

WEM-MX-333mV

Integrated Meter Installation Guidelines

Energy Tracking, LLC

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Integrated Meter Enclosure – Figure 1.

Enclosure Mounting:

The Integrated Meter Enclosure (IME) is a UL approved IP 45 external enclosure that can be mounted indoors or outdoors. This publication provides installation guidelines for mounting it on various surfaces. This enclosure has 4 mounting holes to mount the enclosure.

The external enclosure incorporated with the WEM-MX 333mV meter enclosure, circuit breaker and power supply weighs 5 lbs. The mounting of the enclosure must be done on an even flat surface.

Note: Failure to wear safety glasses with side shields can result in serious personal injury. Always wear ANSI compliant eye protection.

Mounting to Brick, Block or Concrete:

1. Use concrete anchors $\frac{1}{4}$ " (diameter) X 1- $\frac{3}{4}$ " (length). These are commonly available in from local hardware distributors such as Lowes or Home Depot. We recommend the **Buildex Tapcon™** concrete anchors which are corrosion resistant or use similar in capability and performance.
2. Drill a hole using a hammer drill 3/16" drill bit to 1- $\frac{3}{4}$ " in depth.
3. Drive the anchor nut using the hammer drill with nut driver until fully seated for all four mounting locations as shown below in Figure 2 & 3.

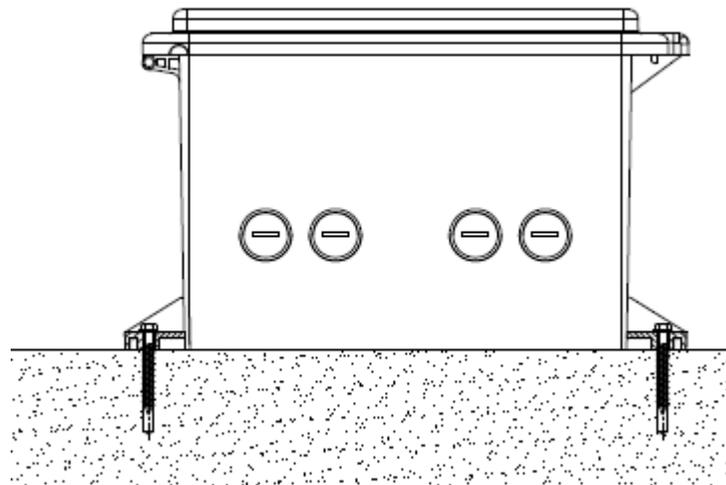


Figure 2 – Bottom View

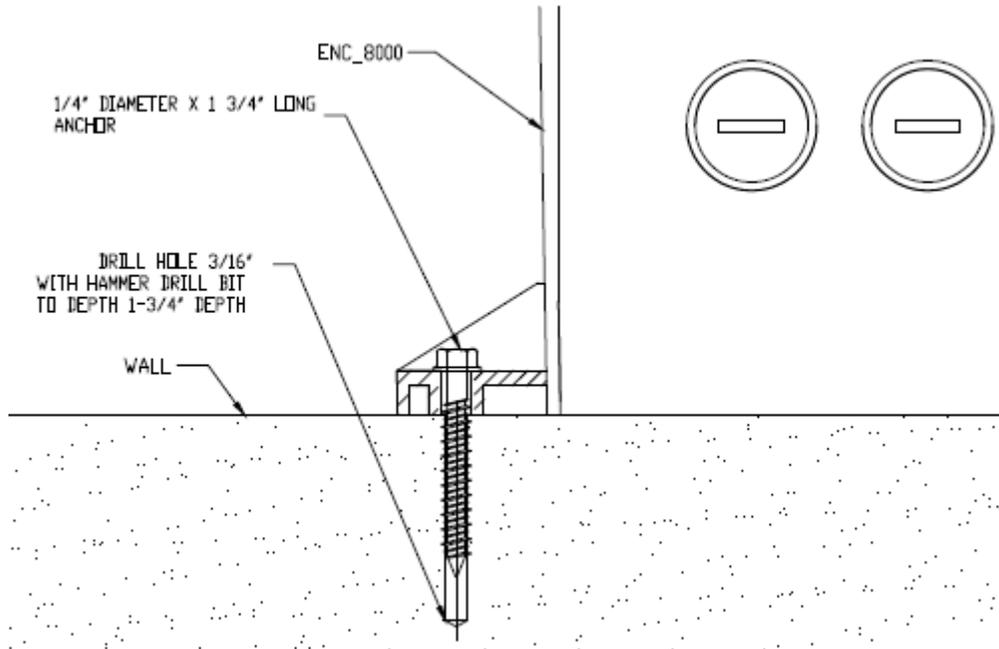


Figure 3 – Bottom View



Figure 4 – WEM-MX 333mV meter

IMPORTANT: If you have not purchased an external enclosure from Energy Tracking then the meter must be installed in a UL Listed UL50 enclosure.

