 0xCD | 3rd Harmonic Voltage V2-N | 30305 | 0x131 | 23rd Harmonic Voltage V3-N |
| 30008 | 0x08 | Voltage V12 | 30108 | 0x6C | KVArh2 (Export) | 30207 | 0xCF | 4th Harmonic Voltage V2-N | 30307 | 0x133 | 24th Harmonic Voltage V3-N |
| 30010 | 0x0A | Voltage V23 | 30110 | 0x6E | KVArh3 (Export) | 30209 | 0xD1 | 5th Harmonic Voltage V2-N | 30309 | 0x135 | 25th Harmonic Voltage V3-N |
| 30012 | 0x0C | Voltage V31 | 30112 | 0x70 | Total KVArh (Import) | 30211 | 0xD3 | 6th Harmonic Voltage V2-N | 30311 | 0x137 | 26th Harmonic Voltage V3-N |
| 30014 | 0x0E | Average Voltage LL | 30114 | 0x72 | Total KVArh (Export) | 30213 | 0xD5 | 7th Harmonic Voltage V2-N | 30313 | 0x139 | 27th Harmonic Voltage V3-N |
| 30016 | 0x10 | Current I1 | 30116 | 0x74 | KVAh1 | 30215 | 0xD7 | 8th Harmonic Voltage V2-N | 30315 | 0x13B | 28th Harmonic Voltage V3-N |
| 30018 | 0x12 | Current I2 | 30118 | 0x76 | KVAh2 | 30217 | 0xD9 | 9th Harmonic Voltage V2-N | 30317 | 0x13D | 29th Harmonic Voltage V3-N |
| 30020 | 0x14 | Current I3 | 30120 | 0x78 | KVAh3 | 30219 | 0xDB | 10th Harmonic Voltage V2-N | 30319 | 0x13F | 30th Harmonic Voltage V3-N |
| 30022 | 0x16 | Average Current | 30122 | 0x7A | Neutral Current | 30221 | 0xDD | 11th Harmonic Voltage V2-N | 30321 | 0x141 | 1st Harmonic Voltage V1-V2 |
| 30024 | 0x18 | KW1 | 30124 | 0x7C | THD of 1st Phase Voltage | 30223 | 0xDF | 12th Harmonic Voltage V2-N | 30323 | 0x143 | 2nd Harmonic Voltage V1-V2 |
| 30026 | 0x1A | KW2 | 30126 | 0x7E | THD of 2nd Phase Voltage | 30225 | 0xE1 | 13th Harmonic Voltage V2-N | 30325 | 0x145 | 3rd Harmonic Voltage V1-V2 |
| 30028 | 0x1C | KW3 | 30128 | 0x80 | THD of 3rd Phase Voltage | 30227 | 0xE3 | 14th Harmonic Voltage V2-N | 30327 | 0x147 | 4th Harmonic Voltage V1-V2 |
| 30030 | 0x1E | KVA1 | 30130 | 0x82 | THD of Voltage V12 | 30229 | 0xE5 | 15th Harmonic Voltage V2-N | 30329 | 0x149 | 5th Harmonic Voltage V1-V2 |
| 30032 | 0x20 | KVA2 | 30132 | 0x84 | THD of Voltage V23 | 30231 | 0xE7 | 16th Harmonic Voltage V2-N | 30331 | 0x14B | 6th Harmonic Voltage V1-V2 |
| 30034 | 0x22 | KVA3 | 30134 | 0x86 | THD of Voltage V31 | 30233 | 0xE9 | 17th Harmonic Voltage V2-N | 30333 | 0x14D | 7th Harmonic Voltage V1-V2 |
| 30036 | 0x24 | KVAr1 | 30136 | 0x88 | THD of Current I1 | 30235 | 0xEB | 18th Harmonic Voltage V2-N | 30335 | 0x14F | 8th Harmonic Voltage V1-V2 |
| 30038 | 0x26 | KVAr2 | 30138 | 0x8A | THD of Current I2 | 30237 | 0xED | 19th Harmonic Voltage V2-N | 30337 | 0x151 | 9th Harmonic Voltage V1-V2 |
| 30040 | 0x28 | KVAr3 | 30140 | 0x8C | THD of Current I3 | 30239 | 0xEF | 20th Harmonic Voltage V2-N | 30339 | 0x153 | 10th Harmonic Voltage V1-V2 |
| 30042 | 0x2A | Total KW | 30141 | 0x8D | 1st Harmonic Voltage V1-N | 30241 | 0xF1 | 21st Harmonic Voltage V2-N | 30341 | 0x155 | 11th Harmonic Voltage V1-V2 |
