LOYTEC Express

Magazine for Building Automation

PRODUCT NEWS:

We present our new L-GATE, L-IP und L-ROC devices

AWARDS:

LOYTEC wins Lux Award with Manchester Airport Project

SUPPORT TIP:

SMI – Standard Interface for intelligent Sun Protection

L-STUDIO 3.0

Complete Building Automation Solution

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MASTHEAD

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

Limitless Integration – a No-Brainer in Technology – but what about the Rest of the World?

Despite or because of increasing wealth in western civilisations as well as many Asian countries, the gap between poor and rich countries is growing. Preservation and protection of former achievements seems to be the major concern and more important than sharing. We are building frontiers in today's world and forget that globalization has been the driving force for our prosperity in the first place. What happened to the days when we were proud of the collapse of the Iron Curtain between Eastern and Western Europe? Political inability has levelled the soil for reordering the world. Fences in Europe, rapid changes in Turkey, Brexit, and Trump's wall in America are warnings of further isolation. What a shame – because the world actually has been on a positive track towards mutual understanding and cooperation. Once again exclusion instead of integration is "en vogue". A very different approach is taken by the technology sector, because here integration has never been at a higher level. Cooperation does the trick!

Integration of trades is the magic formula for more efficient maintenance, optimized operational management, energy savings, increase of comfort, and for value preservations of buildings. With L-ROC room automation, especially with the LROC-400, LOYTEC demonstrates the feasibility of technical integration at the highest level. The Standard Motor Interface (SMI) for sunblind integration is the new feature which we address with a multipage article in this magazine. The Manchester Airport case study shows what light integration in building management and in a flight management system can achieve. Our L-DALI controllers develop their full potential and reward the airports' operators with energy savings of 86% compared to the previous installation. The project even won the Lux Award, a prestigious award of the lighting industry.

Integration was the driving force for the development of our new L-STUDIO 3.0 tool platform. The update to L-STUDIO 3.0 includes support of IEC 61131 programmability in addition to the IEC 61499 standard. This enables system integrators to use event based and cyclical processing of programs within one platform. Likewise, L-STUDIO 3.0 completely integrates data points, logic, and visualisation. Therefore, L-STUDIO 3.0 is the best integrative tool for efficient project management, starting with primary facilities up to the room automation level.

In the world of technology we have found ways towards integration. We want to inspire politicians with that.

Hans-Jörg Schweinzer

L-STUDIO 3.0

The next Step towards extensive Building Automation

L-STUDIO has established itself as an integration platform for the L-ROC system for individual room control installations in accordance with IEC 61499. With the new version L-STUDIO 3.0, LOYTEC is now taking the next step and extending the programming function by a development environment in accordance with the industry standard IEC 61131.

What is L-STUDIO?

Special challenges have arisen for the building automation market over the last few years. The search for energy-efficient operation requires complex control algorithms. At the same time, the comfort for the building's tenants needs to be increased. For regulating primary plants, e.g. ventilation systems, heating control systems or VAV systems, room automation is a relatively young discipline with a regulation of local functions such as lighting, shading and indoor climate. The highest degree of energy efficiency can only be achieved by a functional link-up of primary plants and room automation. Executing companies struggle with considerable cost pressure to offer these systems competitively. At the same time, the largest share of the total costs is attributable to the factor working hours. An essential part of a modern building automation solution is a system that provides tools for the rapid and efficient planning of individual solutions.

Several devices for the automated control of buildings are available. Why do you need another system and what is special about L-STUDIO? The special feature is the comprehensive integration at all levels of the building control system, which enables extremely efficient and cost-effective workflows.

Integration of logic and data points

In L-STUDIO, data points for communication can be stored directly in logic blocks. Functions can be created either using one of the supplied libraries or by the user himself. As a configuration interface, the already familiar L-INX

Configurator was integrated into the L-STUDIO software (see figure 1). The data points are generated automatically in the controller as soon as an instance of the function block for the program is created in the controller. The complete spectrum of LOYTEC's standard protocols (BACnet, CEA-709, Modbus, M-BUS, KNX, EnOcean, SMI, ...) is supported. But not only the data points are created automatically, all automation functions such as alarms, timer programs, trend logs or historical filters, which are specifically defined for these data points, are also generated without further configuration effort.

Integration of logic and visualization

The data points are the backbone for communication in a building automation system – the beautiful face, however, is the graphical visualization through which the end user operates the system. The visualization can be defined si-

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Norbert Reiter is responsible for support, custom applications, and trainings at LOYTEC. In this capacity he has established and developed LOYTEC's comprehensive training programs. He is also an instructor of many training sessions himself, both in-house and abroad. After studying computer technology at University of Technology Vienna, Norbert joined LOYTEC 16 years ago. He made significant contributions to the development of the ORION stack, several software tools and LOYTEC network infrastructure products.

multaneously with the logic functions. For each function block, one or more different "symbols" can be generated. The configuration tool L-VIS Configurator, which is known from the LOYTEC Touch Panels and the software L-WEB, is integrated directly in L-STUDIO. All controls and functions, such as events or triggers, are available in the symbol editor.

By using function blocks, all generated symbols are available in the higher-level blocks and can be combined to form a complete project – both for L-WEB and for the touch displays (see figure 2)!

Integration of room automation, VAV and primary facilities

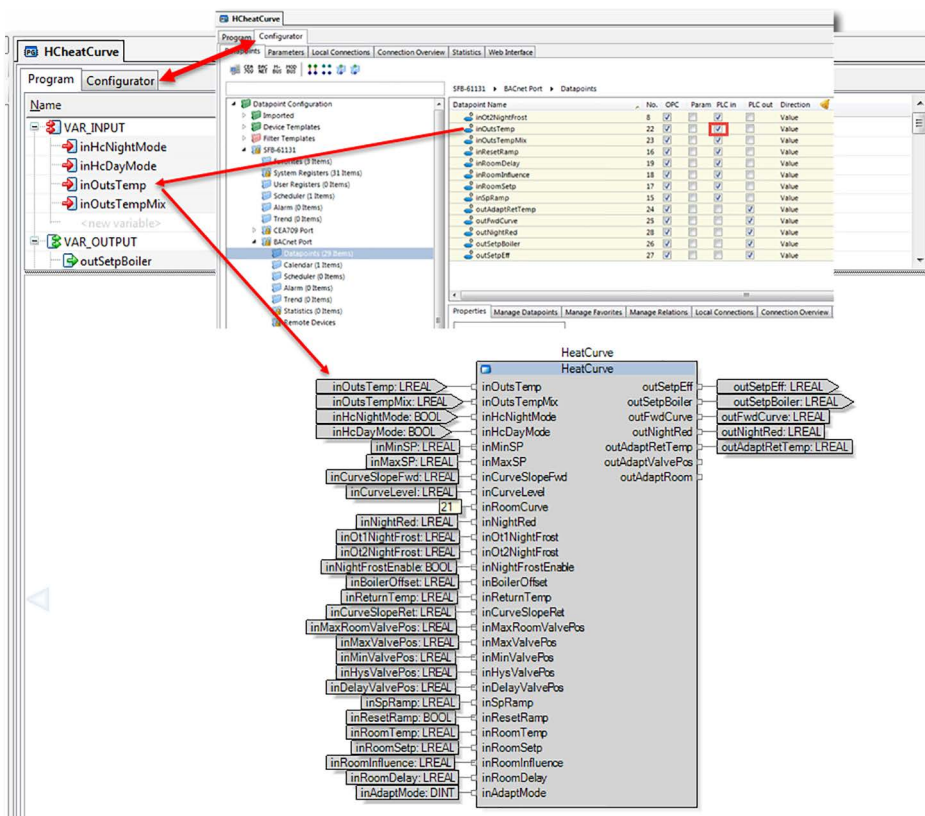The L-ROC library for room automation and the LIOB-AIR library for VAV ▶

