



| KEY PRESS   | ONLINE PAGE DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|-------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Press “VAF” | <p><b>The first screen</b> : Displays voltage, current, power factor of first phase and frequency.</p> <p><b>The second screen</b> : Displays voltage, current, power factor of second phase and frequency.</p> <p><b>The third screen</b> : Displays voltage, current, power factor of third phase and frequency.</p> <p><b>The fourth screen</b> : Displays average value of voltage, current and power factor of three phase and frequency.</p> <p><b>Note</b> : 1) In 3 Ø 3 wire system voltage current power factor and frequency. will be line to line.<br/>2) In 1 Ø 2 wire system only first screen will be available.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
| Press “PF”  | <p><b>The first screen</b> : Displays power factor of three phase and average power factor.</p> <p><b>Note</b> : For 3 Ø 3 wire system, only average power factor will be available on this screen.</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Press “p”   | <p><b>The first screen</b> : Displays active power of three phase and total active power.</p> <p><b>The second screen</b> : Displays reactive power of three phase and total reactive power.</p> <p><b>The third screen</b> : Displays apparent power of three phase and total apparent power.</p> <p><b>The fourth screen</b> : Displays active, reactive, apparent power and power factor of first phase.</p> <p><b>The fifth screen</b> : Displays active, reactive, apparent power and power factor of second phase.</p> <p><b>The sixth screen</b> : Displays active, reactive, apparent power and power factor of third phase.</p> <p><b>The seventh screen</b> : Displays total active, reactive, apparent power and average power factor of three phase.</p> <p><b>The eighth screen</b> : Displays maximum active power demand, reactive power demand and apparent power demand.</p> <p><b>The ninth screen</b> : Displays minimum active power demand and reactive power demand.</p> <p><b>Note</b> : 1) For 3 Ø 3 wire system only seventh, eighth and ninth screen will be available.<br/>2) In 1 Ø 2 wire system only first, second, third &amp; depending on the network selection the fourth or fifth or sixth screen along with eighth and ninth screen will be available.</p>                                                                                                                                                                                                                                                                                                                                                          |
| Press “E”   | <p><b>The first Screen</b> : Displays import active energy of first phase.</p> <p><b>The second screen</b> : Displays import active energy of second phase.</p> <p><b>The third screen</b> : Displays import active energy of third phase.</p> <p><b>The fourth screen</b> : Displays export active energy of first phase.</p> <p><b>The fifth screen</b> : Displays export active energy of second phase.</p> <p><b>The sixth screen</b> : Displays export active energy of third phase.</p> <p><b>The seventh screen</b> : Displays total import active energy of three phase.</p> <p><b>The eighth screen</b> : Displays total export active energy of three phase.</p> <p><b>The ninth screen</b> : Displays total net active energy of three phase.</p> <p><b>The tenth Screen</b> : Displays import reactive energy of first phase.</p> <p><b>The eleventh screen</b> : Displays import reactive energy of second phase.</p> <p><b>The twelfth screen</b> : Displays import reactive energy of third phase.</p> <p><b>The thirteenth screen</b> : Displays export reactive energy of first phase.</p> <p><b>The fourteenth screen</b> : Displays export reactive energy of second phase.</p> <p><b>The fifteenth screen</b> : Displays export reactive energy of third phase.</p> <p><b>The sixteenth screen</b> : Displays total import reactive energy of three phase.</p> <p><b>The seventeenth screen</b> : Displays total export reactive energy of three phase.</p> <p><b>The eighteenth screen</b> : Displays total net reactive energy of three phase.</p> <p><b>The nineteenth screen</b> : Displays apparent energy of first phase.</p> |

