LOYTEC Express

Magazine for Building Automation

Win a brand-new **L-VIS**

LROC-400

The Answer to all Questions about Room Automation

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MASTHEAD

Dipl.-Ing. Hans-Jörg Schweinzer, CEO
LOYTEC electronics GmbH

What 2016 has in store

As an innovative, medium-sized company with an export rate of more than 95 %, LOYTEC looks forward to an exciting year 2016, following a successful 2015. In spite of low energy costs, automation solutions for buildings are more popular than ever before. The future belongs to efficient systems that reduce operating costs and improve comfort. Here, LOYTEC is at the forefront. We used 2015 to create more products and innovations made in Austria than ever before in the company's history. Our product solutions target a global market. Of course, we precisely analyze the local characteristics of our target markets and try to place our product solutions accurately. This way, we have created the LIOB-AIR system that is targeting the currently booming American market. The performant LIOB-AIR controllers use fast IP communication for networking, optionally via Ethernet or WLAN, to build an efficient, networked VAV system that even does without a central controller. In Europe, however, solutions for fully integrated room automation with room segment flexibility are the latest trend. With the L-ROC system, and here especially with the LROC-40x controllers, we provide a solution that fulfils all requirements of room automation and leaves nothing to be desired – both technical and commercial! All products have one thing in common – the technology of LOYTEC – based on most modern hardware and software platforms made by LOYTEC. A wide range of open protocols based on IP, twisted-pair, or wireless, a uniform programming en-

vironment, and also homogeneous configuration tools are self-evident. Integrated web user interfaces and the seamless integration into the building management system LWEB-900 allow different user groups to accurately access the information relevant to them – secure, fast, and even when on the way through mobile devices.

We, at LOYTEC, take pleasure in striking new paths with the greatest thirst for action we have ever had. That's why also 2016 is going to be a year of innovations for the benefit of our customers. Be prepared for surprises!
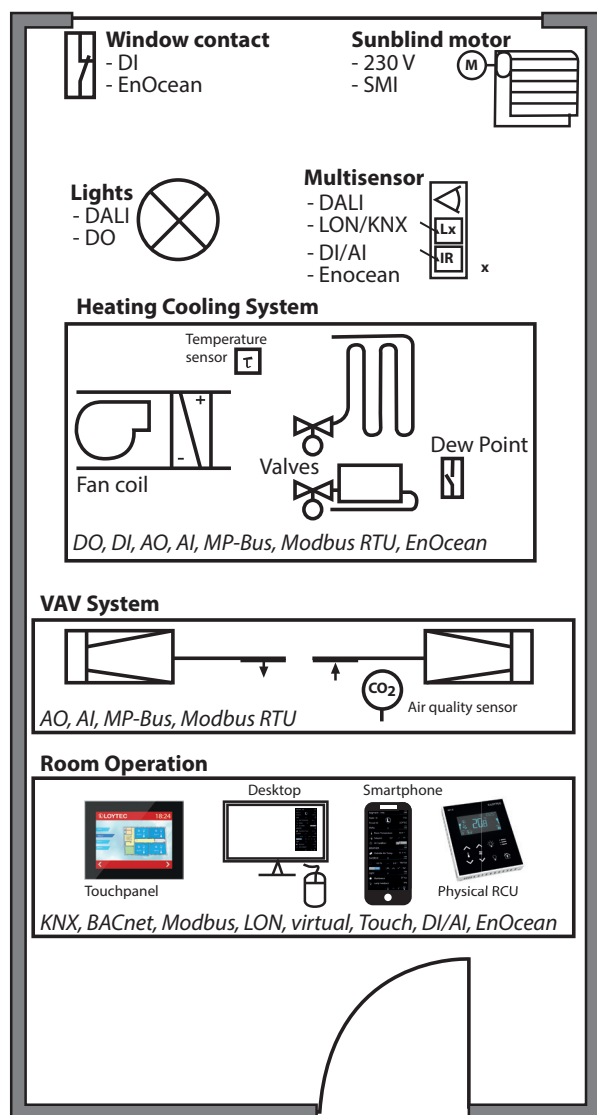
DI Hans-Jörg Schweinzer
CEO

LROC-400

The Answer to all Questions about Room Automation

R oom automation plays an important role in operating a building energy efficiently. Without a comprehensive room automation concept that is also integrating subsystems, requirements for the energy efficiency class A according to EN 15232 can't be met. As a planning tool for implementing the specifications of EN 15232, VDI 3813 German guideline has been created. There, specific room functions are defined that are assigned to physical devices. In the resulting feature list and the control diagram based on the specifically designed shell model, devices and features can then be assigned either to a segment (smallest automation unit), a room, an area, or a building. Hereby, the degree of flexibility for creating new room situations, what is particularly important for office and administration buildings and is frequently required by building owners already in the earliest stage of planning, is defined.

But there is more than efficiency features and flexibility whereupon room automation systems have to respond. Also for energy consumers in a room like sun blinds, lighting, valve actuators, various control options, and requirements are available nowadays. Whereas DALI has been established in lighting control for many years, SMI as a communicative interface for sun blinds enjoys enhanced popularity and is increasingly deployed in projects as an alternative to traditional 230 V engines with relay control. Also MP-Bus as a digital interface for valve actuators and volume flow controllers is considered as an alternative to traditional control through 0–10 V or pulse width modulation.

Another aspect that has to be considered carefully is the room control concept. KNX-TP1 and Modbus RTU are clearly the first communication buses for wired and integrated room control units to be mentioned. Here, numerous different models are available on the market, satisfying any design requirements. With L-STAT, LOYTEC offers a room control unit with Modbus RTU

Requirements for room automation

Window contact
- DI
- EnOcean

Sunblind motor
- 230 V
- SMI

Lights
- DALI
- DO

Multisensor
- DALI
- LON/KNX
- DI/AI
- Enocean

Heating Cooling System

Temperature sensor

Dew Point

Fan coil

Valves

DO, DI, AO, AI, MP-Bus, Modbus RTU, EnOcean

VAV System

CO2

Air quality sensor

AO, AI, MP-Bus, Modbus RTU

Room Operation

Desktop

Smartphone

Touchpanel

Physical RCU

KNX, BACnet, Modbus, LON, virtual, Touch, DI/AI, EnOcean

The LOYTEC Solution

With the LROC-40x room controllers, LOYTEC provides a solution that eliminates all concerns about requirements and questions described above. Embedded in a compact sheet-steel housing for installation in suspended ceilings or in raised floors, the room controllers feature onboard interfaces to BACnet (IP and MS/TP), LON-IP, KNX (IP and TP1), Modbus (TCP and RTU, Master or Slave), OPC, DALI, SMI, MP-Bus and EnOcean. Complicated and cost intensive gateway solutions, e.g. for the integration in a building management system, are no longer necessary. Of course, for the physical connection of consumers, a well-planned constellation of in- and outputs (I/Os) is available.

All models feature two Ethernet ports that can be operated in switch mode. The built-in web server provides customer specific graphics for operation and also visualizations of floor plans that can be operated as HTML5 pages via an arbitrary web browser or via a Windows PC. Of course, the integration into LOYTEC's LWEB-900 Building Management System and also connectivity to systems of other manufacturers are easily possible, as all significant standard protocols are supported.

Sascha Remmers
Sales, LOYTEC electronics GmbH

Sascha Remmers has been working in technical sales at LOYTEC for over 2 years. His main emphasis is on project sales, particularly in room automation. The German works from his homeland, the Ruhr area, North Rhine-Westphalia and takes care of system integrators and planning departments throughout Central Europe. He has over 8 years of experience in technical sales of room automation systems. With this background, Sascha is probably one of the few experts with such comprehensive, specific technical and also market-related know-how.

interface. As a wireless, self-sufficient variant for room control (and also for window contacts and meanwhile valve actuators), EnOcean has become well-established. Another increasingly popular solution is virtual room control. The control of room functions via PC workplace makes sense primarily in open-space offices, as an adequate installation site for traditional room control units can hardly be found. Nowadays, also control via smartphone or tablet shouldn't anymore be a wishful thinking.

But it's the ever increasing demand for virtual room control solutions which causes the next question to be raised: How to create a solution for integrating IP networks of IT and building automation, everyone (both IT and building automation departments) can live with? How much emphasis is placed on IT security in building automation networks in general? In times of bugging scandals, an increasingly relevant question!

L-ROC system architecture

Moreover, all models feature communication via SSL secured web services allowing a level of security that is equal to popular IT security mechanisms.

Depending on the model, each controller can handle up to 16 rooms respectively room segments. Thereby, the entire feature set to reach maximum energy efficiency is available:

- lighting control with constant light controller,
- sun blind control with sun tracking,
- temperature control for heating, cooling and ventilation,
- occupancy detection,
- window monitoring,

- scheduling,
- alarming,
- trending.

All parameters and complete axis flexibility are also part of LOYTEC's prefabricated segment functions that are fully independent of the hardware thanks to IEC61499 technology. Thus, e.g. each segment receives a room ID parameter that defines to which room the segment belongs. If two adjacent rooms receive the same room ID, they automatically belong to one room and no additional parameterization is required. This way, the owner himself is able to create new room situations with minimal effort.

For commissioning the LOYTEC room automation system, with L-STUDIO a software is available that facilitates the implementation of all functions and visualizations described above due to its consistent, object-oriented approach.

LROC-400 – The No-Brainer

LROC-400 has been designed for a system wide solution that prepares you for anything you may encounter in a room. The controller provides 24 relay, 8 TRIAC outputs, 8 analog outputs, 10 universal inputs, and 2 digital inputs, and also communicative interfaces for BACnet (IP and MS/TP), LON-IP, KNX (IP and TP1), Modbus (TCP and RTU, Master or Slave), OPC, DALI, SMI, MP-Bus and EnOcean.

Physical in- and outputs can be configured randomly – hence, relays can be used for optionally controlling e.g. 3-stage fans, sun blinds, or other switched loads. Similarly, inputs, e.g. for dew point or temperature sensors, window contacts, or other sensors and potential free contacts can be configured. Depending on the room requirements, the controller can operate up to a maximum of 8 rooms/room segments. An interface is available to connect room control units, like LOYTEC's L-STAT. Of course, LOYTEC's L-VIS touch panels can be integrated via IP or it is possible to choose the option of virtual room operation. For the integration of third-party products, the interfaces described above are available. To offer a complete solution, LOYTEC provides the multi-sensor LDALI-MS1 with DALI interface.