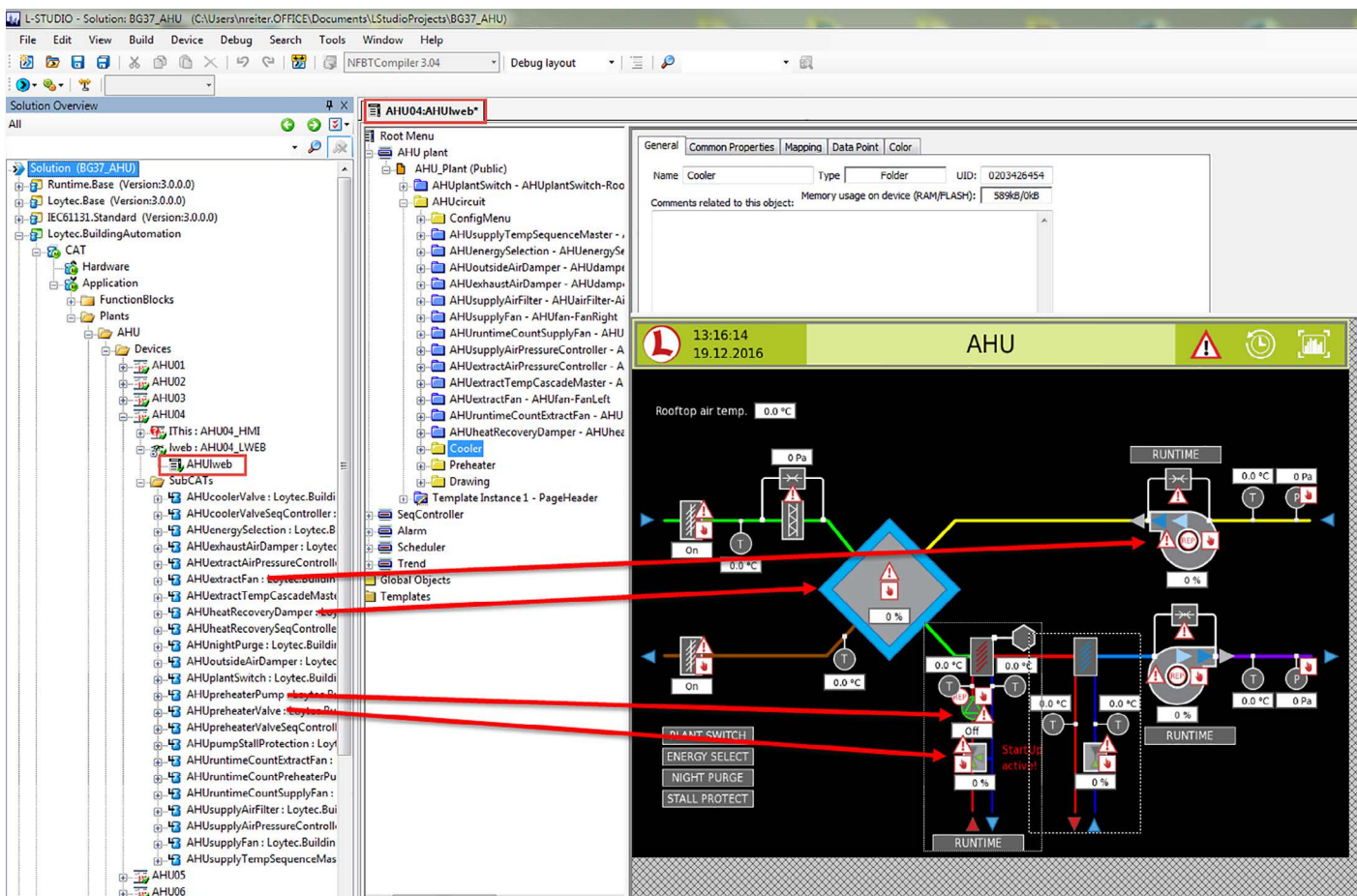Figure 1: Creating data points with the L-INX Configurator Add-In

Figure 2: Using symbols in an L-WEB project

applications based on IEC 61499 have already been presented in previous editions of the L-Express. For the new L-STUDIO 3.0, a comprehensive library for the control of various primary plants has been added. This library was implemented in the widely used language according to IEC 61131. The starting point for the library was the functionality of the library already available for L-LOGICAD. This includes controls for ventilation systems, heating circuits, boilers and pumps. To better meet the needs of customers outside the European market, the scope of the library has been expanded. Now function blocks are also available for fan coil units, chiller, roof top units and water source heat pumps. All function blocks have in common, that for each system an example plant is created as a complete solution, including visualization and data point interface in the form of BACnet objects (see figure 3). When using L-LOGICAD, many customers like to access their own know-how in the control of plants and create their own libraries. Of course, this option also exists with L-STUDIO 3.0. It is also possible to "look" in the libraries created by LOYTEC, and so get ideas for development or copying and changing library elements. Now L-STUDIO 3.0 includes versioning of libraries too. Unlike L-LOGICAD, you do not have to pay attention to maintaining compatibility with existing projects when installing a new library version. In L-STUDIO, each library has its own version management. It is even possible to install different versions at the same time. For each project (solution) you determine which version of the library you want to use. A subsequent update to a new library version is also easy to implement.

Integrated programming of the devices

L-LOGICAD allows managing all programmable controllers of a system in one project. This has the advantage that created function blocks can be used in several controllers. However, each device is managed as a single device. L-LOGICAD does not provide any data exchange beyond the device level. Each individual resource is supplied with the allocated program in an extra step.

In contrast, L-STUDIO is an integrated solution for the entire building system. Not only the individu-
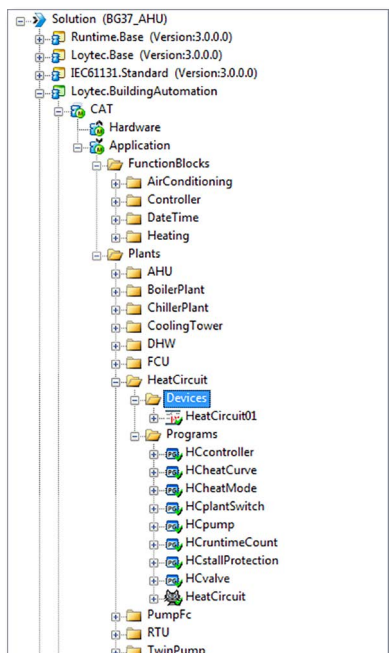
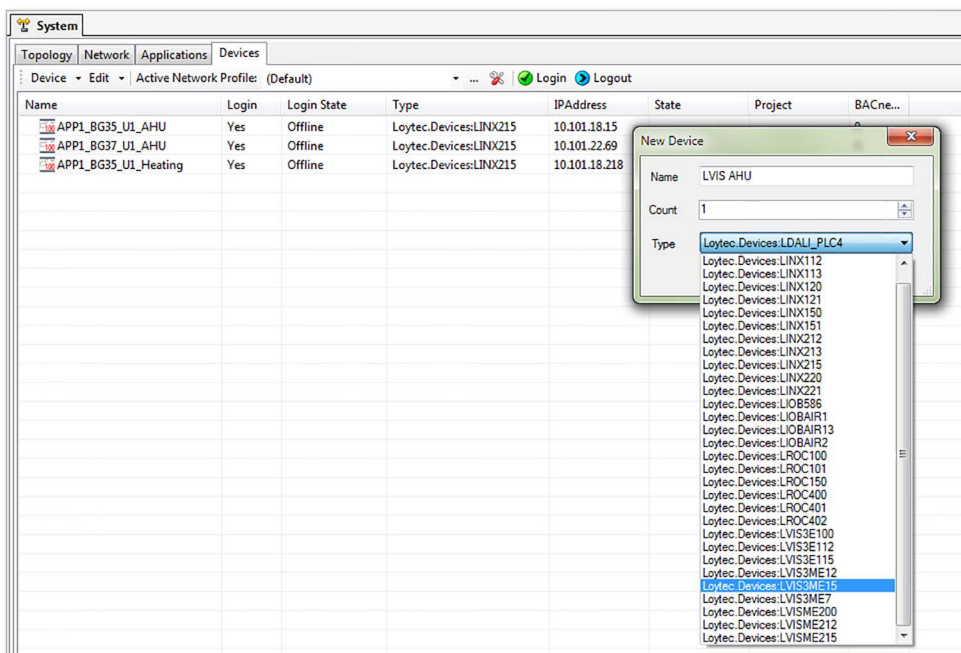Figure 3: LOYTEC Building Automation function library

Figure 4: Managing and loading of devices in L-STUDIO

al controllers are created as resources, but also the data exchange between the devices is defined. As an example, the air volume requirements of all VAV controllers in the building can be collected and returned to the controller of the ventilation system. Data exchange is easily defined through graphical links, regardless of whether the data source and data sink are distributed across a single device or network. In the end, not only the programmable controllers but also the touch panels for system operation (L-VIS) are defined in the L-STUDIO project and the system images defined by the graphic symbols are assigned. Once the project data has been generated, they can be downloaded, deployed in all the devices of the project (see figure 4). This ensures a very efficient and time-saving transfer and guarantees that the overall system is in a consistent state.

Building management: L-STUDIO and LWEB-900 work as a team

In the case of larger projects, a central control system (building management system) is necessary, such as LOYTEC's LWEB-900 system. L-STUDIO projects can be directly imported into the LWEB-900 database. All devices including their configuration are created and saved automatically. Likewise, the graphical projects are loaded and converted from the devices so that they can be used as graphical views in LWEB-900 (see figure 5). When changes are made to the L-STUDIO project, the imported data in

LWEB-900 can be updated in a single step. Special functions on the management level, such as customizing parameters or the management of timer programs and alarms, are adjusted with the LWEB-900 software.

Licensing via USB dongle

The L-STUDIO 3.0 programming environment is licensed via a USB dongle. This ensures that the license continues to function reliably even in case of computer changes or when system updates are necessary. On the controller side, a proprietary licensing algorithm was implemented to enable programming via L-LOGICAD or L-STUDIO. The new LINX-215, LINX-153 and LIOB-586 controllers are programmable with L-STUDIO. If the device is programmed via L-LOGICAD instead, a runtime license has to be acquired. For this purpose, a registration code is generated for a controller which is entered via the controller's website or the LCD display. For existing L-INX controllers (LINX-12x, LINX-22x, LINX-15x, LINX-112, LINX-113, LINX-212, LINX-213) that are programmed only via Logicad, there is the option to purchase an update that enables programming via L-STUDIO.

