CAMILLE BAUER
GMC-INSTRUMENTS GROUP

bentonet

INTERNET OF ELECTRICITY (IoE)

SMART GRID APPLICATIONS AT A SAFE LEVEL

FOLLOWING ISO 27001

MASTERING THE ENERGY TRANSITION TOGETHER

WE BELIEVE IN POWER (QUALITY)

THE CONSORTIUM

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High-quality and fundamental measurement data with maximum flexible connectivity

Camille Bauer Metrawatt AG is a Swiss medium-sized company for the development, production and marketing of industrial measurement technology. Camille Bauer offers customer- and application-oriented solutions in the segment of electrical monitoring and position sensors. This includes a high understanding of the needs for electrical power generation, energy distribution as well as industrial consumers. With its Swiss claim to the highest quality and its high innovative strength, Camille Bauer Metrawatt AG provides its customers with measurable benefits.

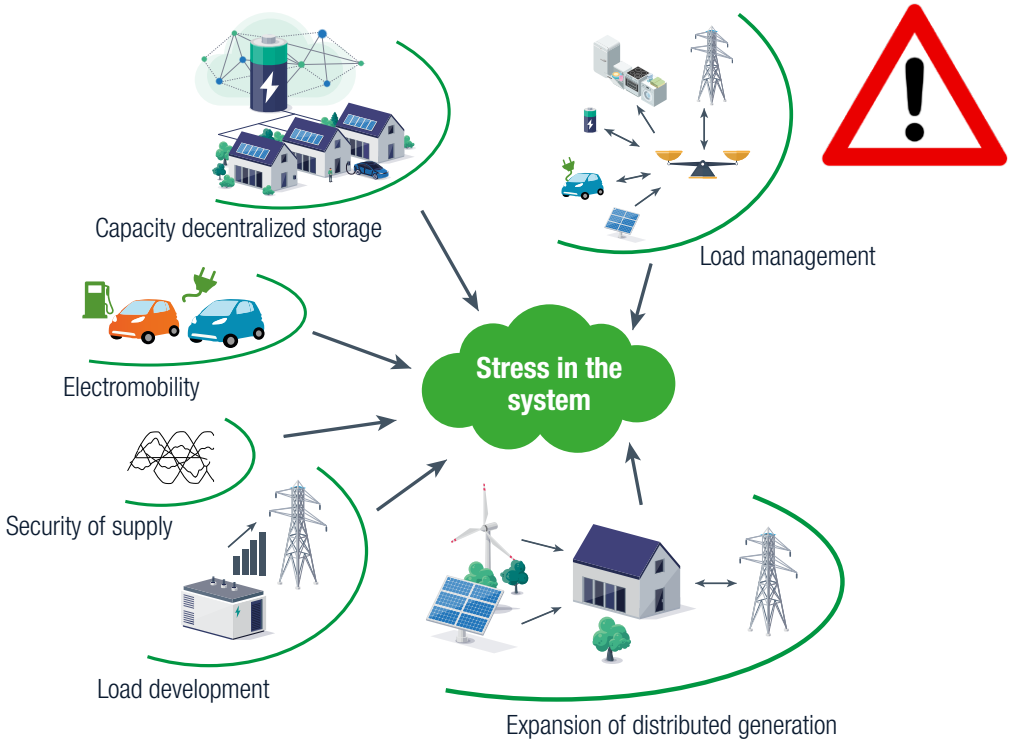
bentonet

BentoNet GmbH's vision for the energy industry of tomorrow:
100% security of supply, 0% emissions and 100% renewable energy.

BentoNet GmbH helps utility network operators such as municipal utilities and other critical infrastructure energy suppliers (CRITIS) to manage the energy transition smoothly, securely, and cost-effectively. The biggest challenge here: the precise distribution of electricity, heat and water. Always in the right place at the right time, 24 hours a day. This task cannot be accomplished without the complete digitization of the supply networks and the processes behind them. BentoNet GmbH provides energy suppliers with everything they need to do this: a complete ecosystem of infrastructure, hardware & services.