LROC-401 – Smart Office

The controller exclusively provides communicative interfaces for BACnet (IP and MS/TP), LON-IP, KNX (IP and TP1), Modbus (TCP and RTU, Master or Slave), OPC, DALI, SMI, MP-Bus and EnOcean. It was designed as a solution that doesn't require any physical in- and outputs. Compared to the other models, it can even control up to 16 rooms/segments.

Up to 16 sun blinds are connected via SMI. For lighting and multi-sensor, a DALI interface is available. Valve actuators (e.g. Belimo 6-ways valve) are controlled via MP-Bus. Room operation is implemented, for example, via L-STAT or EnOcean which also controls possible window contacts.

LROC-402 – Simply HVAC

Meanwhile, most specialists are aware of the meaningfulness of an integral, system wide room automation solution. However, the daily project routine is often different. Stuck and often relatively inflexible project workflows are probably the cause of the frequent separation of lighting and sun blinds control from room climate control and air-conditioning. Once the planning contracts are assigned, it's nearly impossible to connect subsystems according to a uniform and integral concept. Normally, lighting and possibly sun blinds controls are installed by an electrician (mostly KNX). The HVAC company is given the order to take care of room climate control. The benefits of an integral room automation solution with system wide efficiency features and also flexibility
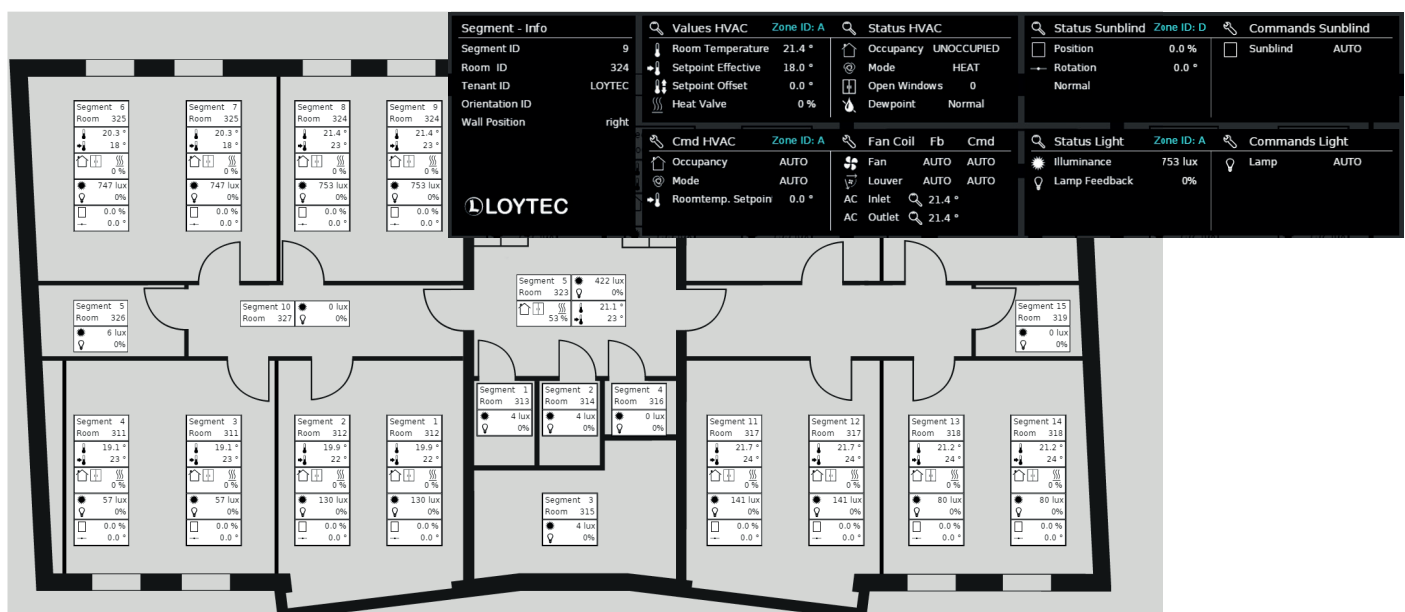
Visualization and floor plan flexibility

with two separate systems can either not be implemented or can only be implemented with extensive effort.

Even here, with LROC-402, LOYTEC has the ideal solution: LROC-402 is designed for the control and regulation of heating-/cooling-, or ventilation systems of a room. It features the same I/Os as LROC-400, 24 relay, 8 TRIAC outputs, 8 analog outputs, 10 universal inputs, and 2 digital inputs. As communicative interface for the field bus integration, only MP-Bus, Modbus, RTU, and also KNX TP1 are available.

The highlight: Via the built-in KNX TP1 interface it is now possible to integrate KNX actuators from the electrical point of view. If the features integrated in LROC-402 to control lighting and sun blinds and KNX modules are only used as actuators and sensors, it is even possible to realize a flexible-axis solution in spite of the separation. If that's not required and lighting and sun blinds are controlled via KNX, LROC-402 can still act as a gateway between KNX and BACnet/IP, e.g. for the connection to a building management system.

Room Operation and Sensors

With the LROC-40x room controllers, LOYTEC offers a solution that even meets the highest standards, yet it provides a simple and uniform installation with all possible interfaces. The controllers can be complemented with LOYTEC products for room operation and sensor technology to provide a comprehensive system solution.

The well-established L-VIS touch panels allow to create arbitrary touch interfaces for room operation. The new glass optics and high resolution fulfill highest design requirements. L-STUDIO provides ready-made graphical projects for integration to create L-VIS projects for every room segment in no time.

With L-STAT, LOYTEC provides a room operation unit that comes with integrated display, temperature sensor, humidity sensor, and CO_2 sensor, NFC interface, eight capacitive touch buttons, and four physical inputs. Despite the impressive range of functions, L-STAT presents a cost-effective solution for room operation. The proportions of red, green, and blue of the display color can be set individually through registers via the system. Also the color of the housing, the
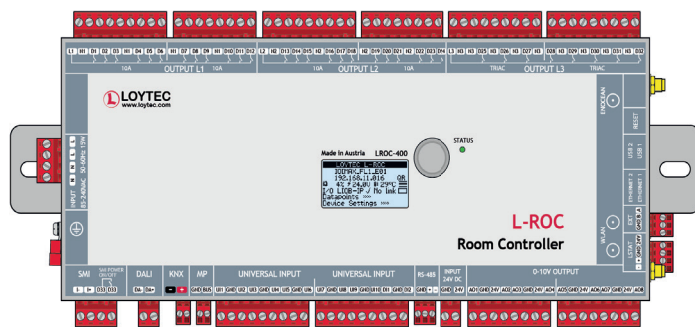
LROC-400 Room Controller

surface, and the control symbols of the eight touch buttons can be customized on request.

For operating a room energy efficiently, LOYTEC provides with the LDALI-MS1 a multi-sensor for automatic presence detection and light measurement as reference for constant light control. The multi-sensor can be integrated seamlessly into the overall solution via the DALI bus. This has the advantage that the sensor can be directly connected to the DALI line, eliminating the need for additional cables.

by Prof. Dr. Peter Fischer

Communication Standards in Building Automation – Status and Outlook

At the end of the 1980s, Germany started standardizing communication systems in building automation. The "company neutral data transmission protocol FND" (DIN V 32725) was, encouraged by public customers represented by the finance department Stuttgart, developed as national and company neutral communication system likewise profibus FMS with the profile "Building Automation" (DIN 19245) that was developed during a research project financed by the Federal Ministry for Research and Technology. At that time, proprietary communication standards were the normal case that made building automation systems, from today's perspective, secure against attacks from outside through data access points (yet unintentionally). However, the drawback was that the chosen manufacturer had the monopoly in this specific project.

Through the development of information and communications technology in the 1990s, the way for European norms for this application area was paved. Computer interfaces became standardized, wide area data networks demonopolized, and the Internet and its protocols started to prevail. Computer systems and automation stations became open systems with all the advantages and disadvantages. The sentence "Open systems are not quite leak proof." is especially true for building automation systems. With the new millennium, standardization has been almost completed. Three European norms have become well-established (also on the market) and are still today; these are:

- EN DIN 13321, Open Data Communication in Building Automation, Controls and Building Management – Home and Building Electronic Systems (KNX),
- EN DIN 14908, Open Data Communication in Building Automation, Controls and Building Management — Control Network Protocol (LON),
- EN DIN 16484-5, Building automation and control systems - Part 5: Data communication protocol (BACnet).

Note: A detailed list of norms is given in the list of communication standards of building automation.

The establishment of norms and open interfaces from and to the devices created completely new situations for planners, manufacturers, or customers.

For building automation planners, the field of activities has been expanded. Nowadays, devices are networked and connected to LANs. On the one hand this means that significantly less cables are laid, but on the other hand the knowledge about requirements and the laying of data

cables must exist. The laying of cables for high data rates, whether copper or optical fiber cables, has to adhere to specific criteria (e.g. bend radius).

Also planning of individual systems has changed, as the information of components from different systems can be used for the overall system by means of communication. As an example, a simple window contact can be mentioned that both serves to close the radiator thermostat valves when windows are open and also to send a message if it's the case that the windows were opened even though nobody was in the room.

The greatest task though, still seems to be integral planning; this not only concerns planners, but also customers. Integral planning means integrating individual systems and planning the information exchange among themselves. At the beginning additional expenditures occur, as planning (and tenders) must be performed in a holistic manner. However, for ongoing operations this creates much more flexibility when using the building.

Additional expenditures imply more costs of investment while costs can be saved during operations. If consumption data together with usage and weather data is constantly

recorded and assessed, the "process building" can ideally be controlled and regulated. That is vital in connection with production and usage of renewable energies.

Proprietary communication protocols of system manufacturers have been replaced by standards. Nowadays, "old" devices are integrated via gateways with multiple functions that are partly able to connect more than two communication protocols with each other. The meanwhile well-established communication systems BACnet, LON, KNX are constantly evolving by integrating new technologies. New radio-based standards like ZigBee and EnOcean are increasingly used in home and building automation together with the above mentioned systems, to e.g. employ wireless switches in applications where the installation of a cable is not possible.

