

# PowerLogic™ ION8650 cellular modem option

This document describes the cell modem option for the PowerLogic™ ION8650 energy and power quality meter. The cell modem option is available on all models of the socket meter. The cell modem option is not supported on the ION8650 switchboard meter.

The cell modem option requires firmware version 4.20 or later.

It is recommended that you upgrade to the latest version of ION Setup to help properly configure the features available on your meter, including the cell modem.

Refer to the documents in “Additional information” for detailed instructions and precautions regarding the ION8650 meter.

For more information regarding this meter, search for ION8650 at [www.schneider-electric.com](http://www.schneider-electric.com).

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**Additional information**

- PowerLogic ION8650 socket meter installation guide
- PowerLogic ION8650 User Guide

# 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.

|                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------|
| <b>⚠ DANGER</b>                                                                                                        |
| <b>DANGER</b> indicates a hazardous situation which, if not avoided, <b>will result in</b> death or serious injury.    |
| <b>⚠ WARNING</b>                                                                                                       |
| <b>WARNING</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> death or serious injury.  |
| <b>⚠ CAUTION</b>                                                                                                       |
| <b>CAUTION</b> indicates a hazardous situation which, if not avoided, <b>could result in</b> minor or moderate injury. |
| <b>NOTICE</b>                                                                                                          |
| <b>NOTICE</b> is used to address practices not related to physical injury.                                             |

## 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.

# Notices

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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.

As standards, specifications and designs change from time to time, please ask for confirmation of the information given in this publication.

## FCC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that the interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment to an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The user is cautioned that any changes or modifications not expressly approved by Schneider Electric could void the user's authority to operate the equipment.

This digital apparatus complies with CAN ICES-3 (B) /NMB-3(B).

This device complies with FCC radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

This equipment complies with Part 68 of the FCC rules and the requirements adopted by the Administrative Council for Terminal Attachments (ACTA). On the side of this equipment is a label that contains, among other information, a product identifier in the format US: AAAEQ##TXXXX. If requested, this number must be provided to the telephone company.

There are no user serviceable parts in this equipment.

Connection to party line service is subject to state tariffs. Contact the state public utility commission, public service commission or corporation commission for information.

If your premises has specially wired alarm equipment connected to the telephone line, ensure that the installation of this Digital Power Meter with Internal Modem does not disable your alarm equipment. If you have questions about what will disable alarm equipment, consult your telephone company or a qualified installer.

## Industry Canada

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should not be so chosen that the equivalent isotropically radiated power (e.i.r.p) is not more than that necessary for successful communication.

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

This device complies with Industry Canada RF radiation exposure limits set forth for general population. This device must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

## Safety precautions

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

### DANGER

#### **HAZARD OF ELECTRIC SHOCK, EXPLOSION, OR ARC FLASH**

- Apply appropriate personal protective equipment (PPE) and follow safe electrical work practices. See NFPA 70E in the USA, CSA Z462 or applicable local standards.
- 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 power is off.
- Replace all devices, doors and covers before turning on power to this equipment.

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

## Overview

The ION8650 meter has a cell modem option that provides another communication method to the meter. The communications board has been revised to accommodate a cell modem module which can replace the 56k analog modem option. In addition to the new hardware, the meter's firmware contains a new core communications module to provide setup information for the cell modem. Once the connection is successful, you can connect to your meter through one of the cell modem ports using a meter configuration tool such as ION Setup.

### Features

- Configure up to six simultaneous connections to the meter using ION, Modbus, TCP and DNP 3.0 protocols. The protocol and number for each port are configured through the meter display or ION Setup.
- View cell modem information such as IP address and signal strength through ION Setup.
- Set the range of IP addresses that are permitted to connect to the meter. The allowed IPs are configured through ION Setup.
- Enable and disable the cell modem port through the ENABLED COM PORTS menu (ION8650C meter only).

