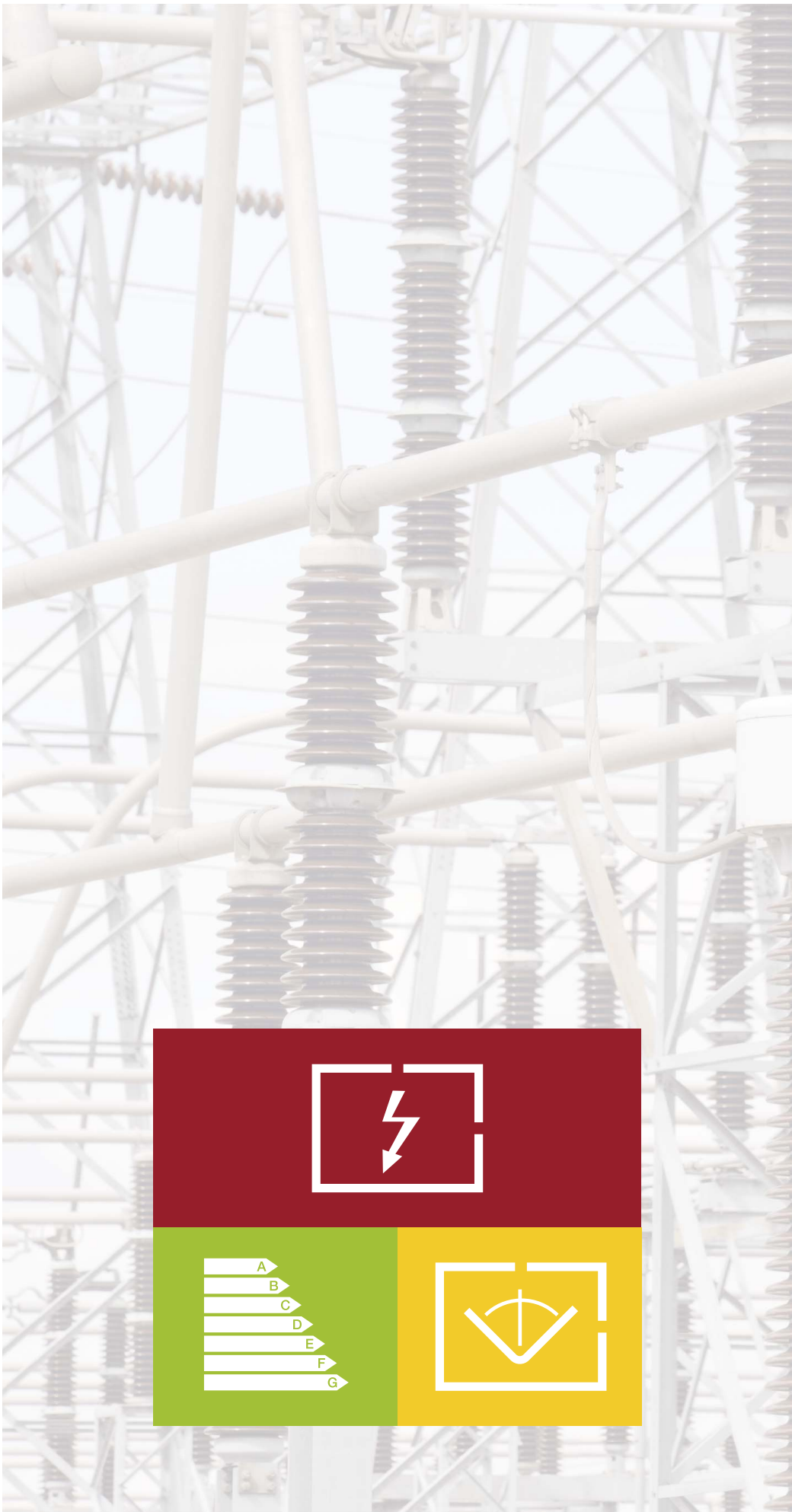
GOSSEN METRAWATT

CAMILLE BAUER

CORE RANGE INDUSTRIAL ENGINEERING

HEAVY CURRENT MONITORING
ROBUST POSITION SENSORS
ENERGY MANAGEMENT



CAMILLE BAUER

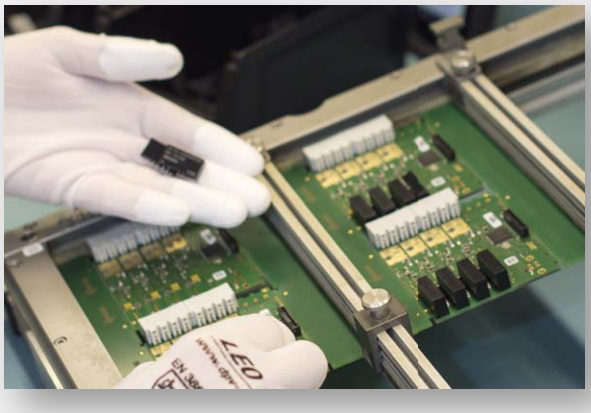
GMC INSTRUMENTS

WELCOME TO CAMILLE BAUER METRAWATT AG.

Operating as a leading provider of high-quality instrumentation, we have pursued the goal of making electric engineering processes safer, more transparent and thus more efficient for more than 70 years.

With our instrumentation and complete solutions, we monitor all invisible variables of electrical energy and distribution processes, secure a stable energy supply and prevent harm to people and property.

Camille Bauer Metrawatt AG is a company of the GMC-Instruments Group.



SWISS TOP QUALITY

At our location, we develop and produce our own products. We are active internationally and export more than 90 % of our products and services to destinations all over the world.

SUSTAINABILITY WITH A SYSTEM

- Resource-conserving raw material management
- Environmentally-friendly production processes
- Permanent further development of products and services under efficiency aspects
- Meticulous quality and environment compatibility tests
- Member of Cleantech Industry Association Switzerland
- Certified according to ISO 9001:2015 and ISO 14001:2015

The products in this catalogue are only an excerpt from our overall program.

PRODUCTS, SYSTEMS, SOLUTIONS FOR ELECTRICAL INSTRUMENTATION

ENERGY IS LIFE

You cannot imagine life today without electrical energy any more. Having this energy always reliably and in high quality available requires the well-conceived interaction between energy producers, grid operators and consumers.

Our products and services help you to devise your energy supply safely and reliably today and in future.

MEASURING AND DISPLAYING

Grid management and equipment monitoring require precise and reliable information of different grid variables. For this purpose, we offer a wide range of high-quality instruments to acquire all variables of the electrical grid.

Our position sensors reliably acquire mechanical positions, angles and inclinations. Supplemented by temperature transmitters and isolating amplifiers, our device portfolio is used throughout the entire measuring chain.

MEASURING AND DISPLAYING

- Programmable power instruments with process visualisation
- Unifunctional as well as multifunctional transducers for all electrical variables
- Energy meters
- Extensive process instrumentation for low-voltage signals
- Position sensors to acquire precise angle positions and inclinations

The **SINEAX AM-series and the SINEAX DM5000** devices are compact instruments to measure and monitor in heavy current grids. They excel in display quality and intuitive operation. The devices provide a wide range of functionalities which may even be extended by optional components. They are connected to the process environment by communication interfaces, via digital I/Os, analog outputs or relays.

The devices have been designed for universal use in industrial plants, building automation or in energy distribution. Nominal voltages of up to 690 V and measurement category CATIII can be directly connected in low voltage systems.

