Demand Supervision Solutions

Landis+Gyr

Load Curtailment vs Load Shedding

1. **Load Curtailment vs. Load Shedding:**
   - **Load Shedding:** Currently, **when electricity generation cannot meet demand**, Eskom and municipalities implement load shedding. During load shedding, selected customers are switched off for a specified period (usually 2.5 hours). The severity of load shedding varies across different stages
   - **Load Curtailment:** Instead of load shedding, **the proposal suggests load curtailment.** This means limiting power to all customers with smart meters or smart switches. It can be achieved by using the "Emergency power limit" feature from smart meters or by removing loads from the grid.
2. **Benefits of Load Curtailment:**
   - **Customer Retention:** By implementing load curtailment, **customers won't be disconnected from the grid entirely**. They'll still have essential power for security, lighting, Wi-Fi, and home entertainment. This approach prevents customers from leaving the electricity grid.
   - **Improved Customer Satisfaction:** Providing limited power during peak demand **ensures that essential services remain** functional. Satisfied customers are more likely to stay with the utility.
   - **Revenue Growth:** By retaining customers and maintaining service quality, utilities can continue to grow their revenue.

Remember to consider the technical feasibility, cost implications, and communication strategies when implementing load curtailment.

Load curtailment strategy

Load curtailment is a strategy used to manage electricity **demand and prevent blackouts**. Instead of disconnecting customers from the grid entirely, which **can be very disruptive**, load curtailment involves reducing the amount of electricity supplied to certain areas or customers.

1. **Reducing Power to Non-Essential Services:** Lowering the power supply to non-essential services while maintaining supply to critical infrastructure like hospitals and emergency services.
2. **Scheduled Reductions:** Implementing scheduled reductions in power usage during peak times, so customers know when to expect lower power availability.
3. **Incentivizing Lower Usage:** Encouraging customers to voluntarily reduce their electricity usage during peak times through incentives or pricing mechanisms.

By using load curtailment, the **overall demand on the grid is reduced**, helping to maintain stability and avoid complete outages. This approach ensures that essential services remain operational, and customers experience less inconvenience compared to a full disconnection.

E460 Smart Meter Solution – Demand Supervision

Loadshedding may be eliminated by using E460 smart meters to reduce the demand threshold

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The smart meter monitors the power usage and only disconnects the household if the active threshold is exceeded

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The Smart meter applies an emergency threshold during specified date and time and it's up to consumer to manage their usage to prevent power disconnection

Control Switch Solution – Demand Supervision

Load switch is a G3-PLC Control Switch for Demand Side Flexibility applications to optimize the distribution network infrastructure and energy usage

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The Load Switch offers a high configuration flexibility due to free allocation of control applications to the individual relays

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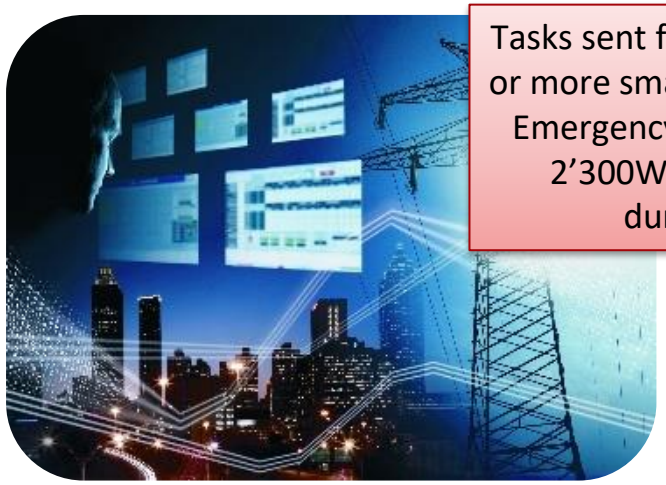
Interaction with on-premise peripheral ecosystem e.g. sensors, PV-converter, twilight switch, home automation systems via digital input for local control or alarming purposes

Load Curtailment with Smart

The proposal to use load curtailment instead of load shedding involves leveraging smart to manage electricity usage more efficiently.

