

# Unexpected readings in Channel Checker

This article covers common physical reasons for unexpected sensor readings in the channel checker or register values including AC (RMS), DC (mean), and Frequency readings.

This article applies to both CTs to measure amperage and [Sensor Hub](#) compatible sensors.

Incorrect readings in the meter and channel checker may be caused by a combination of physical sensor issues and configuration. For additional troubleshooting information for *power calculations* (wattage and power factor), or if you are **unsure how to access the channel checker**, [visit this article](#).

If you would like to view the raw signals the eGauge meter is reading, you may do so using the [Waveform View](#).

## Understanding Frequency Calculations

Starting in meter firmware v4.0.5, frequency of a signal is calculated by the number of zero-crossings. Prior to v4.0.5, frequency was counted based on signal amplitudes.

This means DC signals prior to v4.0.5 will show a frequency value which may be due to ripple voltage, noise, or AC-components in the DC signal. In firmware v4.0.5 and greater, frequency will not show on DC values if the signal does not cross the zero-axis.

The following assumes the meter is using firmware v4.0.5 or greater and therefore counts frequency based on the signal zero-crossing.

### No sensor connection

If there is no sensor or voltage connected to an input, the input will "bounce" unpredictably. RMS, DC, and frequency values for the non-connected input may show significantly higher than zero, especially if the sensor configured but not connected has a "bias" associated with it. This is expected and not an issue.

### Low or no signal

If the input signal is nonexistent or too low, electrical noise, EMI and radio signals in the environment can be picked up on the signal lines and cause zero-crossings that result in high frequency readings. This is expected and normal, as the signal amplitude (e.g., amperage level) may be non-zero but insignificant.

In the case of amperage readings and power calculations, even if there is a higher than expected RMS reading for the amperage due to high noise levels, when power (watts) are calculated the majority of the noise is canceled out.

If validating amperage readings with another meter, ensure there is sufficient minimum load for the CT amperage rating.

## CT not fully clamped

Some CTs require 2 clicks to fully shut. If a CT is not fully closed, it will read incorrect amperage and frequency values, sometimes intermittently.

## Non-twisted pair wire

It is critical to use twisted pair wire for CT or other sensor extensions to the meter. Twisted pair wire ensures there will be minimal effect from outside interference and radio signals. When a signal wire is not twisted, it will act as an antenna.

Line voltages do not use twisted pair wire.

## Extension mix-ups

It is possible to splice multiple sensors together accidentally, for example when running multiple CTs or sensors in a single CAT5 cable, if a pair on one end is switched two different sensor outputs will be connected to a single input of the meter. The results will be unpredictable and can affect multiple sensor inputs.

## Bad splices or pinched wires

As eGauge sensors use a low voltage, 333mV signal to the meter, the line is sensitive to imperfections in the wire. For example, using wire nuts made for power connections will not make a good connection for a low voltage signal cable and will result in bad readings. Similarly, a pinched wire will result in a poor contact point and can disrupt readings, sometimes even intermittently.

Ensure CT or sensor leads using a 2-pin plug have the leads fully secured and in contact.

## Incorrect RJ-11 cable for Sensor Hub Sensors

Sensor Hub compatible sensors use an RJ-11 style cable to connect the sensor to the hub. The eGauge uses "straight-through" RJ-11 style, rather than "reverse" which is typically used for telephones. See [this article](#) for more information.

## Incompatible Sensors

It is possible for an incompatible sensor (e.g., amperage-output, higher than 333mV, etc) to affect other sensor inputs besides the one it is connected to. This may cause damage to the meter or sensors.

## Incorrectly configured or connected sensor or CT

If using non-CTid [sensors](#), it is possible to configure an input for a different kind of CT than is actually physically connected in the port. This will result in incorrect readings.

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Please visit [kb.egauge.net](http://kb.egauge.net) for the most up-to-date documentation.