

PPL CORPORATION, PPL RHODE ISLAND HOLDINGS, LLC,  
NATIONAL GRID USA, and THE NARRAGANSETT ELECTRIC COMPANY  
Docket No. D-21-09  
PPL Corporation and PPL Rhode Island Holdings, LLC's  
Responses to Green Energy Consumers Alliance's First Set of Data Requests  
Issued on September 30, 2021

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GECA 1-1

Request:

Rhode Island has a Renewable Energy Standard in RIGL §39-26-4. This statute requires that all electricity supply services, including those offered by the electric distribution company, include a minimum amount of renewable energy. Additionally, the General Assembly has set forth specific standards for entering long-term contracts with renewable energy generators in RIGL §39-26.1 *et seq.* What experience does PPL have in entering long-term contracts with renewable energy generators?

Response:

PPL and PPL RI refer to their response to data request OER 1-14.

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GECA 1-2

Request:

Rhode Island has consistently been a national leader in its energy efficiency programs, as established in RIGL §39-1-27.7 and the least cost procurement standards adopted in RIPUC Docket 5015. Does PPL operate energy efficiency programs in other jurisdictions? If yes, what percentage of energy savings - on both gas and electricity usage - are they achieving? What process does PPL utilize in developing energy efficiency plans in other jurisdictions?

Response:

In Pennsylvania, PPL Electric Utilities ("PPL Electric") has successfully developed, deployed and implemented energy efficiency programs for more than twelve years in compliance with Pennsylvania Act 129 of 2008 ("Act 129"). Under Act 129, the percentage of savings required to be achieved by each electric distribution company ("EDC") is determined by the Pennsylvania Public Utility Commission ("PUC") at the beginning of each multi-year phase. PPL Electric is currently in Phase IV of its Act 129 energy efficiency program. In each prior Act 129 phase, PPL Electric has exceeded its energy efficiency compliance targets:

Phase I (2009-2013) – PPL Electric achieved 1,642,067 MWh/yr of energy savings representing 143% of the compliance target. See PPL Electric's "Final Annual Report to the Pennsylvania Public Utility Commission – For the Period June 2012 through May 2013 Program Year 4" at <https://www.puc.pa.gov/pcdocs/1266699.pdf>.

Phase II (2013-2016) - PPL Electric achieved 1,194,372 MWh/yr of energy savings representing 145% of the compliance target. See PPL Electric's "EDC Program Year 7 Annual Report" at [https://www.pplelectric.com/-/media/PPLElectric/Save-Energy-and-Money/Docs/Act129\\_Phase3/Reports/py7-annual-report-112016.ashx](https://www.pplelectric.com/-/media/PPLElectric/Save-Energy-and-Money/Docs/Act129_Phase3/Reports/py7-annual-report-112016.ashx).

Phase III (2016-2021) - PPL Electric achieved 1,498,971 MWh/yr of energy savings representing 104% of the compliance target through Program Year 11. See PPL Electric's "Semi-Annual Report to the Pennsylvania Public Utility Commission – Phase III of Act 129 – Program Year 12" at [https://www.pplelectric.com/-/media/PPLElectric/Save-Energy-and-Money/Docs/Act129\\_Phase3/Reports/PPLPY12SemiAnnualReport20210315.ashx](https://www.pplelectric.com/-/media/PPLElectric/Save-Energy-and-Money/Docs/Act129_Phase3/Reports/PPLPY12SemiAnnualReport20210315.ashx). The final Phase III report for Program Year 12 which will include all verified savings for Phase III will be released on November 15, 2021.

In Kentucky, in 2020, LG&E and KU achieved approximately 83 GWh of energy savings from DSM programs, which translates to 0.3% based on 2020 LG&E and KU billed sales of 28,038

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GWh. For natural gas, in 2020, LG&E achieved 105,061 CCF in DSM program savings. This translates to 0.04% based on LG&E billed sales of 273,413,725 CCF.

See PPL's response to data requests OER 1-1 regarding its process in developing energy efficiency plans in other jurisdictions.

GECA 1-3

Request:

For energy efficiency programs developed or implemented by PPL, do they utilize Least Cost Procurement principles? Please describe any cost-effectiveness requirement that these plans met and how the plans met them. Please provide any performance metrics available for the energy efficiency programs such as dollars spent, cost to ratepayers, lifetime and annual MWh and MMBtu savings.

Response:

PPL and PPL RI refer to their response to data request OER 1-1. In Pennsylvania, electric distribution companies' ("EDC") Act 129 plans must be cost effective in accordance with the Pennsylvania Public Utility Commission's Final Implementation Order, at Docket M-2020-3015228, and the Total Resource Cost ("TRC") Test Order, at Docket M-2019-3006868.

The PUC's Final Implementation Order can be found at:

<https://www.puc.pa.gov/pcdocs/1666981.docx>

The TRC Test Order can be found at:

<https://www.puc.pa.gov/pcdocs/1648126.docx>

PPL Electric Utilities Corporation's Phase IV Act 129 plan meets the TRC test and is cost effective as is detailed in its plan that can be found at:

<https://www.puc.pa.gov/pcdocs/1705055.pdf>

In Kentucky, the Kentucky Public Service Commission ("KPSC") has encouraged cost-effective DSM programs and portfolios by utilizing the TRC Test score. Note, exceptions are made for programs that support low-income customers. For a summary of current programs, budgets, and past performance, please see the link below to the most recent DSM filing, Case No. 2017-00441:

[View Case Filings for: 2017-00441 \(ky.gov\)](#)

Also, for information on LG&E Electric DSM ratepayer costs, see Sheet No. 86 at the link below:

[Tariff.pdf \(ky.gov\)](#)

For LG&E Natural Gas DSM ratepayer costs, see Sheet No. 86 at the link below:

[Tariff.pdf \(ky.gov\)](#)



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For KU Electric DSM ratepayer costs, see Sheet No. 86 at the link below:

[Tariff.pdf \(ky.gov\)](#)

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GECA 1-4

Request:

Narragansett Electric has made specific commitments in PUC Docket 4780, generally referred to as Power Sector Transformation. Included in those commitments are the adoption of smart meter technology. National Grid's plan to roll out smart meters was filed in Docket 5113. What percentage of current PPL customers in United States jurisdictions have smart meters? If applicable, please provide technical specifications of any smart meters that the company has utilized. If applicable, has the company created an energy information portal to provide customers with data regarding their energy usage in real or close to real time?

Response:

PPL and PPL RI refer to their response to data request Division 7-49 for information regarding: (1) the percentage of current PPL customers in United States jurisdictions that have smart meters, and (2) technical information about the smart meters PPL Electric Utilities Corporation ("PPL Electric") has deployed to customers in Pennsylvania.

PPL Electric customers can see their usage through a company-created portal, which provides prior usage data in 15 minute intervals with usage data being made available the following day.

Louisville Gas & Electric Company ("LG&E") and Kentucky Utilities Company ("KU") are in the early stages of their smart meter rollout. LG&E and KU are using meters from Landis+Gyr utilizing a mesh network similar to PPL Electric. See Attachment GECA 1-4-1. LG&E and KU will also provide a company-created portal for customers to view prior usage data in 15 minute intervals with usage data being made available the following day. See Attachment GECA 1-4-2.

# Gridstream RF Mesh

Advanced Grid Communications Network



The Gridstream® RF network simply does more. Handles more messages. Connects to more sensors. Provides more control. And ultimately returns more to your bottom line. How? By supporting advanced multi-commodity metering, grid automation and home energy management applications – under a single network. Gridstream RF gives you the power to monitor and control, all while positioning your grid to meet future applications and standards requirements.

The innovative network is designed to support up to 5-minute interval data collections from residential and commercial meters, along with applications for advanced grid and load management.

Gridstream RF is a true mesh, peer-to-peer network where each endpoint, device and router extends the coverage and reliability of the network. It's also self-healing to provide dynamic routing of messages that automatically adjust for changes to endpoints and the introduction of obstructions such as foliage or new construction.

The system's routers are low power devices that extend network coverage and throughput. In addition, data collectors support up to 25,000 meters, which further minimizes infrastructure and maintenance costs.

From operations and engineering to customer service and billing, Gridstream delivers the applications that best define smart grid value.

## HIGHLIGHTS:

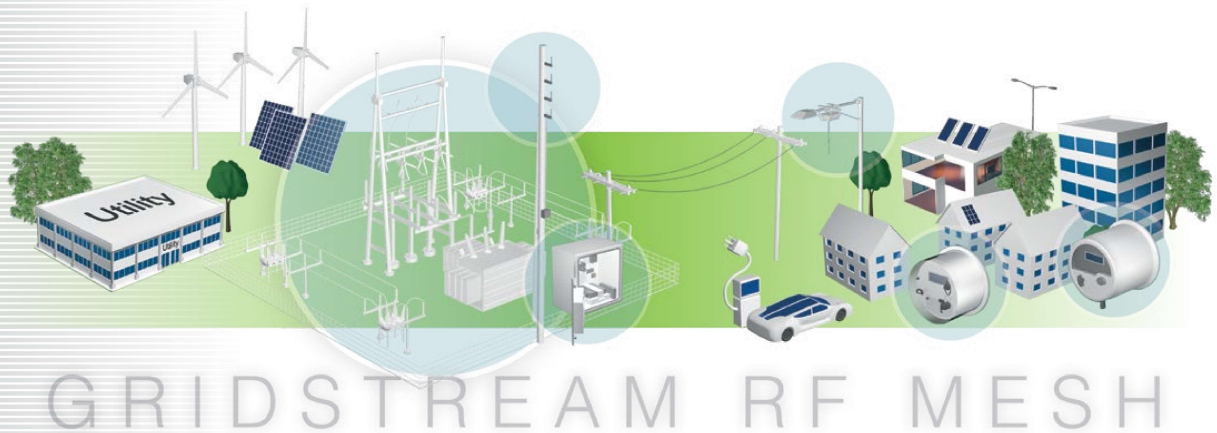
- Best-in-class security
- Remote configuration of endpoints
- “Plug-and-play” auto-registering endpoints and devices
- Outage and restoration notifications
- Variable payment options, such as prepay and time-of-use rates
- Remote disconnect/connect with advanced FOCUS® meters
- ZigBee®-enabled home area network
- Theft detection
- Direct load control and dynamic voltage management
- Standards-based network components, software and software integration

 **Gridstream**

Application Exhibit 4  
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**Application Exhibit 4**  
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**Gridstream RF Mesh Connects Utility Assets Across the Grid**



**Applications**

**Distribution System Analytics**

Leverage voltage and power quality data to optimize performance and reliability and prevent outages before they occur.

**Demand Response**

Peak power management options include dynamic voltage management, time-based pricing programs and direct load control.

**Remote Disconnect**

Offset costs and improve operational efficiency through consumer-directed programs and the ability to perform immediate load-side disconnects.

**Consumer Energy Management**

Engaging the consumer through energy portals, home area networking and dynamic payment programs such as prepay, encourages energy efficiency and improves customer service.

**Multi-Commodity and Scope**

Two-way communication capabilities extend to water and gas modules, distribution devices and direct load control switches for a one-stop resource management package.

**Outage Detection**

Because endpoints are in continuous communication with the network, outage reporting and restoration detection are triggered automatically.

**Integration with Most Applications**

Realize secure and easy integration into existing utility operations. Utilizing a standards-based approach, Command Center (the operating software for the Gridstream system) and the Gridstream Meter Data Management solution enable interoperability with other utility applications like those used for CIS, billing, engineering, operations, analytics and data management.

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**Product Specifications**



**Gridstream**  
**C7500 RF Collector**

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*Extended Data Collection Capabilities for RF Mesh Systems*

**Overview**

With enhanced on-board memory and faster communication speeds, the Gridstream® C7500 Collector is a powerful and flexible data collection and control center for users of Landis+Gyr's RF Mesh advanced metering systems.

The collector is designed to actively monitor up to 25,000 endpoints simultaneously to continuously communicate unique commands to individual endpoints, in both defined groups or across the entire network. Data is received from network routers and endpoints to provide a conduit for system hosting via Internet packets.

Installation options of the secure NEMA-4 collector include a distribution substation, wood utility pole, steel monopole, radio tower or in a rack. In addition, the C7500 is designed to support future applications and upgrades and can accommodate a variety of communications options to the utility including RF, fiber, cellular and microwave with the use of a WAN modem.

**FEATURES & BENEFITS:**

*Why Landis+Gyr makes a difference.*

- Simultaneously monitors to up to 25,000 AMI endpoints in Gridstream environments
- Auto-baud rates enable uninterrupted data communication regardless of RF link quality changes
- Maximizes bandwidth use with asynchronous spread spectrum frequency hopping
- Packet switching guarantees message transfer with automatic store and forward routing
- Auto-notification of power outage and restoration across entire AMI system

**Application Exhibit 4**  
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**Product Specifications: Gridstream C7500 RF Collector**

**Specifications**

Collector Dimensions	18"H x 17.5"W x 11"D (excludes antennas)
Weight	51 lbs.
Antennas	Four (4), remote RF Mesh Antennas, Antenex FG 9023 (typical)
Input Voltage	Selectable: 120/240 +/-20%
Input Current	1A typical at 120V
Power Consumption	48W maximum, 20W typical
Operating Frequency Band	902-928 MHz, Unlicensed
Transmit Output Power	1W maximum for each IWR
Standards Compliance	FCC Part 15, Class B
Operating Temperature	-40°C to +85°C (maximum local internal ambient temperature)*
Storage Temperature	-40°C to +85°C
Color	Gray
Enclosure Material/Type	Aluminum/ NEMA-4, Lockable
Backup Battery	SLA, 12V, 13 Ah
Backhaul Data	Ethernet 10/100T
Mounting Options	Rack Mount, Utility Pole, Pad Mount, Roof Top, Unistrut Frame, other

\*-40C to +60C outdoors, direct sunlight; -40C to +70C indoors or out of direct sunlight

**Gridstream Series V Radio Specifications**

**Electrical** (General)

Input Voltage Range	6 – 28 VDC
Input Current (in transmitting mode)	320 mA typical (12 VDC operation)
Input Current (in receiving mode)	38 mA typical (12 VDC operation)
RF Frequency Range	902-928 MHz
Channel Spacing	100, 300 or 500 kHz depending on the mode
RF Data Rate	9.6, 19.2, 38.4, 115.2, 300 kbps

**Receiver**

Sensitivity (at 10% packet error rate)	-112 dBm (9.6 kbps) Typical
	-101 dBm (115.2 kbps) Typical
	-95 dBm (300 kbps) Typical
Co-channel Rejection	10 dB Typical
Adjacent Channel Rejection	30 dB Typical
Alternate Channel Rejection	45 dB Typical

**Transmitter**

Output Power (at Antenna Connector)	21/25/30 dBm (user selectable)
Modulation Type	2-FSK, GFSK
Modulation Index	1
Out-of-band Spurious Emissions	<-70 dB

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3.18.14



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Product Specifications



**Gridstream**  
**C6500 RF Collector**

**Landis+**  
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C6500 RF Collector *Ethernet only*  
C6550 and C6560 RF Collector *with LTE cellular modem*

*Versatile and Cost-Effective Communication Solution*

**Overview**

Ease of installation and dependable design make the Gridstream® C6500 Collector a cost-effective, workable option for efficient communication between Gridstream RF endpoints, routers and the Command Center server, while performing all necessary functions of the standard data collector.