SINEAX AM SERIES AND SINEAX DM5000

- Direct measurement up to 690V, CATIII
- Condition monitoring
- Energy consumption analysis (meters, load curves, trend analysis)
- Harmonic analysis acc. IEC 61000-4-7
- System imbalance monitoring
- Limit monitoring with alarming
- Universal process I/O
- Graphical measurement displays
- High resolution color TFT display
- Device parameterization via WEB browser

	AM1000	AM2000	AM3000	DM5000
Design	96 x 96 mm	144 x 144 mm	144 x 144 mm	DIN rail
Input channels voltage / current	3 / 3	3 / 3	4 / 4	4 / 4
MEASURED VALUES				
Instantaneous values	▪	▪	▪	▪
Neutral current	calculated	calculated	measured / calculated	measured / calculated
Earth wire current (calculated)	–	–	▪	▪
Visualisation waveform U/I	▪	–	▪	▪
MEASUREMENT UNCERTAINTY				
Voltage, current	±0.2%	±0.2%	±0.1%	±0.1%
Active, reactive, apparent power	±0.5%	±0.5%	±0.2%	±0.2%
Frequency	±10mHz	±10mHz	±10mHz	±10mHz
Active energy (IEC 62053-21/22)	Class 1	Class 1	Class 0.5S	Class 0.5S
Reactive energy (IEC 62053-24)	Class 1	Class 1	Class 0.5S	Class 0.5S
DATA LOGGER (OPTION, ONLY WITH ETHERNET)	internal (≥8GB)	Micro SD card (≥16GB)	Micro SD card (≥16GB)	Micro SD card (≥16GB)
Disturbance recorder (with pretrigger)				
a) 1/2 cycle RMS progression U/I	≤3min.	–	≤3min.	≤3min.
b) Curve shape U/I [#cycles]	5/6 (pretrigger) +10/12	–	5/6 (pretrigger) +10/12	5/6 (pretrigger) +10/12
COMMUNICATION				
Standard I/Os	1 dig. OUT ; 1 dig. IN/OUT	1 dig. IN ; 2 dig. OUT	1 dig. IN ; 2 dig. OUT	1 dig. IN ; 2 dig. OUT
Ethernet: Modbus/TCP, web server, NTP	(Option)	(Option)	▪	▪
Relais	(Option)	(Option)	(Option)	(Option)
Analogue outputs active / passive	(Option)	(Option)	(Option)	(Option)
Digital inputs active / passive	(Option)	(Option)	(Option)	(Option)
IEC 61850 / PROFINET IO	(Option)	(Option)	(Option)	(Option)
RS485: Modbus/RTU	(Option)	(Option)	(Option)	▪
RCM fault current detection	(Option)	(Option)	(Option)	(Option)
GPS time synchronisation	(Option)	(Option)	(Option)	(Option)
Temperature monitoring	(Option)	(Option)	(Option)	(Option)
Uninterruptible power supply	--	--	(Option)	(Option)

DISPLAYING POWER METERS

The **APLUS** is designed for applications in power distribution, in strongly distorted industrial environments and in building automation. This powerful platform for the measuring, monitoring and analyzing of power systems is the ideal device for demanding measurement tasks, where fast, accurate and insensitive analysis of power systems and loads is required.

APLUS

- Acquisition and monitoring of system state quantities
- Universal process-I/O
- Open communication via Modbus, Ethernet or Profibus DP
- Long-term data storage with event recording
- Extended energy consumption monitoring
- Analysis of power quality aspects
- Monitoring means of production

You may select optionally either a TFT or LED display for on-site data visualization.

MULTIFUNCTIONAL DEVICES

The **SINEAX CAM** is an universal, high-precision measurement system, which can be optimally adapted to the measurement task by means of the parameterization. Much emphasis was placed on the communication capabilities. So the device can be easily connected to a control system via analog and digital I/Os as well as standardized interfaces.

SINEAX CAM

- Suited for monitoring strongly-distorted power systems
- Ideal for different test laboratory applications
- Communication via Modbus/TCP or IEC 61850 as an option
- Free assembly of I/O interface
- Optional internal or external display in 7 languages
- Version with Rogowski current inputs available
- Also available for mobile application

The **SINEAX DM5S** and **SINEAX DM5F** are classical high-accuracy transducers, suited for monitoring tasks and retrofit applications in energy distribution and industry. They provide either analog outputs and / or Modbus communication.

SINEAX DM5S / SINEAX DM5F

- System state monitoring: Class 0.2
- All-purpose: V/I, P/Q/S, f, PF etc.
- Remote communication via Modbus
- DM5S: Energy metering Class 0.5 S
- DM5F: Response time 15...25 ms
- Configuration without power supply

SIRAX devices provide the basic functionalities of a measuring transducer at a very good price/performance ratio.

SIRAX BM1200 / SIRAX BM1400

- Well-visible one-line indication of measured data with backlit LCD display
- BM1400: Clear and unambiguous indication of measured values on LED display
- Easy on-site operation and parameterization
- Automatic cyclical scrolling of measured data
- Integrated active and reactive energy meters, cost-effective alternative to energy meters (BM1200)

SIRAX BT5700

- Well-visible two-line indication of measured data with backlit LCD display
- Easy on-site operation and parameterization
- Automatic cyclical scrolling of measured data
- Integrated active and reactive energy meters

SIRAX MM1200 / SIRAX MM1400

- Clear and unambiguous indication of measured values on TFT display
- Easy operation and parameterization via touchscreen
- Automatic cyclical scrolling of measured data
- MM1400: Monitoring and analysis of harmonics (U, I)
- Integrated active and reactive energy meters

The **SIRAX BM1450** multifunctional DC energy meter can be used for monitoring and controlling in DC systems. These meters measure a wide range of electrical parameters such as DC voltage, current, power, energy and many more.

SIRAX BM1450

- Multi-channel support
- Bi-directional voltage and current measurement
- Onsite configuration
- DC power system metering
- Monitoring and controll power switches

UNIFUNCTIONAL DEVICES

This instrument series features the basic functionalities of a measuring transducer and is used as a cost-effective standard solution for the safe acquisition of measured variables in one-phase or three-phase heavy current systems. They convert a heavy current variable such as current, voltage, frequency or power, respectively, into a low-voltage signal (current or voltage).

MEASURING TRANSDUCER FOR VOLTAGE, CURRENT OR FREQUENCY

- One-phase connection (voltage, current or frequency)
- 2 configurable analog outputs linear or kinked in a range from 0…20 mA / 4…20 mA or 0…10 V
- Quick on-site programming using push buttons or via CB-Configurator software
- Simple on-site device operation
- Clear and well readable representation of measured data via LCD display
- Flexible communication and remote readout via integrated Modbus RTU interface
- DIN rail for top-hat rail mounting

Description	Measuring input
SIRAX BT5100	Voltage
SIRAX BT5200	Current
SIRAX BT5300	Frequency

MEASURING TRANSDUCER FOR POWER

SIRAX BT5400

- Connection type: One-phase, 3-phase 3-wire balanced or unbalanced load or 3-phase 4-wire balanced or unbalanced load
- Measuring input for power
- Nominal voltage up to 500 V, nominal current 1 / 5 A
- 2 configurable analog outputs linear or kinked in a unipolar range of
- 0…20 mA / 4…20 mA or 0…10 V or a bipolar range of -20…0 mA or -10…0…+10 V
- Quick on-site programming using push buttons or via CB-Configurator software
- Simple on-site device operation
- Clear and well readable representation of measured data via LCD display
- Flexible communication and remote readout via integrated Modbus RTU interface
- DIN rail for top-hat rail mounting

PROGRAMMING SOFTWARE FOR ALL SIRAX DEVICES

- Data communication via Modbus RTU
- Devices may be selected in the software
- Offline parameterization of measured values
- Loading and storage of configurations
- Upload of predefined measured data to several devices at the same time

UNIFUNCTIONAL DEVICES

These mostly analog based devices are produced as requested by the customer. They convert a heavy-current quantity into a proportional analog DC output signal. Therefore they are suited to a specific measurement task.

Alternating current transducers are available in different qualities. If the input current is almost sinusoidal a more cost-effective device can be used than for distorted currents, where the measurement of the RMS value is more complex.