This often concerns applications in a Smart Home. In this field, these devices are used for the purpose of comfort rather than energy savings. Mobile phones and tablets thereby act as user interfaces for appropriate apps. The respective interfaces to communication standards in home and building automation already exist. For a Smart Building such user interfaces are obviously just applicable for individual room control. However, with this applications,

the ideal usage of energy in any form is crucial. Energy efficiency in a building is only possible with the support of a building management system, where data from every system is constantly recorded and assessed to perfectly control and regulate each individual process. This way the thermal energy of the computer room can be used to heat other rooms.

On the contrary, the connection to an "intelligent" energy network, the so-called Smart Grid, is far more difficult. A technical report from September 2013 with the title "Use Cases in the Area of HBES/BACS on the Interfaces to and from the Smart Grid "provided an overview of already standardized functions of home and building automation and corresponding use cases of the Smart Grid. The project was financed by the booster club DIN-NHRS under project number 2013-004. The study revealed that processes for energy optimization are for the most part already defined by the norm „EN ISO 16484-3 Building automation and control systems (BACS) – Part 3: Functions". Another finding is that in the communication system BACnet, KNX, and LON, these functions are all implemented in the corresponding application layers of the protocols, but there are no illustrations of these use cases on the functions, and vice versa. Even two years after this report, there have been no further major advances.

In context with the connection of building automation to the Smart Grid, and thus the transmission of high sensitive data in- and outside a building, the meaning of security (IT security) of data transmission gained in importance. The federal ministry for security in information technology (BSI) has already established a guideline (see IT baseline protection catalog). Based upon this guideline, VDMA published a draft of the VDMA norm 24774 "IT security in building automation" that describes the specific requirements in connection with building automation systems. The lack of appropriate protective mechanisms can result in data manipulations, loss of data, and failure of the overall building automation system having consequences such as personal injuries, limitation of operation (e.g. loss of production, non-usability of the building), or financial losses. The VDMA norm should help to recognize, avoid, or minimize the impact of threats posed by cyber-attacks. The norm also describes measures for IT security both for new and already established building automation systems

that planners, constructors, and operators should take. Another challenge is Internet communication. The area for IP version 4 addresses has already been exhausted for years. This usually doesn't affect addresses in a local communication network of building automation, as long as a device hasn't to be accessible from outside via Internet. This is possible if such an address from the network operator is already available. If this is not the case, it should be considered to change to IP version 6. Although this protocol has already been published by the end of the 1990s, the

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Since his time at JCI, he has been active in the field of standardization on national, European, and international level. He headed for example the WG4 „Open System Data Transmission" of the European technical committee CEN TC 247 „Building Automation, Controls and Building Management".

transition from IPv4 to IPv6 progresses slowly in Europe. The protocols are quite different, whereby IPv6 meets the requirements of Internet communication more closely. This is clearly indicated by the address area that is 32 bit in the case of IPv4, but 128(!) bit in the IPv6 version. The advantage is quite obvious: virtually any device that is able to communicate can be directly connected to the Internet. Hence, the Internet of Things (IoT) could also be realized in building automation with all its advantages, but also disadvantages.

With this transition to the "new" Internet, an appropriate modification of the standards BACnet, KNX, and LON is necessary. The respective communities are currently testing the first implementations and are developing the transition phase from IPv4 to IPv6.

In summary it can be stated that communication standards are well-established and integral parts of a device in building automation. Systems have become more open, but also more sensitive to possible cyber-attacks. The advancement of the Internet has an impact on the existing communication standards that therefore also advance and keep up to date with developments. Information and communications technology have been essential for home and building automation systems already for years. This trend is expected to continue in the following years as current developments indicate.

List of Communication Standards in Building Automation

BACnet:
- DIN EN ISO 16484-5, Building automation and control systems – Part 5: Data communication protocol
- DIN EN ISO 16484-6, Building automation and control systems (BACS) – Part 6: Data communication conformance testing

KNX:
- DIN EN 13321-1, Open data communication in building automation, controls and building management – Home and building electronic system – Part 1: Product and system requirements
- DIN EN 13321-2, Open Data Communication in Building Automation, Controls and Building Management – Home and Building Electronic Systems – Part 2: KNXnet/IP Communication

LON:
- DIN EN 14908-1, Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 1: Protocol Stack
- DIN EN 14908-2, Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 2: Twisted Pair Communication
- DIN EN 14908-3, Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 3: Power Line Channel Specification
- DIN EN 14908-4, Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 4: IP Communication;
- DIN EN 14908-5, Open Data Communication in Building Automation, Controls and Building Management Implementation Guideline – Control Network Protocol – Part 5: Implementation
- DIN EN 14908-6, Open Data Communication in Building Automation, Controls and Building Management – Control Network Protocol – Part 6: Application elements

Commissioning of DALI Lighting Control Systems with L-DALI

Over the last few years, the DALI protocol (Digital Addressable Lighting Interface) for lighting control has prevailed. The use of this bus system reduces cabling effort during installation and also provides all functional advantages by allowing to flexibly combine luminaires to groups. Additional features like monitoring of lamps, precise and synchronous dimming of luminaires, or controlling luminaires by means of predefined lighting scenes increase the functionality of the system.

System Overview

Up to 64 luminaires can be connected to a DALI channel. These objects can be grouped together to up to a maximum of 16 groups. It is possible to control luminaires individually, however it is advisable to form groups in order to reduce channel traffic and that way minimize luminaires response time. If, for example, 10 luminaires shall be controlled in an office room, they can be combined to a group. Now, the light can be switched with only one single command instead of commanding the luminaires one by one.

Besides luminaires, other bus members like sensors, push button-, or relay modules are connected to the DALI bus. However, these components are not yet entirely included in the current DALI standard, hence, this is more a manufacturer-specific extension requiring individual

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treatment. The LOYTEC websites features a compatibility list that shows a list of devices supported by L-DALI controllers.

Basically, triggering luminaires requires at least one master on the bus – otherwise it stays dark. The LOYTEC L-DALI controllers implement such a DALI master. In the initial version, the L-DALI controllers merely served as gateways to map the functions (switching on/off, dimming, reporting errors, etc.) on BACnet or CEA-709 data points. Through continuous development, the L-DALI controller is nowadays able to demonstrate its strength if no other bus system but DALI is involved. Functions like the integration of multi-sensors, relay modules, and push button modules, very powerful (constant) light control algorithms, extensive alarm generation, and many more, make the L-DALI controllers true all-rounders. However, for system integrators, in case of large plants, an efficient and quick commissioning of systems is even more important than functionality.

Tools for Configuration

L-DALI controllers can be configured via the integrated web interface using a web browser or a configuration software (L-INX Configurator) – often, a combination of both proves to be ideal. Especially for large plants, it is recommended to create the basic configuration with the L-INX Configurator first. This way, names can be assigned to predefined lamp objects and luminaires can be grouped as desired. The same is true for sensor objects, pushbutton objects, or relay modules to be installed. According to this principle, the entire system can be prepared offline and the individual objects can be parametrized.

The configuration is uploaded into the controller on site. In a further step, the physically installed devices have to be assigned to the prepared objects.

Assignment of Luminaires, Switches, and Sensors

During commissioning, the localization of defined luminaires and their assignment is an effort not to be underestimated. The DALI standard requires that logical addresses on ballasts and other modules have to be set during installation. Subsequently, the bus has to be scanned and all devices on the bus „randomly" addressed. This way we learn how many devices are connected to the bus, however, it is still not obvious which predefined devices match which detected device.

For some time it has been possible that the devices send along a serial number during scanning. In practice, however, it is not proven to be useful as many manufacturers of ballasts either don't program serial numbers or they assign the same number to several devices what makes unique identification impossible.

Most of the lamps are thus identified the following way: Only one luminaire on the channel is being switched on ("wink"), meanwhile a person walks through the room(s) to detect the lamp and assign it to the prepared object. This process has a number of disadvantages. In large rooms with anti-reflective luminaires, it is difficult to detect the luminaire actually switched on from afar. Thus it is necessary to walk around the room, until the active lamp becomes visible. If, however, there are several small rooms, at least two persons are required to scan the entire building. Since firmware version 5.2, L-DALI supports a special wizard

on the web interface to quickly locate individual luminaires. A prerequisite for using the wizard is that the basic configuration with the names of the luminaires has been performed and uploaded using the configuration software. Afterwards, you need to choose Commission –> DALI installation from the menu list of the L-DALI web interface. First, it is necessary to scan the devices on the channel by pressing the button "Scan" on the web interface. To scan one or more luminaires using the wizard, check the ticks next to the devices in the list of "Unassigned Devices" and press the button "Search".

Now, the installer needs to get closer to the displayed luminaire and to follow the search wizard's instructions. Only a part of the luminaires is being switched on and the user just needs to answer whether the lamps are on (Yes) or off (No), see figure 1.

Through this binary algorithm, the requested luminaire can be identified after six search steps the latest, in case of a fully equipped DALI channel with 64 luminaires.

Figure 1: Scan

Figure 2: Sensor button

As scanning progresses – less and less unknown devices are on the channel – the amount of search steps is being reduced accordingly. As this scanning function is implement via the web interface of the device, operation is also possible via portable devices, e.g. tablets. Thus, also for a single commission technician it is possible to quickly and efficiently allocate lamps.

Unlike luminaires, there is no possibility of optical feedback on the module for pushbutton modules. However, components can easily be identified by pressing the button. On the web interface, the module

that sent out the most recent command is selected. Thus, the component is logically assigned on the web interface.

