A3 ALPHA® HSDPA SmartMeter

Itron's cellular commercial and industrial (C&I) metering solution features a communications module that is integrated into the Elster A3 ALPHA electricity meter. The A3 ALPHA SmartMeter communicates with a server running Itron's Transaction Management System™ (TMS) and complies with ANSI C12.19 protocols for data storage and transmission.

This solution delivers actionable intelligence (critical usage and rate data) over secure cellular networks (such as AT&T and Rogers Wireless) and the Internet—in lieu of cumbersome and expensive private networks. This makes mass deployments quicker, easier, and more scalable, providing a significantly greater return on resources (RoR) for utilities.

Unlike proprietary, closed-architecture solutions, the A3 ALPHA SmartMeter is essentially a future-proof investment in technology. Its standards-based IP connectivity makes it adaptable and field-upgradable to support today's sensoring and communications needs—as well as tomorrow's opportunities—better than any alternative.

FUNCTIONS & FEATURES

Flexible Two-Way Data Retrieval and Scheduled Data Collection

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

Automated Interval Data/Energy Usage Retrieval

The A3 HSDPA SmartMeter module retrieves and transmits interval data for up to 32 unique energy values for intervals as small as five minutes. Recorded events and exceptions with each interval are also transmitted to the 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 interval data as often as every 15 minutes at interval completion.

Automated Register, Self-Read and TOU Retrieval

The A3 HSDPA SmartMeter module is configured by the TMS to read and transmit all or a subset of enabled registers, including totals, self-reads, maximum demand and time-of-use values.

Instrumentation Profiling/Current and Voltage Profiling

The A3 SmartMeter module retrieves and transmits up to 32 unique instrumentation values from over 400 instrumentation sources, including Current and Voltage sources, for intervals as small as five minutes. Recorded events and exceptions with each interval are also transmitted to the TMS, which interprets them and logs appropriate messages (such as time adjustments).

Critical Peak Pricing

The A3 HSDPA SmartMeter supports critical peak pricing (CPP) functionality that enables utilities to designate specific "super-peak" periods of time dynamically as energy prices warrant.

Demand Resets

The A3 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 A3 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 ultra capacitor energy storage, the A3 SmartMeter module will transmit a real-time "last gasp" notification when detecting an AC power outage without the use of less reliable batteries. The A3 SmartMeter also notifies the TMS when the AC power is restored and provides full configuration of these alarms based on user-defined durations.

Power Quality Monitoring and Alarms

The A3 SmartMeter is capable of performing up to twelve power quality tests. The SmartMeter module may be configured to monitor and report power quality events based on the number of events or within a specific time period. Power quality information accumulated to qualify each test is transmitted to the TMS.

Over-The-Air SmartMeter Module Firmware Upgrade

TMS users with administrator privileges can remotely upgrade the A3 HSDPA SmartMeter module firmware for one or multiple HSDPA modules.

Tamper Detection Alarms

The A3 SmartMeter can monitor and report the following tamper detection events:

- Demand resets through button press
- Power outages due to loss of AC power
- Demand resets through remote communications
- Power outages recognized by the SSI module
- Total demand Resets including calendar initiated
- Number of days since last demand reset
- Number of logons per port
- Number of days since last pulse
- Number of write sessions per port
- Number of security failures per port

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 the 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 A3 SmartMeter supports an optional LCD status sequence to display important SmartMeter indicators periodically. This status sequence includes the meter site coverage status, SmartModule firmware state and any SmartModule firmware warnings/errors enabling technicians to ensure proper installation of the A3 HSDPA SmartMeters and allowing field troubleshooting without any other tools. This feature requires the use of MeterCat™ version 1.8 or higher when programming A3 meters.

Automated Meter Registration

The SmartMeter module automatically transmits a registration message to the TMS when the meter is installed without requiring user intervention. This message permits the 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

256-bit encryption is applied to all messages exchanged between the TMS and the SmartMeter module, utilizing a unique meterspecific encryption key.

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 (such as 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 the TMS by retrieving a final read for one end-user and an initial read for a subsequent end-user. This function is also

utilized to perform meter “switch-outs.”

SPECIFICATIONS

Temperature Ranges

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

Humidity Range

- 0% to 100% non-condensing

Accuracy

- Meets ANSI 12.20 for accuracy class 0.2%

Supported Meter Forms

- Class 20: 3S, 4S, 5S/35S, 6S/36S, 8S/9S, 10A, 35A and 36A
- Class 100: 13A and 16A
- Class 200: 2S, 12S and 14S/15S/16S
- Class 320: 2S, 12S and 16S

Regulatory & Industry Certifications

- FCC Part 15 Class B
- FCC Part 90
- ANSI C37.90.1 – 1989: (SWC)
- ANSI C12.20 – 2010

HARDWARE

CPU board (CPU)	32-bit ARM processor, 8 MB RAM, 4 MB flash
Capacitor Storage Bank (CSB)	Supplies peak power for data transmissions and all functions during power outages – no batteries required
SL8081	GSM modem communicates with the TMS using HSDPA and SMS services
Internal Antenna	Dual band conformal flex antenna
External Antenna kit (optional)	External GSM antenna & isolation circuit for the modem

INPUT/OUTPUT SIGNAL

Module Power Input Voltage	120-480 VAC +/- 20%
Module Input Current Limit	0.1A max
Continuous Power Consumption	300 mW
Meter Serial Interface	3.3V / TTL compatible asynchronous
Meter Option Interface	A3 ALPHA® KYZ option

VERSION AND COMPATIBILITY

A3 ALPHA® meter hardware	Supported meter forms, class and type (T, K, R - Including A & L options)
A3 Meter firmware	Revision 4.2+
SmartModule Revision	Revision R3
SmartModule	A3 HSDPA
Data Acquisition System	Transaction Management System (TMS) 7.1 or higher

Integration

The SmartModule is 100% under-the-glass per Elster’s Third Party AMR Board Design Specifications - 07/10/2003. The A3 HSDPA SmartMeter is shipped as one complete unit, ready for field deployment.

Itron is a global technology company. We build solutions that help utilities measure, monitor and manage energy and water. Our broad product portfolio includes electricity, gas, water and thermal energy measurement and control technology; communications systems; software; and professional services. With thousands of employees supporting nearly 8,000 utilities in more than 100 countries, Itron empowers utilities to responsibly and efficiently manage energy and water resources.

Join us in creating a more resourceful world; start here: **www.itron.com**

CORPORATE HEADQUARTERS

2111 N Molter Road
Liberty Lake, WA 99019
USA

Phone: 1.800.635.5461
Fax: 1.509.891.3355