| KEY PRESS | ONLINE PAGE DESCRIPTION                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
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|           | <p><b>The twentieth screen</b> : Displays apparent energy of second phase.</p> <p><b>The twenty first screen</b> : Displays apparent energy of third phase.</p> <p><b>The twenty second screen</b> : Displays total net apparent energy of three phase.</p> <p><b>The twenty third screen</b> : Displays run hour.</p> <p><b>The twenty fourth screen</b> : Displays Auxiliary Interrupts.</p> <p><b>Note</b> : 1) In 3 Ø 3 wire system only ninth, eighteenth, twenty second, twenty third and twenty fourth screens will be available.<br/>2) In 1 Ø 2 wire system only 7th,8th,9th,16th,17th,18th,22nd, 23rd &amp; 24th screens will be common &amp;<br/>For <b>P1</b> : 1st, 4th, 10th, 13th, 19th Screen will appear.<br/>For <b>P2</b> : 2nd, 5th, 11th, 14th, 20th Screen will appear.<br/>For <b>P3</b> 3rd, 6th, 12th, 15th, 21st Screen will be for appear.</p> |

| NETWORK SELECTION AND WIRING INPUT      |                                                             |
|-----------------------------------------|-------------------------------------------------------------|
| Network selection in configuration mode | Wiring                                                      |
| 3P4W                                    | 3P4W                                                        |
| 3P3W                                    | 3P3W                                                        |
| 1P2W                                    | 1P2W (P1/P2/P3) <sup>1</sup> P1, P2 and P3 are Three Phase. |

#### EXAMPLE TO READ DATA FROM INPUT REGISTER

##### Data format: Big Endian (Default format)

If Total Active Energy = 1234.12kWh  
Start Address : 30090, No. Of register : 02  
Hexadecimal Equivalent of 1234.12 is 0x449A43D7

Data stored at 30090 is LSB :  $\frac{A}{44} \frac{B}{9A}$

Data Stored at 30091 is MSB :  $\frac{C}{43} \frac{D}{D7}$

Data Format to be followed is A-B-C-D

##### Data format: Mid Little Endian

If Total Active Energy = 1234.12kWh  
Start Address : 30090, No. Of register : 02  
Hexadecimal Equivalent of 1234.12 is 0x449A43D7

Data stored at 30090 is LSB :  $\frac{C}{43} \frac{D}{D7}$

Data Stored at 30091 is MSB :  $\frac{A}{44} \frac{B}{9A}$

Data Format to be followed is C-D-A-B

| AUTOMATIC / MANUAL MODE DESCRIPTION                                                                                                                                                               |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Press E (↵) button for 3 seconds to toggle between Automatic and Manual mode.                                                                                                                     |
| <b>Note</b> : By default unit operates in Auto 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 any key is not pressed for 5 sec, unit resumes automatic mode. |

#### CONFIGURATION

There are 6 dedicated keys with symbols marked as . Use these 6 keys to navigate into configuration menu / 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 :