The C6500 can be installed in a variety of locations and is configured to accept public backhaul communication options. The C6500 can be ordered with an internal cellular backhaul modem or without a modem in cases where an Ethernet connection is available.

**FEATURES & BENEFITS:**

*Why Landis+Gyr makes a difference.*

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Integrated wireless radio backhaul modem
- Data security and error-checking algorithms assure integrity and reliability
- Simpler and reduced installation time
- Dynamic routing by each radio in the mesh network
- Downloadable code for easy, over-the-air firmware upgrades and near real-time monitoring and control

**Application Exhibit 4**  
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**Product Specifications: Gridstream C6500 RF Collector**

**Specifications**

Dimensions (excludes antennas)	5.04"H x 11.82"W x 9.30"D
Antennas	Two (2), one blackhaul (top) and one (1) Gridstream (bottom)
Antenna Height Minimum	20 ft.
Weight	9.6 lbs.
Standard Compliance	FCC Part 15, Class B
Operating AC Voltage	96-277 Vrms
Power Consumption	9W typical – batteries not charging 18W typical – batteries charging
Operating Frequency Band	902-928 MHz, unlicensed
Transmit Output Power	1W maximum for single IWR radio
Baud Rate Range	9.6, 19.2, 38.4, 115.2, 300 kbps
Endpoint Capacity (initial)	4,500
Processing	CPU – ARM 9 Internal Memory – 16 MB Flash – 8 MB
Operating Temperature	-40°C to 60°C, outdoors
Storage Temperature	-40°C to 85°C
Color	White
Enclosure Material/Type	Aluminum/NEMA-4, sealed
Battery	Backup Time – 8 hours, typical Backup – LiFePO4 cells in a 4s4p arrangement, 13.2V, 12800mAh nominal Life – 15 years, maintenance free
Backhaul Communications	Integrated LTE cellular modem or wired Ethernet connection
Supplied Cellular Carriers	C6550: Verizon, C6560: AT&T
Mounting Options	Utility poles and streetlights

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## Network Gateway

Application Exhibit 4  
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### Flexible and Interoperable Utility IoT Network Communications

Landis+Gyr's Network Gateway is an integral part of Gridstream® Connect, our industry-leading utility IoT platform. The Network Gateway is a powerful field data center that supports a variety of communications protocols. By enabling device and sensor interoperability, the Network Gateway provides unparalleled flexibility and limitless potential for growth.

#### FLEXIBLE COMMUNICATIONS

- Supports a wide array of communications technologies, including RF Mesh, Mesh IP, and cellular WAN backhaul
- Multiple radio options

#### BATTERY BACK-UP

- Maintenance-free Lithium Iron Phosphate battery

#### LAYERED INTELLIGENCE: INTELLIGENCE WHEN AND WHERE YOU NEED IT

- On-board Linux processor
- Distributed data processing lowers cost of data sharing and networking

#### FUTURE-READY AND SCALABLE

- Configurable, serviceable, and upgradeable
- Secure Wi-Fi for local configuration of radios or integrated sensor controller
- 2X Ethernet ports



FLEXIBLE  
COMMUNICATIONS



BATTERY  
BACK-UP



LAYERED  
INTELLIGENCE



FUTURE-READY  
AND SCALABLE

**Application Exhibit 4**  
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# Network Gateway

## PRODUCT SPECIFICATIONS

ELECTRICAL	
Input Voltage Range	120 to 240 VAC
Current	0.5A-0.25A
GATEWAY PROCESSING UNIT	
CPU	Cortex A5
RAM Memory	512 MB DDR2 RAM
FLASH Memory	2 GB NAND + 4 GB External
GATEWAY RADIO PROCESSING UNIT	
CPU	Dual-core Cortex M4
RAM Memory	304 Kbytes
FLASH Memory	2 MB + 4MB External
ROM Memory	8 Kbytes
SERIES 5 RADIO VARIANT	
Communication Protocol	IEEE 802.15.4g - SUN FSK PHY
RF Frequency Range	902-928 MHz
Channel Spacing	N2450 (RF Mesh IP): 400 KHz N2400 (RF Mesh): 100, 300 KHz
RF Data Rate	N2450 (RF Mesh IP): 50, 150, 200 Kbps N2400 (RF Mesh): 9.6, 19.2, 38.4, 115.2 Kbps
Modulation Type	2FSK, 2GFSK
SERIES 6 RADIO VARIANT	
Communication Protocol	IEEE 802.15.4 - 2015 SUNPHY
RF Frequency Range	902 - 928 Mhz 2400 - 2485 Mhz
Channel Spacing	400 KHz, 1200 KHz
RF Data Rate	50 Kbps to 600 Kbps (900 Mhz Band -Series 5 Compatibility Mode) 100 Kbps to 2400 Kbps (2400 Mhz Band)
Modulation Types	SUNFSK, O-QPSK, OFDM

Kbps = Kilobytes per second

This information is provided on an "as is" basis and does not imply any kind of guarantee or warranty, express or implied. Changes may be made to this information.

TRANSMITTER	
Output Power (at Antenna Connector)	Up to 1W
ETHERNET & WIFI	
ETH 0   ETH 1	10/100/1000 Ethernet   10/100 Ethernet
WI-FI	Yes
LTE Cat6	Yes
MECHANICAL	
Enclosure	Aluminum / IP67
Dimensions	10.94" W x 5.31" D x 12.23" H ( 278mm W x 135mm D x 311mm H)
Weight	11.7 lbs
Operating Temp Range	-40°C to 60°C (-40 to 140° F)
Storage Temp Range	-40°C to 70°C (-40 to 158° F)
REGULATORY COMPLIANCE	
Safety & EMC, FCC Class A Device	

## GET IN TOUCH.

For more information and nationwide warranty terms, visit us at [landisgyr.com](http://landisgyr.com) or call us at 888-390-5733.



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**Landis+Gyr**

## LET'S BUILD A BRIGHTER FUTURE TOGETHER

Since 1896, Landis+Gyr has been a global leader of energy management solutions. We've provided more than 3,500 utility companies all over the world with the broadest portfolio of products and services in the industry. With a worldwide team of 1,300+ engineers and research professionals, as well as an ISO certification for quality and environmental processes, we are committed to improving energy efficiency, streamlining operations, and improving customer service for utility providers.

**Application Exhibit 4**  
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**Product Specifications**



**Gridstream**  
**RF Router**



*Advanced, Yet Cost-effective, Communication Solution*

**Overview**

The Landis+Gyr RF Router helps form the powerful Gridstream® RF wireless mesh network used in Advanced Metering, Distribution Automation and Demand Response applications. Network performance and reliability are assured via the routers basic mesh functions including full two-way, peer-to-peer communication to all devices in the network, asynchronous spread spectrum frequency hopping and dynamic message routing.

The RF Router is designed to deliver enhanced on-board memory and communication speeds to support future application and development needs. In addition, advanced functionality enables individual message prioritization, automatic network registration and localized intelligence. The router can also provide distributed device control capabilities via programmable applets.

To provide critical network operations—even during small or widespread system power outages—a typical purchase includes battery backup integrated within the aluminum housing.

**FEATURES & BENEFITS:**

*Why Landis+Gyr makes a difference.*

- Interoperability to enable integration with numerous partners and supported devices
- Standards-based, including IPv6, to protect existing and future investments
- Individual message prioritization provides end device interfacing with other smart grid applications and functions
- Dynamic routing by each radio in the mesh network
- Data security and error-checking algorithms to assure integrity and reliability
- Downloadable code for easy, over-the-air firmware updates for near real-time monitoring and control

**Application Exhibit 4**  
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**Product Specifications: Gridstream RF Router**

<b>Specifications</b>	
Size	11.82"W x 9.30"D x 4.07"H
Weight	Base – 5 lbs 8 oz (2.49 kg)
	Battery adds 2 lbs 8 oz (1.13 kg)
Operating Temperature	-40°C to +85°C (internal ambient of enclosure)
Power Supply	Operating AC Voltage – 96-317 VAC
	Input for Receive mode / 120VAC Operation – 15 mA (max)
	Input for Transmit mode / 120VAC Operation – 95 mA (peak), 25 mA (Avg)
	Input for Battery charging mode / 120VAC Operation – 30 mA (max)
RF Output Power	21, 25, 30 dBm (user selectable)
General Radio Items	Frequency Range – 902-928 MHz
	Channel Spacing – 100 kHz, 300 kHz, or 500 kHz (dependent on mode)
	Channels – 56, 80, 240 (dependent on mode)
	RF Baud Rates – 9.6, 19.2, 38.4, 115.2, 300 kbps
Battery	Backup Time – 8 hours, typical
	Backup – 12V SLA 2500mAh, nominal
	Life – 5–7 years, typical
Processing	CPU – ARM9
	SRAM – 16 MB
	Flash – 8 MB ANSI C12.1 Compliance
Approvals	FCC Certified Part 15.247
ANSI C12.1 Compliance	Operating vibration; operating shock; electromagnetic radiation emissions, electromagnetic susceptibility, surge withstanding capability, electrostatic discharge
Enclosure Material Type	Aluminum/NEMA-4, sealed
Standard Shipment Includes	White, die-cast aluminum all-weather enclosure
	Operation on DC (12/24 VDC) or AC power, with automatic switching between 120 VAC or 277 VAC when connected to power source
	RS-232/485 lines for both LPPx and transparent port communication
	Standard N-Female antenna connector
	Integrated filter for attenuation of out-of-band interference
	Mounting hardware

**Application Exhibit 5**  
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**Product Specifications**



**Residential:**  
**FOCUS AXe Metering Platform**

E331 FOCUS AXe/AXRe/RXRe  
E351 FOCUS AXe/AXRe/RXRe-SD



*Advanced Metering Performance and Safety*

**Overview**

The FOCUS® AXe platform for advanced electric metering and smart grid applications is designed to enhance your sensor ecosystem with proven reliability and innovative features. Expanding on Landis+Gyr's industry-leading FOCUS AX platform, the FOCUS AXe adds increased memory and processing power to enable greater measurement, power quality, and data profiling capabilities. Furthermore, the FOCUS AXe incorporates a sensor to detect meter removal and insertion as a possible indication of tamper as well as increased power supply capacity to support more advanced AMI modules for expanded communications abilities.

**Reliable disconnect service –  
for any type of residential installation**

The E351 FOCUS AXe-SD provides reliable remote service disconnect and reconnect with a motor driven, cam action switch under the meter cover. Available in both CL200 and newly released CL320 UL certified models, the switches operate safely for thousands of iterations at full rated current. Along with direct switch actuation, the AXe-SD supports multiple load limiting features that initiate a disconnect when a specified instantaneous power or average demand level is reached.

The AXe-SD Form 2SE delivers precedent setting remote service disconnect capability to larger 320 amp installations, providing Landis+Gyr's unique solution to evolving utility requirements.

**KEY FEATURES:**

- Active Energy "kWh" meter: Optional  
Reactive Energy "kVAh or kVARh"
- Two, simultaneous demands: kW, kVA,  
and kVAR
- Motor driven, cam action service disconnect  
switches: 200 amp and NEW 320 amp
- All meters exceed ANSI requirements for  
meter accuracy (0.2%) and surge protection (10KV)
- Power Quality Metrics: Sag, Swell and  
Total Harmonic Distortion
- Up to 8 channels of Load Profile standard
- Independent 2nd 8-channel Load Profile  
Recorder (optional)
- Every S Base meter form is UL listed
- Meter removal and insertion detection to  
indicate possible tamper
- Magnetic and DC presence detection
- Over-the-air firmware and program updates<sup>1</sup>
- Dedicated Voltage Log
- Configurable optical port lockout<sup>1</sup>

## Application Exhibit 5

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## Product Specifications: Focus AXe Residential Electric Metering Platform

### SPECIFICATIONS

General Specifications	ALL models support demand billing and are time-of-use (TOU) Ready – Battery Optional	
	Third Generation processor runs 2x as fast as FOCUS AX	
	2x RAM, 2x ROM, and 4x the Non-Volatile Memory as FOCUS AX	
	Designed for 20+ years life	
	Utilizes ANSI protocol (for optical port and between meter and AMI device)	
	9-Digit LCD	
	Display scroll sequence programmable (factory or end user)	
Operating Temperature	Configuration Port – standard plastic: Optional ANSI C12.18 optical	
	-40C to +85C under cover	
	Nominal Voltage	
	120V or 240V	
	Operating Voltage	
	80% to 115% of Nominal Voltage	
	Frequency	
Humidity	60Hz +/- 5%	
	5% to 95% relative humidity, non condensing	
	Starting Load (Watts)	Class 20            0.005 Amp (0.6W)
		Class 100           0.030 Amp (3.6W)
		Class 200           0.050 Amp (12W)
		Class 320           0.080 Amp (19.2W)
		Class 480           0.120 Amp (28.8W)
	Voltage Burden	
Load Performance Accuracy	< 1.9W Max	
	Accuracy Class 0.2% (reactive energy 0.5%)	
	Available Forms	Self-Contained        1S, 2S, 2SE (320A), 12S, 25S
		Transformer Rated    3S, 4S
		K-Base                2K (480A)
	Display Options	Energy Metrics: +kWh, -kWh, Net kWh, added kWh (Security), KVAh or KVARh
		Metric Energy Display Format – 4x1, 4x10, 5x1, 5x10, 6x1 or 6x10
		TOU, demand billing and two demands (selectable kW, kVA or KVAR)
Communications <sup>1</sup>	Modular design - with or without AMI communication	
Selectable Meter Multiplier	Up to 4096 as result of PT ratio x CT ratio	
Applicable Standards	ANSI C12.1 for electric meters	
	ANSI C12.10 for physical aspects of watt hour meters	
	ANSI C12.18 Protocol specifications for ANSI Type 2 Optical Port	
	ANSI C12.19 Utility Industry End Device Data Tables	
	ANSI C12.20 for electricity meters, 0.2 and 0.5 accuracy classes	
	CAN3-C17-M84 Canadian specifications for approval of type of electricity meters	
	UL 2735 Standard for Electric Utility Meters	
Service Disconnect	200A disconnect - 10,000 operations at full rated current (disconnect/connect)	
	Available forms: 1S, 2S, 12S, 25S	
International Certifications	320A disconnect - 3,000 operations at full rated current (disconnect/connect)	
	Available forms: 2SE	
International Certifications	Measurement Canada (MC) AE-1967	
	Form 2SE-SD pending MC approval	

1. Select features rely on a communications module. Meters that are AMI-enabled with communications are clearly labeled on meter face above digital display.



