

# ION7300 Series Revenue Meter

This document provides an overview of the PowerLogic® ION7300 series revenue meter.

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## Additional Information

- ◆ *ION7300 Series Installation Guide*
- ◆ *ION7300 Series User's Guide*

Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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# Introduction

A revenue meter provides measurements that pass industry standards for accuracy over a defined range of operating conditions. They also ensure adequate protection against unauthorized alteration of these measured quantities. International and national standards define industry-accepted accuracy limits while national and utility-based standards regulate protection against unauthorized alteration of measurements.

## Revenue Meter Models

Four revenue meter models are available for the ION7300 series; each model is designated by the certification it holds.

Security Option	Model	Certification Achievement	Current Inputs	Hardware Lock	Anti-tamper Sealing Kit
2	RMANSI (unsealed)	Complies with the accuracy requirements of the ANSI C12.16 Revenue Metering Standard	Rated for 0.1 Amps to 10 Amps AC	Enabled	Provided
3	RMICAN (unsealed)	Canadian Revenue Metering Standards	Rated for 0.1 Amps to 10 Amps AC	Enabled	Provided
4	RMICAN (sealed)	Canadian Revenue Metering Standards	Rated for 0.1 Amps to 10 Amps AC	Enabled	Factory Installed
6	OFGEM <sup>1</sup>	IEC 60687 Class 0.5 (for 5 Amps nominal)	Rated for 0.1 Amps to 10 Amps AC	Enabled	Provided

<sup>1</sup> The OFGEM option is only available in the United Kingdom. It comes standard with a terminal cover.

## Revenue Meter Installation

See the *ION7300 Series Installation Guide* (included with your meter) for instructions.

## Terminal Cover Installation (OFGEM meters)

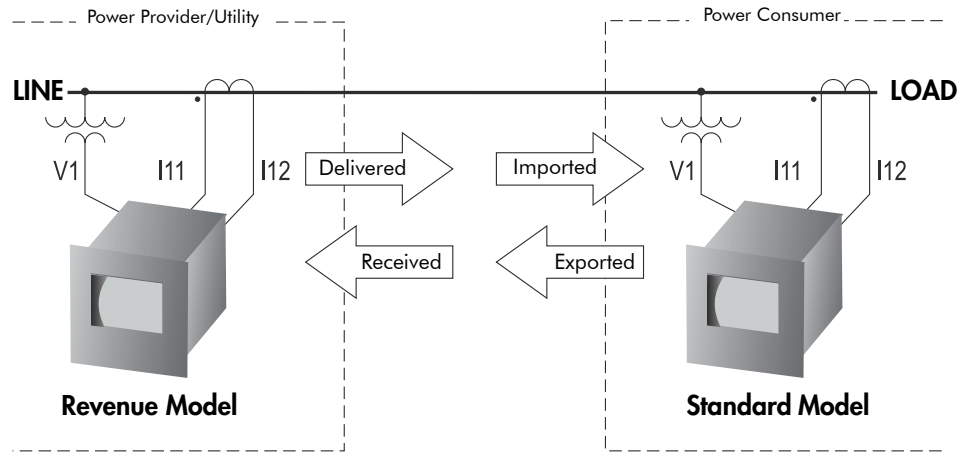
See the *Terminal Cover Retrofit Installation Instructions* (included with your meter).

# Differences Between Standard and Revenue Models

All ION7300 series revenue meters have different energy output register labels in their meter firmware; some also have additional modules for revenue calculations.

## Revenue Meter Energy Register Labels

The revenue and non-revenue meters differ in how they label energy flow.



The energy labels for kVAh, kVARh and kWh are different from the non-revenue devices as follows:

Revenue Meter	Non-revenue Meter
Delivered	Imported
Received	Exported
Total = Delivered + Received	Total = Imported + Exported
Net = Delivered – Received	Net = Imported – Exported

For example, the meter’s output register *kVARh tot* will be *kVARh del+rec* in the revenue meter model.

## Additional Revenue Metering Modules (RMICAN meters)

There are additional modules incorporated into the template of ION7300 series RMICAN revenue meters. Some of these modules are used in the calculation and logging of both  $V^2h$  and  $I^2h$  (used for transformer and line loss compensation).

## Security Mechanisms

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

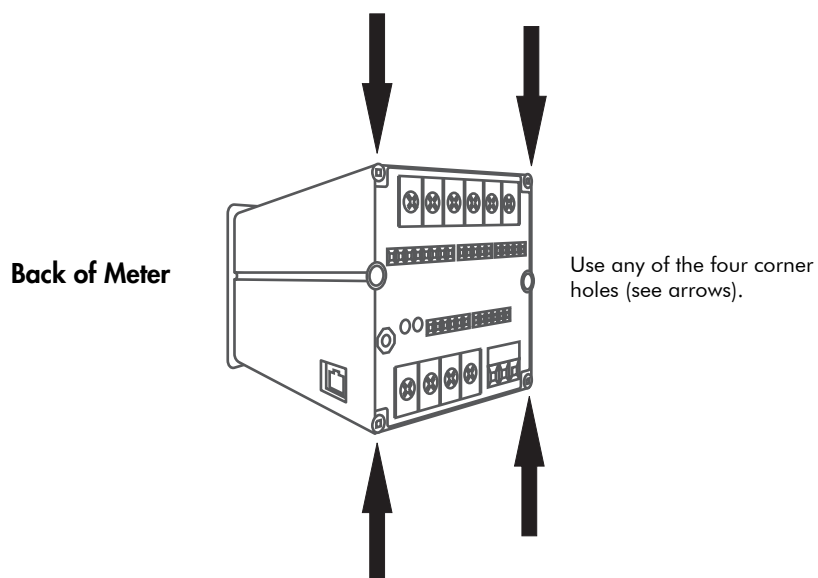
- ◆ traditional anti-tamper mechanical seal on the meter base unit