| 30044 | 0x2C | Total KVA | 30143 | 0x8F | 2nd Harmonic Voltage V1-N | 30243 | 0xF3 | 22nd Harmonic Voltage V2-N | 30343 | 0x157 | 12th Harmonic Voltage V1-V2 |
| 30046 | 0x2E | Total KVAr | 30145 | 0x91 | 3rd Harmonic Voltage V1-N | 30245 | 0xF5 | 23rd Harmonic Voltage V2-N | 30345 | 0x159 | 13th Harmonic Voltage V1-V2 |
| 30048 | 0x30 | PF1 | 30147 | 0x93 | 4th Harmonic Voltage V1-N | 30247 | 0xF7 | 24th Harmonic Voltage V2-N | 30347 | 0x15B | 14th Harmonic Voltage V1-V2 |
| 30050 | 0x32 | PF2 | 30149 | 0x95 | 5th Harmonic Voltage V1-N | 30249 | 0xF9 | 25th Harmonic Voltage V2-N | 30349 | 0x15D | 15th Harmonic Voltage V1-V2 |
| 30052 | 0x34 | PF3 | 30151 | 0x97 | 6th Harmonic Voltage V1-N | 30251 | 0xFB | 26th Harmonic Voltage V2-N | 30351 | 0x15F | 16th Harmonic Voltage V1-V2 |
| 30054 | 0x36 | Average PF | 30153 | 0x99 | 7th Harmonic Voltage V1-N | 30253 | 0xFD | 27th Harmonic Voltage V2-N | 30353 | 0x161 | 17th Harmonic Voltage V1-V2 |
| 30056 | 0x38 | Frequency | 30155 | 0x9B | 8th Harmonic Voltage V1-N | 30255 | 0xFF | 28th Harmonic Voltage V2-N | 30355 | 0x163 | 18th Harmonic Voltage V1-V2 |
| 30058 | 0x3A | Total Net KWh | 30157 | 0x9D | 9th Harmonic Voltage V1-N | 30257 | 0x101 | 29th Harmonic Voltage V2-N | 30357 | 0x165 | 19th Harmonic Voltage V1-V2 |
| 30060 | 0x3C | Total Net KVAh | 30159 | 0x9F | 10th Harmonic Voltage V1-N | 30259 | 0x103 | 30th Harmonic Voltage V2-N | 30359 | 0x167 | 20th Harmonic Voltage V1-V2 |
| 30062 | 0x3E | Total Net KVArh | 30161 | 0xA1 | 11th Harmonic Voltage V1-N | 30261 | 0x105 | 1st Harmonic Voltage V3-N | 30361 | 0x169 | 21st Harmonic Voltage V1-V2 |
| 30064 | 0x40 | KW Max Active Power | 30163 | 0xA3 | 12th Harmonic Voltage V1-N | 30263 | 0x107 | 2nd Harmonic Voltage V3-N | 30363 | 0x16B | 22nd Harmonic Voltage V1-V2 |
| 30066 | 0x42 | KW Min Active Power | 30165 | 0xA5 | 13th Harmonic Voltage V1-N | 30265 | 0x109 | 3rd Harmonic Voltage V3-N | 30365 | 0x16D | 23rd Harmonic Voltage V1-V2 |
| 30068 | 0x44 | KVAr Max Reactive Power | 30167 | 0xA7 | 14th Harmonic Voltage V1-N | 30267 | 0x10B | 4thHarmonic Voltage V3-N | 30367 | 0x16F | 24th Harmonic Voltage V1-V2 |
| 30070 | 0x46 | KVAr Min Reactive Power | 30169 | 0xA9 | 15th Harmonic Voltage V1-N | 30269 | 0x10D | 5th Harmonic Voltage V3-N | 30369 | 0x171 | 25th Harmonic Voltage V1-V2 |
| 30072 | 0x48 | KVA Max Apparent Power | 30171 | 0xAB | 16th Harmonic Voltage V1-N | 30271 | 0x10F | 6th Harmonic Voltage V3-N | 30371 | 0x173 | 26th Harmonic Voltage V1-V2 |
| 30074 | 0x4A | Max I1 Demand | 30173 | 0xAD | 17th Harmonic Voltage V1-N | 30273 | 0x111 | 7th Harmonic Voltage V3-N | 30373 | 0x175 | 27th Harmonic Voltage V1-V2 |
| 30076 | 0x4C | Max I2 Demand | 30175 | 0xAF | 18th Harmonic Voltage V1-N | 30275 | 0x113 | 8th Harmonic Voltage V3-N | 30375 | 0x177 | 28th Harmonic Voltage V1-V2 |