# Commercial Industrial Metering

Choice for Demanding Polyphase Applications



**Do your commercial meters  
deliver the data you need  
while providing both  
flexibility and value?**

With options to cover most metering challenges, Landis+Gyr's commercial and industrial meter family delivers performance and value. Both the E650 S4x and E330 FOCUS® AX Polyphase meters are designed to cover a wide range of requirements and applications – from light commercial to industrial metering – with proven reliability and unmatched features.

Landis+Gyr's polyphase meters eliminate the need to pre-program the service type. Simply install the meter, and it automatically detects the service type and voltage, displaying the information on the LCD and configuring the

GyrBox for a complete diagnostic installation check. By continually performing diagnostics on the metering installation equipment, service wiring and load characteristics, GyrBox identifies issues with equipment, installation, wiring, load conditions, power quality and tampering.

Both platforms provide an ANSI Type 2 optical port for meter programming and firmware upgrades. They utilize advanced second generation over-the-air, flashable firmware, so when supported by the AMI network, they can be upgraded remotely without losing the meter configuration or billing data.

## HIGHLIGHTS:

- Active and reactive energy measurement
- Demand, TOU and load profile
- ANSI C12.19 standard protocol
- Ease of AMI integration
- Over-the-air firmware updates
- Measurement accuracy class of 0.2%
- Unsurpassed 10KV surge protection for safety
- Extensive event logging
- Designed for a 20+ year life

**Application Exhibit 5**  
**Page 4 of 4**

**Choice for Demanding Polyphase Applications**

	The Family of Commercial Meters	
	E330 FOCUS AX Polyphase	E650 S4x
<b>Metrics</b>		
Delivered (+kWh) and received (–kWh) active energy	+	+
Delivered and received reactive energy, kVAh and kVARh	+	+
Voltage sag and swell per phase	+	+
Temperature sensing – record in LP, trigger event	+	+
Twelve self reads – all summations and demands	+	+
True four quadrant meter – all metrics in all quadrants		+
Delivered and received kW, kVA, and KVAR demands		+
Two alternate reactive and apparent energy algorithms		+
All data stored in engineering units for increased resolution		+
<b>Security and Tamper Detection</b>		
Optical port lockout – via AMI system	+	+
Cover removal switch – detects physical tamper		+
Tilt and vibration sensor – detects excessive force		+
Leading PF detection – senses potential DC presence	+	+
Magnetic tamper detection – via hall effect sensor		+
<b>Hardware Options</b>		
Gridstream® RF communication module	+	+
True three-phase power supply		+
Input/output (I/O) board for external sense, KYZ and load control		+
Support 480V line to neutral		+
<b>Load Profile</b>		
Channels	8	16
Standard memory	77 K	256 K
Increased memory (optional)		1 MB
Second recorder – different interval structure (optional)		16 Channels
Data resolution	16 Bit	32 Bit

**E330 FOCUS AX Polyphase**

**Proven Platform**

The AX Polyphase brings the same proven, solid-state performance utilities have come to expect from the FOCUS family in an AMI-ready platform for light commercial applications.

**AMI Communications**

Like all other FOCUS AX meters, the AX Polyphase supports multiple modular AMI solutions. Along with Gridstream RF, solutions are available from four other communications providers spanning RF mesh, cellular and power line carrier technologies.

**Cost Effective**

The FOCUS AX Polyphase is perfectly positioned alongside the full-featured S4x

platform. The FOCUS AX Polyphase provides a cost effective alternative for light commercial metering applications not requiring the same level of functionality as the S4x.

**E650 S4x**

**Metrics and Load Profile**

The E650 S4x provides an extensive array of energy and demand metrics. With more data available, customers can utilize more load profile capability. Standard load profile memory of 256 KB is upgradable to 1 MB without adding metrology hardware. An optional second recorder provides dual structure load profile. Load profile can be configured for up to 16 channels (32 with dual structure) of information from a choice of over 70 different storage metrics.

**Tamper Detection**

The E650 S4x raises the bar on security features and tamper detection. Tilt and vibration sensing, magnetic field detection, and a cover removal switch are innovative new capabilities designed to reinforce revenue protection efforts.

**Input/Output**

An optional I/O board provides up to four solid-state relay outputs and up to two external inputs for recording pulses from remote sources. These relays can be programmed for end-of-interval, power factor alert, diagnostic alert, voltage alert, demand threshold alert, KYZ or load control. The I/O board can be used in conjunction with a Gridstream RF module for ultimate flexibility.

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## Application Exhibit 6

### Product Specifications

Page 1 of 18



**Gridstream:  
M120 RF Residential  
Gas Module**

**Landis+Gyr+**  
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### *Two-way Residential Gas Metering for Network Continuity*

#### Overview

The M120 RF Residential Gas Communications Module provides two-way AMI communications over Landis+Gyr's scalable, secure and interoperable Gridstream® RF Mesh network. The module is designed to record and communicate both total consumption and one channel of interval data. The data can be used to empower utilities to offer flexible rates and assist with capacity planning.

The M120 gas module simplifies deployment by automatically registering on the Gridstream network upon installation, eliminating the need for field installation tools. The M120 module mounts on most any residential gas meter built since the 1950's. In addition, the module is programmed to transmit data once a day.

The M120 gas module is designed to communicate with electric meters, routers or radios on distribution automation devices. This flexibility is key for utilities to maximize the benefits of Gridstream and manage multiple types of endpoints on a single network.

With a 20-year battery life, the M120 gas module ensures years of customer service.

#### FEATURES & BENEFITS:

*Why Landis+Gyr makes a difference.*

- Leverages full potential and scalability of Gridstream AMI network
- Fits most common residential gas meters and uses existing index
- No field programming, special field tools or costly infrastructure add-ons required
- Performs self-diagnostics
- Variety of event settings available to inform of module issues such as low battery
- Enhanced range (250 mW output)
- Plug-and-play activation keeps deployment on-schedule
- Interoperable for future advancements in gas measurement
- Produces one channel of load profile data which can be used for advanced rates, such as time of use

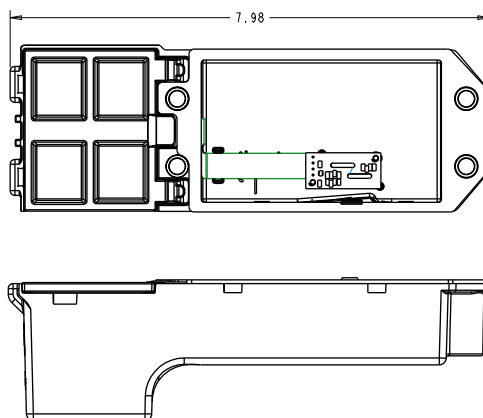
**Application Exhibit 6**  
**Page 2 of 18**

**Product Specifications: Gridstream M120 RF Residential Gas Module**

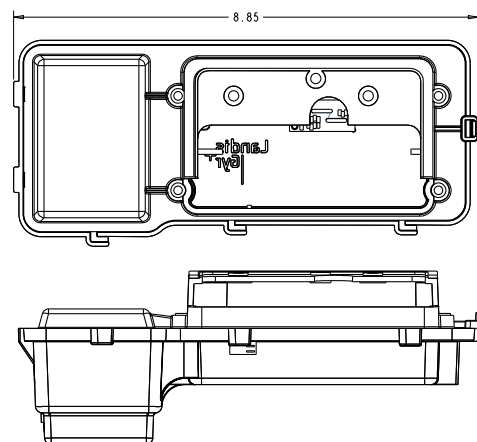
**Specifications**

Power Supply	Two "A" lithium manganese dioxide batteries	
	20-year battery life	
Environmental Temperature Rating	-40°C to +85°C	
Environmental	Relative humidity 0% to 100%	
RF Standards	FCC Part 15.247	
	Frequency: 902 – 928 MHz unlicensed	
	Baud Rate: 9600 to 38400 BPS	
ANSI Standards	B109.1-2000 Compliance	
	B109.2-2000 Compliance	
UL	Class 1, Division 1, Group D	
Data Transmission	The data is transmitted once per day. Each transmission includes last 24 hours of 15-minute interval data and last consumption value.	
Events Included	Tamper detection	
	Tilt switch	
	Consumption rollover	
	Low battery	
	Stale register	
	Extreme temperature change	
	Cover off	
Universal Retrofit	Model	Meter Manufacturer
	M120-1	Elster (American)
	M120-2	Itron (Actaris/Schlumberger/Sprague)
	M120-3	Sensus (Invensys/Equimeter/Rockwell)
	M120-4	National
Interval Data	45 days of one-channel, 15 minute LP data	

**American**



**Sprague**



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## Application Exhibit 6

### Product Specifications

Page 3 of 18



### Gridstream: M220 RF Commercial & Industrial Gas Module

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## Two-way C&I Gas Metering for Utility Efficiency

### Overview

The M220 RF C&I Gas Communications Module provides two-way AMI communications over Landis+Gyr's scalable, secure and interoperable Gridstream® RF Mesh network. The module is designed to record and communicate both total consumption and two channels of interval data (configurable for 15 and 60 minutes). Interval data can be used to empower utilities to offer flexible rates and assist with capacity planning.

The M220 gas module simplifies deployment by automatically registering on the Gridstream network upon installation, eliminating the need for field installation tools. The M220 module also utilizes "Plug and Play" technology allowing accurate count from time of installation, until the pulse input configuration parameters are received over the network. In addition, the module is programmed to transmit data once a day.

The M220 gas module is designed to communicate with electric meters, routers or radios on distribution automation devices. This flexibility is key for utilities to maximize the benefits of Gridstream and manage multiple types of endpoints on a single network.

With a 20-year battery life, the M220 gas module ensures years of customer service.

### FEATURES & BENEFITS:

*Why Landis+Gyr makes a difference.*

- Leverages full potential and scalability of Gridstream AMI network
- Fits most common C&I gas meters and uses current indexes
- No field programming, special field tools or costly infrastructure add-ons required
- Performs self-diagnostics
- Variety of event settings available to inform of module issues such as low battery
- Enhanced range (250 mW output)
- Plug-and-play activation keeps deployment on-schedule
- Interoperable for future advancements in gas measurement
- Provides up to two channels of load profile data which can be used for advance rates, such as time of use

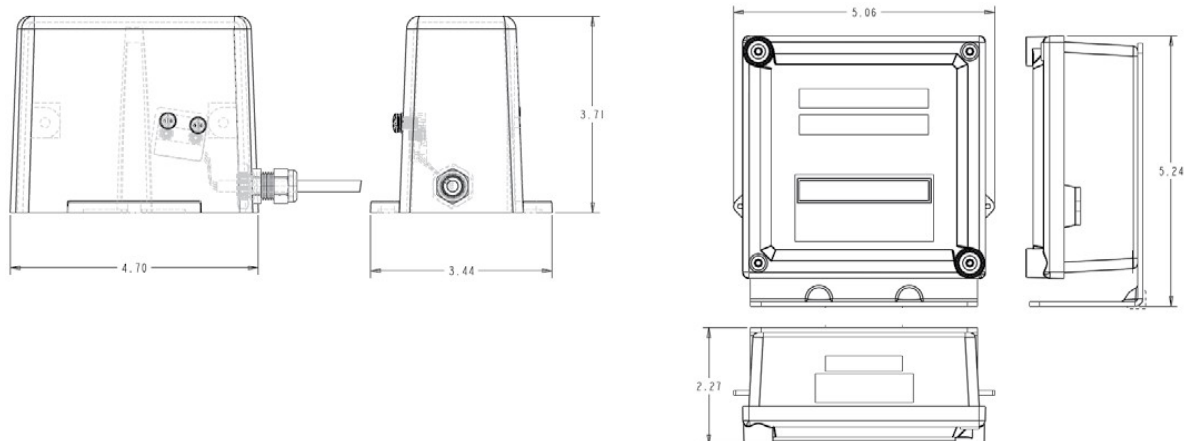
**Application Exhibit 6**  
**Page 4 of 18**

**Product Specifications: Gridstream M220 RF C&I Gas Module**

**Specifications**

Power Supply	Four “A” lithium manganese dioxide batteries	
	20-year battery life	
Environmental Temperature Rating	-40°C to +85°C	
Environmental	Relative humidity 0% to 100%	
RF Standards	FCC Part 15.247	
	Frequency: 902 – 928 MHz unlicensed	
	Baud Rate: 9600 to 38400 BPS	
ANSI Standards	B109.1-2000 Compliance	
	B109.2-2000 Compliance	
UL	Class 1, Division 1, Group D	
Data Transmission	The data is transmitted once per day. Each transmission includes last 24 hours of 15-minute interval data and last consumption value.	
Events Included	Tamper detection	
	Tilt switch	
	Sensor failure	
	Low battery	
	Stale register	
	Extreme temperature change	
Universal Retrofit	Cover off	
	Model	Meter Manufacturer
	M220-1	Elster (American)
	M220-2	Ittron (Actaris/Schlumberger/Sprague)
	M220-3	Sensus (Invensys/Equimeter/Rockwell)
Interval Data	45 days of two-channel, 15 and 60 minute LP data	

**American M220-1**



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## Application Exhibit 6

Product Specifications

Page 5 of 18



### Gridstream GPR-PT Commercial & Industrial Pressure and Temperature Monitoring Module

**Landis+Gyr+**  
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## Two-Way C&I Pressure and Temperature Intelligent Energy Management

### Overview

The Gridstream® Recorder for Pressure and Temperature (GPR-PT) C&I Gas Communications Module provides two-way communications over Landis+Gyr's scalable, secure and interoperable Gridstream RF Mesh network. The two-way gas module records and communicates up to four channels of interval data (configurable for 15, 30 and 60 minutes). A serial Modbus (RS-232) connection is used to communicate with correctors and pressure trackers. Select correctors from Mercury/Honeywell and Eagle Research Inc. are supported. Four dynamic channels can be programmed to record Pressures, Temperature, Corrected and Uncorrected Volumes, and Voltages from the attached device. Data that is recorded can be pushed to the Head End System every 1, 2, 4, 6, 8, 12 and 24-hour period for efficient system monitoring.

The module works with most devices within the Gridstream wireless mesh network – including electric meters, routers or radios on distribution automation devices – to send and receive information.

The module uses the unlicensed FCC part 15 902-928 MHz band to transmit using frequency hopping, spread spectrum technology. For efficiently manage energy consumption, the module is programmed to periodically report customer usage profiles and accept system configuration changes.

