



USE CASE

Save energy, increase performance –
with SENTRON Digital for bakeries

START >

SIEMENS

A typical bakery:

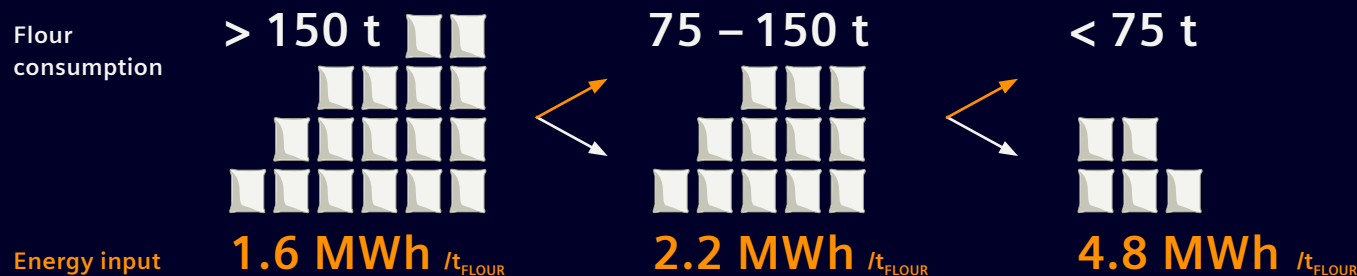
Many processes, high power needs

Wouldn't it be a huge advantage if you could make your production processes more efficient, reduce operating costs, and maximize your competitiveness? SENTRON may not help you bake larger bread rolls in the future, but you can make them at a lower cost. SENTRON is a new kind of energy management that helps you overcome key challenges: How can I determine my exact consumption? Where are the power guzzlers? Where and how can I save energy? SENTRON has the answers.

Focus of interest: The bakehouse

Let's take a look at the bakehouse, since that accounts for the lion's share of consumption. To reduce power costs, it isn't enough just to look at the numbers. You have to be able to differentiate between the different pieces of data and put them in a meaningful context: For example, consider total power requirements per finished bakery product, or the process compared to reference times. And everything must be presented so clearly that you get immediate transparency and can see where you're able to make improvements. Difficult? No. The SENTRON Powermind app makes it child's play.

It all starts with transparency. Trying to optimize without transparency means you're flying blind.



The smaller the bakery, the greater the specific power consumption – and that's a good reason to look particularly closely.

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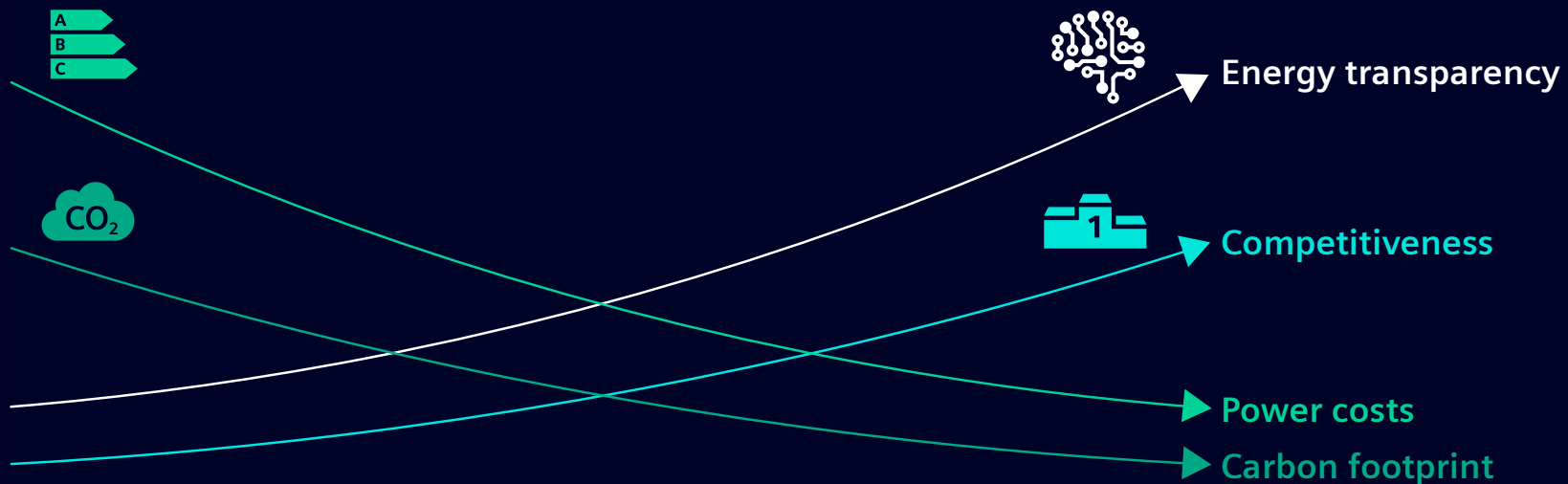
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Energy transparency:

See. Control. Save.

“I came, I saw, I conquered” – to be in control of the situation, you first need to check it thoroughly. And that’s exactly our approach. After all, energy transparency is the prerequisite for keeping your power requirements under control and therefore your costs. Only when you know how much energy is being consumed, and where, you can accurately determine whether those figures are economical, just right, or too high. You can compare these values against standards, your other stores, or defined targets as you work toward a sustainable operation.

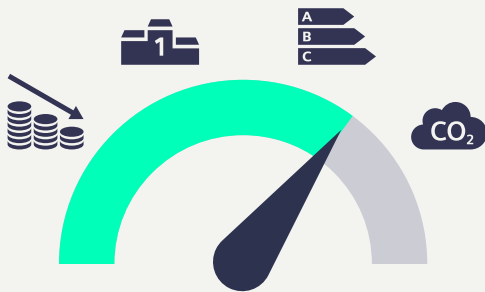
SENTRON also provides you with power and condition data to gain further insights into the technical condition of both the consumers being monitored and the switching devices and protection devices themselves, among other things. This means that maintenance activities can be scheduled before an outage happens, and downtime can be reduced or avoided altogether. The result is a clear competitive edge derived from energy analysis and transparency.



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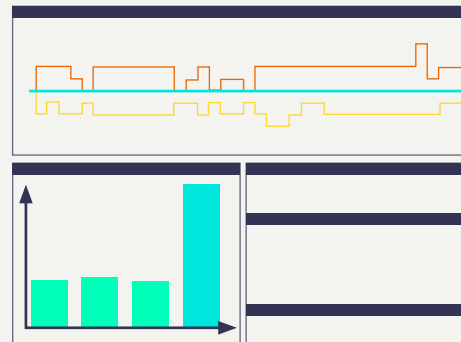
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The ultimate goal: Energy transparency

Energy transparency lays the groundwork for your entire energy management system – whether certified in accordance with ISO 50001, as a foundation for regular energy audits in accordance with DIN EN 16247, or for activities you establish using power-saving guidelines from professional associations or public institutions.

