GOSSEN METRAWATT

Safety through Competence

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SMARTCONTROL

SMARTCONTROL **ECS**
energy | control system

GOSSEN METRAWATT

Energy Management

Systematic Energy Management for Lasting Benefits

Electrical power, gas, water and heat are central cost factors in the production process and in building management – and energy prices are rapidly rising from year to year. For this reason, more and more companies are deciding to take advantage of comprehensive energy management for improved efficiency and reduced consumption of valuable resources. The most important basis for optimizing consumption is always a detailed ascertainment of current consumption, as well as accurately pinpointing when and where how much energy is used in which processes. After all, costs can only be influenced if we know exactly when and how they're incurred.

The Intelligent Way to Optimized Consumption

The new, multi-talented SMARTCONTROL expands the Energy Control System, which enjoys widespread use in industrial environments. It unites energy and consumption data logging for a wide variety of media with peak load optimization, control functions and error message management. And thus it's not only possible to monitor consumption, it can be influenced as well. Valuable resources can be used more efficiently, energy costs can be lastingly reduced and opportunities provided by modern energy management can be fully exploited:

- **Transparency:** visualization of consumption and load structures – detection of weak points
- **Responsibility:** source-related cost allocation of consumption or costs
- **Benchmarking:** acquire figures and compare objects
- **Cost minimization:** identify and realize potential savings
- **Budget security:** precise planning and monitoring of energy costs
- **Tariff optimization:** selection of the least expensive tariff for energy import according to the utility, as well as consumption and contract conditions
- **Eco-friendliness:** reduced consumption sinks CO_2 emissions

Features

- Custom tailored scope of functions thanks to modular concept
- Manufacturer independent connection of data sources via analog, digital and temperature inputs, as well as universal M-Bus, LON and Modbus interfaces
- Use of LON interfaces without binding or special knowledge
- Synchronized meter reading using the FREEZE command with M-Bus and LON
- Flexible control of processes via analog and switching outputs
- Connection to existing infrastructures via Ethernet TCP/IP or optional socket modules for analog telephone lines, ISDN, GSM/GPRS or Bluetooth
- Inexpensive creation of networks with standard components
- Easy data exchange via Windows DLL or OPC server
- Exact time with deviation of less than 1 minute per month, automatic synchronization via time server
- Internal 2 MB flash memory can be expanded with CompactFlash
- Transfer of data and settings to CompactFlash
- SMARTCONTROL manager for simple configuration included

- **Up to date:** real-time overview of consumption and billing data
- **Flexibility:** billing based upon individually adjustable parameters
- **Service requirements:** rising energy consumption indicates a need for maintenance or repair

Saving Potential 5% - 20%

According to leading institutes and energy consultants, potential savings of 20% can be achieved through energy management. Based on their own experience, our customers report savings of 5% to 20%, depending upon the degree of optimization and the implemented measures. The amount of money available for investment can be quickly determined by observing one's energy costs and stipulating an acceptable amortization time.