- Press  +  keys for 3 sec. to enter or to exit from the configuration menu.
- Press  or  key to move cursor left or right by one digit each time.
- Press  or  key to increase or to decrease the parameters value.
- Press  key to go back to previous page.
- Press  key to save the setting and move on to next 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                                     | 1000            |
| 2            | Network Selection        | 3P4W, 3P3W, 1P2W-P1, 1P2W-P2 and 1P2W-P3         | 3P4W            |
| 3            | CT Secondary             | 1A or 5A                                         | 5               |
| 4            | CT Primary               | 1A, 5A to 10,000A                                | 5               |
| 5            | PT Secondary             | 100V to 500V                                     | 350             |
| 6            | PT primary               | 100V to 500kV                                    | 350             |
| 7            | Slave Id                 | 1 to 255                                         | 1               |
| 8            | Baud Rate                | 300, 600, 1200, 2400, 4800, 9600 and 19200 (bps) | 9600            |
| 9            | Parity                   | None, Odd, Even                                  | None            |
| 10           | Stop Bit                 | 1 or 2                                           | 1               |
| 11           | Back Light               | 0 to 7200 sec.                                   | 0000            |
| 12           | Demand interval method   | Sliding / Fixed                                  | Sliding         |
| 13           | Demand interval duration | 1 to 30                                          | 15              |
| 14           | Demand interval length   | 1 to 30 min                                      | 1               |
| 15           | Max Page Auto            | 1 to 21                                          | 21              |
| 16           | Change Page Sequence     | No / Yes                                         | No              |
| 16.01        | Page sequence 1          | 1 to 21                                          | 1               |
| 16.02        | Page sequence 2          | 1 to 21                                          | 2               |
| 16.03        | Page sequence 3          | 1 to 21                                          | 3               |
| 16.04        | Page sequence 4          | 1 to 21                                          | 4               |
| 16.05        | Page sequence 5          | 1 to 21                                          | 5               |
| 16.06        | Page sequence 6          | 1 to 21                                          | 6               |
| 16.07        | Page sequence 7          | 1 to 21                                          | 7               |
| 16.08        | Page sequence 8          | 1 to 21                                          | 8               |
| 16.09        | Page sequence 9          | 1 to 21                                          | 9               |
| 16.10        | Page sequence 10         | 1 to 21                                          | 10              |
| 16.11        | Page sequence 11         | 1 to 21                                          | 11              |
| 16.12        | Page sequence 12         | 1 to 21                                          | 12              |
| 16.13        | Page sequence 13         | 1 to 21                                          | 13              |
| 16.14        | Page sequence 14         | 1 to 21                                          | 14              |
| 16.15        | Page sequence 15         | 1 to 21                                          | 15              |
| 16.16        | Page sequence 16         | 1 to 21                                          | 16              |
| 16.17        | Page sequence 17         | 1 to 21                                          | 17              |
| 16.18        | Page sequence 18         | 1 to 21                                          | 18              |
| 16.19        | Page sequence 19         | 1 to 21                                          | 19              |
| 16.20        | Page sequence 20         | 1 to 21                                          | 20              |
| 16.21        | Page sequence 21         | 1 to 21                                          | 21              |
| 17           | Pulse weight (kWh)       | 0.01 to 99.99                                    | 0.01            |
| 18           | Pulse duration (Sec)     | 0.1 to 2.0                                       | 0.1             |
| 19           | Endianness Selection     | LSBF / MSBF                                      | LSBF            |

| Config page. | Function                     | Range or Selection | Factory Setting |
|--------------|------------------------------|--------------------|-----------------|
| 20           | Factory default              | No / Yes           | No              |
| 21           | Reset energy and MAX demand  | No / Yes           | No              |
| 21.1         | Password                     | 0001 to 9999       | 1001            |
| 21.01        | Reset Active energy          | No / Yes           | No              |
| 21.02        | Reset Reactive energy        | No / Yes           | No              |
| 21.03        | Reset Apparent energy        | No / Yes           | No              |
| 21.04        | Reset MAX Current DMD        | No / Yes           | No              |
| 21.05        | Reset MAX Active power DMD   | No / Yes           | No              |
| 21.06        | Reset MIN Active power DMD   | No / Yes           | No              |
| 21.07        | Reset MAX Reactive power DMD | No / Yes           | No              |
| 21.08        | Reset MIN Reactive power DMD | No / Yes           | No              |
| 21.09        | Reset MAX Apparent power DMD | No / Yes           | No              |
| 22           | Reset Run Hour               | No / Yes           | No              |
| 23           | Reset Auxiliary Interrupt    | No / Yes           | No              |

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

| SERIAL NUMBER DESCRIPTION                                                                                                                                                                |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Press PF (  ) key for 10sec. to display 8 digit serial number only for 10sec. at 5th line of display. |