Many presence detectors include a LED for identification that can be activated via wink command. Depending on the prevailing lighting conditions, the LED is sometimes difficult to detect, hence, L-DALI provides another possibility for identification. For this purpose, on the web interface, a symbol is depicted next to the sensor object that detected the most recent motion (see figure 2). ▶
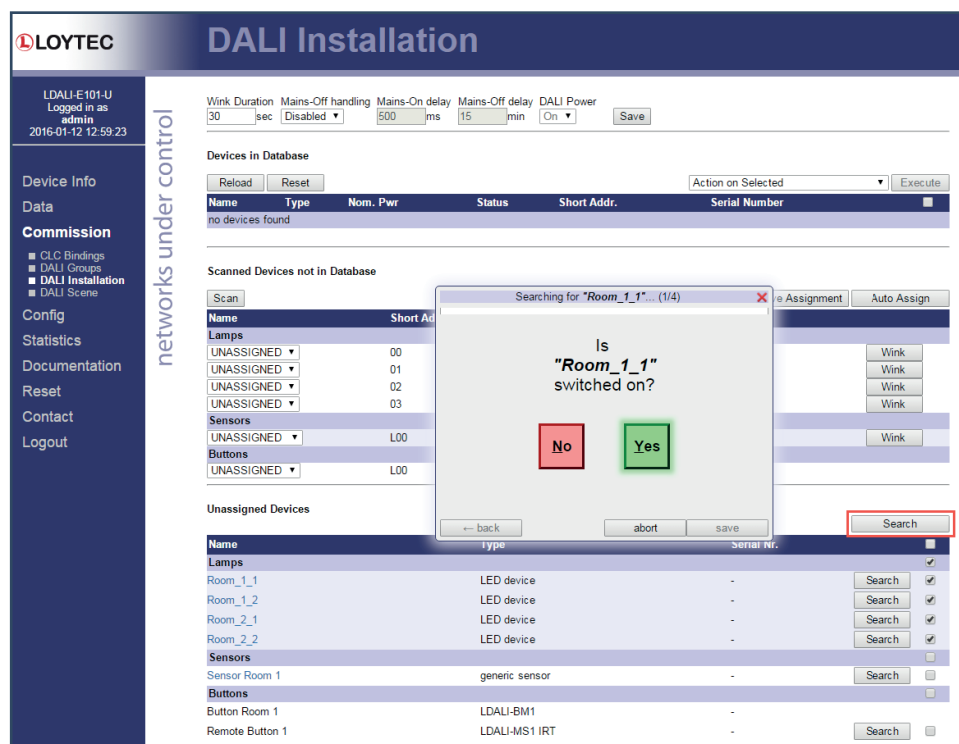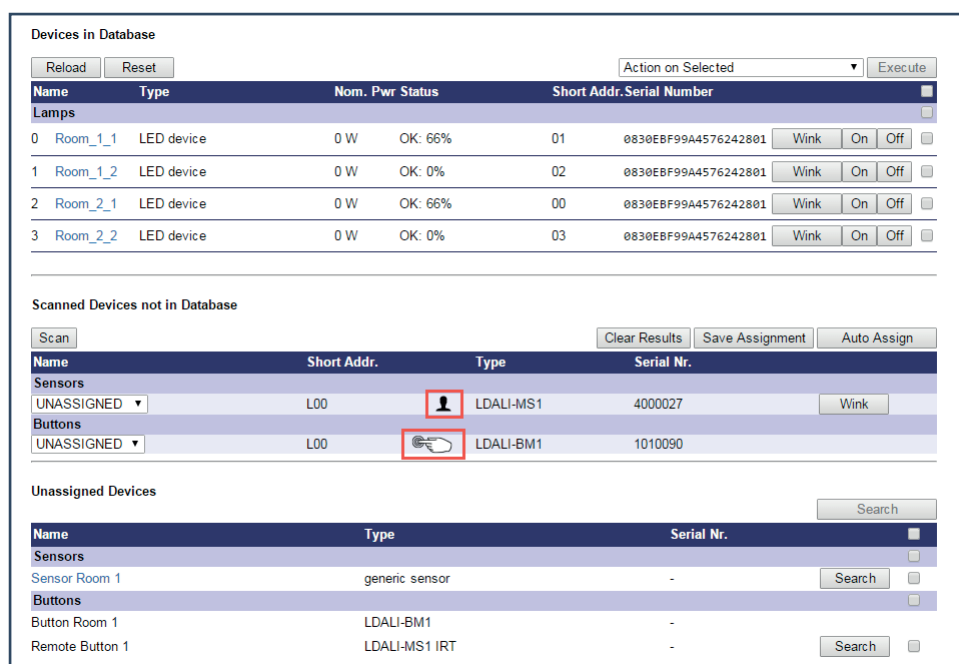
Figure 3: Sensor calibration

Sensor Assignment using the Wizard

The L-DALI firmware provides another elegant method to detect and assign sensors. This method requires the assignment of DALI groups and sensor objects to constant light controller objects. This can be implemented using the L-INX Configurator followed by a download of the configuration file into the L-DALI device.

Subsequently, all luminaires have to be identified like described. In the next step, change to the menu Commission -> CLC Bindings on the web interface of the device. There, press the button "Find Sensors" in order to identify the constant light controller. The L-DALI device then switches the luminaire that is assigned to this controller on and then off again. At the same time the L-DALI controller monitors which of the sensors that are not yet assigned shows the greatest change in brightness. This sensor is then automatically assigned to the sensor object connected to the constant light controller. This way, sensor allocation is finished and a simple function test has been implemented simultaneously.

Calibration of Sensors

For the correct function of a constant light controller, it is necessary to calibrate the used sensors. This is not because of an inaccuracy of sensors, but rather because of the fact that the measured value at the sensor location doesn't match the value that the control should meet (like brightness at work place).

An ideal calibration should be performed in a relatively small range around the work place. For this purpose, the room needs to be darken and the light dimmed until the value measured by a lux meter is almost at the same level as the control set point. The measured value displayed by the lux meter must be entered on the web interface of L-DALI under "Measured lux level". L-DALI then calculates an offset between the measured value and the entered value. For better accuracy over a larger range, further measuring points can be sampled. Therefore, choose another memory in the field "Index" and enter the value like you did for the first measurement. L-DALI now performs a linear interpolation between the bases and calculates the respective offset between the measured value and the value used for control. Using this method, up to seven calibration levels can be recorded (see figure 3). Often, set points for constant light control are not adjusted by the end user. In this case, the calibration for one single base is sufficient.

Conclusion

With the new assignment and search functions, DALI systems can be commissioned even more quickly using L-DALI. This helps system integrators to reduce workload and cost while the risk of configuration errors is minimized. ▪

arcom

Arcom - The Strength of a Group, the Flexibility of an SME

The group Arcom is a fast growing French SME dedicated to innovation in energy management and building automation solutions with the constant idea of sustainable development. With more than 75 employees, a turnover of EUR 9.5 million, and 15 % of this turnover invested each year in R&D, Arcom is a major player in the French building automation market.

With more than 30 years of experience in this market, the group Arcom has developed a complete range of products for the regulation of the building user's comfort: heating, ventilation, air conditioning, sun blinds, lighting, air quality etc. Arcom's headquarters is located in Chalon-sur-Saône in Burgundy that also serves as a pilot building where all Arcom product solutions are demonstrated.

The "Aïther" range of products has been developed based on open protocol standards like: LonWorks®, DALI, etc. and has a high degree of flexibility when it needs to fit to renovation projects. The management of HVAC, lighting, sun blinds and air quality can be realised with a unique controller (HLC or HLBC). A complete range of add-ons can be attached to the Aïther controllers: IR remote controllers, network thermostats, sensors, RF receivers and Bluetooth receivers etc. in order to create a complete solution entirely integrated in LOYTEC systems.

In order to facilitate the commercial deployment of its Aïther product range and to solve all problems that the network integrators usually have, Arcom decided to create its own network of system integrators called 'Réseau Arcom Energies Services'. Created in 2013, RAES covers any place in France with seven offices distributed throughout the country. The 30 technicians regularly attend trainings and each technology has its expert. It is the task of Pierre Borderie, from the office in Tours, to support the LOYTEC product range internally. After having attended a LOYTEC training in Vienna, he made his own experience with deploying a few projects in Paris area and other regions.

Pierre's experience with the LOYTEC range of products allows today all the Arcom offices that are members of the Arcom network, to be more efficient and to have the answers to all questions they can raise while integrating Aïther products to a LOYTEC system.

Because each project is different: schools, office buildings, factories, warehouses, commercial buildings, public establishments etc., the 'Réseau Arcom Energies Services' is clearly dedicated to listen to customer requests. Arcom is then acting like a consultant offering solutions that are innovative, low cost, and sustainable, from the simplest (like an autonomous boiler) to the most advanced ones.

As Patrick Tabouret, CEO of group Arcom likes to mention: "Research and innovation are essential components to the development of our members. But our customers and partners also want us to be proactive and flexible in all our fields of expertise. The proximity to our group is the key to those elements. The different offices of the Arcom network have their own teams of experts and the sharing of skills allows to guarantee a high level of quality, to reproduce solutions and also to guarantee homogeneity everywhere in the country."

At a time of searching for growth in the energy transition period, the group Arcom and its network called Energies Services show a good example of innovation made in France.

Réseau Arcom Energies Services
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Gilbert.fontaine@groupe-arcom.com

Schlumberger: A great Example of an energy saving Solution

The subsidiary of Arcom, Arcom Alsace Lorraine, participated in the renovation of a zone of the Schlumberger factory. This zone was formerly used as a factory and was converted to an office zone in the course of renovation. Schlumberger building, to which the competitive cluster Fibres Energivies awarded the "demonstrator building" label, aimed on creating a high level quality office in terms of energy efficiency, comfort and state of the art attractiveness.

Already at the beginning of the design phase of this pilot building, the idea of energy usage reduction through an optimised usage of natural light, natural cooling, and energy recovered from the exhaust air, isolation, etc. has been taken into considerations.

During the project phase, Arcom Alsace Lorraine installed a building automation system that allows the building to be monitored and managed completely automatically while allowing the users to override the system locally in terms of lighting, sun blinds, and temperature. Even the meeting room is equipped with an air handling unit in order to renew the air in an optimal way.

The room control has been designed depending on the room types that are either office rooms or meeting rooms.

In case of office rooms equipped with a window, keeping in mind the goal of energy saving, in addition to a scheduler and the management of the occupancy mode, different scenarios have been implemented:
• Priority sun blind control in case of a cooling or heating demand,
• Automatic light level control, override mode in case of an open window,
• Temperature set point offset limited for the users.

For meeting rooms, the specific actions are:
• Management of the air renewal by means of a presence detector and an air quality sensor,
• Management of lighting and temperature that are either controlled with the help of a presence detector or manually with a limitation in the set point values.