## Available options

### Meter options

The following options are available with the ION8650 cellular modem option for communications:

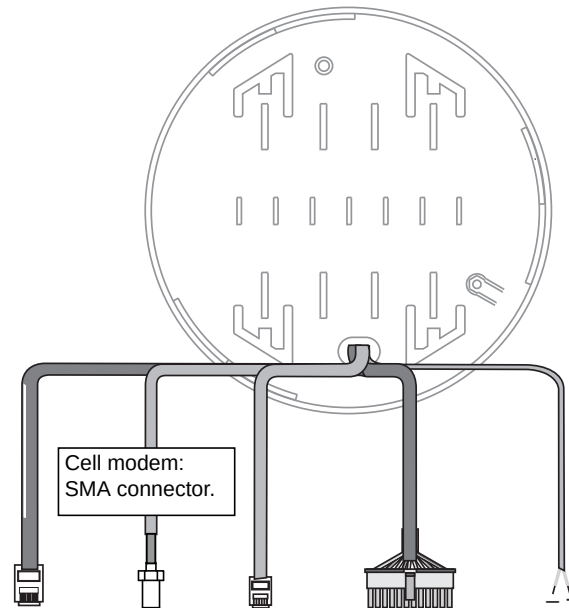
| Option                                                                                                                                   | Code | Description                                                                                       |
|------------------------------------------------------------------------------------------------------------------------------------------|------|---------------------------------------------------------------------------------------------------|
| <b>Power supply</b> <sup>1</sup><br>M 8 6 5 0 A 0 C 0 <span style="border: 1px solid black; padding: 0 2px;">H</span> 6 C 1 B 0 A        | E    | 3-phase power supply (blade powered) <sup>2</sup>                                                 |
|                                                                                                                                          | H    | Auxiliary power supply - Standard                                                                 |
|                                                                                                                                          | J    | Auxiliary power supply - High voltage                                                             |
| <b>Communications</b> <sup>3</sup><br>M 8 6 5 0 A 0 C 0 H 6 <span style="border: 1px solid black; padding: 0 2px;">S</span> 0 A 0 A      | S0   | Front panel infrared optical port, RS-232/RS-485, RS-485, Ethernet, cellular modem <sup>4</sup>   |
| <b>Onboard digital I/O</b> <sup>5</sup><br>M 8 6 5 0 A 0 C 0 H 6 C 1 <span style="border: 1px solid black; padding: 0 2px;">B</span> 0 A | A    | No digital I/O                                                                                    |
|                                                                                                                                          | B    | 4 Form C solid state digital outputs, 3 Form A digital inputs                                     |
|                                                                                                                                          | C    | 4 Form C solid state digital outputs, 1 Form A solid state digital output, 1 Form A digital input |

1. Refer to "High accuracy metering considerations" in the *ION8650 Installation guide* for recommendations when selecting a power supply option.
2. The standard 3-phase power supply is powered from the meter's voltage connections. Ensure your system meets the meter's steady state voltage specifications.
3. The ION8650C meter can only communicate through a maximum of three ports simultaneously (the infrared optical port, plus two other communications ports). The ION8650A and ION8650B meters can communicate simultaneously through all communications ports.
4. The cellular modem option is only available on the ION8650 socket meter.
5. Additional inputs and outputs are available through the separately-ordered I/O Expander.

**NOTE:** The 56k analog modem and cell modem are separate ordering options and cannot be on the same meter.

## Connections to the communications card (all options)

With the cell modem option, the communications cable includes an antenna cable with an SMA connector. See “Specifications” on page 12 for information on the antenna that is included with your meter.



## Process overview

Before you can use the ION8650 cell modem, it must be configured. Follow the steps below to configure the cell modem.

- Contact the service provider for your area and activate the meter. See “Cell modem activation” on page 8 for more information.
- Set port number and protocol for each connection. See “Configuring the ION8650 cell modem” on page 9 for more information.
- Set the range of IP addresses that are allowed to connect to the meter. See “Allowed IPs” on page 11 for more information.

## Cell modem activation

The cell modem requires network activation before it can be used. Follow the steps for the provider in your region.

### Verizon (US provider)

1. Locate the Mobile Equipment Identifier (MEID). This number can either be found on the label on the side of the meter, through the meter display, or by connecting to the meter using ION Setup.
2. Contact Verizon, provide the MEID and modem type and request an activation of the meter’s cell modem.
3. Activate the cell modem by connecting to the meter with terminal software such as Telnet or Hyperterminal. Once you have successfully logged into the meter, enter `cellactivate 1` at the prompt.



**NOTE:** If you are connected to the meter through Ethernet, you must type 9 and press Enter to bring up the debug screen, then enter `cellactivate 1` at the prompt to activate the cell modem.

4. Verify that the IP address shown on the meter matches the IP address issued by the provider.

**NOTE:** It is recommended that when activating your modem, a static IP address is requested. Using a dynamic IP can result in a change of IP address whenever the meter is power cycled.