Modular Online Training

In order to successfully and efficiently implement projects with a new system, a certain amount of training is essential. Therefore, as with the L-LOGICAD programming
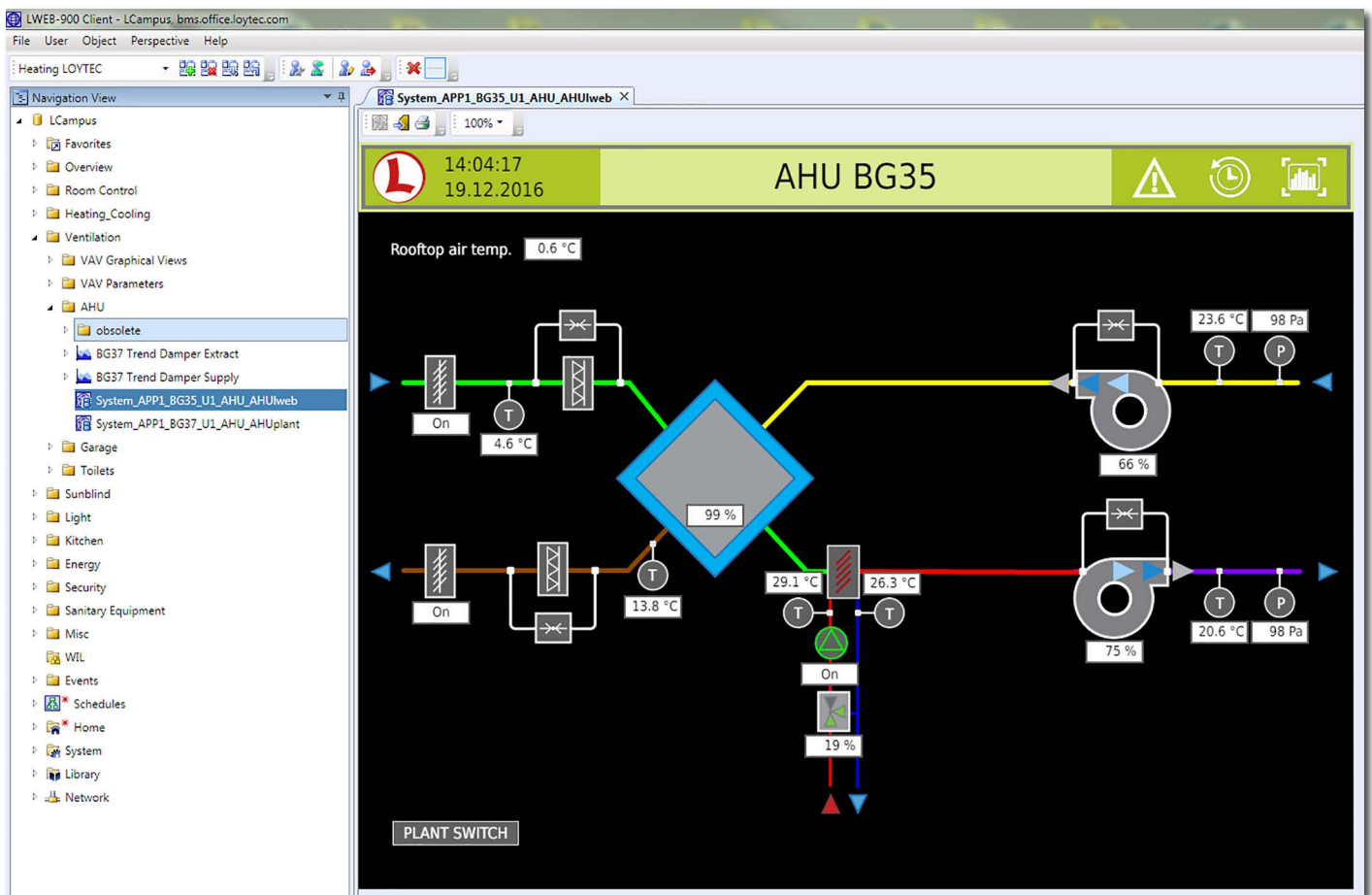
Figure 5: Finished system vizualisation as graphical view in LWEB-900

environment, there will also be a training for IEC 61131 programming with L-STUDIO. For customers who have already worked with L-LOGICAD or other LOYTEC products, there is a major start-up advantage: the creation of data points in the L-INX Configurator, the setting of the data point properties, the configuration of LIOB I/Os as well as the concept of using favorites do not differ from the usual operation in L-STUDIO. Manual synchronization of data points between the programming tool and data point management is no longer necessary, since the LINX Configurator is already integrated in L-STUDIO and all data points are automatically synchronized. It also creates graphical views according to the familiar pattern. All already known controls are available. Compared to working with L-LOGICAD, the new L-STUDIO offers additional simplifications, since the symbol administration eliminates the explicit creation of templates and their derived data point references. The concepts are still the same – however, the software releases the user of the fault-prone management of the references. For all newcomers to the world of LOYTEC products, the

learning of all software components and concepts is, of course, a major challenge. In order to ensure learning outcomes and to reduce the time required for training, the existing training offer is supplemented by modular online training. It will be possible to gather partial aspects independently and to check the knowledge by means of online tests. This allows a certain minimum knowledge to be assumed in the training courses, so that the training courses can be carried out more efficiently and more precisely to ensure the desired training success. This is checked by a test at the end of the training session.

Conclusion

L-STUDIO 3.0 is the next step towards a comprehensive building automation solution that LOYTEC takes. Proven concepts such as data point management and the creation of graphical visualizations are combined in a modern tool platform with programming functions in standard PLC programming languages. With L-STUDIO, you are ready for all challenges in the building automation business! ∎

The Standard Interface for intelligent Sun Protection

Digitalization has also reached the area of roller shutters, blinds, and sun protection systems. Nowadays the requirements for a sun protection system go far beyond "on" and "off". This is why the next logical step was to introduce intelligent control for solar control systems in order to meet the rising expectations. For this reason, leading drive manufacturers have decided to develop a manufacturer-independent standard for the control of roller shutter motors, the standard motor interface (SMI).

The SMI standard is being improved constantly and further developed by a growing number of companies in the SMI task force. The SMI standard defines the commands for the communication information exchange between the actuator and the controller. Compared to conventional drives, SMI drives offer a variety of advantages for sun protection systems.

The biggest difference to conventional drives is that the control electronics is installed directly in the SMI drive. A digitally coded number is sent to the control electronics and the drive moves to the desired position. Due to the uniform implementation of the commands, dependencies on speed and other drive parameters no longer exist. Even the natural wear has no effect on ac-

curacy and allows precise positioning of the blind over the entire lifetime of the drive.

Furthermore, new functions can be implemented using the standard commands which would not be possible with conventional drives. For example, there are commands for reading the current position or diagnosing the drive. The connection between drive and control is made via a

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5-wire cable (L, N, PE, and I+, I- for data transmission). The drive is protected against polarity reversal in the event of incorrect connection. Distances of up to 350 m between controller and drive are possible.

The data transmission rate is 2.4 kbit per second and data can be transmitted in both directions. In addition to standard commands, the transfer of manufacturer-specific commands is possible, too.

By using drive parameters, SMI drives are flexibly configurable and can thus be tailored specifically to individual applications. The format of these parameters is also defined by the standard in order to provide a uniform interface for the configuration.

Up to 16 SMI drives can be connected in parallel. This considerably reduces the installation effort and reduces hardware expense significantly. In parallel operation, the drives are provided with an individual address and are still addressable individually. Drives can also be addressed via a group address. This allows addressing several drives simultaneously with only one command.

SMI solar control systems can also be set up for operation without using any controller. The SMI-Interface has a setup mode through which drives can be activated using simple push buttons.

Products which are developed according to the SMI standard must undergo a certification so that they can use the SMI logo. This guarantees compatibility between products, even if they are not developed by the same manufacturer.

In addition to conventional voltage drives, there are also low-voltage drives which have the LoVo symbol on it.

SMI certified LOYTEC products

The SMI standard is also supported by LOYTEC devices. LOYTEC is a member of the SMI task force. In order to integrate SMI drives as easily as possible, the following products were certified for the SMI standard: LROC-400, LROC-401, LSMI-800, LSMI-804.

The LROC-400 and the LROC-401 have the SMI interface on-board and can be used for the control of a maximum of 16 SMI drives. LOYTEC offers two external interfaces LSMI-800 and LSMI-804. The LSMI-800 allows the connection of up to 16 SMI motors on a single channel via the EXT port of an L-INX, L-ROC, or L-GATE controller. The SMI bus is powered by the LSMI-800. Since the interface

is not galvanically insolated, a SMI LoVo drive cannot be connected to the LSMI-800. The LSMI-804 has four independent SMI channels to which 16 SMI drives can be connected, enabling up to 64 SMI drives driven via the USB port of an L-INX, L-ROC, L-GATE or L-DALI controller. The SMI bus power supply is galvanically insolated with the LSMI-804. This makes it possible to connect SMI high voltage as well as SMI LoVo motors. However, only one motor type may be connected to each SMI channel. In addition, four relays are installed in the LSMI-804, which can be controlled by via L-INX, L-ROC, L-GATE or L-DALI controller and enable or disable the power supply for the individual SMI ports. This reduces the power consumption of SMI drives by more than 140 kWh per year and per channel. The SMI protocol can be activated via the appropriate port configuration of the individual ports (SMI, EXT, or USB).

