



I-210+c[®] Generation II SmartMeter

Itron's residential smart metering solution features a communications module that is integrated into the GE I-210+c electricity meter. The I-210+c Generation II SmartMeter communicates over an existing cellular network with the Itron Transaction Management System™ (TMS) and complies with ANSI C12.19 protocols for data storage and transmission.

The I-210+c SmartMeter is a single-phase electronic watt-hour meter for use in residential and light commercial service locations. The I-210+c's key features include Time of Use, Demand and Load Profile, Remote Connect/Disconnect. The I-210+c SmartMeter may include an optional ZigBee® wireless component for in-premise communications.

FUNCTIONS & FEATURES

Remote Disconnect/Reconnect

Remote connect and disconnect functionality is supported by the I-210+c single-phase SmartMeter, which has a load-limiting switch that can be used to shed overall load at the premise without regards to specific appliance. This 200-Amp switch may be used to throttle load

at the premise to a specific maximum threshold or to perform remote disconnects and reconnects.

Flexible Two-Way Data Retrieval and Scheduled Data Collection

Users can execute all appropriate TMS functionality using user-configurable, SmartMeter-controlled schedules and TMS-controlled schedules and as well as on an on-demand basis.

Automated Interval Data/Energy Usage Retrieval

The I-210+c SmartMeter module retrieves and transmits interval data for 1 energy value for intervals as small as 5 minutes. Recorded events and exceptions with each interval are also transmitted to TMS, which interprets them and logs appropriate messages (e.g. time adjustments).

Real-Time Interval Reads

Real-time interval data acquisition enables utilities to implement Load Curtailment and Real Time Pricing (RTP) programs. With this functionality, the user can configure the SmartMeter module to transmit load profile data as often as every 15 minutes at interval completion.

Automated Register, Self-Read and TOU Retrieval

The I-210+c SmartMeter module is configured by TMS to read and transmit all or a subset of enabled registers, including totals, self-reads, maximum demand and time-of-use values.

Demand Resets

The I-210+c SmartMeter module executes Demand Resets using one of three methods: SmartModule-initiated schedules, TMS-initiated schedules or TMS on-demand requests.

Real-Time Meter Event and Alarm Retrieval

The I-210+c SmartMeter provides automatic real-time alarm reporting of all events defined in the ANSI C12.19 standard, including history and event codes, ANSI Standard status and manufacturer status alarms. Additionally, alarms received by TMS can be automatically routed via e-mail to a specific user or group of users using the TMS Message Routing Interface.

Real-Time Power Outage and Restoration Alarms

With built-in ultracapacitor energy storage, the I-210+c SmartMeter module will transmit a real-time “last gasp” notification when detecting an AC power outage without requiring the use of less reliable batteries. The I-210+c SmartMeter also notifies TMS when the AC power is restored and provides full configuration of these alarms based on user-defined durations.

Service Diagnostic and Tamper Detection Alerts

The I-210+c SmartMeter can report power service and wiring errors detected by the meter, including reverse polarity, cross-phase and energy flow, phase voltage deviation, inactive phase current, phase angle displacement and current waveform distortion. In addition, the SmartMeter can detect and report exceptions for the following tamper events: number of Demand Resets, Loss of AC power and reported power outages.

TMS configures a specific filter in the SmartMeter for each of these events, enabling the transmission of a corresponding alert only after the event is repeated a minimum number of times within a specific duration. TMS can also configure the SmartMeter to reset the event counter when the alert message is transmitted.

Tilt Detection

The I-210+c SmartMeter can detect and report tilt events that occur when the SmartMeter is moved from its installation position.

Meter Clock Synchronization

If enabled, the SmartModule automatically adjusts the meter clock when the time deviation falls within user-defined lower and upper deviation boundaries based on a reference clock provided by TMS. If the deviation exceeds the upper boundary, the module reports the deviation via an alarm but does not correct the meter clock. If the deviation is less than the lower boundary, the module ignores the deviation.

