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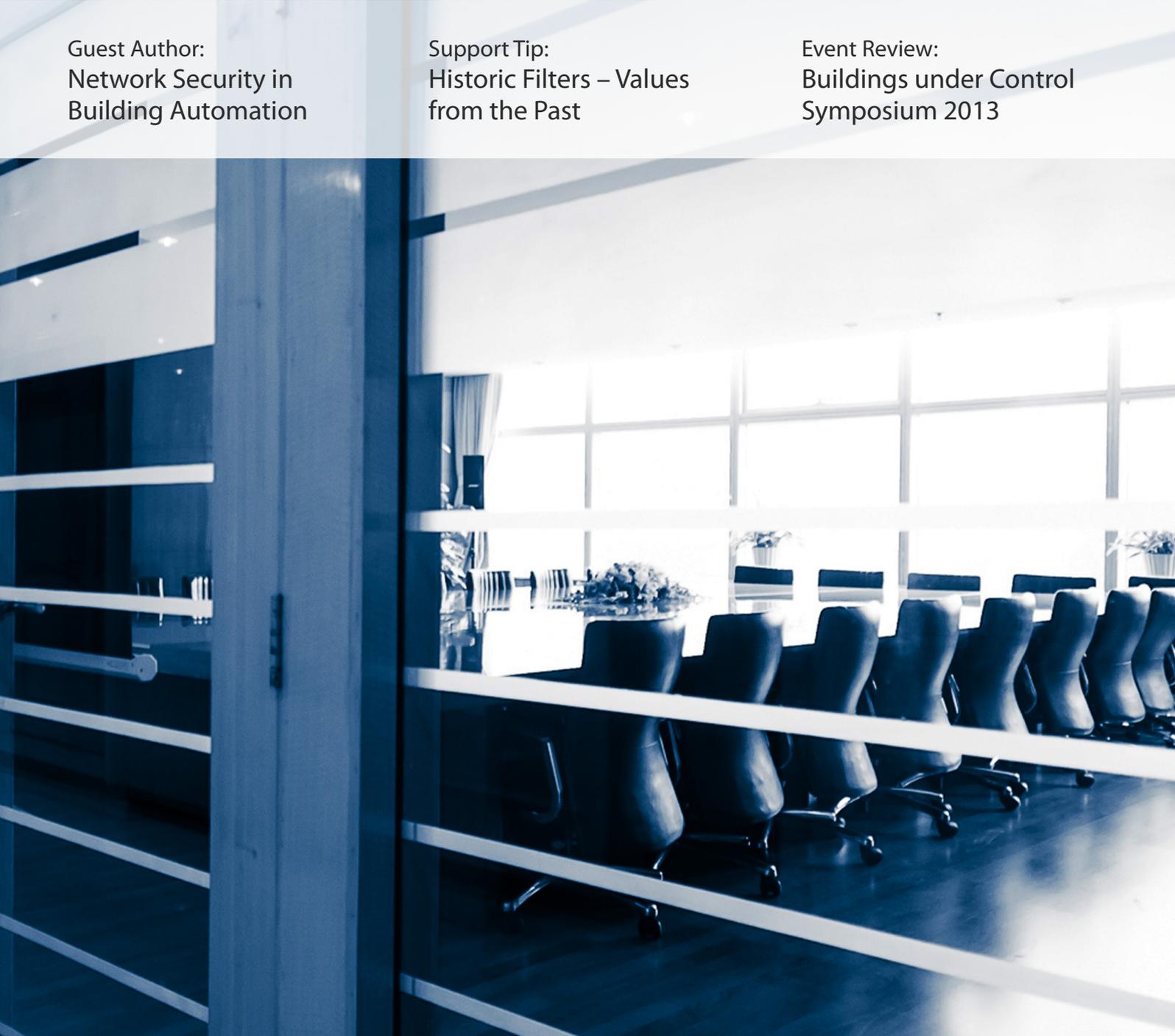
# LOYTEC Express

Magazine for Building Automation

Guest Author:  
Network Security in  
Building Automation

Support Tip:  
Historic Filters – Values  
from the Past

Event Review:  
Buildings under Control  
Symposium 2013



## Flexible Room Automation with L-ROC

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## Masthead

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## Cover Story: Flexible Room Automation with L-ROC



## Guest Author: Network Security in Building Automation



## Review: Buildings under Control Symposium 2013



# Growth despite Crisis

The media wants us to believe that we face the largest economic and financial crisis of the last 60 years. Politicians worldwide are concerned about crisis management, financial centers are insecure, the fight against unemployment is omnipresent – for me, the unemployment rate of young people is particularly troubling – and the pressure on the middle class is growing. One could start doubting the future.

A complete different picture is presented in market places all over the world. That is what I experienced while travelling to clients located in cities like New York, Guangzhou, Taipei, Tokyo, Paris, or Vienna. Here, one can't even find a sign of a crisis. The consumption level is continuously rising and crowded streets, shops, and venues are no exception. Certain demographic groups are excluded from the crisis.

This positive picture can be projected to the building automation scene. Regardless of where I have been talking to company representatives about “the business” in the last 12 months, I never heard any complaints. On the contrary, the majority has more work and orders than they can manage. Remarkable is the universal lack of qualified personnel with sufficient industry know-how.

Business impulses for the building automation industry originate from diverse areas and have different reasons. Our industry's driving forces are unlike those of the energy saving and sustainability industry. The business motivation of the building automation industry mainly differs because of its geographical location.

From my point of view, the world is divided into

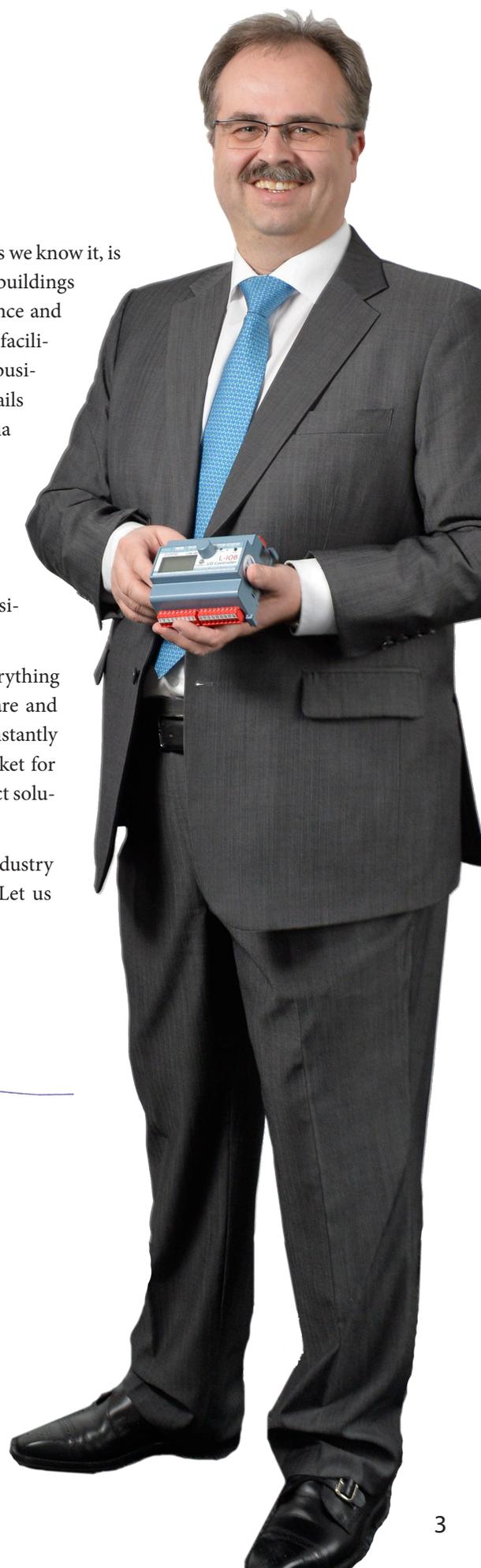
two parts. The Western World, as we know it, is already “built”. Of course, new buildings do emerge. However, maintenance and renewal of building technology facilities account for most of the business. A different situation prevails in emerging nations, with China leading the way. “This world” is just being built. The building boom that has been persistent for years, continues to be. That is why new buildings make up the main part of the business there.

Here comes the good news: Everything that was built, once requires care and maintenance. Due to the constantly growing installed base, the market for professional services and product solutions will be stable for decades.

The building automation industry prospers – no sign of a crisis! Let us hope it stays this way.



Hans-Jörg Schweinzer, CEO  
LOYTEC electronics GmbH



# Flexible Room Automation with L-ROC



Many contradicting requirements need to be fulfilled in building automation. Energy efficiency, flexibility, costs, user acceptance, as well as the architects' and operators' expectations are constraints which planners and integrators have to cope with, under high time and cost pressure.

Dipl.-Ing. Thomas Rauscher

## The L-ROC system

With the L-ROC system, LOYTEC offers a room automation solution that fulfills the complete set of requirements of a modern building. Approved methods, like the VDI guideline 3813, TCP/IP network technology and event driven programming techniques were advanced to a flexible room automation system that perfectly fits into each environment. The L-ROC system is comprised of two core components, the L-ROC device and L-STUDIO. L-ROC devices are powerful controllers which communicate with all popular building networks. L-STUDIO is the programming environment used for building distributed

and event driven applications and visualizations for the L-ROC devices.

## From device to system paradigm

L-Studio translates established automation concepts into the language of the 21st century. Programming is done in the graphical coding language IEC 61499 which offers numerous improvements, as it extends the known language IEC 61131 with a number of modern concepts:

**Communication:** With IEC 61149, entire systems are designed. The design of single controllers and their very time-intensive,

subsequent integration is no longer required. If two objects communicate in a 61499 application, communication modules are automatically added without requiring manual interaction. It does not matter if the object is instantiated on the same controller or if it is distributed in the network.

**Response time:** The cyclical processing of the program logic is replaced by an event driven system that reacts on time on sensor values, user inputs, or alarms without delay. The controllers' CPU load is remarkably reduced through the event control. Thus, several room axes can be efficiently operated by a single controller.

**Reuse:** 61499 programs are object-oriented. All elements of a building, be it floors or sun blinds, are directly represented as objects. Thereby, a type encapsulates the logic, the I/O and network connectivity, as well as the visualization. Each instance of this type automatically takes over the type's attributes. Hence, copy and paste mistakes are eliminated. If, for example, a new function is added to the lighting module, all instances automatically receive this new function. As the types can be encapsulated into one another, entire floors can be designed with a few mouse clicks. Commonly used types can be managed in libraries.