| 30078 | 0x4E | Max I3 Demand | 30177 | 0xB1 | 19th Harmonic Voltage V1-N | 30277 | 0x115 | 9th Harmonic Voltage V3-N | 30377 | 0x179 | 29th Harmonic Voltage V1-V2 |
| 30080 | 0x50 | Max Average Demand | 30179 | 0xB3 | 20th Harmonic Voltage V1-N | 30279 | 0x117 | 10th Harmonic Voltage V3-N | 30379 | 0x17B | 30th Harmonic Voltage V1-V2 |
| 30082 | 0x52 | Hours Run | 30181 | 0xB5 | 21st Harmonic Voltage V1-N | 30281 | 0x119 | 11th Harmonic Voltage V3-N | 30381 | 0x17D | 1st Harmonic Voltage V2-V3 |
| 30084 | 0x54 | KWH1 (Import) | 30183 | 0xB7 | 22nd Harmonic Voltage V1-N | 30283 | 0x11B | 12th Harmonic Voltage V3-N | 30383 | 0x17F | 2nd Harmonic Voltage V2-V3 |
| 30086 | 0x56 | KWH2 (Import) | 30185 | 0xB9 | 23rd Harmonic Voltage V1-N | 30285 | 0x11D | 13th Harmonic Voltage V3-N | 30385 | 0x181 | 3rd Harmonic Voltage V2-V3 |
| 30088 | 0x58 | KWH3 (Import) | 30187 | 0xBB | 24th Harmonic Voltage V1-N | 30287 | 0x11F | 14th Harmonic Voltage V3-N | 30387 | 0x183 | 4th Harmonic Voltage V2-V3 |
| 30090 | 0x5A | KWH1 (Export) | 30189 | 0xBD | 25th Harmonic Voltage V1-N | 30289 | 0x121 | 15th Harmonic Voltage V3-N | 30389 | 0x185 | 5th Harmonic Voltage V2-V3 |
| 30092 | 0x5C | KWH2 (Export) | 30191 | 0xBF | 26th Harmonic Voltage V1-N | 30291 | 0X123 | 16th Harmonic Voltage V3-N | 30391 | 0x187 | 6th Harmonic Voltage V2-V3 |
| 30094 | 0x5E | KWH3 (Export) | 30193 | 0xC1 | 27th Harmonic Voltage V1-N | 30293 | 0x125 | 17th Harmonic Voltage V3-N | 30393 | 0x189 | 7th Harmonic Voltage V2-V3 |
| 30096 | 0x60 | Total KWh (Import) | 30195 | 0xC3 | 28th Harmonic Voltage V1-N | 30295 | 0x127 | 18th Harmonic Voltage V3-N | 30395 | 0x18B | 8th Harmonic Voltage V2-V3 |
| 30098 | 0x62 | Total KWh (Export) | 30197 | 0xC5 | 29th Harmonic Voltage V1-N | 30297 | 0x129 | 19th Harmonic Voltage V3-N | 30397 | 0x18D | 9th Harmonic Voltage V2-V3 |

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| **MODBUS REGISTER ADDRESSES LIST** | | | | | | | | | | | | | | |
| **Readable Parameters : [ Length (Register) : 2 : Data Structure : Float ]** | | | | | | | | | | | | | | |
| Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |  | Address | Hex Address | Parameter |
| 30399 | 0x18F | 10th Harmonic Voltage V2-V3 | 30499 | 0x1F3 | 30th Harmonic Voltage V3-V1 | 30599 | 0x257 | 20th Harmonic Current I2 | 30716 | 0x2CC | Existing MAX I3 Demand |
| 30401 | 0x191 | 11th Harmonic Voltage V2-V3 | 30501 | 0x1F5 | 1st Harmonic Current I1 | 30601 | 0x259 | 21st Harmonic Current I2 | 30718 | 0x2CE | Existing MAX Average I Demand |