Features	I542	I538	I552
Measurement of distorted alternating currents			▪
RMS value measurement			▪
2 measuring ranges	▪		▪
Adjustable maximum value of the measuring range	O	O	S
Without power supply	▪		

O = Optional S = Standard

Alternating voltage transducers are also divided in different application categories.
Here as well sinusoidal and distorted input signals are distinguished.

Features	U543	U539	U553	U554
Measurement of distorted alternating voltages			▪	▪
RMS value measurement (standard)			▪	▪
Adjustable maximum value of the measuring range (option)	▪	▪	▪	
Different characteristics (primary value scale, step)				▪
Without power supply (standard)	▪			
2-wire technology with 4 …20 mA output (option)		▪		

Transducers for frequency, phase angle or their differences.

SINEAX F534 / SINEAX F535 / SINEAX G536 / SINEAX G537

- Frequency (SINEAX F534), frequency difference (SINEAX F535)
- Phase angle (SINEAX G536), phase angle difference (SINEAX G537)
- Determining the system frequency stability
- Monitoring of the reactive power requirement
- Determination of characteristic value for reactive power compensation
- Applicable for display, recording, monitoring, controlling

Transducers for active and reactive power are available for different systems.

SINEAX P530 / Q531

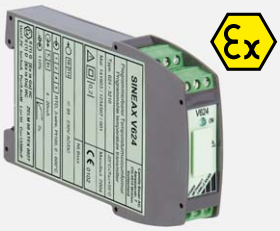
- Monitoring of power demand
- Nominal voltages up to 690 V, nominal current up to 6 A
- Applicable for display, recording, monitoring, controlling
- Connection via transformer or directly

PROCESS CONTROL ENGINEERING

To ensure a continuous and steady process, and to store, manage and visualize process data, we offer a wide portfolio of signal converters and Process-Management-Systems.

SINEAX V604s Programmable multifunctional transmitter

- Measurement of DC voltage, DC current, temperature (RTD, TC) and resistance
- 2 inputs (e.g. for sensor redundancy or substraction)
- 2 outputs (U and / or I)
- System capability: Communication via Modbus interface
- Freely programmable relay, e.g. for limit or alarm signalling
- AC/DC wide-range power supply unit
- Due to intelligent mathematical functions applicable for:
    - DC energy metering
    - Power measurement
    - Load monitoring
    - Difference monitoring
    - Redundant temperature measurement
    - Signal adaptation
    - Gradient / limit value monitoring

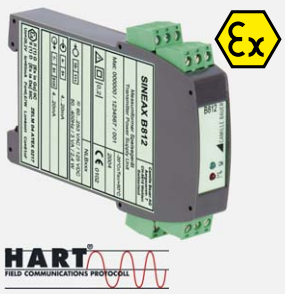


SINEAX V624 Programmable temperature transmitter

- Programmable without any power supply connection
- Zero and span calibration via software
- Suitable for temperature measurement in hazardous areas
- Sensor breakage and short-circuit monitoring

SINEAX TV809 Programmable isolation amplifier

- Current or voltage output in one device
- Safe isolation, enhanced up to 600 V (Cat. II) or 1000 V (Cat. I)
- Limit value relay secures monitoring function



SINEAX B812 Standard power supply unit

- HART pass-through
- Suitable for the supply of transmitters in hazardous areas
- Line monitoring via LED
- Setting time <0.3 ms

PROCESS CONTROL ENGINEERING

SINEAX VS-Series

- Signal converters with very narrow design, only 6.2 mm wide
- On site parameterizing via DIP-switches
- Electrical isolation of all circuits
- Spring-cage clamp connection
- Functions as isolating amplifier, temperature transmitter, or alarm unit
- Power supply optional via DIN rail connector

VIDEOGRAPHIC RECORDERS

The latest generation of paperless Camille Bauer videographic recorders are modular and may thus be adapted individually to the requirements of the most varied applications.

Today videographic recorders are not used for data recording only, but also as powerful indicators, intelligent interfaces between different signal transmission and bus systems (e.g. 4...20 mA to Modbus) and as intelligent and independent computing units on site.

LINAX DR2000 Videographic recorder

- Inexpensive videographic recorder for basic applications
- Very distinct, high-quality TFT display
- Device can be equipped and extended according to customer requirements
- Device protection IP65 / NEMA4 device protection (front)
- Fast scanning of 100ms/channel
- Low operating costs (TCO)

LINAX DR3000 Videographic recorder

- Powerful videographic recorder with high performance
- Simple intuitive operation, with built-in Help
- Up to 12 mathematics channels for complex calculations
- For applications in rough environment due to IP65 / NEMA4 device protection (front)
- Data security in accordance with FDA 21 CFR Part 11
- Guaranteed data integrity (flash memory)
- Low operating costs (TCO)

TRANSMITTERS FOR ANGULAR POSITION

KINAX WT720 Absolute, programmable shaft transmitter for angular position for applications in rough environments, diameter 58 mm

- Robust transmitter version suitable for field applications
- Absolute value angular transmitter
- Capacitive measuring system
- Low wear and maintenance free
- Safe electrical connection thanks to spring-type clamp and reverse polarity protection
- Sturdy against high mechanical loads
- High degree of sealing against water and dust (housing protection class IP67/IP69K)
- Measuring range linear or V-characteristic free programmable
- Interface analog 4 ... 20 mA (2-wire connection) / center position 0° = 12 mA
- Available with explosion protection „Ex ia IIC T4 Gb“, „Ex ia IIIC T80°C Db“ and „Ex tb IIIC T80°C Db“ according to ATEX and IECEx
- Obtainable with GL (Germanischer Lloyd)

KINAX HW730 Absolute, programmable hollow-shaft angular position transmitter for applications in rough environments, diameter 78 mm

- Robust hollow shaft angular transmitter suitable for field applications
- High absolute accuracy (±0.35°) thanks to capacitive 2-wire technology
- Low wear and maintenance free
- Safe electrical connection thanks to spring-type clamp and reverse polarity protection
- Sturdy against high mechanical loads
- High degree of sealing against water and dust (housing protection class IP67/IP69K)
- Flexible and easy to install thanks to hollow shaft up to 30 mm
- Measuring range linear or V-characteristic free programmable
- Interface analog 4 ... 20 mA (2-wire connection) and digital Modbus with PoE
- Easy, variable installation thanks to hollow shaft Ø 30/20/16/12/10 mm
- Available with explosion protection „Ex ia IIC T4 Gb“, „Ex ia IIIC T80°C Db“ and „Ex tb IIIC T80°C Db“ according to ATEX and IECEx
- Obtainable with GL (Germanischer Lloyd)

KINAX WT707 / WT717 Absolute shaft angular position transmitter for applications in rough environments, diameter >100 mm

- Robust single- or multiturn angular transmitter suitable for field applications
- Absolute value angular transmitter
- Sturdy against high mechanical loads
- Low wear and maintenance free
- Programmable and non-programmable versions
- Interface analog 4 ... 20 mA
- Available with explosion protection „Ex ia IIC T6 Gb“, according to ATEX and IECEx
- Obtainable with GL (Germanischer Lloyd)
- Available in sea-water resistant version
- Also available with gear ratio up to 1600:1

TRANSMITTER FOR ANGULAR POSITION

KINAX 3W2 / 2W2 Absolute shaft angular position transmitter to be installed

- Compact version to be installed into other equipment and apparatus
- Absolute value angular transmitter
- Low wear and maintenance free
- Small starting torque < 0.001 Ncm
- Programmable and non-programmable versions
- Interface analog 4 ... 20 mA (2-wire connection)
- Available with explosion protection „Ex ia IIC T6 Gb“, according to ATEX and IECEx
- Obtainable with GL (Germanischer Lloyd)