Create data point configurations with SMI devices

As with other technologies (such as EnOcean or MP-Bus), device templates are used to create the data point configuration. SMI devices are created in the "SMI Port" folder (see Figure 1). The device templates contain all the necessary data points so that the manufacturer-independent functions and parameters contained in the SMI standard can be supported (see Figure 2). The SMI standard also allows manufacturers to implement manufacturer-specific functions and parameters. It is possible to extend these "standard" templates with the required data points as long as the necessary information has been disclosed by the manufacturer. This ensures that drives which are configured for very special applications can also be easily integrated. An extension of the SMI standard with new functions or parameters can also be supported in the LOYTEC device templates. The device templates are supplied together with the configuration tool. If new templates are needed, LOYTEC can create them.

Parameter and calibration of SMI motors

Since each sun-blind differs in its mechanical properties, it is necessary to detect these properties for the most exact control of the sun-blind. For this, there are corresponding parameter data points in the device templates. These include the mechanical slippage, the minimum and maximum slat angle, the slat turn, as well as the upper and lower slat hysteresis. All parameters are given in degrees

of rotation on the motor axis. The Calibration Wizard (see Figure 3) can be used to determine the parameters. It can be accessed via the SMI Commissioning Web Interface by pressing the Calibrate button.

The wizard supports two different calibration methods. Parameters can be entered manually, if they are already known. Via automatic recording of the parameters the user is guided step by step through the parameterization of the drive and can thus very easily determine the required parameter values. If identical drives

Figure 1: SMI port folder

Figure 2: SMI device folder

Figure 3: SMI calibration wizard

and sun-blinds are used, the parameters can be copied to other devices using the calibration wizard. To do this, select the required devices from the list on the right side of the window and then press the "Copy & Save" button.

SMI channels

In addition to the SMI device folders, an SMI channels folder is automatically created as soon as the SMI protocol is activated in the port configuration. The SMI channels folder is used in conjunction with the automatic power supply shutdown. The power on feature has been implemented because blind drives stand still most of the time and therefore it is not absolutely necessary to constantly supply them with power. As soon as a telegram is sent via the SMI bus, the supply voltage for the corresponding port is activated. After two seconds, the switch-on delay according to the SMI standard, communication starts. Before the actual command is sent, the SMI master checks the status of all connected drives. The "motor status" data point (device online / offline) as well as the "error" data point (motor error) provide status information on the drives. After the communication has ended, the supply voltage remains switched on according to the power-off delay time. This

can be set globally for all SMI channels in the SMI channels folder by changing the value of the "PowerOffDelay" data point. By default, 150 seconds are preset. The "PowerOn" data point indicates the current state of the mains voltage (ON/OFF) of the individual SMI channels.

The status of all active SMI channels can be checked on the device information page. There you find information about the functionality and possible device errors. In addition, it can be seen whether the supply voltage of the SMI channel is switched on or not (see figure 4 and 5).

SMI commissioning

A device can be assigned either via a scan of the SMI bus or by using the serial number of the drive on the SMI commissioning web interface (see figure 6). The web interface displays a list of all devices and offers details on the current position, the device status, and how to control the device. The SMI network scan allows scanning all active SMI channels or a single SMI channel. After the scan is completed, all found SMI drives are displayed with serial number, manufacturer, currently assigned address and the SMI channel on which the drive was found. There are buttons next to the serial number which can be used

Power On 17	17	☑	☐	Out	Power on data point for SMI Port 17 (USB-7)	SMI/PowerOn
Power On 18	18	☑	☐	Out	Power on data point for SMI Port 18 (USB-8)	SMI/PowerOn
Power On 19	19	☑	☐	Out	Power on data point for SMI Port 19 (USB-9)	SMI/PowerOn
Power On 20	20	☑	☐	Out	Power on data point for SMI Port 20 (USB-10)	SMI/PowerOn
Power Off Delay	21	☑	☑	In	Delay before power of channel is turned off	SMI/PowerOffDelay

Abbildung 4: SMI Channels

Device Status

✔ OK

L-IOB status	✔ LIOB-Connect ✔ LIOB-FT ✔ LIOB-IP
Port 1	✔ CEA-709
Port 2	✔ LIOB-FT
Port 3	Disabled
Port 4	Disabled
Port 5	✔ SMI 6 (9 devices online)
Port 6	Disabled
LIOB	✔ LIOB-Connect
USB	Disabled

Figure 5: SMI status at device status page

Figure 6: SMI comissioning web interface

Operating with L-VIS touch panel and smartphone
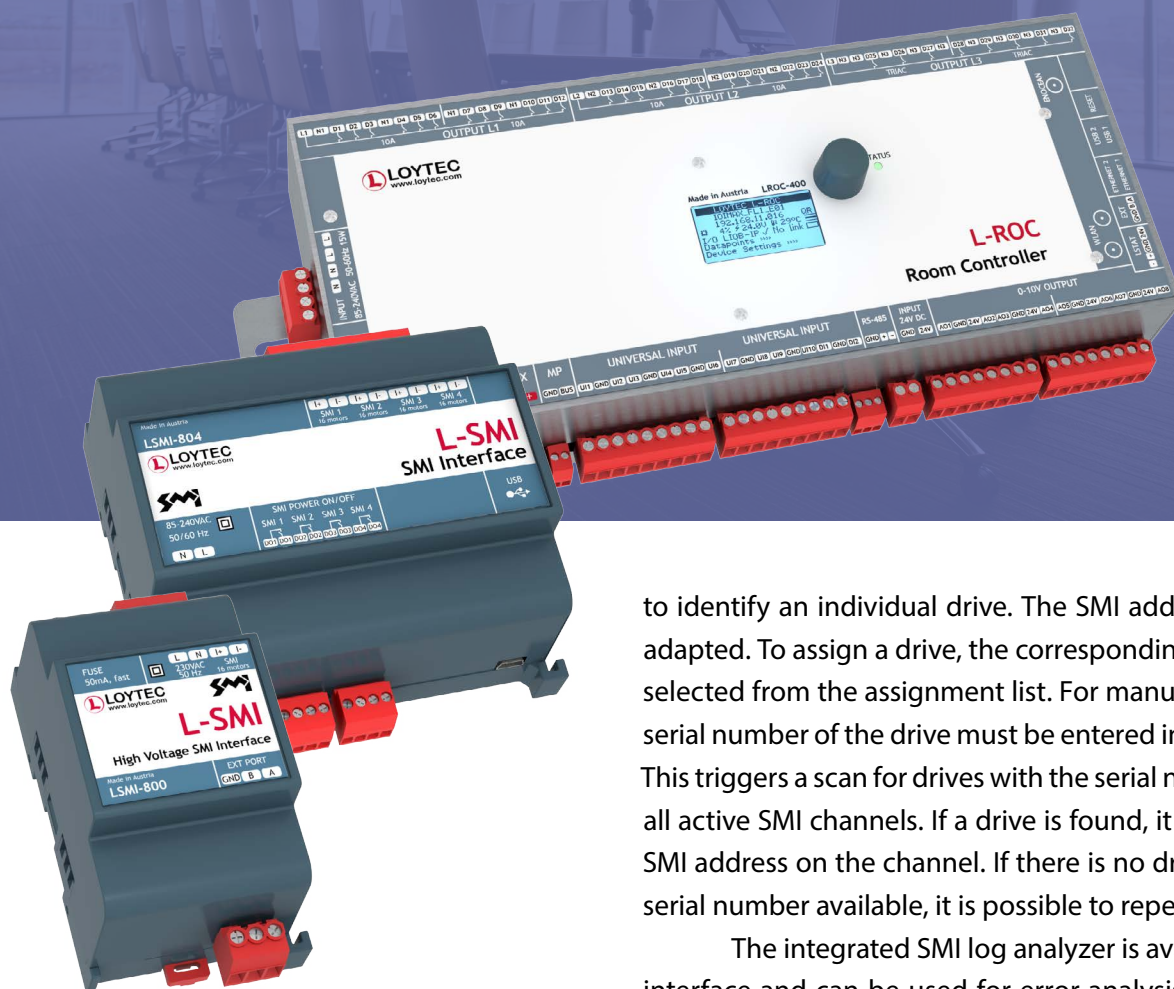
to identify an individual drive. The SMI addresses can also be adapted. To assign a drive, the corresponding device has to be selected from the assignment list. For manual assignment, the serial number of the drive must be entered in the list of devices. This triggers a scan for drives with the serial number entered on all active SMI channels. If a drive is found, it gets the next free SMI address on the channel. If there is no drive with the given serial number available, it is possible to repeat the search.

The integrated SMI log analyzer is available on the web interface and can be used for error analysis. The logs can be downloaded and stored on the PC. There is also an option to activate the debug mode of the SMI master in the SMI Statistics Web Interface in order to receive additional messages in the log files.