### Fast, Easy Installation and Operation

- Auto-Registration
- No Field Programming or special field tools required
- Over-the-Air Firmware Upgrade
- On-Request Data Reads
- Flexible Mounting Bracket

### FEATURES & BENEFITS:

*Why Landis+Gyr makes a difference.*

- Leverages full potential and scalability of Gridstream AMI network
- Supports one generic collector alarm
- Variety of event settings available to inform of issues, such as low battery and tamper
- Serial Modbus Interface directly to Corrector
- Provides four dynamic channels of data to HES
- Configurable channels monitor Pressures, Temperature, Voltages, Corrected Volume and Uncorrected Volumes from supported devices
- Pressure Max and Min thresholds supported at the Head End System

## Application Exhibit 6

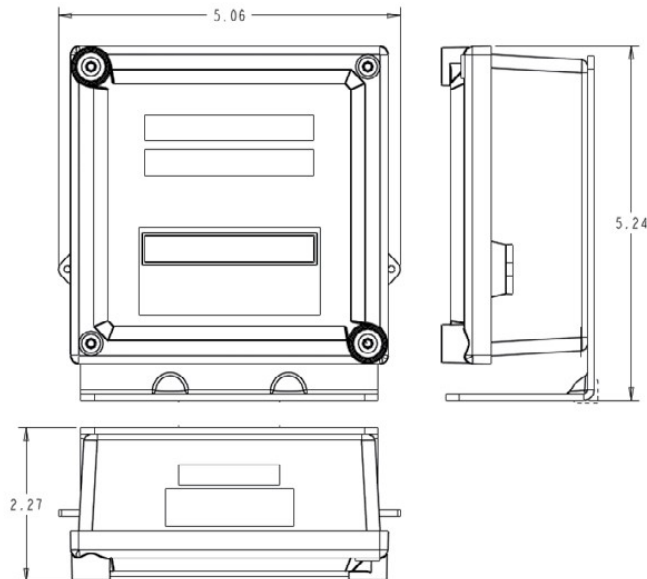
Page 6 of 18

### Product Specifications: GPR-PT C&I Pressure and Temperature Monitoring Module

#### Specifications

Power Supply	Four "A" lithium manganese dioxide batteries
	20-year battery life
Modulation Type	FSK modulation
Operating Temperature Range	-40°C to +85°C
Environmental	Relative humidity 0% to 100%
RF Standards	FCC Part 15.247
	Frequency: 902-928 MHz
	Baud Rate: 9600 to 38400 BPS
ANSI Standards	B109.1-2000 Compliance
	B109.2-2000 Compliance
Enclosure Rating	NEMA 3R
UL	UL – Class 1, Division 1, Group D
GPR-PT Events Included	Tilt switch
	Sensor failure
	Low battery
	Stale register
	Extreme temperature change
	Configuration change
	Cut lead detect

#### GPR-PT



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## 40GB

### Gas ERT® Module

#### *Introduction*

The 40GB Gas ERT module serves as the data collection endpoint device for Itron's industry-leading portfolio of RF-based meter data collection solutions for natural gas meters and measurement devices. The 40GB is built on the legacy leadership of the field-proven 40G Gas ERT® module that transmits consumption and tamper information in traditional wake-up mode to Itron's radio-based handheld and mobile AMR systems.

Itron's line of 40GB Gas ERT module provides two operational modes:

- > **Wake-up** When programmed for wake-up mode, the 40GB operates in traditional wake-up mode and transmits meter reads and tamper information in response to a wake-up signal from an Itron radio-equipped handheld or mobile reader
- > **Bubble-up** When programmed for bubble-up mode, the 40GB transmits information at regular intervals without the need for a wake-up signal from the reading device. Bubble-up mode is intended for use with fixed network solutions that combine collectors and repeaters

A 40GB Gas ERT module operating in bubble-up mode can still receive and respond to a wake-up signal, providing increased flexibility for handheld and mobile reads when operating under a fixed network. Note that an FCC license is required any time a wake-up signal is transmitted from a reading device.

The line of 40GB Gas ERT module allows for field installation on a variety of gas meters, even while gas is flowing through the meter, making AMR easy to install and justify. It is powered by a long-life, replaceable "A" cell lithium battery, which provides an average life in excess of 25 years which exceeds the 20 year design life of the ERT.





## Residential Meters

> **METRIS 250**



> **Sensus/  
Rockwell R275**



> **Elster American  
AC250**



> **National 250**



## Commercial Meters

> **Itron 1000A**



> **Sensus/  
Rockwell 750**



> **Elster American  
AL800**



## Ultrasonic Meters

> **Sensus Sonix**



## Rotary Meters

> **Dresser B3 with  
Direct mount**



> **Dresser LMMA  
with Remote ERT**



## Electronic Correctors

> **Mercury Mini-AT**



### Residential diaphragm meters

Itron provides an extensive line of direct-mount 40GB Gas ERT modules for use with residential diaphragm gas meters with capacities ranging from 75 to 630 CFH for popular models from Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, Itron/Actaris/Schlumberger/Sprague and National/Lancaster. Direct-mount modules are also available for some older meter types such as American 5 Metric and Sprague 1A. The compact design and direct engagement to the meter drive assure the unparalleled accuracy that makes Itron gas ERT modules the industry standard.

A remote-mount module is also available for some less common meter types where a direct-mount solution is not available.

### Commercial diaphragm meters

Itron also provides direct-mount 40GB Gas ERT modules for use with the following commercial diaphragm gas meters: Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, and Itron/Actaris/Schlumberger. The unobtrusive profile is easy to install and the direct meter drive engagement assures the highest level of accuracy. Built-in passive radiators are standard on all commercial, direct-mount 40GB.

Elster American Meter and Itron/Actaris/Schlumberger commercial diaphragm meters with top-mount instrument drives utilize the same version commercial direct-mount module. For American commercial diaphragm meters, the ERT mounts directly to the meter. For Itron/Actaris/Schlumberger meters, an adapter kit must be purchased.

A remote-mount module is available for some less common meter types where a direct-mount solution is not available.

### Ultrasonic Meters

Itron offers a remote-mount 40GB Gas ERT module for use on the Sensus Sonix gas ultrasonic meter. The 40GB Sonix ERT module is available with mounting hardware to make installation fast and easy. The electrical connection to the meter is established through the Sensus factory-connected ERT.

### Rotary meters

Itron has several solutions for interfacing with rotary gas meters. For Dresser LMMA and B3 rotary meters with Dresser-supplied AMR adapter, Itron offers direct-mount ERT modules designed for American and Sensus residential diaphragm meters. For Dresser rotary meters with Instrument Drive (ID), Itron offers the direct mount ERT designed for American commercial diaphragm meters. For Dresser, Romet and American Meter rotary meters with pulse output (version 17 or higher required for Dresser) and a military connector pin, Itron offers the remote-mount 40GB Gas ERT module.

### Electronic Correctors

Itron offers a remote-mount 40GB Gas ERT module for Mercury Instruments for EC-AT, Mini-P, Mini-AT and Mini-Max electronic correctors. The 40GB can be connected to these gas electronic correctors for temperature- and pressure-corrected consumption (Form A board required). The module attaches easily to the Mercury corrector circuit board through the terminal strip connector already installed on Mercury units. One 40GB can be used for uncorrected consumption and a second 40GB can be used for corrected consumption.



## Application Exhibit 6

### Page 9 of 18

#### Functional Specifications

- > Power source: "A" cell lithium battery
- > Radio programming parameters: wake-up mode or bubble-up mode, index reading, count rate, index rollover, pressure compensation and security level
- > Additional programming parameters for Mercury Instruments
  - Correctors must have a Form A board (Form C and mechanical reed switch outputs are not supported)
  - Item #056 Pulse Scaling Factor: must be set to 2.0
  - Item #096 Corrected Volume Display: must be set at 1, 2, 3 or 4 Blanks (0 Blanks is not supported)
  - Item #115 Output Pulse Code: must be set at 1, 2, 3 or 4 (0 Output Pulse Code is not supported)
- > Tamper detection:
  - Direct-mount modules: mercury-free tilt tamper and magnetic tamper
  - Remote-mount modules: mercury-free tilt tamper and cut cable
- > Operating temperature: -40° to +158°F (-40° to +70°C)
- > Operating humidity: 5 to 95% non-condensing relative humidity
  - 40GB ERT modules can be installed indoors or outdoors above grade
- > Product identification: numeric and bar-coded ERT module type and serial number

#### Programming Options

- > **Wake-up mode:** ReadOne Pro, ERTInstall, FC200R, FC200SR or FC300 with SRead can be used to program the ERT module. When using ReadOne Pro, no changes to a legacy 40G ROCL are required. 40GB ERT modules can also be programmed using Itron's 900MHz Belt Clip Radio and a customer supplied laptop with Endpoint-Link version 5.5 or higher. The Belt Clip Radio can be connected to a laptop via USB cable or Bluetooth™
- > **Bubble-up mode:** ReadOne Pro can be used to program the ERT module. The ReadOne Pro must be version 5.0 or higher and ROCL must be base V22 or higher. Contact Itron for additional options

#### Approved Reading Devices

- > 40GB ERT modules used in wake-up mode are compatible with all Itron handheld and mobile reading devices
- > 40GB ERT modules used in bubble-up mode are compatible with Fixed Network 2.0 collectors and repeaters. If 40GB ERT modules are programmed to bubble-up mode and handheld or mobile reads are desired, an FCC license is required to transmit the wake-up signal from a reading device. In this case, the 40GB ERT module will transmit its standard consumption message upon hearing the wake-up signal

#### Battery Life and Design Life

- > All 40GB ERT modules contain field-replaceable "A" cell lithium battery
- > 40GB programmed to wake-up mode has an average battery life in excess of 25 years
- > 40GB programmed to bubble-up mode with 15 second bubble-up interval has an average battery life of 13 years
- > All 40GB ERT modules are designed for a 20 year total life

#### Regulatory & Standards

- > FCC compliance: Part 15 certified
- > Industry Canada 864K1124, 864101732A; Measurement Canada AG-0371
- > Safety approvals: intrinsically safe per UL Class I, Division 1, Groups C & D

#### Operational

- > Receive frequency (wake-up mode): 952-956 MHz (MAS Bands)
- > Transmit frequency: unlicensed spread spectrum 910-920 MHz
- > FCC license is required for the reading device if a signal will be transmitted to wake up the 40GB ERT module
- > Data integrity: verified in every message

#### Physical

##### > Residential Direct-Mount

Material of construction: gray polycarbonate housing; encapsulated electronics for protection against environmental hazards and tampering

Dimensions:

- American: 5.54" x 2.57" x 3" (140 x 65 x 76 mm)
- Sensus/Rockwell: 4.3" x 2.8" x 2.9" (109 x 71 x 74 mm)
- Actaris/Sprague: 6" x 3.3" x 3.9" (152 x 84 x 99 mm)
- National: 6.2" x 3" x 3.4" (157 x 76 x 86 mm)

##### > Commercial Direct-Mount

Material of construction: gray polycarbonate housing; encapsulated electronics for protection against environmental hazards and tampering

Dimensions:

- American: 5.16" x 2.42" x 5.16" (131 x 61 x 131 mm)
- Sensus/Rockwell: 5.38" x 4" x 2.5" (137 x 102 x 64 mm)

##### > All Remotes

Material of construction: black polycarbonate housing; encapsulated electronics for protection against environmental hazards and tampering

Dimensions:

- 4.9" x 3.6" x 1.7" (124 x 92 x 43 mm)

**Application Exhibit 6**  
**Page 10 of 18**

## Shipping Information

	Modules Per Box	Box Dimensions	Box Weight	Modules Per Pallet*	Pallet Dimensions	Pallet Weight
<b>Residential Direct-Mount</b>						
Elster American	30	18.6" x 15.8" x 8.3"	19.4 lbs / 8.8 kg	1080	37.1" x 47.4" x 54.9" H	698 lbs / 318 kg
Sensus/Rockwell	30	18.6" x 15.8" x 8.3"	17.4 lbs / 7.9 kg	1080	37.1" x 47.4" x 54.9" H	626 lbs / 285 kg
Itron/Sprague	30	19.25" x 18" x 9"	22 lbs / 10 kg	600	40" x 48" x 50" H	490 lbs / 222 kg
National	30	20" x 20" x 9.25"	30 lbs / 13.6 kg	600	40" x 48" x 50" H	650 lbs / 295 kg
<b>Commercial Direct-Mount</b>						
Elster American & Itron	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 54" H	530 lbs / 240 kg
Sensus/Rockwell	10	18" x 14.5" x 9.5"	16 lbs / 7.3 kg	300	40" x 48" x 54" H	530 lbs / 240 kg
<b>Remotes</b>	30	30	20" x 13" x 13"	24 lbs / 10.9 kg	900	40" x 48" x 72" H

\* ERT modules are not stacked when shipped but can be stored 2 pallets high. Modules are to be stored indoors. If outdoor storage is necessary, modules must be sheltered from weather and damage

### Meter Compatibility

- > Refer to Gas ERT Meter Compatibility List (PUB-0117-002) for detailed information on gas meter compatibility

### Additional Information

- > 40GB Installation Guide – Direct Mount (PUB-0025-100)
- > 40GB Installation Guide – Remote Mount (PUB-0087-001)
- > Gas ERT Ordering Guide (PUB-0117-001)
- > Endpoint Technology Guide (PUB-0156-001)
- > ROCL Checklist Form (TDC-0064)
- > ReadOne Pro ERT Programming Guide Formatted Reads Version (TDC-0440)
- > ReadOne Pro ERT Programming Guide (TDC-0027 – WYSIWYG water)
- > Endpoint-Link ERT Programming Guide (TDC-0744)
- > The Proving Ground: Itron delivers industry-leading battery performance and the test data to back it up
- > Predicting ERT Module Life

### About Itron Inc.

Itron Inc. is a leading technology provider to the global energy and water industries. Our company is the world's leading provider of intelligent metering, data collection and utility software solutions, with nearly 8,000 utilities worldwide relying on our technology to optimize the delivery and use of energy and water. Our products include electricity, gas, water and heat meters; data collection and communication systems, including automated meter reading (AMR) and advanced metering infrastructure (AMI); meter data management and related software applications; as well as project management, installation, and consulting services. To know more, start here: [www.itron.com](http://www.itron.com)



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Application Exhibit 6  
Page 11 of 18

# 100G DLS Datalogging

## ERT® Module



The 100G DLS Datalogging ERT® module is the fourth evolution in Itron's line of 100 series radio frequency (RF) gas meter modules and is part of our industry-leading portfolio of RF-based meter data collection solutions. The 100G DLS Datalogging ERT, or 100G DLS, offers all the benefits of its 100G predecessors while delivering a new message called SCM+, which is different from the legacy SCM message. The new SCM+ message has the capacity to use serial numbers up to 10 digits long and includes other valuable data. The 100G DLS also offers optional enhanced security with the addition of authentication and encryption.