FACTS	
Location	Rue de la République, Guebwiller, France
Number of nodes	approx. 67
Topology	LON FT/10, Modbus RTU, M-Bus, IP852
Companies involved	Arcom Alsace Lorraine, BET SERAT, Cabinet, Bernard Leibenguth, Archidesign, SARL Gilles, Henry, CHRISTEN SARL, Fibres Energivie
LOYTEC Components	2 x LINX-120, 3 x LIOB-101, 5 x LIOB-102, 4 x LIOB A2, 1 x L MBUS20, 1 x LVIS-3ME12-A1, 1 x LPOW-2415A, 1 x LIOB-100
LOYTEC Tools	L-Logicad, L-INX Configurator, L-VIS Configurator, LWEB-900

SG Controls and Integration Ltd. :

First LOYTEC Competence Partner in the United Kingdom

S G Controls and Integration Ltd (SGCI) based in Cambridgeshire, UK (the UK's first LOYTEC Competence Partner), operates as a systems integrator offering a multitude of services from consultancy, design and commissioning through to after sales service and support within the intelligent buildings sector and vertical markets.

The company's expertise centres on utilising and embracing open protocol building control technologies (including BACnet, LON, KNX, DALI, Modbus, and EnOcean) to build complex control networks and systems to operate, monitor, and control HVAC, lighting, natural ventilation systems, ground/air source heat pumps, and much more within a given building. The company's emphasis, however complex the system is, to always offer a simple, intuitive user interface (UI) and experience (UX). This is achieved by designing the system thoroughly at the start and by understanding the customers' requirements as well as their own individual technical level fully; for example an L-VIS touch panel that goes into a main control panel within a plantroom is primarily used by technicians to diagnose plant conditions, whereas an L-VIS in a school classroom needs to be designed with easy to use functions and data displays for local control. In any case both touch panels variants could easily reside within the same building and on the same network.

Formed in 2003 by its managing director Steve Goldspink, the company has grown over the years and moved to new premises in 2013. Steve is backed by a team of expert engineers and technicians who design and deliver (commission) the projects to the company's extensive UK wide customer base.

To date, SGCI have undertaken various projects around the UK utilizing a wide range of LOYTEC products and software.

Recent projects have included building and commissioning a new twisted pair LON network at a RAF (Royal Air Force) base to monitor and control their standby power generator systems, and, among other things, two interesting projects which are presented in the following pages.

One of the company's next projects is a major undertaking whereby LOYTEC products shall be used to control the primary heating systems for an extensive country residence, including integration with swimming pool plant, irrigation systems and full integration with the house wide KNX home automation system (also being designed and supplied by SGCI). Supervisory management control of under-floor heating, ventilation and lighting scenes will be possible via L-WEB. ∎

From Left to Right: Oliver Turner, Mark Wilson, Steve Goldspink

SG Controls and Integration Ltd.
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steve@sg-controls.co.uk
www.sg-controls.co.uk

University of Lincoln – Think Tank Building, Lincoln, United Kingdom

The Think Tank building is based within the Campus of the University of Lincoln and provides office and meeting room space for various departments of the University. It also acts as an incubator for start-up businesses.

The original BMS (Building Management System), although originating from 2008, was found to be poorly installed and configured. This led to numerous operational issues with the plant and ultimately high energy usage. Therefore, the University approached the LOYTEC Competence Partner SGCI to design a new cost viable solution to replace the entire system, with the caveat to drastically improve user comfort within the occupied spaces of the building as well as reducing energy consumption.

The building was already installed with one gas fired boiler, a CT and VT circuit plus associated pump sets, two GSHP (Ground Source Heat Pumps) with associated pump sets, underfloor heating systems (UFH) and a Monodraught natural ventilation system (NVS).

The SGCI solution was to utilize the extensive range of products from LOYTEC for all the control elements of the project and to re-wire the entire BMS infrastructure as the original installation/cabling was found to be inadequate. A new control panel was designed and installed within the boiler plant room with spare capacity for future expansion of plant & equipment.

All local room/zone controllers were replaced with LOYTEC L-IOB I/O controllers along with all of the associated sensors (Temp & CO_2), UFH manifold valve actuators as well as Belimo actuators for the Monodraught units (with position switch interfaces to improve BMS control of the NVS). A new weather station was also installed to provide wind speed/direction, rain level, and outside air temperature measurements.

Programs defined within the new BMS are:

- Boiler plant optimization,
- Demand led CT & VT circuits,
- Boiler/GSHP sequencing,
- Night purge of NVS,
- Improved control and interface of both NVS and UFH for each room/space,
- Improved NVS control by way of utilizing CO_2 levels,
- Provision of user adjustments to their own room/space by way of set point adjusters and NVS override switches,
- Time clock occupancy control of landlord and tenant areas,
- Security lock down of ground floor window ventilation system,
- Alarming of critical plant status incl. e-mail notification to estates department & maintenance teams,
- Trend logging both current (24hr) and archived (72 hr+) for each sensor connected,
- User Interface via LWEB-803 visualization software loaded onto multiple university PCs for access to the system incl. PIN level protection of adjustable parameters,
- VPN remote access for SGCI bureau monitoring and support.

FACTS

Location	Lincoln, United Kingdom
Number of Nodes	25
Topology	(CEA 709) FT10 & IP852 + Modbus RTU & BACnet via LINX-150
Companies involved	SG Controls & Integration Limited
LOYTEC Components	1 x LINX-150, 1 x LINX-111, 4 x L-IOB I/O Modules, 18 x LIOB-180, 1 x L-VIS Touch Panel, 1 x LPOW-2415A, 18 x LPOW-2415B
LOYTEC Tools	LWEB-803, L-INX Configurator, L-VIS Configurator, L-Logicad (IEC 61131) & LPA (LOYTEC Protocol Analyser)

NAPP Pharmaceuticals, Cambridge, United Kingdom

FACTS

|	
Location	Cambridge, United Kingdom
Number of nodes	12 LON, 256 DALI
Topology	(CEA-709) FT-10, IP852 & DALI
Companies involved	SG Controls and Integration Ltd (design and commissioning), SSE Contracting Ltd. (Installation)
LOYTEC Components	2 x LDALI-3E102, 2 x LDALI-3E104, 2 x LDALI-PWR2-U, 2 x LDALI-PWR4-U, 1 x LVIS-3E112, 1 x LINX-111
LOYTEC Tools	L-INX Configurator, L-VIS Configurator, L-Logicad (IEC 61131) & LPA (LOYTEC Protocol Analyser)

S GCI was commissioned to design and commission a complex lighting control solution (using the open standard of DALI) for the interstitial plant area inside building 191a of NAPP Pharmaceuticals located within the Cambridge Science Park.

Based on the client's extensive requirements, a design solution based around the LOYTEC L-DALI was selected. The L-DALI system is complemented by networked multi-PIR sensors at points of ingress and egress, a 12.1" L-VIS touch panel for local user visualization (also remotely accessible via VNC) and network redundancy by way of industrial Ethernet switches with dual power supply feeds. The main control panel is also dual fed from both UPS and generator standby power systems.

One of the client's primary requirements was the ability to identify failed lamps/ballasts and also to conduct their emergency lighting tests remotely (including result logging and e-mail alerts). This was easily achieved using L-DALI controllers combined with an L-INX automation server to facilitate automatic testing and monitoring of the emergency lighting in addition to the constant super-vision and monitoring of all lamps and ballasts. By using DALI technology and the L-DALI system throughout the installation, it was possible to achieve the required high level of lighting control and management.

The client's engineering team significantly benefitted from this L-DALI solution as a VNC link to the L-VIS touch panel provides them with a remote graphical user interface. In addition, a diagnostics portal is available via the L-DALI multi-master controllers inbuilt web interface. Emergency lighting test results and any system or component fault notifications, (i.e. failed lamp, ballast, or emergency control gear) are reported by e-mail to the engineers across the NAPP intranet. ■
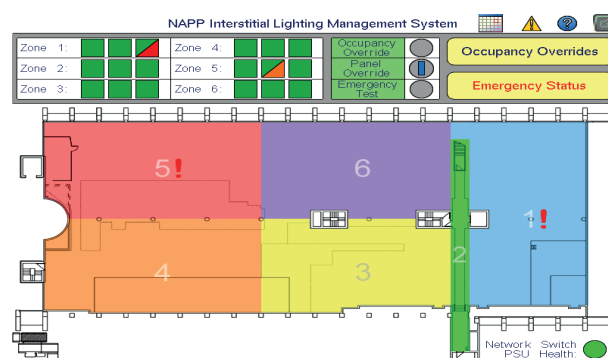
PRODUCT NEWS

01 New LIOB-AIR Controller

Our newly released L-STUDIO AIR VAV system has just expanded its family with two new VAV controllers, the LIOB-AIR2 and the LIOB-AIR13. Both new VAV controllers are fully supported in L-STUDIO AIR and in our LWEB-900 building management system. The new family members are cost optimized versions of the LIOB-AIR1 controller with stripped down functionality for further cost savings. The following table shows the major differences between the three available VAV controllers. The LIOB-AIR2 has a reduced I/O count and no WLAN communication. If space is tight, the LIOB-AIR13 offers an actuator to be mounted separate from the VAV controller, but of course the actuator will be shipped with the VAV controller.

Feature	LIOB-AIR1	LIOB-AIR2	LIOB-AIR13
WLAN	YES	NO	YES
MS/TP	YES	NO	NO
85-240VAC supply	YES	NO	NO
3x 16A relays	YES	NO	NO
Actuator mounting	Internal	Internal	external

02 The new, middle class L-INX

The L-INX automation servers LINX-10x/20x/11x/21x have been revamped and come out in new, even more powerful models, following a simple formula: Old L-INX + 2 = new L-INX. For example, the LINX-110 is replaced by the new LINX-112. The new models provide all features of their older siblings, including CEA-709, CEA-852, BACnet, Modbus, M-Bus, L-IOB I/O, OPC XML-DA, programmable logic, built-in configuration server, backup/restore, remote Wireshark. They are fully compatible in LNS and older backups can be restored.

The new LCD display with jog-dial makes device setup easier. The two Ethernet ports can be operated in switch mode and allow a daisy-chain installation which reduces cabling effort. For enhanced maintainability by IT departments the L-INX has an integrated SNMP server.

