Technical Specifications:

- Nominal Voltage Ranges:
  - 120V to 480V, 2-wire, Single-phase, One Line & Neutral
  - 120V to 480V, 3-wire, Single-phase, 2 Lines & Neutral
  - 120V to 415V, 3-wire, 3-phase, 3 Lines, No Neutral
  - 120V to 480V, 4-wire, 3-phase, 3 Lines and Neutral


- The equipment is protected throughout by double insulation as indicated by this symbol: ⊙

- Accuracy Class 0.5

- Rated Frequency: 50Hz/60Hz

- Black CT wire connects to Port 1 on the Omnimeter. White CT wire connects to Port 2.

Safety Precautions:

- Meter should be installed by a qualified electrician.

- Turn off all power supplying the equipment before preforming any wiring. Use a properly rated volt meter to confirm power is off.

- Use of this device inconsistent with this manual can cause permanent damage to the unit and/or serious harm to the operator.

Tools/Materials List:

- Volt meter
- Small standard screwdriver
- Wire stripper
- DIN-Rail
- 16-22 AWG stranded copper wire
- Inline fuse holder with maximum 1Amp fuse (recommended)
- Enclosure (with appropriately rated conduit and fittings) is required if meter will be installed outdoors

Installation Instructions

For All Systems:

1. Disconnect or switch power off before attempting to install, connect, disconnect or service the meter or the external current transformers (CTs). ALL POWER MUST BE DISCONNECTED!

2. Mount the meter using 35mm DIN Rail in a protected indoor location. If installing outdoors, a watertight enclosure is required.

3. IMPORTANT: Distinguish and then identify the Neutral and the Line(s) ('hot' wire(s), usually black or red). Label the Neutral and then,

4. Tightening torque of terminals:
   - All terminals: 4.4 in-lb. (0.5 Nm)

120V, 2-Wire, Single Phase:

1. Label Line 1 as L1.

2. Fit CT1 around L1. Make sure the arrow is facing towards the load (in the direction of flow). (Fig 2)

3. Black CT wire connects to Port 1 on the Omnimeter. White CT wire connects to Port 2. (Fig 2)

With split core CTs, close the CT around the wire to be measured and press firmly until you feel and hear it click to indicate full closure. The buttons should be fully out. Use a zip tie to ensure the CTs remain securely closed.

5. To power the meter and get a voltage reference: Use a maximum 1.0 Amp inline fuse on L1. Connect one fuse holder pigtail to the breaker, lug or an appropriate line-tap device, and connect the other pigtail to 16-22 AWG stranded copper wire for connection to the meter.

6. L1 connects to Port 7 on the Omnimeter, Neutral to Port 10. (Fig 2)

7. Once the meter is properly mounted to the DIN Rail or enclosure and all wiring is completed, with terminal block covers installed, power can be turned back on.

8. Meter will then begin cycling through meter values. For details go to: http://documents.ekmmetering.com/EKM_Metering_LCD_Display_Value_Reading.pdf

9. A video of proper install of a 120V system can be found here: http://www.youtube.com/watch?v=ky9sgrLTMrk

120/240V, 120/208V, Single Phase, 3-Wire:

1. Label L1 and L2. (Arbitrarily assign labels.)

2. You will be using 2 CTs for this install. Label them CT1 and CT2.

3. Fit CT1 around L1. Make sure the arrow is facing towards the load (in the direction of flow).

4. Fit CT2 around L2.
5. Black wire from CT1 connects to Port 1 on the Omnimeter. White wire from CT1 connects to Port 2. (Fig 3)
6. Black wire from CT2 connects to Port 3. White wire from CT2 connects to Port 4. (Fig 3)
7. With split core CTs, close the CT around the wire to be measured and press firmly until you feel and hear it click to indicate full closure. The buttons should be fully out. Use a zip tieto ensure the CTs remain securely closed.
8. To power the meter and get a voltage reference: Use a maximum 1 Amp inline fuse on L1 and L2. Connect one fuse holder pigtail to the breaker, lug or an appropriate line-tap device, connect the other pigtail to 16-22 AWG stranded copper wire.
9. Tap into L1 at the breaker panel, with small stranded copper wire. This L1 tap connects to Port 7 on the Omnimeter. (Fig 3)
10. Tap into L2 at the breaker panel with small stranded copper wire. This L2 tap connects to Port 8 on the Omnimeter. (Fig 3)
11. Neutral connects to Port 10.
12. Once the meter is properly mounted to the DIN Rail or enclosure and all wiring is completed, with terminal block covers installed, power can be turned back on.
13. Meter will then begin cycling through meter values. For details go to: http://documents.ekmmetering.com/EKM_Metering_LCD_Display_Value_Reading.pdf
14. A video of a proper install of a 120V-240V system can be found here: http://www.youtube.com/watch?v=ky9sgr1LTMk