INCLINATION TRANSMITTERS

KINAX N702 Programmable inclination transmitter unidimensional

- Robust inclination transmitter suitable for field applications
- Absolute postion always available
- Magnetoresitive measuring system
- High degree of absolute measuring accuracy (±0.2°)
- Unidimensional oil-damped pendulum system
- Measuring range and sense of rotation free programmable
- Interface analog 4 ... 20 mA and digital CANopen or SSI
- Easy installation and commissioning

KINAX N702 INOX Programmable inclination transmitter

- Hermetic watertight and dust-proof housing IP68/IP69K
- Optimally resistant to aggressive media such as sea water and detergents
- Stainless steel housing INOX AISI 316Ti (1.4571)
- High degree of absolute measuring accuracy (±0.2°)
- Resistant against high mechanical strains thanks to robust design and high quality materials
- Safe electrical connection through flexible control cable
- Standard synchro flange or mounting plate
- 2-wire connection via flexible control cable
- Free parameterization via control line
- Interface analog 4 ... 20 mA or digital HART

INDUSTRIAL ENERGY MANAGEMENT

Acquiring, evaluating and optimizing the energy consumption and its allocation to incurring cost centres constitutes a central task of any company. To enable its recognition on all levels, we offer all of the required components, from energy meters and summators through to the analysis and billing software.

Summator SMARTCONTROL

- Acquisition of energy and consumption data, temperatures, switching statuses and process variables
- Error message management, continuous comparison of characteristic values and indication of errors via switching output, e-mail or SMS
- Peak load management in combination with switching outputs
- Manufacturer-independent connection of data sources via analog, digital or S0 pulse and temperature inputs as well as universal M-Bus, LON and Modbus interfaces

Energy Meters ENERGYMID

- Professional energy counters for 2-, 3-, 4-wire systems with up to 80 A direct or 1 A, 5 A transformer connection
- Flexible communication and remote readout thanks to a broad range of interfaces such as LON, M-Bus, Modbus RTU, Ethernet, BACnet or pulsed output
- Maximum transparency through multifunctional design for the acquisition of reactive energy and other measured variables in the grid
- Integrated connection error diagnose for simple and time-saving installation
- Adaptable to future rate structure in the energy market thanks to the possibility of setting up to 8 different rates

Energy Meters ENERGYSENS

- Intelligent sensor system to measure the power, energy, current, voltage and frequency of individual consumers in low-voltage systems
- Different sensor variants with 3 or 12 measuring points. The nominal current amounts to 40A or 80A
- Facilitates the integration into any system due to universal Modbus interfaces (TCP/RTU)
- Warning against overload before larger damage can occur
- Very low internal consumption compared to other measuring systems

Current Transformers

Current transformers convert high amperage AC current of up to 1000 A (primary current) into small, safe, measurable current of 1 A or 5 A (secondary current). Thanks to their compact design, the split-core current transformers are especially suited for use in areas of restricted access and confined space. The separable core makes it easier to install the transformers on cables or rails.

CAMILLE BAUER

THE EXPERTS IN POWER QUALITY ANALYSIS

Power quality monitoring - avoiding problems before they arise

- Conformity assessment according to
  EN 50160 (LV / MV / HV) including island systems
  IEC 61000-2-2 LV
  IEC 61000-2-4 (Class 1 / 2 / 3)
  IEC 61000-2-12 MV
  and own limits
- Recording of power quality events
- Metrologically certified

PQ-EASY REPORT

Conformity report via browser without extra software

Certified by METAS

POWER QUALITY

Modern power electronics and non-linear consumers increasingly impair the electrical grid which is the reason why alternating current has not shown the original sinusoidal characteristic already for a long time. This bears heavily on electrical devices and machines and extends to higher thermal losses, increased energy consumption through to the disturbance and downtime of plants. Our solutions ensure that problems are early recognised, even before they occur.

POWER QUALITY

- Recording of power quality events to secure supply quality
- Power quality instruments Class A according to IEC 61000-4-30 Ed. 3 and IEC 62586-1 Ed. 2
- Independent certification according to IEC 62586-2 Ed. 2 by an accredited institute
- Power quality data by PQDIF format according to IEEE 1159.3 available
- Supports conformity reports concerning the voltage quality standard (e.g. according to EN 50160, IEC 6100-2-2, IEC 6100-2-4, IEC 6100-2-12 and more.)
- Stationary and portable devices available

24/7 - STATIONARY MEASUREMENT OF POWER QUALITY

Traditionally, power quality monitoring is only conducted as a reaction to trouble such as device failure, plant malfunctions, process interruption or communication breakdown. However, all these problems cost money and nobody wants to experience the same thing again just to be able to create a corresponding record for analysis. Therefore, the greatest advantage of continuous power quality monitoring is that users put themselves in a position to proactively build up their knowledge thus increasing system availability.
Devices such as **LINAX PQ3000 / PQ5000** help to detect trouble before it can do any damage and to provide data for the identification of the root cause in case an event actually occurs.

For panel mounting

For top-hat rail

PQ-EASY REPORT

LINAX PQ3000 / PQ5000

- Power quality analysis in Class A, according to IEC 61000-4-30 Ed. 3
- Data exchange format for power quality data: PQDIF
- Energy consumption analysis, Class 0.5S according to EN 62053-22/24
- Network state monitoring: 0.1 % (U,I), 0.2 % (P,Q,S)
- Ethernet: Modbus/TCP, NTP, http (parameterising via web page)
- Optional extensions (up to 3 modules)
  - Uninterrupted power supply: 5 times 3 minutes
  - Relay outputs (2 channels per module)
  - Analog outputs: 2 or 4 channels ±20 mA; only 1 module
  - Digital inputs: 4 channels active or passive

MOBILE MEASUREMENT OF POWER QUALITY

PQ-EASY REPORT

By means of the mobile measurement solution **LINAX PQ5000-Mobile** the operational aspects of the energy supply can be verified:

- Quality of supply
- Availability of supply
- Evaluation of changes or improvement measures
- Energy flow analysis

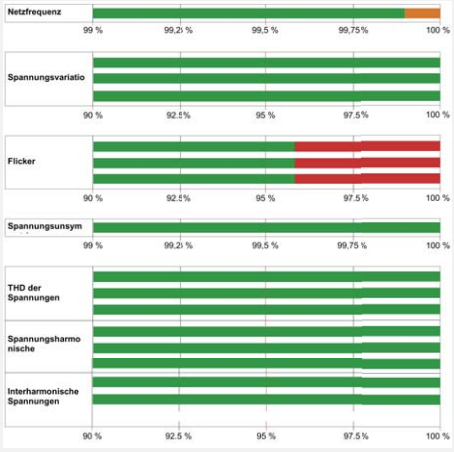
This measurement solution supports campaigns (repeated measurements at the same location) by a configuration manager with up to 20 storable device settings, can provide a WLAN access point for connecting mobile devices and provide all data for evaluation via the device›s own website. In order to be able to validate the power quality at the measuring location, the duration of the measurement should be at least 7 full days.

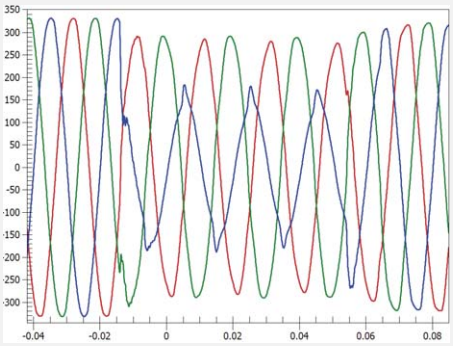
RECORDING AND EVALUATION OF THE MEASURED DATA

Energy supply disturbance can lead to production and equipment failure. Frequently, the reaction only comes after a high financial loss has occurred. But many of these incidents could be avoided, if the signs had been recognized in time by continuous monitoring of the situation.

