WattNode Modbus - Option FP (Fast Power)

Overview

Option FP supports utility feed-in limit requirements. Some utilities have limits on the power that may be fed into the grid by inverters. To avoid exceeding this limit, a meter must monitor the power flowing to and from the grid. The inverter must then monitor the output of the meter and adjust the generated power accordingly.

WattNode Modbus meters have a one second power update rate, which can result in delays up to slightly over two seconds on feed-in limiting. With Option FP, the update rate for floating-point power measurement speeds up to 200 milliseconds (five updates per second), allowing for feed-in response times of 500 milliseconds.

Detailed Changes

Option FP is implemented as a special firmware version, because it requires compile-time changes to the firmware. The changes include:

- Update the **Version** register (1708) to report version 22.

- Add a new value OPT_FP (weight 16384), to the **Options** register (1709) to indicate that option FP is present. For information on identifying options with this register, see http://www.ccontrolsys.com/w/WattNode_Modbus_Option_Identification.

- Add the **OptFastPower** register (1738) that reads a one if option FP is present, zero otherwise. Note: trying to read this register on older firmware versions will result in a Modbus exception 02 (Illegal data address) indicating an invalid register address, since this register does not exist on firmware versions before 22.

- Add the **OptRevenueGrade** register (1737) that reads a one if the model is revenue grade, zero otherwise. This is a general improvement not directly associated with option FP. Note: trying to read this register on older firmware versions will result in a Modbus exception 02 (Illegal data address) indicating an invalid register address, since this register does not exist on firmware versions before 22.

- Add a **PowerSecondsFast** register (1035) to the Basic Float register set. This reports the floating point seconds since power was applied. It can be used to detect updates to the fast power registers because **PowerSecondsFast** will increment by 0.2 seconds for each update. It rolls over to zero every 24 hours to prevent issues with floating point rounding that can occur when floating point numbers become large.

- Add four fast update rate power registers to the Basic Float register set. These update every 200 milliseconds. They report the average power over the preceding 200 milliseconds. They are not affected by the configuration of the **Averaging** register.

  - **PowerSumFast** (1037): Reports the sum of the power for all phases.

  - **PowerAFast** (1039): Reports the power for phase A.

  - **PowerBFast** (1041): Reports the power for phase B.

  - **PowerCFast** (1043): Reports the power for phase C.

- During the first second of operation, the meter reports correct values for the accumulated energy and for the fast power registers. Previously, these would report zero values for the first second of operation. Other measurement registers may still require one second of operation before reporting non-zero values.

The calibration system was updated to add support for option FP with firmware version 22, but the calibration procedure is unaffected.

Additional Information

See the full manual for information not in this supplement:

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

At the time of release, firmware version 22 is only being used for option FP (fast power). WattNode meters without this option will continue to use firmware version 20.

Contact technical support for any other questions.