

9200 Revenue Meter

This document applies to 9200 meters with firmware version 205 or greater, and explains how to set up and seal the meter for revenue functionality.

Revenue meters provide power measurements that are within industry-accepted limits for accuracy over a defined range of operating conditions, and provide adequate protection against unauthorized alteration of these measured quantities. International and national standards define industry-accepted accuracy limits. National and utility-based standards regulate protection against unauthorized alteration of measured quantities.

9200 Revenue Meter Model

The 9200 revenue meter model is designated by the certification it holds.

Order Code	Model	Certification	Current Inputs	Revenue Metering Security Systems
2	RMANSI (unsealed)	Complies with the accuracy requirements of the ANSI C12.20 0.5 Revenue Metering Standard	Rated for 0.1 Amps to 10 Amps AC	Disabled
3	RMICAN (unsealed)	Canadian Revenue Metering Standards	Rated for 0.1 Amps to 10 Amps AC	Disabled
4	RMICAN-Seal	Canadian Revenue Metering Standards	Rated for 0.1 Amps to 10 Amps AC	Enabled

In This Document

- ◆ **Security Mechanisms** **2**
 - Anti-Tamper Seal 2
 - Password Protected Peak Demand Register Reset 2
 - Hardware Locking Security 2
- ◆ **Revenue Meter Configuration** **3**
 - Enabling Revenue Meter Functionality 4
 - Hardware Locking the Revenue Meter 4
 - Sealing a Revenue Meter 5
 - Configuring Revenue Meter Parameters 6
 - Unsealing and Unlocking a Revenue Meter 6

Security Mechanisms

To meet government regulations and utility security requirements, the revenue meter incorporates three types of security systems:

- ◆ a traditional anti-tamper mechanical seal on the meter base unit.
- ◆ a password-based security system that permits password-protected Peak Demand reset.
- ◆ a hardware-based security system that prevents modification of measured quantities after the meter is sealed.

Anti-Tamper Seal

The revenue meter incorporates a sealing tab and a sealing plate through which a traditional lead-wire seal is inserted. When utilized, this lead-wire seal effectively prevents unauthorized personnel from altering any revenue-related meter measurements.

The sealing tab has two different hole sizes to accommodate different sealing methods. It is recommended that the smaller hole be used with traditional lead-wire seals. Refer to page 5.

Password Protected Peak Demand Register Reset

The meter front panel incorporates a password that must be entered to reset the peak demand register values. To learn about meter resets, refer to the section “Reset Mode” in the *9200 Installation and Operation Guide*.

Hardware Locking Security

The revenue meter is equipped with a comprehensive security system that provides protection against unauthorized alteration or tampering of revenue-related quantities. This security system locks all revenue-related measurements. Of particular importance is that basic meter configuration parameters including Volts Mode (service-type), the PT ratio, and the CT ratio are locked. These locks are enabled by default for all sealed revenue meters. Typical values that are protected include:

- ◆ kWh, kVARh, kVAh delivered, received
- ◆ kW, kVAR, kVA Sliding Window demand values
- ◆ digital outputs controlling the energy pulsing applications
- ◆ all power system settings, including PT and CT ratios

A four-pin hardware locking jumper is used to enable and disable the hardware security as described in the next section.

Revenue Meter Configuration

Your revenue meter includes firmware version 205 or greater, and ships with:

- ◆ a power supply
- ◆ an Option Card
- ◆ a hardware locking jumper
- ◆ sealing hardware

A typical workflow for configuring your meter as a revenue meter is:

1. Enable revenue meter functionality by applying the hardware locking jumper to the meter, and powering up the meter.
2. Set up meter parameters. Note that some meter parameters can be configured after the meter is “hardware locked”. See “Configurable Parameters for the hardware-locked Revenue Meter” on page 6.
3. Seal the meter with the sealing hardware, then power up the meter (*without* the hardware locking jumper applied) to “hardware lock” the meter.

To enable revenue meter functionality (step 1 listed above), the meter must be disassembled.