Mounting Screws: Please use #6 X 1/2" self-tapping screws. Phillips/Pan Head/ Type A / 18-8 Stainless Steel.

Internal Enclosure Dimensions: 7.0" (L) X 4.0" (W) X 2.3" (H).

Integrated Meter Enclosure Dimensions: 12.1" (L) X 7.0" (W) X 7.4" (H).

Environment: -20 deg C to +60 deg C.

High Voltage Wiring Type:

Meter Wiring:

Recommended hookup wire is 16 to 22 AWG Stranded.

Voltage Rating: 600V.

Wire Type: Teflon, THHN, THWN, MTW, TFF, TWN75 or T90 Nylon.

Max Temperature Rating: 105 deg C.

Receptacle Wiring:

Recommended hookup wire is 14 AWG Stranded.

Voltage Rating: 600V.

Wire Type: THHN, MTW.

Max Temperature Rating: 90 deg C.

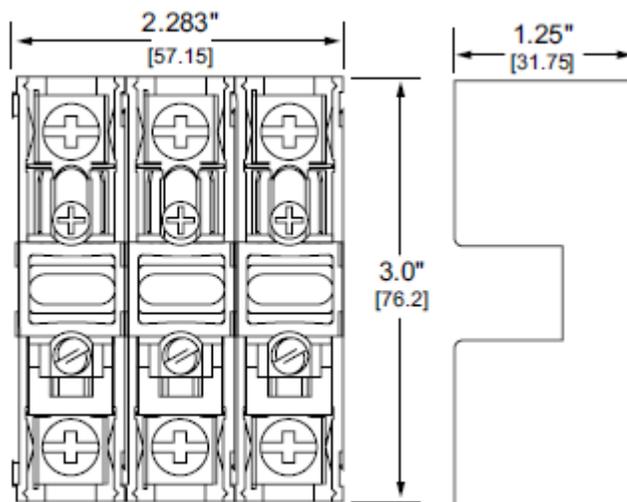
A 15 Amp circuit breaker shall be provided on the power outlet circuit as part of the building installation.

High Voltage Fusing Options:

Fuse Holder and Fuse Details for up to 600 VAC:

The recommended fuse holder is: Littelfuse.

AMP RATING	POLES	CLASS CC ORDERING NUMBER		MIDGET ORDERING NUMBER		CONNECTOR TYPE	TORQUE	WIRE RANGE	WIRE TYPE	BASE TEMP	COVER ORDERING NUMBER**
		NON-DIN*	DINR	NON-DIN*	DINR						
30	1	L60030C1SQ	L60030C1SQDINR	L60030M1SQ	L60030M1SQDINR	Screw w/Q.C. Terminal	2.3 N-m (20 in-lbs)	10-14 AWG	CU Solid / Stranded	125°C	SPL001
	2	L60030C2SQ	L60030C2SQDINR	L60030M2SQ	L60030M2SQDINR						
	3	L60030C3SQ	L60030C3SQDINR	L60030M3SQ	L60030M3SQDINR						



The recommended fuses: Manufacturer – Littelfuse Model KLK (midget fuse 600 VAC, 1 Amp).

Circuit Breaker Option for up to 480 VAC:

Instead of a fuse block, you may use a UL registered circuit breaker as shown above for input voltages up to **480 VAC**.