| MODBUS REGISTER ADDRESSES LIST                                           |             |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
|--------------------------------------------------------------------------|-------------|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|-----------------------------------------------|---|-------------|---|-------------|---|-------------|---|-------------|---|-------------|---|-------------|---|------------|---|------------|---|------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|
| Readable Parameters : [ Length (Register) : 2 ; Data Structure : Float ] |             |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| Address                                                                  | Hex Address | Parameter                      | Address                                                                                                                                                                                                                                                                                                                                                                                                                         | Hex Address        | Parameter                                     |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30000                                                                    | 0x00        | Voltage V1N                    | 30102                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x66               | kVArh2 (Imp)                                  |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30002                                                                    | 0x02        | Voltaage V2N                   | 30104                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x68               | kVArh3 (Imp)                                  |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30004                                                                    | 0x04        | Voltage V3N                    | 30106                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x6A               | kVArh1 (Exp)                                  |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30006                                                                    | 0x06        | Average Voltage LN             | 30108                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x6C               | kVArh2 (Exp)                                  |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30008                                                                    | 0x08        | Voltage V12                    | 30110                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x6E               | kVArh3 (Exp)                                  |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30010                                                                    | 0x0A        | Voltage V23                    | 30112                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x70               | Total kVArh (Imp)                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30012                                                                    | 0x0C        | Voltage V31                    | 30114                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x72               | Total kVArh (Exp)                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30014                                                                    | 0x0E        | Average Voltage LL             | 30116                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x74               | kVAh1                                         |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30016                                                                    | 0x10        | Current I1                     | 30118                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x76               | kVAh2                                         |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30018                                                                    | 0x12        | Current I2                     | 30120                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x78               | kVAh3                                         |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30020                                                                    | 0x14        | Current I3                     | 30122                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x7A               | Neutral Current                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30022                                                                    | 0x16        | Average Current                | 30124                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x7C               | THD of 1st Phase Voltage                      |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30024                                                                    | 0x18        | kW1                            | 30126                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x7E               | THD of 2nd Phase Voltage                      |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30026                                                                    | 0x1A        | kW2                            | 30128                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x80               | THD of 3rd Phase Voltage                      |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30028                                                                    | 0x1C        | kW3                            | 30130                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x82               | THD of Voltage V12                            |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30030                                                                    | 0x1E        | kVA1                           | 30132                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x84               | THD of Voltage V23                            |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30032                                                                    | 0x20        | kVA2                           | 30134                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x86               | THD of Voltage V31                            |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30034                                                                    | 0x22        | kVA3                           | 30136                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x88               | THD of Current I1                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30036                                                                    | 0x24        | kVAr1                          | 30138                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x8A               | THD of Current I2                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30038                                                                    | 0x26        | kVAr2                          | 30140                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x8C               | THD of Current I3                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30040                                                                    | 0x28        | kVAr3                          | 30684                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2AC              | Serial no. (Data Structure : Hex)             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30042                                                                    | 0x2A        | Total KW                       | 30692                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2B4              | MAX I1 Demand                                 |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30044                                                                    | 0x2C        | Total KVA                      | 30694                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2B6              | MAX I2 Demand                                 |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30046                                                                    | 0x2E        | Total KVAr                     | 30696                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2B8              | MAX I3 Demand                                 |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30048                                                                    | 0x30        | PF1                            | 30698                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2BA              | MAX Avg. I Demand                             |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30050                                                                    | 0x32        | PF2                            | 30700                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2BC              | Phase Sequence Indication                     |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30052                                                                    | 0x34        | PF3                            |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    | ( 0-Invalid, 1-Anticlockwise, 2-OK clockwise) |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30054                                                                    | 0x36        | Average PF                     | 30702                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2BE              | Existing Max. Active Power (kW) DMD           |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30056                                                                    | 0x38        | Frequency                      | 30704                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2C0              | Existing Min. Active Power (kW) DMD           |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30058                                                                    | 0x3A        | Total net kWh                  | 30706                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2C2              | Existing Max. Reactive Power (kVAr) DMD       |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30060                                                                    | 0x3C        | Total net kVAh                 | 30708                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2C4              | Existing Min. Reactive Power (kVAr) DMD       |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30062                                                                    | 0x3E        | Total net kVArh                | 30710                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2C6              | Existing Max. Apparent Power (kVA) DMD        |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30064                                                                    | 0x40        | Max. Active Power (kW) DMD     | 30712                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2C8              | Existing MAX I1 Demand                        |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30066                                                                    | 0x42        | Min. Active Power (kW) DMD     | 30714                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2CA              | Existing MAX I2 Demand                        |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30068                                                                    | 0x44        | Max. Reactive Power (kVAr) DMD | 30716                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2CC              | Existing MAX I3 Demand                        |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30070                                                                    | 0x46        | Min. Reactive Power (kVAr) DMD | 30718                                                                                                                                                                                                                                                                                                                                                                                                                           | 0x2CE              | Existing MAX Avg. I Demand                    |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30072                                                                    | 0x48        | Max. Apparent Power (kVA) DMD  | Formula to find address of individual Harmonic                                                                                                                                                                                                                                                                                                                                                                                  |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30080                                                                    | 0x50        | Auxiliary Interrupt            | <table><tr><th>Constant Parameter</th><th>Meaning</th></tr><tr><td>0</td><td>Voltage V1N</td></tr><tr><td>1</td><td>Voltage V2N</td></tr><tr><td>2</td><td>Voltage V3N</td></tr><tr><td>3</td><td>Voltage V12</td></tr><tr><td>4</td><td>Voltage V23</td></tr><tr><td>5</td><td>Voltage V31</td></tr><tr><td>6</td><td>Current I1</td></tr><tr><td>7</td><td>Current I2</td></tr><tr><td>8</td><td>Current I3</td></tr></table> | Constant Parameter | Meaning                                       | 0 | Voltage V1N | 1 | Voltage V2N | 2 | Voltage V3N | 3 | Voltage V12 | 4 | Voltage V23 | 5 | Voltage V31 | 6 | Current I1 | 7 | Current I2 | 8 | Current I3 | {143 + [(Harmonic no-2) x 2]<br>+ 60 x Constant Parameter}<br>For Example,<br>To find the 14 <sup>th</sup> Harmonic address<br>of Voltage V31 following formula<br>can be used : |  |
| Constant Parameter                                                       | Meaning     |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 0                                                                        | Voltage V1N |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 1                                                                        | Voltage V2N |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 2                                                                        | Voltage V3N |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 3                                                                        | Voltage V12 |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 4                                                                        | Voltage V23 |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 5                                                                        | Voltage V31 |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 6                                                                        | Current I1  |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 7                                                                        | Current I2  |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 8                                                                        | Current I3  |                                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30082                                                                    | 0x52        | Run hour                       | Formula with the parameter :<br>{143 + [(Harmonic no-2) x 2]<br>+ 60 x CP}<br>Eg. {143 + [(14-2) x 2 ] + 60 x 5} = 467                                                                                                                                                                                                                                                                                                          |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30084                                                                    | 0x54        | kWh1 (Imp)                     | So, Check the 14 <sup>th</sup> Harmonic of<br>Voltage V31 at 467 address.                                                                                                                                                                                                                                                                                                                                                       |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30086                                                                    | 0x56        | kWh2 (Imp)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30088                                                                    | 0x58        | kWh3 (Imp)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30090                                                                    | 0x5A        | kWh1 (Exp)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30092                                                                    | 0x5C        | kWh2 (Exp)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30094                                                                    | 0x5E        | kWh3 (Exp)                     |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30096                                                                    | 0x60        | Total kWh (Imp)                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30098                                                                    | 0x62        | Total kWh (Exp)                |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |
| 30100                                                                    | 0x64        | kVArh1 (Imp)                   |                                                                                                                                                                                                                                                                                                                                                                                                                                 |                    |                                               |   |             |   |             |   |             |   |             |   |             |   |             |   |            |   |            |   |            |                                                                                                                                                                                  |  |

