

SAUTER FACTS

The magazine for SAUTER customers

BACnet Secure Connect (BACnet/SC)

Effective measures protecting against cybercrime

SAUTER Remote Management

Remote access for service and operation via SAUTER Cloud

SAUTER Facility Services is growing

Techne S.p.A. (Italy) company profile and project report



Facts No. 40

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The SAUTER Facility Services division is growing

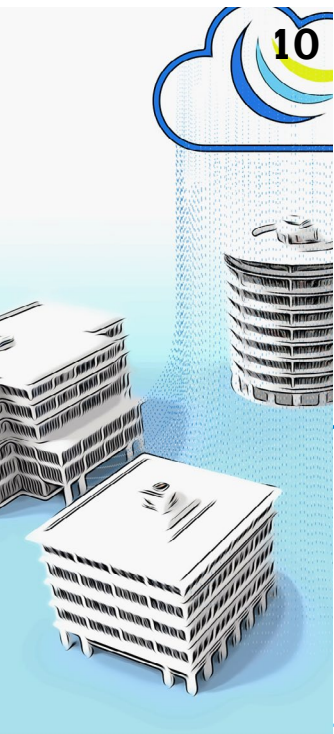
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Editorial



**Dear Customers and Business Partners,
Dear Readers,**

Summer is here and we've got a new SAUTER FACTS for you!

Last year, despite difficult market conditions, all business divisions of the SAUTER Group continued winning prestigious contracts and, against all odds, pressed ahead with ongoing projects. I'm therefore proud to show you, once again, some selected references from Switzerland, Germany, France and Dubai in this issue.

I am also pleased to inform you that SAUTER grew in 2020. The acquisition of Techne S.p.A. allowed us to expand the Facility Services division further. You can find out more about the company, which has a strong presence in the Italian market, on pages 4-5 and 22-23.

"Remote working" was a buzzword of the Covid crisis. Building operators also sought solutions for remote maintenance to continue running their properties at maximum energy efficiency. The launch of SAUTER Remote Management, which offers secure remote access for servicing and operating customer plants through the SAUTER Cloud, has generated plenty of interest. More details can be found on page 10.

Another topic that remains a hot one is cybersecurity. BACnet/SC ("Secure Connect"), an extension of the international communication protocol for building automation, is supported by tried and tested IT protection mechanisms to shield the building infrastructure from malicious attacks. SAUTER welcomes this development and is excellently prepared with modulo 6. Speaking of modulo 6, a playful timeline will show you all its enhancements since it was launched back in 2019 (page 8).

This issue also highlights the components we offer for optimising heating and cooling systems and the reason why this is especially topical right now (page 12).

I wish you a stimulating read!

Yours, Werner Karlen, CEO

Introducing Techne S.p.A.

In mid-2020, the SAUTER Group acquired Italian facility management company Techne S.p.A. The Group thus further expanded its Europe-wide market presence in the Facility Services business segment. Techne is not only represented throughout Italy but also adds global clients to SAUTER's map.

SAUTER operations span all building sectors, from educational establishments and public buildings to private-sector office buildings. In Techne, a target company has been found which slots neatly into the expansion plans for SAUTER Facility Services while supporting its wider portfolio. Both Techne and the SAUTER Group strive to nurture long-term, sustainable business relationships.

Techne describes itself as a key Italian company in facility management. Its extensive services include maintaining and managing technical systems as well as the upkeep of buildings. The company is committed to increasing its success in the fields of quality, health, security and the environment.

For Dario Vieceli, General Manager at Techne, the organisation's strength lies in its customer-centric focus and ability to act as a proactive partner – indeed, a precondition for guaranteeing service quality. "In this regard, the issues of environmental management and process sustainability are common to all our company operations – from the supplier to the customer. We therefore not only involve our employees in optimising processes but also empower them through ongoing training in quality, health, security and environmental management." The company is proud to hold a dozen ISO certifications, with project and energy managers certified to acclaimed standards.

Joining the SAUTER Group will allow Techne to further expand and guarantee holistic services to its clientele. The acquisition continues SAUTER's growth strategy which started by acquiring Wren in the UK in 2018 and then with the purchase of Sirius in Ireland in 2019.

You can find out more about Techne's activities on page 22!



Dario Vieceli, General Manager Techne

PROFILE

Established: 2003

Headquarters: Villa di Serio (Bergamo)

Employees: Approx. 230

Revenue in 2020: Approx. €40m

Services:

- Installation of electrical and HVAC systems
- Facility management
- Building management
- Automation and special plants

Sectors:

- Healthcare
- Universities
- Postal and banking
- Public administration
- Housing
- Shopping centres and major distributors
- Industry
- Airports

Labor omnia vincit
(Latin: “Work conquers all”)

Company motto

Cybersecurity in a building with BACnet Secure Connect (BACnet/SC)

Effective measures protecting against cybercrime are also essential in building automation. A new generation of BACnet equipment aims to secure the building automation as early as the hardware level. We explain the requirements that these BACnet/SC devices must fulfil.

Imagine the following scenario: In the laboratories of a global pharmaceutical company, research is in progress day and night on an active compound for treating a chronic illness. Human clinical trials on the product are about to start. If the drug is approved later on, this will be seen as a breakthrough and help hundreds of thousands of people around the world.

Both research and production processes are highly critical and maximum stability of environmental conditions is called for. The requirements placed on pharmaceutical products are also ever increasing. Suddenly, the lab unit control systems signal a minimal but significant rise in room temperature. Shortly after, the CEO receives an email from an anonymous sender explaining that hackers have now taken control of all research facility systems. Pinpoint readings confirm this disturbing news. The hackers are demanding a crippling ransom and threaten to completely shut down the temperature, humidity and room-pressure regulation systems. Jeopardisation of the ongoing research not only spells reputational damage but, in this (fictitious) case, millions in public research funds and company investments would also go down the drain.

How can such a scenario be prevented?

Cyber attacks on the up – how does BACnet respond?

Hacker attacks are taking off right now. Sadly, the building sector is not immune to this either. Traditionally, building networks were – and in some cases still are – separated physically from other networks entirely. Thus, for a long time, no one in the building automation sector cared about cybersecurity. If hackers gain physical access to a building's inner network, all doors open up to them. In this event there is nothing that anyone can do.

“Traditional building networks are like open barn doors for hackers.”

The advent of the Internet of Things (IoT) has meant a dramatic change in situation in recent years, with today's smart building automation systems often connected to the Web. Studies show that over a third of computers in control of these very systems have already been exposed to malicious attacks.