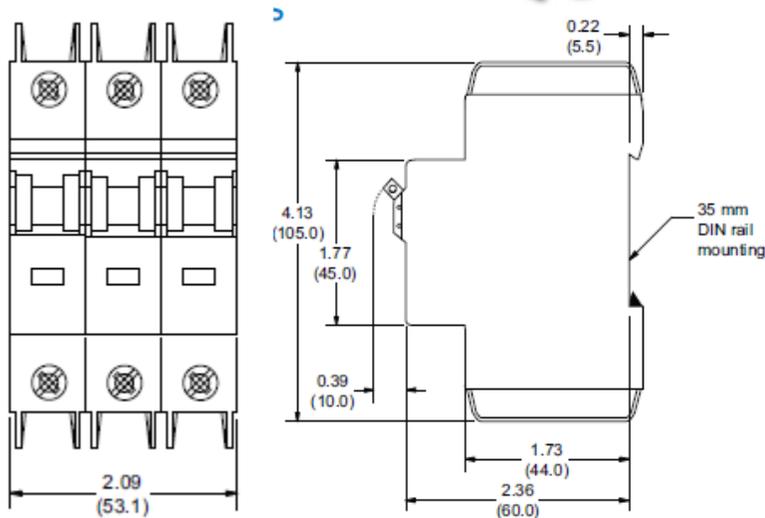


Figure 5

Wiring Diagram and Instructions:

To enable proper power and energy measurement, a meter needs to have connections to the voltage and current inputs for each phase. It appears to seem quite simple but, on the practical level this does not appear to be so. Therefore, the purpose of this document is to help ensure that proper connections to the metering equipment are done.

