What's New with Eaton DR?

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May 16, 2024

Agenda

- Product Releases/Updates
- Product Development
- Projects Under Consideration
- What ideas do you have?
- Wrap Up

Product Releases

Released: LCR-7600

Simple and Fast Installation

- No cellular setup required at site.

- Terminal connection on board.

- Retrofit into 3rd party equipment.

Capacity and Grid Services Support

- Quick response to dispatch request

- No pre-conditioning required

- Flexible control strategies

- Immediate acknowledgement

- Control adapts to connected resource

Grid Edge Monitoring and Autonomous Control
- Monitor and report Line Voltage and Frequency

- Monitor and report Load Consumption

- Under Frequency and Voltage deviation response

Forecasting, M&V and Appliance Monitoring

- Reports Interval KWh consumption for load

- Reports Demand of the load

- Data Available to detect potential failure

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Yukon Support for LCR 7600C

A new cellular / Wi-Fi LCR model

- Event management
- Inventory and account management
- Program enrollments
- Data display and export capabilities
- Asset availability
- Device specific actions

LCR 7600C additional data points

Device provides some new data options

- Hourly delivered kWh
- 15-minute kWh per interval
- Hourly demand
- Device power lost flag that may be monitored using a data monitor

Device Points

Point Name ↑	Attribute	Value/State	Date/Time	Point Type	Point Offset
BLC Connection Loss Counter	BLC Connection Loss Counter	107 Counts	01/09/2024 10:35:50	Analog	45
Blink Count	Total Blinks and Outages	113 Counts	01/03/2024 15:36:54	Analog	1
Comms Loss Count	Comms Loss Count	4 Counts	01/09/2024 13:56:15	Analog	2
Current Active Radio	Current Active Radio	■ Cell	01/08/2024 18:25:32	Status	14
Delivered kWh Channel 1	Delivered kWh Channel 1	1,116.643 kWH	01/09/2024 13:00:00	Analog	52
Delivered kWh Channel 2	Delivered kWh Channel 2	1,160.607 kWH	01/09/2024 13:00:00	Analog	55
Delivered kWh Per Interval Channel 1	Delivered kWh per Interval Channel 1	0.000 kWH	01/09/2024 13:45:00	Analog	51
Delivered kWh Per Interval Channel 2	Delivered kWh per Interval Channel 2	0.000 kWH	01/09/2024 13:45:00	Analog	54
Demand Channel 1	Demand Channel 1	0.000 kW	01/09/2024 13:00:00	Analog	50
Demand Channel 2	Demand Channel 2	0.000 kW	01/09/2024 13:00:00	Analog	53
Device Power Lost	Device Power Lost	■ False	01/03/2024 15:36:54	Status	15
Firmware Update Status	Firmware Update Status	■ Success	01/03/2024 15:36:54	Status	1
Frequency	Frequency	60.009 Hz	01/09/2024 13:00:00	Analog	4
Relay 1 Activation Status	Relay 1 Activation Status	■ False	01/09/2024 13:00:00	Status	2