## Configuring the ION8650 cell modem

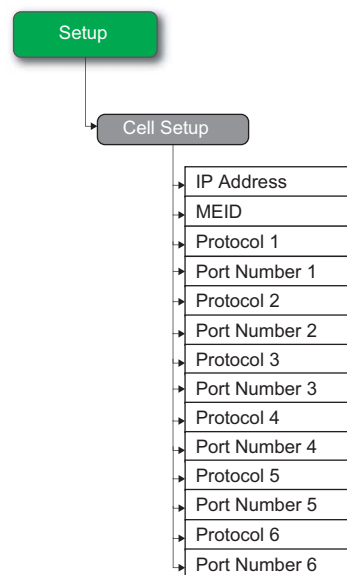
### Using the display

Use the display to navigate to the setup menus to perform cell modem setup on your meter.

1. Press and hold the round (**ALT/ENTER**) button to access the meter's setup screens.
2. Use the up or down arrow buttons to select **CELL SETUP** and press **ALT/ENTER**.
3. Configure the settings (Protocol and Port Number) for each connection.

**NOTE:** To disable the connection to a port, set the port number to zero. This allows you to restrict the number of simultaneous connections to the meter through the cell modem.

### Display cell modem menu



| Setting       | Description                                                       | Range (Values)                 | Default          |
|---------------|-------------------------------------------------------------------|--------------------------------|------------------|
| IP Address    | Displays the IP address assigned to the cell modem by the network | xxx.xxx.xxx.xxx                | not configurable |
| MEID          | Displays Mobile Equipment Identifier                              | not configurable               | not configurable |
| Protocol 1    | Specifies the protocol used for connection 1                      | None, ION, Modbus TCP, DNP 3.0 | None             |
| Port Number 1 | Specifies the port number to establish connection 1               | 1 - 65535                      | 0                |
| Protocol 2    | Specifies the protocol used for connection 2                      | None, ION, Modbus TCP, DNP 3.0 | None             |

| Setting       | Description                                         | Range (Values)                 | Default |
|---------------|-----------------------------------------------------|--------------------------------|---------|
| Port Number 2 | Specifies the port number to establish connection 2 | 1 - 65535                      | 0       |
| Protocol 3    | Specifies the protocol used for connection 3        | None, ION, Modbus TCP, DNP 3.0 | None    |
| Port Number 3 | Specifies the port number to establish connection 3 | 1 - 65535                      | 0       |
| Protocol 4    | Specifies the protocol used for connection 4        | None, ION, Modbus TCP, DNP 3.0 | None    |
| Port Number 4 | Specifies the port number to establish connection 4 | 1 - 65535                      | 0       |
| Protocol 5    | Specifies the protocol used for connection 5        | None, ION, Modbus TCP, DNP 3.0 | None    |
| Port Number 5 | Specifies the port number to establish connection 5 | 1 - 65535                      | 0       |
| Protocol 6    | Specifies the protocol used for connection 6        | None, ION, Modbus TCP, DNP 3.0 | None    |
| Port Number 6 | Specifies the port number to establish connection 6 | 1 - 65535                      | 0       |

## Using ION Setup

You can configure the port number and protocol connections over the associated cellular network through ION Setup.

**NOTE:** The following configuration steps must be completed for the cell modem to function properly.

1. Start ION Setup.
2. Open the Setup Assistant for your meter.
3. Navigate to **Communications > Cellular Settings > Connections**.
4. Select the entry you want to change and click **Edit**. The **Cellular Protocol Options** dialog appears.
5. Select the protocol from the dropdown list (ION, Modbus, TCP, DNP 3.0), enter the port number associated with the protocol and click **OK**.

Use ION Setup to view information relating to your meter, configure the permitted IP addresses for the cell modem, and configure the available protocol connections over the cellular network.

## Additional features

### Info

You can view information relating to your service provider's cellular network through ION Setup.

1. Start ION Setup.
2. Open the Setup Assistant for your meter.
3. Navigate to **Communications > Cellular Settings > Info**.