- ◆ password-based security system that permits password protected minimum/maximum resets (for example, Sliding Window Demand reset)
- ◆ hardware-based security system that prevents modification of revenue quantities after the meter is sealed

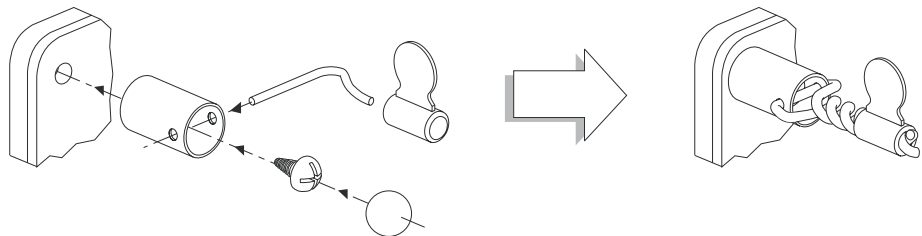
## Anti-Tamper Seals

The ION7300 series revenue meter incorporates one or two sealing cans through which traditional lead/wire seals can be inserted. These seals effectively prevent unauthorized personnel from gaining access to meter internals. Seals are provided with the meter and are installed as follows:

1. Remove the screw from one of the rear panel corner holes. Place the sealing can over the hole and insert the screw back into the hole, through the sealing can.



2. Insert the ball bearing into the sealing can over the head of the screw. Install the wire through the two holes in the sealing can.



3. Twist the wire and crimp the lead-sealing tab onto the wire.

## Password Protected Min/Max Register Resets

The meter front panel incorporates a password that must be entered in order to reset any of the minimum/maximum or peak demand register values.

## Hardware-based Security

The ION7300 series 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 ION modules, links and setup registers. Basic meter configuration parameters including volts mode, PT ratio, and CT ratio are locked. These locks are enabled at the factory for all sealed revenue meters. Typical values that are protected include:

- ◆ kWh, kVARh, kVAh delivered, received, del-rec, del+rec
- ◆ kW, kVAR, kVA Thermal and Sliding Window demand min and max values
- ◆ Digital Outputs controlling the energy pulsing applications
- ◆ All Power system settings, including PT and CT ratios

For a list of all the locked modules for your meter, see the *ION Device Templates* document available from the PowerLogic website at [www.powerlogic.com](http://www.powerlogic.com).

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

# Configuring the Revenue Meter

When enabled, the revenue meter security system prevents unauthorized alteration of revenue-related quantities. By default, all ION7300 series revenue meters are shipped from the factory with the security system enabled. You can temporarily disable the security to configure your revenue meter. This is done by removing the meter's back plate, and placing a jumper into the meter.

## Before Disassembling the Meter

Before attempting to remove the back plate of the revenue meter, ensure that it is protected against static electricity discharge. To prevent damage to the unit, wear an anti-static wrist strap at all times.

### **DANGER**

During normal operation of an ION7300 series revenue 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.

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.
3. Disconnect all other wiring (or power off all other circuits) that may present potentially hazardous voltage to the unit, such as connections to the relay outputs.
4. Ensure that all cables still connected to the revenue meter are **NOT** live.

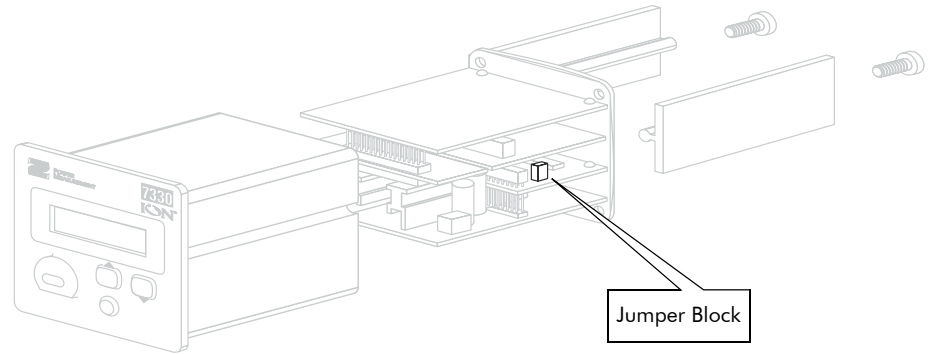
## Inserting the Key

In order to configure the revenue meter, ensure that adequate safety precautions have been exercised as above.

### **CAUTION**

The components inside an ION7300 series revenue meter are extremely sensitive to electrostatic discharge. To prevent damage to the unit, always wear an anti-static wrist strap when working inside the unit. Failure to use proper equipment during servicing will void the meter's warranty.

1. Remove the thumbscrews and retainer bars from the unit.
2. Remove the anti-tamper wire seal and four screws on the rear panel.
3. Slide out the rear plate of the device to reveal the unit's circuit board panels.
4. Locate the two-pin jumper header labeled "J1" on the communications card.



5. Place the jumper block onto the J1 two-pin header (this disables the hardware based security). Slide the rear plate back into the device and replace the four screws onto the rear panel. Reconnect the meter's power supply.
6. Configure the meter (e.g. Volts mode, PT and CT ratios, Pulse outputs).
7. Disconnect the meter's power supply.
8. Slide the rear plate out and remove the jumper block from the two-pin header to re-enable the hardware-based security.
9. Replace the rear plate and re-apply the anti-tamper seals.

## CT & PT Selection

Consult your local Revenue Metering authorities to obtain standards for CT and PT selection for revenue metering applications in your region.