

EM100B Power Monitor Frequently-Asked Questions

1. Questions related to the electric meter and installing the Sensor

1.1 I live in an apartment or condominium. Can I use the Power Monitor?

In order to use the Power Monitor, you need access to your electric meter, and your meter needs to be within 60 feet of where you want to put your display. Your meter might be out of range if you live in an apartment or condominium.

1.2 Is the Power Monitor compatible with all electric meters?

The Power Monitor is compatible with up to 90% of electric meters in the US. To confirm that your meter is compatible, check this link for a complete list and images of meters known to be incompatible:

<http://www.blackanddecker.com/Energy/PowerMonitorCompatibility.htm>

Non-Compatible Meters:

1. Mechanical meter (dials or an odometer, like in a car), and a spinning wheel, but the front edge of the wheel is not visible. You are more likely to have this kind of meter if the meter is inside your home.
2. Digital display (like on a calculator) and a two-port optical port (two adjacent holes, sometimes in a circular metal housing). You are more likely to have this kind of meter if you have time-of-use billing (you are charged a different rate for power at different times of the day).

1.3 My utility is installing new “Smart” meters. Will my Power Monitor be compatible with them?

Among the new generation of Smart meters, the Power Monitor is compatible with the GE I-210 meter, the Elster REX meter, and the Itron / Schlumberger Centron® meter. It is not compatible with the Landis + Gyr Focus meter. Black & Decker will post any known compatibility problems on our web site, and your product is fully warranted in the event that it is not compatible with your meter.

1.4 Where can I install my Display?

The Power Monitor Display needs to be within 60 feet (20 meters) of your electric meter in order to receive a signal. You may need to locate it closer if there are metal cabinets, steel beams, or metal stud walls between your meter and the Display.

You can remove the plastic stand on the display and mount it to a wall if you prefer.

If the Display is moved too far away from the Sensor, the animated bars will stop moving across the screen and the display will say “SLEEP”. Move the display closer and press any button to regain contact with the sensor.

1.5 I am unsure of my electric meter type. How can I find out which type of meter I have?

You need to know your meter type in order to install the sensor properly. The photos in Section 3 of the Instruction Manual show the three types of meters:

electromechanical, electronic with an optical port on the face, and electronic with an optical port on the top. The majority of existing meters fall under one of these generic types. Determine which photo most closely matches your meter, and follow the installation instructions for that meter type.

1.6 After installing the Sensor on my meter and pressing the RESET button, nothing happens. The red indicator does not light up at all.

The STATUS light in the Sensor doesn't come on until 10 seconds after pressing the RESET switch. If it doesn't come on at all, try these steps:

1. Confirm that the batteries are inserted in the correct orientation. + and - symbols are printed on the green circuit board inside the battery compartment.
2. Confirm that the batteries are not dead. We recommend lithium batteries for longer life in freezing conditions.
3. Confirm that the battery lid is closed and screwed down. The lid has to be fastened down all the way for the batteries to make contact. The screw on the battery door should screw down until no threads are showing and it is holding the door closed. You might have to turn the screw hard to get it to go in all the way. If it will not seat, unscrew it, then realign the screw and try again.

1.7 I attached the sensor to the meter and pressed the RESET button, but I never see the red light flashing like it says in the manual.

When the sensor is installed and aligned correctly, the red light will flash slowly for about two minutes. If it doesn't ever flash, you probably need to realign the sensor.

1.7.1 Mechanical meter (spinning wheel):

1. Make sure that you can see the edge of the spinning wheel from the front face of the meter. You don't need to see the top or bottom, just the edge. Make sure that the glass is clean in front of the disk.
2. Turn on some appliances in the house to make the wheel rotate faster.
3. Align the sensor arm so it's mostly parallel with the disk, centered in front of the disk, and as close to the glass as possible (ideally touching it). Lock it in place (tighten the strap and close the latch on the sensor). If you can't get the strap tight enough, put the rubber shim between the sensor and the meter.
4. Press the RESET button on the sensor and wait until the red light comes on solid. The red light will stay solid for several seconds while the sensor figures out what kind of meter you have.