120V-415V, 3-Phase, 3-Wire:
1. Label L1, L2 and L3. (Arbitrarily assign labels.)
2. You will be using 3 CTs for this install. Label them CT1 and CT3.
3. Fit CT1 around L1. Make sure the arrow is facing towards the load.
4. Fit CT3 around L3.
5. Black wire from CT1 connects to Port 1 on the Omnimeter. White wire from CT1 connects to Port 2. (Fig 4)
6. Black wire from CT3 connects to Port 5 on the Omnimeter. White wire from CT3 connects to Port 6. (Fig 4)
7. With split core CTs, close the CT around the wire to be measured and press firmly until you feel and hear it click to indicate full closure. The buttons should be fully out. Use a zip tieto ensure the CTs remain securely closed.
8. To protect the meter, use a maximum 1.0 Amp inline fuse on each line.
9. To power the meter and get a voltage reference: Tap into L1 at the breaker panel. Connect one fuse holder pigtail to the breaker, lug or an appropriate line-tap device, and connect the other pigtail to 16-22 AWG stranded copper wire for connection to the meter. This L1 tap connects to Port 7 on the Omnimeter. Tap into L2 and L3 and repeat the connection process. L2 tap connects to Port 8. Be sure to add a jumper to Port 10. (Fig 4) L3 tap connects to Port 9.
10. Once the meter is properly mounted to the DIN Rail or enclosure and all wiring is completed, with terminal block covers installed, power can be turned back on.
11. Meter will then begin cycling through meter values. For details go to: http://documents.ekmmetering.com/EKM_Metering_LCD_Display_Value_Reading.pdf
12. A video of a proper install of a 120V-208V, 3-Phase, 4-Wire system can be found here: http://www.youtube.com/watch?v=ky9sgr1LTMk

120V-480V, 3-Phase, 4-Wire:
1. Label L1, L2 and L3. (Arbitrarily assign labels.)
2. You will be using 3 CTs for this install. Label them CT1, CT2 and CT3.
3. Fit CT1 around L1. Make sure the arrow is facing towards the load (in the direction of flow).
4. Fit CT2 around L2.
5. Fit CT3 around L3.
6. Black wire from CT1 connects to Port 1 on the Omnimeter. White wire from CT1 connects to Port 2. (Fig 5)
7. Black wire from CT2 connects to Port 3 on the Omnimeter. White wire from CT2 connects to Port 4. (Fig 5)
8. Black wire from CT3 connects to Port 5 on the Omnimeter. White wire from CT3 connects to Port 6. (Fig 5)
9. With split core CTs, close the CT around the wire to be measured and press firmly until you feel and hear it click to indicate full closure. The buttons should be fully out. Use a zip tieto ensure the CTs remain securely closed.
10. Use a max 1.0 Amp inline fuse on each line to protect the meter.
11. To power the meter and get a voltage reference: Tap into L1 at the breaker panel. Connect one fuse holder pigtail to the breaker, lug or an appropriate line-tap device, and connect the other pigtail to 16-22 AWG stranded copper wire for connection to the meter. L1 connects to Port 7. Tap into L2 and L3 and repeat the connection process. L2 connects to Port 8. L3 connects to Port 9. Neutral connects to Port 10. (Fig 5)
12. Once the meter is properly mounted to the DIN Rail or enclosure and all wiring is completed, with terminal block covers installed, power can be turned back on.
13. Meter will then begin cycling through meter values. For details go to: http://documents.ekmmetering.com/EKM_Metering_LCD_Display_Value_Reading.pdf
14. A video of a proper install of a 120V-208V, 3-Phase, 4-Wire system can be found here: http://www.youtube.com/watch?v=ky9sgr1LTMk

120-~415V Line to Line

120V-240V
120/208V

Single-Phase
3-Wire
Load

Fuse
CT1
CT2
CT3

Blk   Wht

1 2 3 4 5 6 7 8 9 10

3-Phase
3-Wire
Load

Fuse
CT1
CT2
CT3

Blk   Wht

1 2 3 4 5 6 7 8 9 10

120-~480V Line to Line

120-~480V

3-Phase
4-Wire
Load

Fuse
CT1
CT2
CT3

Blk   Wht

1 2 3 4 5 6 7 8 9 10

RS-485 and Pulse Output:

• Terminal 20 (A) connects to RS-485+ or T+ on the RS-485 network.
• Terminal 21 (B) connects to RS-485- or T-. (Fig 8) Terminal 22 (G) is used for the RS-485 network (signal) ground if needed. Observe proper RS-485 network topology. Twisted pair wiring is recommended. Shielded twisted pair may be beneficial in electrically noisy environments or for very long runs. RS-485 supports up to 256 devices on up to 4000 feet wire. Terminating resistors may be helpful.
• Terminals 15 and 16 are for pulse output. (Fig 8) Pulse rate: 800 Impulse/kWh. Polarity sensitive. Maximum 27VDC, 27mA.
• Red LED on the meter face flashes 800 times/kWh. 1 flash = 1.25Wh.
Pulse Output:

Like all of our meters, the Omnimeter Pulse v.4 has a Pulse Output. The Pulse Output 1 pulses at a rate of 800 pulses per kilowatt hour when set to 200 amp current transformers. This is the same rate that the red LED flashes on the meter face – 800 times/kWh. It also has a Settable Pulse Output (S02). The Programmable Pulse output can be set in software to pulse anywhere from 1 pulse per kWh to 800 pulses per kWh (limits are dependent on CT ratio). These are unpowered electronic dry contact pulses that can be counted by standard electronic pulse counters. Pulse counters can be located up to 200 feet away from the Omnimeter Pulse v.4. Connect Pulse Counter to port 16 and port 14 (ground) for the Fixed Pulse Output (this pulses at the same rate as the red pulse output LED on the face of the meter) or port 15 and port 14 (ground) for the Settable Pulse Output. Pulse Width 90ms, Polarity Sensitive, max 27VDC, max 27mA. (Fig 8)

<table>
<thead>
<tr>
<th>CT Ratio</th>
<th>Impulse Constant</th>
<th>Settable impulse range</th>
</tr>
</thead>
<tbody>
<tr>
<td>100/26.6</td>
<td>1600</td>
<td>1600, 800, 400, 320, 200, 160, 100, 80, 64, 50, 40, 32, 25, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>200/26.6</td>
<td>800</td>
<td>800, 400, 200, 160, 100, 80, 50, 40, 32, 25, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>400/26.6</td>
<td>400</td>
<td>400, 200, 100, 80, 50, 40, 25, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>800/26.6</td>
<td>200</td>
<td>200, 100, 50, 40, 25, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>1000/26.6</td>
<td>160</td>
<td>160, 80, 40, 32, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>2000/26.6</td>
<td>80</td>
<td>80, 40, 20, 16, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>4000/26.6</td>
<td>40</td>
<td>40, 20, 10, 8, 5, 4, 2, 1</td>
</tr>
<tr>
<td>5000/26.6</td>
<td>32</td>
<td>32, 16, 8, 4, 2, 1</td>
</tr>
</tbody>
</table>

(Fig 6)

Pulse Input:
The Omnimeter Pulse v.4 can also count the pulses from up to 3 different pulse output devices. These could be pulses from our Pulse Output Water and Gas Meters or from any other unpowered dry contact pulse output device. Pulse Input ratios can be set in software from 1 to 9999 pulses per increment. The state of the 3 Inputs can also be polled in software, the Omnimeter Pulse v.4 will return a High or Low state for each pin in real-time (use this for sensing switch states, open or closed doors, etc). Connect Pulse Generator or Switching Sensor to each of the 3 Pulse Inputs. Connect all grounds to port 14 and each of up to 3 Pulse Generators to ports 11, 12, or 13. By default, the pulse input ratio of the Omnimeter v.4 is now set 1:1. So for every 1 pulse sent to the Omnimeter v.4 from a pulse output device, the Omnimeter will increment 1. This ratio can be changed using the EKM Dash software. (Fig 8)

Relay Control:
The Omnimeter Pulse v.4 comes with 2 controllable relay outputs. These can be controlled via software. You can set the outputs to be high or low to drive an external relay. The outputs are both 50 mA at 12 volts DC. Control lights, motors, etc by controlling relays. The Relay Control Outputs can also be set to go on or off from 1 to 9999 seconds. The realtime state of the outputs can also be polled via software, such as our EKM Dash. The outputs can also be used to power an external device (Wireless 485Bee Module, sensors, etc). Connect 12VDC (50mA max) relays, LED indicators, or buzzers to port 17 (ground) and port 19 for Output1 or port 17 (ground) and port 18 for Output2. (Fig 8)

Working Principle:
When the meter is working, the energy consumed by the user is transformed into voltage and current signals, which are sampled by sample circuits. A pulse signal is then produced by a specialized IC. The Pulse signal is directly proportional to power consumption. The MCU records and stores the corresponding energy use. The LCD screen displays the energy use. Recorded information and data can be transferred using the RS485 interface.