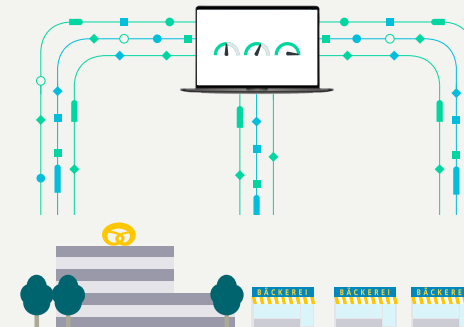
With SENTRON, you can discover the potential energy savings in your production facilities and stores: Which of my stores uses the least electricity – and why? How much power do we need to process a metric ton of flour, or for each square meter of shop floor? Why is my cooling unit's power consumption on the rise? What are my biggest power consumers? Based on detailed measured values, you can work out effective measures.



Moment of revelation: System transparency

Using measured power consumption values for entire systems, individual motors, ventilators, and compressors, the appropriate analytical tools in the cloud can provide insights into their devices' technical condition. Long-term data recording, in particular, can reveal trends that would not be evident based on selective consideration.

Another benefit is that protection devices like SENTRON 3VA molded case circuit breakers use a range of data to determine their own state of health and accurately express their remaining service life. Using this knowledge, it's possible to schedule maintenance during production downtime or other downtime when the necessary spare parts are available.

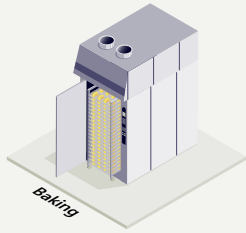


More knowledge adds value: Operational transparency

Why exactly are the power costs in Store 1 so much higher than in all the others? And is that actually what's happening, if we relate energy consumption to products sold? Or to the factory area? And where is additional power needed?

You can get the answers to these questions if you have the energy data from your main business and production facility in the cloud – as well as energy data from your retail stores, which increasingly use their own ovens. Having a detailed overview of all consumption also allows you to organize in-house workflows based on optimized energy principles.

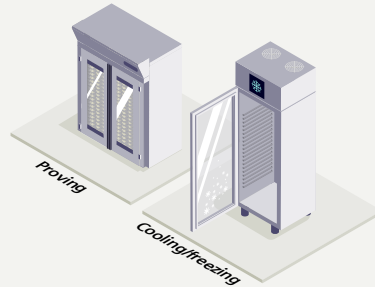
Selected key consumers and approaches to optimization



Ovens

15 – 30%

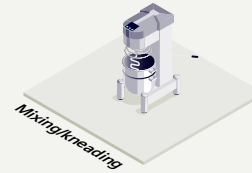
Ovens account for more than half of a bakery's power needs. That's why investments in energy-saving technologies are especially valuable. In addition to the type of oven (deck oven, rack oven, etc.), the power source (gas, electricity, wood pellets) will also determine the extent of your power costs. This is also an area where it's particularly helpful to look at the question of energy recovery or multiple use.



Cooling units/
refrigeration systems

15 – 30%

The power consumption of refrigeration systems accounts for about 7% of a bakery's total power needs. Because they essentially run continuously, their waste heat is well suited for purposes like space heating and providing hot water. The consumption of provers, fermentation interrupters, and cooling and fermentation cabinets can also be recorded without difficulty using meters on the control panel. That will make it clear whether a new investment in energy-saving measures is worthwhile.



Electrical devices

15 – 40%

Dough mixers, kneaders, bread roll presses, and dishwashers – you know the wide variety of electrical devices you use. But do you know where to find the greatest potential for savings? Dishwashers, for example, should be connected to the hot-water supply at the minimum, and should ideally have a heat recovery system. The key lies in finding the right dimensions and utilizing energy-saving devices in general.



Lighting

20 – 50%

← **Saving potential**

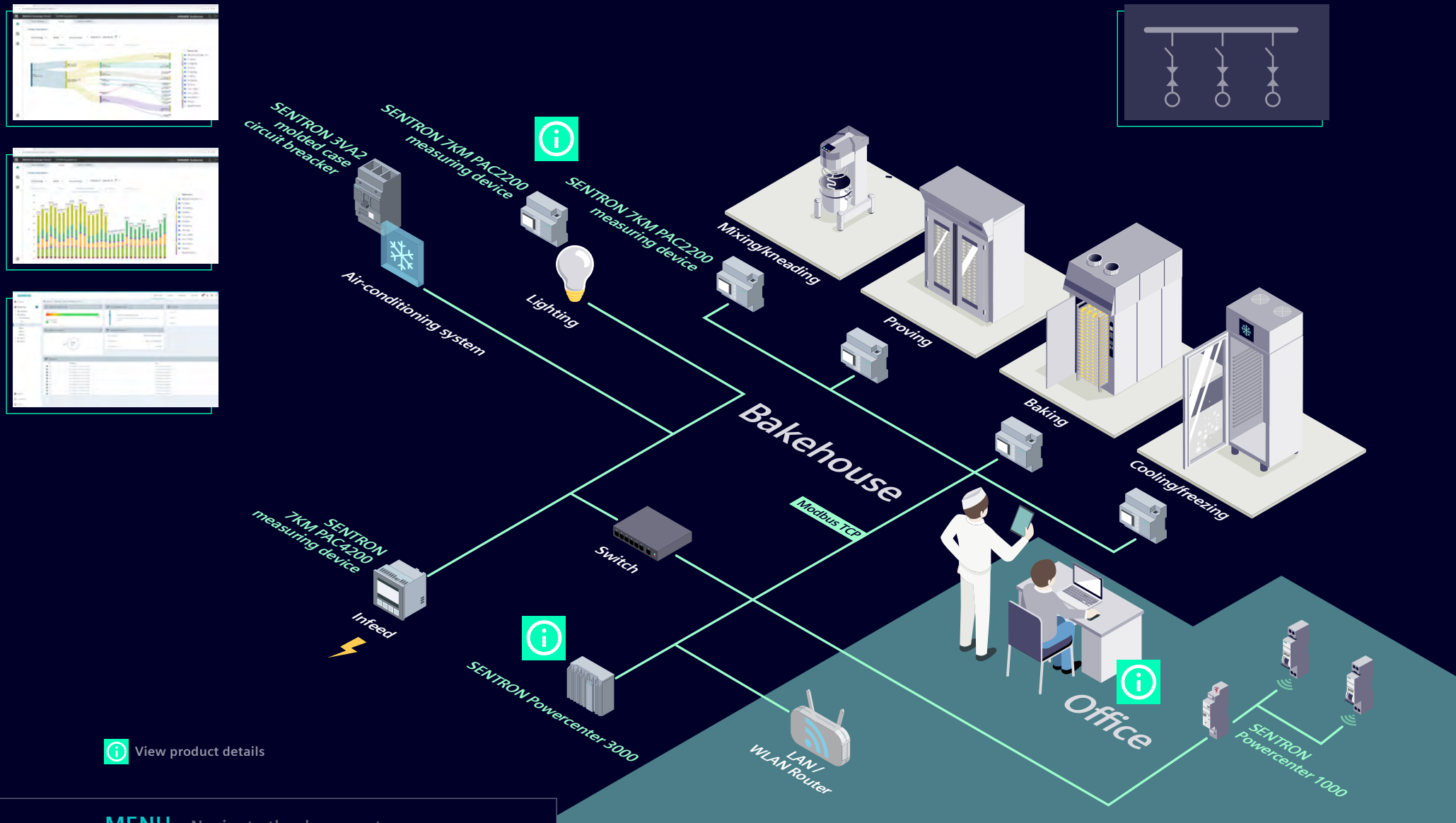
Is it a question of good working light or presenting your products attractively? Lighting isn't usually a major consumer in bakeries, but there's still room for major savings when you select the right lighting – not just in terms of power costs but also maintenance (for example, LED systems have a longer service life).