5. When the sensor arm is properly aligned, the red light will flash about a second after the black stripe goes by. If you still don't see the flash, try adjusting the sensor arm from side to side, or up or down a little bit until you see the flash. If there's a scratch or smudge on the glass, move the sensor arm to one side or the other, but keep the arm mostly parallel to the disk.

6. Some mechanical meters have a plastic dome instead of a glass one, and there's a blemish in the plastic right in the spot where the sensor arm needs to look. Try moving the arm to be a little to the right of the blemish and at an angle, as shown in the image:



1.7.2 Digital Meter with a single optical port on the front face of the meter:

1. Check the compatibility guide on our web site to confirm that your meter is compatible, and that you've identified the correct optical port. If the port is on the front face of the meter, it will look like a little transparent dome. Make sure that the glass is clean in front of the port.

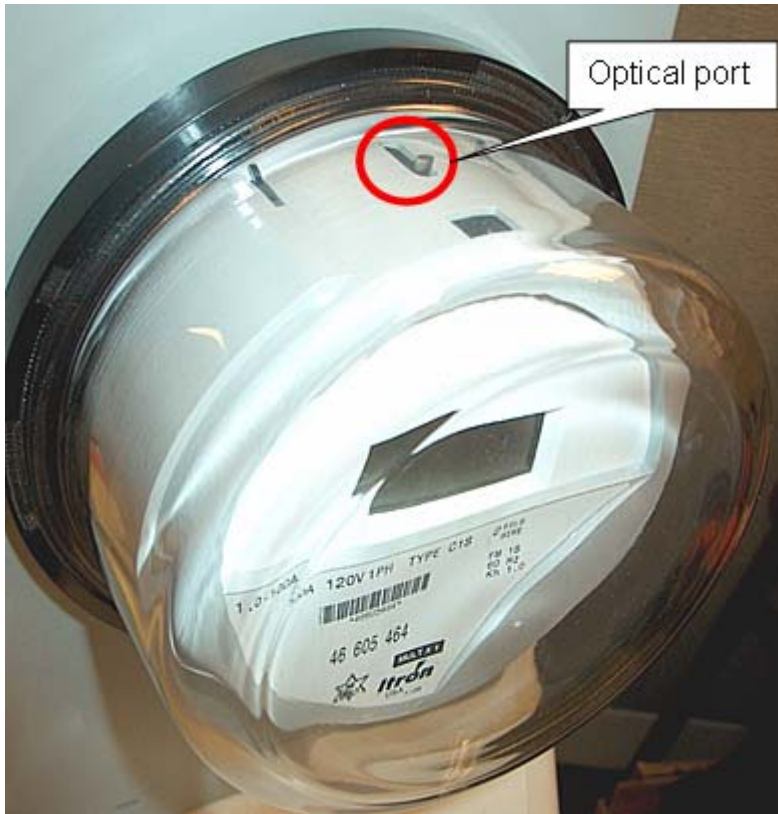
2. Turn on some appliances in the house to make it easier for the sensor to detect a signal. You can't see it, but the port is flashing an infrared signal, and the flashing is faster when you use more power.
3. Align the sensor arm so the black dot on the end of the arm is over the optical port, and lock it in place (tighten the strap and close the latch on the sensor)
4. Press the RESET button on the sensor and wait until the red light comes on solid. The red light will stay solid for several seconds while the sensor figures out what kind of meter you have.
5. When the sensor arm is properly aligned, the red light will flash slowly. If you still don't see the flash, try adjusting the sensor arm from side to side, or up or down a little bit until you see the flash.

1.7.3 Digital Meter with a single optical port on the top of the meter:

1. This type of meter is labeled either "Schlumberger Centron®" or "Itron Centron®".



On the top of the meter, through the glass, there's a square hole and an oval hole with a small clear plastic pipe sticking up out of the oval hole. That's the optical port. Make sure that the glass is clean in front of the port.