The 100G DLS boasts an accuracy of 99.999 percent between the index read and ERT read—an unprecedented benchmark in Advanced Metering Infrastructure (AMI) and Automated Meter Reading (AMR). The module also achieves the industry's highest UL rating for intrinsic safety. The two-way 100G DLS surpasses its predecessor, the 100G DLN, by offering optional authentication of command and encryption of communications data when Itron Security Manager is added to your Itron system. Additionally, the 100G DLS offers extended data—low battery indicator, metrology and non-metrology programming counters—which can be read not only by fixed network, but for the first time by mobile and handheld readers. The 100G DLS also offers improved tilt tamper detection.

The 100G DLS automatically stores 40 days of hourly data, providing a "black box" of hourly usage which has proven valuable in case of a catastrophic event. This functionality benefits mobile customers by providing valuable information for: move in/move out reads to minimize off-cycle reading; daily data for customer service and billing disputes; monthly gas balancing reads; hourly data to facilitate load studies and data to support mid-cycle rate changes. With its programmable output power and two-way functionality, the 100G DLS easily enables migration from mobile to fixed network reading and supports time-synchronized interval data and Gas Day Take reads.

### FEATURES

- » Offers optional enhanced security with authentication of command and encryption of communications data
- » New SCM+ message allows unique ERT ID numbers up to 10 digits and includes extended data
- » Can be read alongside legacy gas ERT modules with Itron's 900 MHz ChoiceConnect® handheld, mobile and fixed network data collection solutions
- » Continually stores and updates the last 40 days of hourly interval data which can be read via handheld, mobile and fixed network
- » Operates in bubble-up mode and does not require a license from the Federal Communications Commission (FCC) or Industry Canada (IC)

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- » Designed for a 20-year battery life regardless of data collection solution to ensure low operating and maintenance costs
- » Module design makes installation fast and easy, especially when gas is flowing through the meter
- » Made in the USA at Itron's facility in Waseca, Minnesota

### Residential Meters

Itron provides the most extensive line of direct mount 100G DLS ERT modules for use with residential diaphragm gas meters. Capacities range from 75 to 630 CFH for popular models from Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, Itron/Actaris/Schlumberger/Sprague and National/Lancaster. Direct mount modules are also available for older Sprague 1A and Sprague 175RM meters. The compact design and direct engagement with the meter drive assure the unparalleled accuracy that makes Itron gas ERT modules the industry standard. A remote mount module is available for some less common meter types where a direct mount solution is not available.



**Itron I-250**



**Sensus/ Rockwell R275**



**Elster American AC250**



**National 250**

### Commercial Meters

Itron also provides direct mount 100G DLS ERT modules for use with the following commercial diaphragm meters: Elster American Meter, Itron/Actaris/Schlumberger and Sensus/Invensys/Equimeter/Rockwell. The unobtrusive profile is easy-to-install and the direct meter drive engagement assures the highest level of accuracy. Built-in passive radiators are standard on all commercial, direct mount 100G DLS ERT modules.

Elster American Meter, and Itron/Actaris/Schlumberger commercial diaphragm

meters with top-mount instrument drives utilize the same version commercial direct mount module. For Elster American Meter commercial diaphragm meters, the ERT mounts directly to the meter. For Itron/Actaris/Schlumberger meters, an adapter kit must be purchased. A remote mount module is available for some less common meter types where a direct mount solution is not available.



**Itron 1000A**



**Sensus/ Rockwell 750**



**Elster American AL 800**

### Rotary Meters

Itron has several solutions for interfacing with rotary gas meters. For Dresser LMMA and B3 rotary meters with Dresser-supplied AMI/AMR adapter, Itron offers the American residential 100G DLS. For Dresser rotary meters with Instrument Drive (ID), Itron offers the direct mount ERT designed for American commercial diaphragm meters. For Dresser, Romet and American Meter rotary meters with pulse output (version 17 or higher required for Dresser) and a military connector pin, Itron offers the remote mount 100G DLS.



**Dresser B3 with Direct mount**



**Dresser LMMA with Remote ERT**

### Electronic Meters and Correctors

Itron offers a remote mount 100G DLS for Itron's DATTUS meter. One 100G DLS can be used for uncorrected consumption and a second module can be used for corrected consumption.

Itron offers a remote mount 100G DLS for Honeywell/Mercury Instruments EC-AT, Mini-P, Mini-AT, Mini-Max and TCI electronic correctors. The ERT

can be connected to these devices for temperature- and/or pressure-corrected consumption (Form A board required). The ERT attaches easily to the Mercury corrector circuit board through the terminal strip connector already installed on Mercury units (module to TCI is wired). Itron offers a remote mount 100G DLS for Dresser Micro Correctors (IMC/W, MC2 and Eagle MPplus. For Mercury, Dresser, and Eagle, one 100G DLS module can be used for uncorrected consumption and a second module can be used for corrected consumption.



**DATTUS III**



**Mercury Mini-AT**



**Eagle MPplus**



**Dresser IMC**

### Functional Specifications

- » Power source:
  - Direct mount module: "A" cell lithium battery
  - Remote-mount module: Two "A" cell lithium batteries
- » Radio programming parameters: Utility ID, index reading, count rate, index rollover, pressure compensation, security level, output power and bubble-up rate
- » Tamper detection:
  - Direct mount module: mercury-free tilt tamper and magnetic tamper
  - Remote mount module: mercury-free tilt tamper and cut cable (for Mercury TCI, optionally can get any TCI alarm in place of cut cable)
- » Battery Counter Indicator
- » Operating temperature: -40°F to +158°F (-40°C to +70°C)
- » Operating humidity:
  - 5 to 95% non-condensing relative humidity
  - 100G DLS ERT modules can be installed indoors or outdoors above grade
- » Product identification: Numeric and bar-coded ERT module type and up to 10 digit serial number

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### Programming Mode Options

- » **Mobile/Handheld Mode\*** with +10 dBm output power (10 milliwatts) and a 15-second bubble-up rate with a 20-year battery life. This mode is recommended when using traditional walk-by or drive-by meter reading methods
- » **Mobile HP Mode\*** with +24dBm output power (250 milliwatts) and a 60-second bubble-up rate with a 20-year battery life. This mode allows readings to be collected from further away, bypassing many streets and reducing total miles driven
- » **Hard-to-Read Mobile/Handheld Mode\*** with +24 dBm output power (250 milliwatts) and a 30-second bubble-up rate. This mode reduces battery life to 18 years with basic security and 13 years with enhanced security. Assuming that utilities would prefer a 20-year battery life, this mode should only be used for exceptionally hard-to-read applications such as meters on a roof or in a sub-basement
- » **Fixed Network Mode\*\*** with +27 dBm output power (500 milliwatts), and a 5-minute bubble-up rate of the Network Interval Message (NIM). The NIM includes the current index read and the last 8 hourly intervals (7 full hours and one partial hour) with a 20-year battery life
- » **Itron Cellular Solutions (ICS) Mode\*\*** The 100G DLS module is compatible with the OpenWay CENTRON with 3G Itron Cellular Module (ICM) and is programmed with FDM Tools with Enhanced Security or FDM. In ICS mode, the 100G DLS transmits a high-powered network interval message (NIM) RF message every five minutes across 50 channels for optimum operation. Output power in this mode is 500 milliwatts or +27 dBm with a 20-year battery life

NOTE: The 100G DLS must be in full security mode to work with ICS

\*\*NOTE: Interspersed in the high power NIM, the 100G transmits a medium power RF message at 10 milliwatts or +10 dBm every 60 seconds

### Approved Reading Devices for Collecting Reads with Basic Security

Handheld and Mobile Application Software  
SCM+ Only:

- » MV-RS v8.5.5 or higher
- » Field Collection System (FCS) v2.3 or higher
  - Including FCS DC v2.3.10.1 and FCS DC v2.4.8.2
- » Mobile Collection Software v3.4 or higher
- » Field Deployment Manager (FDM) v3.3 or higher

Handheld and Mobile Application Software  
Datalogging:

- » MV-RS v8.5.5 or higher
- » Field Collection System (FCS) v2.3 or higher
  - Including FCS DC v2.3.10.1 and FCS DC v2.4.8.2 and the database update script from FCS Server 2.3.2.4 HF5 and FCS Server 2.4.1.20 HF8
- » Mobile Collection Software v3.4 or higher
- » Field Deployment Manager (FDM) v3.3 or higher

Handhelds and Radios:

- » FC300SR: All models along with application software listed above
- » 900MHz Belt Clip Radio: All models require firmware v1.6.12 or higher along with FDM software listed above
- » FC200SR: Application software listed above along with models listed here:
  - SCM+ Only: FC2-0005-002, FC2-0006-002, FC2-0005-003, FC2-0006-003, FC2-0006-004
  - Datalogging: FC2-0005-004, FC2-0006-004, FC2-0005-104, FC2-0006-104

Mobile Collectors:

- » MC3 when used with Mobile Collection Software v3.4 and application software listed above.
  - SCM+ Only: DCU-5300-001 \*, DCU-5300-011U \*, DCU-5300-101U, DCU-5300-111U
  - Datalogging: DCU-5300-001DL, DCU-5300-001DLU, DCU-5300-011DLU, DCU-5310-001, DCU-5310-011, DCU-5310-011U
- » MCLite when used with application software listed above.
  - SCM+ Only: DCU-5000-001 \*, DCU-5000-002 \*, DCU-5000-002U \*, DCU-5000-102U
  - Datalogging: DCU-5000-002DL, DCU-5310-201

Network Products:

- » ChoiceConnect Network Software v4.1.6.68
- » CCU100: All models when used with Network Software v4.1.6.68 or higher
- » Repeater 100: All models when used with Network Software v4.1.6.68 or higher
- » CCU 4.2: All models when used with updated Network Software and the included firmware update

### Approved Reading Devices for Collecting Reads with Enhanced Security

Note: Requires purchase of security keys (SEC-0000-001), Itron Security Manager and FDM or FDM Endpoint Tools Enhanced

Handheld and Mobile Application Software:

- » Field Collection System (FCS) v2.5 or higher
- » Mobile Collection Software v3.5.1 or higher
- » Field Deployment Manager (FDM)
  - FDM work orders v3.3 or higher
  - or FDM Tools with Enhanced Security v3.3 or higher

Note: ICS mode requires v3.4 or higher

- » FC300SR: All models along with application software listed above
- » 900MHz Belt Clip Radio - All models require firmware v1.6.12 or higher along with FDM software listed above
- » FC200SR: Application software listed above along with models listed here:
  - SCM+ Only: FC2-0005-002, FC2-0006-002, FC2-0005-003, FC2-0006-003, FC2-0006-004
  - Datalogging: FC2-0005-004, FC2-0006-004, FC2-0005-104, FC2-0006-104

Mobile Collectors:

- » MC3 when used with Mobile Collection Software v3.4 and application software listed above.
  - SCM+ Only: DCU-5300-001 \*, DCU-5300-011U \*, DCU-5300-101U, DCU-5300-111U
  - Datalogging: DCU-5300-001DL, DCU-5300-001DLU, DCU-5300-011DLU, DCU-5310-001, DCU-5310-011, DCU-5310-011U
- » MCLite when used with application software listed above.
  - SCM+ Only: DCU-5000-001 \*, DCU-5000-002 \*, DCU-5000-002U \*, DCU-5000-102U
  - Datalogging: DCU-5000-002DL, DCU-5310-201

Network Products:

- » ChoiceConnect Network Software v5.0
- » CCU 100: All models support enhanced security when used with Network Software v5.0
- » Repeater 100: All models support enhanced security when used with Network Software v5.0 and the included firmware update

### Battery Life and Design Life

- » 100G DLS allows for a field-replaceable

\*Firmware must be updated at service center.



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- “A” cell lithium battery
- » All programming modes and security levels support a 20-year battery life (20+ years for remotes) except Hard-to-Read Mobile/Handheld mode, which reduces battery life to 18 years with basic security and 13 years with enhanced security
  - » All 100G DLS modules are designed for a 20-year total life

### Regulatory & Standards

- » FCC compliance: Part 15.247 and Part 15.249 (programming) certified
- » FCC ID EWQ100GDLAS, Industry Canada 864D-100GDLAS; Measurement Canada (AG-0546)
- » Safety approvals: Intrinsically safe per UL Class I, Division 1, Groups C & D

### Operational

- » All 100G DLS ERT modules operate

without the need for an FCC or IC license

- » Frequency Range: Frequency-Hopping Spread Spectrum 903 to 926.85 MHz in the ISM band
- » Program frequency: 908 MHz
- » NIM: FM modulation; all other messages are AM modulated
- » Data integrity: Verified in every message

### Physical

All 100G DLS ERT modules have encapsulated electronics for protection against environmental hazards and tampering. All 100G DLS module housings are made of gray polycarbonate. For direct mount residential ERT modules, the gasket material is molded Sevrene™ and the index cover material is clear polycarbonate.

### Meter Compatibility

Refer to Gas & Telemetry Module

Compatibility List (PUB-0117-002) for detailed information on gas meter compatibility.

### Additional Information

- » 100G DLS Datalogging ERT Module Installation Guide: Direct Mount (TDC-0823)
- » 100G DLS Datalogging ERT Module Installation Guide: Remote Mount (TDC-0824)
- » Gas & Telemetry Module Ordering Guide (PUB-0117-001)
- » 100 Series Technology Guide (TDC-0825)
- » Field Deployment Manager Endpoint Tools Mobile Application Guide (TDC-0934)
- » Field Deployment Manager Endpoint Tools Configuration Guide (TDC-0935)
- » Field Deployment Manager Endpoint Checklist (TDC-0942)

### Physical (width x height x depth)

	Elster American	Sensus/Rockwell	Itron/Sprague	National	All
Residential	5.54" x 3.57" x 3.1"	4.3" x 3.8" x 2.9"	6" x 4.1" x 3.9"	6" x 3.3" x 3.9"	
Commercial	5.16" x 2.42" x 5.16"	5.38" x 4" x 2.5"	5.16" x 2.42" x 5.16"		
Remote					4.9" x 3.6" x 2.5"

### Shipping Information

	Modules Per Box	Box Dimensions	Box Weight	Modules Per Pallet*	Pallet Dimensions	Pallet Weight
<b>Residential Direct-Mount</b>						
Elster American	10	20" x 11.75" x 4"	8.5 lbs / 3.9 kg	800	40" x 48" x 48" H	680 lbs / 308 kg
Sensus/Rockwell	10	20" x 11.75" x 4"	6.9 lbs / 3.1 kg	800	40" x 48" x 48" H	552 lbs / 250 kg
Itron/Sprague	10	21" x 12.625" x 4.25"	8.8 lbs / 4.0 kg	600	40" x 48" x 50" H	528 lbs / 240 kg
National	10	21" x 12.625" x 4.25"	9.7 lbs / 4.4 kg	600	40" x 48" x 50" H	582 lbs / 264 kg
Itron/Sprague 175 RM	10	22.625 x 11.25" x 4.75"	9.8 lbs / 4.4 kg	600	40" x 48" x 50" H	588 lbs / 267 kg
<b>Commercial Direct-Mount</b>						
Elster American & Itron	5	20" x 11.75" x 4"	7.6 lbs / 3.4 kg	300	40" x 48" x 52.5" H	456 lbs / 207 kg
Sensus/Rockwell	5	20" x 11.75" x 4"	7.5 lbs / 3.4 kg	300	40" x 48" x 52.5" H	450 lbs / 204 kg
<b>Remotes</b>	20	23" x 15.8" x 6.5"	22 lbs / 10.1 kg	500	40" x 48" x 37.5" H	550 lbs / 253 kg

\* Modules are not stacked when shipped but can be stored two pallets high. Modules are to be stored indoors. If outdoor storage is necessary, modules must be sheltered from weather and damage.