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Automated/semi-automated **bakehouse**



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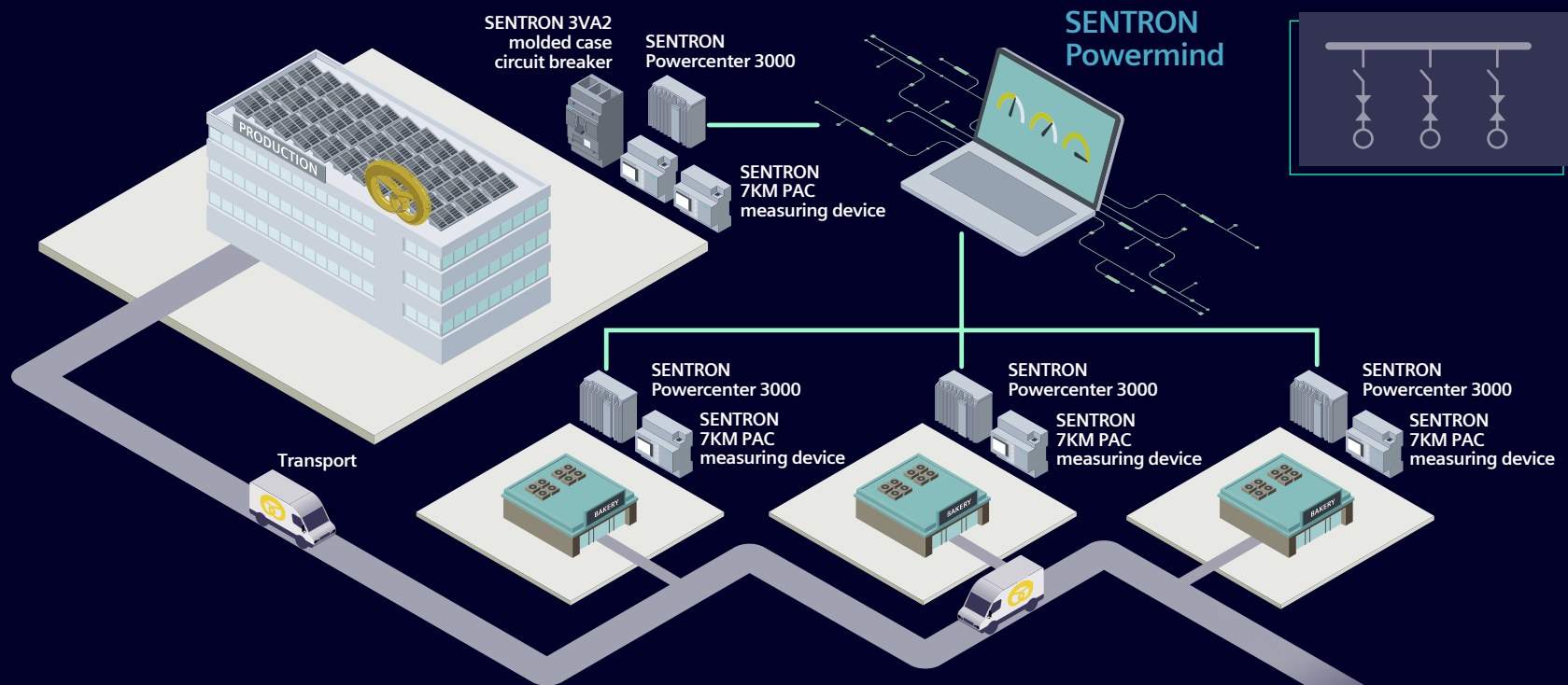


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Give your operations a lift – into the cloud

Let your high costs evaporate

Whether you're a major operator or a smaller bakery, a cloud solution offers clear benefits in every case. In particular, you can avoid high investment costs for hardware and software, and you don't need to worry about looking after updates and security settings. But there's typically no reason for smaller operators in particular to create and maintain a large in-house IT infrastructure. And instead of inflexible and cost-intensive software licenses, subscription-based apps are much cheaper and more practical. The SENTRON Powermind app takes this into account, and can be easily and flexibly expanded, reduced, or even terminated at any time if circumstances change.



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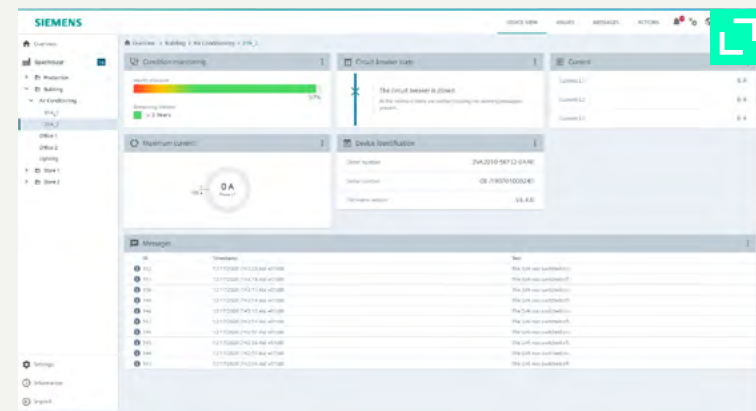
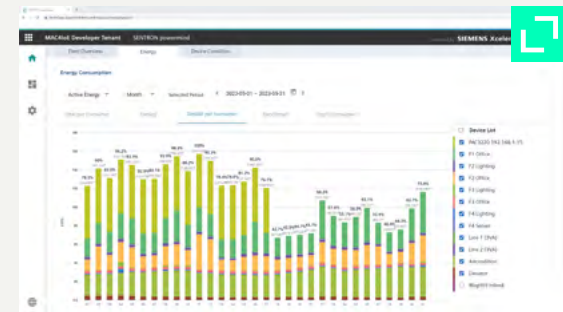
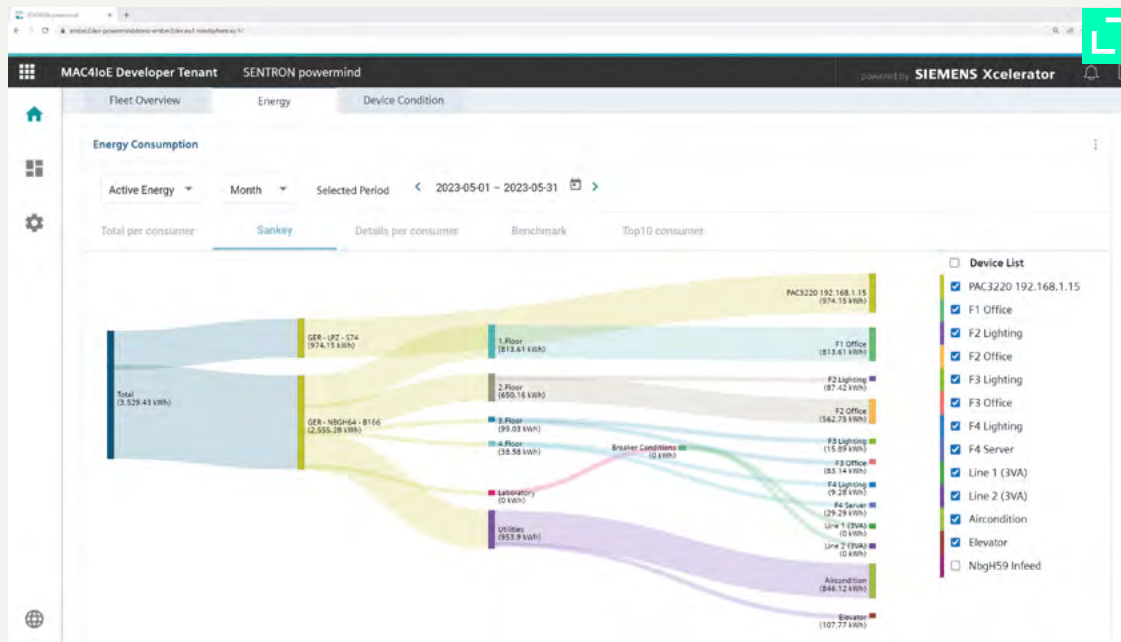
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The power duo for synergy