2. Turn on some appliances in the house to make it easier for the sensor to detect a signal. You can't see it, but the port is flashing an infrared signal, and the flashing is faster when you use more power.
3. Follow the instruction manual to reconfigure the sensor for a "type 3" meter. You need to pull out the sensor arm and fit it into the body of the sensor. See the video on our web site.
4. Attach the clear plastic template to the top of the meter so the white arrow is pointing at, but not covering up the port.
3. Align the sensor over the top of the meter as shown in the manual for a type 3 meter.
4. Press the RESET button on the sensor and wait until the red light comes on solid. The red light will stay solid for several seconds while the sensor figures out what kind of meter you have.
5. When the sensor arm is properly aligned, the red light will flash slowly. If you still don't see the flash, try adjusting the sensor from side to side, or forward or back a little bit until you see the flash. When you see the flash, tighten the mounting strap. Be careful that you don't move the sensor out of alignment while tightening the strap.

1.8 The red STATUS indicator on my Sensor is flashing rapidly, and I cannot proceed with the installation as described.

The fast flashing indicates that the Meter Sensor has not received a signal from the meter, or can not see the rotating meter wheel, after 20 minutes of trying. Follow the steps in Section 3 of the instruction manual to make sure the Sensor is properly aligned on your meter. Then press the RESET button. The indicator will turn off and light up again after 10 seconds. You can then proceed with the installation normally.

1.9 My Sensor STATUS LED is flashing regularly, but every now and then, there is an extra flash. Is there anything wrong with my unit?

This is exactly what you should see. Electronic meters produce one single pulse every time you have consumed one watt-hour. When the Meter Sensor first detects a pulse from an electronic meter, the STATUS indicator starts flashing. Thereafter, the indicator keeps on flashing at the same frequency. In addition, it will flash once every time it reads a pulse from your meter, at intervals that vary according to your current rate of electricity consumption. This periodic irregular flashing is absolutely normal.

1.10 I raised the gray latch on the sensor to try to adjust the sensor arm, and a piece of the housing came off. Now what?

Just snap the part back on and close the latch. You can adjust the arm position without lifting the latch all the way up.

2. Questions related to Synchronizing the Sensor to the Display

2.1 When I try to synchronize my Display and Sensor, the Display keeps showing “id” on the screen.

This indicates that the Digital Display is in ID mode, searching for a signal from your Sensor. Press the RESET button on the Sensor. If the Display remains in ID mode, move it to a location between 2 and 10 feet (60 cm to 3m) of the Sensor, and then press the RESET button again.

3. Questions related to understanding an electric bill

3.1 What kind of billing schemes does the Power Monitor support?

The Power Monitor supports the following billing plans:

- flat-rate billing (you are charged a single rate for the amount of electricity you use)
- tiered billing (you are charged one rate for an initial amount of electricity, then a different rate for the next amount, and so on)
- time-of-use billing (you are charged different rates at different times of the day)

The power Monitor can also take into account any taxes or fees that are proportional to the amount of electricity you use.

The Power Monitor can not take into account fixed fees that are charged regardless of the amount of power you use.

If you are charged different rates in the summer and winter, you will have to program those new rates each season.

3.2 How do I figure out what kind of billing plan I have?

You should be able to tell from your bill. If you see the words “tier” on your bill, you probably have tiered billing. If you see the words “peak rate” and “off-peak rate” on your bill, you probably have time-of-use billing. Most power companies have excellent web sites that can help you understand your bill.

3.3 I can't decipher my electric bill. What numbers do I enter?

First, check you power company's web site for an explanation of your bill, or call their support number. If you are still confused, use this technique to approximate your billing rate:

1. From your latest bill, find the total electricity consumption. This number will be labeled in kWh, or kilowatt-hours.
2. From your latest bill, find the total cost for electricity, including all fees and taxes. Make sure you have not added in costs for gas, water, or any other municipal services.
3. Divide the total cost in dollars by the total consumption in kWh, for a flat billing rate in \$/kWh.
4. Multiply that number by 100 to get a flat billing rate in cents/kWh
5. Follow the instruction manual to enter that rate as a flat billing rate.