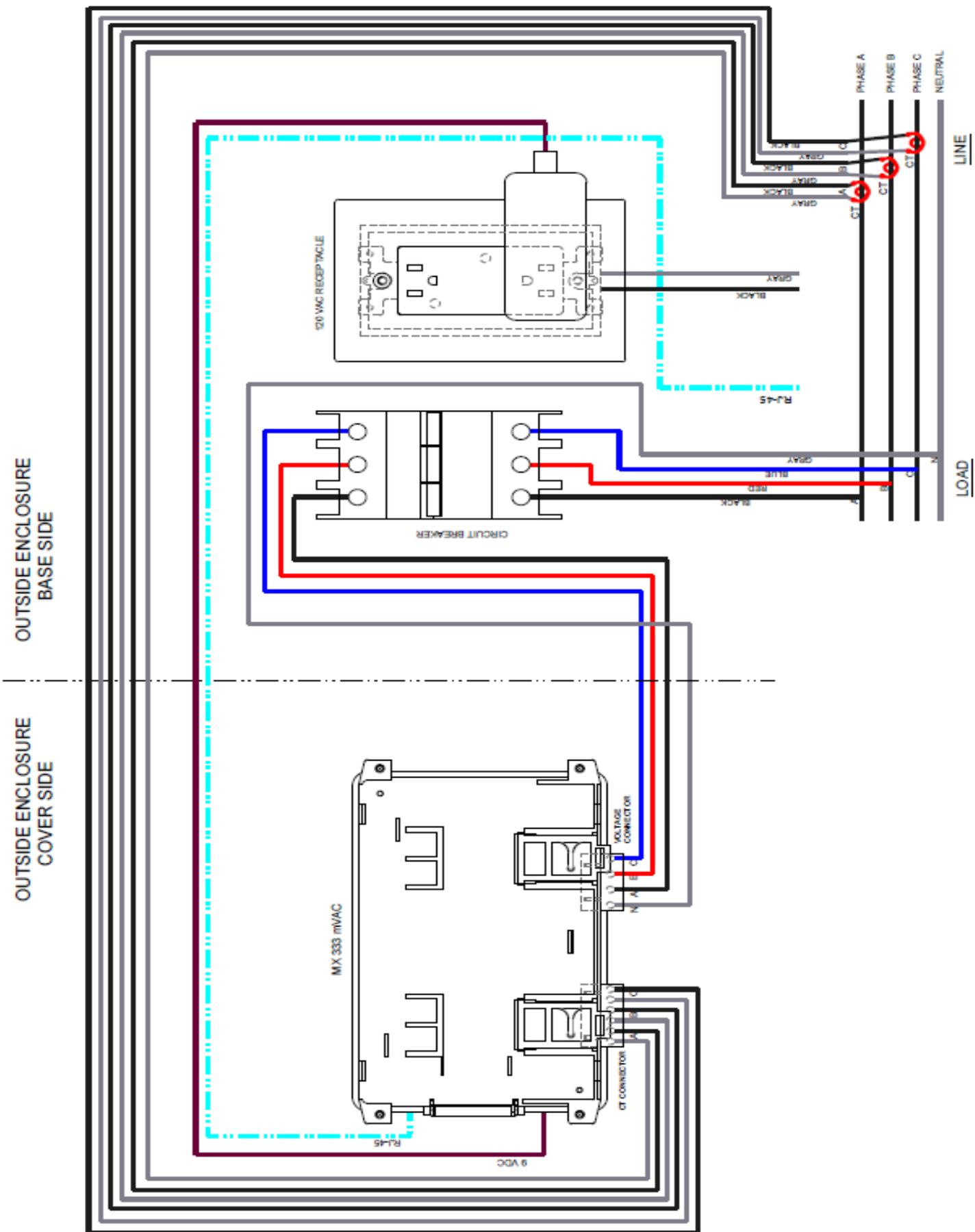


Figure 6

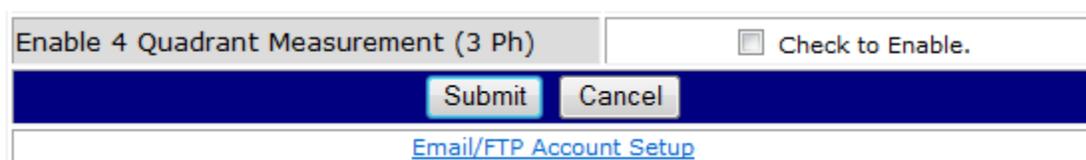
Common Mistakes:

The following are the most common mistakes done during installation of a meter and associated current measurement transformers (CTs) inputs.

- a. The voltage connections for the respective phases A, B & C (L1, L2, & L3) must match the voltage designated inputs to the meter. Each phase must be confirmed to ensure it matches the voltage measurement input to the meter.
- b. The current transformer connections for the respective phases A, B & C must match the associated voltage phases to the meter. i.e.; Phase 'A' CT must be routed through the phase 'A' voltage conductor. Each phase must be confirmed to ensure it matches the current measurement input to the meter.
- c. The current transformer(s) need to be oriented properly. Each current transformer will have either an arrow or orientation of the output secondary leads (X2, X1) that should point towards the load. No damage will occur to the meter if incorrectly installed. The power factor for each phase will be displayed as a negative value indicating power flow in the opposite direction. See note below in (d). To correct, flip the current transformer(s) until all phases report positive power factors.
- d. Note: From an electric utility's perspective energy "delivered" or "imported" is energy flow from the grid to the load / building. Energy "received" or "exported" is flow of energy from the load / building to the grid which can occur when metering a solar power plant or onsite generator. When installing a "NET" meter where energy flows in both directions need to be recorded, you must enable the 4 quadrant logging in the meter.

Click on '[Setup >> Schedule Reporting & Setup](#)'.

Enable the checkbox and click the "**Submit**" button.