Acquiring and Optimizing Energy Consumption

**Production facilities, business parks, administration buildings, branch offices –
electrical power, gas, water, heat and other media are required everywhere – are you
aware of your consumption habits and how efficiently you're using natural resources?**
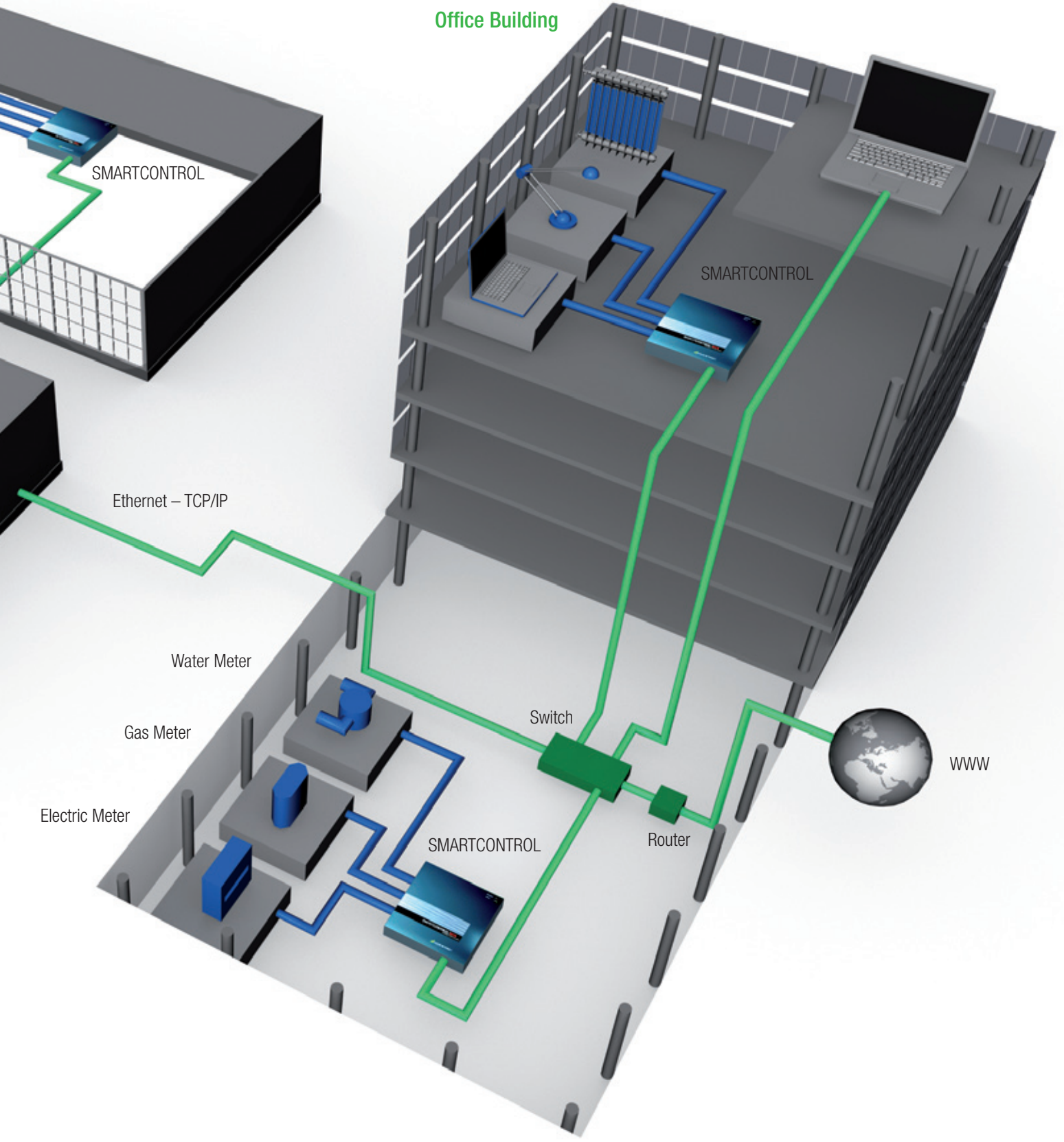
Production Facility