| Readable / writable parameters : [Data Structure : Integer] |             |                             |                 |                                        |                   |
|-------------------------------------------------------------|-------------|-----------------------------|-----------------|----------------------------------------|-------------------|
| Address                                                     | Hex Address | Parameter                   | Range           |                                        | Length (Register) |
| 40000                                                       | 0x00        | Password                    | Min value : 0   | Max value : 9998                       | 1                 |
| 40001                                                       | 0x01        | N/W Selection               | Value : 0       | Meaning : 3P4W                         | 1                 |
|                                                             |             |                             | Value : 1       | Meaning : 3P3W                         |                   |
|                                                             |             |                             | Value : 2       | Meaning : 1P2W-P1                      |                   |
|                                                             |             |                             | Value : 3       | Meaning : 1P2W-P2                      |                   |
|                                                             |             |                             | Value : 4       | Meaning : 1P2W-P3                      |                   |
| 40002                                                       | 0x02        | CT Secondary                | Min value : 1   | Max value : 5                          | 1                 |
| 40003                                                       | 0x03        | CT primary (CT Secondary=5) | Min value : 5   | Max value : 10000                      | 1                 |
|                                                             |             | CT primary (CT Secondary=1) | Min value : 1   | Max value : 10000                      |                   |
| 40004                                                       | 0x04        | PT Secondary                | Min value : 100 | Max value : 500                        | 1                 |
| 40005                                                       | 0x05        | PT primary                  | Min value : 100 | Max value : 500kV                      | 2                 |
| 40007                                                       | 0x07        | Slave id                    | Min value : 1   | Max value : 255                        | 1                 |
| 40008                                                       | 0x08        | Baud rate                   | Value : 0x0000  | Meaning : 300                          | 1                 |
|                                                             |             |                             | Value : 0x0001  | Meaning : 600                          |                   |
|                                                             |             |                             | Value : 0x0002  | Meaning : 1200                         |                   |
|                                                             |             |                             | Value : 0x0003  | Meaning : 2400                         |                   |
|                                                             |             |                             | Value : 0x0004  | Meaning : 4800                         |                   |
|                                                             |             |                             | Value : 0x0005  | Meaning : 9600                         |                   |
|                                                             |             |                             | Value : 0x0006  | Meaning : 19200                        |                   |
| 40009                                                       | 0x09        | Parity                      | Value : 0x0000  | Meaning : None                         | 1                 |
|                                                             |             |                             | Value : 0x0001  | Meaning : Odd                          |                   |
|                                                             |             |                             | Value : 0x0002  | Meaning : Even                         |                   |
| 40010                                                       | 0x0A        | Stop bit                    | Value : 0x0000  | Meaning : 1                            | 1                 |
|                                                             |             |                             | Value : 0x0001  | Meaning : 2                            |                   |
| 40011                                                       | 0x0B        | Backlight OFF               | Min Value : 0   | Max Value : 7200                       | 1                 |
| 40012                                                       | 0x0C        | Factory Default             | 1               | Meaning : Set to factory setting range | 1                 |
| 40013                                                       | 0x0D        | Reset Active Energy         | 1               | Meaning : Reset Total Active Energy    | 1                 |
| 40014                                                       | 0x0E        | Reset Apparent Energy       | 1               | Meaning : Reset Total Apparent Energy  | 1                 |
| 40015                                                       | 0x0F        | Reset Reactive Energy       | 1               | Meaning : Reset Total Reactive Energy  | 1                 |
| 40016                                                       | 0x10        | Auto Mode Pages             | Min Value : 1   | Max Value : 21                         | 1                 |
| 40017                                                       | 0x11        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40018                                                       | 0x12        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40019                                                       | 0x13        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40020                                                       | 0x14        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40021                                                       | 0x15        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40022                                                       | 0x16        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40023                                                       | 0x17        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40024                                                       | 0x18        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40025                                                       | 0x19        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40026                                                       | 0x1A        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40027                                                       | 0x1B        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40028                                                       | 0x1C        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40029                                                       | 0x1D        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40030                                                       | 0x1E        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40031                                                       | 0x1F        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40032                                                       | 0x20        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40033                                                       | 0x21        | Page Address Sequence       | 1-21            | Meaning : 1-First Page ; 21-Last Page  | 1                 |
| 40034                                                       | 0x22        | Demand Interval Method      | Value : 0x0000  | Meaning : Sliding                      | 1                 |
|                                                             |             |                             | Value : 0x0001  | Meaning : Fixed                        |                   |
| 40035                                                       | 0x23        | Demand Interval Duration    | Min Value : 1   | Max Value : 30                         | 1                 |
| 40036                                                       | 0x24        | Demand Interval Length      | Min Value : 1   | Max Value : 30                         | 1                 |