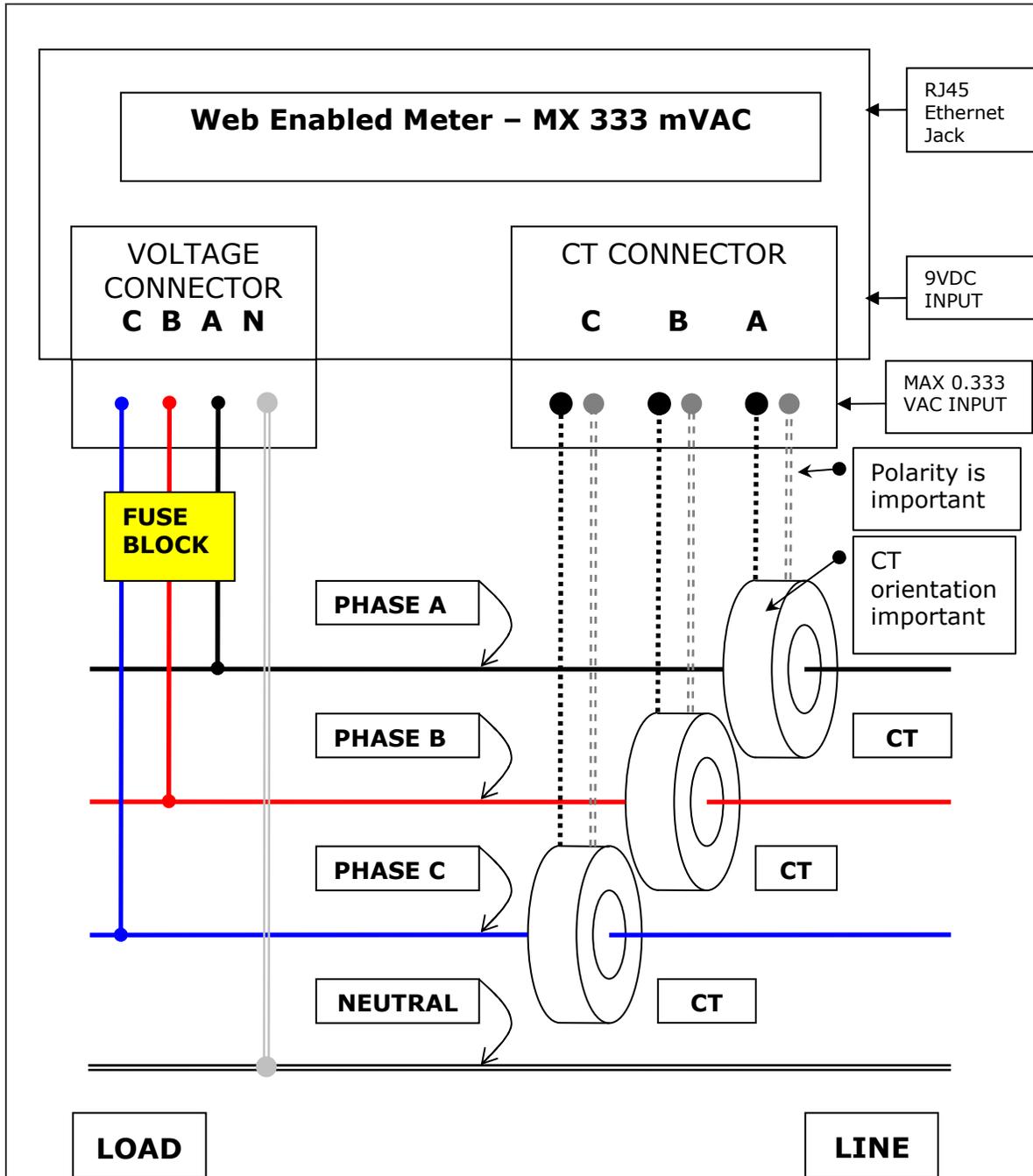


The screenshot shows a web form with a title bar that reads "Enable 4 Quadrant Measurement (3 Ph)". To the right of the title bar is a checkbox labeled "Check to Enable." Below the title bar is a dark blue bar containing two buttons: "Submit" and "Cancel". At the bottom of the form is a link labeled "Email/FTP Account Setup".

Figure 7

Wiring Diagram:

Three Phase – 4 Wire WYE Connection WEM-MX 333mV:



Check for CT label 'THIS SIDE TOWARDS SOURCE' on the CT always faces the LINE.

Figure 8

Powering the WEM-MX Meter:

The WEM-MX is supplied by a 110 VAC to 9 VDC power supply. Before applying power to the meter, connect the WEM-MX's RJ-45 network jack to the router.

Note: The router **must** be connected to the Internet so that it can get the latest time from the time servers on the Internet via SNTP.