SMARTCONTROL

Switch
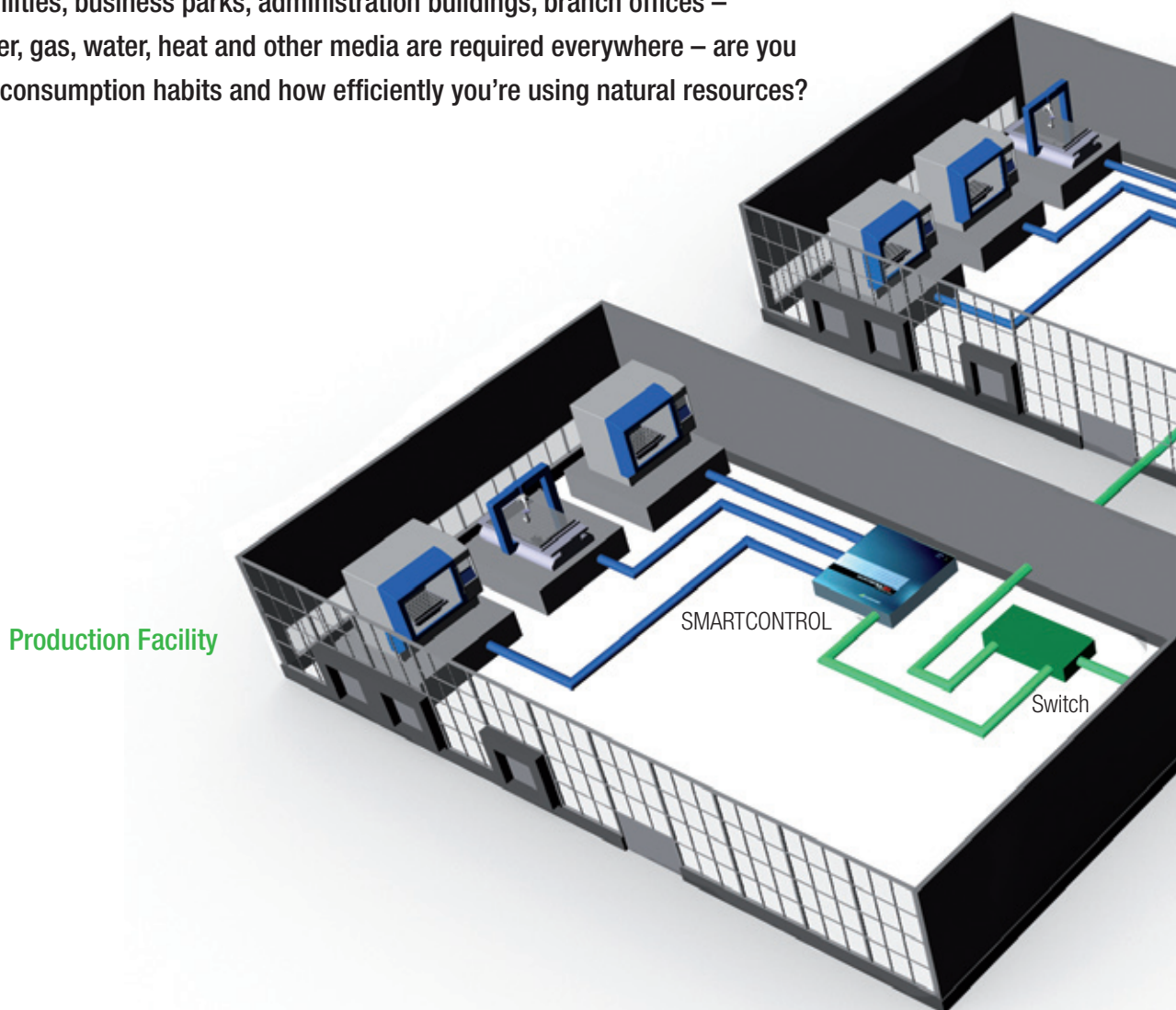