**Visualization:** As the visualization is already developed along

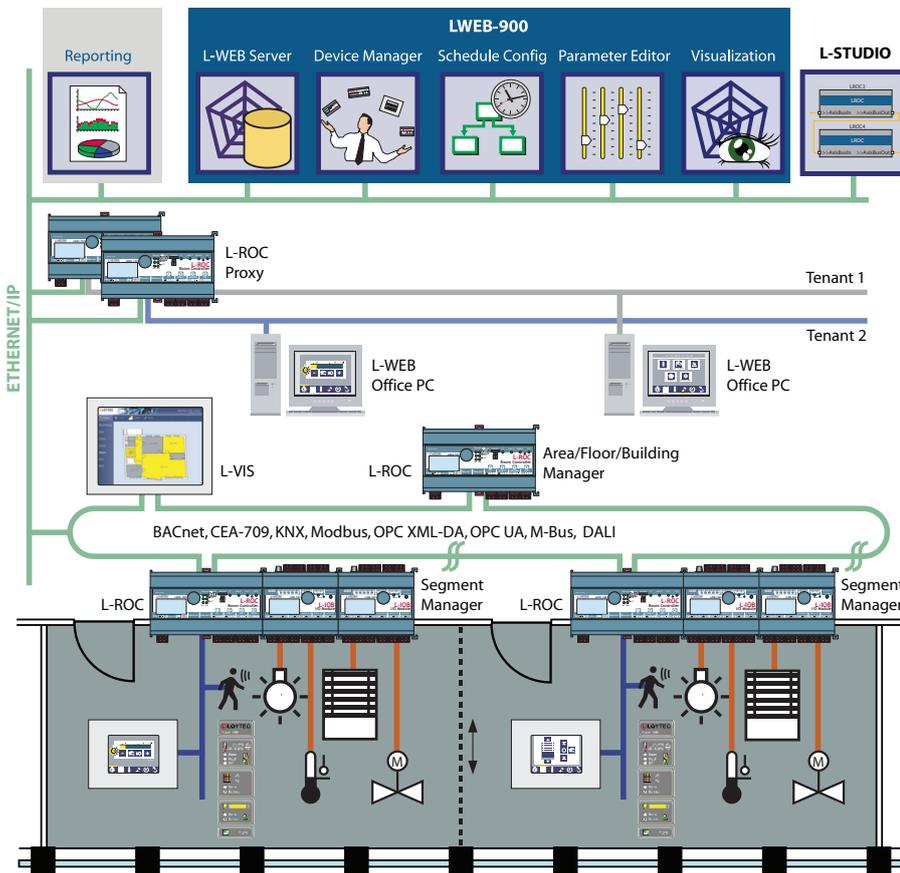
with the application, the subsequent, tedious integration of the visualization is no longer required. Room control can directly be accomplished on L-VIS devices and via LWEB-800/LWEB-802. All visualization projects are automatically created and uploaded to the controllers.

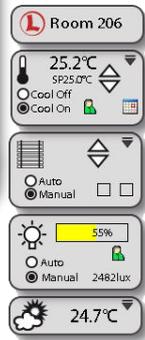
**One tool:** L-STUDIO is the solution regarding the proliferation of tools that are necessary for integration. This environment allows developing libraries and projects. Both logic and data point configuration, as well as visualization can be designed. All project phases, from development and testing all the way to commissioning and maintenance, are directly supported. Likewise, documentation and project administration are performed directly within the tool.

**One system for all applications**

The flexibility of the L-ROC hardware allows to freely choose sensors, actuators, as well as room control panels according to the project and user requirements. For that purpose, the open communication interfaces BACnet, KNX, CEA-709 (LON), OPC XML-DA, OPC UA, MODBUS, and M-BUS are available. Through L-IOB modules, also physical I/Os can be attached directly. New L-IOB models that support DALI and an EnOcean interface are planned for this year.

Furthermore, the connection of the L-ROC system to central





control systems is made possible easily. With BACnet, OPC XML-DA and OPC UA, all process parameters can be monitored and modified.

The possibilities of room control devices range from a simple hardware module connected to physical I/Os to a sophisticated L-VIS or a mobile LWEB-802 solution.

In designing the L-ROC system, the structural situation of the building can be taken into account entirely. The controllers can either be placed in the control cabinet or in the floor/ceiling boxes. The built-in Ethernet switches allow connecting the controllers in a ring topology. For that purpose, a standard Ethernet switch with Rapid Spanning Tree Protocol can be used. This reduces the cabling effort on one hand, on the other hand it ensures redundancy.

The connection of physical I/Os through L-IOB modules adjusts as well to the project requirements. Cabling is done centralized via LIOB-Connect, or decentralized via LIOB-FT or LIOB-IP.

Thanks to the event-driven orientation and the powerful LROC-100 hardware, the features heating/cooling, ventilation, lighting, sunblind control, and security for up to 16 room segments can be automated by means of one controller. For 2014, an integrated LROC-400 combining an L-ROC controller with I/Os for two room segments in a compact housing is planned.

## From segments to buildings

The L-ROC system is based on an IEC 61499 library that was developed according to the VDI 3813 guidelines. The library contains modules for heating/cooling, ventilation, lighting, sunblind control, and security. Besides the basic features, also convenience features such as shading, optimum start, and constant light control are implemented. Functions for energy optimization, like terminal load, are also already available.

Naturally, the entire IEC 61499 environment is available for enthusiasts. Using graphical programming or Structured Text, it is possible to implement custom features, thus avoiding the necessity of dedicated controllers.

The core element of an L-ROC project is the room segment which defines the available room functions. The first planning step is to identify the required segment types. Typically, there is one segment for an office room that needs all automation features. Additionally, aisle segments where all lighting functions are necessary, as well as special segments for particular features, like those needed in a conference room, are often required.

Visualizations for these segments can be built and displayed via L-VIS devices or LWEB-802 on mobile devices. These visualizations can either be created out of the symbols of single modules, using Drag & Drop, or designed entirely according to customer specifications.



**Dipl.-Ing. Thomas Rauscher**  
LOYTEC electronics GmbH

Thomas Rauscher is product manager of the L-ROC product family. Product development, development tools, as well as IT management are part of his tasks. Furthermore, IP networks, LINUX environments and distributed systems fall within his area of competence. After his studies of computer technology at the Vienna University of Technology he started his employment at LOYTEC in 2000. Beside his development activities he also supervises a research cooperation with the University of Applied Sciences, Technikum Wien.

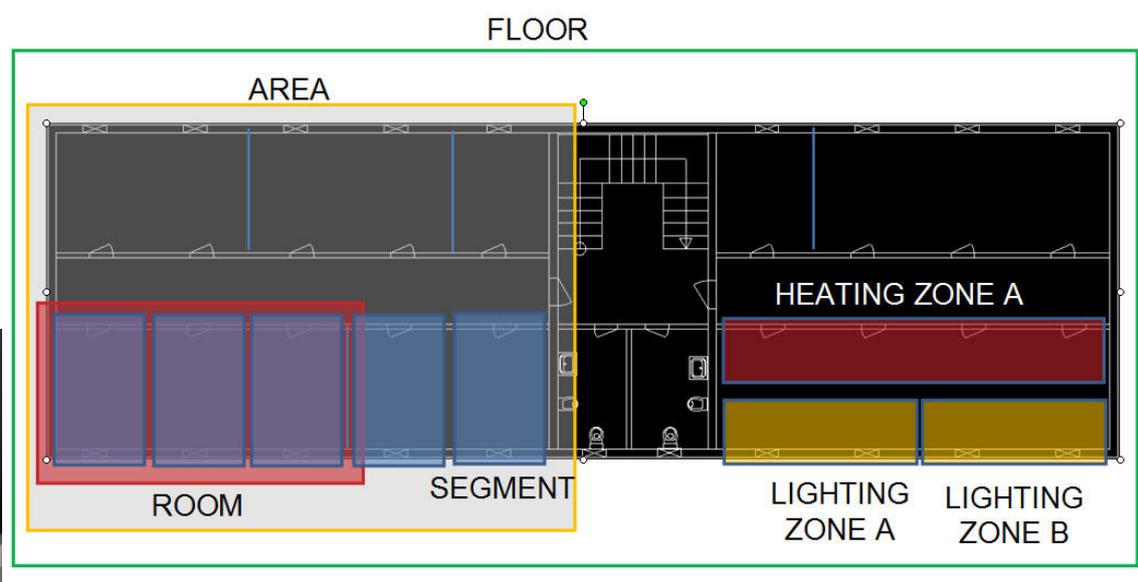
L-ROC allows combining several segments into a room. This assignment can be readily parameterized at runtime, without changing the application. Thereby, all involved segments act as an entity that can be controlled by any room panel. Within a room, separate zones can be defined, for example different lighting zones. Up to 16 segments are handled by one LROC-100. Also the network and I/O connections are defined for this device type.

Based on the project's room segments, larger project parts can be defined. This way it is possible to group wings of a building or building parts in areas. A floor, in turn, contains several areas. In the end, the building is comprised of numerous floors. Here, the advantage of type based programming can be clearly seen. Similar building parts have to be created only once, the instantiation is done automatically.