Before Disassembling the Meter

DANGER

During normal operation of the meter, hazardous voltages are present which can cause severe injury or death. These voltages are present on the terminal strips of the device and throughout the connected potential transformer (PT), current transformer (CT), status input, relay, and control power circuits. Installation and servicing should be performed only by qualified, properly trained personnel.

Before disassembling the meter, take the following precautions.

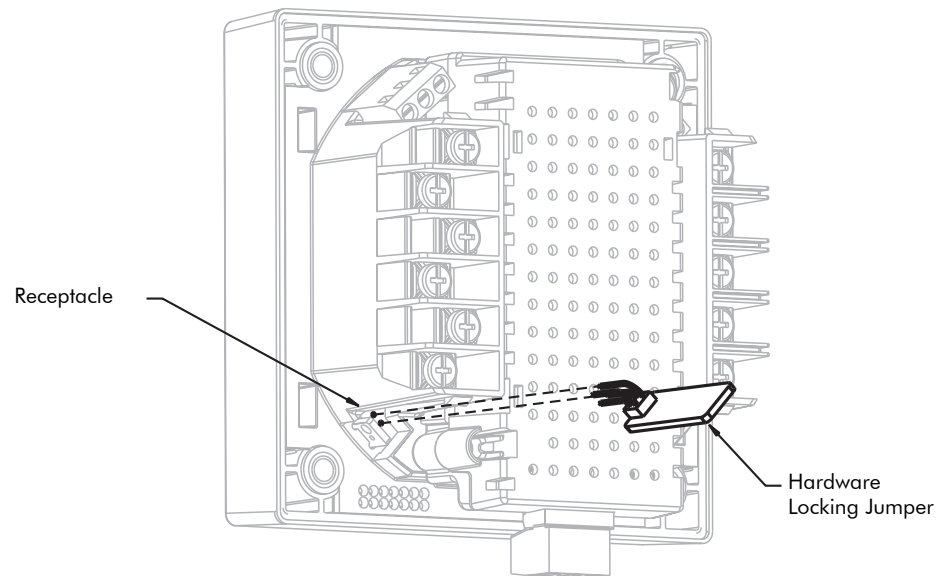
1. Open all PT fuses (or direct voltage input fuses) and close all CT shorting blocks.
2. Turn off all power to the revenue meter and disconnect the Line and Neutral (or DC power) wires from the Supply Power inputs to the meter.
3. Disconnect all other wiring (or power off all other circuits) which may present potentially hazardous voltage levels to the unit, such as connections to the relay outputs.
4. Ensure that all cables still connected to the revenue meter are **NOT** live.

Enabling Revenue Meter Functionality

A meter is not a revenue meter until the meter is powered up for the first time after the hardware locking jumper is applied.

Follow the directions below to enable revenue functionality.

1. Install the Options Card by sliding it into the slot on the back of the meter. For detailed instructions, refer to the *9200 Options Card Retrofit Instructions*.
2. Place the hardware locking jumper into the receptacle (see below).

