PowerLogic ION8650 cellular modem option

This document describes the cell modem option for the PowerLogic™ ION8650 energy and power quality meter.

What's in This Document

Additional information

Visit www.schneider-electric.com to download additional documentation.

For additional information regarding operation and installation of these meters, see the following documents available for download from the website:

*   *PowerLogic ION8650 socket meter Installation guide*
*   *PowerLogic ION8650 User manual*

Schneider Electric™

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 a hazardous situation which, if not avoided, **will result in** death or serious injury.

⚠ WARNING

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

⚠ CAUTION

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

NOTICE

NOTICE 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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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.

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.

Conformément à la réglementation d'Industrie Canada, le présent émetteur radio peut fonctionner avec une antenne d'un type et d'un gain maximal (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Dans le but de réduire les risques de brouillage radioélectrique à l'intention des autres utilisateurs, il faut choisir le type d'antenne et son gain de sorte que la puissance isotrope rayonnée

équivalente (p.i.r.e.) ne dépasse pas l'intensité nécessaire à l'établissement d'une communication satisfaisante.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Le présent appareil est conforme aux niveaux limites d'exigences d'exposition RF aux personnes définies par Industrie Canada. L'appareil doit être installé afin d'offrir une distance de séparation d'au moins 20cm avec l'utilasateur, et ne doit pas être installé à proximité ou être utilisé en conjonction avec une autre antenne ou un autre émetteur.

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 that all power is off.
- Treat communications and I/O wiring connected to multiple devices as hazardous live until determined otherwise.
- Do not exceed the device's ratings for maximum limits.
- 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.

NOTE: See IEC 60950-1:2005, Annex W for more information on communications and I/O wiring connected to multiple devices.

Overview

The ION8650 meter has a cell modem option that provides an additional 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.

The cell modem option is available on all models of the socket meter. The cell modem option is not supported on the switchboard meter.

Modem	Firmware required
CDMA (Code Division Multiple Access)	4.20 (4.020.000) or later
LTE	4.30 (4.030.000) 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.

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.
- Configure the cell modem to activate when the account with your cellular carrier is set up for roaming.
- 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).
- Programmable APN.
- Time sync over cell modem for ION and other protocols.

Meter options

All usual meter options are available with the ION8650 cell modem option, including I/O and power supply.

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

| Option	Code	Description
Communications[1] M 8 6 5 0 A 0 C 0 H 6 S 0 A 0 A	S0 (CDMA) S1 (LTE)	Front panel infrared optical port, RS-232/RS-485, RS-485, Ethernet, cellular modem[2]

[1] 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.

[2] The cellular modem option is only available on the ION8650 socket meter.

Cell modem connection

With the cell modem option, the communications cable includes one (CDMA) or two (LTE) antenna cables with SMA connectors.

See "Specifications" for information on the antenna that is included with your meter.

A. Main antenna cable (black)
B. Diversity antenna cable (red) (LTE only)
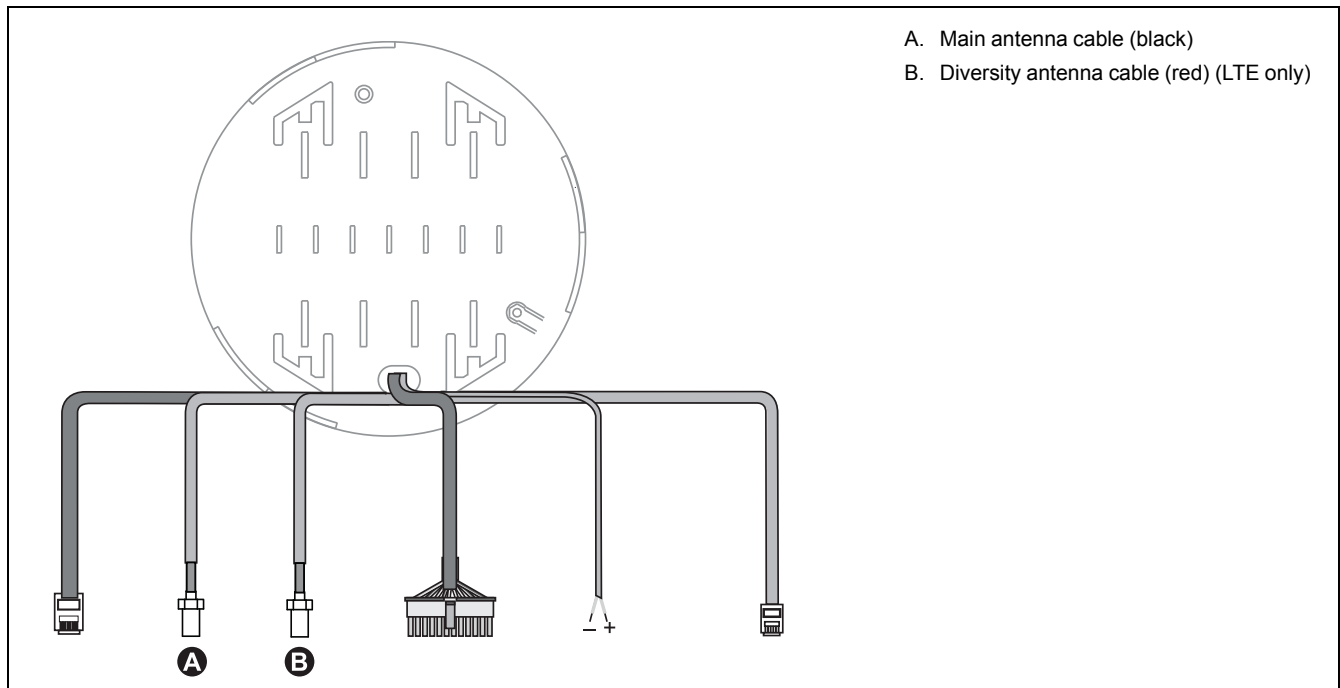
Configuration process overview

Before you can use the ION8650 cell modem, it must be configured.