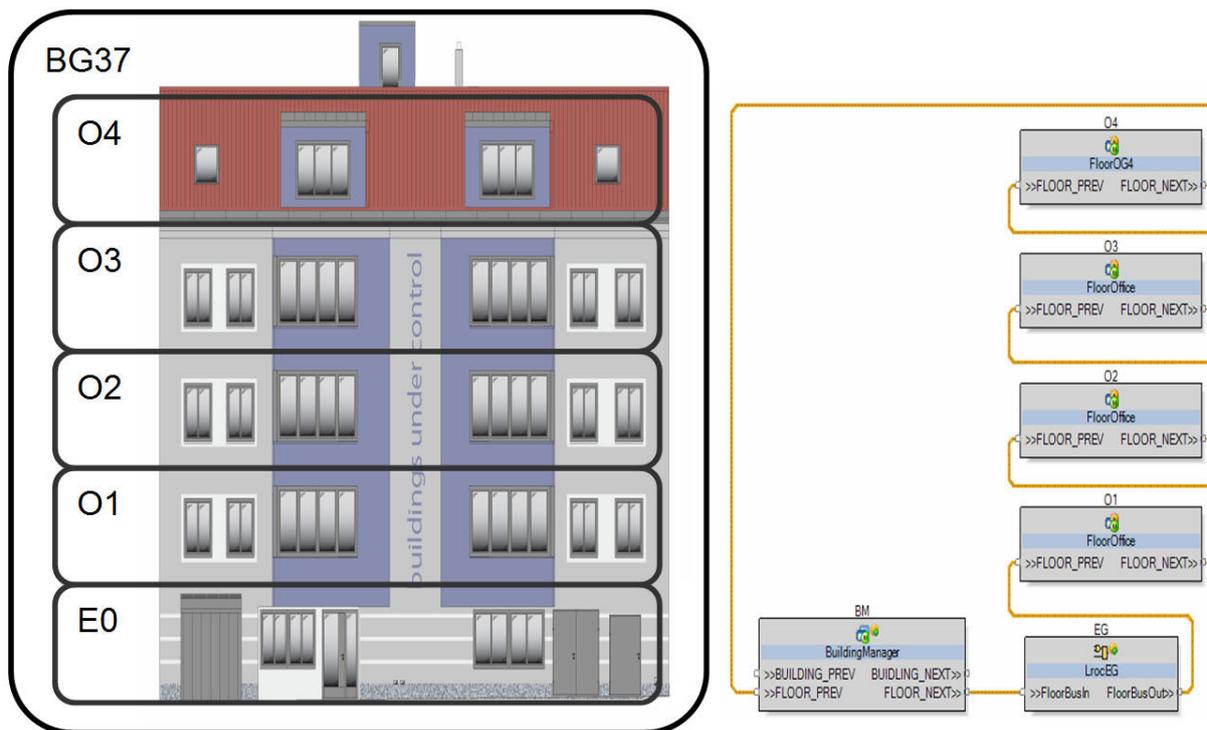
It is often the case that building parts appear to be similar, but provide small differences, like an additional luminary or a sunblind for a bay window. These features can be implemented additionally on an L-ROC instance, without having to drop the benefits of the type concept.

As soon as the application is fully developed, all necessary L-ROC devices can be compiled by one mouse click. After specifying the IP addresses, the 61499 application can be downloaded in a matter of minutes.

In the course of the implementation it is possible to monitor every logic block of the system in real time. Defective sensor values or parameters can be located and fixed easily without additional tools.



# Cover Story



## L-ROC in the LOYTEC headquarters

The L-ROC system could already prove its capabilities in the new LOYTEC headquarters, where it was necessary to automate heating/cooling, sunblinds, and lighting.

Sensors and actuators are connected via L-IOB devices. Per floor, the cabling comes together in a centralized control cabinet. LIOB-IP devices are used for remote sensors. The lighting is controlled by L-DALI gateways that also deliver brightness values and occupancy information of the DALI sensors to the L-ROC system.

Room control is done via LVIS-XX100 devices and mobile devices, using LWEB-802. In aisles and larger rooms, LVIS-XX115 devices are installed for customized visualizations.

The floor types were identified in the first stage of project planning. The ground-floor, with its production hall, differs considerably from the four standard upper floors. As both wings of the standard floors are symmetrically arranged, only one area type was defined that could be instantiated eight times (4 floors, 2 wings). Although the room arrangement differs between floors, the same area type could be used. For that purpose, only the allocation of the room numbers had to be changed. An additional type was created for the stair case that could be used five times altogether.

If the L-ROC project needs to be updated, the deploy function of L-STUDIO is used to install the new application within minutes. The project file itself can be stored in the L-ROC devices, whereby a project backup and documentation are available on site at any time.

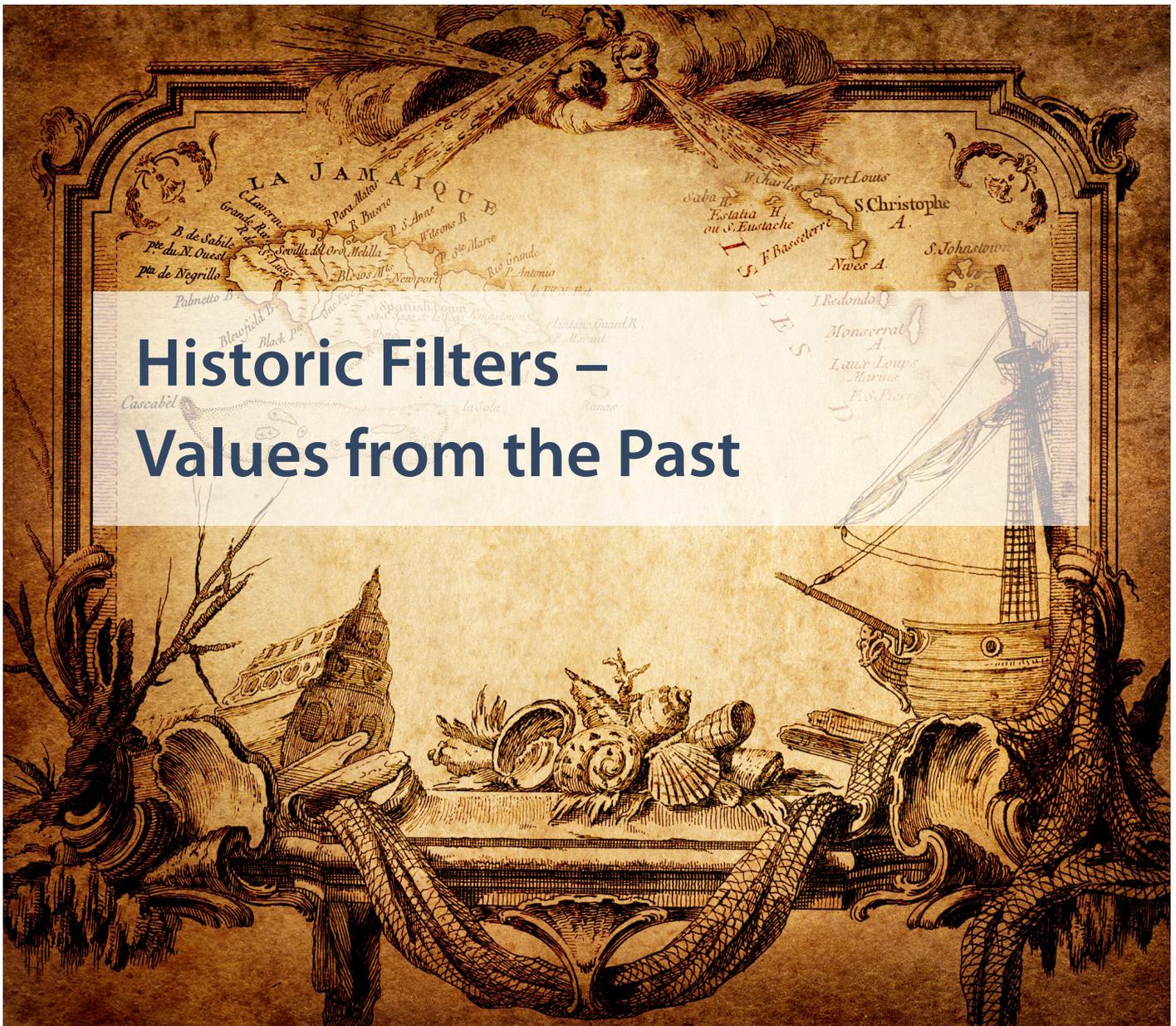
The parameterization and maintenance of the system is carried out by an LWEB-900 project. For that purpose, parameter views for heating/cooling, lighting, and sunblinds have been created. Firmware updates and backups can be initiated easily.

The embedded project planning and documentation abilities of L-STUDIO have successfully proven their worth in course of the project development. Changes were stored in a Subversion repository, whereby all involved developers had permanent access to the current project status and each change could be documented.

Because of the efficiency features of the L-ROC system, LOYTEC was able to acquire an eu.bac system certification of the highest class A+, reaching 87 out of 100 possible points, for the new building at Blumengasse 37 (see page 25).

## Conclusion

With the L-ROC system, a new era of flexible room automation has begun. Using most modern technologies, a building can be modelled as an entire system and be depicted directly in L-STUDIO. Complex network integration, as well as the tedious creation of separate visualizations are no longer required. As with the L-INX family of devices, all common building networks, both on the field and central control level can be used.



## Historic Filters – Values from the Past

The statistical analysis of sensor data and energy consumption constitutes crucial added value of a modern building automation system. An easily understandable presentation of these values allows the operator to optimize processes and provides direct evidence for the efficiency of the system.

Dipl.-Ing. Norbert Reiter

In this kind of comparisons, not only current measurements are important. It is also necessary to resort to past data for comparative purposes or further calculations.

For this objective, the concept of “historic filters” was added to the data point management of LOYTEC products.

### What is a historic filter?

In short, historic filters deliver the value of a data point at a certain predefined point in the past. Hence, not only the current value of a data point can be used, also a value from the past can be determined and, if applicable, be used for further calculations.

Historic data is available as a “Property Relation” of the original data point. It can be used directly, like a data point, for the display via OPC, or linked to a different data point in order to further process the value in the targeted technology (e.g. CEA-709 network variable or BACnet object).

The concept of historic filters can be applied to data points of all kind of technologies. Therefore, each freely chosen data point can serve as the origin. Such a historic filter data point can be configured for the following temporal settings:

- Value all x minutes, whereby x stands for 1, 2, 5, 10 or 30 minutes. The alignment of the interval is at full hours.

# Support Tip

- Value at the top of the hour.
- Daily value at a certain time (hour/minute/second).
- Weekly value at a certain time on a specific weekday.
- Monthly value at a certain time on a specific day of the month.
- Annual value at a certain time on a specific day.

Through appropriate setup it is also possible to reference values of past measurements. For example, the counter value at midnight of that day, the preceding day and another days in the past can be stored.

Several historic filter data points can be collected in a historic filter record and applied to different data points. Apart from compiling filter conditions, no additional configuration steps are required. The firmware of the devices automati-

cally stores the necessary historic data in the needed intervals. Naturally, the data is stored in flash memory, for preserving historic values also in case of a device reset or power outage.

A simple example for clarification:

The current outside temperature is available in an analog input object of a BACnet system. Now, the temperature of the last seven days at midday shall be determined, for example, for display in an L-WEB Visualization as a bar chart.

For that purpose, it is necessary to set up a new historic filter. We assign the name

Historic filters deliver the value of a data point at a certain predefined point in the past.

“Values at noon during the last 7 days” to the filter. In order to generate the values, a new record in the dialog box is created and is chosen to be of type “Value at hh:mm:ss of the day”. 12:00:00h is entered as the time.