1. **Smart Meter Integration:** Smart meters are installed at customers' premises. These devices can communicate with the utility company in real-time, providing detailed information about electricity usage.
2. **Dynamic Power Management:** Instead of cutting off power completely (as in load shedding), the utility company can reduce the power supply to each customer. This reduction is managed dynamically based on real-time data from the smart meters.
3. **Targeted Reductions:** Power reductions can be targeted to non-essential appliances or systems. For example, during peak demand periods, the power supply to air conditioning units or electric water heaters might be reduced, while essential services like lighting and medical equipment remain unaffected.
4. **Customer Notifications:** Customers can be notified in advance about potential power reductions, allowing them to plan and adjust their usage accordingly. This can be done through mobile apps, SMS, or email alerts.
5. **Incentives for Reduced Usage:** Customers who voluntarily reduce their electricity usage during peak times can be rewarded with incentives such as lower rates or rebates.

Load Limiting, End-to-end Solution



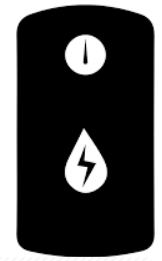
Electricity Service Provider

Tasks sent from HES to one or more smart meters. “Set Emergency Threshold to 2’300W for 2 hours duration”

L540 G3-PLC Load Switch

- 4 x 16A relays
- Direct control from HES or local control with TOU

L540 Load Switch



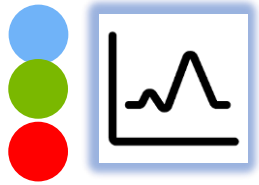
Mobile Network

G3-PLC
Data Concentrator

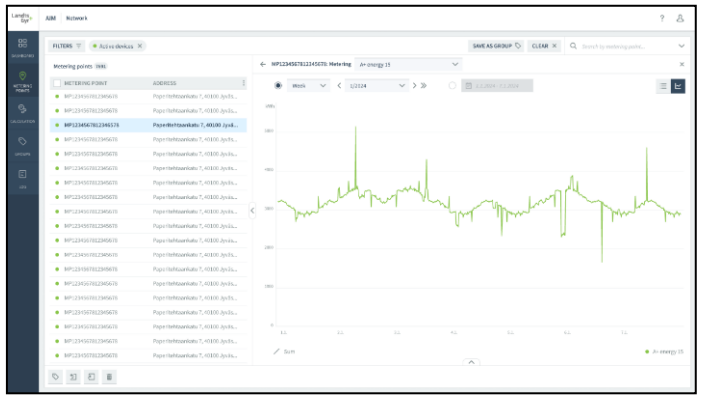
Threshold = 18’400W

Active Threshold = 18’400W

Emergency Threshold = 2’300W for 2 hours



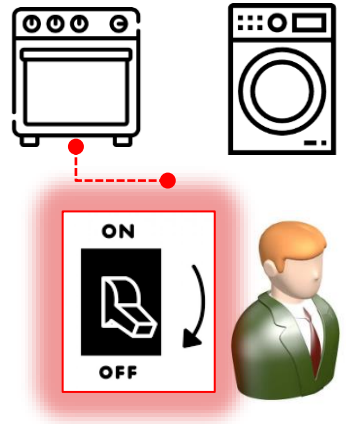
Monitoring Power



Landis+Gyr Gridstream AMI system

E460 Smart Meter P2P with modem

P160 Customer Interface Unit



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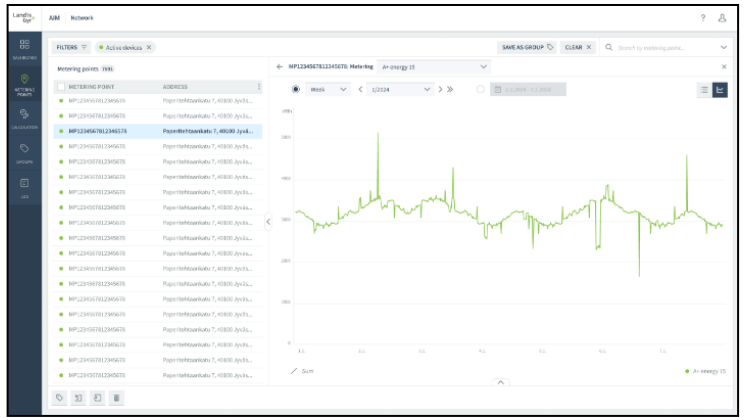
Load Limiting, Using the L540 Load Control Switch

Electricity Service Provider

L540 G3-PLC Load Switch
- 4 x 16A relays
- Direct control from HES or local control with TOU