Briefly summarized

The new SMI compatible LOYTEC products LROC-400, LROC-401, LSMI-800 and LSMI-804 enable easy integration of SMI drives. LOYTEC device templates can be used to create data point configurations with SMI devices. Due to their flexible design, special manufacturer-specific functions are also supported. Calibration Wizards are a great help to automatically or manually calibrate SMI drives. Furthermore, the LOYTEC SMI interfaces offer a power-on feature, which enables the mains voltage to be switched on or off automatically. This makes LOYTEC devices the ideal choice for implementing automated and intelligent control of sun protection systems in your building. ■

PGA was founded in 1998 and is a very successful and expanding company for applications of state-of-the-art automation technologies. With 40 employees PGA is a one-stop provider for complete system solutions concerning process, industrial and building automation. Substantial professional experience allows us to establish and maintain long-lasting customer relationships.

As a solution provider and system integrator, PGA provides complete building automation system solutions as well as automation and PLC / DDC applications for systems from different manufacturers. Tailor-made equipment is designed and manufactured in-house. Innovative, standardized software technologies are combined with high-performance hardware components. PGA integrates a wide range of systems from different manufacturers in order to ensure homogenous communication from the lower fieldbus level through automation to the management level.

Future-oriented products, systems, services as well as a high level of commitment from all employees enable PGA to work according to the worldwide standards for complete automation solutions with high integration depth. Industry 4.0, digitization and the Internet of Things are a safe working environment for PGA. Highly qualified employees have many years of experience in process design and engineering technology as well as the latest know-how in information, communication and automation technology to meet these high demands.

With PGA you have an excellent business partner concerning initial consultation up to technical management of your systems. ■

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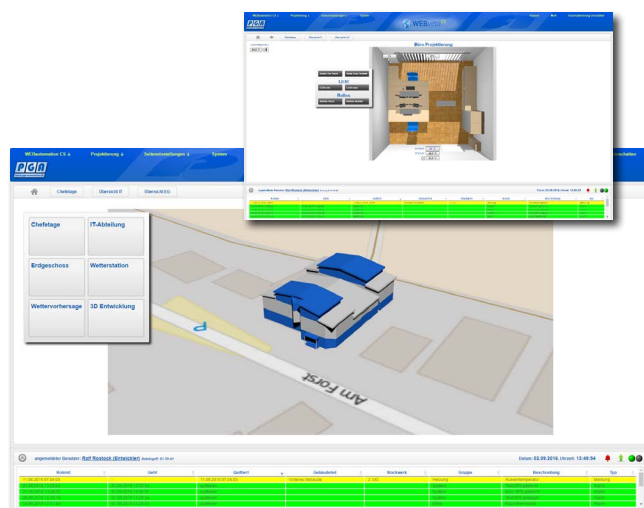
Langestraße 100 in Baden-Baden, Germ

L angestraße 100 in Germany is a newly built 5-star rated design hotel with 130 spacious rooms and suites, a state-of-the-art medical center with 15 medical specialists, an apartment building with 16 flats and a two-storey underground garage with 200 parking spaces.

Close to the Festspielhaus Baden-Baden, Germany's largest opera and concert house, a group of buildings is being developed with a five-star hotel as the central element. It is arranged at a forecourt which is planned to be used for summer gastronomy as well as events before and after performances in the Festspielhaus. The tenant of this new hotel is the well-known group of operators of the internationally celebrated "Roomers" design hotel in Frankfurt. In 2010 "Roomers" in Frankfurt won the "hotel property award of the year".

A main goal of the new "Roomers" in Baden-Baden is to offer the most comfortable place for customers of the hotel and the restaurant, to provide a luxurious lifestyle and relaxation at an international level. The well-known Italian designer Piero Lissoni (Lissoni Associati) implemented the interior visions of the investor as well as of the operator.

F.B. Wagener, constructor and investor, intends to realize a project that fits into Baden-Baden and the surrounding districts of the Festspielhaus. The area emphasizes a favourable development of the district and wants to provide enriching ideas to the town as a whole. ∎

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Fotos: © Piero Lissoni Design

FACTS	
Location	**Baden-Baden, Germany**
Number of nodes	**1000 LOYTEC Components**
Topology	**OPC UA, OPC XML DA**
	BACnet® IP
	Modbus RTU, Modbus TCP
	DALI
	KNX IP, KNX TP
	M-Bus
Companies involved	**Competence Partner: PGA Gesellschaft für Prozess- und Gebäudeautomatisierungstechnik mbH**
	Building owner: Lange Straße 100 GmbH & Co. KG;
	Project controllers : PrOBau Gesellschaft für Projektorganisation im Bauwesen mbH
	Architects: Architecture office KHP in Baden-Baden;
	Architecture Interior-Design: Piero Lissoni of Lissoni Associati
	Specialist planning technical building equipment: KW2 engineers
	Engineering partnership, Rappenstraße 13, 76227 Karlsruhe
LOYTEC Components	**141 LROC-100 Room Controller**
	3 LGATE-951 Universal Gateway
	135 LSTAT-800-G3-L2 Network Thermostat
	260 LIOB-100 I/O Module
	65 LIOB-102 I/O Module
	138 LIOB-103 I/O Module
	25 LPOW-2415B Power Supply
	62 LIOB-A4 L-IOB Adapter
	11 LIOB-A5 L-IOB Adapter
	6 LDALI-PWR4-U DALI Power Supply
	6 LDALI-ME204-U BACnet DALI Controller
	140 LKNX-300 KNX Interface
	6 LVIS-3ME15-G2 Touch Panel
LOYTEC Tools	**L-STUDIO**
	LWEB-900 Integrated Building Management System
	L-VIS Configurator

LUX Awards 2016 WINNER

Manchester Airpor

L-DALI Lighting Solution optimizes E

The LOYTEC systems integrator Calon in cooperation with the company Building Environment Controls integrated a modern DALI lighting system with constant light control and occupancy detection in the Manchester Airport's Terminal 2 already in 2013. In further project stages, the very same lighting control solution has been extended to the public areas of the airport's terminals T1 & T3, with the aim of further reducing energy consumption following the site wide replacement of the existing luminaires to a full LED solution.

The project included the installation of DALI occupancy and DALI daylight sensors in all areas, this coupled with field intelligent processors, would enable lighting loads to be shed when areas were unoccupied. By introducing this level of automation, further energy reductions would be achieved by utilising natural daylight.

Individual control panels are installed locally within the terminal switch rooms; these connect the DALI

control bus to the BACnet based BMS system via LOYTEC L-DALI controllers. The system design not only provides a fully dynamic lighting control solution, but also provides full system monitoring of the energy consumption, device status along with detailed reporting of fault conditions. Information is available down to individual ballast and sensor level. The system design is based completely around open protocol solutions (BACnet and DALI), from sensors to controllers and also incorporates complete flexibility for any future expansion. The lighting controls system is an integral part of the BMS system, providing a full graphical implementation, which is also combined with detailed reporting functions to support the on-site maintenance teams. The system is a fully web-based solution and is therefore available both internally and externally.

In 2014 following successful trials, the BMS system was linked to Manchester Airport's flight information system (Chroma), which provided further energy savings

rt
nergy Efficiency

by the use of dynamic scheduling. Lighting setpoint levels could now be adjusted based on real time flight movements and therefore further maximise the lighting efficiency.

The fundamental principal behind intelligent lighting controls and intelligent building controls is to ensure to use energy as and when required. The lighting controls system powers lighting only when the lighting levels drop below a preset threshold and when there is occupancy presence within these areas. Results are quite impressive, with energy reduction of up to 89 %, totalling to a reduction of 7 GWh of electrical energy (see table below).

In addition, the installed system now provides in depth management information about each individual luminaire, such as installed date, level of dimming, failures and overall energy use. The data provided by this system is a key tool in supporting Manchester Airport's asset optimisation process. ◼

Total consumption in MWh

8338 MWh		Before efficiency measures
3208 MWh		After lamp exchange
1200 MWh		After further savings via automation functions

0   2000   4000   6000   8000   10000   MWh
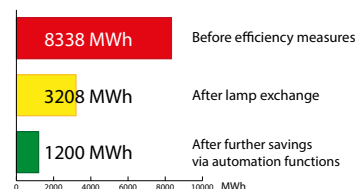
86%
Annual Energy Savings

FACTS

Location	**Manchester, United Kingdom**
Number of Nodes	**Lights > 9500, Multi-Sensors > 1200**
Topology	**BACnet, DALI**
Companies involved	**CALON Building Enviroment Controls**
LOYTEC Components	**85 x LDALI-ME204**

Awarded: LOYTEC receives the Lux Award 2016 for the Project at Manchester Airport

Each industry has an "Oscar", a prize awarded annually for the best. For outstanding lighting products, projects and companies, the Lux Awards are available. The key criteria are innovation and change, which must be actively supported by companies. LOYTEC receives the "Project of the Year" award in the "Industrial and Transport Lighting" category for the ambitious project at Manchester Airport in the UK.

With more than 21 million passengers per year, Manchester Airport is an important traffic hub in the UK, and LOYTEC is demonstrating what the intelligent L-DALI lighting solution can achieve in terms of energy efficiency in this flagship project. At the current state-of-the-art, LOYTEC enables full integration with the existing systems in the building. Details on this project can be found on page 18 and 19 in this magazine.