Subsequently, the record can be duplicated and the value in the column “samples ago” incremented by one (see Figure 1). Thereby, one receives the values of the current day, as well as those of the last six days at 12 o'clock midday each. In the end, meaningful names for the single filter data points need to be assigned (such as

midday today, midday 1 day ago, midday 2 days ago ...) and the filter needs to be applied to the temperature data point.

This set of filter data points can conveniently be stored as a historic filter template. Thereby, the setup can easily be recycled and applied to further data points. If such a filter template is altered later on – for example for adding another week – the changes automatically affect all used instances of the template.

The property relations that result from the filter are assigned as sub data points to the original data point and can be referenced through expanding the data point hierarchy (Figure 2).

## Processing of counter values

The filter function can also be used for analyzing counter values of energy meters. The values increase continuously in correlation to the consumed energy. In order to get the consumption in a specific time interval from the stored values, the difference of the reading at the beginning and at the end of the interval has to be calculated.

In this scenario it is not only possible to sample a value at a given time, but also to automatically reference a different filter data point and calculate the value difference. The resulting data point already includes the consumption for an interval. Not only a different filter data point, but



**Dipl.-Ing. Norbert Reiter**  
LOYTEC electronics GmbH

Norbert Reiter heads the support and training unit at LOYTEC. In this capacity he has established and developed LOYTEC's comprehensive training programs. He is an instructor of many training sessions himself, domestic and abroad. After studying computer technology at University of Technology Vienna, Norbert joined LOYTEC 12 years ago. He had significant contributions to the development of the ORION stack, several software tools and LOYTEC network infrastructure products.

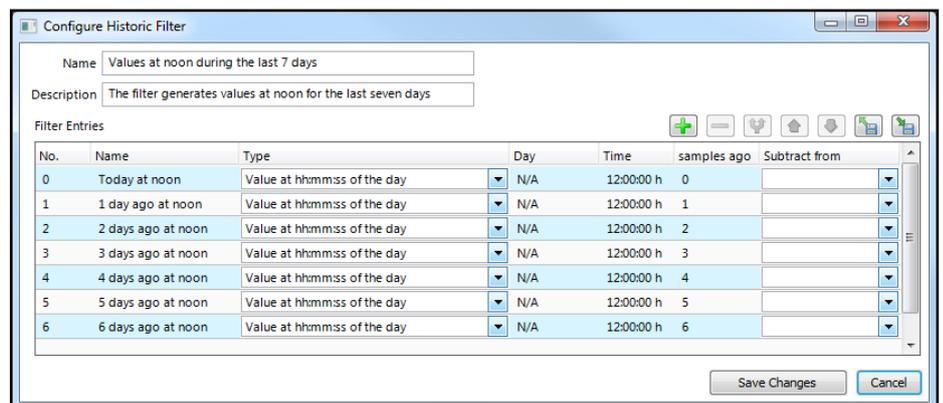


Fig. 1: Configuration of a historic filter entry

LINX-150 ▶ BACnet Port ▶ Datapoints							
Datapoint Name	No.	OPC	Param	PLC in	PLC out	Direction	
Outdoor_Temperature	1	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Out	
... historicFilter (Today at noon)	1.1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (1 day ago at noon)	1.2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (2 days ago at no...	1.3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (3 days ago at no...	1.4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (4 days ago at no...	1.5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (5 days ago at no...	1.6	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	
... historicFilter (6 days ago at no...	1.7	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	In	

Fig. 2: Historic Filter Data Points

also “current” can be chosen as the difference value, whereby the difference between the current value and the point in time set in the filter can be calculated. Thus, the amount of energy that has been consumed up to that time can be acquired.

**These settings are demonstrated by an example:**

A Modbus counter delivers the counter value of the consumed energy in kWh. The values for the consumed energy of the previous day, previous week, and previous month need to be established as data points. Additional filter data points shall contain the currently used energy of this day, this week, and this month.

For this purpose, filter data points for the value at 0 o'clock each current day, every Monday, and every first day of the month

are created. After that, these data points need to be duplicated and in each case, the value of the time period before needs to be set. The preceding value serves as the value for the “Subtract from” selection. Figure 3 shows this configuration.

Last but not least, values for 0 o'clock that day, Monday of that week, as well as the first day of the month need to be created. The setting “current” for “Subtract from” delivers the currently used energy that day, that week, and that month.

This historic filter configuration can simply be applied to different meter data points in the configuration. If the OPC option at the filter data points is activated, the data points can be accessed in Visualizations such as LWEB-800/802.

The resulting filter data points can be recorded in a trend log for storing the cal-

culated consumption values over a longer period of time. It must only be ensured that the trend data point is recorded after the calculation is completed. This can be best achieved by choosing Change of Value (COV) as the trend mode, since the value always changes after the consumption value has been determined.

Through the processing of filter data and trend data and with the help of LWEB-800/802 or L-VIS Visualization, a simple but yet powerful reporting functionality is available. The reports can be generated without the need for complex logic programming.

[www.loytec.com/support](http://www.loytec.com/support)

No.	Name	Type	Day	Time	samples ago	Subtract from
0	Today	Value at hh:mm:ss of the day	N/A	00:00:00 h	0	Today
1	Yesterday	Value at hh:mm:ss of the day	N/A	00:00:00 h	1	Today
2	This month	Value at hh:mm:ss on day of month	1	00:00:00 h	0	This month
3	Last month	Value at hh:mm:ss on day of month	1	00:00:00 h	1	This month
4	This year	Value at hh:mm:ss on DD/MM of the year	01/01	00:00:00 h	0	This year
5	Last year	Value at hh:mm:ss on DD/MM of the year	01/01	00:00:00 h	1	current
6	Current usage today	Value at hh:mm:ss of the day	N/A	00:00:00 h	0	current
7	Current usage this mon...	Value at hh:mm:ss on day of month	1	00:00:00 h	0	current
8	Current usate this year	Value at hh:mm:ss on DD/MM of the year	01/01	00:00:00 h	0	current

Fig. 3: Historic Filter to display energy consumption

# Network Security in Building Automation

Prof. Norbert Pohlmann



The Internet, with its diverse and innovative possibilities, has a continuously growing relevance in our modern society. Through advanced software solutions and complex correlations between protocols, services, and infrastructures, vulnerabilities of Internet technologies are becoming more diverse and much larger than ever before. Attacks on high value assets within IT systems and their availability are executed more distributed, sophisticated, and professional. There is also a noticeable industrialization of cybercrime, resulting in a professionalized sustainability which shouldn't be underestimated and which has never existed before. Some particularly striking security problems, arising

from the critical assessment of the current IT security situation, could be solved by a paradigm shift.

## **First security problem: „Too many software vulnerabilities“**

Software represents an evolving proportion of value added in all sectors. It is used in PCs, notebooks, smartphones, large datacenters, but also increasingly in cars, industrial plants, houses, and similar application areas. A major security problem is the amount of software vulnerabilities. The software quality of operating systems and applications is no longer sufficient for today's threat landscape. Currently, the error density averages 0.3,

referring to the number of bugs per 1,000 lines of code in a high quality software. Since common operating systems consist of about 10 million lines of code, there are about 3,000 errors prevailing. Parts of them represent potential targets for successful attacks. Over the next ten years, a considerable improvement of software quality in major operating systems and applications is not expected. Even if the quality of the software improves, attacks on the minimized vulnerabilities will be executed more professional.

## **Second security problem: „Insufficient protection against malware“**

Malware is the generic term for „Mali-

cious software“ such as viruses, worms, and Trojan horses. Attackers, like criminal organizations, spies, and terrorists, exploit software vulnerabilities to install malware on IT devices. Injection of malware on IT devices happens almost unnoticed, through email attachments or so called „drive-by“ downloads from unsafe web sites. The Institute for Internet Security currently assumes that every twentieth IT device in Germany is infected by unwanted malware, controlled by botnets. Hence, attackers are able to retrieve information via key-loggers and Trojans, to distribute spam and execute DDoS attacks (distributed denial-of-service attacks), and to encrypt data and demand ransom for their decryption. Critical observations show that today’s detection rate of anti-malware products is only between 75% and 95%. The detection rate of direct attacks on IT systems is only averaging 27%.

Advanced persistent threat (APT) is the concept, which has established itself for intelligent malware like Stuxnet and Flame, internationally. It is usually considered as a targeted attack with complex technologies and tactics, as well as background information on victim’s IT systems and its surroundings. In this case, the attacker puts great effort (advanced) in successfully accessing a victim’s IT system and staying undetected over a long period of time (persistent). His purpose is to spy out as much information as possible or

to cause damage. Currently, there are no suitable defense technologies against this kind of sophisticated attacks with intelligent malware.

**Third security problem: „No international solutions for identification and authentication“**

In 2014, we still use passwords for authentication in the Internet. The resulting problems are well known: the usage of bad passwords, or a single well-considered password, which is used for multiple applications. Via email, passwords are transmitted as plain text throughout the internet. Each year, the use of unsecure authentication technologies causes huge damage.

**Fourth security problem: „Unsafe Web sites on the Internet“**

The most frequent form of distributing malware is through unsafe company websites on the internet. Hereby, the major problem is that websites, resulting from companies and government agencies, place their focus on user guides, color schemes and performance, but not on IT security. This is nothing other than a logistics company using trucks without brakes in road traffic.