THE CHALLENGES

- The push of the energy transition is inevitable (politically, socially, ecologically, economically)
- Consumers are increasingly becoming producers (prosumers)
- The electrical load on the grids is increasing rapidly (e.g., due to heat pumps, e-mobility, air conditioning, etc.)
- Growing stakeholder groups (regulatory, environmental, political, social, customers, DSOs, etc.)
- New disorder on the formerly electric one-way street = bidirectional networks with many nodes
- Shortage of skilled workers inevitably leads to «inactivity»
- Sharply increasing complexities (technical, IT connectivity, regulatory, commercial, etc.)
- Large data lakes emerge
- Network quality (so-called power quality) suffers (faults, outages, defects, etc.)
- Cyber attacks on critical infrastructure are increasing rapidly

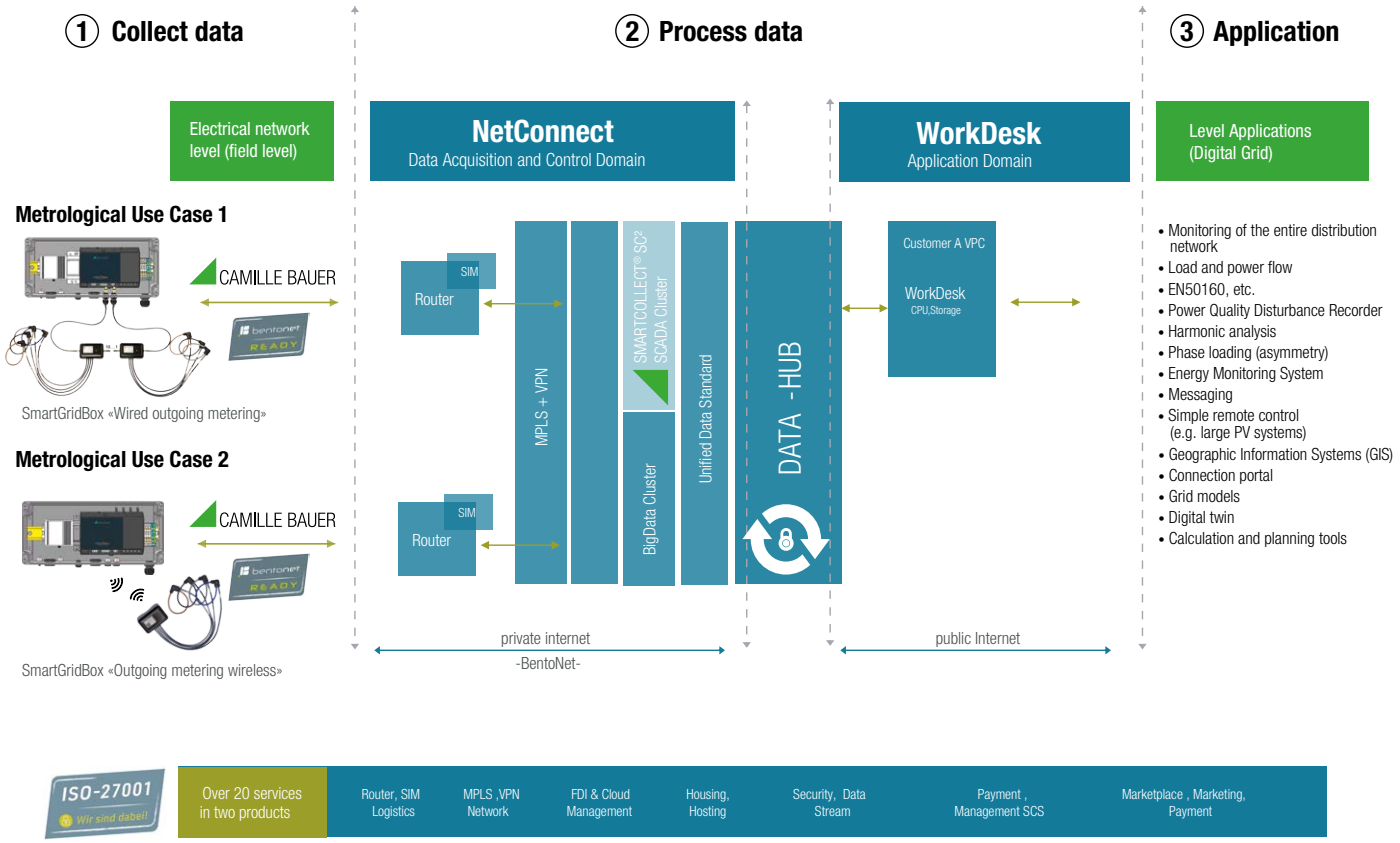


CONCLUSIONS

- Technology support is needed, not replacement
- Beneficial digitization of existing systems is imperative
- An expansion and modernization of the electr. infrastructures is required
- A meaningful «transparency» in the networks must be established
- A targeted handling of data for systemic processing & use is substantial
- A cyber security OT must be applied holistically down to the field level (measurement level)
- Meaningful applications for visualization and automation become fundamental
- A future-oriented system openness versus limitations must be considered
- Use of competence bundling through technical provider consortium instead of isolated island operations
- Before a roll-out, first carry out a pilot project. And do it quickly and without complications