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# 100G DLT Datalogging

## ERT® Module

The 100G DLT Datalogging ERT® Module, or 100G DLT, is a hybrid in Itron's line of 100 series radio frequency (RF) gas meter modules and is part of our industry-leading portfolio of RF-based meter data collection solutions. The 100G DLT combines fourth generation circuit board hardware with the same SCM message used in the 100G DLN. This means that utilities currently reading the SCM message from the 100G DLN can use the 100G DLT without any upgrades needed for programming or meter reading. The circuit board hardware used in the 100G DLT offers improved tilt tamper detection compared to the 100G DLN but does not offer optional enhanced security or extended tamper information available in the 100G DLS.

The 100G DLT boasts an accuracy of 99,999 percent between the index read and ERT read—an unprecedented benchmark in Advanced Metering Infrastructure (AMI) and Automated Meter Reading (AMR). The module also achieves the industry's highest UL rating for intrinsic safety. The two-way 100G DLT surpasses its predecessor, the 100G DLN, by offering improved tilt tamper detection. The 100G DLT automatically stores 40 days of hourly data, providing a "black box" of hourly usage which has proven valuable in case of a catastrophic event. This functionality benefits mobile customers by providing valuable information for: move in/move out reads to minimize off-cycle reading; daily data for customer service and billing disputes; monthly gas balancing reads; hourly data to facilitate load studies and data to support mid-cycle rate changes. With its programmable

output power and two-way functionality, the 100G DLT easily enables migration from mobile to fixed network reading and supports time-synchronized interval data and Gas Day Take reads.

### FEATURES

- » Utilities currently reading the SCM message from the 100G DLN can use the 100G DLT without any upgrades needed for programming or meter reading
- » Can be read alongside legacy gas ERT modules with Itron's 900 MHz ChoiceConnect® handheld, mobile and fixed network data collection solutions
- » Continually stores and updates the last 40 days of hourly interval data which can be read via handheld, mobile and fixed network
- » Operates in bubble-up mode and does not require a license from the Federal Communications Commission (FCC)
- » Designed for a 20-year battery life regardless of data collection solution to ensure low operating and maintenance costs
- » Module design makes installation fast and easy, especially when gas is flowing through the meter
- » Made in the USA at Itron's facility in Waseca, Minnesota

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#### Residential Meters

Itron provides the most extensive line of direct mount 100G DLT ERT modules for use with residential diaphragm gas meters. Capacities range from 75 to 630 CFH for popular models from Elster American Meter, Sensus/Invensys/Equimeter/Rockwell, Itron/Actaris/Schlumberger/Sprague and National/Lancaster. Direct mount modules are also available for older Sprague 1A and Sprague 175RM meters. The compact design and direct engagement with the meter drive assure the unparalleled accuracy that makes Itron gas ERT modules the industry standard. A remote mount module is available for some less common meter types where a direct mount solution is not available.



**Itron I-250**



**Sensus/ Rockwell R275**



**Elster American AC250**



**National 250**

#### Commercial Meters

Itron also provides direct mount 100G DLT ERT modules for use with the following commercial diaphragm meters: Elster American Meter, Itron/Actaris/Schlumberger and Sensus/Invensys/Equimeter/Rockwell. The unobtrusive profile is easy-to-install and the direct meter drive engagement assures the highest level of accuracy. Built-in passive radiators are standard on all commercial, direct mount 100G DLT ERT modules.

Elster American Meter, and Itron/Actaris/Schlumberger commercial diaphragm meters with top-mount instrument drives utilize the same version commercial direct mount module. For Elster American Meter commercial diaphragm meters, the ERT mounts directly to the meter. For Itron/Actaris/Schlumberger meters, an adapter kit must be purchased. A remote mount module is available for some less common meter types where a direct mount solution is not available.



**Itron 1000A**



**Sensus/ Rockwell 750**



**Elster American AL 800**

#### Rotary Meters

Itron has several solutions for interfacing with rotary gas meters. For Dresser LMMA and B3 rotary meters with Dresser-supplied AMI/AMR adapter, Itron offers the American residential 100G DLT. For Dresser rotary meters with Instrument Drive (ID), Itron offers the direct mount ERT designed for American commercial diaphragm meters. For Dresser, Romet and American Meter rotary meters with pulse output (version 17 or higher required for Dresser) and a military connector pin, Itron offers the remote mount 100G DLT.



**Dresser B3 with Direct mount**



**Dresser LMMA with Remote ERT**

#### Electronic Meters and Correctors

Itron offers a remote mount 100G DLT for Itron's DATTUS meter. One 100G DLT can be used for uncorrected consumption and a second module can be used for corrected consumption.

Itron offers a remote mount 100G DLT for Honeywell/Mercury Instruments EC-AT, Mini-P, Mini-AT, Mini-Max and TCI electronic correctors. The ERT can be connected to these devices for temperature- and/or pressure-corrected consumption (Form A board required). The ERT attaches easily to the Mercury corrector circuit board through the terminal strip connector already installed on Mercury units (module to TCI is wired). Itron offers a

remote mount 100G DLT for Dresser Micro Correctors (IMC/W, MC2 and Eagle MPplus. For Mercury, Dresser, and Eagle, one 100G DLT module can be used for uncorrected consumption and a second module can be used for corrected consumption.

#### Functional Specifications



**DATTUS III**



**Mercury Mini-AT**



**Eagle MPplus**



**Dresser IMC**

##### » Power source:

- Direct mount module: "A" cell lithium battery
- Remote-mount module: Two "A" cell lithium batteries

##### » Radio programming parameters: Utility ID, index reading, count rate, index rollover, pressure compensation, security level, output power and bubble-up rate

##### » Tamper detection:

- Direct mount module: mercury-free tilt tamper and magnetic tamper
- Remote mount module: mercury-free tilt tamper and cut cable (for Mercury TCI, optionally can get any TCI alarm in place of cut cable)

##### » Battery Counter Indicator for FN reads

##### » Operating temperature: -40°F to +158°F (-40°C to +70°C)

##### » Operating humidity:

- 5 to 95% non-condensing relative humidity
- 100G DLT ERT modules can be installed indoors or outdoors above grade

##### » Product identification: Numeric and bar-coded ERT module type



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#### Programming Device (same as 100G DLN)

- » 100G DLT ERT modules can be programmed using FC200SR with Endpoint- Link (EPL) or Endpoint-Link Pro (EPLP) v5.3 or higher or using FC300SR with EPL or EPLP v5.5 or higher for all modes except fixed network mode which includes the Network Interval Message. 100G DLT ERT modules can also be programmed using Itron's 900 MHz Belt Clip Radio and a customer-supplied laptop with EPL v5.5 or higher for all modes except fixed network mode. The Belt Clip Radio can be connected to a laptop via USB cable or Bluetooth

Note: EPL and EPLP are no longer supported

- » 100G DLT ERT modules can be programmed using FC200SR or FC300SR with Field Deployment Manager (FDM) v1.1 or higher. 100G DLT ERT modules can also be programmed using Itron's 900 MHz Belt Clip Radio and a customer supplied laptop with FDM v1.1 or higher. The Belt Clip Radio can be connected to a laptop via USB cable or Bluetooth

Note: EPL and EPLP are no longer supported

#### Programming Options (same as 100G DLN)

- » **Mobile/Handheld Mode\*** with +10 dBm output power (10 milliwatts), and a 15-second bubble-up rate with a 20-year battery life. This mode is recommended when using traditional walk-by or drive-by meter reading methods
- » **Mobile HP Mode\*** with +24dBm output power (250 milliwatts) and a 60-second bubble-up rate with a 20-year battery life. This mode allows readings to be collected from further away, bypassing many streets and reducing total miles driven
- » **Hard-to-Read Mobile/Handheld Mode\*** with +24 dBm output power (250 milliwatts) and a 30-second bubble-up rate. This mode reduces battery life from 20 years to 15 years. Assuming that utilities would prefer a 20-year battery life, this mode should only be used for exceptionally hard-to-read applications such as meters on a roof or in a sub-basement

- » **Fixed Network Mode** with +27 dBm output power (500 milliwatts), and a 5-minute bubble-up rate of the Network Interval Message. The NIM includes the current index read and last 8 hourly intervals (7 full hours and one partial hour) with a 20-year battery life

\*Note: When reading 40 days of hourly intervals with mobile or handheld, the operator will need to slow or stop briefly which will increase route processing time. Interspersed in the high power NIM, the 100G transmits a medium power RF message at 10 milliwatts or +10 dBm every 60 seconds

#### Approved Reading Devices for Collecting SCM Reads (same as 100G DLN)

- » FC200SR with; MV-RS® v7.8.6 or higher; Field Collection System (FCS) v1.8.5.2 or higher
- » FC300SR with; MV-RS v8.0 or higher; FCS v2.1 or higher
- » G5SR with; Premierplus4 v3.2 or higher; MV-RS v7.8.6 or higher; Integrator v6.0 or higher
- » Mobile Collector 2.0 or higher with MC Software v2.6 or higher with; MV-RS v7.7 or higher; FCS v1.6 or higher; Premierplus4 v3.2 or higher; Integrator v6.0 or higher
- » MC3 with MC Software v3.0 or higher with; MV-RS v7.7 or higher; FCS v1.6 or higher; Premierplus4 v3.2 or higher; Integrator v6.0 or higher
- » MC Lite with MV-RS v7.8.5 or higher
- » ChoiceConnect Fixed Network 2.0; Cell Control Unit (CCU) 4.2; 8-channel repeaters; CCU Meter Reading Application software v3.6.02 or higher; Fixed Network Application software v2.2.3 or higher; Billing Gateway software v2.0.8 or higher

#### Approved Reading Devices for Collecting Datalogging Reads

- » Availability of SCM based ERT ID's are being extended requiring FCS v2.5 with a service pack, FCS v2.6 or higher, or MV-RS v8.4.6 or higher with the following:
  - MC3 (MC3-B or MC3-DL radio) with MC software v3.3 or higher
  - MC Lite (MCL-B radio)
  - FC300SR
  - FC200SR (part number FC2-0005-004 or FC2-0006-004)

#### Approved Reading Device for Collecting Network Interval Message (NIM) Reads

ChoiceConnect Fixed Network 100 Network; Cell Control Unit 100 (CCU100); Repeater 100; Network Software v4.0 or higher; Billing Gateway software v3.0.4 or higher.

#### Battery Life and Design Life

- » 100G DLT ERT modules allow for a field-replaceable "A" cell lithium battery
- » When programmed to mobile/handheld mode or fixed network mode, battery life is 20 years (20+ years for remotes)

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### Regulatory & Standards

- » FCC compliance: Part 15.247 and Part 15.249 (programming) certified
- » FCC ID EWQ100GDLAS
- » Safety approvals: Intrinsically safe per UL Class I, Division 1, Groups C & D

### Operational

- » All 100G DLT ERT modules operate without the need for an FCC license
- » Frequency Range: Frequency-Hopping Spread Spectrum 903 to 926.85 MHz in the ISM band
- » Program frequency: 908 MHz
- » NIM: FM modulation; all other messages are AM modulated
- » Data integrity: Verified in every message

### Physical

All 100G DLT ERT modules have encapsulated electronics for protection against environmental hazards and tampering. All 100G DLT module housings are made of gray polycarbonate. For direct mount residential ERT modules, the gasket material is molded Sevrene™ and the index cover material is clear polycarbonate.

### Meter Compatibility

Refer to Gas Endpoint Meter Compatibility List (PUB-0117-004) for detailed information on gas meter compatibility.

### Additional Information

- » 100G Datalogging ERT Module Installation Guide: Direct Mount (TDC-0823)
- » 100G Datalogging ERT Module Installation Guide: Remote Mount (TDC-0824)
- » Gas Endpoint Ordering Guide (PUB-0117-003)
- » 100 Series Technology Guide (TDC-0825)
- » Field Deployment Manager Endpoint Tools Mobile Application Guide (TDC-0934)
- » Field Deployment Manager Endpoint Tools Configuration Guide (TDC-0935)
- » Field Deployment Manager Endpoint Checklist (TDC-0942)

### Physical (width x height x depth)

	Elster American	Sensus/Rockwell	Itron/Sprague	National	All
Residential	5.54" x 3.57" x 3.1"	4.3" x 3.8" x 2.9"	6" x 4.1" x 3.9"	6" x 3.3" x 3.9"	
Commercial	5.16" x 2.42" x 5.16"	5.38" x 4" x 2.5"	5.16" x 2.42" x 5.16"		
Remote					4.9" x 3.6" x 2.5"

### Shipping Information

	Modules Per Box	Box Dimensions	Box Weight	Modules Per Pallet*	Pallet Dimensions	Pallet Weight
<b>Residential Direct-Mount</b>						
Elster American	10	20" x 11.75" x 4"	8.5 lbs / 3.9 kg	800	40" x 48" x 48" H	680 lbs / 308 kg
Sensus/Rockwell	10	20" x 11.75" x 4"	6.9 lbs / 3.1 kg	800	40" x 48" x 48" H	552 lbs / 250 kg
Itron/Sprague	10	21" x 12.625" x 4.25"	8.8 lbs / 4.0 kg	600	40" x 48" x 50" H	528 lbs / 240 kg
National	10	21" x 12.625" x 4.25"	9.7 lbs / 4.4 kg	600	40" x 48" x 50" H	582 lbs / 264 kg
Itron/Sprague 175 RM	10	22.625" x 11.25" x 4.75"	9.8 lbs / 4.4 kg	600	40" x 48" x 50" H	588 lbs / 267 kg
<b>Commercial Direct-Mount</b>						
Elster American & Itron	5	20" x 11.75" x 4"	7.6 lbs / 3.4 kg	300	40" x 48" x 52.5" H	456 lbs / 207 kg
Sensus/Rockwell	5	20" x 11.75" x 4"	7.5 lbs / 3.4 kg	300	40" x 48" x 52.5" H	450 lbs / 204 kg
<b>Remotes</b>	20	23" x 15.8" x 6.5"	22 lbs / 10.1 kg	500	40" x 48" x 37.5" H	550 lbs / 253 kg

\* Modules are not stacked when shipped but can be stored two pallets high. Modules are to be stored indoors. If outdoor storage is necessary, modules must be sheltered from weather and damage.