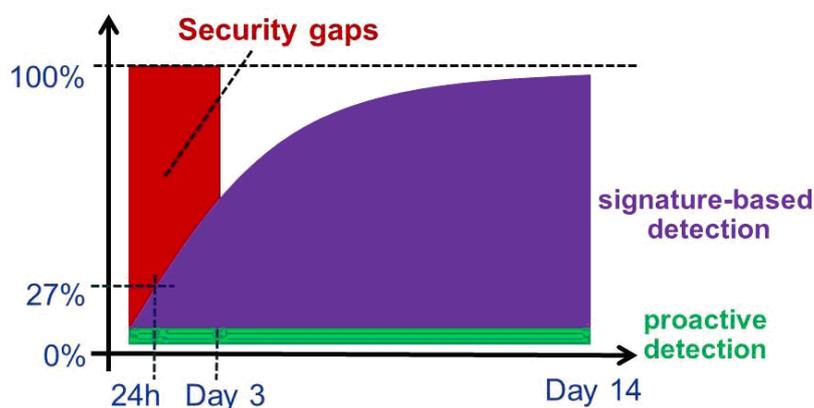
**Fifth security problem: „New threats through the use of mobile devices“**

The advantages of mobile devices, such as smartphones and tablets are impres-

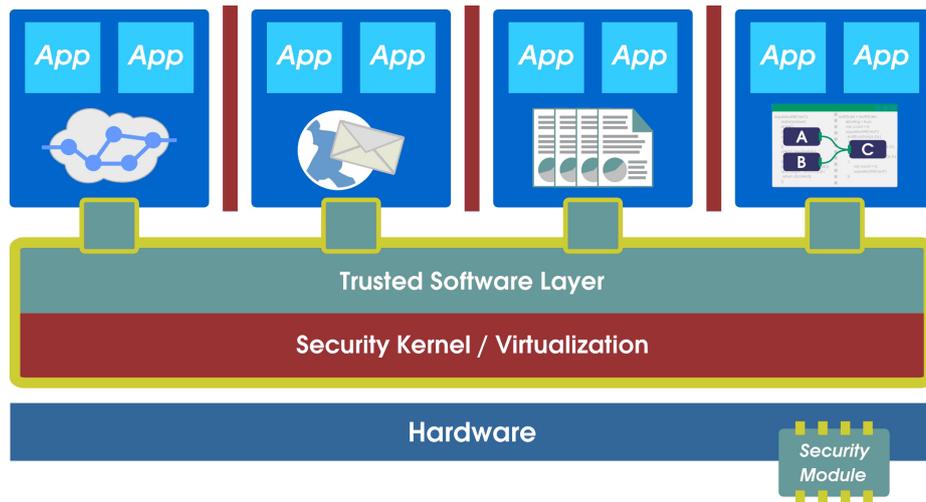
sive. Through various communication interfaces like WLAN, UMTS, and LTE, the Internet with its services is always and everywhere available. Touchscreens allow a quick and easy use of the devices. Mobile devices are multi-functional: mobile phone, computer, navigation system, music player, and access to the company’s network - all in one device. With „local based service“, useful and innovative services are added. But with mobile devices, new vectors of attack occur, which are causing further risks. Changing and unsafe environments, like airports, train stations, and cafés, increase the probability of accidental loss and targeted theft. The potential of creating motion profiles and the ease of public inspection are not to be underestimated.



**Prof. Norbert Pohlmann**  
Westfälische Hochschule, Gelsenkirchen



Norbert Pohlmann is a professor of informatics for distributed systems and information security in the field of information technology as well as managing director of the Institute for Internet Security at the Westphalia University of Applied Sciences Gelsenkirchen. Furthermore, since April 1997 he has been chairman of the IT Security Association TeleTrust. Numerous professional articles and books, lectures, as well as seminars about information security are testament of his professional expertise and his commitment regarding IT security.



**Sixth security problem: „Insufficient Internet literacy of its users“**

Internet users need to know the dangers of the Internet, otherwise they harm themselves and others, through infections of malware. Based on a BITKOM survey in 2012, 30% of all internet users have no personal firewall and 28% no anti-malware solution installed on their devices. Hence, no adequate protection is given.

Further current challenges are the result of parameter changes. The Internet goes beyond all borders and cultures. There are different opinions about what is right and what is wrong. The uncertainties of different legal systems must be taken into account as well. There are still too many countries, where no criminal prosecution is possible. Additionally, we are currently experiencing a radical development and alteration within the IT and the Internet, through social networks like Facebook, Twitter, or even through cloud computing and critical infrastructures. The in general very unsafe and poorly implemented technology, combined with an insufficient internet literacy of its users, indicates the need for a paradigm shift, for a less risky use of internet technologies and services in the future.

**Paradigm shift - proactive versus reactive security solutions**

IT attacks are currently tracked with reac-

tive IT security systems, such as anti-malware and intrusion detection systems. When an IT security system detects an attack by a corresponding attack signature or anomaly, it tries to protect the system as quickly as possible to reduce damage. This means, that we are always one step behind. The growing diversity and complexity of our IT devices and infrastructures lead to the need of considerably more reliable, robust, and effective IT security concepts. We need to refrain from exclusively using reactive IT security systems and move toward modern and proactive systems to prevent the execution of intelligent malware, one of the biggest problems at present. Proactive IT security systems operate with a small core of security and virtualization. They are able to provide measurable software, and offer sustainable and appropriate IT security as well as the possibility of separating applications and its data, through a strong isolation.

**Paradigm shift - responsibility versus indifference**

Currently, the major technology manufacturers and service providers such as Google, Apple, Facebook, and Microsoft decide about what we as users need.

However, they do not assume responsibility for their solutions. But this is exactly what we need, a producer responsibility such as in the automotive industry!

If we buy a car today, the manufacturer will take full responsibility. Although the automobile manufacturers are working together with several hundreds of suppliers, there is still only one contact person for us to approach. The manufacturers check all functionalities of their cars on a regular basis and if they detect a failure, big recalls are started, to resolve failures before actual problems occur. This has built great confidence in the manufacturers. But who takes over the responsibility for IT systems? In the end, no one. If the IT vendors start to take over responsibility, today’s IT security problems will be considerably lower. As a result, software and hardware will be better aligned and errors will be detected and fixed more easily.

**Paradigm shift - collaboration versus isolation**

The generally unsafe and poorly implemented technology, as well as the insufficient internet literacy of its users, causes damages through attacks. If a company is faced with an attack, it usually tries to solve the problem single-handed and isolated. Thus, the details of successful executed attacks, the attackers procedures, the extent of the damage, and the effectiveness of countermeasures can’t be used by society. Through a well-structured and trustworthy cooperation between companies and authorities, an increased overall

IT security could be achieved. Consequentially, the current security situation would be better assessable, critical vulnerabilities could be jointly identified, resistance could be increased, the defense costs reduced and the access to qualified security professionals could be optimized.

### IT security in building automation

In Germany, there is the political will toward a long-term exit from nuclear energy and the use of more renewable energy. For this purpose, smart grids that have to be connected to the internet are necessary. Hence, all known internet attacks are likewise applicable to intelligent electricity networks. In order to ensure an adequate security, the German BSI designed a smart metering gateway to ensure high security against attacks. The smart metering gateway interconnects building automation with the intelligent power grid and provides services like data integrity, authentication, encryption, as well as the guarantee of data protection. Furthermore, it creates a high level of security, which is absolutely necessary, from the perspective of cyber warfare.

### Conclusion

If we want to strategically utilize the positive possibilities of modern IT and the Internet, we need to quickly adopt to new pathways and to initiate the described paradigm shifts for an improved IT security and trustworthiness. The paradigm shifts will be expensive, and require coordination. However, a modern society should recognize and quickly implement these steps.



# LOYTEC Competence Partner Intelligent System Integration from Switzerland – PentaControl AG

PentaControl AG is a solution provider and integrator of integral building and room automation. The innovative Suisse company, headquartered in Beringen near Schaffhausen, relies on modern technologies. Its cooperative partnership with LOYTEC turned out to be a real success story.

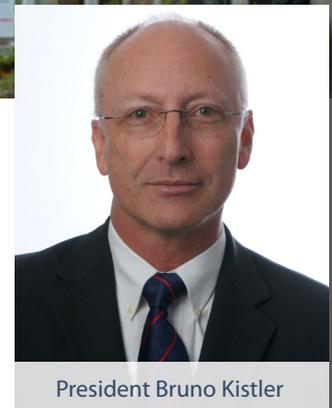
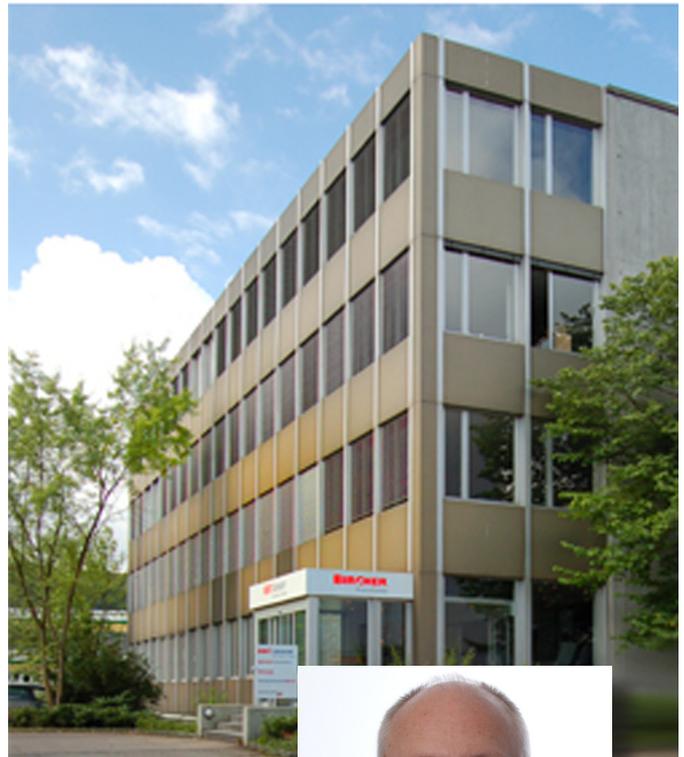
The company, with its headquarters in Beringen, Schaffhausen in Switzerland has been active in building automation for more than 20 years. It emerged from the department of building technology of Bircher AG, a medium-sized company in the field of switching devices and automation solutions. Initially, the company developed and distributed alarm systems and lighting controllers. The foundation of the present business activities was laid with the formation of Bircher Gebäudetechnik AG, a subsidiary firm of Bircher AG, in 1996. Within 4 years, the innovative company completely separated itself from the mother company. In order to declare autonomy in the market, the name was changed to “PentaControl AG – Integrale Gebäudetechnik”.

PentaControl AG accomplishes integral room and building control from the concept through implementation and commissioning all the way to maintenance. The company takes full responsibility for the optimized interaction of different parts of the system, whereby the team of specialists’ main concern is the provision of energy efficiency, comfort, and safety through high quality solutions. Typical fields of application are office and

industrial buildings, schools, hospitals, and occasionally, villas of higher standard. Since its formation, PentaControl AG has been able to continuously expand its position in the Suisse market, due to its innovative and qualitative solutions. Meanwhile, the impressive list of references includes a great number of renowned projects. A growing number of building contractors and planners relies on PentaControl AG’s experience and appreciates the performance of the small and flexible company.