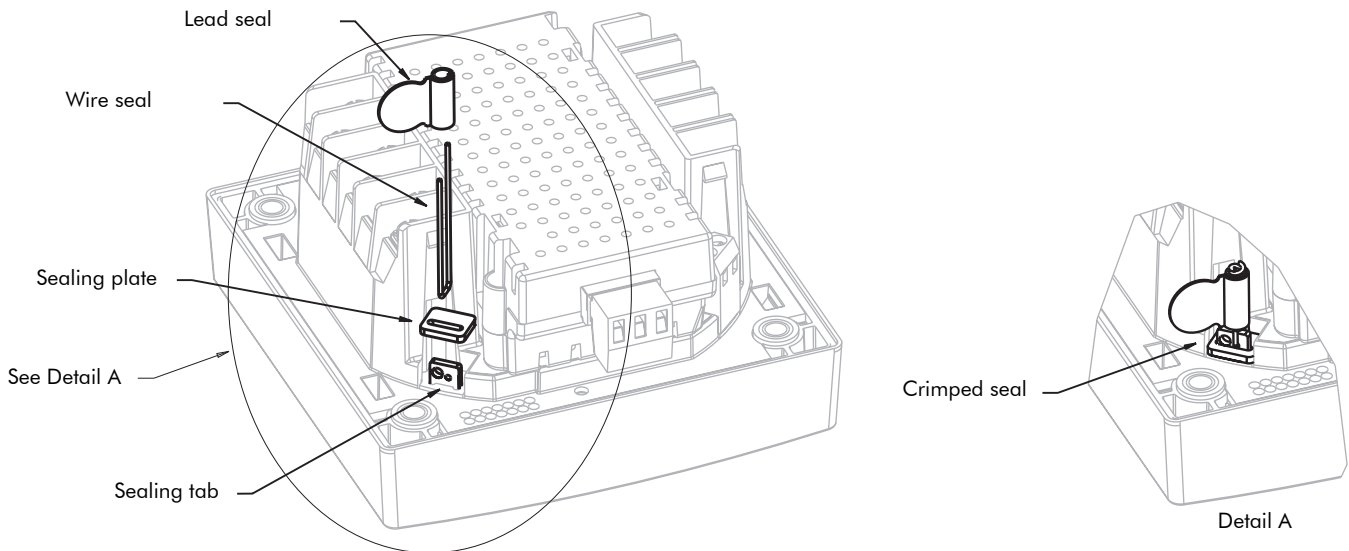


3. Plug the power supply into the meter. For detailed instructions, refer to the *9200 Power Supply Retrofit Instructions*.
4. Power up the meter. Revenue functionality is now enabled and the meter is ready for configuration.

Hardware Locking the Revenue Meter

A revenue meter is “hardware locked” when the hardware locking jumper is *not* applied at meter power up. (A revenue meter is “hardware unlocked” when the jumper *is* applied on meter power up).

Sealing a Revenue Meter



To seal the meter, follow the directions below.

1. Place the sealing plate over the top of the sealing tab as shown in the illustration above.
2. Insert the sealing wire through one of the holes in the sealing tab.
3. Twist the wire and crimp the lead seal on to the wire (refer to detail A above).
4. Install the Options Card by sliding it into the slot on the back of the meter. For detailed instructions, refer to the *9200 Options Card Retrofit Instructions*.
5. Plug the power supply into the meter. For detailed instructions, refer to the *9200 Power Supply Retrofit Instructions*.
6. Power up the meter.

Because the hardware locking jumper is not applied to the meter, the meter is now hardware locked. Once the meter has been hardware locked, the Options Card that is currently in the meter becomes tied to that meter using the Option Card serial number.

- ◆ If the key is switched after the meter is sealed, the meter will display only frequency and I4. Modbus register access is blocked and pulsing stops.
- ◆ An option key can be swapped out of a hardware locked meter only by unlocking the meter with the hardware locking jumper, replacing the option key, and then locking the meter again.

Configuring Revenue Meter Parameters

You can configure setup parameters for your revenue meter:

- ◆ out of the box
- ◆ after revenue meter functionality has been enabled and the meter is hardware unlocked
- ◆ when the revenue meter is hardware locked

Configurable Parameters for the hardware-unlocked Revenue Meter

Hardware unlocked revenue meters allow you to configure all of the setup parameters and perform Demand Resets including an Energy Demand reset.

Configurable Parameters for the hardware-locked Revenue Meter

Hardware locked revenue meters allow you to:

- ◆ configure the communication parameters
- ◆ configure the communication scaling
- ◆ configure the display update parameters
- ◆ configure the password
- ◆ perform a Peak Current Demand reset
- ◆ perform Peak Power Demand reset



NOTE

An Energy Demand reset cannot be performed.

For meter configuration instructions, refer to the *9200 Installation and Operation Guide*.

Unsealing and Unlocking a Revenue Meter

A revenue meter is unsealed when the anti-tamper wire seal is removed. A revenue meter is hardware unlocked when the hardware locking jumper is applied to the meter on power up.

To unseal, then unlock the meter, follow the directions below.

1. Remove the anti-tamper wire seal.
2. Remove the sealing plate.
3. Unlock the meter by applying the hardware locking jumper to the meter.
4. Power up the meter. Unlocked meters allow you to configure all of the setup parameters. Refer to the *9200 Installation and Operation Guide* for configuration details.