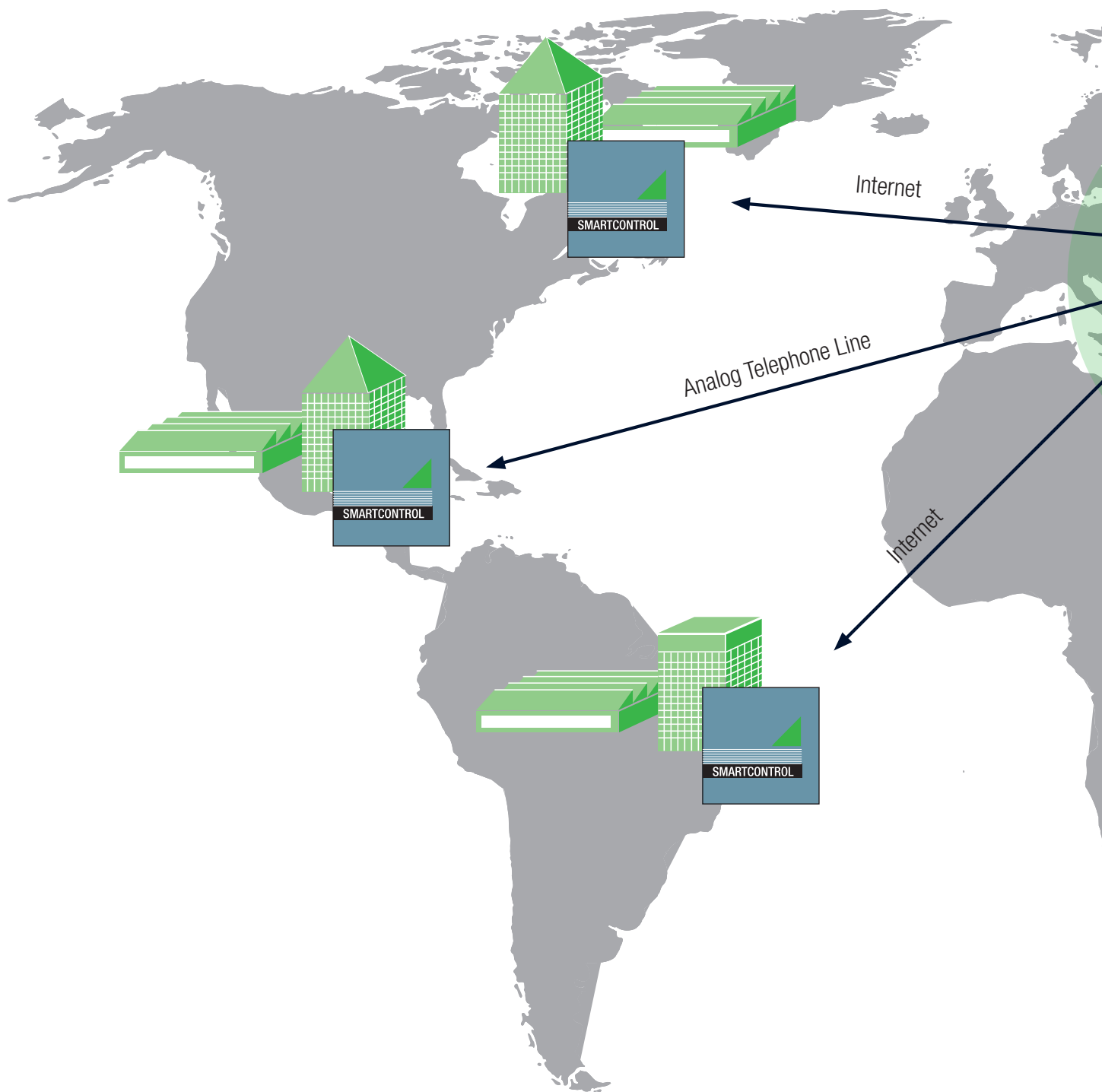## SMARTCONTROL – Acquiring and Saving
Consumption Values