This approximation will give you a good idea of relative costs as you learn to be more efficient with your energy use.

4. Questions related to the device not working

4.1 The Meter Sensor appears to have detected my meter properly, but I only see dashes (--) on my Display.

This indicates that the Display is not receiving transmissions from the Sensor. Try these steps, in order:

1. Move the Display closer to the Sensor. The Power Monitor has a range of 60 ft. (20 m), including transmission through an exterior wall. The range may be less if there are metal walls or beams between the Sensor and the Display. Also, the range may decrease as the batteries in the Sensor lose power, or in extremely cold weather. We recommend lithium batteries for the Sensor if the temperature falls below freezing.
2. Inspect the Meter Sensor. Make sure that the batteries are not dead, and that the Sensor is still properly aligned on the meter. Press the RESET button on the Sensor. The STATUS light should light up solid, then begin flashing slowly (once per revolution for an electromechanical meter). Refer to Section 3 in the instruction manual if you need to re-align your Sensor, or refer to Question 1.6 above.

3. Make sure the battery door on the sensor is closed all the way. The screw on the battery door should screw down until no threads are showing and it is holding the door closed. You should not have to turn the screw hard to get it to go in all the way. If it will not seat, unscrew it, then realign the screw and try again.
4. Re-synchronize the Sensor and the Display. Bring the Display to within 2 feet of the Sensor. Press and hold the **prog/sync** button on the Display until you hear two beeps and the Display says "id". Then press and hold the RESET button on the Sensor for 6 seconds. When you release the RESET button, the Display should beep, and "id" will disappear. After two minutes, the Display should show data.

4.2 My Display is showing "SLEEP" and dashes. What do I do?

This indicates that the Display is not receiving transmissions from the Meter Sensor, and the Display has gone to sleep to save battery life. Press any button on the Display to wake it up. If the Display does not show data within two minutes, try these steps, in order:

1. Move the Display closer to the Sensor. The Power Monitor has a range of about 60 ft. (20 m), including transmission through an exterior wall. The range may be less if there are metal walls or beams between the Sensor and the Display. Also, the range may decrease as the batteries in the Sensor lose power, or in extremely cold weather. We recommend lithium batteries for the Sensor if the temperature falls below freezing.
2. Inspect the Meter Sensor. Make sure that the batteries are not dead, and that the Sensor is still properly aligned on the meter. Press the RESET button on the Sensor. The STATUS light should light up solid, then begin flashing slowly (once per revolution for an electromechanical meter). Refer to Section 3 of the instruction manual if you need to re-align your Sensor.
3. Re-synchronize the Sensor and the Display. Bring the Display to within 2 feet of the Sensor. Press and hold the **prog/sync** button on the Display until you hear two beeps and the Display says "id". Then press and hold the RESET button on the Sensor for 6 seconds. When you release the RESET button, the Display should beep, and "id" will disappear. After two minutes, the Display should show data.

4.3 The power usage shown on my Display is not updating or is unusually low.

Try turning on an electric appliance that consumes a large amount of power such as a stove or dryer. If the values on the Digital Display do not start to update within a few minutes, then the Meter Sensor is likely not aligned correctly on your utility meter. Try repeating the appropriate alignment steps described in the Instruction Manual.

4.4 My Display behaves erratically and shows illogical values.

My Display says “ERROR”

Try resetting your display – you will have to re-program it with your billing information afterwards. Press the **prog/sync** and **clr** buttons simultaneously, until you hear a beep. You will have to follow the instructions in the Instruction Manual to synchronize to the Sensor and program your billing rates again.