- Contact the service provider for your area and activate the meter. See "Activating the cell modem" for more information.

- Set port number and protocol for each connection. See "Configuring the cell modem" for more information.

- Set the range of IP addresses that are allowed to connect to the meter. See "Allowed IPs" for more information.

Activating the LTE cell modem for Verizon (US provider)

Verizon will activate your cell modem after you contact them and provide them with your device's information.

Before the cell modem can be activated on your meter, you must request activation with your cellular carrier:

- Locate the International Mobile Equipment Identity (IMEI) number. This number can either be found on the label on the side of the meter or by connecting to the meter using ION Setup.

- Contact Verizon, provide the IMEI number and modem type and request an activation of the meter's cell modem.

1. Open the Setup Assistant for your meter. See the ION Setup for more information.

2. Navigate to **Communications > Cellular Settings** and select the **Info** tab.

3. Find the IMEI number for the device.

   NOTE: Once Verizon completes their activation, you may be required to adjust the APN as per Verizon's instructions. After changing the APN, your meter should automatically activate on the network (it may take up to 60 seconds). Instructions to configure the APN are detailed in the section "Viewing and configuring cellular network information using ION Setup".

Activating the CDMA cell modem for Verizon (US provider) using ION Setup

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. Open the Setup Assistant for your meter. See the ION Setup online help for more information.

4. Navigate to **Communications > Cellular Settings** and select the **Info** tab.

5. Select Activation Status then click **Activate**.

6. 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.

Activating the CDMA cell modem for Verizon (US provider) using Telnet/Hyperterminal

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 cell modem using the display

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

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

1. Press and hold the **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 Protocol to None. This allows you to restrict the number of simultaneous connections to the meter through the cell modem.

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/CCID	Displays Mobile Equipment Identifier	Not configurable	Not configurable
Protocol 1–6	Specifies the protocol used for connection 1–6	None, ION, Modbus TCP, DNP 3.0	None
Port Number 1–6	Specifies the port number to establish connection 1–6	1 - 65535	0

Configuring the cell modem 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**.

Viewing and configuring cellular network information using ION Setup

You can view information relating to your service provider's cellular network through ION Setup. There are also some settings you can configure.

1. Start ION Setup.

2. Open the Setup Assistant for your meter.

3. Navigate to **Communications > Cellular Settings > Info**.

Setting	Description	Read/write
IP Address	Displays the TCP/IP address assigned to the meter[1]	Read
MEID/CCID	Displays the SIM card number or MEID (CDMA)	Read
Signal Strength	Displays the cellular signal strength in decibel-milliwatt (dBm)	Read
IMEI	Displays the International Mobile Equipment Identifier	Read
Allow Roaming	This specifies whether the device is allowed to roam on a different service provider if it is outside their cellular network service provider's coverage	Read/write

Setting	Description	Read/write
APN	Enter the Access Point Name if requested by the cellular network service provider	Read/write
Network	Displays the current network and cellular service provider	Read

[1] Only IPv4 addresses are supported.

NOTE: Not all settings are available for all meters.

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.

Configuring allowed IPs using 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 the 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 or ENABLED and press **ALT/ENTER**. If prompted, enter the meter password to confirm the change.

4. 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

You can enable and disable your meter's cell modem on the ION8650C using ION Setup.

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

1. Start ION Setup.

2. Open the Setup Assistant for your meter.

3. Select **Communication > Enable/Disable** and click the **Enabled Ports** tab.

4. Select the Cellular Modem port.

5. Click **Edit**. Enter the meter password if prompted. The **Set Enabled Ports** dialog appears.

6. Select the checkbox to enable the cell modem, or clear the checkbox to disable it.

7. 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

Specifications depend on which modem is installed.

CDMA

Specification		Description
Cellular modem	Model/type	CDMA2000 1xRTT / EV-DO Rev A (backwards compatible to EV-DO Rev. 0 and CDMA 1x networks)
	Frequency bands	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
	Gain	2
	Radiation	Omni-directional
	Polarization	Linear vertical

LTE

Specification		Description
Cellular modem	Model/type	MTSMC-LVW3 / LTE FDD Cat 1, 3GPP release 9 compliant
	Data speed	LTE: 10 Mbps downlink/ 5 Mbps uplink
	Frequency bands	4G: 1900 (B2) / 700 (B13) / AWS 1700 (B4)
Antennas	Frequency range	690 - 960 MHz / 1710 - 2700 MHz
	Power rating	10 W

Specification		Description
	VSWR	< 2.0:1
	Gain	1 dBi
	Radiating element	1/2 wave element
	Polarization	Linear