The BACnet communication standard therefore needs to adapt. The iron-clad separation of BACnet/IP networks from the remaining IT networks in a building's infrastructure has also been relaxed in recent years. BACnet has come under growing pressure. To allow both the IT world and building automation sector to benefit from synergies in future, BACnet had to obey the rules of jointly managed network infrastructures. Measures were to be driven forward for significantly reducing commissioning and maintenance overheads. These were:

- Using internationally standardised mechanisms for data security and encryption (e.g. Transport Layer Security, TLS)
- No more fixed IP addresses and hence reducing the IT infrastructure and administration costs incurred, particularly for specialised Broadcast Managers (BBMD: BACnet Broadcast Management Device)
- An end to the data transmissions (broadcasts) caused by the BBMDs which spread across the whole network
- Avoidance of uncontrollable routing by BACnet devices

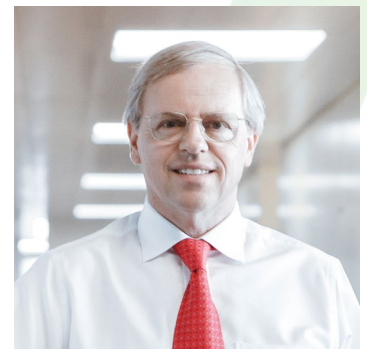
In a successive approach over many years, the BACnet Working Group responsible, (SSPC-135 IT-WG) focussed intensively on these issues. The result was published in late 2019. The outcome was a new BACnet data transmission protocol known as BACnet/SC (Secure Connect), the communication mechanisms of which are based entirely on accepted best practices in IT. Fixed IP addresses are no longer mandatory and BBMDs have been taken out of the picture. BACnet/SC enables BACnet devices to intercommunicate securely both over the cloud and within systems. With TLS 1.3, BACnet/SC uses the latest encryption protocol for transmitting data and is easily integrated into existing modern IT infrastructures.

The SAUTER BACnet/SC solution

There is a key aspect for the building technology industry: BACnet/SC must preserve all the functionalities of BACnet/IP and therefore offer backwards compatibility at application level with current BACnet implementations and equipment. The only question, however, is whether the hardware is indeed BACnet/SC-capable. The devices, for example, need to be powerful enough so that their processors can withstand the increased load associated with encrypted communication.

The modulo 6 product family is being further enhanced to meet these demands. SAUTER first plans to launch a router enabling connection between unencrypted BACnet/IP and BACnet/SC networks. The cloud-based building management system (SAUTER Vision Center) and a local building automation system can, for example, be connected via a line secured with BACnet/SC. Secondly, any automation station in infrastructures requiring special protection will be able to communicate with BACnet/SC. This communication in the protected network will no longer occur at device level but over a BACnet/SC hub instead. This can be likened to a switching station that checks whether the automation stations have valid signed certificates and thus the authorisation to participate. Similarly to the cybersecurity measures in computer centres and networks, BACnet/SC makes greater demands of the hardware being used.

Thanks to our modulo 6 system family, however, SAUTER is ahead of the curve. The building functions of our customers, as well as the companies and people in the building, thus have the benefit of protection that they can rely on.



Dr. Felix Gassmann
Executive Vice President
CTO & CIO

The evolution of modulo 6

Since the product launch of the modulo 6 automation system in spring 2019, the hardware and software have undergone continuous development. Here we would like to give you an overview of the key milestones and what we also have in the pipeline.

- Impressive performance 
- IoT and Cloud 
- Intuitive operation 
- Maximum security 
- Perfect integration 
- Guaranteed investment protection 

2019



Launch of modulo 6 product family and moduWeb Unity

- High-performance hardware and firmware
- Safety features based on IEC 62443-3-3:
 - Integrated network separation
 - Encrypted communication
 - Role-based user administration
 - Rule-based access control list
 - Audit Trail
- Interfaces/communication: BACnet/IP, SLC, Modbus, HTTPS, NTP, SMTP, SMPP, Bluetooth
- Local priority operation with colour LCD
- Expandable with I/O modules for analogue and digital signals
- Integrated moduWeb Unity web server with plant visualisation for operation and maintenance



BACnet certificate for modu680-AS

"Profile B-BC" features according to revision 1.16

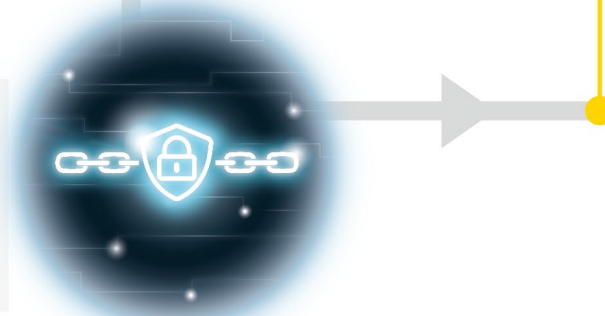
2020

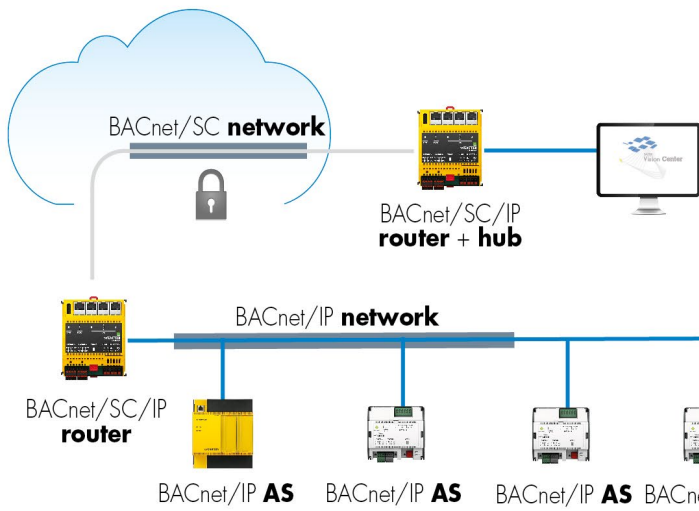


Launch of Building Data Integrity Manager

modu615-BM

- Ensures data integrity in the building automation using blockchain technology
- Patented process
- Creation of digital twins
- Notifications in the event of data integrity breaches
- Automatic recovery

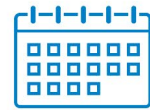




modulo 6 cloud integration



COMING
SOON



BACnet/SC

- Standard encryption (TLS) reduces cyber risks for entire building automation systems

Extension of communication module range

- modu620-CM: Module with RS-485 interfaces for Modbus RTU/ASCII
- modu630-CM: Module with 2-wire (EN 13757-2) and RS-232 interfaces for M-Bus



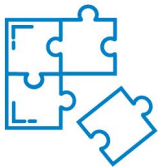
Extension of modulo 6 automation station range

modu660-AS for decentralised plants

- Interfaces/communication: BACnet/IP, SLC, HTTPS, NTP, SMTP, SMPP, Bluetooth
- BACnet B-BC profile
- 2 network interfaces for daisy chain wiring



M-Bus



2021

moduWeb Unity

Features of the firmware update

- Extended dynamic display of characteristic curves
- Improved performance through new database



Remote building management: effective service, minimum response times

Remote Management, a service from the SAUTER Cloud, enables secure remote system maintenance and optimisation. This guarantees minimum response times and continuous operation.