The built-in firewall and web interface for installations using HTTPS make the new L-INX even more secure devices. By configuring separate IP networks on the two Ethernet ports, the building automation network on the LAN can be entirely isolated from the visualization on the WAN. An embedded OPC UA server with full-featured certificate authentication is also included. This makes security hardening a simple task.

The new L-INX devices also go on WiFi with the LWLAN-800 adapter. The LENO-80x adapter integrates wireless EnOcean devices. Support for KNX, SMI, ekey fingerprint readers, and custom serial protocols have also been added. They also offer more trend data, more OPC tags, and more OPC clients.

03 MP-Bus

New LOYTEC devices such as the LIOB-AIR Controllers, and the LROC-40x now provide a dedicated MP-Bus port for direct connection of Belimo devices. The MP-Bus protocol appears as a new tab in the port configuration and supports point-to-point mode for one device and multi-point mode for up to 16 devices. The point-to-point mode is the default and provides a zero-configuration interface, such as the LIOB-AIR1 bundled with one Belimo device.

For multi-point mode, LOYTEC devices provide a commission function on the web interface. The data point configuration prepares the Belimo devices with the "commission later" option. These devices can then be assigned to physical devices using the web interface by entering the device serial numbers or by using the auto-address feature, which identifies the Belimo device with a button press. The web interface also allows temporarily disabling and replacing devices.

The Configurator provides an MP-Bus port folder, in which individual device folders for each Belimo device are created. The devices are added by using device templates that are shipped with the software. The device names and descriptions are found again on the web interface. Data points in the MP-Bus device folders are ready to be used in the programmable logic, connections, or by OPC.
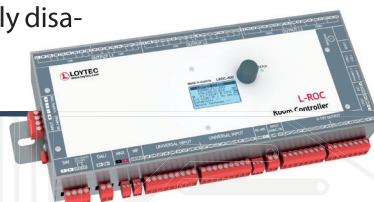
04 The new Universal Gateway LGATE-902

The LGATE-902 is the successor of the well-known BACnet-to-LON gateway LGATE-900. But it's not only a new model number that is fully backward-compatible, both in LNS and for restoring old backups. The LGATE-902 is now a fully universal gateway for all protocols supported by its bigger sibling, the LGATE-950. This includes built-in support for BACnet, LON, Modbus. A new EXT port supports external adapters for M-Bus, KNX, and SMI. The LGATE-902 also goes on WiFi with the LWLAN-800 adapter, and wireless EnOcean devices can be integrated with the LENO-80x adapter.

The new LCD display with jog-dial on the LGATE-902 makes device setup easier. It also comes with two Ethernet ports that can be operated in switch mode and allow a daisy-chain installation which reduces cabling effort. For enhanced maintainability by IT departments, the LGATE-902 has an integrated SNMP server.

The LGATE-902 has security written all over it: A built-in firewall, a web interface for installations using HTTPS, separate IP networks on the two Ethernet ports (LAN and WAN). Using separate networks, the building network can be isolated from the office network. Or the LGATE-902 can connect two isolated building network domains, such as BACnet/IP and KNXnet/IP.

An embedded OPC UA server with full-featured certificate authentication is also included. Together with full LWEB-802 support, it is now easy to get the LGATE-902 on a graphic page. The device also offers more trend data, more OPC tags, and more OPC clients.

High School Halstenbek

WOLFGANG-BORCHERT-GYMNASIUM
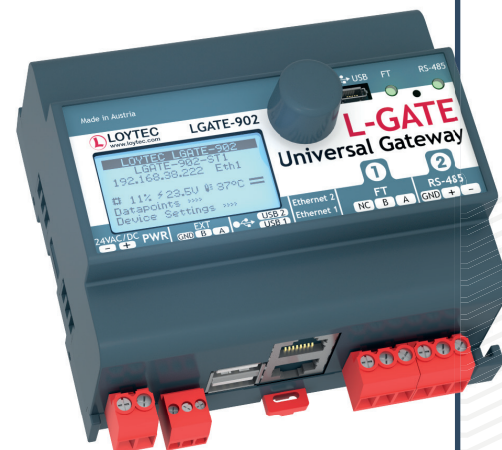
U.Beenck GmbH –
Hanseatic reliable. For

Since 1971, U.Beenck GmbH has been active in measurement and control technology. Things have changed a lot over time, and also the company didn't stand still. Founded by master electrician Uwe Beenck, the initially small company faced a rapid growth and grew up to a company that is well known on the market because of its high demands on quality. After Beenck's withdrawal in 2006, Ralph Schmidt accepted the responsibility as managing director. Since 2009, Ulf Brüggmann, (Dipl.-Ing. FH electrical engineering), who has a long working experience and expert know-how, has been at his side.

Today, the U.Beenck GmbH is an innovative company that combines experience and ingenuity in the best possible way. The company is considered to be a competent partner for the automation of supply systems in buildings, industrial plants, and also on ships.

The family-run business with more than 30 regular employees including apprentices is on a clear course towards future. This is achieved with a young team having the goal – added value from a single source – in mind at any time.

U.Beenck offers services and solutions in the complex field of automation technology. The vast range of services for automation makes the company a "system house" with almost 100 % of service coverage. The extensive offer ranges from project management and software support to construction and switchgear production. In addition, also administrative tasks are handled by the commercial department. Services and product solutions are constantly

Klubhaus St. Pauli

more than 40 Years.

adapted to the latest requirements. This ensures a high availability of the system – including its complex control technology – in combination with an optimum of energy efficiency.

Switchgear cabinet and plant constructions are the heart of U.Beenck GmbH. In their in-house workshop, customized switchgears are manufactured and combined with powerful hardware components and innovative software.

The sound know-how makes the company a reliable and trustworthy full-service provider whose special focus is on having the greatest possible chain of value. Technicians and engineers implement the best possible sustainable solutions in a practical and professional way, transparent and on time. This solutions rarely are the most expensive

with U.Beenck. The holistic view on processes opens synergy effects for the entire project, reducing process costs through all phases.

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U.BEENCK
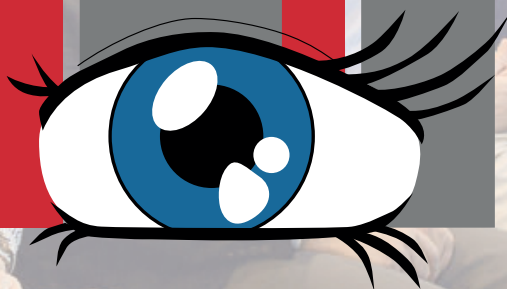
Buildings under Control
Symposium 2015

## Record attendance for our international expert conference

From October 20–21, 2015 LOYTEC hosted the fifth Buildings under Control Symposiums in Vienna. More than 100 attendees from all over the world were greatly interested in the product presentations and the accompanied product exhibition. In addition, expert discussions and networking were high on the agenda.

The kick-off event, the LOYTEC Open House Tour, took place on October 19, 2015 at the LOYTEC headquarters in Vienna. The tour through the building and the production premises offered all attendees the unique possibility to take a closer look behind the scenes.

The following two days offered a colorful and diverse program. The numerous presentations of the LOYTEC product managers about important developments and innovations together with the product exhibition delivered LOYTEC's answers to the challenges of modern building and room automation.

We are looking forward to the next Symposium in 2017! ■
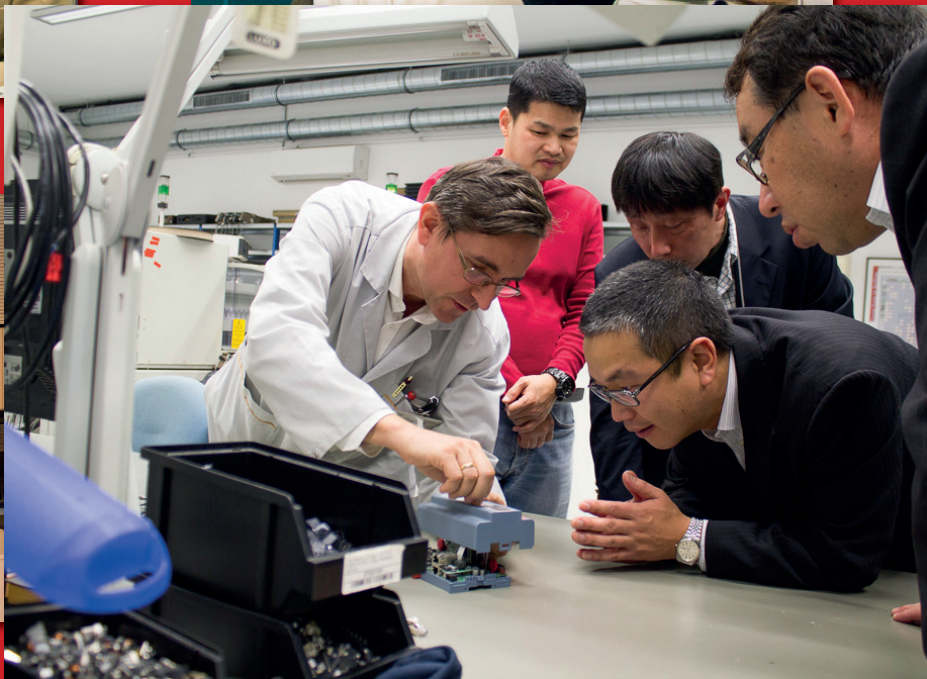
GREENBUILD 2015, Washington DC, USA

Greenbuild is the premier event in North America for sustainable buildings. LOYTEC attended the event from November 18–20, 2015 with the commitment to contribute to energy conservation via efficient and integrated building automation and control. LOYTEC was highlighting its fully dimmable lighting control solution using open protocols. This allows architects and designers the freedom to select from multiple manufacturer products to deliver maximum efficiency and operation in buildings.

Additionally demonstrated was the new control concept which assembles buildings the way architects conceive them. This concept opens the door for architects to better realize how their designs operate from an automation standpoint. Utilizing LOYTEC's L-STUDIO, building control systems are assembled in the manner architects think, starting with the building, floors, areas, through to the automation, meeting the needs of the space. Energy data can be aggregated at all levels for LEED requirements; at the individual space, area, floor, or entire building. Dynamic reconfiguration of the building controls saves resources for TI (tenant improvement) build outs. ■

AHR EXPO 2016, Orlando, USA

From January 25–27, 2016 the AHR Expo opened its doors to a large audience despite the rough weather throughout much of the eastern United States. LOYTEC was part of the event and demonstrated the highest level of integrated building automation.