| 30403 | 0x193 | 12th Harmonic Voltage V2-V3 | 30503 | 0x1F7 | 2nd Harmonic Current I1 | 30603 | 0x25B | 22nd Harmonic Current I2 | **APPLICATION OF PULSE OUTPUT**  Pulse output from RI-F385-G meter can be interfaced into a process through a PLC for the on-line control of energy content in the process. If the PLC has a self exciting digital input, an external DC voltage supply is not needed.  The KWh pulse is also used to derive average KWh information at the PLC.  **# All fuse are : 0.5A Class CC UL type**  **0.5A fast acting 600Vac**  **LEFT HAND CT MOUNTING PHASE CORRECTION**  The meter phases L1, L2 & L3 are setup as default for the CT to be mounted as an incomer on the RH (Right Hand) side of the board. Meter display shows rH when “I” is pressed for 3 seconds.  When the CT is mounted on the LH (Left Hand) side of the board the phase sequence needs to be reversed.   1. Press “I” for 3 seconds, then release and then press again for 3 seconds. Phase will be reversed and the display will show LH. 2. Wait 5 seconds for the meter to resume online reading. Meter display shows LH when “I” is pressed for 3 seconds. | | | |
| 30405 | 0x195 | 13th Harmonic Voltage V2-V3 | 30505 | 0x1F9 | 3rd Harmonic Current I1 | 30605 | 0x25D | 23rd Harmonic Current I2 |
| 30407 | 0x197 | 14th Harmonic Voltage V2-V3 | 30507 | 0x1FB | 4th Harmonic Current I1 | 30607 | 0x25F | 24th Harmonic Current I2 |
| 30409 | 0x199 | 15th Harmonic Voltage V2-V3 | 30509 | 0x1FD | 5th Harmonic Current I1 | 30609 | 0x261 | 25th Harmonic Current I2 |
| 30411 | 0x19B | 16th Harmonic Voltage V2-V3 | 30511 | 0x1FF | 6th Harmonic Current I1 | 30611 | 0x263 | 26th Harmonic Current I2 |
| 30413 | 0x19D | 17th Harmonic Voltage V2-V3 | 30513 | 0x201 | 7th Harmonic Current I1 | 30613 | 0x265 | 27th Harmonic Current I2 |
| 30415 | 0x19F | 18th Harmonic Voltage V2-V3 | 30515 | 0x203 | 8th Harmonic Current I1 | 30615 | 0x267 | 28th Harmonic Current I2 |
| 30417 | 0x1A1 | 19th Harmonic Voltage V2-V3 | 30517 | 0x205 | 9th Harmonic Current I1 | 30617 | 0x269 | 29th Harmonic Current I2 |
| 30419 | 0x1A3 | 20th Harmonic Voltage V2-V3 | 30519 | 0x207 | 10th Harmonic Current I1 | 30619 | 0x26B | 30th Harmonic Current I2 |
| 30421 | 0x1A5 | 21st Harmonic Voltage V2-V3 | 30521 | 0x209 | 11th Harmonic Current I1 | 30621 | 0x26D | 1st Harmonic Current I3 |
| 30423 | 0x1A7 | 22nd Harmonic Voltage V2-V3 | 30523 | 0x20B | 12th Harmonic Current I1 | 30623 | 0x26F | 2nd Harmonic Current I3 |
| 30425 | 0x1A9 | 23rd Harmonic Voltage V2-V3 | 30525 | 0x20D | 13th Harmonic Current I1 | 30625 | 0x271 | 3rd Harmonic Current I3 |
| 30427 | 0x1AB | 24th Harmonic Voltage V2-V3 | 30527 | 0x20F | 14th Harmonic Current I1 | 30627 | 0x273 | 4th Harmonic Current I3 |
| 30429 | 0x1AD | 25th Harmonic Voltage V2-V3 | 30529 | 0x211 | 15th Harmonic Current I1 | 30629 | 0x275 | 5th Harmonic Current I3 |
| 30431 | 0x1AF | 26th Harmonic Voltage V2-V3 | 30531 | 0x231 | 16th Harmonic Current I1 | 30631 | 0x277 | 6th Harmonic Current I3 |