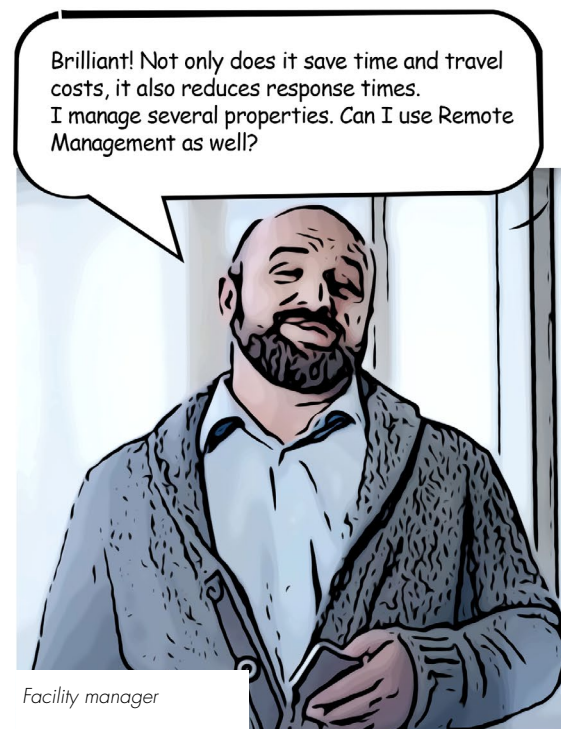
In FACTS No. 39, we gave you an insight into the SAUTER Cloud strategy ("SAUTER Digital Services"). The potential of cloud computing is not only unleashed with innovative hardware such as modulo 6, software from the cloud also meets state-of-the-art customer requirements and enhances processes even further.

Secure access to local systems and applications

The SAUTER Cloud, the heart of Remote Management, forms the interface between the system and service technician.

Remote Management allows services relating to building automation, energy management and the associated IT infrastructure and software applications to be provided quickly and actively. Staff from external service providers, building operators and facility management benefit from the highly effective service options through direct access to decentralised systems and applications. Resolution of malfunctions is therefore faster, maintenance and servicing more efficient and applications can be expanded or adapted remotely.

Three user subscriptions are available. These are tailored to the tasks of facility managers ("End User"), service technicians ("Engineering User") and administrators ("Admin User"). The subscriptions include appropriate access and processing rights for the respective target group. The administrator logs into, via the internet, the SAUTER Cloud and defines the access rights and connections required for service technicians and facility managers. Configuration is quick and intuitive. Users are authenticated through the SAUTER Cloud and granted access to selected buildings, systems or applications via a web browser and secure VPN connection.



As if you were right there

The remote connection between the service technician and customer's system means greater flexibility and shorter response times for the building operator. Change requests or extensions to the building management can be performed from anywhere. Engineering tools, i.e. commissioning and maintenance programs, can be used as though the technicians were directly on site. The cloud acts as a relay station, receiving signals and automatically forwarding them. If specialist knowledge is required, application experts can be called in from headquarters – online and at short notice.

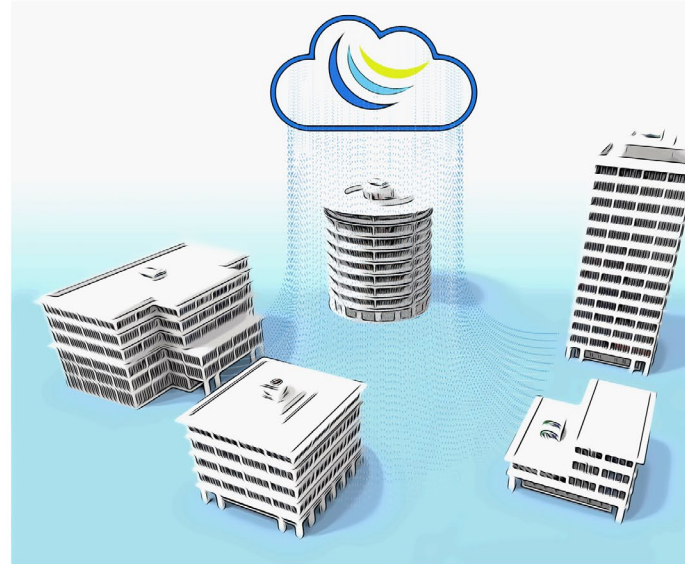
SAUTER Digital Services

Remote Management minimises service response times for systems and buildings. This ensures trouble-free operation, high availability and user comfort. Extension of the service from the cloud is also possible with analytics and energy management from SAUTER Vision Center (SVC). This makes building operation measurable while increasing operational efficiency.

The benefits at a glance

- Secure access to decentralised systems and applications
- Service provision for building automation, energy management, IT infrastructure, software, etc.
- Faster response to faults thanks to precise initial diagnosis and direct access to experts
- Transparent and secure network connection via browser and Windows client
- Additional security through user management and 2-factor authentication

Yes, an 'end user' is able to access the local applications from any location. To do so, you simply use a web browser and log into the SAUTER Cloud.



Aligning temperature and energy through hydronic balancing

Hydronic balancing is necessary for fault-free and energy-optimised heating or cooling. It is just as important as the correct planning and installation of the system. SAUTER offers various regulating valves to solve the task.

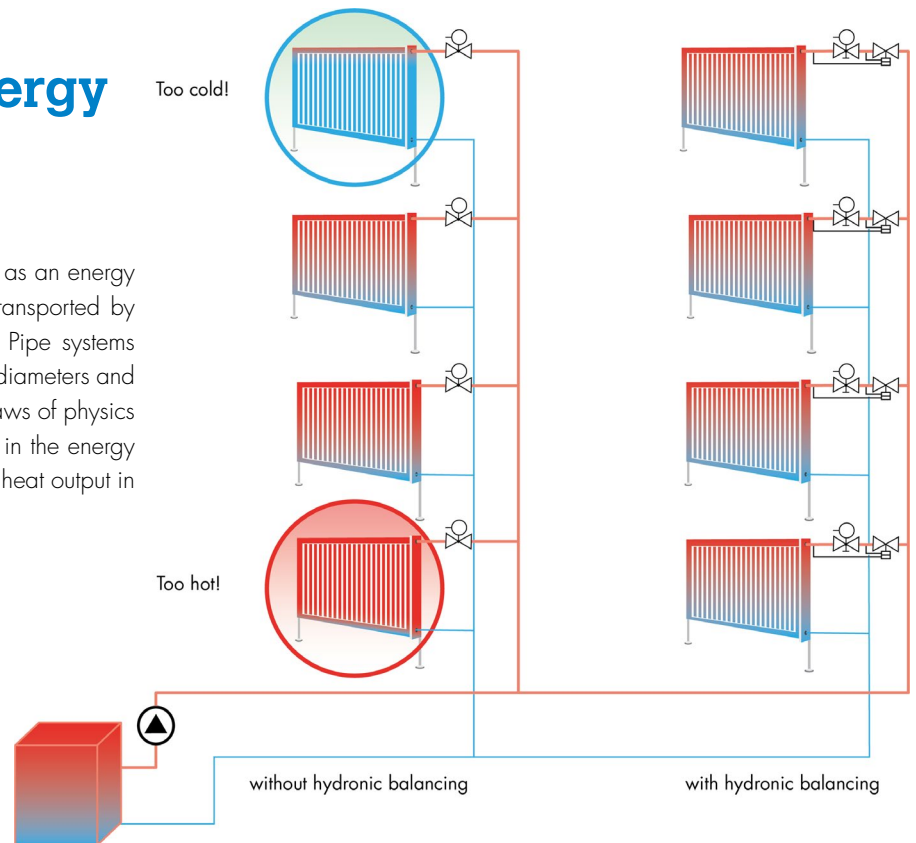
The desire for a comfortable room temperature might sound simple, but this requirement in itself has become a socio-political issue. After all, heating, hot water and air conditioning account for a major part of a building's energy consumption. A clear goal has been set in place: to drastically reduce the energy consumption of buildings all around the world.