- Provide for scalability that is open to the future in the context of technology, applications and budget.
- Consider the transformation of technology and people
- Create individual services with standardized modules

DIGITIZING THE NETWORKS

BentoNet and Camille Bauer confidently make a plug-and-play platform architecture possible.



Technology stack

Your advantages and benefits summarized

√ Implement a pilot project very quickly and easily (plug and play concept)
√ Through the accompanied pilot project you get to know your network
√ Automation can be initiated through the pilot project
√ Further applications build on the system (e.g. asset management, connection calculations, GIS, traffic light functions, etc.)
√ No need to invest in your own IT infrastructure - all you need is a web browser
√ The measurement data belong «securely» only to you (ISO27001)
√ Computing power of the system always remains at a high level due to own data hub (CPU)
√ Scalability of measurement technology and applications possible at any time
√ Future-proof due to an open and state-of-the-art platform architecture
√ Performance and network quality make the network transparent for you
√ A roll-out is based on your experience and can therefore be designed optimally
√ In a possible market place, you only book what is helpful to you

MEASUREMENT USE CASE 1: RING BUS

Fast in the pilot - fast in the roll-out.
We recommend this:

LoadFlow
Digitized load flow measurement

RetoFlow
Platform for the digital planning of energy grids

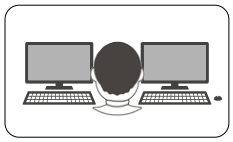
PQEasyReporting
Power quality analysis and statistical evaluation