On display were a full lineup of IP based devices, the highlight being the simultaneous multi-protocol LIOB-AIR VAV controllers. Attendees were very impressed by the large I/O count on the devices, the easy way of generating HTML5 web pages and the possibility of displaying data on the stylish L-STAT network thermostats. Most importantly, attendees were surprised of the ability to rapidly deploy VAV systems with complete system graphics significantly faster than with conventional system methods.

LOYTEC also presented its L-DALI lighting control solution at the show. The HVACR industry understands networked automation. Therefore, understanding the benefits of a full lighting control system and how it provides information and management functionality was easy to appreciate.

On top of that, the visitors received an introduction to LWEB-900. This top level management system was recognized as not only a graphical user interface, but a valuable and flexible operational management tool for their business, providing analytical data, reporting, HTML5 web pages, and fast methods to edit and control large amounts of data.

LOYTEC thanks all visitors who took the time to visit our booth and we hope to see everyone again in 2017! ◼

Parkway Atrium Building Tenant Build-out

FACTS

www.lpc.com

Location	Washington DC, USA
Topology	LonWorks, DALI
Companies involved	Lincoln Property Company
LOYTEC Components	approx. 450 DALI compliant LED lighting fixtures
	4 x LDALI-3E104, 8 x LDALI-PWR4-U, 105 x LDALI-MS1, 85 x LDALI-BM1

The Lincoln Property Company worked on a project to implement a DALI lighting control solution for a 32,000 sq ft LEED (Leadership in Energy and Environmental Design) Commercial interior tenant build-out that is located in a LEED Gold certified building in the Washington DC metropolitan area.

The tenant space has large eastern and southern exposures and the majority of the exterior exposures were to contain the open office areas. In order to take advantage of the natural light exposures the interior offices were designed with glass fronts. Many meeting and conference rooms were also incorporated into the design. A large central break room was designed to be the "hub" of the space to allow for an inviting comfortable area to enjoy meals and socialize during the day.

The LOYTEC L-DALI control gear was specified by the building owner and required all lighting control to be integrated into the existing LonWorks building automation system. The Owners also worked with the design team

to select an all LED DALI compliant lighting fixture package. All private offices, meeting rooms, and break rooms were provided with local dimming control. Open office areas were set up with constant light control. Local energy codes required all spaces have occupancy control.

The DALI lighting system allows for fine tuning of the specified lighting level in all areas and provides the tenants to adjust the lighting level in their work space to suit their desired needs.

A before and after energy comparison was completed and the overall lighting energy consumption has been reduced more than 50 % during occupied hours. ■

L-TRAIN ON TOUR

On September 14, 2015 Norbert Reiter and Jörg Welskop travelled across the pond to our subsidiary LOYTEC Americas, where 13 participants of different partner companies from America, Canada, and Taiwan joined the L-TRAIN training for the VAV-System LIOB-AIR.

The L-TRAIN coaches
left to right: Fred Arnold, Norbert Reiter, Daryl Clasen, Jörg Welskop

LOYTEC Americas Inc.
Pewaukee, WI, USA

Lunchtime at the beautiful Pewaukee Lake
left to right:
Fred Arnold, Sonny Coleman, Gary Dick, Adam Wolfersberger, Richard McClay, Rick Joyner, Jim S. Claire, Joe Lefebvre, Drew Warwick, Francois Fournier, Daryl Clasen, Norbert Reiter, Michael Lee, Robert Zhu, Jörg Welskop.
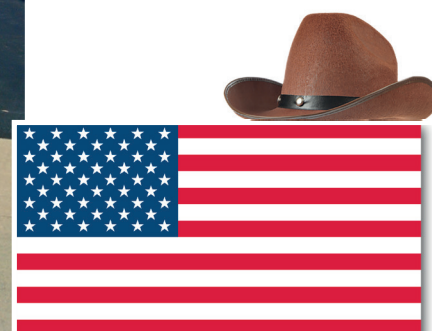
The big LOYTEC Express QUIZ

We celebrate the 10!

The 10th issue of the L-Express customer magazine is produced – this calls for a celebration! It is always a challenge to prepare interesting and informative articles, portraits, and reports. But it's a challenge we love to face. We promise that we will also endeavor in the future to produce readable and attractive content. We would like to thank you, our dear readers, with this quiz where you have the chance to win a fantastic first prize. We will award a stylish 7" L-VIS touch panel in silver (LVIS-3ME7-G1) to the winner that is picked among all correct entries. Please send your solution word to **loytecinfo@loytec.com** by 31st of May 2016. It's definitely worth participating! Good luck!

1) LOYTEC hosted the fifth Buildings under _____ Symposium in October 2015. Which word is missing? 2) LOYTEC shows commitment in the field of wireless communication with a membership of which alliance? 3) Which software is used for programming L-ROC Room Controllers? 4) What's the name of LOYTEC's universal network interfaces for CEA-709 and IP-852 (Ethernet/IP) channels? 5) What is the meaning of the S in AST? Alarming, _____, Trending? 6) Our L-VIS touch panels may be confused with which celebrity? (The name reveals it) 7) On which continent, in addition to America, LOYTEC owns another subsidiary? 8) Also in 2015, LOYTEC is awarded as one of Austria's Leading Companies. Did we receive gold, silver, or bronze? 9) LOYTEC is headquartered in which Austrian city? 10) The LOYTEC lighting control system is based on which protocol?

Win a brand-new L-VIS
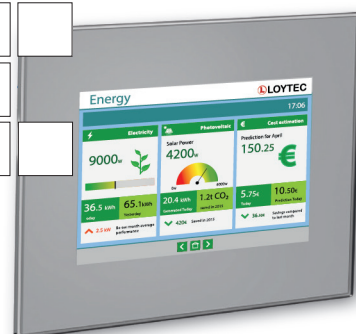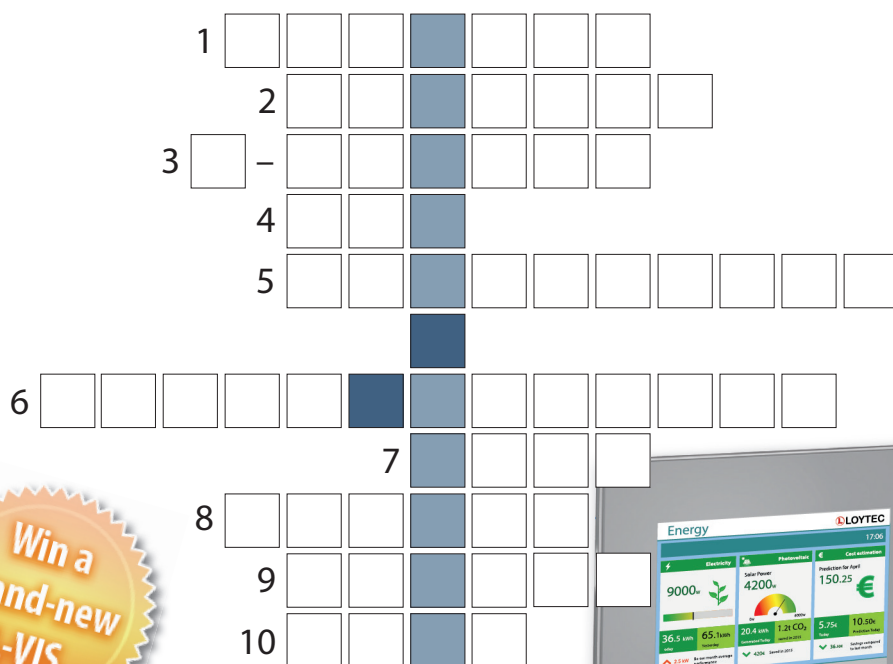
Conditions of participation:
The drawings are made without possibility of recourse to legal action. The prize cannot be paid cash. The winner will be informed in writing. The information collected in the context of this quiz is intended solely for the organizing company and shall not be transferred to any third parties.

LOYTEC's Kitchen ABC

Cutlets in Port Wine Sauce with Herb Bulgur

INGREDIENTS

Veal cutlets
4 veal cutlets cut from the topside
4 tablespoons of oil
2 teaspoons of butter
50 g flour
8 leaves of sage
Salt and pepper

Port wine sauce
1/2 bundle of scallions
2 tablespoons of butter
1 tablespoon of brown sugar
2 tablespoons of dated balsamic vinegar
50 ml red port wine
100 ml red wine
250 ml veal stock (out of a glass)
1 tbsp. of ice-cold butter (for the sauce)

Herb bulgur
150 g bulgur
500 ml vegetable broth
250 g tomatoes
1/2 bundle of scallions
1 bundle of parsley
1 bundle of mint
1 bundle of chervil
2 twigs of thyme
Salt, freshly ground pepper
1 tablespoon of olive oil, cold-pressed
1 tablespoon of canola oil, cold-pressed
Some grated zest of an untreated lemon
1 pinch of cayenne
2 tablespoons of crème fraîche

For the herb bulgur, bring the vegetable broth to a boil and add the bulgur. Cook on a medium heat and allow the rice to simmer for 20 minutes. Wash, deseed and chop the tomatoes into small slices. Wash the herbs, pluck the leaves, and chop them finely. Cut the scallions into thin rings. Mix bulgur, herbs, oil, crème fraiche, scallions, and lemon zest together and season with salt, cayenne, and pepper.

Finely dice the scallions and braise them lightly in butter. Stir in the brown sugar and leave to caramelize. Deglaze with balsamic vinegar, boil it down, and pour with port and red wine. Boil down with medium heat and add the vegetable broth. When the sauce is smooth and creamy, add the cold butter.

Beat the cutlets until thin, season with salt and pepper, and sprinkle one side with flour. Heat butter and oil in a large and heavy pan. Roast the cutlets gently on the floured side at medium heat for about two minutes, then turn it. Add sage, pour with sauce and let all simmer over low heat for about one minute.