L540 Load Switch

Mobile Network



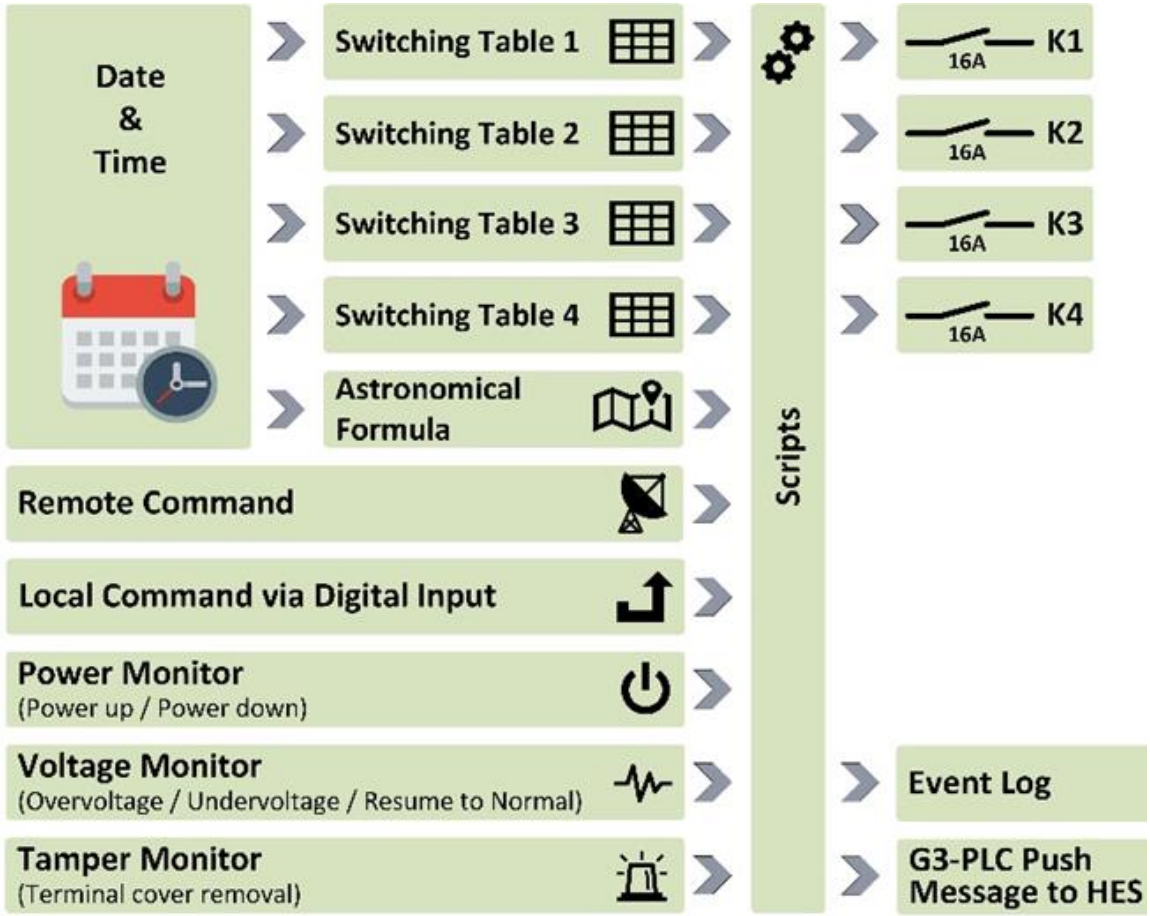
G3-PLC
Data Concentrator

Landis+Gyr Gridstream AMI system

Landis+Gyr

L540, Configuration & Installation Flexibility

- **Allocation of appliances** to the relays.
- **Each relay has its own time-of-use** program with 24 switching actions per day.
- **Random delays** come back to avoid load peaks.
- **G3-PLC communication** with HES via DC450 Data Concentrator.
- **HES control** to react to changing grid conditions or to control appliances spontaneously.
- **Digital Input** for interaction with local ecosystem (e.g. PV converter, twilight switch, home automation system)



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Load Limiting, Using the E460 Smart Meters