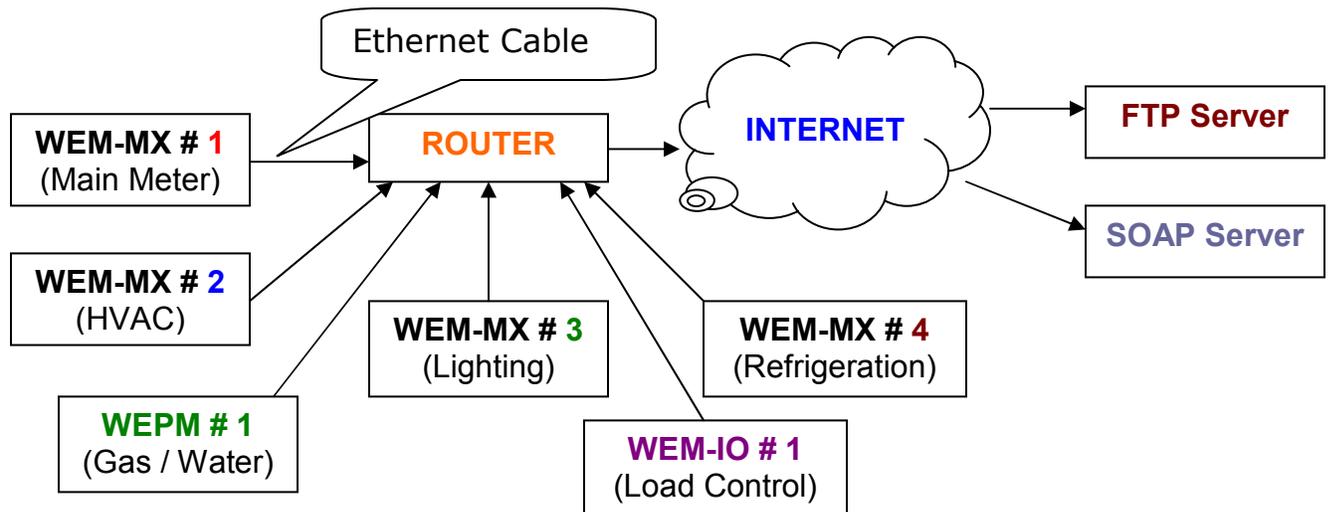


Figure 9

Note: Default operation of ALL devices is DHCP. It will get a leased IP Address from the DHCP Server. Then it will access the Internet to update its time. You may request the factory to provide preconfigured meter(s) with a static IP address, subnet and gateway.

Accessing the WEM-MX 333mV Meter:

You may have purchased a WEM-MX meter without a display. Hence, you need to know the IP Address to Log-In to the meter.

You MUST use Microsoft Internet Explorer™ Web Browser.

Download and install the 'Discover IP' software application from Energy Tracking's web site. You can find this application by clicking on the 'Download' link. This application will help identify the meter's IP Address so you can connect to it from your Internet Browser.

<http://www.energytracking.com/download.htm>

This application will provide minute-by-minute updates.

Please refer to the WEM-MX 333mV manual for more details.

After installation, launch the application go to 'Menu >> Debug'.

Click the lower button that says 'Start'. You will see data appear within 1~2 minutes.

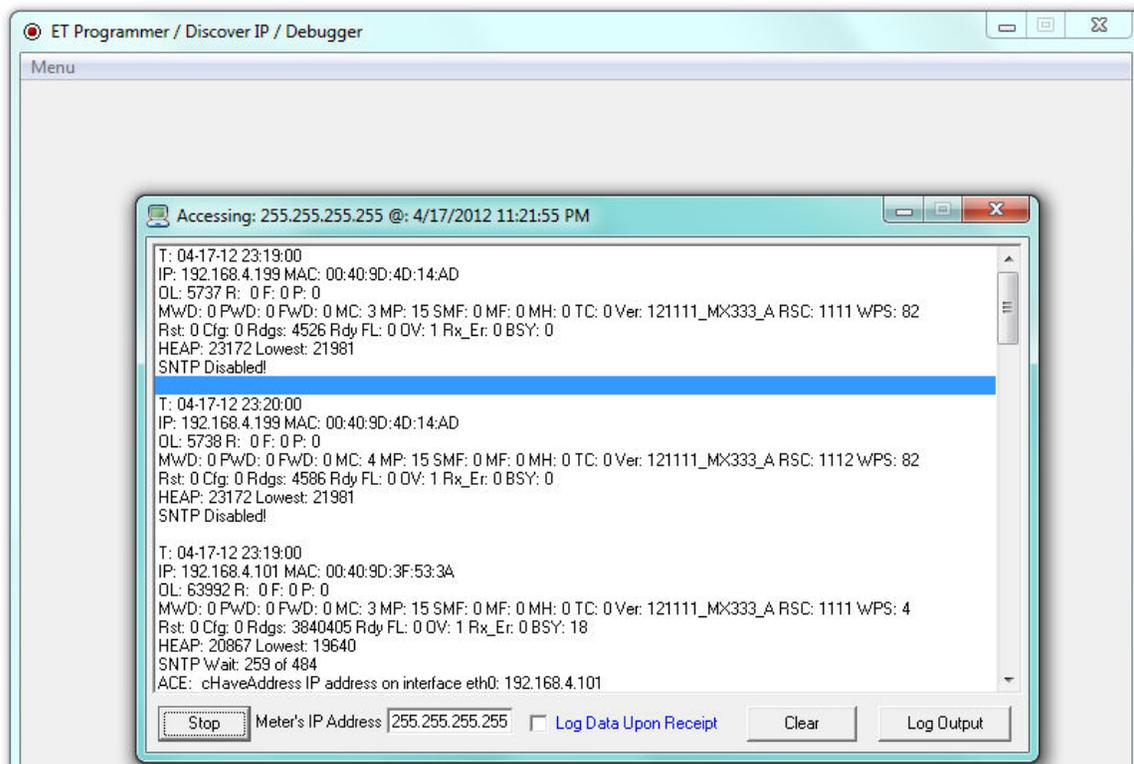


Figure 10

Once the IP Address is identified, log-in to the meter using an Internet Browser MS Internet Explorer. Note: You must use MS IE™

Log-In to the Meter:

<http://xxx.xxx.xxx.xxx>

Energy Tracking

Web Enabled Meter (WEM-MX 333mV)

[Log-In](#)

Figure 11

You should see the page shown above. Click on the 'Log-In' link and an authentication pop-up dialog will appear.



