PowerLogic ION7550 / ION7650 revenue meter

This document provides an overview of PowerLogic™ ION7550 and ION7650 revenue meters.

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Additional Information

- ION7550 / ION7650 User guide
- ION7550 / ION7650 Installation guide
- ION Reference
Safety information

Important information

Read these instructions carefully and look at the equipment to become familiar with the device before trying to install, operate, service or maintain it. The following special messages may appear throughout this bulletin or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.

The addition of either symbol to a “Danger” or “Warning” safety label indicates that an electrical hazard exists which will result in personal injury if the instructions are not followed.

This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.

**DANGER**

**DANGER** indicates an imminently hazardous situation which, if not avoided, will result in death or serious injury.

**WARNING**

**WARNING** indicates a potentially hazardous situation which, if not avoided, can result in death or serious injury.

**CAUTION**

**CAUTION** indicates a potentially hazardous situation which, if not avoided, can result in minor or moderate injury.

**NOTICE**

**NOTICE** is used to address practices not related to physical injury. The safety alert symbol shall not be used with this signal word.

Please note

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.

A qualified person is one who has skills and knowledge related to the construction, installation, and operation of electrical equipment and has received safety training to recognize and avoid the hazards involved.
Safety precautions

Installation, wiring, testing and service must be performed in accordance with all local and national electrical codes.

<table>
<thead>
<tr>
<th>DANGER</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH</strong></td>
</tr>
<tr>
<td>• Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NRPA 70E in the USA, CSA Z462 or applicable local standards.</td>
</tr>
<tr>
<td>• This equipment must only be installed and serviced by qualified electrical personnel.</td>
</tr>
<tr>
<td>• Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.</td>
</tr>
<tr>
<td>• Always use a properly rated voltage sensing device to confirm that power is off.</td>
</tr>
<tr>
<td>• Ensure the device has been unpowered for at least 10 minutes prior to disassembly.</td>
</tr>
<tr>
<td>• Replace all devices, doors and covers before turning on power to this equipment.</td>
</tr>
<tr>
<td>• Connect protective ground (earth) before turning on any power supplying this device.</td>
</tr>
</tbody>
</table>

**Failure to follow these instructions will result in death or serious injury.**
Overview of the revenue meter option

The fundamental functions of a revenue meter are to provide measurements that are within industry-accepted limits for accuracy over a defined range of operating conditions and to 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.

Meter ordering options

ION7550 / ION7650 meters ordered with security ordering options 1, 3, 4 and 6 can be used for revenue metering. Each option has different security features. See the table below for more details.

NOTE

The current probe input order options are not OFGEM approved or RMICAN certified.

<table>
<thead>
<tr>
<th>Security ordering option</th>
<th>Security features</th>
<th>Certification achievement</th>
<th>Hardware lock</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>● Password protected</td>
<td>● ANSI C12.20 Class 0.2, Current Class 2, 10 or 20</td>
<td>Not available</td>
</tr>
<tr>
<td></td>
<td>● Anti-tamper sealing kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>● Password protected</td>
<td>● ANSI C12.20 Class 0.2, Current Class 2, 10 or 20</td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td>● Anti-tamper sealing kit</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Hardware lockable</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3&lt;sup&gt;1&lt;/sup&gt;</td>
<td>● Password protected</td>
<td>● Canadian Revenue Metering Standards certified</td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td>● Anti-tamper sealing kit</td>
<td>● ANSI C12.20 Class 0.2, Current Class 2, 10 or 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Hardware lockable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● RMICAN certified firmware and frameworks</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4&lt;sup&gt;1&lt;/sup&gt;</td>
<td>● Password protected</td>
<td>● Canadian Revenue Metering Standards certified</td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td>● Anti-tamper sealing kit</td>
<td>● ANSI C12.20 Class 0.2, Current Class 2, 10 or 20</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Hardware lockable</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● RMICAN certified firmware and frameworks</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Unit comes sealed, with anti-tamper mechanisms installed</td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>● Password protected</td>
<td>● OFGEM approved</td>
<td>Enabled</td>
</tr>
<tr>
<td></td>
<td>● Anti-tamper sealing kit</td>
<td>● IEC 62053-22: 2003 Class 0.2, Nominal Currents 1, 2, 5 or 10</td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Security lock enabled</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>● Voltage, current and I/O terminal strip covers&lt;sup&gt;2&lt;/sup&gt;</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<sup>1</sup> Only for delivery to Canada.