4.5 Whenever it rains, I don't get a signal / the display shows zero power consumption.

Sometimes your meter can fog up on the inside of the glass, preventing the sensor from seeing the wheel or optical port. If the Display shows 0, you're still getting a radio signal from the sensor. Wait until the weather changes and the measurement should reappear. If the display shows dashes or “SLEEP”, that means you have lost the signal. Heavy rain can weaken the radio signal from the sensor. Move the display closer to the sensor and press any button to wake it up. The Display will try to re-acquire the signal for 10 minutes.

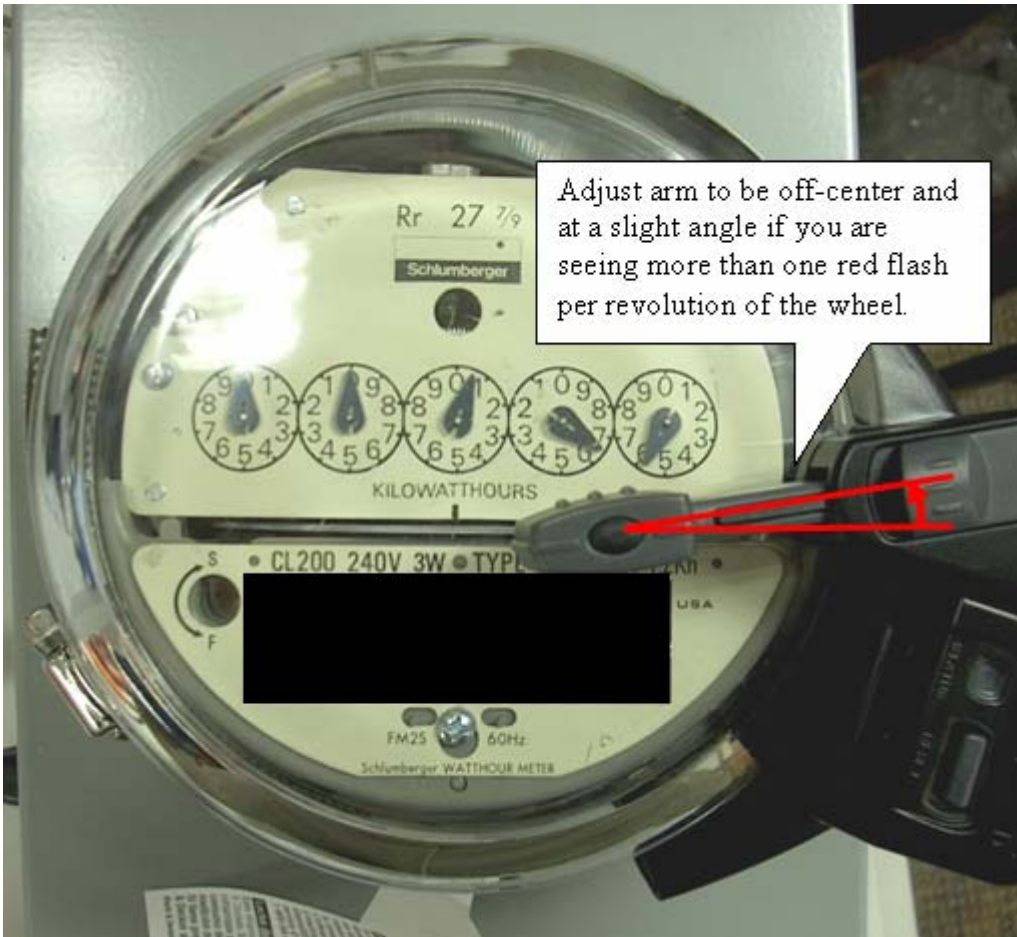
5. Questions related to accuracy, not matching the electric bill, not matching the outside temperature

5.1 The power usage shown on the Display is low or does not match what it should be.

You may have entered the wrong Power Factor (Kh), which calibrates the Digital Display to your electric meter. Use the tare feature to measure the consumption of your microwave or toaster, and compare the value on the Digital Display to the value marked on the nameplate of the appliance. If the numbers are off by a factor of 2 or more, you need to change the Power Factor. Refer to section 3 in the Instruction Manual. Go out to your electric meter and confirm the Power Factor (sometimes labeled Ks or Kt). On some larger homes, there may be a sticker on the meter indicating that your utility has changed the meter's Power Factor. Then, follow the programming instructions to enter a new value into the Digital Display.