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### CORPORATE HQ

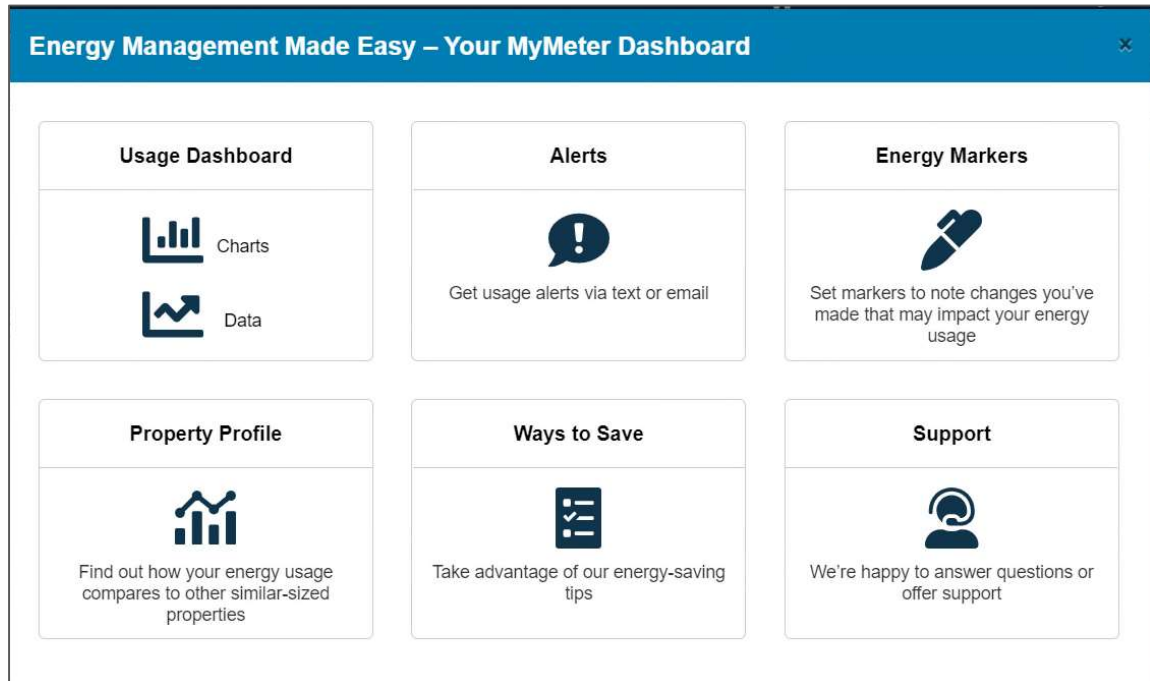
2111 North Molter Road  
Liberty Lake, WA 99019 USA

**Phone:** 1.800.635.5461

**Fax:** 1.509.891.3355

## **Appendix C – Engagement Phase Communication Examples**

### **Usage Dashboard – Access and Home Page**



**How do I create my MyMeter account?**

<sup>7</sup>

<sup>7</sup> [https://youtu.be/\\_6GGqxfnWw](https://youtu.be/_6GGqxfnWw)

## Usage Dashboard – Charts



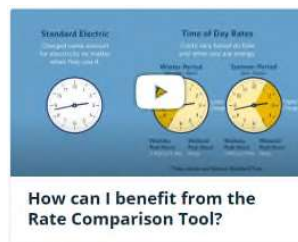
8



9



10



11

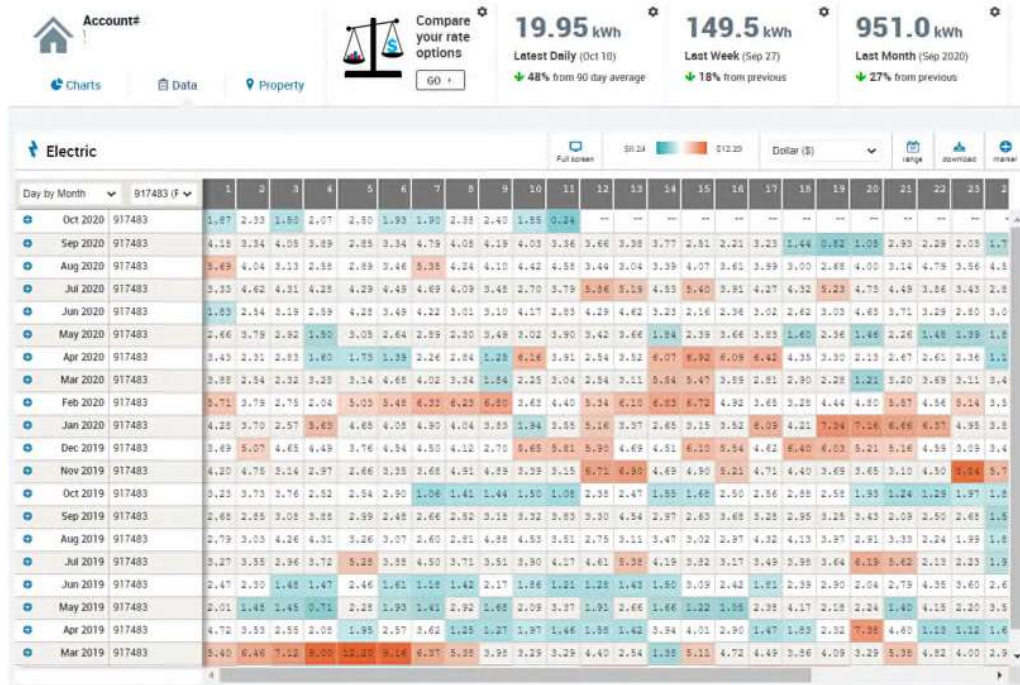
<sup>8</sup> <https://youtu.be/nhJ5lcEwvvk>

<sup>9</sup> <https://youtu.be/WD0N0qlA8zA>

<sup>10</sup> [https://youtu.be/tvz0\\_3PMom0](https://youtu.be/tvz0_3PMom0)

<sup>11</sup> <https://youtu.be/zI9HQw0loVg>

## Usage Dashboard – Data



**I want to know more about the data I see in my MyMeter dashboard.**



**How can I use my MyMeter data to save energy in my home?**

12,13

<sup>12</sup> <https://youtu.be/57f8WicBKny>

<sup>13</sup> [https://youtu.be/DeCgy\\_TTRcE](https://youtu.be/DeCgy_TTRcE)



**Exhibit ELS-2**  
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**Alerts – Notifications**

Add Threshold Notifications

Notification Details

Location
Account

Service Type
Electric

Meter
Meter #

Threshold Details

Notify me when
15-Minute
usage is
Over
0
kWh

You currently average 30.4288 kWh per day, 213.0018 kWh per week, and 912.8647 kWh per month on meter 917483 ( Residential Electric Service )

Recipient Details

Contact Method
Email
Email
Email Address

Add Recipient +

Delivery Method

Enabled

There are no recipients for this notification. Please fill out the recipient details section and click the "Add Recipient+" button to add recipients to the notification.

Close
Save Changes



**What are "alerts?"**

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<sup>14</sup> [https://youtu.be/BP2\\_xuReeKU](https://youtu.be/BP2_xuReeKU)



**Exhibit ELS-2**  
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## Energy Markers



**What is an Energy Marker®?**

15



**What is the Energy Challenge?**

16

<sup>15</sup> <https://youtu.be/GIK7uxoGNpo>

<sup>16</sup> <https://lge-ku.com/node/16246>

**Exhibit ELS-2**  
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## Property Profile

The screenshot shows the LG&E KU myMeter dashboard. At the top, there's a navigation bar with 'Dashboard', 'Notifications', and 'Usage History'. Below this, a row of energy usage cards displays: '19.95 kWh Latest Daily (Oct 10)' with a 48% decrease from the 90-day average, '149.5 kWh Last Week (Sep 27)' with an 18% decrease from the previous week, and '951.0 kWh Last Month (Sep 2020)' with a 27% decrease from the previous month. A 'Compare your rate options' button is also present.

The 'Property Profile' section is titled 'Location #: 1' and includes a map icon. Under 'Details', there are input fields for 'Name' (with a placeholder 'Property Nickname'), 'Primary Use' (a dropdown menu currently showing 'Choose Property Type'), 'Total Sq Ft', 'Occupants', and 'Year Built'. A note below these fields says: 'Select your property type to view and edit your profile details.'

To the right of the details is the 'ENERGY STAR Home Energy Yardstick' section. It explains that the yardstick provides an energy efficiency score based on usage and local weather. A score of 10 indicates high efficiency, while a 1 indicates more room for improvement. A 'SCORE' button with a checkmark is visible.

At the bottom of the profile section, a note states: 'Updates you make while in your myMeter dashboard will be reflected only in your dashboard's property profile or your custom notifications you schedule to receive about your energy usage. If you need to update your profile information associated with your LG&E and KU account, please log in to My Account.'

The footer contains links for 'Contact LG&E and KU', 'Feedback', and 'Privacy Policy', along with a 'Select Language' dropdown and version information 'v5.1.5.3 Powered By: mymeter'.



## How do I complete my Property Profile?

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<sup>17</sup> <https://lge-ku.com/node/16246>

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GECA 1-5

Request:

What plans does the company have to expand smart meter functionality in any United States jurisdiction? Will it be possible for Rhode Island customers to utilize existing smart meter backend infrastructure, or would the entire cost of installing smart meters and the accompanying backend technology be borne by Rhode Island ratepayers?

Response:

PPL and PPL RI refer to their response to data request Division 7-49. PPL continues to evaluate whether it will be feasible to utilize existing smart meter backend infrastructure from other jurisdictions in Rhode Island. Regardless of whether PPL and PPL RI are able to utilize any existing smart meter backend infrastructure, Narragansett will benefit from the experiences, learnings and best practices from PPL's deployment of smart meters in Pennsylvania and Kentucky and apply this expertise to a future smart meter deployment in Rhode Island.

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GECA 1-6

Request:

Does PPL plan to continue National Grid's work to propose a smart meter plan in Rhode Island?

Response:

Yes. PPL and PPL RI refer to their responses to data requests Division 2-8, 2-46, 2-47, 7-45, and 7-52 for information related to PPL's plans for and experience with deployment and utilization of advanced metering functionality.

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GECA 1-7

Request:

Referring back to PUC Docket 4780, National Grid has also made commitments with respect to operation and expansion of electric transportation programs. What experience does PPL have in the operations of electric transportation programs in other United States jurisdictions?

Response:

PPL Electric Utilities Corporation ("PPL Electric") has experience with electric transportation programs and facilitates customer electric vehicle ("EV") adoption. PPL Electric has begun providing summary EV and EV charger information on its website and actively works with customers seeking to install charging infrastructure. These efforts include answering customer inquiries about upgrades and reinforcements required when installing Level 2 and DC Fast Chargers, performing the upgrades, and ensuring all integration requirements are met. Further, PPL Electric actively participates in the Pennsylvania Department of Environmental Protection-led EV coalition called "Drive Electric Pennsylvania", focused on partnering a broad array of stakeholders to advance vehicle electrification throughout the state. PPL Electric has recently joined the Electric Highway Coalition, which represents a partnership of seventeen U.S. utilities who support the development of a seamless network of EV charging stations connecting major highway systems throughout the United States. Finally, PPL Electric has installed EV chargers at multiple service centers for its employees' use, has begun transitioning its fleet to battery electric vehicles and hybrid electric vehicles, and has supported customer installations of charging stations in support of both private and public charging access.

Louisville Gas and Electric Company ("LG&E") and Kentucky Utilities Company ("KU") also have experience with electric transportation programs.

LG&E and KU recently joined the Electric Highway Coalition. The group is a partnership of seventeen U.S. utilities established to support the development of a seamless network of rapid electric vehicle charging stations connecting major highway systems. LG&E and KU will collaborate with coalition members to provide drivers access to efficient, fast electric vehicle charging stations that broaden the network of charging infrastructure and create convenient options for long distance EV travel.

Formed in March 2021, Electric Highway Coalition members agree to work together to implement effective fast-charger deployment plans to enable long distance EV travel along highways stretching from the Atlantic Coast through the Midwest and South and into the Gulf and Central Plains regions. The coalition's focus includes optimizing the placement of infrastructure and complementing existing travel corridor fast-charging sites.

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LG&E and KU support EV drivers through programs that improve accessibility to charging infrastructure and connect customers with tools and information to make informed choices. The utilities have installed twenty of Kentucky's publicly available EV charging stations and plan to deploy additional fast-charging stations along major Kentucky highway corridors. The utilities also enable businesses to host charging stations of their own, offer EV-related facts on their corporate website, and the LG&E and KU online Marketplace helps those considering an EV compare, shop and save.

LG&E and KU are also taking steps to electrify the utilities' fleet vehicles and reduce their overall transportation environmental footprint. LG&E and KU have committed to electrifying 100 percent of the corporate light duty fleet by 2030. Also, the Companies have started and have already begun incorporating EVs, including bucket trucks that operate by battery as crews complete line work in the field, equipping heavy-duty bucket trucks with electric power take-off systems, which use battery storage to enable operation of the power boom, heating and cooling of the cab, and use of electric power tools at the job site without using the diesel engine.



GECA 1-8

Request:

Referring back to PUC Docket 4780 and Docket 5114, what experience does PPL have installing and operating volt-VAR optimization in other jurisdictions?

Response:

In 2021, PPL Electric Utilities Corporation ("PPL Electric") is deploying a system-wide load and voltage management program ("LVM") through the Advanced Distribution Management System ("ADMS"). The LVM program is being deployed after two years of piloting, testing and analysis. LVM will provide volt/VAR optimization on all distribution circuits by the end of 2021, which will involve more than 5,000 switched capacitor banks and other voltage support devices, along with the potential volt-amps reactive ("VAR") contributions from inverter-based distributed energy resources ("DER") enrolled in PPL Electric's DER Management program.

Starting in 2022, Louisville Gas & Electric Company ("LG&E") and Kentucky Utilities Company ("KU") plans to deploy volt/VAR Optimization ("VVO") technologies and business processes which enable greater capabilities to manage system-wide voltage levels and reactive power flow on the electric distribution grid. LG&E and KU will utilize a phased approach, which will allow the companies to optimally design VVO operations while building the core organization, internal skills, business processes, and controls for effective implementation and integration with the ADMS and Distribution Supervisory Control and Data Acquisition ("DSCADA").