<sup>2</sup> For more information, see the ION7550 / ION7650 Terminal Strip Covers product option document.

Enclosure label

The revenue meter comes with a label that you can adhere to the enclosure where the meter is installed. The label contents include:

- Order and serial number
- Calibration date
- Frequency
Specifications for the power supply, current input range, voltage input range and operating temperature range.

- Device MAC address
- Test amperage and test constant
- Class accuracy
- Wiring configuration
- Fields to note PT (or VT) and CT ratios

Security features

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

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

Order option 4 (see “Meter ordering options” on page 4) also has an anti-tamper sticker affixed to the meter nameplate.

Anti-tamper sealing kit

The meter incorporates two sealing cans and two sealing bars through which traditional lead/wire seals can be inserted. When utilized, these lead/wire seals help prevent unauthorized personnel from gaining access to internal meter components.
These seals are provided with the revenue meter, and are installed as follows:

1. Remove the screw (C) located on the opposite side of the communications (COM) card from the sealing bar.
2. Place the sealing can over the hole and insert the screw back into the hole, through the sealing can.
3. Install the ball bearing into the sealing can over the head of the screw.
4. Install the sealing wire through the two holes in the sealing can.
5. Thread the wire through the sealing bar (A) on the I/O card (or faceplate).
6. Twist the ends of the wire together and crimp the lead sealing tab over the ends of the wire.
7. Repeat the steps above on the screw hole (B) and sealing bar (D) on the other side of the meter.
Password-protected Min/Max value resets

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

Hardware-based security

The meter is equipped with a comprehensive security system that helps provide protection against unauthorized alteration or tampering of revenue-related quantities. This security system is intended to lock all revenue-related ION™ modules, ION links and ION setup registers. Basic meter configuration parameters are locked, including volts mode (service-type), PT ratio, and CT ratio. These locks are enabled at the factory for all sealed meters. Typical values that are protected include:

- kWh, kVARh, kVAh delivered, received, del-rec, del+rec
- kW, kVAR, kVA 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 complete list of all the locked modules that apply to specific firmware versions of ION7550 / ION7650 meters, see the ION Device Template Reference.

A two-pin jumper block is used to enable and disable the hardware security as described in “Disabling the hardware-based security” on page 9.
Configuring the revenue meter

When enabled, the meter security system helps prevent unauthorized alteration of revenue-related quantities. By default, all revenue meters are shipped from the factory with the security system enabled. To configure the revenue meter you need to:

◆ disable the hardware-based security by removing the communications (COM) card and repositioning a jumper on the card.
◆ reinstall the COM card with the repositioned jumper and configure the meter.
◆ Re-enabling the hardware-based security by removing the COM card and repositioning the jumper.

The components inside the device are extremely sensitive to electrostatic discharge.

DANGER

HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH
- Ensure your work area is clear of metal fragments and debris that could create a short circuit inside the meter.
- Ensure that your hands are free of any oils and contaminants that could damage the meter’s board components.
- Replace all screws removed during disassembly of the meter.

Failure to follow these instructions will result in death or serious injury.

NOTICE

ELECTROSTATIC DISCHARGE
Always wear an anti-static wrist strap and use an anti-static workbench or mat when working with the device’s inner components.

Failure to follow these instructions can result in damage to the meter.