| 30433 | 0x1B1 | 27th Harmonic Voltage V2-V3 | 30533 | 0x215 | 17th Harmonic Current I1 | 30633 | 0x279 | 7th Harmonic Current I3 |
| 30435 | 0x1B3 | 28th Harmonic Voltage V2-V3 | 30535 | 0x217 | 18th Harmonic Current I1 | 30635 | 0x27B | 8th Harmonic Current I3 |
| 30437 | 0x1B5 | 29th Harmonic Voltage V2-V3 | 30537 | 0x219 | 19th Harmonic Current I1 | 30637 | 0x27D | 9th Harmonic Current I3 |
| 30439 | 0x1B7 | 30th Harmonic Voltage V2-V3 | 30539 | 0x21B | 20th Harmonic Current I1 | 30639 | 0x27F | 10th Harmonic Current I3 |
| 30441 | 0x1B9 | 1st Harmonic Voltage V3-V1 | 30541 | 0x21D | 21st Harmonic Current I1 | 30641 | 0x281 | 11th Harmonic Current I3 |
| 30443 | 0x1BB | 2nd Harmonic Voltage V3-V1 | 30543 | 0x21F | 22nd Harmonic Current I1 | 30643 | 0x283 | 12th Harmonic Current I3 |
| 30445 | 0x1BD | 3rd Harmonic Voltage V3-V1 | 30545 | 0x221 | 23rd Harmonic Current I1 | 30645 | 0x285 | 13th Harmonic Current I3 |
| 30447 | 0x1BF | 4th Harmonic Voltage V3-V1 | 30547 | 0x223 | 24th Harmonic Current I1 | 30647 | 0x287 | 14th Harmonic Current I3 |
| 30449 | 0x1C1 | 5th Harmonic Voltage V3-V1 | 30549 | 0x225 | 25th Harmonic Current I1 | 30649 | 0x289 | 15th Harmonic Current I3 |
| 30451 | 0x1C3 | 6th Harmonic Voltage V3-V1 | 30551 | 0x227 | 26th Harmonic Current I1 | 30651 | 0x28B | 16th Harmonic Current I3 |
| 30453 | 0x1C5 | 7th Harmonic Voltage V3-V1 | 30553 | 0x229 | 27th Harmonic Current I1 | 30653 | 0x28D | 17th Harmonic Current I3 |
| 30455 | 0x1C7 | 8th Harmonic Voltage V3-V1 | 30555 | 0x22B | 28th Harmonic Current I1 | 30655 | 0x28F | 18th Harmonic Current I3 |
| 30457 | 0x1C9 | 9th Harmonic Voltage V3-V1 | 30557 | 0x22D | 29th Harmonic Current I1 | 30657 | 0x291 | 19th Harmonic Current I3 |
| 30459 | 0x1CB | 10th Harmonic Voltage V3-V1 | 30559 | 0x22F | 30th Harmonic Current I1 | 30659 | 0x293 | 20th Harmonic Current I3 |
| 30461 | 0x1CD | 11th Harmonic Voltage V3-V1 | 30561 | 0x231 | 1st Harmonic Current I2 | 30661 | 0x295 | 21st Harmonic Current I3 |
| 30463 | 0x1CF | 12th Harmonic Voltage V3-V1 | 30563 | 0x233 | 2nd Harmonic Current I2 | 30663 | 0x297 | 22nd Harmonic Current I3 |
| 30465 | 0x1D1 | 13th Harmonic Voltage V3-V1 | 30565 | 0x235 | 3rd Harmonic Current I2 | 30665 | 0x299 | 23rd Harmonic Current I3 |
| 30467 | 0x1D3 | 14th Harmonic Voltage V3-V1 | 30567 | 0x237 | 4th Harmonic Current I2 | 30667 | 0x29B | 24th Harmonic Current I3 |
| 30469 | 0x1D5 | 15th Harmonic Voltage V3-V1 | 30569 | 0x239 | 5th Harmonic Current I2 | 30669 | 0x29D | 25th Harmonic Current I3 |
| 30471 | 0x1D7 | 16th Harmonic Voltage V3-V1 | 30571 | 0x23B | 6th Harmonic Current I2 | 30671 | 0x29F | 26th Harmonic Current I3 |
| 30473 | 0x1D9 | 17th Harmonic Voltage V3-V1 | 30573 | 0x23D | 7th Harmonic Current I2 | 30673 | 0x2A1 | 27th Harmonic Current I3 |