SmartMeter Status Display

The I-210+c SmartMeter supports an optional LCD status sequence to display important SmartMeter indicators periodically. The status sequence includes the meter site coverage status, signal strength, SmartModule firmware state and any SmartModule firmware warning/errors enabling technicians to ensure proper installation of the I-210+c SmartMeters and allow field troubleshooting without any other tools.

Automated Meter Registration

The SmartMeter module automatically transmits a registration message to TMS when the meter is installed without requiring user intervention. This message permits TMS to create or update the meter record with validated information, ensuring accurate and automated record entries without user intervention.

Secure and Encrypted Data Transmissions

Cryptographic digital signature is applied for all firmware along with the capability to validate digital signature prior to uploading and applying any new firmware. 256-bit encryption is applied to all messages exchanged between TMS and the SmartMeter module, utilizing a unique meter-specific encryption key.

Bi-Directional Metering

The I-210+c SmartMeter is a bi-directional meter that supports Net Metering. Both received and delivered data metrics are stored in the meter and can be delivered to the utility as needed to support “green-credit” electricity programs for consumers who own renewable energy facilities or participate in vehicle-to-grid systems.

Over-The-Air SmartMeter Module Firmware Upgrade

TMS users with administrator privileges can remotely upgrade the I-210+c SmartMeter module firmware for one or multiple communication modules.

Transmission Efficiency

In addition to support for allowing users to filter the number of meter channels and types of diagnostics that are returned, all wireless messages are converted to binary and optimally compressed before transmission to ensure the most economical data processing rates. The compression ratio can be as high as 50% and overall data usage can be as little as 5% of the total usage of other wireless systems.

Automated ID Tracking

Barcode labels and important identifiers (e.g. ICC-ID / MS-ISDN) are attached to the integrated SmartMeter for tracking and troubleshooting purposes. The SmartMeter module manufacturer and meter integrator scan and track all device IDs accurately.

On-Demand Data Reads For Virtual Disconnect

Customers can perform virtual disconnects through TMS by retrieving a final read for one end-user and an initial read for a subsequent end-user. This function may also be used to perform meter “switch-outs.”

SPECIFICATIONS

Temperature Ranges

- » Operating: [-40°C, +85°C]
- » Transmission (wireless): [-40°C, +70°C]

Humidity Range

- » 0% to 95% non-condensing

Accuracy

- » Meets ANSI 12.20 for accuracy class 0.5%

Supported Meter Forms Without Disconnect

- » Class 20: 3S, 4S
- » Class 100: 1S
- » Class 200: 2S, 12S, 25S
- » Class 320: 2S

Supported Meter Forms With Disconnect

- » Class 100: 1S
- » Class 200: 2S, 12S, 25S

Regulatory & Industry Certifications

- » FCC Part 15 Class B
- » ANSI C37.90.1 – 1989: Surge Withstand Capability (SWC)
- » ANSI C12.20 (Class 0.5) – 1998
- » PTCRB Certified
- » Measurement Canada Certified
- » Network Carrier Certified

HARDWARE

Radio Control Module Board (RCM)	32-bit ARM processor, 64MB RAM, 128MB flash
Capacitor Storage Bank (CSB)	Supplies power for and all functions during power outages – no batteries required
Modem	Modem communicates with head-end using EVDO and SMS services
2.4 GHz Transceiver	Wireless component configurable for two-way communications/WPAN 802.15.4
Internal Antenna	Flexible dual frequency antenna for the modem

INPUT/OUTPUT SIGNAL

Module Power Input Voltage	120 - 240 VAC
Meter Serial Interface	3.3V / TTL compatible asynchronous

VERSION AND COMPATIBILITY

I-210+c Meter Hardware:	Supported meter forms, classes, and types, equipped with battery
I-210+c Meter Firmware:	Latest fully supported
SmartModule:	I-210+c EVDO SmartMeter Module
Itron TMS:	Version 7.2.1 or higher for EVDO

Integration

The SmartMeter module is a fully integrated, under-the-cover option inside the I-210+c meter. The I-210+c SmartMeter is shipped as one complete unit, ready for field deployment.



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