Since the beginning, PentaControl AG applies LonWorks™ as the basic technology. Thereby, it advanced to a trendsetter in integral building automation. Initially, LonWorks™ was open to a few specialists only, but the extreme pow-

erful technology has established itself as a renowned standard over time. The availability of components in every area of measurement and control technology is accordingly large. In implementing its



President Bruno Kistler

## History PentaControl AG

- Till 1996: Building technology department of Bircher AG in Beringen, Switzerland
- 1996: Formation of Bircher Gebäudetechnik AG
- 2000: Complete autonomy of Bircher AG
- 2002: Rebranding to PentaControl AG

solutions, PentaControl AG follows its philosophy of utilizing products that are available and approved on the market. Under the trademark PENTALON®, the company develops a range of both new and complementary products. The integration of modern automation solutions is not restricted to LonWorks™ systems. On the contrary, it is necessary to integrate established systems like Dali lighting control or wireless EnOcean buttons and sensors into an overall system and to ensure data exchange, for example over BACnet. This is where PentaControl AG possesses broad knowledge.

The company's core competence lies in the intelligent interconnection of features within buildings and rooms to an entire system. Dependent on the usage and the ambient conditions, lighting, shading, sunblinds, ventilation and climate are controlled. Thereby, high comfort at a maximum of energy efficiency is the main ambition.

With an active involvement in expert committees like the building network initiative GNI, or LonMark Switzerland, Penta Control AG also speaks out publicly regarding modern control in buildings. The company promotes the funding of open standards and intelligent features in building automation, as means of increasing energy efficiency.

[www.pentacontrol.com](http://www.pentacontrol.com)

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# Maintenance Facility “Herdern” of the Swiss Federal Railways: Make way for latest technologies



Swiss Federal Railways (SBB AG) extended the maintenance facility Herdern at the Herdern-Areal in Zurich-Altstetten to one of the most modern maintenance facilities for service and repair work. PentaControl AG was entrusted by the general contractor Allreal AG with the complete building automation, whereby it applied latest technologies.

Entire compositions of long-distance trains are maintained and serviced within the plant in multi-shift operations. Basically, the maintenance facility Herdern is designated for three types of work processes: service, repair, and revision. This work is performed according to its requirements on three tracks with different track lengths. The project is impressive, as the huge hall with a

unique industrial architecture and a length of 425 m allows to accommodate two train compositions or entire trains of up to 410 m in length at once. Furthermore, the extension of the plant encompasses a rebuild of the existing office building.

Correspondingly extensive are the requirements that are imposed on the automation. The focus is on high energy efficiency, a maximum of safety, as well as a maximum of availability of the plant. Through an optimized operation, the tough environmental laws need to be adhered to at any time. Additionally, the user appreciates a clear and simple handling of the entire facility.

The integral solution includes the following features:

- Control of the heating system
- Control of the ventilation system
- Control of the entire lighting
- Control of smoke and heat extraction



Maintenance facility Herdern

- Control of the acoustic system
- Detection and forwarding of alarms

Different factors had to be considered when designing the system. The focus was laid on the tremendous physical dimensions of the facility, respectively the widespread arrangement of sensors and actuators. Another main criteria was the consistent integration of different functional subsystems.

Because of the plant's dimensions, PentaControl AG decided on an architecture of decentralized intelligence. Data points are centrally gathered by a fieldbus and processed. Thus, the installation expense was minimized. Simultaneously, the chosen system achieved a high plant availability. The outage of single components, if any, only exercises a marginal influence on the combined functionality of the facility.

Hereby, the concept of LOYTEC, with its distributed automation servers and interfaces to all common subsystems with complete data consistency, proved to be ideal, independent of the communication technology that was used (CEA-709, BACnet, DALI, M-Bus, Modbus, KNX ...).

The core of the facility is the LWEB-900 Building Management System for configuration, parameterization, and visualization. Through its management and operating features, it represents the user interface. Its client-server architecture allows to access ope-

rating data of the entire network in real-time. The sophisticated central control system is applied from conception, through implementation, to maintenance. As a central component, the LWEB-900 server stores system and operating parameters, historic data, access rights, and device configurations (backup) in corresponding SQL data bases.

Plant illustrations, operating conditions, and current values are available at over fifteen control panels, spread across the entire hall. Here, the LOYTEC L-VIS Touch Panels with 12" displays are deployed. The control concept was developed with emphasis on simplicity and clarity.

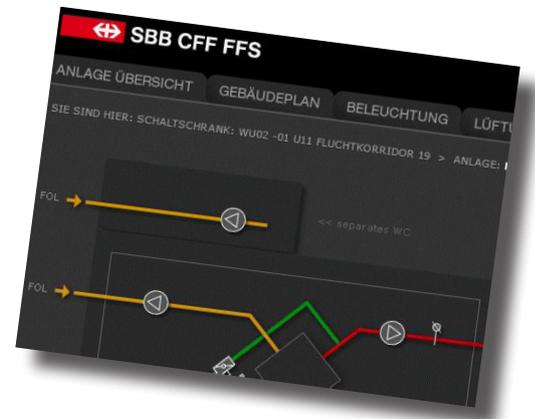
The applied automation concept excels as a highly flexible solution. Enlargements and adjustments are possible at any time. That, as well as the use of standards provide a high investment protection for the customer throughout the whole lifetime of the building.



Commissioning through a technician



Lighting control: Touch Panel LOYTEC L-VIS 12.1"



Right fig.: Ventilation visualized by LWEB-900

## SBB AG maintenance facility Herdern

- Length of the building: 425 m
- Decentralized controllers
- Number of physical data points: 1200
- DALI lighting control: 3700 luminaires
- Decentralized sensors and actuators with LonWorks®
- Handling via touch panels at over fifteen control stations
- Project duration for PentaControl AG: 15 months

# PRODUCT NEWS



## Historic Filters for a Simple Visualization of Parameters

The determination of parameters and consumption values from historic data is now accomplished with data points, as fast and simple as it has ever been. The clue hereby is the new historic filter function, which is supported by all LOYTEC controllers.

Who has ever been faced with the task of determining daily, monthly, or yearly consumptions based on meter data points couldn't avoid the setup of complex mathematic objects or calculations in the logic program. We are pleased to tell you, that these times of difficulties have come to an end, as our products' new function that allows the generation of historic filters, remarkably facilitates these tasks for you!

The new historic filter defines certain points in time, on which a data point value will be saved. For example, the function allows to save the value "on the first month at midnight" or "daily at 12 am". Unlike Trend Logs, one can access these values by means of data points which allow to visualize the values such as in bar charts.

	VL [°]	RL [°]	D [°]	Vol [m³/h]	Power [W]	Woche [kWh]	vorige Woche	Monat [kWh]	voriges Monat	Jahr [kWh]	Gesamt [MWh]
FBH	27	26	0	0.336	100	709.0	974.0	3616.0	5341.0	8957.0	85.6
Radiatoren	35	32	2	0.176	500	58.0	84.0	258.0	233.0	491.0	1.1
Rampe	17	16	1	0.000	0	0.0	0.0	215.0	595.0	810.0	3.5
Lüftung	38	30	8	0.234	2000	137.0	208.0	683.0	991.0	1674.0	5.2
Boiler	56	55	0	0.106	0	50.0	64.0	197.0	300.0	497.0	1.7
Pool	17	17	0	0.000	0	0.0	0.0	0.0	0.0	0.0	1.4

In order to determine consumptions in a simple way, it is also possible to generate filter requirements with a differential calculus. Hence, a filter data point can display the difference between the current value and the last filter value. The filter data points are also capable of storing values of the former past. For instance, the beginning of last week compared to the latest week's start.

Filter definitions are finally being equipped with meaningful names and stored as a template. Now they can be used for all available data points on every device, may it be network variables, BACnet objects, or internal registers. In the end,

such instances of historic filters are available as property data points.

	P1 [W]	P2 [W]	P3 [W]	Ptot [W]	Energie [kWh]	Woche [kWh]	Monat [kWh]	Jahr [kWh]
DG	60	30	60	150	1410.1	18.4	89.1	241.8
OG2	50	10	20	80	863.0	8.9	47.2	148.9
OG1	20	20	230	270	2695.8	20.6	87.4	223.0
EG	30	40	220	290	3282.4	44.2	223.5	555.5
KG	370	330	80	780	15326.0	89.3	381.9	955.1
PV	0	0	0	0	4448.7	35.6	106.1	202.4
MAIN	530	430	620	1580	20257.2	154.4	742.1	1953.2



# Create Energy Reports with LWEB-900

The LWEB-900 Building Management System accompanies you from installation and configuration of LOYTEC devices (L-INX Automation Servers, L-IOB I/O Modules and Controllers with IP connectivity, L-ROC Room Controllers, L-GATE Gateways, and L-VIS Touch Panels), all the way to daily operation of the facilities. Starting with version 1.3.0, LWEB-900 is able to create reports which can be used, for example, to document the energy consumption in a building. The generation of a report can be triggered in one of the following ways:

- Periodically: Reports can be generated daily, weekly, monthly, or yearly.
- Event: The change of a data point value (e.g. alarm condition) can trigger a report.

- Manually: A report can be triggered manually by the user.

Reports can be generated in PDF, Excel, or Word format. Furthermore, they can be automatically distributed via e-mail.

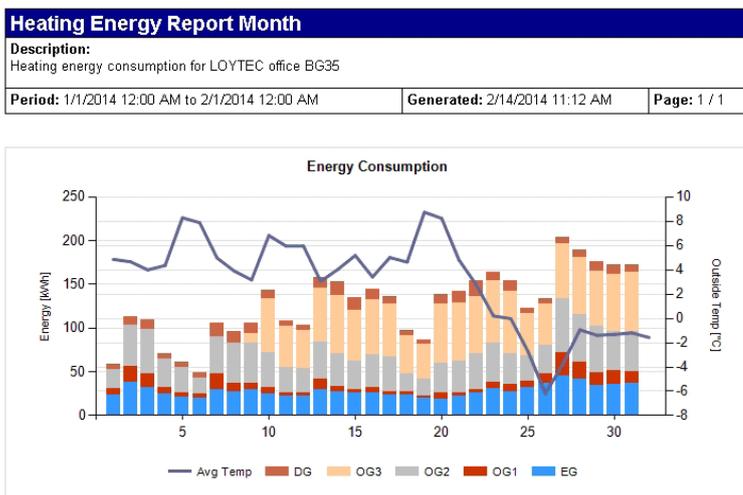
## LOYTEC Devices Compliant with BACnet BTL-Standard

All BACnet-compatible L-IOB I/O Modules and Controllers have been officially certified to be compliant with the BACnet Building Controller (B-BC) BTL-Standard. Furthermore, the L-INX Automation Servers as well as all L-GATE Gateways have been recertified as B-BC. The BACnet router LIP-ME201 is BTL certified as BACnet Application Specific Controller (B-ASC). For all shipped products, LOYTEC offers a free firmware update.