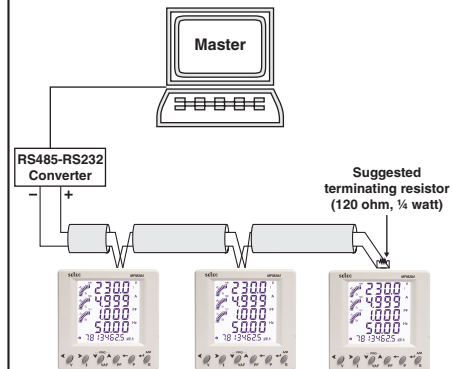
# MODBUS REGISTER ADDRESSES LIST

Readable / writable parameters : [Data Structure : Integer]

MODBUS register addresses list continued...

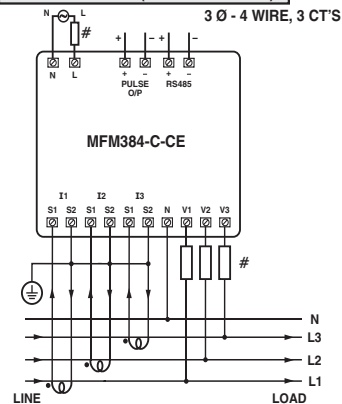
| Address | Hex Address | Parameter                    | Value :              | Range                                                                                            | Length (Register) |
|---------|-------------|------------------------------|----------------------|--------------------------------------------------------------------------------------------------|-------------------|
| 40037   | 0x25        | Reset Max.Active Power DMD   | Value : 1            | Meaning : Reset Max.Active power DMD                                                             | 1                 |
| 40038   | 0x26        | Reset Min.Active Power DMD   | Value : 1            | Meaning : Reset Min.Active power DMD                                                             | 1                 |
| 40044   | 0x27        | Reset Max.Reactive Power DMD | Value : 1            | Meaning : Reset Max.Reactive power DMD                                                           | 1                 |
| 40040   | 0x2C        | Reset Min.Reactive Power DMD | Value : 1            | Meaning : Reset Max.Apparent Power DMD                                                           | 1                 |
| 40041   | 0x29        | Reset Max.Apparent Power DMD | Value : 1            | Meaning : Reset Run Hour                                                                         | 1                 |
| 40042   | 0x2A        | Reset Run Hour               | Value : 1            | Meaning : Reset Auxiliary Interrupt                                                              | 1                 |
| 40043   | 0x2B        | Reset Auxiliary Interrupt    | Value : 1            | Meaning : Reset Min. Reactive power DMD                                                          | 1                 |
| 40054   | 0x36        | Page Address Sequence        | 1-21                 | 1-First Page ; 21-Last Page                                                                      | 1                 |
| 40055   | 0x37        | Page Address Sequence        | 1-21                 | 1-First Page ; 21-Last Page                                                                      | 1                 |
| 40057   | 0x39        | Pulse Duration               | Min Value : 0.1(sec) | Max Value : 2.0(sec)                                                                             | 1                 |
| 40058   | 0x3A        | Pulse Weight                 | Min Value : 0.01     | Max Value : 99.99                                                                                | 1                 |
| 40059   | 0x3B        | Page Address Sequence        | 1-21                 | 1-First Page ; 21-Last Page                                                                      | 1                 |
| 40060   | 0x3C        | Page Address Sequence        | 1-21                 | 1-First Page ; 21-Last Page                                                                      | 1                 |
| 40064   | 0x40        | Reset Max Current            | Value : 1            | Meaning : Reset Max Current                                                                      | 1                 |
| 40070   | 0x46        | Change Endianness.           | Value : 0 or 1       | Meaning : 0 : Mid Little Endian (CDAB)<br>1 : Big Endian (ABCD)<br>Default Setting : Big Endian. | 1                 |

## CONNECTION DIAGRAM FOR COMMUNICATION



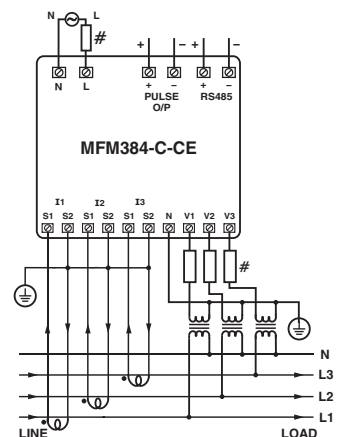
Contact sales for PC based monitoring software to communicate with the meters.