Managing Director Hans-Jörg Schweinzer enthusiastically accepted the award in London and sees this Lux Award as confirmation for the LOYTEC technology developed and produced in Austria as well as for the implementation of such large-scale projects with the appropriate partners. The course for possible future awards is set as the same L-DALI lighting solution is currently being installed at Stansted airport. ∎

Symposium in Cooperation with the Austrian Association of Hospital Technicians (ÖVKT)

From Control Center to Building Management System

Every year the Austrian Association of Hospital Technicians organizes a technical symposium to offer its members a more detailed look at one topic. "Building automation and associated management systems" has been selected in 2016, currently, many health care organization are working on this subject. Hospitals use several systems from different manufacturers and now have to think about combining these systems. An important step into the future: Visualization is adapted individually to the needs and qualifications of the staff.

The lectures were kicked off by the expert Helmut Zirbs who created a common basis for concepts and definitions. Apart from important basic prerequisites for competent and successful planning in the field of automation, it turned out that an integration planner is almost indispensable. He guarantees the definition, design and function of the interfaces. Maximilian Riegler of MR-Tech gave an insight into the challenges of the implementation of an automation project and highlighted the interests of the actors. After the lunch break, our colleague Thomas Zhanel had the task to keep the participants from their afternoon nap. This has been achieved easily with the aid of LOYTEC technology. He started with the description of the most important trades

sections in room automation, which can be achieved through the L-ROC into a fully integrated automation. Following with a short essay on management systems he described how flexible and customer-oriented a modern solution can be today. Finally, with the help of the LOYTEC visualization tool, Thomas Zhanel pointed out how simple it can be to create visualizations. The participants of the symposium were shown that the user-friendly creation of user interfaces can be done very quickly and flexibly.

Security was a recurring topic during the symposium, driven by the current hacker attacks worldwide. Therefore, it becomes more and more important to use safety functions in building automation systems. For example, this could be done with encryption of the individual data connections in the automation network and security implementation with certification management of automation stations More than 50 participants enjoyed the art nouveau ambience in the "Festsaal" of the Kurhaus in the Otto Wagner Hospital and it became apparent that the requirements and problems in the area of building automation are very similar to many visitors.

With LOYTEC technology, we can actively support our customers in mastering all these challenges. ◼

LOYTEC Meeting Point

On June 23rd 2016, LOYTEC hosted the first LOYTEC Meetingpoint for all their Austrian clients in and around Vienna. The event took place in the LOYTEC headquarters and started with interesting presentations about the LWEB-900 Buildings Management System and the flexible L-ROC Room Automation concept held by LOYTEC product managers. In lively debates between building owners, planners and executing companies, the often very unsatisfactory situations of room automation in der current projects has been discussed. The attendants agreed on the benefits of a fully integrated automation of lighting, heating, cooling, ventilation and sun blinds control, leading to an interactive discussion during the L-ROC lecture. On top of that, specialists and industry colleagues have been eager to exchange ideas and information. The event came to a culinary close with cheese platter and suckling pig followed by a delightful glass of wine. ◼

From January 30 to February 1, the AHR show 2017 opened its doors to a large audience. 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 LI-OB-AIR VAV controllers. LOYTEC also presented its L-DALI lighting control solution at the show. On top of that, 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.

PRODUCT NEWS

01   The new LGATE-952 Universal Gateway

The LGATE-952 is the successor of the well-known universal gateways LGATE-950 and LGATE-951. It basically combines the two variants of RS-485 and EXT ports into one common model. The LGATE-952 has one FT, two RS-485 (one can be MS/TP) and three EXT ports. This is beneficial in several ways: First, no distinction in purchasing needs to be made. Second, this model provides even more flexibility because all LOYTEC protocol interfaces can be used and mixed with this model.

This includes built-in support for BACnet, LON, Modbus. The EXT ports support external interfaces for M-Bus, KNX, and SMI. The LGATE-952 also goes on WiFi with the LWLAN interface, and wireless EnOcean devices can be integrated with the L-ENO EnOcean Interface. This makes the LGATE-952 a one-fits-all device!

And the LGATE-952 features full backward compatibility. That means all backups and data point configurations previously made for LGATE-950 and LGATE-951 can be used on the new model. Easy setup over the LCD display, dual Ethernet ports, integrated OPC server, LWEB-802 graphical views and SNMP maintainability by IT departments are other standard features.

The LGATE-952 has security written all over it: Built-in firewall, a web interface for installation 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. LGATE-952 can connect two isolated building network domains, such as BACnet/IP and KNXnet/IP.

02   The new LROC-102 Room Controller
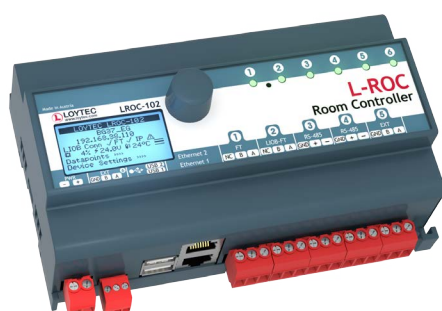
The new LROC-102 is the successor of the well-known L-ROC models 100 and 101. It basically combines the two variants of RS-485 and EXT ports into one common model. The LROC-102 has LIOB-Connect and one FT, one LIOB-FT, two RS-485 (one can be MS/TP) and two EXT ports. This is beneficial in several ways: First, no distinction in purchasing needs to be made. Second, this model provides even more flexibility because all LOYTEC protocol interfaces can be used and mixed with this model.

This includes built-in support for BACnet, LON, Modbus. The EXT ports support external interfaces for M-Bus, KNX, and SMI. The LROC-102 also goes on WiFi with the LWLAN-800 adapter, and wireless EnOcean devices can be integrated with the L-ENO EnOcean Interface.

And the LROC-102 features full backward compatibility. That means all backups and data point configurations previously made for LROC-100 and LROC-101 can be used on the new model. Easy setup over the LCD display, dual Ethernet ports, integrated OPC server, LWEB-802 graphical views and SNMP maintainability by IT departments are other standard features.

The LROC-102 has security written all over it: A built-in firewall, a web interface for installation 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. In the end, the LROC-102 is a perfect replacement for all LROC-100 and LROC-101, which can be deployed by L-STUDIO in one fell swoop.

03 The new L-IP Multiport Routers: LIP-ME204C (BACnet) and LIP-3333ECTC (LonMark)

The new L-IPs run on a fine-tuned hardware that gives even more performance. The LIP-ME204C has four MS/TP ports, is routed to BACnet/IP and can serve a full-blown MS/TP channel. The LIP-3333ECTC offers four FT ports and provides all the standard features of its predecessor, the LIP-3333ECTB, including the built-in configuration server, enhanced communications test, backup/restore, remote LPA protocol analyzer, support for DHCP and extended NAT. Of course, the new models are fully backward-compatible.

The new L-IPs now come with an LCD display and jog-dial, which makes device setup much easier. The two Ethernet ports can be operated in switch mode and allow a daisy-chain installation, which reduces cabling

and BACnet/IP (LIP-ME204C) on the LAN can be entirely isolated from the configuration interface on the WAN. This makes security hardening a simple task. For perfect integration into building management software such as LWEB-900 by LOYTEC, the new L-IP model offers an embedded OPC UA server with certificate authentication. This server exposes important operational parameters as OPC tags. For enhanced maintainability by IT departments the L-IPs provides the same data also through an integrated SNMP server.
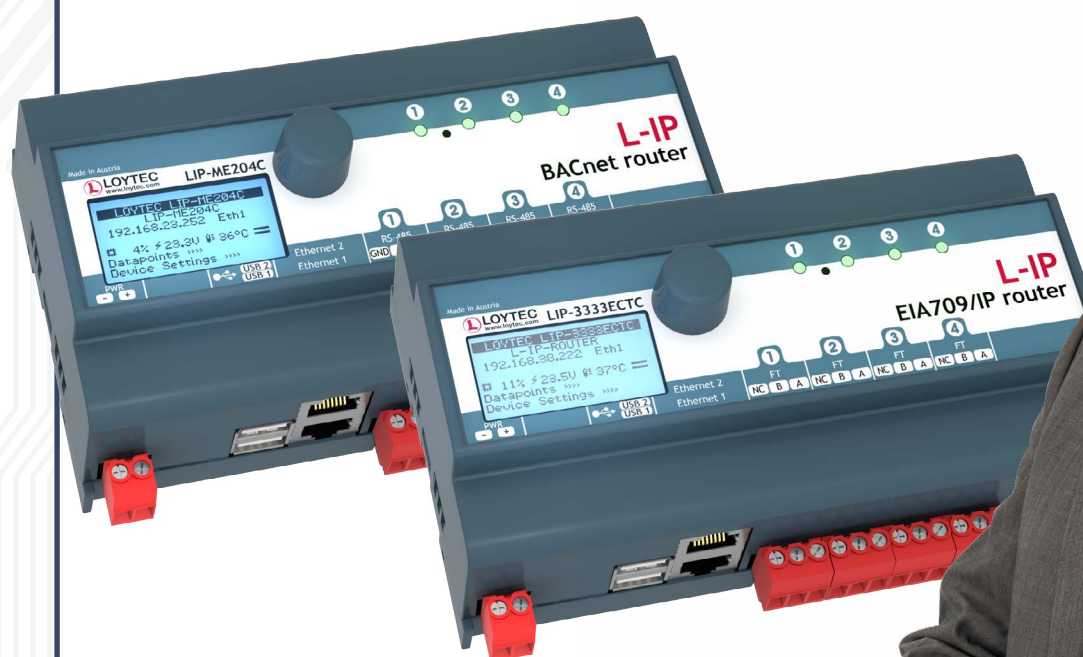
effort. Project documentation can be stored and accessed directly on the Web interface. A Wireshark packet capture can analyze the IP network as well as the MS/TP channels. Together with the LWLAN-800 Interface the new L-IP can even operate on the wireless LAN. The built-in firewall and Web interface for installation using HTTPS make this L-IP model an even more secure device. By configuring separate IP networks on the two Ethernet ports, the building's CEA-852 network (LIP-3333ECTC)

Delta GreenTech and LOYTEC work hand-in-hand on China's next-gen Railway Station

The Foshan-Zhaoqing Intercity Railway opened in China on March 30, 2016, as part of the intercity rail transportation network of the Pearl River delta. The Zhaoqing Railway Station, with a building area of 13,000 square meters, has become an important landmark of Zhaoqing City after its completion.