A certification implies the conformity of the software or the device with the BACnet-Standard of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) in all five interoperable areas: data exchange, alarm and event management, scheduling, trending, as well as device and network management.

Overview of LOYTEC BTL-certified products:

LINX-150/151, LINX-200/201, LINX-210/211, LINX-220/221, LGATE-900, LGATE-950, LIP-ME201, LIOB-BIP I/O Module, LIOB-BIP I/O Controllers.

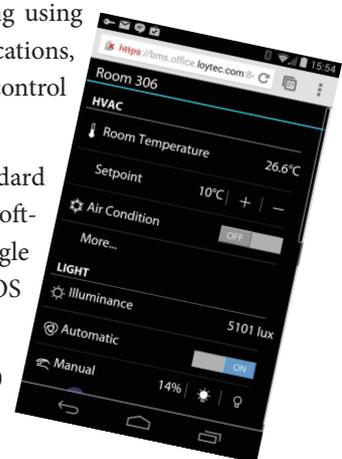


## LWEB-802: Managing Buildings in a Web Browser

LWEB-802 allows to monitor and operate a building using mobile devices. It can be used for a variety of applications, for example, to visualize an air handling unit or to control space temperature and lighting in a room.

Dynamic LWEB-802 pages can be shown in a standard web browser without the need to install additional software or browser plugins. Supported browsers are Google Chrome (Android), Firefox, Internet Explorer, and iOS web browser (iPod, iPhone, and iPad).

LWEB-802 is an integrated part of the LWEB-900 Building Management System. It can also be used as a stand-alone visualization for L-INX, L-ROC, L-GATE, L-VIS, and L-IOB I/O Controllers. The LWEB-802 stand-alone version is free of charge.



# Buildings under Control Symposium 2013



At the Buildings under control Symposium that took place at Tech Gate Vienna in October 2013, already for the fourth time, building automation's who-is-who came together. Besides technical lectures and discussions, networking and socializing was particularly emphasized.

The symposium was opened at LOYTEC's headquarters in October, 14 with an open house tour. In the course of that event, our new production area was proudly introduced to our international guests.

At Tech Gate Vienna, a diverse two-day program wrapped in an eventful agenda followed. We were able to welcome a number of European guest speakers and also several LOYTEC employees, who had the privilege of talking in front of a top-class audience. Furthermore, our two managing directors, Hans-Jörg Schweinzer und Dietmar Loy, insisted on having the pleasure at the speaker's desk. Total Building Control and L-INX: From physical I/O to Web services have been their lectures' central themes. Every now and then, a cup of coffee seduced to gossiping with like-minded people. Likewise, an extensive lunch break as well as a gala dinner with an entertainment program was on the agenda.

Conclusively, we can look back at an informative symposium with inspiring discussions, interesting speeches, and unique personalities. We are proud to call ourselves this industry's get-together's host, and are already looking forward to the next symposium in 2015!

See for yourself how great this event was by browsing through the best memories of the Buildings under Control Symposium 2013!



## LOYTEC Open House Tour



# Event Review



[www.loytec.com/review](http://www.loytec.com/review)

# Event Review





**System**  
 eu.bac european building automation controls association

**ENERGY Performance**

**Building Name**

System points (Range 0 ... 100) **87**

Version 22 -2014

# LOYTEC's Extension Building is Certified by eu.bac

In summer 2013, the LOYTEC headquarters was extended by a new building complex that now serves as a new home e.g. for production (L-Express has already addressed this subject in detail in October last year). In the extension, the functions of heating/cooling, sunblind control, and lighting, have been fully automated by the L-ROC system that is specially designed for room automation (see cover story page 3). Thanks to the efficiency of the L-ROC system, LOYTEC currently received an eu.bac Certification Mark of the highest class A+ with 87 out of 100 points for the new building at Blumengasse 37 in Vienna.

The eu.bac system audit was introduced by eu.bac, the European Building Automation Controls Association. The association developed the certificate following different EU guidelines and national laws regarding energy savings and the energy performance of buildings, which demand the proof of energy efficiency. These requirements, rising energy costs, as well as the fact that energy costs will be a critical decision criteria in terms of property rentals in the future, encourage building owners and tenants to reduce energy consumption.

The eu.bac Certification Mark and Energy Label assures users the conformity to products and systems, defined in the European guidelines and norms. Additionally, the registered eu.bac Cert Mark symbolizes energy efficiency and quality and is furthermore the European quality label for products in the field of building automation.

A number of information and data had to be transmitted in the course of the evaluation. All rooms together with their control features, the logic connections across rooms, as well as the energy flows were depicted in the system testing tool provided by eu.bac. According to this information, the energy efficiency of the building extension was classified, and finally awarded with the highest class A+.



# AHR Expo 2014, New York – A Perfect Storm inside and out



The AHR Expo is the largest HVAC (heating, ventilation, air conditioning and cooling) show in North America. Over 60,000 people converged in New York for the AHR Expo 2014, despite the extreme weather conditions that hit the city hard during the event.

The attendance was brisk, along with the weather outside. The cold and stormy weather persuaded the visitors to stay indoors and to examine more thoroughly what the vendors had to offer. LOYTEC emphasized IP based solutions and products in the course of the fair and introduced attendees to the benefits of utilizing IP, down to the smallest level of controllers in a building.

Hereby, the LOYTEC presenters observed a notable difference; the customers are now eschewing the long time use of older field bus technologies and start to embrace the idea of control systems that are entirely IP based. An attendee of the show remarked: “Although it seems that 70% of the offering at the Expo is still serial (field bus), this type of control is outdated. It’s time for something that better fits modern world requirements.” LOYTEC, with its IP System, offers the solution.“

Furthermore, the LWEB-900 Building Management System, as well as LWEB-802 that allows to monitor and operate a building using mobile devices were on display. Head of development Andreas Döderlein was there to demonstrate the features of the product, whereby he couldn’t avoid the inevitable question he faced throughout his New York experience; “Do you know that you look like Kevin Bacon?” Besides that, LWEB-900, the full featured Building Management System, was the star of the show.

Interest was also shown in the new, unitary dual port Ethernet devices. Now, IP based systems offer, similar to field bus, the added benefit of leveraging IP technology for redundant looped communication structures.

Altogether, the Expo has been a great and successful event for LOYTEC and we are therefore already looking forward to the next AHR expo, to be held 2015 in Chicago, IL, USA.

## Total Building Integrations, Inc.



Total Building Integrations, Inc., short TBI, offers total building integrations that consist of only one system, with multiple platforms, seamless Silo migration, and one ultimate idea at the top. The LOYTEC Integrator carries the best brands on the market and designs and engineers a system tailored for each facility. TBI was founded in Clearwater, Florida, in 2012. Its core group of employees has been working together for over 16 years. The president Rick Joyner has 32 years of overall experience in the field, including his time as a member of the LonMark Board of Directors.

Mr. Joyner’s control designs have won many awards including the LonWorld Multi-Vendor Award in 2000, for installations in the Osceola School District in Central Florida. He also served as an

# KISSCO – Keep it Simple Stupid Company



President Richard McClay

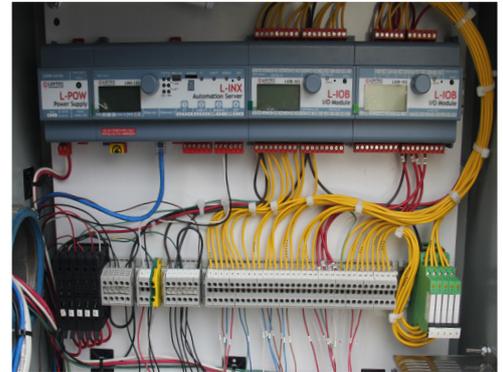
KISSCO Control Systems is a C10 (electrical contractor license of the State of California) service provider of electrical systems, fabrication, maintenance, installation and inspection services and is located in San Leandro, California. Its name originates from KISS – the acronym for “Keep it simple, stupid” – a design principle noted by U.S. Navy in 1960.

The president Richard McClay has years of military and industry experience. He used the GI bill (a law that provided a range of benefits for military veterans) to get an

electronics education at a night school, where he studied hard besides his working days. Because of this background he states:” I worked hard, so I can play hard!” Mr. McClay has a pilot’s license and enjoys street and adventure motorcycling with friends and family. Furthermore, he is best known for his hat with the cat – as you can see on the picture – and his passion for “Tomokazu Japanese Cuisine“ that he willingly shares with LOYTEC visitors.

As a UL 508 – the Standard for Safety of Industrial Equipment – listed panel shop, KISSCO has done a lot of work for the Caterpillar dealer Petersen Power regarding mobile cooling equipment. When KISSCO was introduced to LOYTEC, it started to use L-IP routers in order to solve CEA-709 routing problems. Now, KISSCO is using the L-VIS display for the mobile chiller plants along with a L-INX and L-IOB I/O devices. The feedback is very positive as everybody loves the L-IOBs because of their convenient handling that the staff immediately understands. Lately, KISSCO has finished a controls upgrade at the Van-

denberg Air Force Base – a United States Air Force Base – with L-INX and L-IOB



I/O that received an equally positive feedback.

What’s next for KISSCO? The company’s next project is the installation of a LOYTEC BACnet/IP system, including wireless networking, for a Firehouse in San Francisco. Independent web based projects are already created for each area of the building, so upon installation, a flexible and comfortable environment will be available.

[www.kisscocontrols.com](http://www.kisscocontrols.com)

integration consultant for Army Corps of Engineers, National Gallery of Art (DC), and Florida International Museum. The designs were also used for major airlines all around the world and are still maintained in over 200 gates and in ground support equipment by TBI.

Currently, TBI designs are installed in 8 countries worldwide and can be found, for example, in local hospitals and in many school buildings in Osceola, Pinellas and Polk counties of Florida. Most recently, TBI has implemented LOYTEC’s LWEB-900 in the Osceola School District, together with L-INX Automation Servers, monitoring data of all 48 schools that belong to the district.

The next project for TBI and LOYTEC will be another installation of IP based LOYTEC controllers for a VAV (variable air volume) system in a medical building.

[www.totalbuildingintegrations.com](http://www.totalbuildingintegrations.com)



# L-TRAIN: Knowledge is Power

Skilled and competent business partners are important. That is why trainings have always been an integral part of LOYTEC's business philosophy. These trainings are regularly held by the head of support, Norbert Reiter, and take place either in Vienna at LOYTEC's headquarters or – just recently – also in the US. Both German and English trainings are hereby offered alternately.