The combination of the SENTRON Powercenter 3000 IoT data platform and the SENTRON Powermind app makes energy transparency as easy as can be, especially because retail stores can also be easily included in the analysis via the cloud. The SENTRON Powercenter 3000 gathers and processes energy and condition data, displays it using the integrated web interface, and transmits it to the SENTRON Powermind app for further analyses. The dashboards give you a clear view of the organized data and can be accessed conveniently anywhere, any time, and on any device.

The benefit

Analyses are performed quickly and easily. You can concentrate fully on your core business – and still be able to make informed decisions at all times.



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SENTRON Powercenter 3000

The powerful IoT data platform and software

Are you looking for an easy and cost-efficient entry into digitalization of your power distribution system, and want to make the most of the added value? The SENTRON Powercenter 3000 is a solution for companies of all sizes. In particular, this smart IoT platform gives you a transparent overview of your power consumption, supplies condition information, and thus lays the foundation for an operational energy management system that includes optimized servicing and maintenance.

The communications-capable devices in the SENTRON portfolio record power values like current and voltage or condition and status information and transmit it to the SENTRON Powercenter 3000, where the data is organized and visualized for direct analysis in an integrated, browser-based interface. You also get the opportunity to utilize all the data from your power distribution system from any location, thanks to cloud-based solutions like SENTRON Powermind.

Highlights

- Easy and cost-effective entry into energy management, especially for smaller businesses
- Secure and universal communications interface for the entire plant
- Easy commissioning right in the integrated web interface or using the free SENTRON Powerconfig configuration software
- Support for meeting standard requirements (for example, ISO 50001 for energy management systems)
- Easy handling and intuitive data analysis via the integrated web interface and various cloud applications
- Full range of functions, security precautions, and opportunities for future expansions (i.e. the cloud) are available with no further demands in terms of IT infrastructure or software maintenance
- Alarm and notification function: for example, if limit values are exceeded or in response to defined events



SENTRON Powermind

The smart cloud application

Analyze and evaluate energy and system data, regardless of location, in real time and over time – it's completely easy with SENTRON Powermind. This smart app lets you keep an eye on everything: power flows (sankey diagram), current, voltage, power values, and changes in these values over time, both for entire systems and for individual electrical consumers. You can also see the current condition and remaining service life of key protection devices and switching devices.

Highlights

- Real-time analysis and storage of all relevant energy data
- Intuitive operation
- Easy and flexible expansions via in-app purchases
- Rapid identification of spikes and high consumption patterns
- Fault location and analysis for predictive maintenance
- Support for the creation of an operational energy management system – for example, in accordance with ISO 50001 or as the basis for regular energy audits as per DIN EN 16247



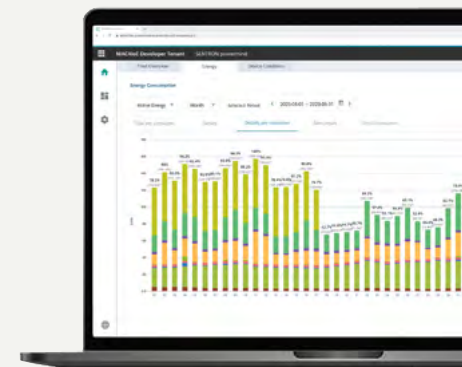
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Totally transparent power distribution – everywhere, any time

Storage and analysis of data from your power distribution system



Features

- Full transparency for your power distribution – everywhere, any time
- Storage and analysis of data from your power distribution system
- Simple dashboard templates including power consumption, load curves, and comparison with historical data
- Visualization in graphic form for a direct overview (sankey, heat map, line chart, etc.)
- Comparison of energy/electricity consumption for various periods, including KPIs (for example, “Percentage utilization rate”)
- Energy consumption on work days compared to weekends
- Convenient notification function

Benefits

- Discover potentials for saving power
- Reduce costs by identifying and avoiding power demand spikes
- Identify energy waste or uncharacteristically high energy consumption patterns
- Recognize spikes and overloads
- Display device status and key values like phase current, total power, and energy
- Condition monitoring
 - Constant monitoring of circuit breakers to enable action before problems arise
 - Information about remaining service life to improve maintenance work and scheduling

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SENTRON

Protection, switching, and measuring devices

High performance, accurate measurements, and powerful communication

You need to gather all kinds of information to ensure transparent energy and condition data. It's collected by devices in low-voltage switchgear, power distribution systems, and machine distribution boards or control panels. The communications-capable SENTRON protection, switching, and measuring devices record all relevant electrical energy values, status information, and condition data and forward it for visualization, evaluation, and analysis.