To meet the demands for an integrated monitoring system at the Zhaoqing Intercity Railway Station, Delta GreenTech (DGC) chose LOYTEC's building management and control solution, which is comprised of the highly expandable single management platform and its automation control solution. Effective integration can be achieved among diverse electrical and mechanical systems, such as air-cooled heat pumps, air conditioning, VRV, ventilation and exhaust, water supply and drainage, elevator monitoring, smart lighting control, and more. This tackles the inherent difficulty of managing the large and diverse

scope of a modern railway station, while optimizing operation and maintenance efficiency. The result is maximum productivity throughout the service cycle of a station as the system is easily tuned at any time according to a customer's specifications.

LOYTEC automation servers have a high integration capability that fully support backbone communication protocols commonly used throughout the industry, such as BACnet, LonMark Systems and Modbus, all of which support IP networking and various bus protocols. Easier equipment maintenance and replacement contributes to lower operation and maintenance costs, while meeting customer needs by incorporating their current monitoring and control systems for sewage drainage and fire pumps.

Coupled with an I/O module, a programmable automation server can integrate data points of the subsystem's equipment and achieve real-time system or equipment ▶
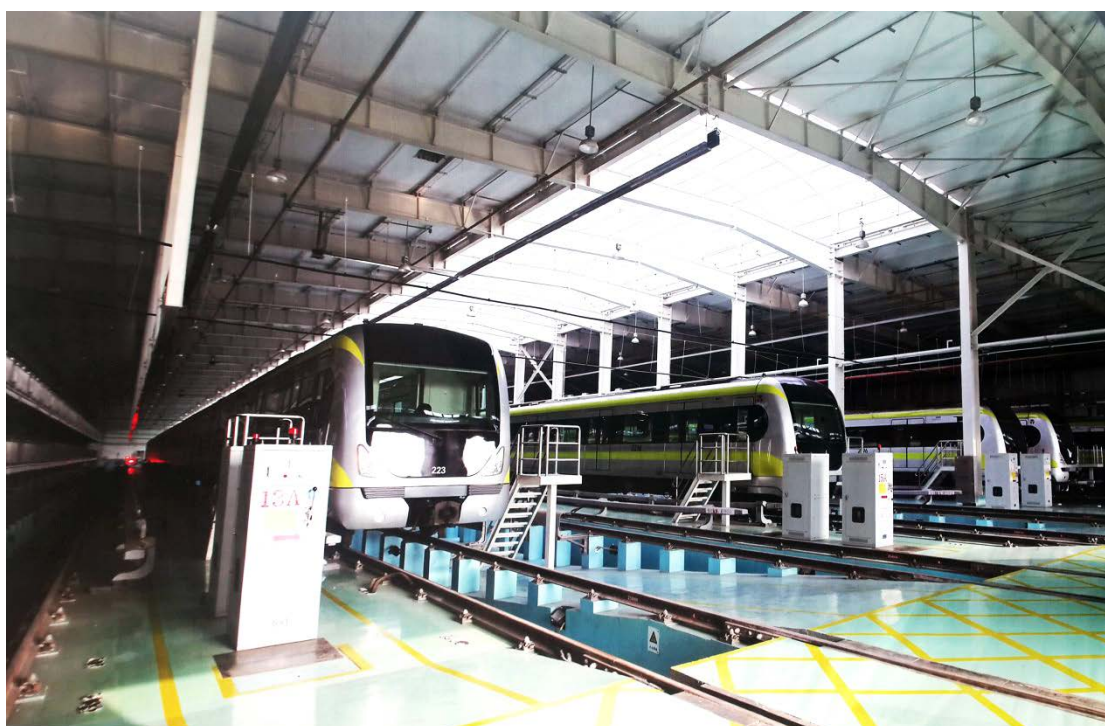
monitoring and control. Automated features, such as preset alarms, scheduler, and historical trends, save on time needed for equipment management. The integrated display screen and jog dial on the controller is a convenient tool for commissioning and maintenance of the system. LOYTEC devices provide a graphical user interface that simplifies complicated setting procedures. Operation and maintenance staff can use a single integrated interface to monitor and control the systems in the station.

The web interface literally reduces the need for personal onsite visits to carry out routine system operation or equipment maintenance. Now, a remote computer client can connect anytime, anywhere, for commissioning, maintenance or operation, and relieve staffing efforts. Multi-station monitoring is now a reality with saves on administrative costs while achieving better management efficiency.

DGC not only provides for the integration of hardware and software, but also offers custom-tailored system planning and consultation based on the customer's requirements. In addition, DGC provides adequate training to ensure that facility managers know how to best use and make the most of the system. ∎

LOYTEC products feature a high integration capability that supports backbone communication protocols commonly used throughout the industry, fully satisfying customer requirements for integration of highly complex monitoring systems.

FACTS

Location	Zhaoqing, China
Topology	LonMark System FT-10
Companies involved	China Railway No. 5 Engineering Group
LOYTEC Components	2 x LINX-121
	17 x LIOB-150
	15 x LIOB-151
	1 x LIOB-152
LOYTEC Tools	L-INX Configurator, L-VIS Configurator, L-LOGICAD, LWEB-803

LOYTEC
A Delta Group Company

DELTA
Smarter. Greener. Together.

Hontai Plaza, Ningbo:

Paragon of intelligent Building Management

Hontai Plaza is an important urban complex that towers amid the sprawl of China's eastern port, Ningbo. Boasting a total construction area of 0.7 Million square meters, the Hontai Plaza is a hub that includes a premium shopping center, 5 A-rated office buildings, 5-star hotel, recreation center, gourmet food market, and leisure facilities that offer fashion and a trendy life style.

As part of the newly developed eastern city of Ningbo, Hontai Plaza's design is "energy efficient, comfortable, green and intelligent". Its effective building automation solution enhances efficiency and reduces unnecessary energy consumption of electrical and mechanical equipment. There is a great deal of electrical and mechanical equipment operating within the confines of the Hontai Plaza. Complicating the issue are diverse devices in distributed locations with large power loads.

Raising the difficulty of project execution are more than 6,300 control points with integrated subsystems, such as for the monitoring and control of chillers, air-cooled heat pumps, boiler systems, VAV, AHU, ventilation & exhaust, water supply and drainage, intelligent lighting, power distribution, and elevators.

The Hontai Plaza incorporates a shopping center, recreation center, art center, and 5-star hotel. All require a central monitoring and control system that can integrate various subsystems vertically, and different electrical control systems within multiple buildings horizontally, while managing indoor air quality, comfort and lighting conditions to ensure consistent high-quality comfort in multiple buildings.

LOYTEC products support BACnet, LON, Modbus and OPC communication standards and more, which allows a rapid integration of diversified systems such as chiller system, elevators, and more on a single control platform. In addition, LOYTEC's solution can readily control a vast

FACTS	
Location	Ningbo, China
Topology	LonMark System FT-10
Companies involved	Ningbo Construction
LOYTEC Components	2 x LINX-121, 17 x LIOB-150, 15 x LIOB-151, 1 x LIOB-152
LOYTEC Tools	LWEB-900, L-INX Configurator, L-VIS Configurator, L-LOGICAD

number of devices across multiple buildings, lowering overall investment costs and saving energy.

Operation and maintenance personnel, per his or her authorization level, can acquire real-time data analysis for operation decisions, and respond in time to alarm conditions, so as to ensure a stable operation. This is made possible by simply accessing the integrated LCD displays on the controllers (local control mode), smart phones, tablets (browser mode) or PC (monitoring mode) for a unified management interface across different client devices.

Delta GreenTech has made full use of LOYTEC's stability features, and the solution it provides for Hontai Plaza's requirements for overall comfort, security, and intelligent control and management. ∎

LOYTEC's Kitchen ABC

Tyrolean Kaspressknödel with Tomato-Ginger-Chili Sauerkraut

Our Chef de Cuisine, Eugen, exclusively tells you his cooking secrets.