### Everything new in 2014

LOYTEC welcomes the year 2014, besides some New Year's resolutions, with certain changes and announces four of them right at the start. The first innovation concerns the new training room. A modern setting with new devices assist our participants in learning and mastering technical specifications.

Furthermore, LOYTEC schedules permanent trainings that take place in the USA. These trainings are held at LOYTEC Americas, LOYTEC's subsidiary firm, in Wisconsin, Pewaukee. The exact training dates can be taken from the training schedule, listed on page 31.

In addition to that, the training documents experienced a facelift. In their new design and conception, the documents shall ensure a more competent and consistent training procedure.

LOYTEC's latest product innovation, the LWEB-900 Management System, completes the set of renewals. This revolutionary



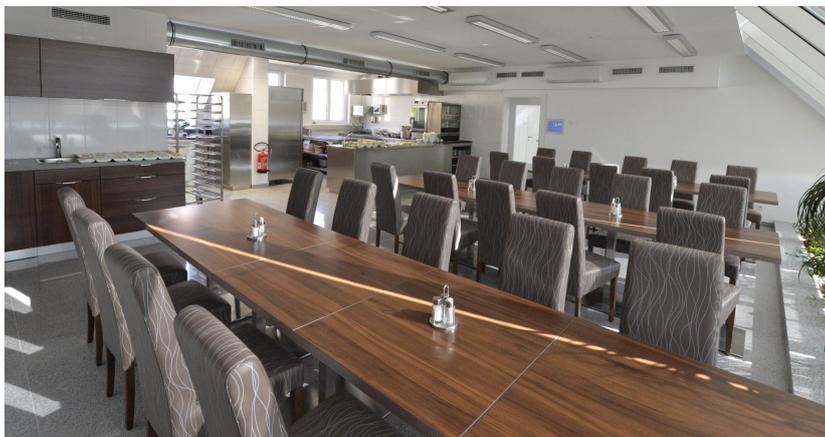
system will be initially introduced in the course of the trainings. Get more information on LWEB-900 in our product news corner on page 21.



### L-INOX Training in Vienna

The main focus of the last training that took place in Vienna, January 20-24, was programming L-INOX Controllers. The English course language was testament to the international participants. According to the script, the first three days covered the usage of LOYTEC's function library, whereas the final phase addressed the LWEB-900 building Management System. The participation of the technicians was based on their companies' future projects regarding the utilization of LOYTEC components.

# Full employees are happy employees!



Since November 2013, LOYTEC employees in Vienna were enjoying a particular pleasure. A kitchen, along with an adjoining dining room moved into the upper floor of the new building complex.

But what is a kitchen without a cook? With

Eugen Feichtinger, soon a subtle chef was found. From the beginning, Eugen was responsible for the good of the entire team. His experience in gastronomy is shown in fancy creations. He affectionately combines different ingredients and exotic spices. A true taste adventure!

Not only meat lovers get their money's worth as also a vegetarian menu is offered optionally. So he grants a coherent menu, consisting of soup, main dish, and dessert, daily. Satisfied faces, enjoy your meal!



## LOYTEC is official partner of the research funding program "Josef Ressel Zentrum"

"Josef Ressel centers offer universities of applied sciences the unique opportunity of conducting research in cooperation with regional companies, lasting for several years. The companies gain from the scientific university's competence. The universities, in turn, benefit from the companies' practical know-how", Commerce Secretary, Reinhold Mitterlehner, explains the program and its added value.

One of these centers with research

focus on the verification of embedded computing systems was opened at "FH Technikum Wien" at October 1, 2013. The research team managed by FH-Prof. DI Dr. Martin Horauer set its objective on detecting solutions and approaches for the elimination of errors in these specific computing systems.

Embedded computing systems can be deployed in various different areas including LOYTEC's domain of build-

ing automation. Nowadays, possible errors that only appear rarely are so self-evidently integrated in everyday life that they are mostly not or at least not early enough recognized.

We believe that this research is worth a participation! Therefore, LOYTEC joined the research project as one out of five corporate partners in order to benefit from potential research solutions and insights for the clients' sake.



# Daryl Clasen, LOYTEC-Sales: “I wouldn’t work for LOYTEC if I didn’t believe in them!”

As a perfect victim of circumstance, the avid motorcyclist Daryl describes his start at LOYTEC over five years ago. Everything started with his visit at LOYTEC’s headquarters, where the know-how and expertise of the technology start-up entirely persuaded him. The rest is history.

Daryl’s CV deserves serious attention: 25 years of experience in mechanical and metal fabrication, whereby 10 of them have been a job as a system integrator. In the past he enjoyed an education with degree for HVACR systems (heating, ventilation, air conditioning and refrigeration). Further education as well as plenty

on-the-job trainings followed. Kick-off for his technical career has been his work on pneumatic and electro-mechanical systems, back in the days where things such as DDC (direct-digital-control) still have been at their infancy. That cries for expertise!

Since his start at LOYTEC, Daryl’s area of responsibility has been in sales. To deliver high quality solutions for his partners and customers is one of his ultimate goals and that’s what he is assigned to. LOYTEC’s product spectrum is continuously growing and with that the need for quality and profound solutions that hold water comes along. But not only has his theoretical knowledge made him an ace, his practical experience provides him with crucial advantages. In the course of his career, Daryl has already seen and experienced a lot at first hand. To get one’s hands dirty is not unfamiliar to him. That’s why he exactly knows whereof he speaks. The smart engineer is accustomed to all the challenges that need to be tackled, all pitfalls that need to be

fought off. That’s especially why his credibility is unquestioned.

To be stereotyped as a “sales guy” is the worst for the American, since he can’t identify himself with that image at all. “Just the thought of it grates on me as nails on a chalkboard”, he theatrically describes. And you, our dear readers, calling back your school time, certainly know what he is talking about – that literally scratches on one’s own nerves.

Serve customers, offer solutions, tell the truth! As simple as that, these three things probably describe his work moral the best. Above all, faithfulness and transparency regarding information that is necessary for the client’s decision making, is his greatest concern. “In the end, however, the reliable and sophisticated products of LOYTEC are which close the deal!” Daryl feels certain.

[www.loytec-americas.com](http://www.loytec-americas.com)



# LOYTEC Training Schedule

All trainings take place at the LOYTEC headquarters in Vienna, Austria. The training sessions are held by our well experienced trainers. Additional training dates are available on request. Please contact sales@loytec.com for more information.

## LTRAIN-LINX

### Programming the L-INX Automation Server (5 days)

- Configuration of the L-I/OB I/O Modules
- Creating IEC 61131-3 applications
- Testing and debugging the application
- Using Alarming, Scheduling, and Trending (AST™)
- Working with LOYTEC Function Library
- LWEB-900 Building Management System

May 5, 2014      Sep 8, 2014      Dec 1, 2014  
 Jun 2, 2014      Oct 13, 2014  
 Jun 30, 2014      Nov 10, 2014

## LTRAIN-LGRAPHICS

### Graphical Design for L-VIS and L-WEB (2 days)

- Creating L-VIS and LWEB-800 projects with the L-VIS/L-WEB Configurator
- Creating a distributed visualization based on L-INX and LWEB-800
- Efficient project design using templates

Mar 23, 2014      Sep 15, 2014      Oct 20, 2014

## LTRAIN-LGATEWAY

### Gateway Applications and Data Point Management (2 days)

- LOYTEC data point concept
- CEA-709, BACnet, M-Bus, Modbus, OPC XML-DA
- Local and remote AST™ functions
- Building gateway applications with L-GATE, L-Proxy, and L-INX

May 26, 2014      Sep 22, 2014      Nov 24, 2014

## LTRAIN-DALI

### Lighting Control with L-DALI (2 days)

- Introduction to DALI
- Features of the LOYTEC DALI Controllers
- Configuring LOYTEC DALI Controllers
- Setting up a DALI network
- Troubleshooting the DALI installation

Jun 16, 2014      Oct 6, 2014      Nov 17, 2014

# LOYTEC sets up a foreign base in Taiwan



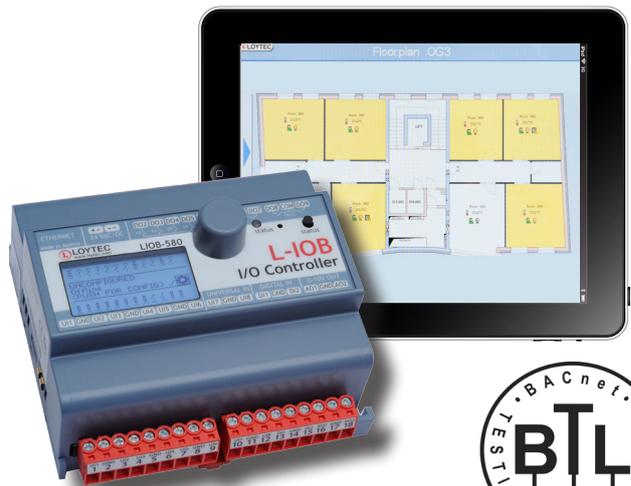
In March 2014, LOYTEC Asia Inc. started its business activities in the Asian market. LOYTEC Asia emphasizes sales and technical support of LOYTEC products on the Asian continent. An optimal strategic location was chosen with Taipei, Taiwan, as the company's headquarters. The high-tech country Taiwan provides excellent business premises. Besides the native language Chinese, a great amount of people is also capable of the English language. Taiwan maintains perfect business relations with its neighboring country China. That is why LOYTEC Asia uses Taipei also as a springboard for business deals in China.



# Innovative Building Automation

## BACnet/IP down to the field level

LIOB-55x I/O Modules and LIOB-58x I/O Controllers (freely programmable) directly communicate over BACnet/IP and adhere to the BACnet Building Controller Profile (B-BC).



BACnet is a registered trademark of ASHRAE. ASHRAE does not endorse, approve or test products for compliance with ASHRAE standards. Compliance of listed products to requirements of ASHRAE Standard 135 is the responsibility of the BACnet International. BTL is a registered trademark of the BACnet International.

- 2 Ethernet/IP-852 ports
- Built-in Ethernet switch
- Integrated web visualization
- Local operation and override
- Alarming, Scheduling, Trending
- Native BACnet server objects for direct access to all I/Os
- BACnet client maps

 **LOYTEC**  
buildings under control™

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### Preisfrage



Unsere Produkte haben Sie überzeugt? Unsere Preise sind genauso attraktiv. Hier geht's zur Preisfrage.

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Hier erfahren Sie alles über das LOYTEC Competence Center und die Vorteile, die es Ihnen bietet.

### Competence Partner



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