Building specifications and standards are one way of achieving this. At the same time, positive up-take in all industries – and implementation at a local level – can yield the desired outcome. This is where HVAC systems play a critical role.

Such system problems are often invisible but their consequences, sadly, are not. These may include energy inefficiency, limited user comfort and high operating costs. "Dynamic hydronic balancing" however can be performed quickly and easily. This keeps the volume flow constant and thus, in turn, the temperature level. PICVs (pressure independent control valves) instead of standard regulating valves are used. They respond, as the name suggests, to the changing pressure conditions in the heating and cooling systems. They therefore maintain the water quantity required where it is consumed, for example in the radiator or the heated/chilled ceiling. "Dynamic" in this context means that water volume distribution remains the same, regardless of consumption.

Temperature and energy under control

Hydronic HVAC systems use water or water mixtures as an energy medium. The fluid is heated (or cooled) and then transported by pumps to the location where it delivers its energy. Pipe systems have a highly complex design with different nominal diameters and pipe lengths. Water, on the other hand, follows the laws of physics and takes "the path of least resistance", if this results in the energy medium being unevenly distributed in the system, the heat output in the connected rooms will be impacted.



And the potential monetary savings?

To begin with, dynamic hydronic balancing brings transparency to the system's energy flow. Studies have shown that this can save up to 20% of the total heat energy. In addition to this, hydronic balancing provides tangible collateral benefits when it comes to heating and cooling systems generally. Firstly, indirect costs, such as CO₂ taxes on fuels, are already having medium-term significance. Secondly, operating costs can be reduced by ensuring that the room climate already meets users' needs and that no extra heating or cooling is necessary. Thirdly, the facility management will be called upon less to intervene in the event of malfunctions. Thus, the cost of energy efficiency and preventing temperature fluctuations is by no means prohibitive. What is more, PICVs are soon ready for use, requiring little planning, installation or commissioning work.

The ideal balance means:

- Greater energy efficiency
- Lower CO₂ emissions
- Reduced operating costs
- A comfortable room climate

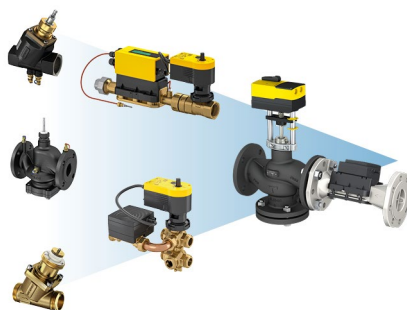
Electronic PICVs allow you to keep an eye on energy consumption and volume flows. You can also optimise an entire plant's systems centrally through the building management system. Whether mechanical or electronic dynamic control valves are used, the plant hydraulics are dynamically balanced, enhancing the overall system greatly.

Some governments subsidise hydronic balancing which means that PICVs have also entered the political arena. A consultation on energy efficiency and the best solutions for your heat distribution system can clearly identify the ways PICVs can improve comfort levels in your building. SAUTER is there to help and advise you. You will find contact information on page 26.

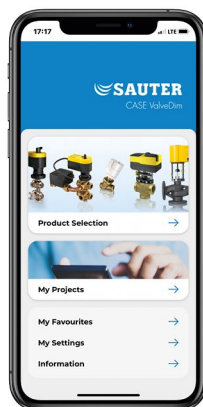


SAUTER PICVs

SAUTER offers two product groups for solving the task: mechanical PICVs and electronic PICVs. Find further product information in our product catalogue.



By the way...



Are you familiar with CASE ValveDim?

With SAUTER's mobile app, you can find the most suitable valves and actuators for your project at any time (even offline). See for yourself how convenient and efficient it is!

Free to download from your app store:





Bergwelt Grindelwald – Rustic chalet charm meets high-tech room automation

Alpine design resort Bergwelt Grindelwald (literally meaning “Grindelwald Mountain World”) combines small-luxury-hotel comfort with the fascination of the Swiss Alps. For winter skiers and summer hikers pleasant indoor climates await – possible due to SAUTER’s automation solution. A concept which, with reduced resource use and optimised energy costs, also won over the operators.

If you wish to trek the borders of Grindelwald – a community of 4,000 inhabitants – be sure to pack sturdy shoes. Here you’ll have ten 3,000-metre peaks and three 4,000-metre peaks to contend with. Grindelwald lies in a valley on the northern side of the Alps, within a scenic panorama boasting the famous Eiger, Mönch and Jungfrau mountains. The village below the north face of the Eiger has been a tourist magnet for generations.

Alpine charm with state-of-the-art design features

This year there’s a new place to stay in the village: Bergwelt Grindelwald. The apartment hotel marries modern design furnishings with the rustic charm of the Bernese Oberland. It has plenty

more to offer behind its façade too. A spa area (800 m²) and outdoor and indoor pools will relax the body and soul, while the cigar lounge and bar present the perfect backdrop for conversation. At “BG’s Grill”, dishes are served on a stone slab, brought directly from the open charcoal grill. And if you like, you can even go straight to the fitness centre and work off that hearty Swiss cuisine!

At the centre of the complex of chalets and condos is the hotel with more than 90 rooms. In winter, sports enthusiasts can jump on their skis and take to the slopes in a flash. In summer and autumn, it forms the ideal springboard for hiking through crevasses or exploring the magic of the Jungfrau region.

