Commissioning readings with the Channel Checker

After configuring the eGauge, it is necessary to commission the readings to ensure accuracy using the channel checker. The channel checker can be accessed via **Tools -> Channel Checker**.

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The Channel Checker tool provides instantaneous readings of all the inputs of the eGauge including voltage, amperage, watts, frequency and power factor.

Example: Good 3-phase solar

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The left-side shows the channel inputs: the Line-Line voltages are ~500V, Line-Neutral are ~288V. Currents on CT1, CT2, and CT3 are between 640A and 660A. Only channels that are configured in a register will appear here.

The right-side shows the registers and calculated power. Each leg of the solar inverter is outputting ~183kW, and have a good power factor of ~.98 (as expected by a solar inverter).

> For information on common physical issues that cause bad AC (RMS), DC (Mean) or frequency readings, view this article.

Example: Negated value on main usage

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If a system with a neutral does not have any solar or other power back-feeding through the CTs, all power polarities should be the same. In this example, CT7*L3 shows a negative value (-2259.8W), while CT8*L2 and CT9*L1 show positive power values. When these are added together in the register, CT7*L3 reduces the overall power and will give inaccurate power values.

Cause	Fix
The CT is physically reversed (MOST COMMON)	Physically reverse the CT, or negate it in the Installation Settings register component (e.g., CT7*L3 to -CT7*L3)
Phase mix-up (MOST COMMON USUALLY W/ BAD POWER FACTOR)	Locate the correct phase and move the CT to it, or change the association in the Installation Settings register component (e.g., CT7*L3 to CT*L2). Visit this KB article for more information on phasing.
The CT black/white leads have been swapped	Swap the leads, or negate it in the Installation Settings register component. This is more common with CT extensions.
Multiple conductors in CT of different phases, or different directions	If multiple conductors are run through the CT with different phases, or different directions, it can cause polarity to randomly shift or stay at an unexpected polarity. Ensure only conductors of the same phase are in the CT.
Bad CT splices	If CTs have been extended or modified, sometimes they are mistakenly wired different on each end which can lead to combined signals that cause bad data. Ensure twisted pair wire is used.
CT not connected or insufficient amperage	If the CT is not connected the signal will bounce and can switch polarity. If there is no or insufficient amperage, noise can cause bad readings.
Wrong CT selected	Configuring with the wrong CT can cause the power to be negated or wrong.

False Positives	Reason

There is bidirectional power or back-feeding active	Power flowing through a CT in one direction gives a positive polarity, and if power reverses direction (like in back-feeding) the polarity negates. Make sure there is no back-feeding when troubleshooting polarity.

Example: Poor power factors

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In a system with a neutral, power factors are between 0 and 1. Higher power factors usually indicate better performance, resistive loads (like a heater, hot water heater, solar inverter, etc) generally have high power factors, while capacitive or inductive loads (like motors, pumps, switching power supplies, CFL lighting, etc) will have lower power factors.

Generally, standard equipment tends to have a .6 power factor or higher, but it's not always the case.

Cause	Fix
Phase mix-up (MOST COMMON, USUALLY W/ NEGATED VALUES)	Locate the correct phase and move the CT to it, or change the association in the Installation Settings register component (e.g., CT7*L3 to CT*L2). Visit this KB article for more information on phasing.
CT not clamped fully, or other damage	Ensure CT is fully clamped and undamaged. Some CTs take two clicks to fully close.
CT not configured correctly	If the type of CT is wrong (Rope, DC CT, AC CT), it can cause poor power factors and incorrect amperages.

False Positives	Reason
Active production from inverter on back-fed system (does not have to be actively back-feeding)	Solar and other inverters put out all real power, so as production increases on a back-fed system less real power is demanded from the utility and more reactive power, bringing the grid power factors down. This is normal. Run tests without any active production.
Insufficient amperage	When there is insufficient amperage on a CT (especially rope CTs), noise can cause higher than real amperage readings, and that noise is cancelled out when power is calculated resulting in a lower than real power factor. This is normal.

False Positives	Reason
Equipment uses a lot of reactive power	Some equipment like HVAC systems can have a power factor of ~.5.