As a rule, consumption values are acquired by separate energy and consumption measuring instruments such as electric, gas, water and heat meters, and are made available by the meters at various interfaces.

The simplest interface which can be used for a variety of media is the pulse output. Each pulse corresponds to a defined unit of consumption, and the sum of all pulses indicates overall consumption. However, in the long run it's more advantageous to use meters with M-Bus or LON interfaces. With just minimal wiring effort, these meters always transmit meter readings and make manual meter reading corrections unnecessary after the occurrence of system faults. Occasionally, data may also be available via Modbus or in the form of standard signals, i.e. 0/4 to 20 mA or 0 to 10 V.

SMARTCONTROL easily deals with all of these interfaces, ascertains consumption values from the connected meters and stores them autonomously at the selected interval. Synchronization to the power utility's measuring interval is possible. Sequential read-out of meter readings may result in time offsets in the case of slow transmission speeds and large numbers of bus users. Bus compatible electric meters from Gossen Metrawatt are capable of compensating time offset by means of SMARTCONTROL's "FREEZE" command.

The integrated data memory module can be expanded with a CompactFlash card in order to accommodate large volumes of data or long read-out intervals.

SMARTCONTROL

Office Building

SMARTCONTROL

Ethernet – TCP/IP

Water Meter

Gas Meter

Electric Meter

Switch

SMARTCONTROL

Router

WWW

Internet

Analog Telephone Line

Internet

SMARTCONTROL

SMARTCONTROL

SMARTCONTROL

EMC Software – Evaluating Consumption and Discovering Potential Savings

In combination with Energy Management Control software (EMC), SMARTCONTROL is the ideal tool for energy managers and controllers.

Consumption data from dispersed locations are gathered together in a license-free database via a great variety of communications channels. Visualized load profiles assure transparency for load peaks, excessively high or unnecessary consumption, irregularities, leaks and defects. This frequently makes it possible to realize considerable potential savings with minimal investment costs.

Allocation and billing of consumption costs can also be implemented with EMC. Both measures result in efficient use of valuable resources. Internal and external performance comparisons of companies, buildings and divisions are supported with calculable characteristic values.