Guests at Bergwelt Grindelwald are treated to a direct view of the Eiger. Its legendary north face – 1,800 vertical metres between ice fields and cliffs – was only conquered in 1938 and presents the ultimate challenge for many climbers. The alpine panorama is truly cinematic. The James Bond film, “On Her Majesty’s Secret Service”, was shot in and around Grindelwald, as were scenes from Star Wars too. Author J. R. R. Tolkien also succumbed to the terrain’s beauty, hiking in 1911 through the nearby Lauterbrunnen Valley. The rugged, steep rocky slopes were in fact a model for the landscape of “Lord of the Rings”.



Room automation with SAUTER components throughout

HRS Real Estate AG, the resort's constructors, already knew from previous collaborations the value of SAUTER expertise. As it optimised the individual room regulation concept originally tendered, SAUTER proposed a dovetailed automation solution using single-source technology. This cut the resources needed by an impressive 20%, proving to both customer and specialist planners that SAUTER indeed had the ideal solution.

From the building management system, automation level, individual room control right through to the field devices: the rooms and HVAC installations at Bergwelt Grindelwald are equipped with SAUTER components. The original tender consisted of Modbus intelligent unitary control. The enhanced concept, however, provides modulo system-based room automation with native BACnet support. It not only monitors room climate but the window contacts and card readers as well. The modular room automation stations at Bergwelt Grindelwald take the shape of ecos504 room controllers, their powerful function modules minimising energy use. ecoUnit room operating units enable individual adjustment of room climates. Energy meters are system-integrated via M-Bus. A specialist planner will always be on hand to continuously optimise energy consumption.

SAUTER Vision Center is deployed for building management at Bergwelt Grindelwald. Countless features such as customised dashboards and user-specific evaluations provide key information at a glance.

111 YEARS OF SAUTER

This project is not the only reason why Grindelwald has a special meaning for SAUTER. The company was founded here no less, 111 years ago. In 1910, Fritz Sauter opened a small workshop in a barn where he developed timers (pictures). Back then, his inventions helped increase the efficiency of boilers and street lamps. While his company's product portfolio has constantly evolved over the years, SAUTER has remained true to the original idea – efficiency.





Merck: How liquid crystals improve building sustainability

Merck has installed liquid crystal windows at its new Electronics Research Center in Darmstadt. It takes just a touch of a button to darken them. With SAUTER technology, they can be controlled directly through the customer's own app.

Liquid crystals bring colour into our lives. They are found in mobile phone displays or TVs, for example. They can, however, also control light for specific purposes. Under the eyrise® brand, the Merck technology company is developing liquid crystal windows ("LC windows"). Their dynamic shading function can increase room comfort, reduce energy costs while also allowing transparency and a view of the outside.

In a period of more than 350 years, Merck has evolved into a global company. From eco-friendly solvents to drugs for treating multiple sclerosis, its products have become essential in many realms of everyday life. Merck is also a leading player worldwide in the development of new liquid crystal technologies.

As part of an intensive investment programme, Merck opened its Electronics Research Center in 2020. The eight-storey building located on the Group campus in Darmstadt has offices for 140 employees. It is also home to laboratories where pioneering semiconductor and display materials are developed. If you wish to see the liquid crystals in action, you don't need to enter the labs. Looking at the façade will suffice – eyrise® windows cover a 300 m² area at the Electronics Research Center.

Plenty of daylight with little heat

Glass façades flood rooms with daylight and allow people to see the surroundings and yet a large transparent area is not without its drawbacks. Direct sunlight, for example, creates glare reflections and heats up the rooms inside – particularly so in summer. eyrise® windows, however, can be darkened in seconds, reducing irritating reflections and temperature rises. In contrast to window blinds, when the windows are tinted, enough light comes in and you can still see outside. It's just like looking through sunglasses.

People's comfort levels in a room can be gauged with the PPD index ("Predicted Percentage Dissatisfied"). While conventional double glazing achieves only 21%, eyrise® windows have a PPD index of 6% – well below the 10% target. An improved room climate also means less energy is needed for air conditioning. Furthermore, with no mechanical parts, the windows are low-maintenance and weather-resistant.

The key to the eyrise® technology is a transparent liquid crystal mixture infused with dyes. When an electrical voltage passes through the liquid crystals, they realign, thus changing the orientation of the dyes. This principle means that the window light transmission can be dimmed to the exact level. The alternation from light to dark takes less than a second. These fast switching times are highly convenient, especially when the cloud cover is ever-changing.



Windows without dimming



Partially darkened windows



Total darkened windows
© Merck KGaA

SAUTER using MQTT gateway for demand-based light control

One of the challenges facing SAUTER Germany was integrating window regulation into Merck's own app. Specific IoT data points were programmed for access. Each eyrise® control module addresses up to eight windows out of a total of 112. The SAUTER ecos504 automation station forms the MQTT gateway, allowing modular room automation with optimised energy consumption. The eyrise® windows were treated like normal window blinds. Integration of the room control therefore conforms to VDI3813.

The Electronics Research Center has 18,500 physical and virtual data points in total. In addition to MQTT for the IoT connection, SAUTER deployed various other communication standards: BACnet/IP (system- and manufacturer-independent) for laboratory control, EnOcean for room operating units, DALI for the lighting control and SMI for external sun shading. SAUTER fitted 11 cabinets in the technical control centres for system automation and 30 cabinets on the different storeys for room automation. Modbus applications were also implemented by SAUTER.

SAUTER's modulo system formed the basis of the system solution tailored to the center's technical requirements. Decentralised room automation kept installation costs low. The integrated solution and harmonised products (HVAC functions, sun shading and lighting) also help reduce emissions.

In matters of building automation, SAUTER Germany has been the go-to expert for Merck since 2009. SAUTER has played a role in the running of some 40 of Merck's buildings at the Darmstadt location. It has taken over, for example, the building automation at the Merck Innovation Center which opened in 2018. Just one more reason why Merck chose SAUTER's expert solutions for operating its Electronics Research Center.

Schlumberger Riboud Product Center – "powered by the Earth"

Using geothermal for heating and air conditioning, Celsius Energy – a French energy start-up – is helping to reduce CO₂ emissions, save energy and increase property values. For their first installation they turned to SAUTER France for the building automation and management level solutions.