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GECA 1-9

Request:

Rhode Island continues to be on the forefront of the development of offshore wind generation, which is expected to be a critical component to meeting the increasing Renewable Energy Standard and the Long-term Contracting Standard (RIGL §39-26.1). What experience does PPL have in conducting or engaging with an RFP for offshore wind?

Response:

PPL does not presently have its own experience in conducting or engaging with offshore wind RFPs in its current utilities in Pennsylvania and Kentucky. PPL and PPL RI will ensure that Narragansett has the necessary experience post-closing in conducting RFPs for offshore wind by: (1) working with National Grid USA Service Company, Inc. ("National Grid Service Company") and Narragansett personnel with experience in this area during the transition period, (2) hiring National Grid Service Company personnel with experience in this area to continue providing service to Narragansett under PPL RI ownership, and (3) bringing additional resources with this expertise on-board into the PPL organization.

GECA 1-10

Request:

RIGL §39-1-27.7 requires an electric distribution company to procure system reliability through diverse and cost-effective sources. This law has become the basis for a process to evaluate, procure, and recover costs of non-wires alternatives through the System Reliability Procurement report. Does PPL have a process for conducting RFPs for non-wires alternatives or experience in analyzing non wires alternatives when considering new grid upgrades?

Response:

PPL Electric Utilities Corporation ("PPL Electric") considers Non-Wires Alternatives ("NWA") as the first mitigation option when addressing reliability concerns. Through a cost-benefit analysis and the consideration of the historic performance of the grid, PPL Electric has identified opportunities where NWAs are the least-cost alternative to minimize the duration of a sustained outage to customers. This method targets circuits with persistently poor performance that extend towards the end of the service territory with limited viable alternatives and a high Customer Experiencing Multiple Interruptions ("CEMI") count, restoring single-phase customers in adverse conditions due to upstream, three-phase outages. Additionally, the implementation of NWAs not only addresses the reliability for these customers, but also improves voltage and power quality of the system.

The existing RFP process is initiated by PPL Electric's Distribution Planning team as the need is identified and the scope of the NWA is developed. Once the scope is finalized, an RFP is sent out to a list of vendors. A vendor is then selected, and the engineering and construction will follow, respectively.

Kentucky and Virginia do not have statutes that require consideration of NWAs in lieu of traditional investments for addressing capacity or reliability issues. However, Louisville Gas & Electric Company ("LG&E") and Kentucky Utilities Company ("KU") utilize NWAs to reduce distribution system constraints and defer or avoid capital investments. For example, LG&E and KU have implemented smart grid infrastructure, system automation and control, and energy efficiency programs to mitigate capacity constraints and improve system reliability. Also, LG&E and KU are continuing to evaluate opportunities to leverage distributed energy resources for addressing capacity and reliability issues as more resources are available and connected to its distribution system.

GECA 1-11

Request:

Please provide a breakdown of the fuel mix for electricity in each electric distribution territory served by PPL. Please distinguish between coal, oil, natural gas, solar, wind, nuclear, hydropower, biomass, and other renewables or other non-renewables. Please also indicate the required minimum percentage of electricity that must be renewable in each territory, what statute, order, or other regulation requires such a percentage, and whether the company exceeds that requirement.

Response:

PPL Electric Utilities Corporation ("PPL Electric") does not have specific fuel mix figures for the electricity delivered to end-use customers in its service territory. PPL Electric operates in a deregulated energy market, therefore it has no information on Electric Generation Supplier product offerings or the generation supply used to support those customer offerings. Further, PPL Electric's default service energy supply is primarily met through fixed price load following full requirements, which do not require suppliers to communicate on the generation mix used to meet their supply obligations.

PPL Electric operates within the PJM ISO, who reports generation mix annually. The PJM report entitled "State of the Market Report" for 2020, states that the generation mix was as follows:

- Coal - 19.3%
- Nuclear – 34.2%
- Natural Gas – 39.8%
- Hydroelectric – 2.0%
- Wind – 3.3%
- Waste Fuel – 0.5%
- Oil – 0.3%
- Solar – 0.5%
- Battery – 0.0%
- Biofuel – 0.1%

Source: <https://www.pjm.com/-/media/committees-groups/committees/mc/2021/20210329-special/20210329-state-of-the-market-report-for-pjm-2020.ashx>

Further, Pennsylvania has implemented an Alternative Energy Portfolio Standards Act ("AEPS Act") which requires Pennsylvania load serving entities to obtain AECs in an amount equal to certain percentages of electric energy sold to retail customers in this Commonwealth. See 52 Pa.

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§ Code 54.182. Currently under the AEPS Act, PPL Electric is obligated to procure 18% of its electricity from alternative energy sources. As required by the PA AEPS Act, PPL Electric has always met its alternative energy supply obligations through the purchase of alternative energy credits. PPL Electric is only responsible for meeting the PA AEPS Act for default service customers and does not have information on Electric Generation Supplier's or their compliance with the AEPS Act.

Louisville Gas & Electric Company and Kentucky Utilities Company's generation mix can be found at page 12 of PPL Corporation's Form 10-K which can be found at the following link:

<https://app.quotemedia.com/data/downloadFiling?webmasterId=101533&ref=115648011&type=HTML&formType=10-K&dateFiled=2021-02-18&cik=0000922224&CK=922224&symbol=0000922224&companyName=PPL+Corp>

Kentucky does not have a required minimum percentage of electricity that must be renewable.

GECA 1-12

Request:

Former Governor Raimondo issued an executive order 20-01, which is still in effect, calling for a study on how RI could meet 100% of its electricity needs with renewable energy by 2030. The resulting study conducted by the Office of Energy Resources and The Brattle Group was published in 2020 to aid in guiding the state towards this goal. Has PPL reviewed this study? What parts of this report does PPL consider an obligation on an electric distribution company? What planning has PPL undertaken to prepare for operating in a jurisdiction with this or similar mandates?

Response:

PPL and PPL RI object to this data request because it seeks irrelevant information and exceeds the scope of this proceeding. This joint petition seeks Division approval for PPL Rhode Island Holdings, LLC's purchase of all shares of common stock of The Narragansett Electric Company ("Narragansett") under R.I. Gen. Laws s. 39-3-24 and 39-3-25. Those statutes and the Division's August 19, 2021 Order in this proceeding establish the standard of review applicable to this proceeding: they require a finding that the proposed transaction will neither cause a detriment to the public nor diminish the provision of Narragansett's electric and gas distribution service. As the Division has held in this proceeding, this review is narrow. First, before approving a R.I.G.L. § 39-3-24 petition, "the Division must find that there will be no degradation of utility services after the transaction is consummated." *In re Petition of PPL Corporation, PPL Rhode Island Holdings, LLC, National Grid USA and The Narragansett Electric Company for Authority To Transfer Ownership of The Narragansett Docket No. D-21-09 Electric Company to PPL Rhode Island Holdings, LLC and Related Approvals*, Dkt. No. D-21-09, 74 (R.I.D.P.U.C. August 19, 2021) (internal citations and quotations omitted). "The Division makes this determination by considering the buyer's experience and financial strength," not by reference to the due diligence performed by the buyer. *Id.* at 75. Second, the Division must find "that the proposed transaction will not unfavorably impact the general public (including ratepayers)." *Id.* (internal citations and quotation marks omitted). The information requested in this data request will not inform the Division's application of the standard.

This data request seeks information that does not bear on the two-pronged standard the Division applies to evaluate this transaction. Specifically, this request for a legal conclusion regarding a report published by the Office of Energy Resources and The Brattle Group is not relevant because such information has no bearing on PPL and PPL RI's experience and financial strength or on whether the proposed transaction will unfavorably impact the general public, including ratepayers. Such information will not inform the evaluation of whether PPL can continue to operate Narragansett in a manner that provides an equivalent level of service. Nor does this request seek



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any information that bears on the impact the transaction will have on the public. Rather, this request seeks irrelevant information regarding PPL's legal conclusion on a report of the Office of Energy Resources and The Brattle Group. Accordingly, this request seeks information beyond the scope of this proceeding.

PPL has reviewed the referenced study conducted by the Office of Energy Resources and The Brattle Group that was published in 2020. PPL and PPL RI refer to their response to data request AG 1-29, which speaks to PPL's experience with renewable energy programs and PPL and PPL RI's plans related to Rhode Island.

GECA 1-13

Request:

Recently enacted RIGL §42-6.2 *et seq.* creates legally enforceable targets for greenhouse gas emissions reductions beginning in 2030 through 2050. Has PPL, (or National Grid) or any of its related companies, ever taken a position, e.g. made public statements, hired lobbyist, and/or engaged in a trade association campaign, in opposition to greenhouse gas emissions reductions by any government entity?

Response:

PPL and its affiliates engage with policymakers on a number of policy, regulatory and legislative energy-related proposals, and provide input in the best interest of their customers and shareowners.

PPL believes that to be the most effective in producing lasting carbon reductions, legislation mandating greenhouse gas emissions reductions should be economy-wide, market-based and provide for regional flexibility. PPL supports a federal carbon rule that is based on “inside the fence” or unit-specific reductions that are demonstrated to be achievable. PPL’s Kentucky subsidiary, LG&E and KU Energy LLC, opposed the Obama Administration’s final Clean Power Plan (“CPP”) as it was inconsistent with this view and subsequently joined in a lawsuit requesting reconsideration of the rule based on flaws in EPA’s methodology, analyses, and assumptions. LG&E and KU Energy LLC have also filed comments and joined in comments by trade associations identifying deficiencies or concerns with various other proposed rules including EPA’s Greenhouse Gas New Source Performance Standards, CPP Federal Plan, and Model Trading Rules.

After a reasonable investigation, it is believed that the CPP is the only greenhouse gas emissions reduction regulation where PPL participated directly in a legal challenge in opposition to the rule. PPL has not identified any instances where it took a general position in opposition to greenhouse gas reductions in general, as opposed to identifying substantive or procedural deficiencies in specific proposed or final rules.

National Grid is not aware of having opposed any federal government efforts to reduce greenhouse gas emissions, generally. National Grid has joined in comments by trade associations identifying potential deficiencies and concerns with various proposed rules or policy constructs addressing greenhouse gas emission reductions. National Grid has also expressed concerns about potential implementation paths for greenhouse gas emission reductions as part of public comment processes or open public meetings

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GECA 1-14

Request:

Has PPL (or National Grid) conducted any studies or published any reports regarding how it or any other utility could achieve mandatory greenhouse gas emissions reductions?

Response:

PPL's Climate Action Plan can be found on the corporate website with links to its Corporate Sustainability Report and CDP report:

<https://www.pplweb.com/sustainability/climate-action/>

For information regarding National Grid's efforts, see National Grid's responses to data requests GECA 1-1 and AG 1-30.

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GECA 1-15

Request:

What plans have PPL (or National Grid) developed to decarbonize the electricity grid in Rhode Island, as would be required to meet the targets in §42-6.2-2(A)(2)?

Response:

PPL and PPL RI refer to their response to data request AG 1-29. See also National Grid USA and Narragansett's response to data request AG 1-30.

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GECA 1-16

Request:

What plans have PPL (or National Grid) developed to convert homes and businesses in Rhode Island from oil, propane, and natural gas to heat pumps, as would be required to meet the targets in §42-6.2-2(A)(2)?

Response:

PPL and PPL Rhode Island refer to their responses to data requests AG 1-33 and AG 1-35.

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GECA 1-17

Request:

What plans have PPL (or National Grid) developed to support the electrification of cars, trucks, and buses?

Response:

PPL and PPL RI refer to their response to data request GECA 1-07. See also National Grid's response to GECA 1-03.



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GECA 1-18

Request:

Municipal aggregations have recently been approved by the PUC, and National Grid is in the process of updating the relevant tariffs. What experience does PPL have working with Municipal Aggregation Programs?

Response:

In Pennsylvania, opt-out municipal aggregation is only permitted with Pennsylvania Public Utility Commission ("PUC") approval. See <https://www.puc.pa.gov/pcdocs/1124730.docx>. There are currently no approved municipal aggregation programs in PPL Electric Utility Corporation's ("PPL Electric") service territory. However, PPL Electric is familiar with the municipal aggregation concept and does discuss the possibility of municipal aggregation with municipalities from time to time.

PPL CORPORATION, PPL RHODE ISLAND HOLDINGS, LLC,  
NATIONAL GRID USA, and THE NARRAGANSETT ELECTRIC COMPANY  
Docket No. D-21-09  
PPL Corporation and PPL Rhode Island Holdings, LLC's  
Responses to Green Energy Consumers Alliance's First Set of Data Requests  
Issued on September 30, 2021

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GECA 1-19

Request:

Does PPL expect to incur any transition costs in taking over National Grid's role in supporting these programs? Please describe any expected costs. Does PPL expect to recover those costs from ratepayers?

Response:

PPL and PPL Rhode Island do not have any specific expectation that they will incur transition costs in taking over National Grid's role in supporting Municipal Aggregation Programs. To the extent PPL and PPL Rhode Island incur any such transition costs, they refer to their response to data requests Division 1-33 and Division 2-39 regarding the approach they will take in determining whether to seek recovery of such costs.

PPL CORPORATION, PPL RHODE ISLAND HOLDINGS, LLC,  
NATIONAL GRID USA, and THE NARRAGANSETT ELECTRIC COMPANY

Docket No. D-21-09

PPL Corporation and PPL Rhode Island Holdings, LLC's  
Responses to Green Energy Consumers Alliance's First Set of Data Requests  
Issued on September 30, 2021

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GECA 1-20

Request:

Green Energy Consumers Alliance currently partners with National Grid to offer a GreenUp option for customers that allow them to purchase additional new Rhode Island RECs from Green Energy Consumers Alliance. Will PPL continue to offer this program? If so, does the company anticipate any transition costs to administer the program? Will it seek to recover those costs from ratepayers?

Response:

PPL RI plans to continue The Narragansett Electric Company's ("Narragansett") existing GreenUp program on Day 1 following the completion of the transaction in the same manner that the GreenUp program is currently operated and managed. PPL RI will evaluate Narragansett's GreenUp program after the transaction closes to consider opportunities to determine whether any program changes are appropriate.

Narragansett's existing electric base distribution rates as approved in its last rate case will remain in effect after the transaction closes. PPL RI does not intend to seek cost recovery for expenses that may duplicate expenses for which National Grid or Narragansett has already sought recovery through its electric base distribution rates. That said, PPL RI may seek to recover portions of the costs of its investments in the GreenUp program to the extent that PPL RI can demonstrate the incremental benefits to customers of these transition costs.