SENTRON 3VA molded case circuit breaker



SENTRON 7KM PAC measuring device



Measurement communication-capable SENTRON circuit protection devices

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The following products were used for data recording in this use case:



SENTRON
7KM PAC2200
measuring device

SENTRON 7KM PAC4200 measuring device



SENTRON 3VA molded case circuit breaker

- Protection device with integrated measuring function
- Records relevant data for energy management
- Integrated condition monitoring assures the monitoring function
- Provides device-specific status and remaining service life

SENTRON 7KM PAC2200 and SENTRON 7KM PAC4200 measuring devices

- Compact rail devices and multi-function measuring devices (front-mounted)
- To measure and calculate all relevant energy management data, from infeeds to individual outgoing feeders or consumers

Measurement communication-capable SENTRON circuit protection devices

- Portfolio comprises:
 - SENTRON 5SL6 COM miniature circuit breakers
 - SENTRON 5SV6 COM arc-fault detection device/miniature circuit breaker combination
 - SENTRON 5ST3 COM auxiliary switch/fault signal contact (to incorporate 5SY miniature circuit breakers as well as 5SV RCCBs and 5SV1/5SU1 RCBOs)
 - SENTRON Powercenter 1000
- For reliable protection from short circuit, overload, overvoltage, function failure, and electric shocks – with an integrated measurement and communications function
- Smart, safe, and space-saving solution for transparency all the way to the final circuit

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Energy management for your business

As a bakery business, your company is in one of the most energy-intensive categories. Your power consumption can vary greatly, depending how large your operation is. For smaller bakeries that process less than 75 metric tons of flour per year, energy consumption per ton of flour is about twice that of large-scale bakeries. Paying closer attention to energy transparency and efficiency is especially important in this area.

Energy transparency + energy saving ...

- Processed data and measured values from the bakery and retail stores facilitate decision-making
- Long-term data from the bakehouse, sales area, and branches is used to monitor trends and the effects of improvements and to compare them against industry standards (monitoring, KPIs, benchmarking)

... with SENTRON Digital ...

- Easy and effective energy management for smaller and medium-sized enterprises in particular (certification in accordance with ISO 50001)
- Real-time monitoring and analysis over time, fault location and analysis for predictive maintenance
- Clearly laid out dashboards showing analyses of measured values, smart displays and data transparency for all major consumers
- Ideal transparency for energy data from all locations, facilitating comparability and identification of best practices

... for lasting benefits

- Better system transparency for power distribution and maintenance planning
- Easy, low-cost entry into energy management (subscription-based app), flexibly expandable, easy to terminate
- Demonstrable improvement in lifecycle balance/carbon footprint
- Concrete proof of sustainability and awareness of energy consumption
- KPIs/parameters to compare with other bakeries
- More sustainable energy management results in an enhanced image and employee motivation



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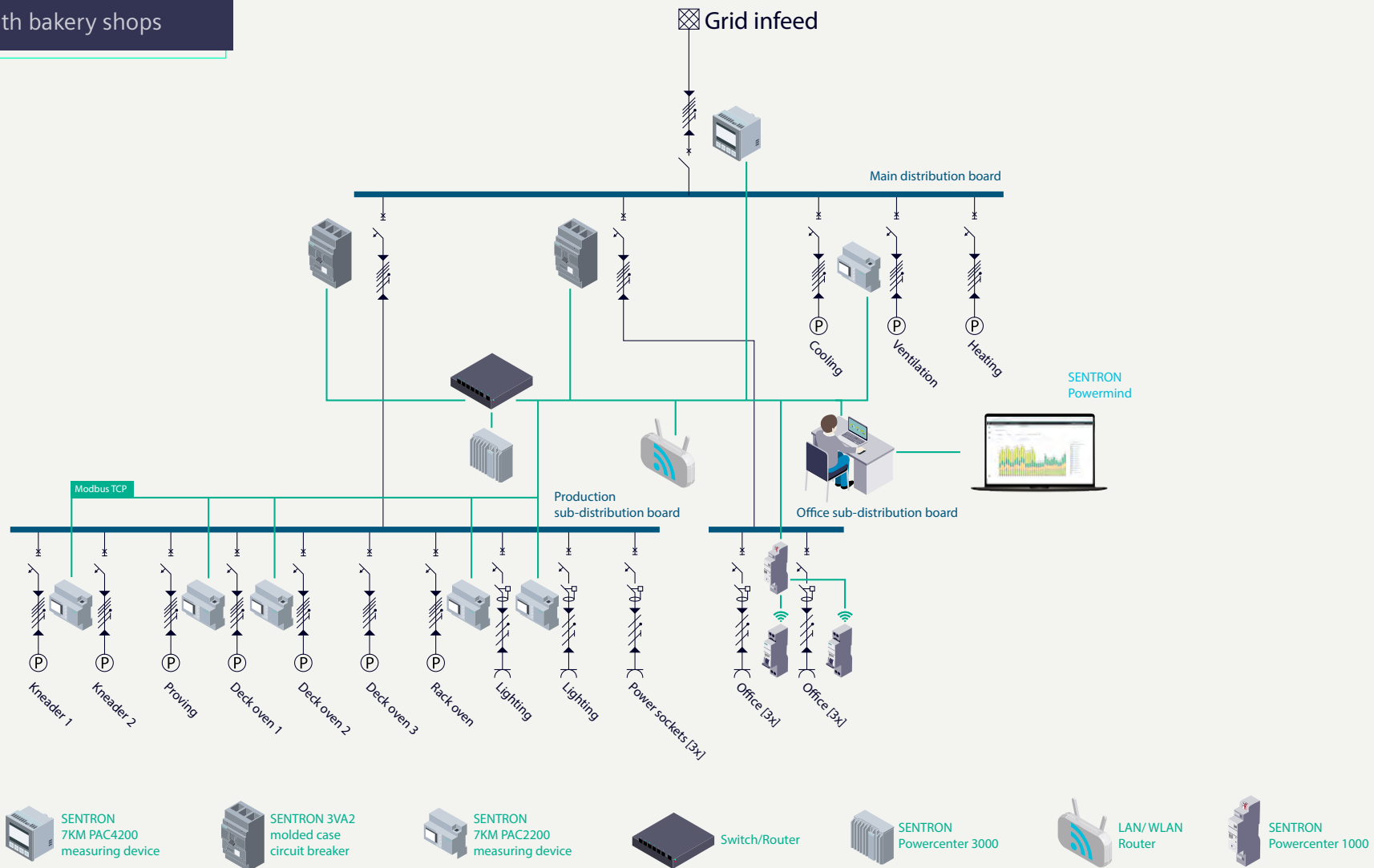
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Automated/semi-automated **bakehouse**