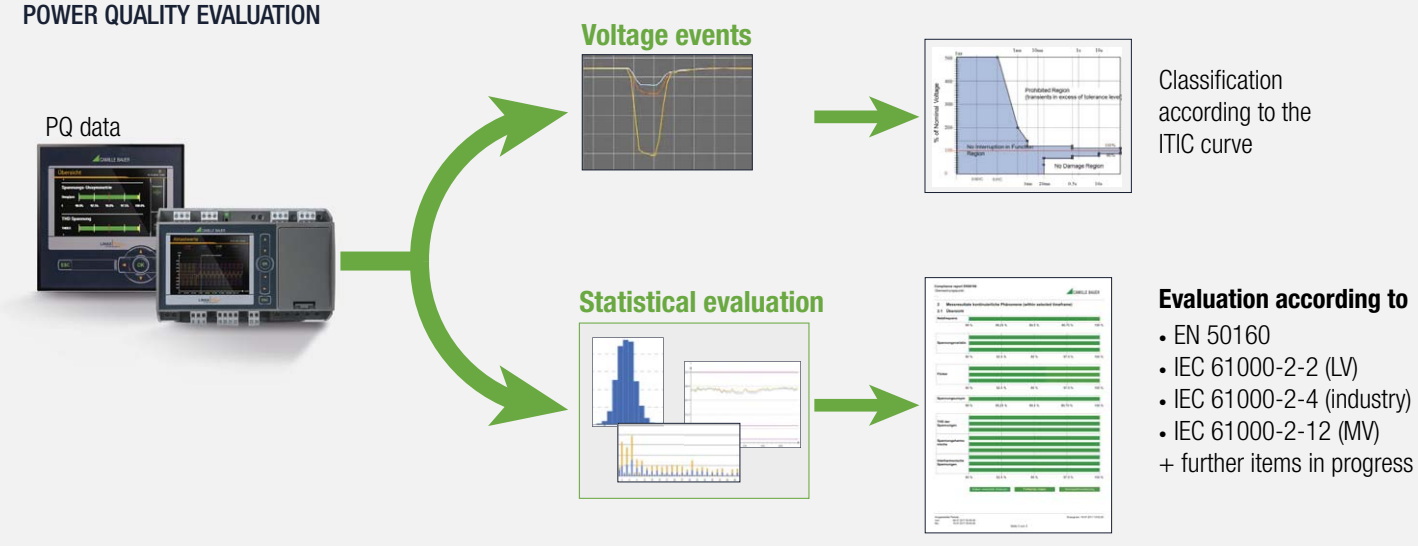
Power quality monitoring provides both a statistical evaluation permitting a comparison with standards (e.g. EN 50160) or supply contracts and recording of grid events (e.g. voltage drops) to enable the analysis of their causes and consequences.

POWER QUALITY EVALUATION	DESCRIPTION	BENEFIT
Statistical evaluation	All of the relevant supply voltage parameters are monitored, statistically averaged and compared with specified values. In this way, conformity can be proven or attention can be drawn to possible problems. Currents are also monitored in relation to level, harmonic content and imbalance. However, these results do not form an integral part of the statistical evaluation since limit values are not available.	Verification of the adherence to standards (e.g. EN 50160) or contracts between energy supplier and energy consumer. Observing the change of results makes it possible to determine a deterioration of the power quality and the search of its causes in good time. The effectiveness of introduced measures can be directly verified.
Event recording	All of the voltages are monitored in terms of disturbances like dip, interruption or excess of supply. These disturbances are recorded as events. A statistical evaluation is not performed since the number of permitted events is not limited. Event recording comprises, on the one hand, the curve shape of voltages as well as currents upon the occurrence of the event.	The evaluation of a disturbance recording enables the discovery of the cause and, in the best case, a correlation with the determined events can be established (e.g. breakdown of control or equipment). Appropriate remedy measures can be derived from this and verified in respect of their effectiveness.