Filter By: Select Point Type(s) — Filter | Download | + Create

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TrueCycle Save Profile

TrueCycle Save the Date

- Able to Initiate Save Run Time Profile Request for Dashboard

- Save Today's or Yesterday's Run Time Profile

- Applied to TrueCycle table in device

- TrueCycle table used to adjust the control for each device

Power Lost Reporting and Filtering

TrueCycle Save the Date

- LCR-7600 reports a "last gasp" prior to power down.
- Possible Reason for Unavailable
- If Power Lost is logical, don't visit
  - AC control in the winter
- Filter Asset Availability with Power Lost state
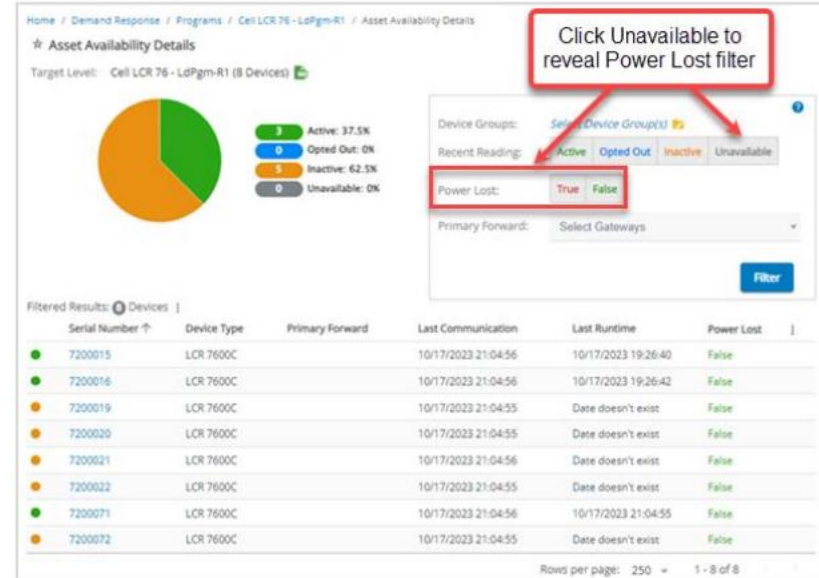
DR Measurement & Verification Reports

Compare Event to Baseline

- Select Control Event to Analyze
- Comparable Non-Control Day(s) used a Baseline
- Report Shows the results in Graphical and Tabular Views
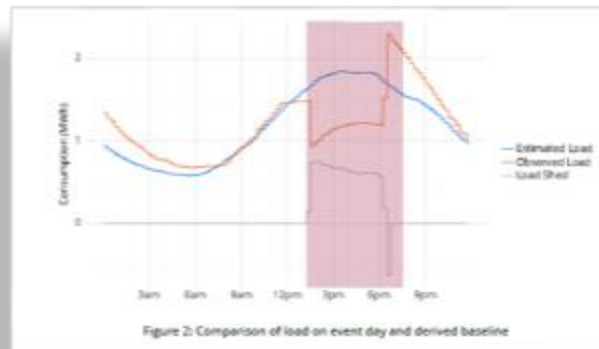- Summary of Achieved Load Reduction Provided

Figure 2: Comparison of load on event day and derived baseline

Load reduction

Figure 2 shows a comparison between the demand reported on the day of the control event and the baseline derived using historical data. These comparisons are further detailed in Table 1.

- In total, it was estimated that the control event curtailed **12.2MWh** of demand relative to what would have been expected on a similar day without a control event.
- This amounts to **3.2kWh** of load shed per participating device.
- Across all devices, **9,619** total hours of shed time were reported during the control event, representing a maximum potential load reduction of **32.7MWh**
- On average, the baseline load during the time of the event was estimated as **1.8MWh**. Given the participation rate (**99.1%**), and the load shed proportion (**100%**), the estimated load reduction during the time of the event was **1.8MW.**

Table 1: Comparison of reported load and estimated baseline on control day

Time of day	Estimated baseline load (MWh)	Reported load on event day (MWh)	Estimated load shed (MWh)
Midnight - 1am	3.6	4.9	0.0
1am - 2am	3.1	4.1	0.0
2am - 3am	2.8	3.6	0.0
3am - 4am	2.5	3.1	0.0
4am - 5am	2.4	3.0	0.0
5am - 6am	2.3	2.8	0.0
6am - 7am	2.4	2.8	0.0
7am - 8am	2.8	2.8	0.0
8am - 9am	3.4	3.3	0.0
9am - 10am	4.0	4.0	0.0
10am - 11am	4.7	4.9	0.0
11am - 12pm	5.5	5.8	0.0
12pm - 1pm	6.2	6.0	0.0
1pm - 2pm	6.8	4.9	1.8
2pm - 3pm	7.3	4.2	3.1
3pm - 4pm	7.6	4.6	2.9
4pm - 5pm	7.6	4.8	2.8
5pm - 6pm	7.5	4.8	2.7
6pm - 7pm	7.0	7.2	0.3
7pm - 8pm	6.5	8.4	0.0
8pm - 9pm	6.1	7.4	0.0
9pm - 10pm	5.7	6.4	0.0
10pm - 11pm	5.0	5.3	0.0
11pm - midnight	4.2	4.4	0.0