Electricity Service Provider

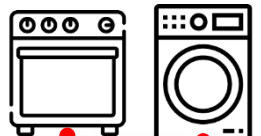
Tasks sent from HES to one or more smart meters. “Set Emergency Threshold to 2’300W 2 hours duration”

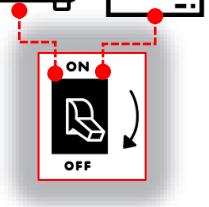
Threshold = 18’400W

Active Threshold = 18’400W

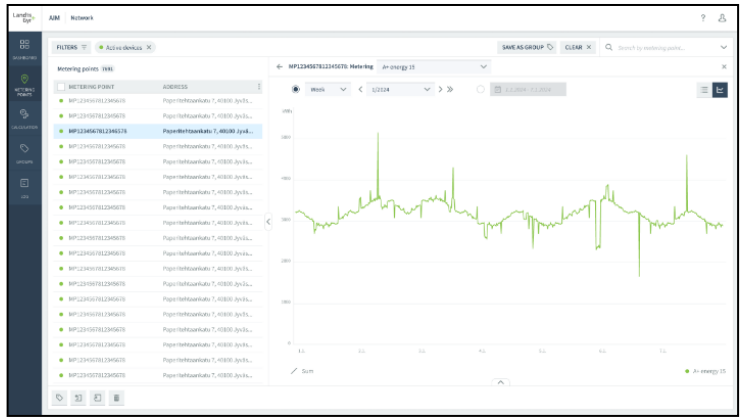
Emergency Threshold = 2’300W for 2 hours

Monitoring Power





Mobile Network



Landis+Gyr Gridstream AMI system

G3-PLC
Data Concentrator

E460 Smart Meter

P160 Customer Interface Unit

P160 Customer Interface Unit

Landis+Gyr

E460 Meter Configuration

- **Demand supervision meter overall.**

Main Load 230V x 80A = 18400W Threshold

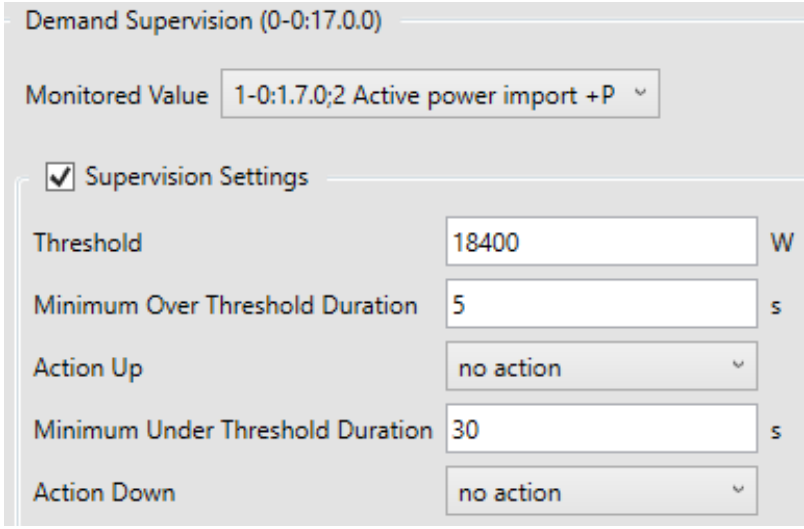
The main meter load limit remains inplace no matter the change in emergency settings