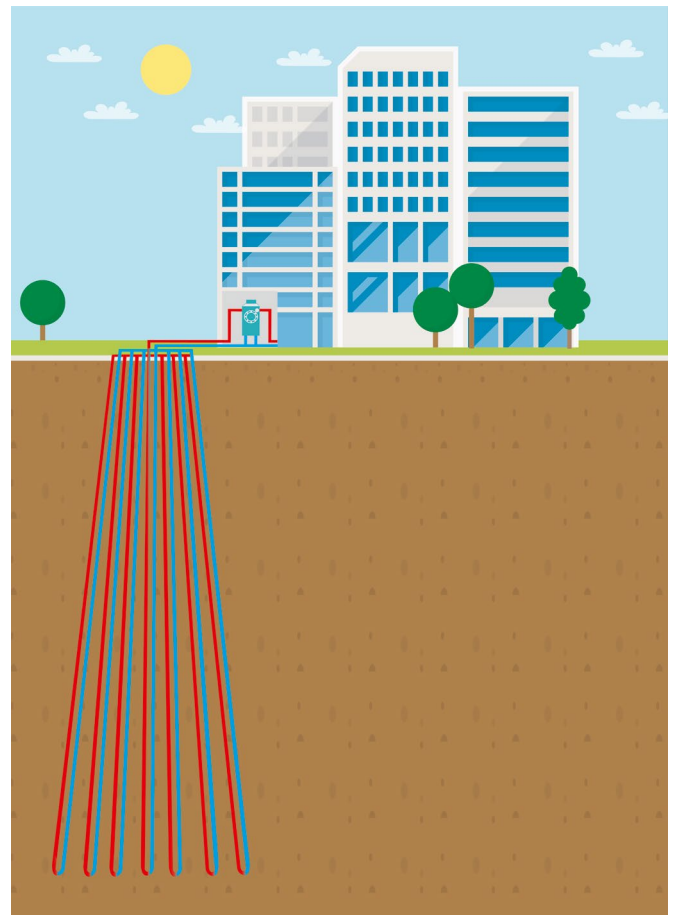
Our planet glows. Perhaps it doesn't glow as obviously as the Sun but the Earth's core has a temperature exceeding 6,000°C. This heat remains constant – regardless of the season or weather – and can be harnessed. It's therefore a long-term global energy source with huge potential. One of its biggest – or at least highest-profile – fans is none other than former U.S. Vice President Al Gore. He even goes so far as to call geothermal energy "potentially the largest and presently most misunderstood energy source" on Earth. He bases his assertion on scientific data indicating that geothermal energy could supply global annual energy demand about 280,000 times over.

There are different ways and technologies of putting geothermal energy to work. Firstly, the heat itself can be used, secondly, it can be transformed into electricity. There may still currently be a large gap between geothermal's potential and its contribution to the world energy mix. Its use, however, is steadily on the rise. Today, at least 88 countries produce geothermal heat and 29 create geothermal electricity. Germany and France are among the ten countries leading the way.

Recognising the potential and exploiting it

Schlumberger, one of the world's foremost energy companies, has also seen the inexhaustible capacity of geothermal. The company – an expert in drilling and tapping the ground below – set up Celsius Energy, a business venture specialising in heating and cooling methods using geothermal energy. Innovative technology developed by Celsius Energy requires very little surface area for the boreholes where the geothermal probes are positioned. To avoid spoiling the landscape, equipment is placed in either the ground or a building. The solution is thus viable for almost all types of buildings – whether existing or new ones – and even in densely populated areas.

Celsius Energy's geothermal solution regulates building temperatures all year round. It provides heating in winter and cooling in summer – or even both at the same time. Compared to other energy sources, the technology claims to cut a property's CO₂ emissions by up to 90%. Operating costs can be reduced by 40%.



The first successful project was completed in late 2020. This was the Schlumberger Riboud Product Center in Clamart – just outside Paris – Schlumberger's largest technology centre in Europe. The plant was installed in a 3,000 m²-campus building frequented by at least 200 people on weekdays. To provide efficient heating and cooling in the four-storey building, a heat exchanger and a heat pump system were installed – in just half a year and without



Matthieu Simon, Celsius Energy CTO, points to SAUTER's modulo 6 automation station in the company's own plant.
© Celsius Energy



Space-saving – the footprint of the pyramid-shaped boreholes is minimised compared to the heat transferred.
© Celsius Energy

interrupting business activities. The entire surface installation takes up a mere 20 m², roughly the same as two car parking spaces. Celsius Energy's heating and cooling solution is managed via a digital platform. This dynamically integrates the subsurface, heat pump system and building, optimising operations in real time.

Energy innovation meets building automation innovation

Running the energy generation system and coupling it with the HVAC was challenging and called for an experienced partner. There were, however, many factors making SAUTER France the start-up's collaborator of choice: excellent project references, the impressive performance of modulo 6 and its consideration of building automation safety in compliance with the IEC 62443-3-3 standard.

In the Schlumberger Riboud Product Center, modulo 6 controls the heat pump of the geo-energy system and the hydronic installation for heating and cooling. Thorough planning by SAUTER meant that building equipment conversion could be kept to a minimum. Air-supported systems such as fan coil units – communicating with the building automation through LON and KNX protocols – were retained, for example. In addition to developing and installing the building automation system, SAUTER's remit also included training the technical staff.

Operation is optimised by means of the cloud. An automation system was therefore needed, allowing systems to exchange data over the internet. The interoperability necessary was achieved with a REST API interface via SAUTER Vision Center, itself communicating with Celsius Energy's digital platform. The final result was continuous transparency – for system performance and status, real-time energy consumption and CO₂ emissions no less.



Dubai CommerCity: e-commerce hub demanding cloud-based building automation



Dubai building projects are always known for setting records. This is no less the case with the extensive Dubai CommerCity project, which is considered the largest free trade zone for e-commerce in the Middle East, North Africa and South Asia. The project requires optimised building automation with a high degree of economy – and SAUTER Middle East delivered.

The Dubai CommerCity project is a real estate project near Dubai International Airport. The investment amounts to around one billion US dollars. It is the first free trade zone for e-commerce in the Middle East, North Africa and South Asia regions. Dubai CommerCity offers both established e-commerce partners and start-ups an optimal development environment for their businesses. This all-in-one e-commerce hub is also intended to attract additional foreign investments to Dubai.

Three clusters

Ground was broken in 2019 and the hub became operational in 2021. Dubai CommerCity, which spans across an area of more than 2.1 million sq. ft or 200,000 m², is divided into three clusters: a business cluster with a development area and a leasable area spread over 12 office buildings. The logistics cluster offering warehouses and fulfilment centres in sizes ranging between 200 m² and 20,000 m². Finally, the social cluster housing restaurants and

cafes, as well as leisure facilities, event and multi-purpose halls. The Free Zone is equipped with solar panels and the desert heat is defied by a district cooling system and a thermal air conditioning unit that support during peak and partial load operation. Most of the building services are located in a central utility cluster. Intelligent field devices ensure that, on the one hand, building comfort is guaranteed in the many different cluster rooms and areas and, on the other hand, the building technology functions effectively in an energy-saving manner.

IoT and cloud technology in building automation

For Dubai CommerCity occupants, the use of digital technologies such as cloud services or IoT is a matter of course. The proposal to use the modulo 6 system from SAUTER quickly met with approval from investors due to its high performance, integration capability, security, and ease of use. The fact that many functionalities can also be accessed and used on the move via an app, fits in with the business models and the needs of e-commerce companies. Finally, the modulo 6 system can be flexibly expanded, e.g. according to the construction progress of the project and designed in such a way that it is constantly updated along the life cycle of the building.

modulo 6 serves all three clusters, i.e. all main and auxiliary buildings and systems. They will be connected in stages as construction progresses. The modulo 6 automation stations monitor and control the HVAC and ventilation systems, pumps as well as the power supply. Other functions supplied by third parties are also integrated, for example lighting and alarms as well as parking and access control systems. In addition, special air-conditioning systems such as direct expansion air-conditioning units (DX Unit), which are necessary for the cooling of the server rooms, are integrated.