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Product Update

- Power Line Carrier (PLC)
  - History
    - Introduced by Westinghouse ~1984
    - Cannon Technologies founded in 1987
      - PC-based Load Management Software utilizing Westinghouse hardware
    - Cannon Purchased manufacturing rights to the hardware from ABB in 1997
    - Introduced solid state meter support in 2004 (MCT-410iL)
    - Cannon acquired by Cooper in 2006
    - Cooper acquired by Eaton in 2013
  - Update:
    - Customer Success Team
      - Phone Support EXTENDED through 2026 for customers transitioning to Eaton RF or Cellular offerings
      - Phone Support through 2025 for remaining customers
    - Component challenges approaching
      - Equipment availability not expected after 2025
        - CCU-721, RPT-902, RPT-801, MCTs
        - Some inventory of CCU-711 boards

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New Product Development

- LCR-7200
  - Same hardware platform as the LCR-7600
  - Board Retrofit in exiting small enclosure products
  - Support Cat-M1 Cellular and Wi-Fi to start
  - Supports up to 2-3A relays for interrupting multiple control circuits.
  - Can support an additional external relay with a 3rd relay driver.
  - Metering options for measuring appliance load.

Future Development

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Planned Development

- Dispatchable Load Forecasting
  - Support Current Availability
  - Planned to Forecast Next 36 Hours
  - Incorporate Weather Forecast
  - Use Asset Data to Refine Availability
  - Additional Support for Meter Data
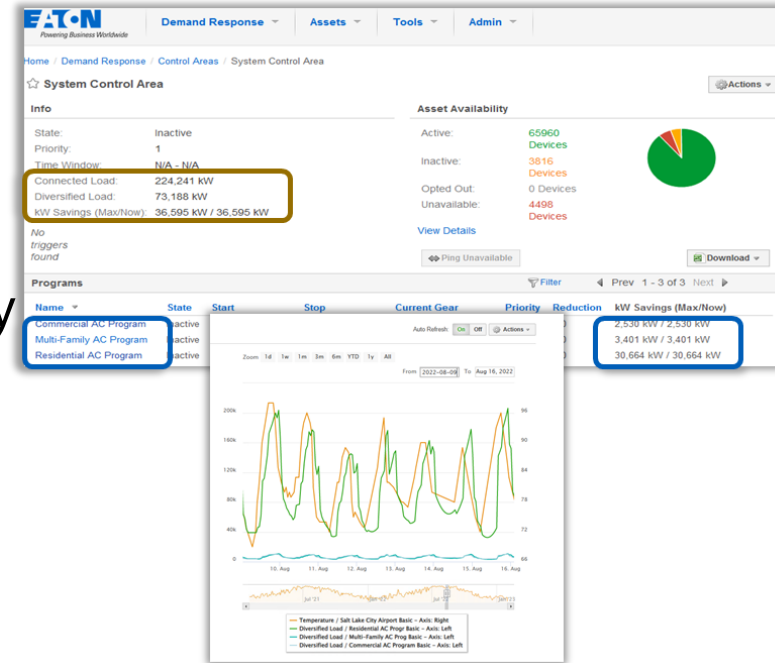
Product Under Consideration

- Gen II Smart Breaker (Coming)
  - 2 Pole BR Type, 15 – 60 Amps
  - 2 pole GF protection, Thermal magnetic
  - Communications:
    - Wi-Fi
    - Cellular Gateway Option
  - 0.5% Metering Accuracy
  - Classified Listing
  - Integration to Yukon??

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Products Under Consideration

- Enhanced EV Control with and without Disconnect Meters

- Enhanced EV Control with and without Disconnect Meters

- Asset Monitoring and Alarming
  - Short Cycle Detection
  - Water Heater Leak Detection

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Products Under Consideration

- Yukon Dynamic Dispatch – Attributes

- Yukon w- SMP Control of DG Resources

- Interactive Mapping Visualization of System

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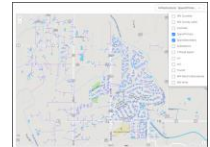
What Products/Features would you like to see?

- Including Hardware, Software, Analytics, or Services

Wrap Up

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