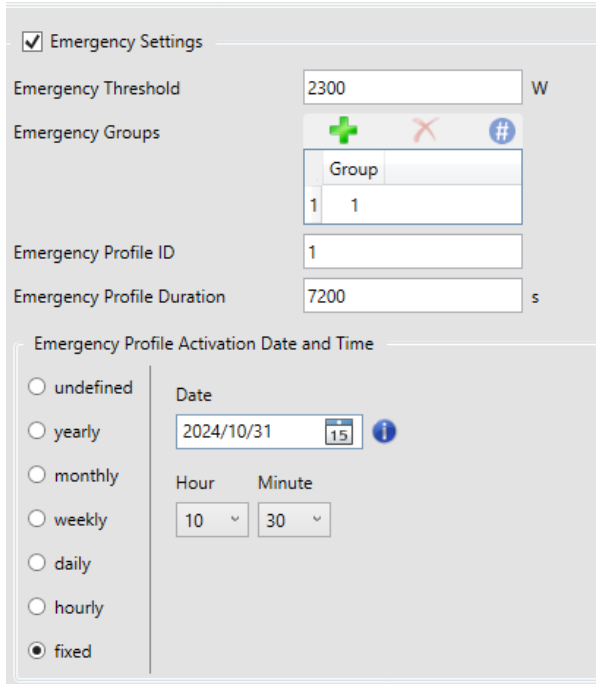
- **Emergency threshold**
  - Weekly
  - Daily
  - Fixed period remotely configurable as and when required

  e.g. 230V x 10A = 2300W

  If exceed on 31/10/2024 from 10:30 – 12:00

  Duration 7200 second 7200/60=120 minutes





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Benefits of Smart Load Switching

1. **Enhanced Grid Stability:** Helps maintain grid stability and prevent blackouts by reducing load during peak times.
2. **Energy Efficiency:** Ensures efficient use of electricity by prioritizing essential loads during high-demand periods.
3. **Cost Savings:** Reduces costs for both utilities and customers by avoiding peak power generation expenses and lowering electricity bills.
4. **Improved Reliability:** Enhances the reliability of electricity supply by better managing load, reducing outages.
5. **Environmental Benefits:** Lowers greenhouse gas emissions by optimizing electricity usage and reducing the need for additional power generation.

Applications

1. **Residential:** Manages appliances like
   - HVAC systems,
   - Water heaters,
   - Pool pumps,
   - Electric vehicle chargers in homes,
2. **Commercial:**
   - Controls lighting,
   - HVAC systems,
   - Other non-essential equipment in commercial settings.
3. **Industrial:** Manages machinery and equipment that are not critical to continuous operations in industrial facilities.

Note: Load limiting shifts electricity usage to off-peak times, ensuring that the utility continues to sell kilowatt-hours (kWh).

Customer service

- Losing customer
  - Theft
  - By-pass
  - Alternative energy (lost for good)
    - GAS
    - Solar
    - Wind

Note

- Electricity **customers pay our salaries**
- Electricity is essential for our safety
- Electricity is essential for our health
- Electricity is essential for growth
- Electricity is essential for communication
- Electricity is essential for education
- Etc,

Thank you for your time

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