SAUTER Vision Center and SAUTER EMS are in place as building and energy management systems. The architecture of the building management system maps the structure of the building clusters. The individual clusters are each equipped with a BMS workstation that is connected to an Ethernet backbone via BACnet/IP.

Energy-optimised cooling supply

An energy-efficient control of the cooling supply is a particular challenge. The core of this is a large cooling supply system and a thermal energy store with 16,000 kW/RT¹⁾ per hour. The entire equipment for this system with highly efficient cooling machines,

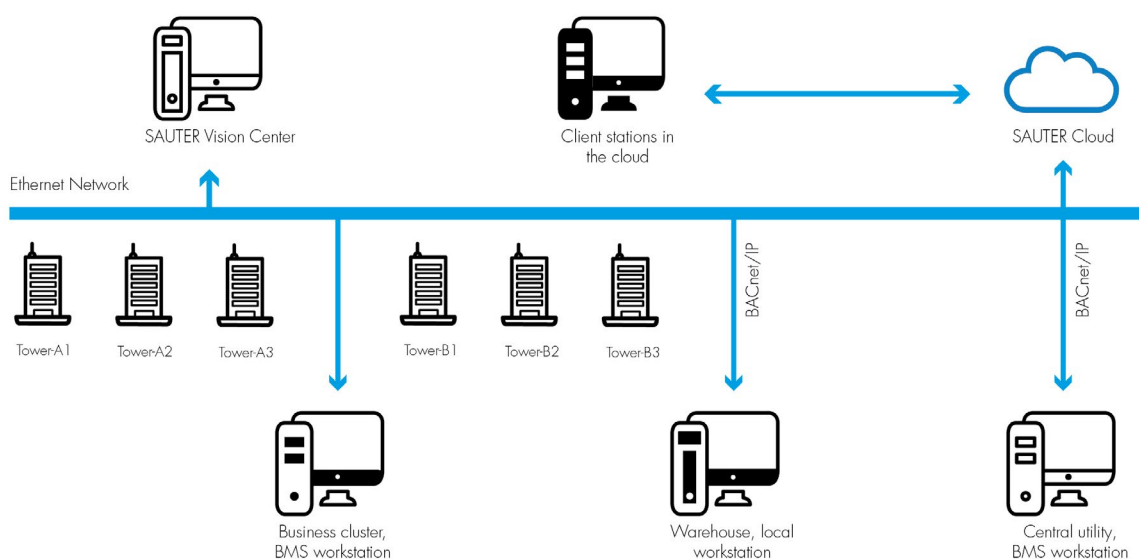
pumps and cooling towers is monitored and controlled via the modulo 6 automation stations. Here, the modulo 6 system and other SAUTER products not only ensure safe building operation, but also that the efficiency potential of the state-of-the-art functions are fully exploited, and optimum energy efficiency is achieved.

Comprehensive services

The first part of SAUTER Middle East's offering consisted of the delivery, installation, and commissioning of the building management system for the central supply system and three buildings. The work was successfully completed within six months of signing the contract. The main focal points of the overall order include: the delivery of the building control system, the building management system, the energy management system for all three clusters, the cooling building management system for the central utility cluster, the system optimisation of the cold-water system as well as extensive measures for energy optimisation including the maintenance of the systems over the next five years.

¹⁾ The efficiency of chilled water plants is measured in kilowatt (kW) per refrigeration ton (RT).

Comprehensive BMS Architecture





Techne S.p.A. highlight – projects with Enel in Milan

Italian subsidiary Techne has entered into a “Global Service Contract” with Enel. The office building in Milan will be technically refurbished and its consumption optimised. The quality and sustainability of the facility services will also be enhanced. The improvements will focus on the psychological well-being of the users. Together, the companies are developing concepts for energy optimisation in buildings.

According to the German statistics portal Statista, Italian energy group Enel is not only the largest energy supplier in Europe but, in fact, the largest in the world. Enel translates as “National Unit for Electricity” and herein lies a clue to its roots. The company was founded in 1962 with the merger of more than a thousand energy producers. Its business focuses on generating, distributing and supplying energy. Since then, decades of expansion have followed, along with innovations and commitments to sustainability. By 2030 the share of renewable energies is set to almost triple as a result of investments totalling over €160 billion.

The company, which operates in more than thirty countries, is embracing the megatrends of digitalisation, e-mobility, the circular economy and decarbonisation. More generally, digitalisation is seen as a key tool in making electricity more accessible. It should also transform the energy consumption of cities, homes, businesses and transport. One feature that Enel is committed to is Open Innovation. This largely entails the targeted involvement of external partners in its own innovation activities. The Enel X division was launched in 2017 as a catalyst for smart, innovative technologies and services.

Well-being with certification

Enel constantly sets itself ambitious new goals. As a partner supplier, Techne S.p.A. has helped Enel to certify its Milan headquarters, thus becoming the first building in Italy to comply with the WELL building standard. SAUTER Italia was also commissioned to assist in optimising the technical infrastructure of Enel’s headquarters. This enabled the parameters required for WELL certification to be captured and recorded.

The works contracted to Techne are remarkably comprehensive – and standardised. The “Global Service Contract” covers not only technical facility management, cleaning, sanitation and the management of green areas, but also fire protection, concierge services and surveillance. The scope of the service and responsibility for the results are laid out in the Italian standard UNI 10685/1998. This Global Service Contract is among the first of its kind to be developed in Italy.

Creating innovative solutions together

The business relationship with Techne extends beyond assignments at Enel’s corporate offices. Techne has teamed up with the Enel X division to develop concepts for the refurbishment and energy transformation of existing buildings. This aims to create more sustainable businesses and cities. One such case has been the University of Milano-Bicocca’s competition to increase the energy efficiency of its campus. A project proposal was jointly developed that included both the technical systems and IoT of the building as well as the digital services for its users.