## 3 PHASE 4-WIRE (COMMONLY USED)

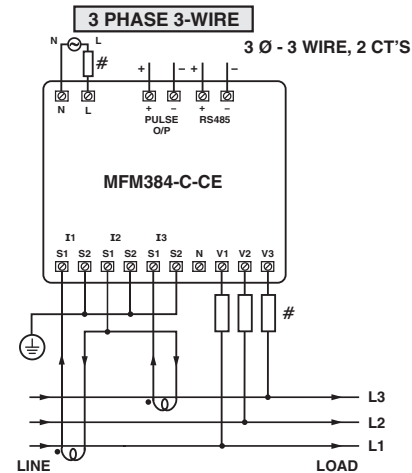
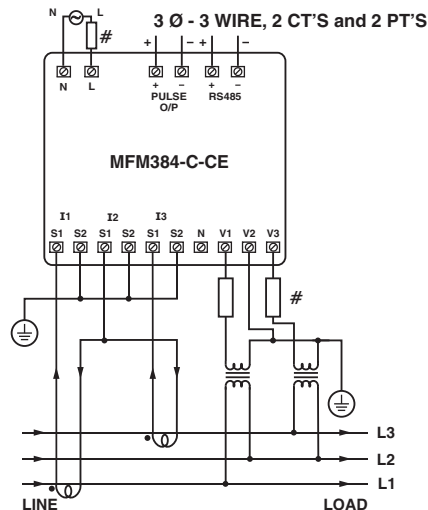


## 3 PHASE - 4 WIRE

3 Ø - 4 WIRE, 3 CT'S and 3 PT'S

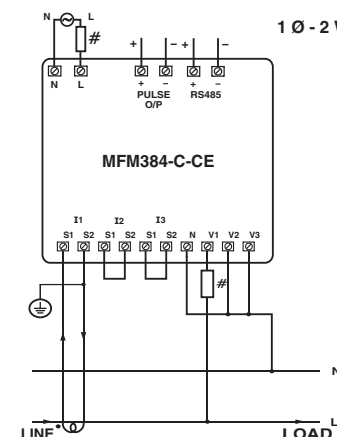


## TYPICAL WIRING DIAGRAM



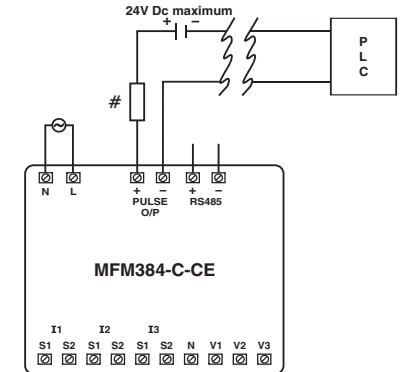
## 1 PHASE - 2 WIRE

1 Ø - 2 WIRE, 1 CT



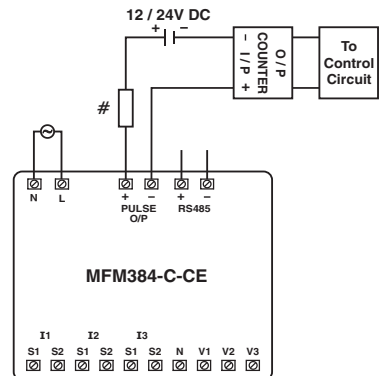
## APPLICATION OF PULSE OUTPUT

### ● PROCESS INTEGRATION



Pulse output from MFM384-C-CE meter can be interfaced into a process through a PLC for on line control of energy content in the process. If the PLC has a self excited digital input, external DC supply is not needed. The kWh pulse is also used to derive average kWh

### ● ENERGY CONTROLLER



Pulse output from MFM384-C-CE meter can be used as alarm generator or total energy controller by interfacing it with Pre-settable counter and control circuits (Contactors, Relay, Trip Circuit).

The counter is loaded with the maximum energy consumption. When count reaches setpoint it provides output to control circuit to take appropriate action.

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

(Specifications are subject to change, since development is a continuous process.)

## Selec Controls Pvt. Ltd.

### Factory Address :

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