POWER QUALITY EVALUATION

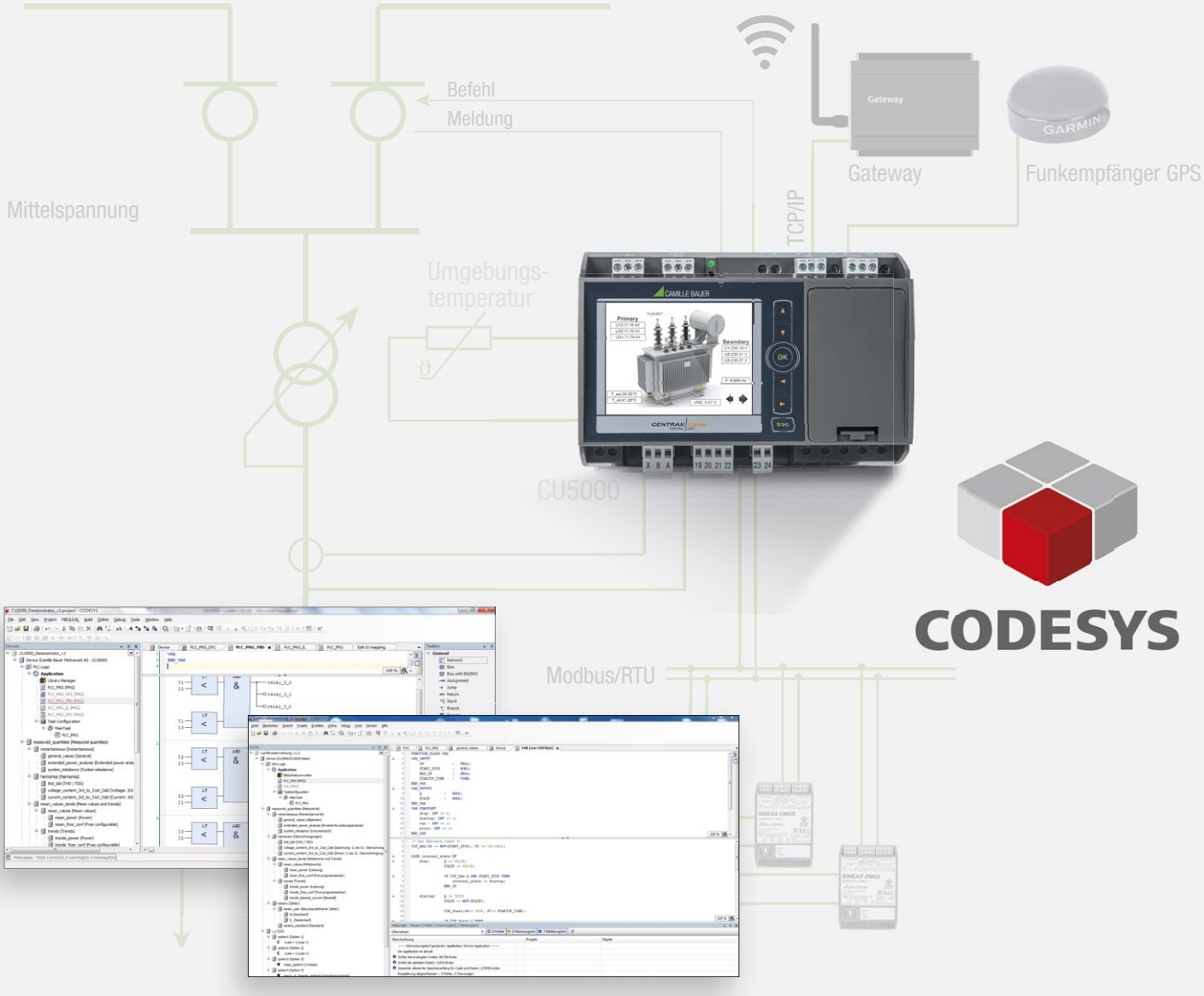


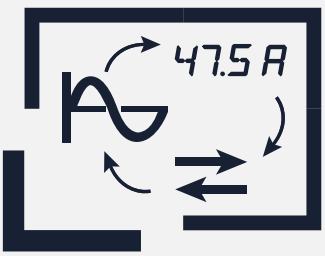
	LINAX PQ3000 / LINAX PQ5000	LINAX PQ5000-MOBILE
Design	DIN rail / 144 x 144	Handheld
Display/operation	▪ / Buttons	– / Buttons
MEASURING		
IEC 61000-4-30 Class A	Ed. 3	Ed. 3
Sampling rate (bandwidth)	18 kHz (4.5 kHz)	18 kHz (4.5 kHz)
Samples per perdiod 50 / 60 Hz	360 / 300	360 / 300
RCM	▪	–
Energy meter	▪	▪
Conformity standards	EN 50160 IEC 61000-2-2 IEC 61000-2-4 IEC 61000-2-12 IEEE 519 GB/T	EN 50160 IEC 61000-2-2 IEC 61000-2-4 IEC 61000-2-12 IEEE 519 GB/T
Accuracy U / I [%]	0.1	0.1
Accuracy energy meter	0.2S	0.2S
VOLTAGE MEASUREMENT		
Overvoltage category	600 V CAT III	600 V CAT III
Number of channels	4	4
Measuring range LN / LL	480 V / 832 V	480 V / 832 V
Power frequency	42 … 69.5 Hz	50 Hz / 60 Hz
CURRENT MEASUREMENT		
Sensor technology	CT	Rogowski/clip
Category	300 V CAT III	600 V CAT IV / 600 V CAT III
Number of channels	4	4
RECORDING / PROTOCOL		
Memory size	16GB	16GB
PQDIF	via device	via device
CSV	via web browser	via web browser
PDF conformity report	via web browser/ software	via web browser/ software
POWER SUPPLY		
Supply	100/230 V AC/DC 24/48 V DC	100/240 V AC
USV	5 x 3 min	–
COMMUNICATION		
Interface	Ethernet RS485	Ethernet WiFi
Protocol	Modbus Profinet IEC 61850	Modbus

MONITORING AND CONTROLLING

We offer the unique possibility of not only acquiring all variables of the electrical grid precisely and reliably, but also processing them directly via a PLC integrated into the device and controlling processes.

This enables us to realise process controls directly at the measuring point. You thus save a separate PLC or you realise an autarkicly working redundant solution.





MONITORING AND CONTROLLING

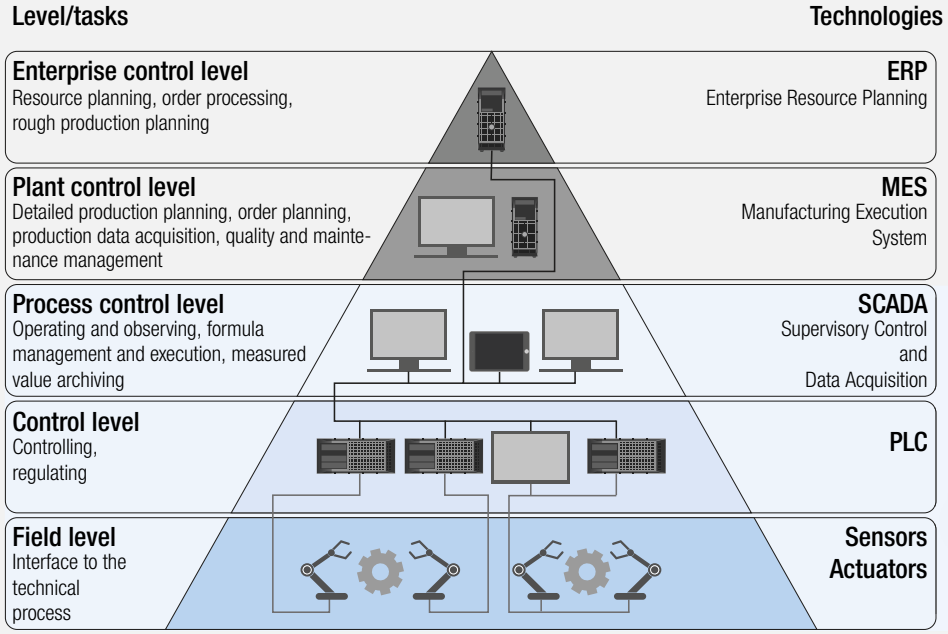
- Functionality of a highly precise instrument combined with a Soft-PLC
- On-site recording and visualising of measured data
- User-specific visualising of the programmed PLC facility
- Innovative and scalable operating concepts for intuitive use of data (WebGUI)
- Integration of further devices via Modbus interface
- Measuring tasks and automation tasks derived from the same can be solved directly

DISPLAYING POWER METERS

Classical automation processes usually follow the system shown in the Figure. The most varied measuring devices collect data on the field level and forward it for processing to the control level. Depending on the requirements, control tasks are derived from the measured data or the data is sent to the next higher level for visualising or analysis.

This separation of functionalities causes a not inconsiderable input of devices, installation, know-how and time even for the most insignificant control tasks.
Especially for the highly precise measurement of all variables in the power grid and the diversity of control and regulating tasks occuring in this respect, Camille Bauer Metrawatt AG offers an innovative solution.

Classical instrumentation



Automation pyramid according to ISA-85/DIN EN 62264-1

CENTRAX

FUNCTIONS

- Direct measurement up to 690V, CATIII
- Condition monitoring: class 0.1 (U/I), class 0.2 (P/Q/S)
- Energy consumption analysis, class 0.5S (meters, load profiles, trend analysis)
- Harmonic analysis acc. IEC 61000-4-7
- System imbalance monitoring
- Universal process I/O
- Graphical measurement displays
- High resolution color TFT display

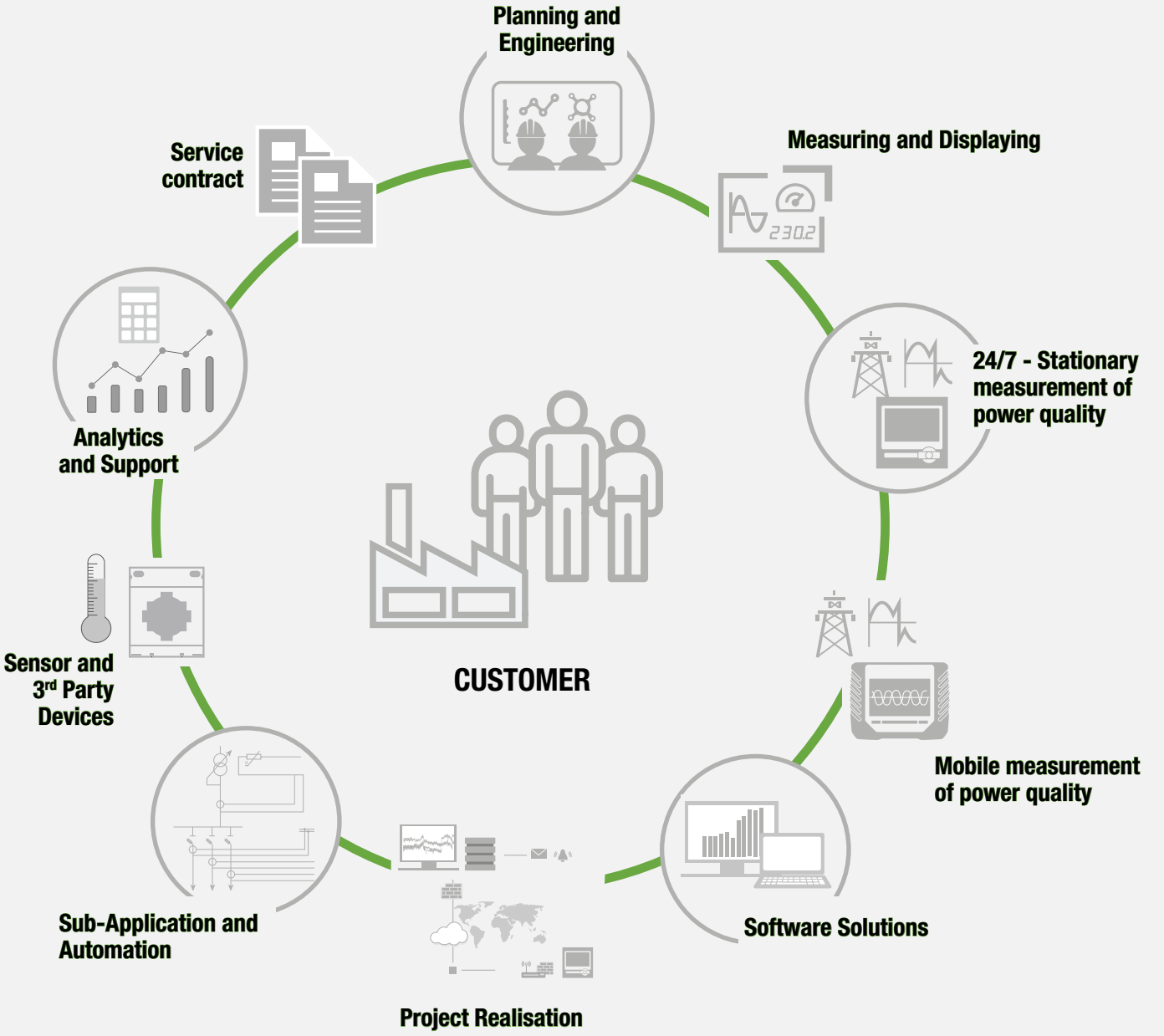
PREPARATION OF INDIVIDUAL CONTROL USING STANDARD LANGUAGES ACCORDING TO IEC61131-3:

- KOP Contact plan
- AWL Instruction list
- FUP Function component
- AS Sequential function chart
- ST Structured text
- CFS Signal flow plan

SOFTWARE, SYSTEMS AND SOLUTIONS

Holistic solutions for transparency and analysis in the industrial setting.

Our range of offerings comprises the following components:



SOFTWARE, SYSTEMS AND SOLUTIONS

- We are your partner in the entire value added chain, from individual products and customised system solutions through to the evaluation and visualisation of your measured data.

SMARTCOLLECT

Data management Software

SMARTCOLLECT is a data management software which can acquire measured data in an easy manner and store the same in an open SQL database. This software offers basic functionalities for data analysis and for easy energy monitoring as well as the easy preparation and disposal of reports.

Providing a mature graphic user interface, the SMARTCOLLECT software is clearly structured and easily operated.

SMARTCOLLECT is modularly designed and permits supplementing modules or functions at any time.

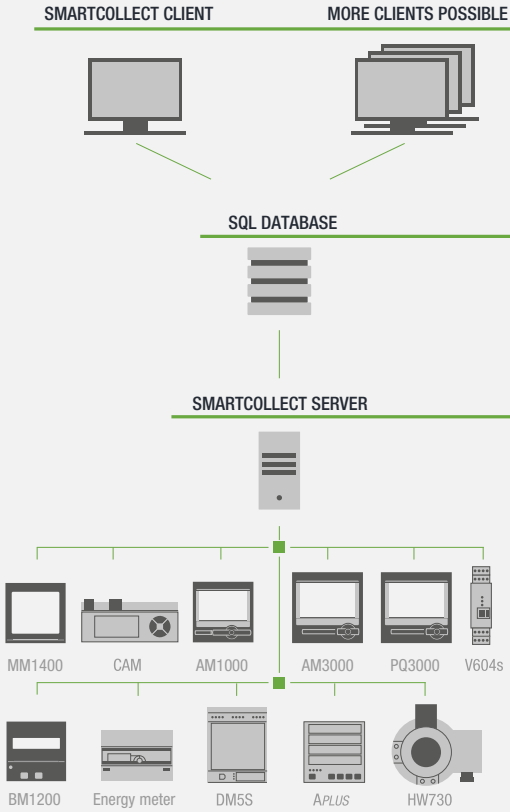
CUSTOMER BENEFITS

- Easy data communication via Modbus RTU / TCP, ECL and SmartControl-Direct
- Connection also via OPC
- Devices of Camille Bauer and Gossen Metrawatt are already predefined and selectable in the software
- Open for the devices of all manufacturers
- Data is stored in an open MS SQL database (depending on the scope Express or Server)
- Modular cost / performance model – basic version may be extended at any time

MODULAR DESIGN

COMPONENTS

The SMARTCOLLECT energy management software consists of the following components:



SMARTCOLLECT CLIENT

- Graphic visualisation of queried data
- Export via Excel file
- User interface to define the data sources to be read out as well as error and warning messages via email.

SMARTCOLLECT DATABASE

- MS SQL-Database (depending on the scope Express or Server)
- Contains the collected data
- Open and unencrypted

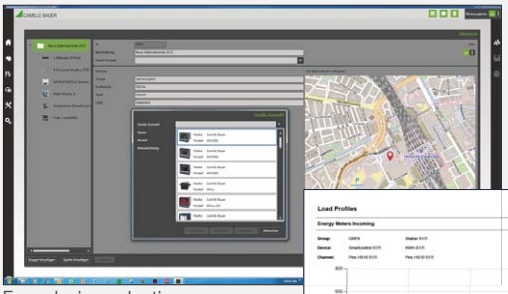
SMARTCOLLECT SERVER

- Collects and configures data from active sources and channels and writes the same directly into the central database.

SMARTCOLLECT software components may be installed on an individual system or on several servers or computers.

SMARTCOLLECT PM10 - BASIC MODULE

The basic PM10 module acquires measured data in an easy manner and stores it in an open SQL database. The module offers basic functionalities for data analysis and smooth energy monitoring and facilitates the preparation and dispatch of reports. Employing a sophisticated graphic user interface, SMARTCOLLECT provides clearly arranged software and is easily operated.



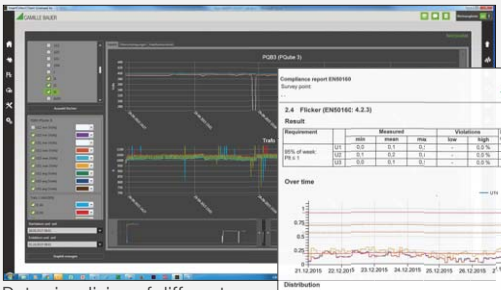
Easy device selection

Cost centre

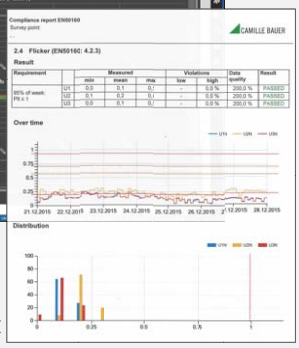
Camille Bauer and Gossen Metrawatt devices are easily and quickly integrated using merely a few clicks.
Energy data may be allocated to cost centres and merged into reports in relation to a desired period of time. Variables like temperature, voltages or currents may be visualised in an overview report. Users can store these reports or forward them automatically via email.

SMARTCOLLECT PM20 - POWER QUALITY

The PM20 module extents the basic PM10 module by varied visualising and analysis options for system quality instruments. The PQDIF files of system quality instruments are imported, converted and written into the database. Measured data may be issued as a report according to EN 50160.