| 30475 | 0x1DB | 18th Harmonic Voltage V3-V1 | 30575 | 0x23F | 8th Harmonic Current I2 | 30675 | 0x2A3 | 28th Harmonic Current I3 |
| 30477 | 0x1DD | 19th Harmonic Voltage V3-V1 | 30577 | 0x241 | 9th Harmonic Current I2 | 30677 | 0x2A5 | 29th Harmonic Current I3 |
| 30479 | 0x1DF | 20th Harmonic Voltage V3-V1 | 30579 | 0x243 | 10th Harmonic Current I2 | 30679 | 0x2A7 | 30th Harmonic Current I3 |
| 30481 | 0x1E1 | 21st Harmonic Voltage V3-V1 | 30581 | 0x245 | 11th Harmonic Current I2 | 30684 | 0x2AC | Serial No (Data Structure : Hex) |
| 30483 | 0x1E3 | 22nd Harmonic Voltage V3-V1 | 30583 | 0x247 | 12th Harmonic Current I2 | 30700 | 0x2BC | Phase Sequence Indication |
| 30485 | 0x1E5 | 23rd Harmonic Voltage V3-V1 | 30585 | 0x249 | 13th Harmonic Current I2 | 30702 | 0x2BE | Existing KW MAX Active Power |
| 30487 | 0x1E7 | 24th Harmonic Voltage V3-V1 | 30587 | 0x24B | 14th Harmonic Current I2 | 30704 | 0x2C0 | Existing KW MIN Active Power |
| 30489 | 0x1E9 | 25th Harmonic Voltage V3-V1 | 30589 | 0x24D | 15th Harmonic Current I2 | 30706 | 0x2C2 | Existing KVAr MAX Reactive Power |
| 30491 | 0x1EB | 26th Harmonic Voltage V3-V1 | 30591 | 0x24F | 16th Harmonic Current I2 | 30708 | 0x2C4 | Existing KVAr MIN Reactive Power |
| 30493 | 0x1ED | 27th Harmonic Voltage V3-V1 | 30593 | 0x251 | 17th Harmonic Current I2 | 30710 | 0x2C6 | Existing KVA MAX Apparent Power |
| 30495 | 0x1EF | 28th Harmonic Voltage V3-V1 | 30595 | 0x253 | 18th Harmonic Current I2 | 30712 | 0x2C8 | Existing MAX I1 Demand |
| 30497 | 0x1F1 | 29th Harmonic Voltage V3-V1 | 30597 | 0x255 | 19th Harmonic Current I2 | 30714 | 0x2CA | Existing MAX I2 Demand |



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| **MODBUS REGISTER ADDRESSES LIST** | | | | | | | | | | | | |
| **Readable / Writable Parameters : [ Data Structure : Integer ]** | | | | | | | | | | | | |
| **Address** | **Hex Address** | **Parameter** | **Range** | | **Length (Register)** |  | **Address** | **Hex Address** | **Parameter** | **Range** | | **Length (Register)** |
|  |  |  | **Min Value** | **Max Value** |  | 40024 | 0x18 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40000 | 0x00 | Password | 0 | 9998 | 1 | 40025 | 0x19 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | **Value** | **Meaning** |  | 40026 | 0x1A | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40001 | 0x01 | Network Selection | 0x0000 | 3P4W | 1 | 40027 | 0x1B | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | 0x0002 | 1P2W-P1 | 1 | 40028 | 0x1C | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | 0x0003 | 1P2W-P2 | 1 | 40028 | 0x1D | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | 0x0004 | 1P2W-P3 | 1 | 40030 | 0x1E | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | **Min Value** | **Max Value** |  | 40031 | 