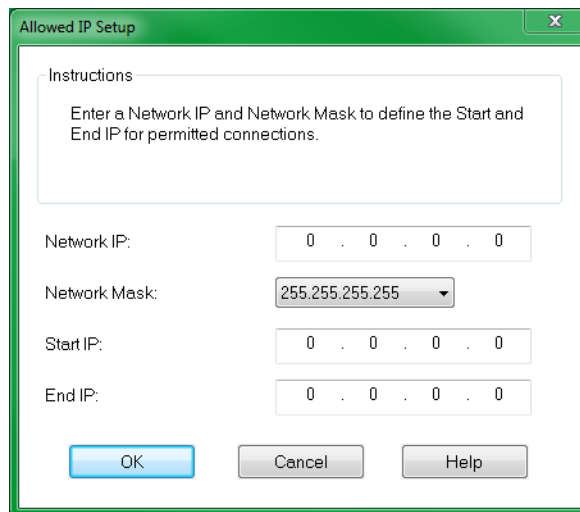
| Setting         | Description                                                      |
|-----------------|------------------------------------------------------------------|
| IP Address      | Displays the TCP/IP address assigned to the meter.               |
| MEID            | Displays the mobile equipment identifier.                        |
| Signal Strength | Displays the cellular signal strength in decibal-milliwatt (dBm) |

## Allowed IPs

Through ION Setup, you can configure the IP addresses that are allowed to be connected to the meter using the cellular network. This feature allows you to select the IP address range that the cell modem will accept a connection from. If the IP address falls outside this range, a connection cannot be made to the meter through the cell modem.

**NOTE:** This function can only be performed through ION Setup.

1. Start ION Setup.
2. Open the Setup Assistant for your meter.
3. Navigate to **Communications > Cellular Settings > Allowed IPs**.
4. Click **Add** to add another IP address to the list. The **Allowed IP setup** dialog appears. Enter the IP address in the **Network IP** field using the aaa.bbb.ccc.ddd format.
5. Select the applicable network mask from the dropdown list. The addresses provided for the **Network IP** and the **Network Mask** define the start and end IP addresses.
6. Click **OK**.



7. Select an entry from the list and click **Edit** to modify an existing IP address. The **Allowed IP setup** dialog appears. Modify the IP address in the **Network IP** field using the aaa.bbb.ccc.ddd format. Select the applicable network mask from the dropdown list. Click **OK**.
8. Select an entry from the list and click **Delete** to remove an IP address from the list. Click **Yes** to confirm.

**NOTE:** A **Start IP** of 0.0.0.0 and an **End IP** to 255.255.255.255 allows all incoming connections to the cell modem.

## ENABLED COM PORTS menu (ION8650C only)

Up to three COM ports can be active simultaneously on the ION8650C. COM3 (the front optical port) is always enabled. The ENABLED COM PORTS menu allows you to select the other two COM ports that you want enabled. The cell modem is one of those ports.

## Enabling and disabling ION8650C cell modem using the display

1. Press the **ALT/ENTER** button to enter the SETUP menu
2. Use the arrow buttons to scroll down the menu and select **ENABLED COM PORTS**, then press **ALT/ENTER**. Select **CONTINUE** and press **ALT/ENTER** when prompted.
3. Select **CELL MODEM** and press **ALT/ENTER**. Select **DISABLED** and press **ALT/ENTER**. If prompted, enter the meter password to confirm the change.
4. Select **CELL MODEM** and press **ALT/ENTER**. Select **ENABLED** and press **ALT/ENTER**. Confirm the change if prompted.
5. Select **REBOOT** and press **ALT/ENTER**. Enter the meter password and confirm the change if prompted.

**NOTE:** Select **UNDO & RETURN** to exit the **ENABLED COM PORTS** setup menu without making any changes. Your meter will not reboot.

## Enabling and disabling the ION8650C cell modem using ION Setup

**NOTE:** You must manually power cycle the meter for the changes to take effect.

1. Select **Communication > Enable/Disable** and click the **Enabled Ports** tab.
2. Select the Cellular Modem port.
3. Click **Edit**. Enter the meter password if prompted. The **Set Enabled Ports** dialog appears.
4. Select the checkbox to enable the cell modem, or clear the checkbox to disable it.
5. Click **OK** to return to the Setup Assistant. Changes take effect the next time the meter is power cycled, either manually or in a power outage.

## Specifications

|                |                                                                                                                     |
|----------------|---------------------------------------------------------------------------------------------------------------------|
| Cellular modem | CDMA2000 1xRTT<br>EV-DO Rev A (backwards compatible to EV-DO Rev. 0 and CDMA 1x networks)<br>Dual-band 800/1900 MHz |
| Antenna        | Frequency Range: 482 - 894 MHz / 1850 - 1990 MHz                                                                    |
|                | Impedance: 50 Ohms                                                                                                  |
|                | VSWR: Should not exceed 2.0:1 at any point across the bands of operation                                            |
|                | Typical Radiated Gain: 2                                                                                            |
|                | Radiation: Omni-directional                                                                                         |
|                | Polarization: Linear vertical                                                                                       |