GSM / GPRS

EMC-Software

SMARTCONTROL

ISDN
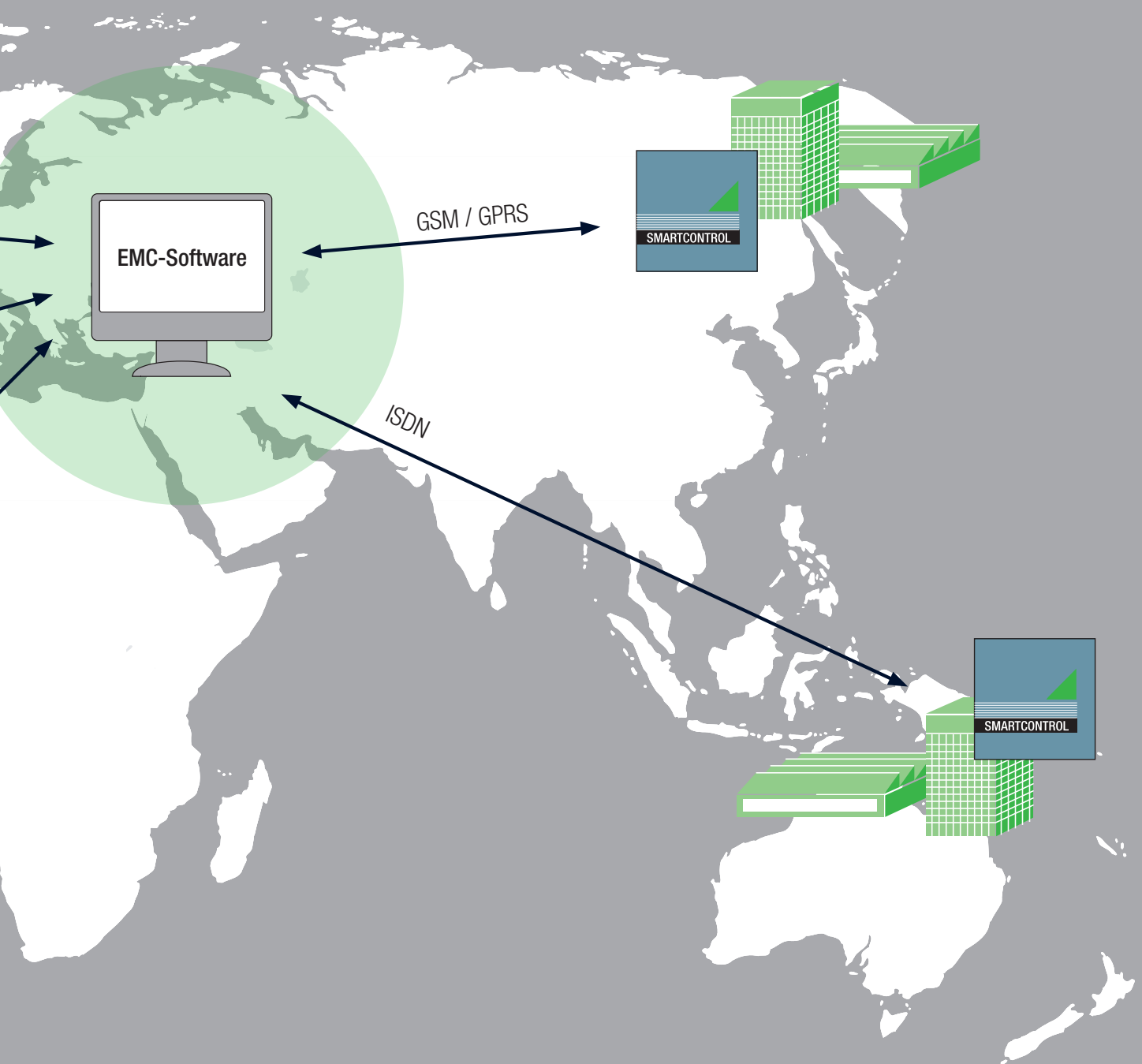
SMARTCONTROL

Central Data Acquisition – Local Control

Thanks to its modular design, SMARTCONTROL can be ideally adapted to the respective application as a highly versatile communicator. All SMARTCONTROL locations can be merged with EMC software.

When acquiring values from building and branch offices, only a few measuring points exist at dispersed locations, which are read out via analog telephone lines, ISDN or GSM/GPRS. Appropriate modules can be plugged into SMARTCONTROL.

There are many measuring points at each location in industrial parks and business parks, which are read out locally using the existing company network – Ethernet TCP/IP. SMARTCONTROL is furnished with the right interface as standard equipment. Central acquisition of values from dispersed locations can be implemented by means of a secure Internet connection.

Local processes are controlled by SMARTCONTROL programs, regardless of computer and network availability.

Monitoring, Optimization and Protection

In addition to pure data acquisition, universal SMARTCONTROL programmability opens up additional applications as well. Numerous predefined commands can be combined in the SMARTCONTROL manager to this end, and are saved to SMARTCONTROL as a program.

Error Message and Alarm Management

Acquired measured quantities can be continuously compared with limit values, and limit value violations can be used to trigger notification via switching output, e-mail or SMS. Depending upon programming, leaks and error states can thus be detected, or alarm systems can be implemented.

Peak Load Optimization

The integrated peak load optimization function is a simplified process for reducing peak load, with the goal of diminishing power costs for imported electrical power and gas. Before using this function, it's advisable to determine whether or not available functionality is adequate for the desired optimization task.

Mains Monitoring

Measured quantities from three-phase systems can be acquired with multifunctional power indicators or energy meters, read out via a bus system and monitored locally.

Timer Programs

Actuation of switching outputs by means of universal timer programs can be used in order to shift consumption from peak to off-peak tariff periods, with the goal of reducing energy costs. A further example is lighting control in order to simulate the presence of personnel in the building.

Control and Regulation

Diverse control functions can be implemented by linking various commands to inputs and outputs. Regulation is also supported by means of a special command.

Calculation Functions

The computer makes it possible to convert and link different variables, and provides a result which can in turn be used as an input value for subsequent commands. Special commands are additionally available for calculating mean values and integrals, as well as heating and cooling quantities.

Direct Input or Bus System

SMARTCONTROL acquires nearly all meter readings, states, operating hours, temperatures and measuring signals directly via analog, digital and PT1000 inputs. Measuring range and input functions can be selected for each channel with jumpers, and can be scaled with the help of the software. The status display for digital inputs and switching outputs on the PCB is especially helpful for functions testing.

If the measuring points are widely dispersed, if measured values will be transmitted directly, or if more measured quantities than just consumption are to be evaluated, bus compatible consumption meters or measuring instruments are used. All bus systems which are relevant for this application are supported by SMARTCONTROL, i.e. Modbus, M-Bus and LON. ⟶

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8 + 24 digital inputs
8 analog inputs
8 temperature inputs
M-Bus via level converter
LON
Modbus

SMARTCONTROL ECS

Ethernet
Analog
ISDN
GSM/GPRS
Bluetooth

e-mail
SMS

EMC Software

Visualizing and Billing Consumption

2 + 4 switching outputs
2 analog outputs

Controlling and Regulating Consumers and Processes

Data Transfer and Configuration

Even for those who do not want to use Gossen Metrawatt's complete solution, SMARTCONTROL's highly diverse functions can nevertheless be used to supplement in-house control technology. Configuration is supported by the SMARTCONTROL manager in this case as well.