0x1F | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40002 | 0x02 | CT Secondary (Readable Only) | 5 | 5 | 1 | 40032 | 0x20 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40003 | 0x03 | CT Primary | 5 | 10000 | 1 | 40033 | 0x21 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40004 | 0x04 | PT Secondary | 173 | 415 | 1 | 40054 | 0x36 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40005 | 0x05 | PT Primary | 100 | 500000 | 2 | 40055 | 0x37 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40007 | 0x07 | Slave ID | 1 | 255 | 1 | 40059 | 0x3B | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
|  |  |  | **Value** | **Meaning** |  | 40060 | 0x3C | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40008 | 0x08 | Baud Rate | 0x0000 | 300 bps | 1 |  |  |  | **Value** | **Meaning** |  |
|  |  |  | 0x0001 | 600 bps | 1 | 40034 | 0x22 | Demand Interval Method | 0x0000 | Sliding | 1 |
|  |  |  | 0x0002 | 1200 bps | 1 |  |  |  | 0x0001 | Fixed | 1 |
|  |  |  | 0x0003 | 2400 bps | 1 | 40035 | 0x23 | Demand Interval Duration | Min 1 | Max 30 | 1 |
|  |  |  | 0x0004 | 4800 bps | 1 | 40036 | 0x24 | Demand interval Length | Min 1 | Max 30 | 1 |
|  |  |  | 0x0005 | 9600 bps | 1 | 40043 | 0x2B | Reset Max | 1 | Reset All Max Power | 1 |
|  |  |  | 0x0006 | 19200 bps | 1 | 40044 | 0x2C | Reset Energy | 1 | Reset All Energy To Factory Setting Range | 1 |
| 40009 | 0x09 | Parity | 0x0000 | None | 1 |
| 40045 | 0x2D Reset | Reset Hours Run | 1 | Reset Hours Run | 1 |
|  |  |  | 0x0001 | Odd | 1 |
|  |  |  | **Min Value** | **Max Value** |  |
|  |  |  | 0x0002 | Even | 1 |
| 40057 | 0x39 | Pulse Duration | 0.1(second) | 2.0(seconds) | 1 |
| 40010 | 0x0A | Stop Bit | 0x0000 | 1 | 1 |
| 40058 | 0x3A | Pulse Weight | 00.10 | 99.99 | 1 |
|  |  |  | 0x000 | 2 | 1 |
|  |  |  | **Value** | **Meaning** |  |
|  |  |  | **Min Value** | **Max Value** |  |
| 40063 | 0x3F | Reset Max Current | 1 | Reset Max Current | 1 |
| 40011 | 0x0B | Backlight OFF | 0 | 7200 | 1 |
|  | | | | | | |
| 40012 | 0x0C | Factory Default Reset | 1 | Set to factory setting range | 1 |
| 40016 | 0x10 | Auto Mode Pages | 1 | 21 |  |
|  |  |  | **Page No** | **Meaning** |  |
| 40017 | 0x11 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40018 | 0x12 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40019 | 0x13 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40020 | 0x14 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40021 | 0x15 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40022 | 0x16 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |
| 40023 | 0x17 | Page Address Sequence | 1-21 | 1-First Page : 21-Last Page | 1 |



Specifications subject to change as development is a continuous process

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