Data:
The LCD display shows 42 pieces of data. Every five seconds the LCD screen will display a new piece of data. The meter also provides max demand(kW) data and the demand period can be set to one of three intervals: 15minutes, 30 minutes, or 60 minutes. The max demand can be reset to zero in software over RS485. The meter has four time-of-use tariffs(T1, T2, T3, T4) to calculate the power during different time periods, and it can set up to four time periods per day, and specify the number of the tariff for that period(from T1 to T4). The meter time can be set using the RS485 interface. By design the main kWh registers 01 and 02 cannot be reset, though registers 39 and 40 can be reset. See Fig 6 below for a list of all 42 data values.

Transport and Handling:
The meter should be handled with care, as there are precision components inside that could break and/or cause faulty readings should the meter become damaged. The process of transportation, handling, and installation should be done according to the transportation and storage rule of GB/T15464-1995. Keep the meter in the original packaging when stored. The storage temperature range should be 0–40°C. The relative humidity should be <85%. There should be no toxic chemicals present and no corrosive substances or gases in the air. The meters should be stacked on a platform no more than ten units high.

Warranty:
Within two years from the date of sale, and on the condition that the user abide by the specifications and installation instructions listed here, and the sealing is kept completely intact. If the meter does not correspond with the rule of the enterprise standard, the meter shall be repaired free or replaced.
Data:
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<table>
<thead>
<tr>
<th>#</th>
<th>LCD Display Data</th>
<th>#</th>
<th>LCD Display Data</th>
<th>#</th>
<th>LCD Display Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>Total kWh</td>
<td>15</td>
<td>Cosθ L3</td>
<td>29</td>
<td>Pulse Count 1</td>
</tr>
<tr>
<td>02</td>
<td>Reverse kWh</td>
<td>16</td>
<td>T1 kWh (Time of Use 1)</td>
<td>30</td>
<td>Pulse Count 2</td>
</tr>
<tr>
<td>03</td>
<td>Volts L1 (Line 1)</td>
<td>17</td>
<td>T2 kWh</td>
<td>31</td>
<td>Pulse Count 3</td>
</tr>
<tr>
<td>04</td>
<td>Volts L2</td>
<td>18</td>
<td>T3 kWh</td>
<td>32</td>
<td>kWh on L1 (Line 1)</td>
</tr>
<tr>
<td>05</td>
<td>Volts L3</td>
<td>19</td>
<td>T4 kWh</td>
<td>33</td>
<td>Reverse kWh on L1</td>
</tr>
<tr>
<td>06</td>
<td>Amps L1</td>
<td>20</td>
<td>Reverse T1 kWh</td>
<td>34</td>
<td>kWh on L2</td>
</tr>
<tr>
<td>07</td>
<td>Amps L2</td>
<td>21</td>
<td>Reverse T2 kWh</td>
<td>35</td>
<td>Reverse kWh on L2</td>
</tr>
<tr>
<td>08</td>
<td>Amps L3</td>
<td>22</td>
<td>Reverse T3 kWh</td>
<td>36</td>
<td>kWh on L3</td>
</tr>
<tr>
<td>09</td>
<td>Watts L1</td>
<td>23</td>
<td>Reverse T4 kWh</td>
<td>37</td>
<td>Reverse kWh on L3</td>
</tr>
<tr>
<td>10</td>
<td>Watts L2</td>
<td>24</td>
<td>VARs L1 (Reactive)</td>
<td>38</td>
<td>Total KVARh (Reactive Total kWh)</td>
</tr>
<tr>
<td>11</td>
<td>Watts L3</td>
<td>25</td>
<td>VARs L2</td>
<td>39</td>
<td>Resettable kWh</td>
</tr>
<tr>
<td>12</td>
<td>Watts Total</td>
<td>26</td>
<td>VARs L3</td>
<td>40</td>
<td>Resettable Reverse kWh</td>
</tr>
<tr>
<td>13</td>
<td>Cosθ L1 (Power Factor)</td>
<td>27</td>
<td>VARs Total</td>
<td>41</td>
<td>3 Inputs High/Low</td>
</tr>
<tr>
<td>14</td>
<td>Cosθ L2</td>
<td>28</td>
<td>Frequency (Hz)</td>
<td>42</td>
<td>Maximum Demand</td>
</tr>
</tbody>
</table>

(Fig 7)

Terminal Block Layout:

(Fig 8)

(Fig 9)