Monitoring
Monitoring of the entire distribution grid

③
Application

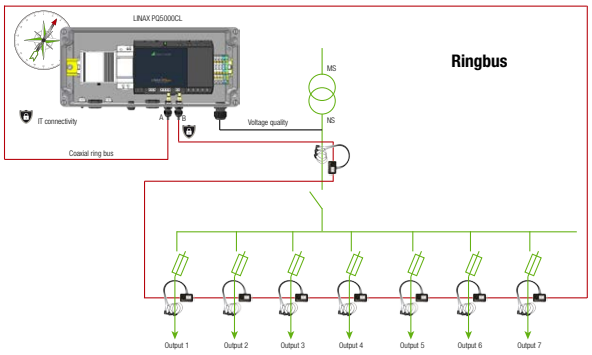
Further open application connections

Control center

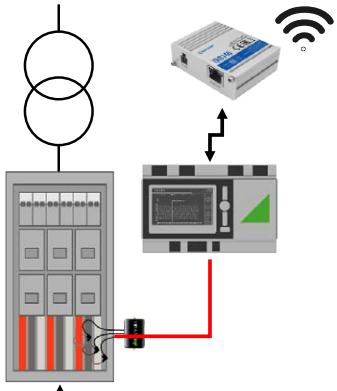


NetConnect

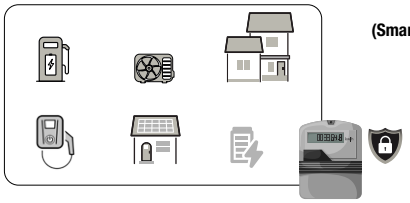
②
Process data



Ringbus



①
Collect data



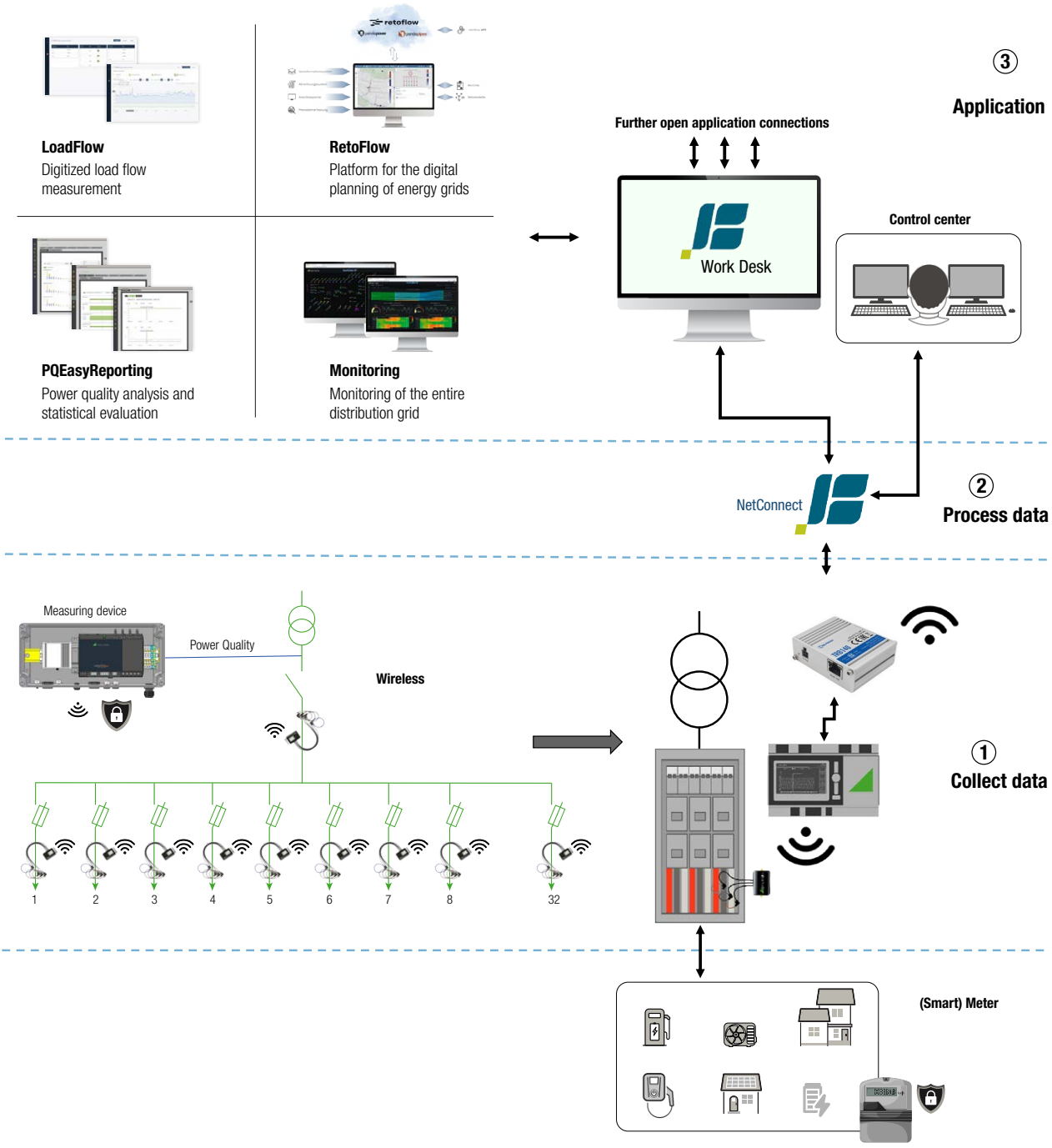
(Smart) Meter

This Use Case 1 is the best fit for you if you:

- want to build a computationally capable and automated network
- want to detect rapid changes in the network in real time
- need to capture very high currents (up to 20kA)
- consider highly dynamic power optimization
- demand the protection of flexibilities
- consider network quality and interconnected power as critical parameters
- want to detect problems before they cause damage
- want the data to be yours at all times
- focus on a future-proof, flexible and secure system
- see the digitalization of electricity as crucial to the energy transition
- want to ensure security of supply at all times