Show with bakery shops



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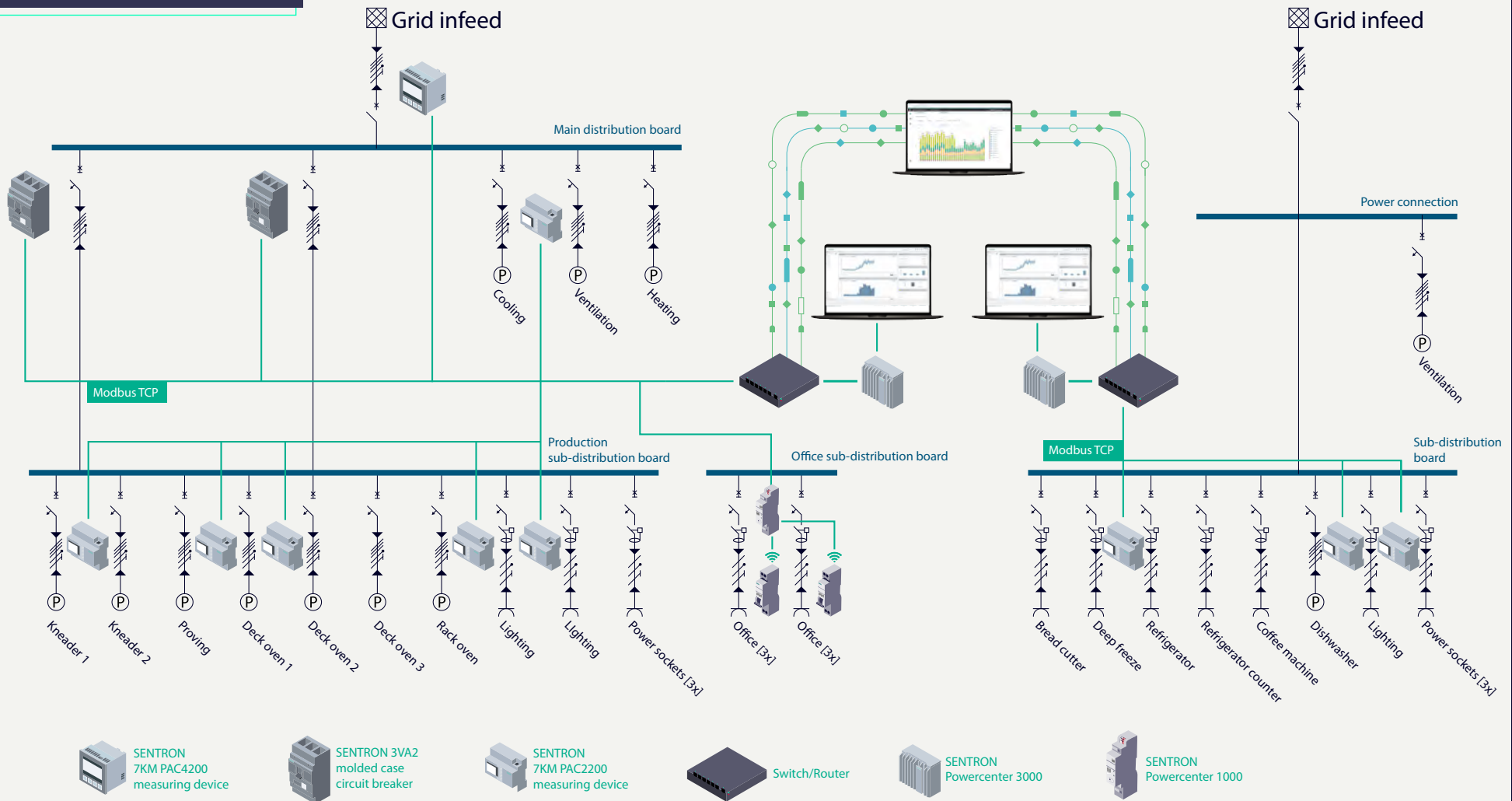
Give your operations a lift – into the cloud

Show without bakery shops

Shop floor and office

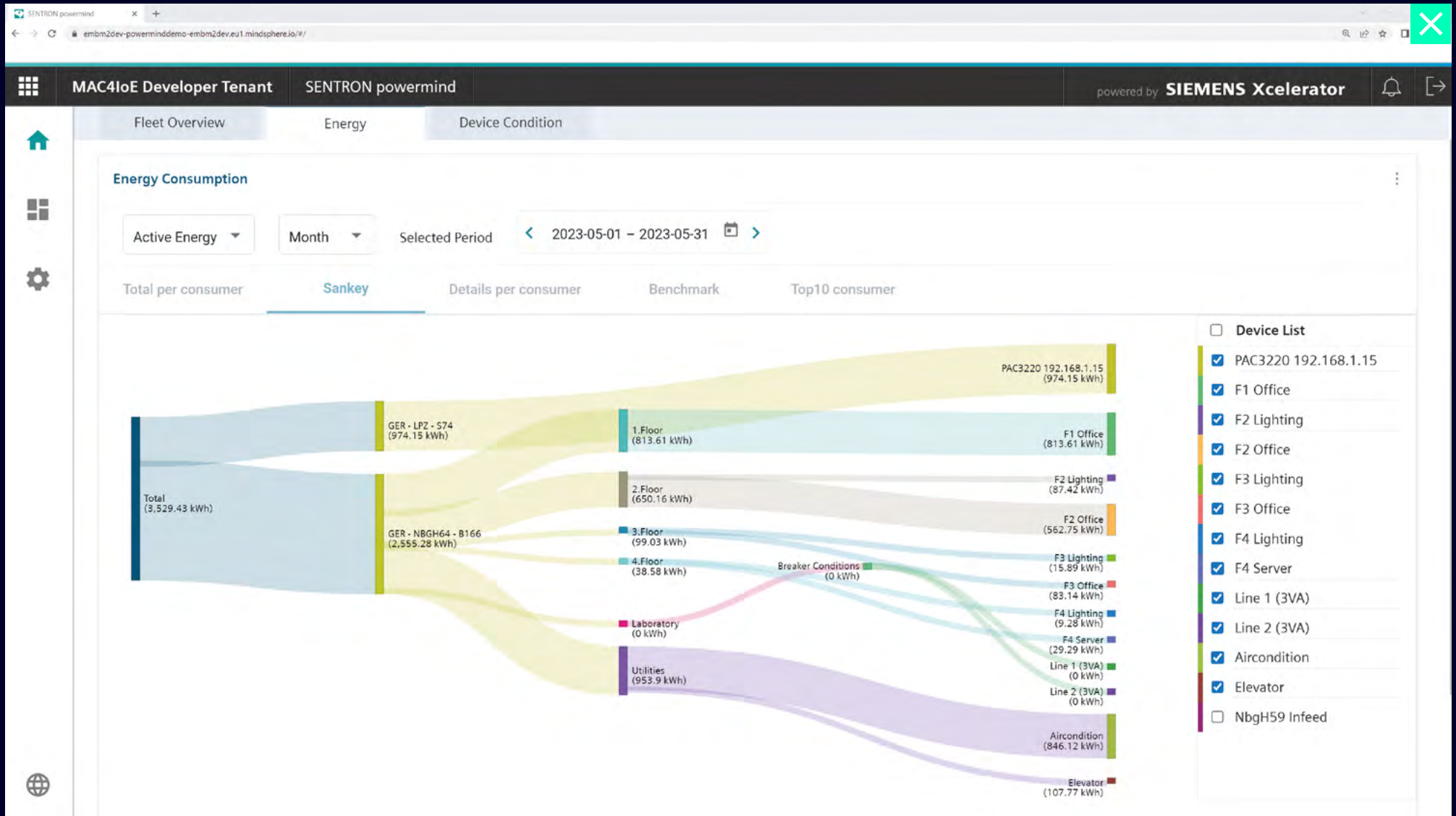
SENTRON Powermind

Bakery shop(s)