Finally, serve the veal cutlets together with the bulgur and the port wine sauce. We wish you bon appétit! ■

„Keeping Promises"
Thomas Zhanel, LOYTEC Sales

Since December 2014, Thomas Zhanel has been enriching the LOYTEC sales department. In his position as a sales person, he mainly serves Austrian customers. Of course, also activities in neighboring countries arise for him, this is not only due to transnational projects but also foreign activities of Austrian companies.

In exercising his business development activities, Thomas observes planned and ongoing construction activities in order to identify a possible potential for the use of LOYTEC technology and he also supports our Competence Partners in the development of their LOYTEC projects. Moreover, Thomas aims on increasing LOYTEC's level of awareness within the real estate industry. Another piece of puzzle in his market observations are planning companies that he informs about news and latest developments. For him, his special challenge in this highly competitive market is to identify those persons that have

„Try to set course towards **LOYTEC**"

decision-making power, and to try as much possible to set the course towards LOYTEC. Of course, his jobs brings a lot of meetings with different personalities. For him, this part maybe is the most exciting part of his job, since he is interested in humans, their background, attitude, and motivation. His philosophy is to follow everything consistently and result-driven.

Consistently, he also pursued his professional career. Thomas laid the foundation for this with his education at an HTL (Polytechnic) in the communications engineering program. After graduating and completing military service, he decided to focus on information technology.

For some years, he has been working as project technician for IT cabling. He was interested in the emerging structured building cabling (Cat.5 – long, long time ago) but also in fiber optic technology. For fiber-optic connections he also

conducted splice and measurement work by himself. By the time, his desire to become a sales person grew. Finally, his former employer Mattig-Schauer provided him with this opportunity and he started to serve Telekom Austria. Several major customers and also ÖBB (the Austrian federal railways) became his clients in the following years. As Thomas accepted the offer to establish the subsidiary of a Swiss company, he became the managing director of Diamond Österreich GmbH that was active in the fields of fiber-optic and connectors. After six successful years, Thomas changed to Kapsch BusinessCom AG where he was responsible for selling facility solutions like safety technology, control station, IT infrastructure, media technology, and IT cabling solutions. After five years at Kapsch and a short performance at PORREAL, where he could gain important insights into the functioning and organization of a construction company, Thomas found his way to LOYTEC. What he particularly values at LOYTEC? "The high level of technical competence and the solution-oriented approach of all employees that ensure that all promises are kept!"

www.loytec.com/training

LTRAIN-LIOB-AIR

Controlling VAV-Systems with LIOB-AIR (2 days)

• Introduction to the LIOB-AIR system
• Adapting device templates
• Creating a complete VAV system
• Using the graphical user interface
• Connection to the AHU
• Integration into BACnet and CEA-709 systems
• Advanced features, examples and use cases

Vienna - Austria	Pewaukee, WI - USA
2016-06-20 (GER)	2016-03-07
2016-06-23 (ENG)	2016-06-27
2016-08-30 (GER)	2016-09-15
2016-10-04 (ENG)	2016-11-21

All trainings are taking place either at the LOYTEC headquarters in Vienna, Austria or at LOYTEC Americas, Pewaukee, WI at LOYTEC Americas Inc. The course offer includes trainings in both German and English language. Additional training dates are available on request. For further information, please contact sales@loytec.com.

LTRAIN-LINX

**Programming the
L-INX Automation Server (3 days)**

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

Vienna - Austria		Pewaukee, WI - USA
2016-04-04 (GER)	2016-10-10 (ENG)	2016-06-06
2016-05-09 (ENG)	2016-11-07 (GER)	2016-09-19
2016-06-06 (GER)	2016-11-28 (ENG)	2016-11-14
2016-09-26 (GER)		

LTRAIN-GATEWAY

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

Vienna - Austria
2016-05-23 (ENG)
2016-06-16 (GER)
2016-09-12 (GER)
2016-11-17 (ENG)

LTRAIN-BMS

LWEB-900 Building Management System (2 days)

• Introduction to the LWEB-900 System
• LWEB-900 Project Setup
• Working with LWEB-900 Views
• LWEB-900 User Management

Vienna - Austria		Pewaukee, WI - USA
2016-03-03 (ENG)	2016-09-29 (GER)	2016-06-09
2016-04-07 (GER	2016-10-13 (ENG)	2016-09-22
2016-05-12 (ENG)	2016-11-10 (GER)	2016-11-17
2016-06-09 (GER)	2016-12-01 (ENG)	

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

Vienna - Austria	Pewaukee, WI - USA
2016-05-02 (ENG)	2016-05-09
2016-06-13 (GER)	2016-12-12
2016-10-06 (GER)	
2016-11-21 (ENG)	

LTRAIN-GRAPHICS

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

• Creating L-VIS and LWEB-803 projects with the L-VIS/L-WEB Configurator
• Creating a distributed visualization based on L-INX and LWEB-803
• Efficient project design using templates

| Vienna - Austria	Pewaukee, WI - USA
2016-05-30 (ENG)	2016-05-11
2016-06-02 (GER)	2016-12-05
2016-10-17 (GER)	
2016-11-24 (ENG)	

LTRAIN-LROC

Room Automation with L-ROC (2 days)

• System design based on a sample project
• Creating the IEC 61499 application for the sample project
• Creating virtual room operating units and using them with LWEB-802/803
• Creating floor plan visualizations
• Integration into LWEB-900
• Parameterization, testing, and debugging the application
• Concepts and features of important IEC 61499 function blocks

Vienna - Austria	
2016-04-18 (ENG)	2016-10-20 (GER)
2016-04-21 (GER)	2016-11-15 (ENG)
2016-09-20 (GER)	
2016-09-22 (ENG)	

LOYTEC
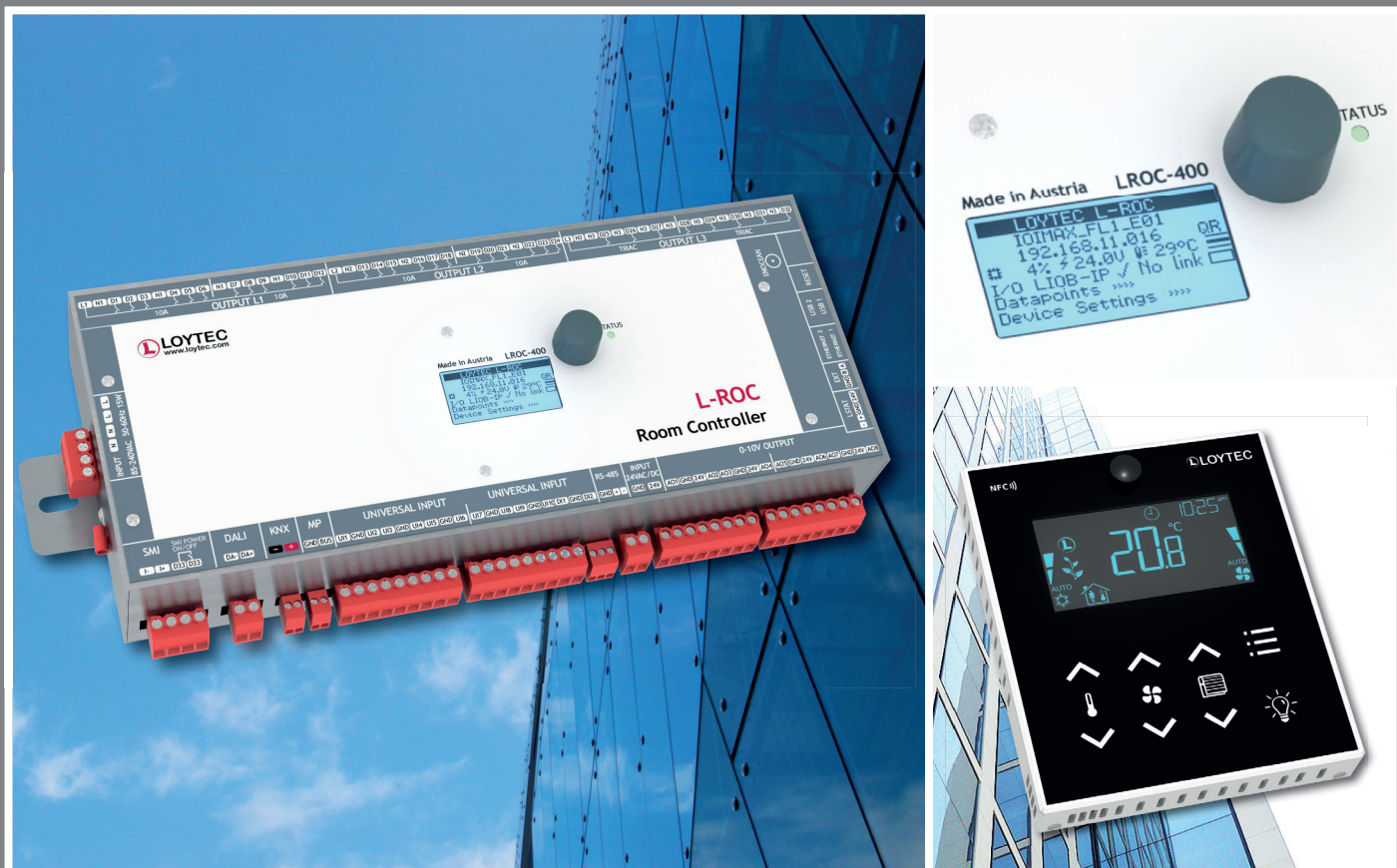
LROC-400

THE ANSWER TO ALL QUESTIONS ABOUT ROOM AUTOMATION.

- Comprehensive room automation applications
- Integrates HVAC, lighting control, sun blind control, and security functions
- Complete function library according to VDI3813
- Define and change room layouts in no time
- IP connectivity at room segment level
- AST™ (Alarming, Scheduling and Trending) for each room segment
- Simultaneously integrates BACnet, LON, KNX, OPC XML-DA and OPC UA, DALI, Modbus, SMI, and EnOcean

- Seamless connection to building management
- Dual Ethernet for low cost cabling
- WLAN via LWLAN-800
- Supports SSL and HTTPS for secure data communication
- Built-in firewall
- Room operation via L-STAT or L-VIS Touch Panel
- Web visualization (HTML5) of customer specific graphic pages
- Stores user defined project documentation directly on the device