MEASUREMENT USE CASE 2: WIRELESS

Fast in the pilot - fast in the roll-out.
We recommend this:



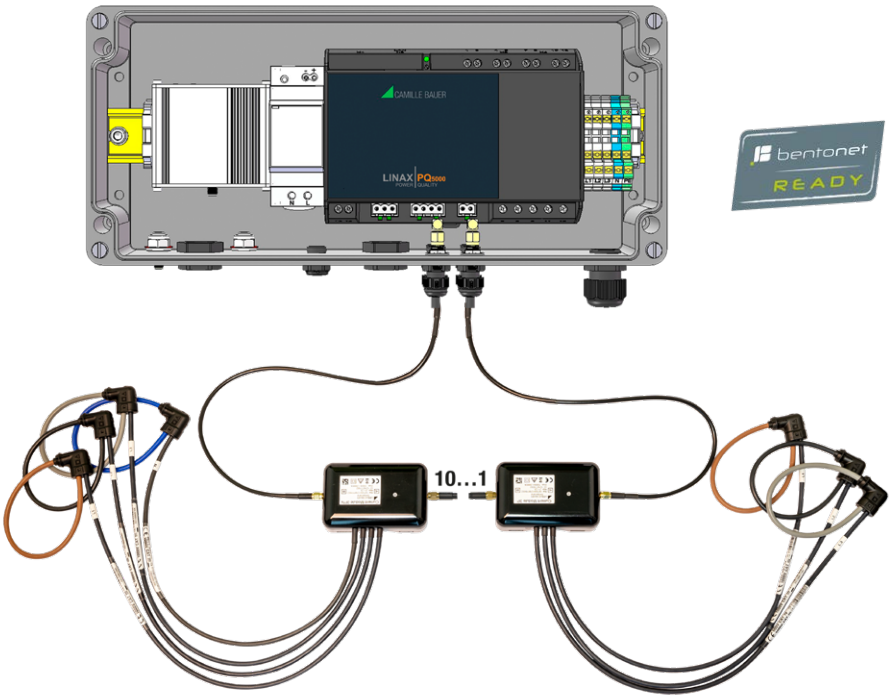
This Use Case 2 is the best fit for you if you:

- want to detect changes in the network
- want to monitor load profile, energy and instantaneous values (e.g. also for ISO5000x)
- cope with currents up to 1kA
- accept wireless solutions on the sensors
- demand the protection of flexibilities
- consider power quality and power in the network as decisive parameters
- want to detect problems before they cause damage
- want the data to be yours at all times
- focus on a future-proof, flexible and secure system
- see the digitalization of electricity as crucial to the energy transition
- want to ensure security of supply at all times

HARDWARE SETUP (MEASUREMENT USE CASE 1: RING BUS)

Smart Grid Box, incl:

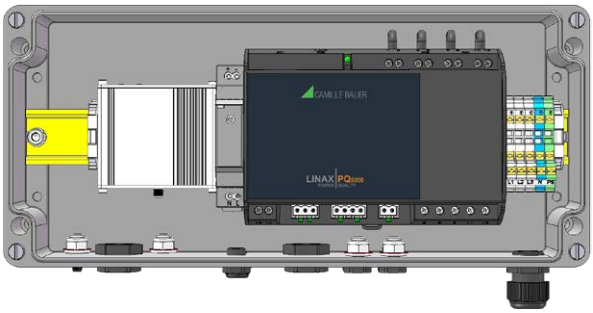
- LINAX® PQ5000 Current Link (power quality meter and data concentrator)
- Current Link Sensors (3P or 3PN)
- Gateway, including power supply
- Power supply Current Link Module
- Antenna for mobile radio transmission
- SIM card
- Optionally also via broadband, 240 MHz



HARDWARE SETUP (MEASUREMENT USE CASE 2: WIRELESS)

Smart Grid Box, incl:

- Measuring instrument (power quality or power monitoring)
- Integrated PME radio control center
- Gateway, including power supply
- PME radio sensors (3P or 3PN)
- Antenna for mobile radio transmission
- SIM card
- Optionally also via broadband, 240 MHz
- Optionally also with PV control system



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