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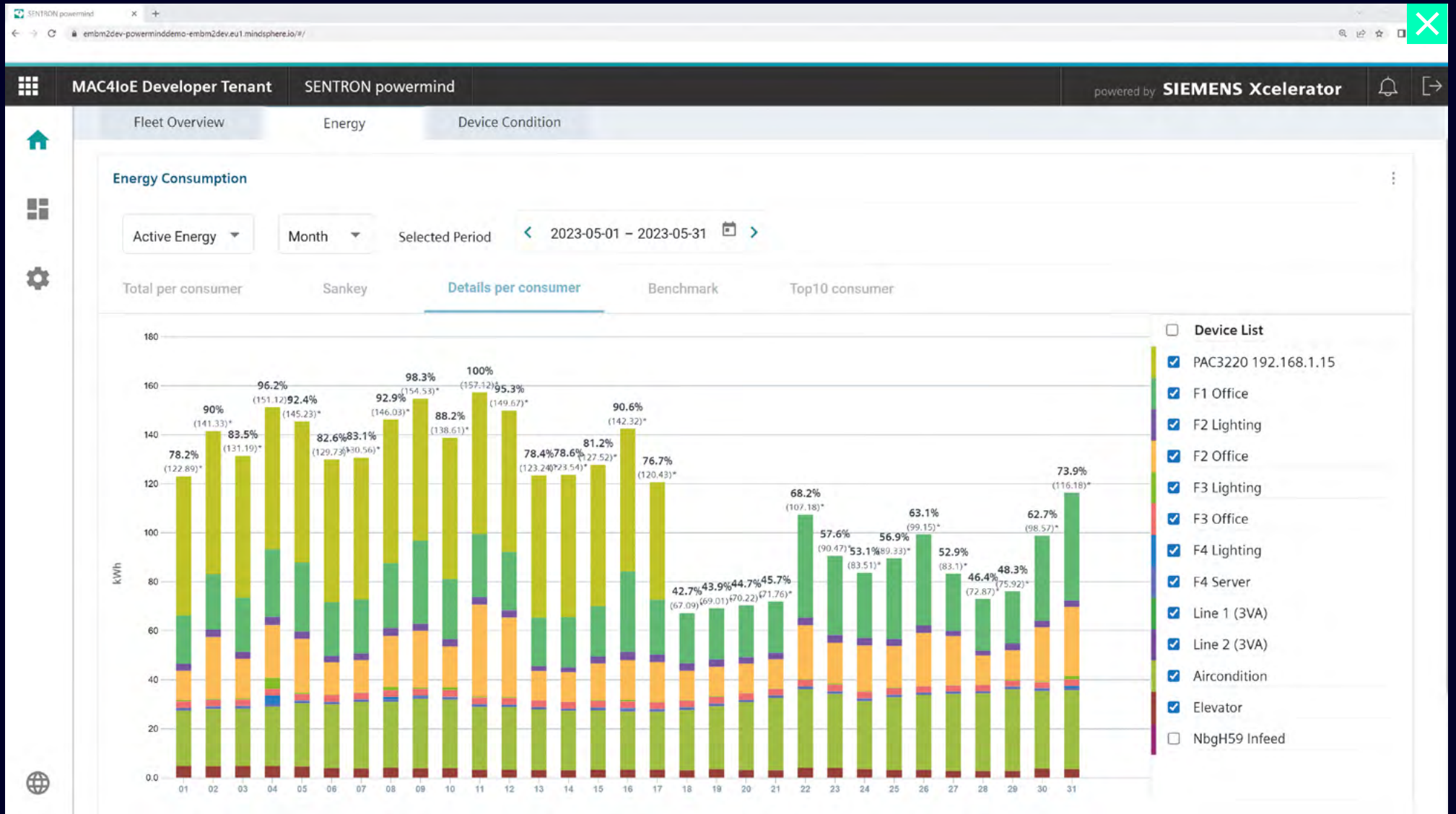
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Overview

Bakehouse 16

Production

Building

Air Conditioning

3VA_1

3VA_2

Office 1

Office 2

Lighting

Store 1

Store 2

Settings

Information

Imprint

Overview > Building > Air Conditioning > 3VA_2

Condition monitoring

Health indicator

97%

Remaining lifetime

> 3 Years

Maximum current

0 A

Phase L1

Circuit breaker state

The circuit breaker is closed.

At the moment there are neither tripping nor warning messages present.

