

## WattNode Revenue for Modbus

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### Overview

Continental Control Systems, LLC offers a line of revenue-grade meters which meet the accuracy requirements of the ANSI C12.1 standard when used with approved CCS current transformers.

The WattNode Revenue meter must be used with Option C0.6 CTs (indicating IEEE C57.13 class 0.6 accuracy). Not all CCS CTs are available with this accuracy rating, so check with our sales department or on our website for availability.

Each WattNode Revenue is shipped with a certificate of calibration. In addition CCS can provide self-certification reports for C12.1 accuracy upon request for our most popular meters and CTs showing compliance with the following ANSI C12.1 tests, using NIST (or equivalent) traceable equipment.

- **1:** No load
- **2:** Starting load
- **3:** Load performance
- **4:** Effect of variation of power factor
- **5:** Effect of variation of voltage
- **6:** Effect of variation of frequency
- **7:** Equality of current circuits
- **11:** Effect of internal heating
- **13:** Stability of performance
- **14:** Independence of elements
- **15:** Insulation
- **16:** Voltage interruptions
- **19:** Effect of variation of ambient temperature

### Detailed Changes

The WattNode Revenue meter for Modbus is similar to the normal WattNode Modbus model, with the following changes.

- Improved factory calibration with tighter tolerances and additional calibration points.
- The CT model must be specified when placing the meter order. A label showing the CT model will be located on the meter housing above the CT connector. Furthermore, the **CtAmps** configuration (**CtAmps**, **CtAmpsA**, **CtAmpsB**, and **CtAmpsC**) will be locked at the factory and **cannot be changed in the field**.
- On all WattNode Modbus models, the calibration coefficients are locked with a secure key. In addition, on Revenue models, any configuration registers that could affect energy readings are locked: **GainAdjustA**, **GainAdjustB**, **GainAdjustC**, **PhaseAdjustA**, **PhaseAdjustB**, **PhaseAdjustC**, **CreepLimit**, and **CtDirections**.
- To support these revenue features, there is a new Modbus firmware version 19.
- In the Modbus slave device ID field, the model will start with "RWNC" in place of "WNC".

- The meter will be provided with a certificate of calibration showing traceability to NIST or equivalent calibration equipment.

## Notes

For a full list of firmware updates to the WattNode Modbus, see [http://www.ccontrols.com/w/WattNode\\_Modbus\\_Firmware\\_Versions](http://www.ccontrols.com/w/WattNode_Modbus_Firmware_Versions).

## Installation

It is always important to take care when installing metering equipment, because wiring mistakes and other problems can result in inaccurate measurements. With revenue-grade applications, this becomes even more important. See the **WattNode Modbus - Installation and Operation Manual** for complete installation instructions, troubleshooting, etc. Below are lists of ways to verify correct operation and the most common installation mistakes.

### Verify Correct Measurement

- Ideally, use a portable power analyzer to verify the readings from the WattNode meter. If the WattNode meter is wired correctly, these should agree to within a few percent.
- If feasible, compare the readings from the WattNode meter (or meters) to a utility meter. This is generally only possible if one or more WattNode meters are monitoring the same loads as measured by the utility meter.
- Check the WattNode meter registers for PowerA, PowerB, PowerC, PowerReacA, PowerReacB, PowerReacC, PowerFactorA, PowerFactorB, and PowerFactorC while your load is active. Make sure these are reasonable, especially the power factor values. Wiring errors commonly show up as negative power or unusually lower power factor values on one or more phases.

### Common Installation Mistakes

- One or more CTs reversed (not facing the source of energy), or the leads from one or more CTs reversed where they connect to the meter (the white and black leads must match the dots on the label).
- Line voltage and CT phases are mismatched. For example, if the meter is monitoring L1, L2, and L3 (in that order), but the CTs are on L3, L1, and L2 (in that order). This is a surprisingly easy mistake to make, because there are sometimes a mixture of single-, double-, and triple-pole breakers in a panel.

## Additional Information

See the full manual for information not in this supplement:

- **WattNode Modbus - Installation and Operation Manual**

Contact technical support for any other questions.