Connection to the Building Management System via OPC Server

With the help of an OPC server, SMARTCONTROL can be connected to any building services management system with OPC client function. The Data Access Custom Interface, as of version 3.0, is used to this end. Access to data points and outputs is configured with the SMARTCONTROL manager.

Common communications channels are supported, i.e. TCP/IP, RS 485, RS 232, ISDN and modem. Software licenses can be obtained per computer and SMARTCONTROL. Access via DCOM is possible for several clients.

Easy Transport of Data and Programs

SMARTCONTROL is equipped with a CompactFlash slot, which can be used to expand the internal 2 MB data memory module. After formatting a commercially available CompactFlash card with the SMART-CONTROL manager, the card is ready for use. SMARTCONTROL not only stores the data, it also saves the program to the memory expansion module. If the memory card is removed and plugged into a new SMARTCONTROL, the program is loaded and launched during start-up, and data recording is resumed. This is a useful function which is above all helpful in the event that service is required.

Simple Configuration – SMARTCONTROL manager

SMARTCONTROL's diverse range of applications makes individual programming necessary. SMARTCONTROL's various parameters and functions are defined by means of the SMARTCONTROL manager and its graphic programming interface. Linking the inputs to calculations, logic functions and timer programs, as well as relay, SMS and e-mail outputs, is extremely easy. Acquired channel data can be read out for test purposes, visualized in tables or graphic representations, and exported in CSV or BMP format. All commands can be immediately executed with the test function, and results are then returned. No special programming knowledge is required.
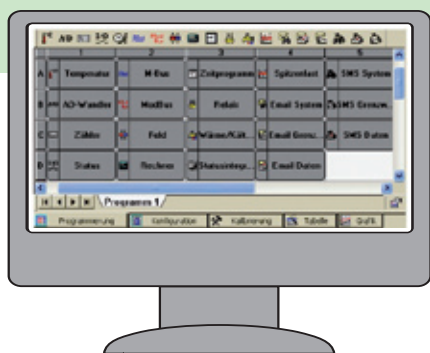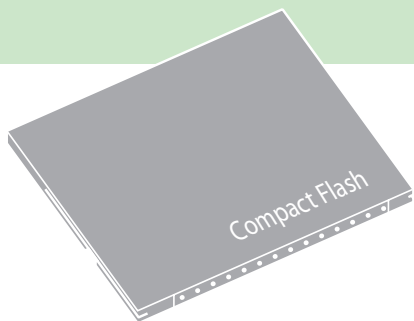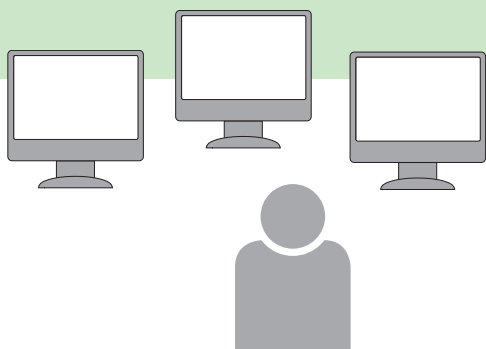
Developed in Dialogue,
Effective in Actual Practice

Consulting

The most important prerequisite for successful energy management is a detailed analysis which makes load characteristics apparent and ascertains all operating requirements. An experienced and competent partner is required to this end: The specialists at Gossen Metrawatt have many years of experience in energy management, and can provide you with comprehensive consultation.

Analysis

In consideration of all of your individual conditions, we prepare an optimization concept together with you, determine the effectiveness of individual measures and evaluate their efficiency.

Implementation

If you're convinced by our optimization model, you receive the concept and a turnkey system from a single source. Upon request, Gossen Metrawatt can operate the optimization system for you as well, and make any necessary adjustments.

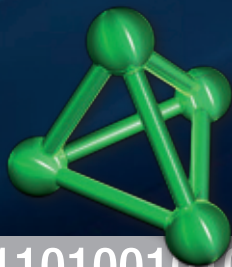**You concentrate on your core business activities – we reduce your energy costs!**

GOSSEN METRAWATT

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