Figure 12

User Name: eM200
Password: PW

Enter the default values above (case sensitive).

Post Log In:

Upon a successful log-in, you will see a menu to the left.

- [Home](#)
- [Real Time Data 1](#)
- [Real Time Data 2](#)
- [Load Profile 24 Hrs.](#)
- [Load Profile Flash](#)
- [Current Month](#)
- [Last Month](#)
- [SOAP Service](#)
- [Setup](#)

Figure 13

Click on '**Real Time Data 1**':

With no voltage or current inputs connected, you should see:

Energy Tracking - WEMM			
Phase	VOLTAGE	CURRENT	POWER FACTOR
PH_A:	0.000	0.000	1.000
PH_B:	0.000	0.000	1.000
PH_C:	0.000	0.000	1.000

Figure 14

With voltage and current applied, you should see.

Energy Tracking: WEM-MX 333mV			
Phase	VOLTAGE	CURRENT	POWER FACTOR
PH_A:	277.049	40.025	1.000
PH_B:	276.992	40.025	1.000
PH_C:	276.992	40.025	1.000

Figure 15

Note: Power factor values will typically be in-between 0.8 to 0.9.

Now, you can connect each voltage phase and confirm its proper connection by clicking on the '[Real Time Data 1](#)' link.

Next, connect each current transformer (CT) input and check the reading by phase by clicking on the '[Real Time Data 1](#)' link.

Note: If after connecting the CT, the Power Factor value is **negative**, then the CT is not oriented properly. The CT orientation must be reversed. If you are installing the meter at a location where only the **absolute** current flow needs to be measured; you can disable 4-quadrant measurement by:

Click on '[Setup >> Schedule Reporting & Setup](#)'.

Enable 4 Quadrant Measurement (3 Ph)	<input checked="" type="checkbox"/> Check to Enable.
<input type="button" value="Submit"/>	<input type="button" value="Cancel"/>

Figure 16

IMPORTANT: For Solar power plants that must measure bi-directional energy, then you MUST enable the checkbox.

Finally, in order for the meter to measure the correct energy consumption, we must enter the primary CT value.

Click on '[Setup >> Schedule Reporting & Setup](#)'. Identify the row shown below and enter the appropriate CT size. For example: If the Primary CT sizing is 200 Amps, then enter the CT size = 200.

The image shows a screenshot of a web form. The top part of the form has a label 'Primary CT Size:' followed by a text input field containing the number '200' and the unit 'Amps'. Below this, there is a section labeled 'CT Options' with two radio button options: 'Solid Core or Rope' (which is unselected) and 'Split Core' (which is selected with a black dot).

Figure 17

You **must** select the “**CT Options**” depending on the type of current transformers you have installed.

After clicking on the '**Submit**' button, the meter will apply the new primary CT size. This can be viewed by clicking on the link '[Real Time Data 1 or 2](#)' where the CT size is applied.

Important: Fuses or circuit breakers must be installed on the voltage inputs.

A surge suppressor is strongly recommended on the 9VDC power supply.

Commissioning the Installation:

Before leaving the installation site we recommend the following:

- a. Validate the voltage values per phase.
- b. Validate the current values per phase.
- c. Validate the power factor values per phase. Note: Low values below 0.7 is a strong indication that the wiring has not been correctly done. Please review the section above on “**Common Mistakes**”.
- d. Validate that the current transformer (CT) primary amps have been correctly entered.

Please email support@energytracking.com if you have any questions or require additional details.

Ordering Details:

The integrated meter enclosure (IME) can be ordered with a circuit breaker or a fuse block based on the primary voltage as follows:

- WEM-MX-480V-333mV-CB-IME. (circuit breaker option)
- WEM-MX-480V-333mV-FB-IME. (fuse block option)
- WEM-MX-600V-333mV-FB-IME. (fuse block option)



Figure 18