Current

Current L1 0 A

Current L2 0 A

Current L3 0 A

Device identification

Order number 3VA2010 5KP32 0AA0

Serial number OE /190701000245

Firmware version V4.4.0

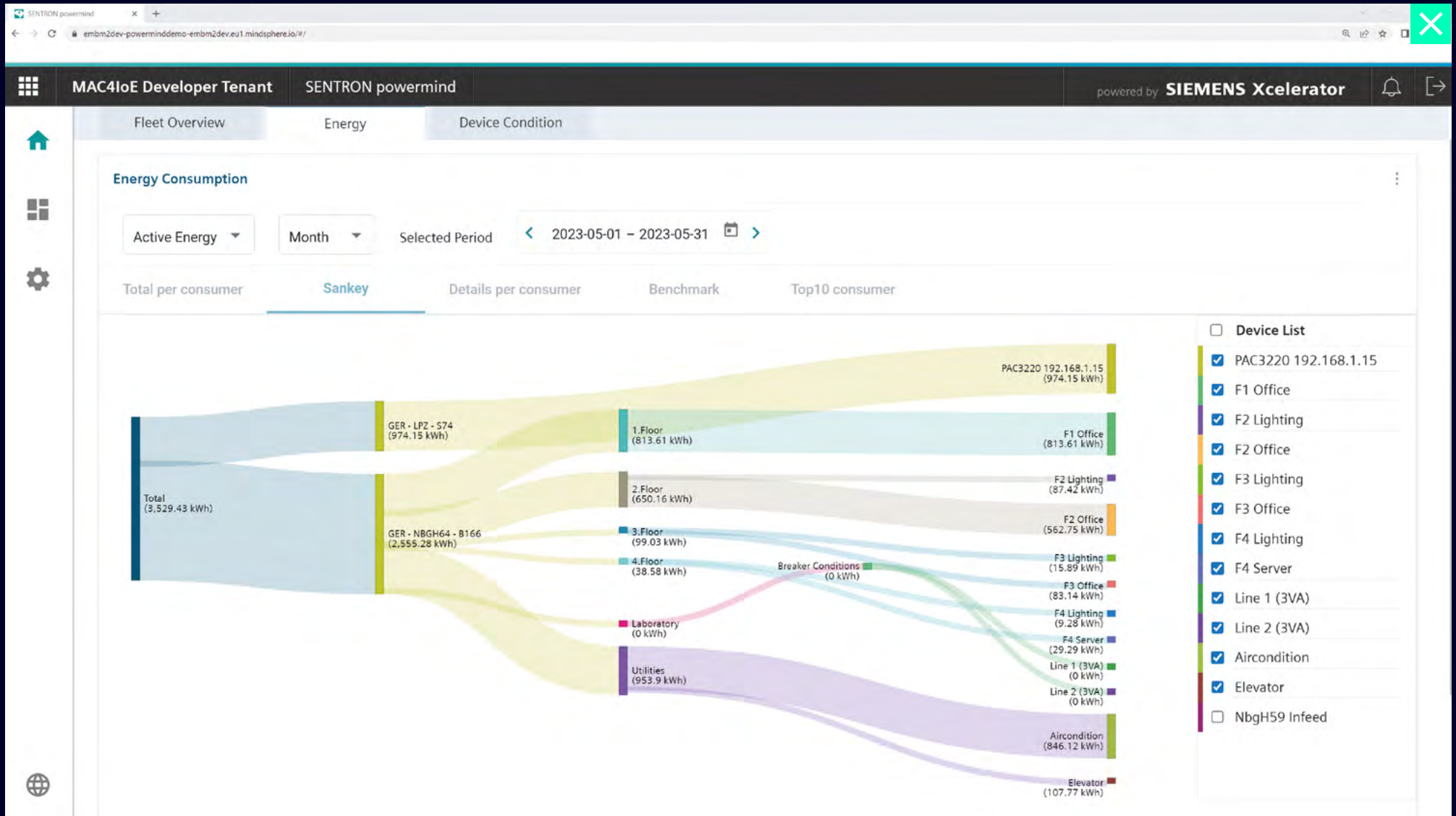
Messages

ID	Timestamp	Text
152	12/17/2020 7:47:28 AM +01:00	The 3VA was switched on.
151	12/17/2020 7:43:18 AM +01:00	The 3VA was switched off.
150	12/17/2020 7:43:17 AM +01:00	The 3VA was switched on.
149	12/17/2020 7:43:16 AM +01:00	The 3VA was switched off.
148	12/17/2020 7:43:15 AM +01:00	The 3VA was switched on.
147	12/17/2020 7:43:14 AM +01:00	The 3VA was switched off.
146	12/17/2020 7:42:57 AM +01:00	The 3VA was switched on.
145	12/17/2020 7:42:56 AM +01:00	The 3VA was switched off.
144	12/17/2020 7:42:55 AM +01:00	The 3VA was switched on.
143	12/17/2020 7:42:54 AM +01:00	The 3VA was switched off.

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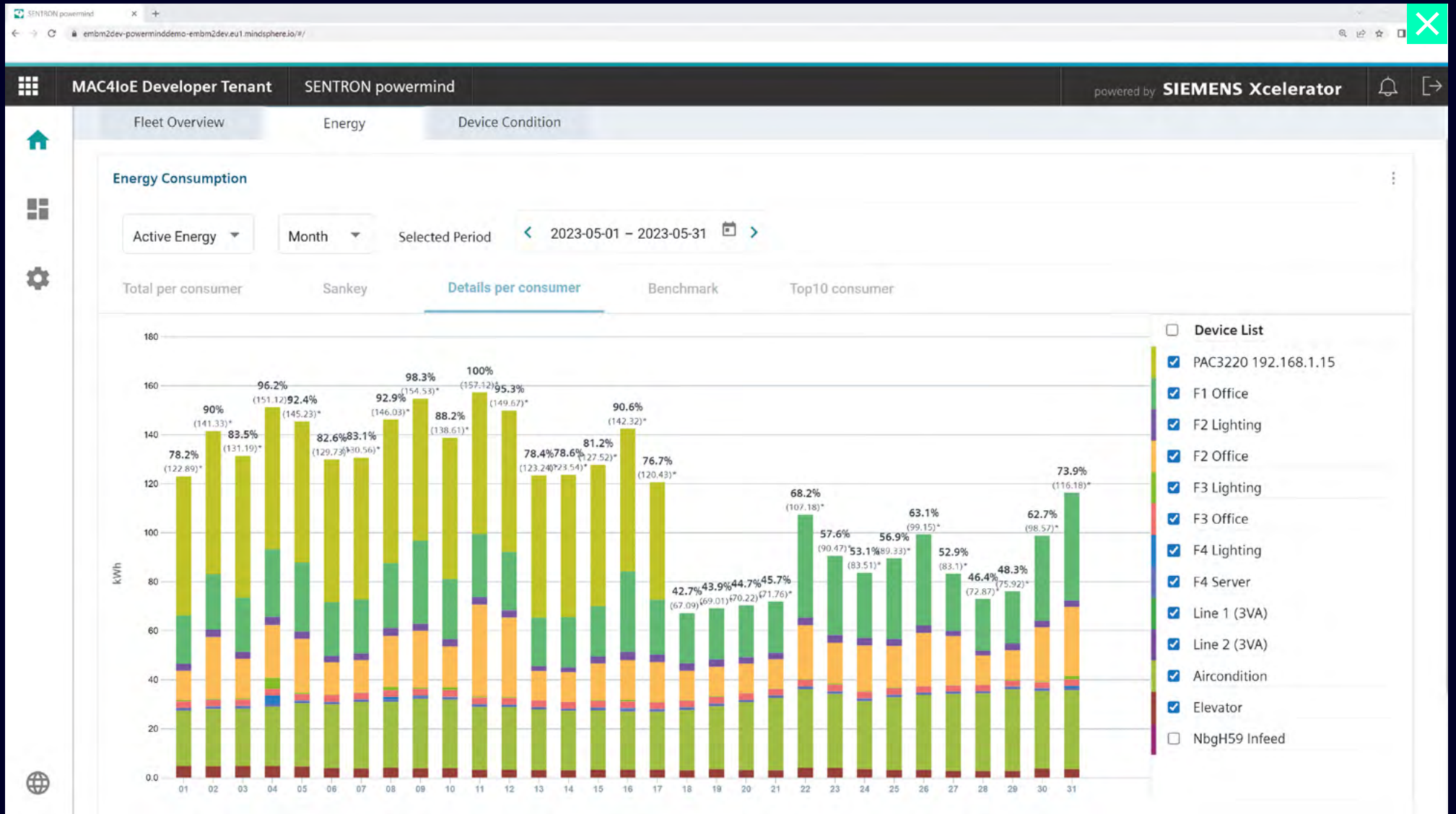
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SIEMENS

Overview

Bakehouse 16

Production

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Air Conditioning

3VA_1

3VA_2

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Lighting

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Current L3

0 A

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147	12/17/2020 7:43:14 AM +01:00	The 3VA was switched off.
146	12/17/2020 7:42:57 AM +01:00	The 3VA was switched on.
145	12/17/2020 7:42:56 AM +01:00	The 3VA was switched off.
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Measurement communication-capable
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- Fault location and analysis for predictive maintenance
- Support for the creation of an operational energy management system – for example, in accordance with ISO 50001 or as the basis for regular energy audits as per DIN EN 16247



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