Explained in brief

WELL^{*}

BUILDING
STANDARD™

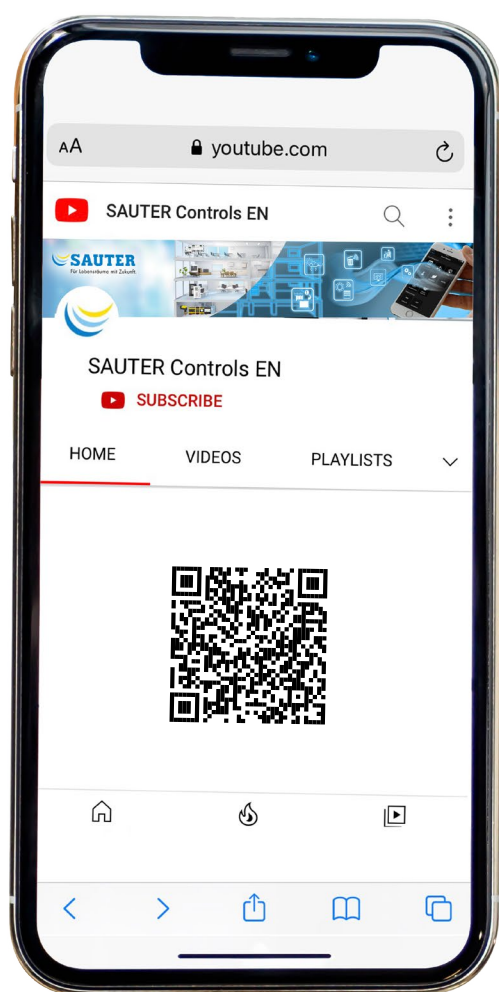
WELL is an evaluation system for buildings, organisations and communities. Compared to other protocols such as BREEAM or LEED – each with their own individual focus – WELL primarily centres on the comfort, health and well-being of a building's users. WELL Certification not only considers the design and quality of a building and its spaces. It also relates to the behaviour of users within and the management and operation of the building.

The link between well-being and the working environment is not a new concept. The publication of research in recent years, however, showing a connection between productivity and general comfort, has given the subject renewed impetus.

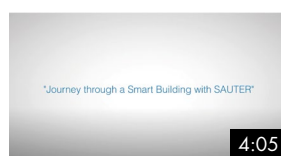
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Overview of SAUTER videos on our YouTube channel

We have compiled the highlights for you. Subscribe to our channel and don't miss anything new!



[Link to the playlist](#)

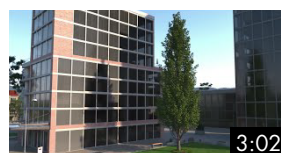


EN

SAUTER Smart Spaces

Intelligent building management means meeting the new user requirements for networking and comfort. The classic functions of room and building automation are supplemented with functions for the efficient management of space and the tracking of assets and / or people.

In this video we take you on a journey into the possibilities of digitalisation!



DE, FR, EN
Audio (spoken)

SAUTER Smart Shading – Automatic sunblinds with shadow correction

The aim of advanced sunshading is to maximise the use of daylight. Depending on the sun's position and the surrounding shading objects, the Smart Shading function automatically controls how the angle and position of the blinds are adjusted. Together with the room climate and lighting control, Smart Shading provides the user with ideal working conditions and energy efficiency.



DE, FR, EN
Audio (spoken)

Smart Actuator, 3 in 1: Valve actuator and controller with cloud integration for autonomous control

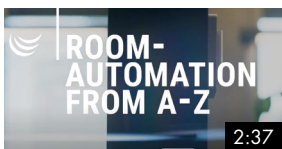
1. A large application library in the cloud and clearly defined interfaces (BACnet, Modbus, MQTT) enable a digital building.
2. Plug-in system solution for easy installation.
3. Easy commissioning with the mobile app.
4. 3-in-1: Valve actuator and controller with cloud integration for autonomous control of heating and air-conditioning.
5. Predictive maintenance for safe and reliable operation.



DE, FR, EN, IT
Audio (spoken)

SAUTER modulo 6

1. Performance: Modular structure with a high data point density and processing speed.
2. Integration: BACnet, M-Bus, Modbus – modulo 6 combines the heating, ventilation, air-conditioning and power supply systems in a stable, secure overall system.
3. Security: Integrated network separation, encrypted communication, integrated user administration.
4. Operation: Integrated moduWeb Unity web server, smartphone app for commissioning and maintenance, local priority operation with graphical colour display.
5. IoT and Cloud: Integration of IoTs with MQTT and Cloud Services for control, operation and engineering.
6. Investment protection: Backwards compatible with modulo 5.



DE, FR, EN

SAUTER room automation from A to Z

Modular system components enable optimum integration of all equipment systems and full flexibility. Simple concepts and coordinated products make for flawless fitting and rapid commissioning.



DE, FR, EN

SAUTER – Integrated room automation

This video will show you what integrated room automation means to us. We create customised concepts according to individual functional requirements. All the functions of a room can be included in one room controller, and all systems can be controlled using a single room operating unit. This is how SAUTER room automation equips buildings for higher energy efficiency classes.

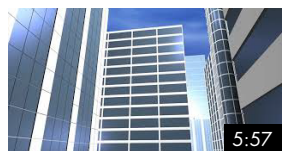


DE, FR, EN
Audio (spoken)

SAUTER ecoHeat

The new SAUTER ecoHeat Control strategy optimises the heating curve of central flow temperature control systems, based on outside temperatures, with mechanical thermostatic valves. ecoHeat reduces distribution losses and provides the exact heat energy that is actually required.

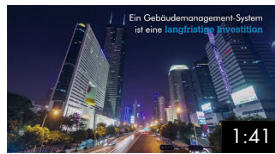
ecoHeat is self-learning and automatically determines the optimum flow temperature. You also benefit from energy savings of 15-25%.



DE, EN

SAUTER eValveco

The SAUTER eValveco system is used for real-time flow control and automatic hydronic balancing in the full or partial load ranges. It thus replaces a static balancing valve and a regulating or control valve or a ball valve.



DE, FR, EN
Audio (spoken):
EN and FR only

SAUTER Vision Center – Adaptable and future-proof

The trusted management and operating level enables plants to be operated and visualised – regardless of location or system. The universal building management system features many strengths, including the integration of different functions, web-based access, and high-level flexibility and scalability.



DE, FR, EN
Audio (spoken):
EN and FR only

SAUTER Vision Center – User-friendly operation and visualisation

In this video, you will learn more about the user-friendly operation and visualisation of SAUTER Vision Center (before version 7).



DE, FR, EN
Audio (spoken)

SAUTER Vision Center – Building management regardless of location or terminal device

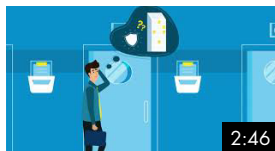
In this video you will learn more about the benefits of using SAUTER Vision Center via the internet.



DE, FR, EN

SAUTER Facility Services

SAUTER FM is facility management from the specialist for building management and energy efficiency. With its expertise and its holistic approach, SAUTER FM ensures value retention, security and sustainability for your properties. This short clip shows you what we mean by holistic.



DE, FR, EN
Audio (spoken)

Cyber security in building automation

Watch this video to learn about the functions for ensuring cyber security in SAUTER's new modulo 6 automation system, and how the Building Data Integrity Manager can protect the data integrity in your plants.

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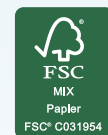
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