Before disassembling the meter

Complete the following steps before attempting any service on the device:
1. Familiarize yourself with the contents of this document, in particular the “Safety precautions” on page 3.
2. Make sure you have all tools and parts required for the procedure, including an anti-static wrist strap and an anti-static workbench or mat.
3. Ensure all important data from the device (for example, revenue values) has been retrieved.
4. Turn off ALL power supplying the device. This includes high voltage digital inputs and relay connections. Ensure the device has been unpowered for at least 10 minutes prior to disassembly.
5. Use a properly rated voltage sensing device to confirm power is OFF.
6. Open all PT fuses (or direct voltage input fuses).
7. Close all CT shorting blocks.
8. Ensure that all cables still connected to the device are NOT live.

**Recommended tools**
- Phillips #1 manual (not electric) screwdriver
- Small adjustable wrench
- Anti-static wrist strap and anti-static workbench or mat
- Voltage sensing device

## Disabling the hardware-based security

To configure the revenue meter you need to reposition the revenue jumper located on the device’s COM card. This disables the hardware-based security.

### NOTICE

**DATA LOSS**
Ensure all important data from the device has been retrieved before removing the communications card.

**Failure to follow these instructions can result in permanent data loss.**

1. Unplug all wires connected to the communications card.

### NOTICE

**LOSS OF COMPLIANCE**
Ensure that you re-certify your meter with the appropriate revenue metering authorities after re-enabling the hardware-based security.

**Failure to follow these instructions may render your device non-compliant for billing purposes.**

2. Remove the anti-tamper seals from the device. Use a Phillips #1 manual screwdriver to remove the screw from the sealing can.
3. Remove the remaining screw from the other screw hole on the COM card.
4. Remove the chassis ground nut, using a small adjustable wrench.
5. Remove the sealing sticker (if applied) from the meter.
6. Remove the COM card by grasping it on both sides of its backplate and carefully pulling it out of the socket, away from the chassis.
If the card sticks in the meter, wedge the tip of a flat tip screwdriver between the card’s backplate and the meter chassis and gently pry the card loose.

7. Locate the jumper pin labeled “Revenue Sealing Jumper” on the COM card. The label is printed on the COM card circuit board next to the jumper pin.

8. Move the jumper onto one pin only to disable the hardware-based security. You can move the jumper to either pin as long as it is only on one pin.

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**Reinstalling the COM card and configuring the meter**

**NOTICE**

**EQUIPMENT DAMAGE**

- Properly orient the components and connectors when reinstalling them in the meter.
- Do not use excessive force when reinstalling the circuit boards or components or when tightening the screws.

Failure to follow these instructions can result in damage to equipment.

1. Re-insert the COM card by sliding the edges of the circuit board down the slots along each side of the chassis. Align the main connector of the CPU with the socket and press the card firmly into place.

   Secure the card with the two screws and the chassis ground nut. Ensure the ground wire is connected to the meter protective earth ground terminal (for example, ground nut/lug/post etc.).
2. Apply control power to the meter.
3. Configure the meter as required (for example, volts mode, PT and CT ratios, Pulse outputs) now that hardware security is disabled.
4. Remove control power from the meter.
5. Use a properly rated voltage sensing device to confirm power is OFF.

**DANGER**

HAZARD OF ELECTRIC SHOCK, EXPLOSION OR ARC FLASH

- Verify the control power source meets the specifications for your meter’s power supply option.
- Make sure protective ground (earth) is connected before turning on power to the meter.
- Turn off all power supplying this device and the equipment in which it is installed before working on the device or equipment.
- Always use a properly rated voltage sensing device to confirm that all power is off.

*Failure to follow these instructions will result in death or serious injury.*
Re-enabling the hardware-based security

1. Remove the COM card again and move the jumper fully onto both pins to re-enable the hardware-based security.

2. Re-insert the COM card by sliding the edges of the circuit board down the slots along each side of the chassis. Align the main connector of the CPU with the socket and press the card firmly into place.

3. Secure the COM card with the two screws, re-applying the anti-tamper sealing to one of the screw holes (see “Anti-tamper sealing kit” on page 5).

4. Secure the chassis ground nut. Ensure the ground wire is connected to the meter protective earth ground terminal (for example, ground nut/lug/post etc.).

**CT & PT selection**

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