5.2 The power usage shown on the Display is several times higher than what it should be.

If you have a mechanical meter (it has a rotating wheel), the sensor may be detecting scratches on the wheel, instead of just the black stripe. Turn on some lights or appliances in your house, then take a look at the your meter. Press the RESET button on the sensor. After 10 seconds, the red light will come on solid. Then after a minute, it will start to flash. It should only flash once per revolution of the wheel, shortly after you see the black stripe on the wheel pass by. If the red light flashes several times per wheel revolution, you need to adjust the position of the sensor arm. Move the sensor arm a little off-center from the wheel, and angle it up or down, as shown in the photo. You may need to use a screwdriver to loosen and re-tighten the clamping strap.



If the sensor has stopped flashing, press the reset button again, and confirm that the light flashes only once per disk revolution, just after the stripe goes by.

If your Display is not receiving a signal after re-adjusting the arm, you may need to re-synchronize it with the sensor. See section 4 in the instruction manual to re-synchronize.

5.3 The consumption information shown on my Display is not correct and it jumps randomly.

Several factors can affect the accuracy of the information shown on your Digital Display and they all relate to interference. If your neighbor also has a Power Monitor system, you may be receiving their information. In this case, you need to change the Sensor address and re-synchronize the Digital Display. Repeat section 04 in the Instruction Manual, but press and hold the RESET button for five (5) seconds. This will cause the Sensor to select a new radio address.

Wireless devices, such as weather stations or old-style baby monitors and cordless phones, transmit information on frequencies similar to the Power Monitor. If you have a wireless weather station, try turning it off briefly and check to see if the Power Monitor Display returns to normal operation. If it does, then check to see if you can change the weather station's operating channel.

5.4 The total shown on my Display does not match the total shown on my electricity bill.

It is unlikely that the Power Monitor will exactly match your bill. This product is intended to help you understand the cost of power as you use it, and to *estimate* your effectiveness as you learn to be more efficient in your energy use.

Some sources of error include:

- Not having the current rate programmed into the Display. For example, some utilities charge different rates in winter and summer. Some utilities change their rates every month.
- Not including taxes and fees when you calculate the rates to enter into the display
- Fixed fees and surcharges that can not be programmed into the display.
- Not knowing the exact time and date when the billing period starts, so you can reset the accumulated total.

5.5 The temperature shown on the Display does not match weather reports or appears to be incorrect.

The temperature shown on the Digital Display is the temperature at your electric meter – it does not measure the air temperature. If your electric meter is exposed to direct sunlight, or there has been a freeze overnight, the reading will be higher or lower than the air temperature. The reading will match the air temperature more closely when it is in the shade, and when the outside temperature has not changed significantly over the last hour.

6. Questions related to the Tare button/Appliance Mode

6.1 What does “Tare” mean?

“Tare” is a term used on weighing scales. When you go to a salad bar, the cashier uses a Tare button to zero out the weight of your plate and just weigh the salad. Our button works the same way. It zeros out all the ongoing power use – lights, TVs, other appliances – and lets you see only the power consumption of the next item you turn on.

6.2 I pressed the Tare button but nothing happened when I turned on a light.

The minimum power level that the Power Monitor can measure is 0.1 kW (100 Watts). A single incandescent light bulb consumes about 60 Watts. It’s about the same for a computer, and even less for a compact fluorescent light bulb. So you won’t be able to measure a power level that low.

You will be able to measure a computer plus a large monitor, or a large TV, or a room full of lights. And these are the items that cost you money to operate.