Data visualising of different measured values

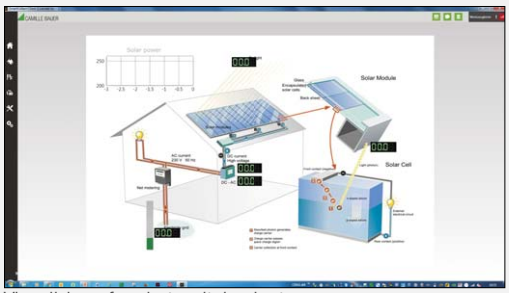


EN 50160 report

After the export of PQDIF files from the system quality instrument, they are both unpacked and stored in the database and may also be stored on a hard disk in original format, if required. The PM20 module graphic interface permits visualising of the most varied measured values of an instrument.

SMARTCOLLECT PM30 - VISUALIZATION

The PM30 module, in turn, builds on the PM20 module and supplements it to visualise plants, processes and procedures. Individual images, diagrams or drawings with live measured data, switching statuses and limit values may be linked to develop extensive visualising.



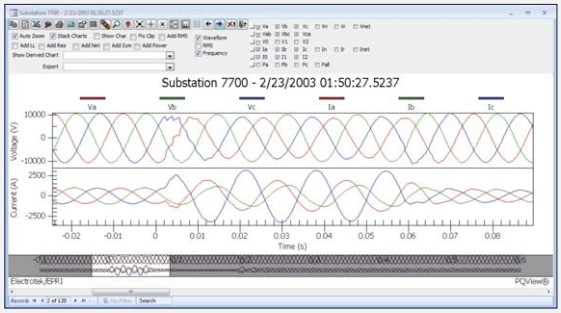
Visualizing of a photovoltaic plant

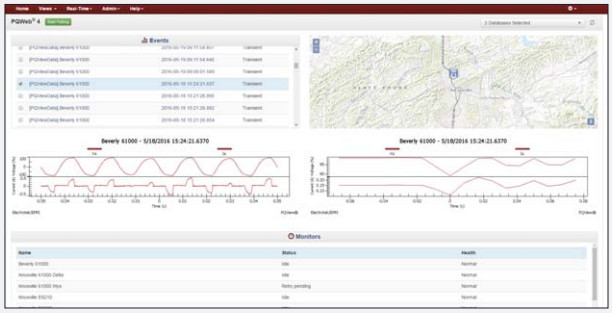
Using the integrated designer, any background can be extended to become an individual SCADA overview image. Digital displays, analog indicators, signal lamps, switches, charts and many more items may be arranged as desired and inserted in the image.

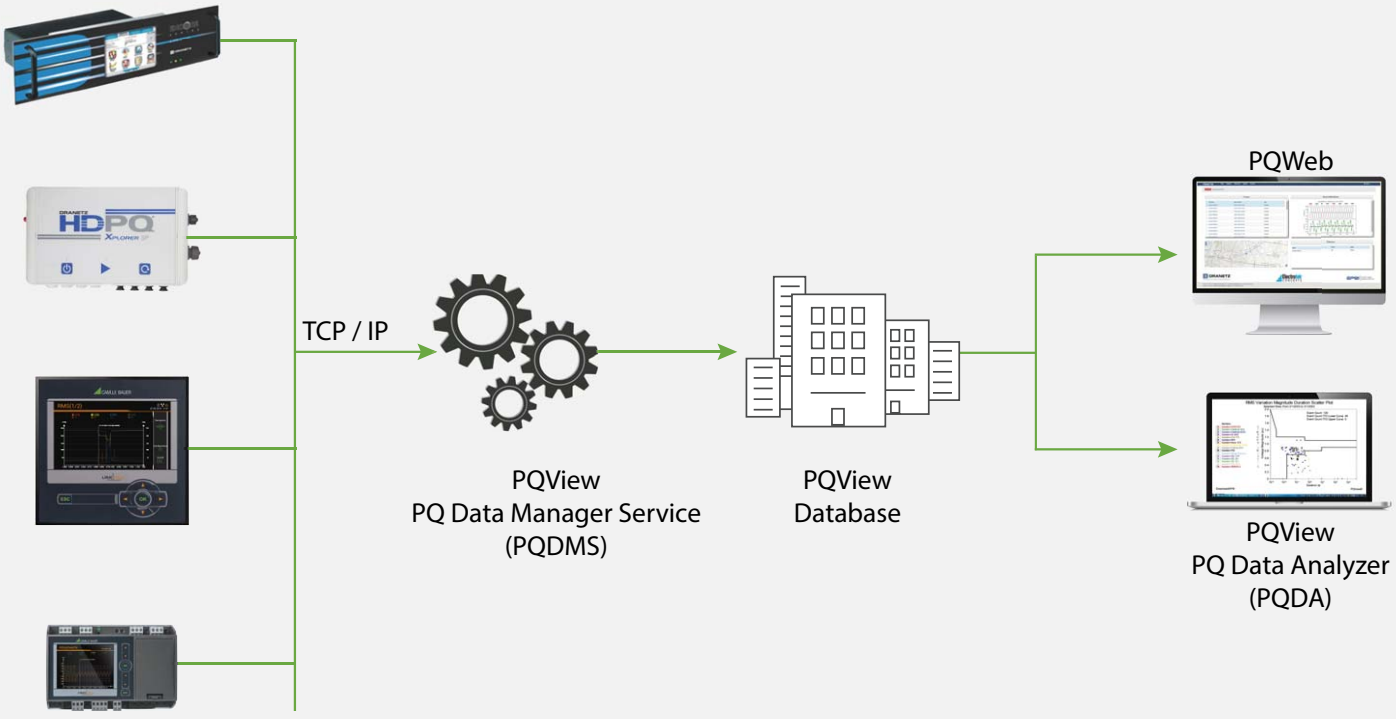
PQ-VIEW

INTELLIGENT, WEB-BASED SOFTWARE FOR POWER QUALITY ANALYSIS

- Web-based access
- Works as system controller and user surface
- Automated communication with connected devices via supported communication methods
- Application from small systems through to large multipoint, plant and supply monitoring
- Data like trends, real-time views and reports can be easily exchanged and checked, e.g. Word, Excel
- Client-, Server architecture (database)







CAMILLE BAUER METRAWATT ACADEMY

The Camille Bauer Metrawatt stands as a traditional Swiss company, for a high degree of quality, reliability and expertise. In many inspiring seminars, we offer a platform to participate in our knowledge and that of many external experts.

Our goal is to provide all those interested with the necessary expertise in the field of electrical energy and thus make processes more efficient, to protect the environment and to protect man and machine.

Each of our seminars offers you:

- A platform for maintaining your personal network
- The opportunity to ask questions at any time and get to know the speakers in person
- Catering at day seminars
- An on-site calibration service for your measurement devices
- A certificate of participation as proof of your further education

GMC INSTRUMENTS

CAMILLE BAUER

Find our complete product portfolio in our main catalogue:

- POWER SYSTEM MONITORING
- POSITION SENSORS
- ENERGY MANAGEMENT
- SERVICES

GOSSEN METRAWATT

GOSSEN

Further fields of the GMC-Instruments Group:

TEST AND MEASUREMENT

TEST AND MEASUREMENT

Being a leading provider of measuring and testing technology, we offer our customers a wide and modern portfolio of instruments.
High-quality multimeters, device testers, installation test devices as well as an extensive service program – this is what Gossen Metrawatt stands for.

Secutest

MEDICAL ENGINEERING

MEDICAL ENGINEERING

More than 100 years of experience in measuring and testing technology combined with state-of-the-art standards guarantee the highest degree of quality and reliability in sensitive areas. Our medical engineering instruments ensure the correct and safe operation of often vital equipment.

Seculife Hit

PHOTOGRAPHY

PHOTOGRAPHY AND LIGHT MEASURING

Gossen Foto- und Lichtmesstechnik GmbH is specialised in light measurement and has decades of experience in this field.
The portfolio comprises instruments to determine illumination intensity and light density and to monitor interior light.

Mavolux

GMC INSTRUMENTS

GOSSEN METRAWATT

CAMILLE BAUER

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