6.3 It takes forever after I press the Tare button to see a change.

Actually, it takes 30 seconds to one minute. The Display gets a new measurement from the Sensor every 30 seconds (any sooner and your batteries wouldn't last). To get an accurate measurement of an appliance, you should:

- Press the Tare button
- Then turn on the appliance
- Wait at least a minute and a half, so that the display has received at least two measurements

6.4 I'm trying to measure an appliance, but the measurement jumps around, or doesn't seem correct.

If some other device in your house turns on at the same time, or shortly after you turn on the appliance you're measuring (sump pump, refrigerator compressor, kids turn on a light in another room), your appliance measurement will be affected. To try again:

- Turn off the appliance you were trying to measure.
- Exit Tare mode (press the Tare button again. The display should not say "TARE" in the upper left-hand corner)
- Wait for at least one minute, allowing time for the Display to update and for any automatic appliance to end its cycle (sump pump or refrigerator compressor turns off).
- Press the Tare button again ("TARE" appears in the upper left-hand corner)
- Turn on the appliance
- Wait at least a minute and a half, so that the display has received at least two measurements

6.5 The display is showing negative power consumption.

Using the Tare button is all about timing. The Tare button zeros out your current power measurement. If your power usage goes up or down after you press the button, that change will show, positive or negative. For example, if your electric hot water heater was on before you pressed the Tare button, and then it turns off, your household power consumption will drop and the display will show a negative number. A lot of devices in your home turn on and off automatically (sump pump, refrigerator compressor, dehumidifier) and they may affect your Tare measurement.

7. Questions related to Battery Life

7.1 How many and what kind of batteries do I need?

You need 4 AA batteries; two for the Sensor, and two for the Display. We recommend name-brand alkaline batteries for best life. If you expect freezing weather, we recommend lithium AA batteries for the Sensor; they last longer in cold weather.

7.2 Can I use rechargeable batteries?

No. Rechargeable AA batteries have a lower voltage than alkaline or lithium batteries and will not operate the electronics properly. Also, they will not last nearly as long as a single-use battery before needing to be recharged.

7.3 How long will the batteries last?

If you use name-brand batteries, they should last about 6 months in both the Sensor and the Display.

7.4 The Sensor Battery indicator shows a low battery level, but I installed fresh batteries not long ago.

Regular alkaline batteries can become exhausted very rapidly when it is extremely cold outside. If you are expecting an extended period of temperatures below 32°F (0°C), try using lithium AA batteries in the Meter Sensor. They last longer in cold weather.

8. Questions related to issues with the local Power Company

8.1 Does the Power Monitor affect my electric meter in any way?

No. The Power Monitor uses an infrared sensor to count the revolutions of the wheel (if you have a mechanical meter), or count the flashes from the optical port (if you have a digital meter). The sensor can not in any way affect the reading on your meter.

8.2 Will the Power Company allow me to attach this to my meter?

Most power companies are aware of this product and do not have a problem with it as long as the sensor is not getting in the way of the meter reader.

However, it is the user's responsibility to ensure compliance with their power company's policies. Do not install the Power Monitor on meters designated as incompatible; the sensor may obstruct your utility's ability to read the meter. It is the user's responsibility to re-install a sensor removed for meter maintenance.

The Sensor has a weather-proof tag that explains the product to your meter reader and includes a phone number the utility can call for further information. Do not remove the tag.

8.3 My meter reader keeps taking the Sensor off of my meter.

The Power Company called and told me to remove my Power Monitor.

If you have a digital meter with a 2-port optical port (2 adjacent holes, sometimes in a circular metal housing), the meter reader may need to access that port to make his reading each month. If that is the case, we recommend you remove your Power Monitor and return it to the place of purchase for a full refund. Please accept our apologies for your inconvenience.

The use and depiction of specific meters in this document does not represent or imply that the Power Monitor has been approved or endorsed by their manufacturer or your local power company. All brand, product names and other trademarks are the property of their respective owners.