INGREDIENTS (for 4 people)

Tyrolean Kaspressknödel
500 g potatoes, cooked and grated
200 g of curd cheese
100 g bread cubes
400 g of grated cheese (gray cheese, mountain cheese & emmental cheese)
1 large onion, diced and stewed
2 whole eggs
Salt
2-4 tablespoons of flour
Nutmeg
Shives
Butter

Tomato-Ginger-Chili Sauerkraut
2 onions, finely cut into strips
2 cloves of garlic, finely chopped
1 teaspoon of ground cumin
3 tablespoons oil
1 pinch of pepper
0.25 liters of vegetable stock
1 pinch of salt
400 g of tomatoes
400 g of mild sauerkraut
1 tablespoons of chopped ginger
2 pieces Red peppers, pitted and cut into strips
Chili to your taste
2 tablespoons of crème fraîche
1 tablespoons of forest honey

Preparation Tyrolean Kaspressknödel
In a large saucepan sauté onion, paprika, ginger, and garlic over medium heat. Add caraway, salt, vegetable stock, chili and tomatoes and then simmer for about 15 minutes. When the vegetables are soft, add the crème fraîche and pass with the bar blender. Add sauerkraut and honey, mix well and simmer for about 15 minutes.

Preparation Tomato-Ginger-Chili Sauerkraut
Boil the potatoes in salt water and let them cool down. Peel the potatoes and add the curd cheese, eggs and bread cubes. Then add the steamed onions and the grated cheese also into the bowl. Now add salt, nutmeg and flour and knead the dough well. Using moistened hands form small dumplings from the dough and flatten them. Do not take too much dough, otherwise the dumplings will be too big. Then fry them in the pan until they turn crisply brown.

Serve the crispy Kaspressknödel and the tomato-ginger-chili sauerkraut with chives and enjoy.

Eugen's TIP: Add butter and oil to the pan. The oil prevents the butter from burning. The butter ensures the full taste.

ENJOY YOUR MEAL!

„A real Asset"
Paolo Laganà, LOYTEC Sales Italy

B ecoming a LOYTEC employee was almost a natural evolution for Paolo Laganà. At the same time, it was a choice that could really benefit both the company and Paolo himself.

Paolo, an electronics engineer, worked in the BMS world since it was frequently mistaken for "home automation" and was often just a concept on paper. Therefore his experience covers all aspects of the world of building automation, from marketing propositions to all the technological developments, towards which he has always shown particular attention. With theoretical knowledge of "open systems" and integration between different automation systems, Paolo gained early hands-on experience as Field Application Engineer of Motorola, dealing with the first Neuron Chip conquering the Italian market.

He worked for years in the LonWork's world as head of the Italian company Echelon. Right from the start he has focused on complete solutions rather than on single devices, and on the need to invest in the introduction and continuous training of system integrators. For this reason, he switched from a product centered policy to a system centered approach, and consequently he invested in many small companies that are an important part of the Italian economy and offer high competence and innovation drive. Subsequently he established himself as a system integrator. He has developed a deep knowledge of all communication platforms, particularly of the open protocols, which became increasingly more important through the support of big companies.

Today, anyone who works in this field knows that BMS cannot disregard IP. For products with "smart grid" infrastructure LOYTEC is the leader and offers a very wide range that can cover all the needs, which includes control and management on PCs, touch panels and mobile devices. For Paolo the strength of LOYTEC's technology is to provide secure remote access via Internet to all the main functions concerning data, information, visualization and storage used in building automation subsystems like HVAC, lighting, shading, access control and energy management.

Paolo Laganà always believed, even in very difficult times, in *over IP's* potential, back when most designers were determined it was impossible, even unacceptable, to use network data and Internet as the backbone of an automation system. Therefore, Paolo was bound to choose LOYTEC's direction. If you take into consideration that LOYTEC devices are open and interoperable, and integrate the most common protocols as OPC XML-DA / OPC UA, LON, Modbus, KNX, BACnet, DALI, SMI, MP-Bus, and EnOcean, you can see the obvious reasons why this marriage between the Austrian company and Paolo could be a perfect one. ■
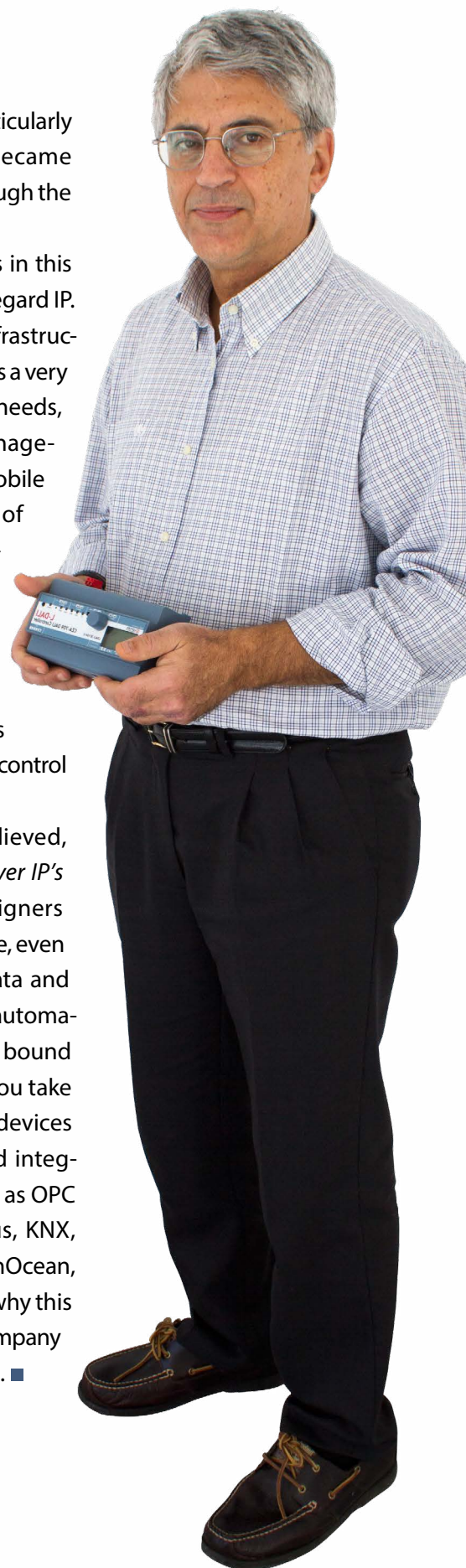
WE OFFER TRAININGS IN GERMAN, ENGLISH, TRADITIONAL CHINESE, AND SIMPLIFIED CHINESE. ADDITIONAL TRAINING DATES ARE AVAILABLE ON REQUEST. FOR FURTHER INFORMATION ON TRAININGS, PLEASE CONTACT **SALES@LOYTEC.COM**.

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 - USA
2017-05-22 (ENG)	2017-04-03
	2017-06-12

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 - USA	Taipei - Taiwan	Shanghai - China
2017-03-27 (GER)	2017-03-13	2017-2-13 (ENG)	2017-3-13 (CN)
2017-04-24 (ENG)	2017-05-01	2017-5-15 (TW)	2017-9-11 (CN)
2017-05-15 (GER)	2017-06-19	2017-8-14 (ENG)	2017-12-11 (CN)
2017-06-19 (ENG)		2017-11-13 (TW)	

LTRAIN-GATEWAY

Gateway Applications and Data Point Management (2 days)
- LOYTEC data point concept
- CEA-709, BACnet, M-Bus, Modbus, OPC XML-DA
- AST™ functions, local and remote
- Building gateway applications with L-GATE, L-Proxy and L-INX

Vienna - Austria
2017-05-08 (GER)
2017-06-26 (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 - USA	Taipei - Taiwan	Shanghai - China
2017-03-30 (GER)	2017-03-16	2017-2-16 (ENG)	2017-3-16 (CN)
2017-04-27 (ENG)	2017-05-04	2017-5-18 (TW)	2017-9-14 (CN)
2017-05-18 (GER)	2017-06-22	2017-8-17 (ENG)	2017-12-14 (CN)
2017-06-22 (ENG)		2017-11-16 (TW)	

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 - USA	Taipei - Taiwan	Shanghai - China
2017-05-29 (GER)	2017-04-10	2017-4-18 (TW)	2017-3-30 (CN)
2017-06-29 (ENG)	2017-06-26	2017-6-1 (ENG)	2017-6-15 (CN)
		2017-7-11 (TW)	2017-8-4 (CN)
		2017-10-31 (ENG)	2017-11-30 (CN)

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 - USA
2017-04-20 (ENG)	2017-03-23
2017-05-11 (GER)	2017-05-22

LTRAIN-LROC

Room Automation with L-ROC (2 days)
- System design based on a sample project
- Creating the IEC 61499 application for the same 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	Taipei - Taiwan	Shanghai - China (CN)
2017-03-23 (ENG)	2017-4-12 (TW)	2017-3-28
2017-04-06 (GER)	2017-5-23 (ENG)	2017-6-13
2017-05-04 (ENG)	2017-7-4 (TW)	2017-8-1
	2017-10-24 (ENG)	2017-11-2
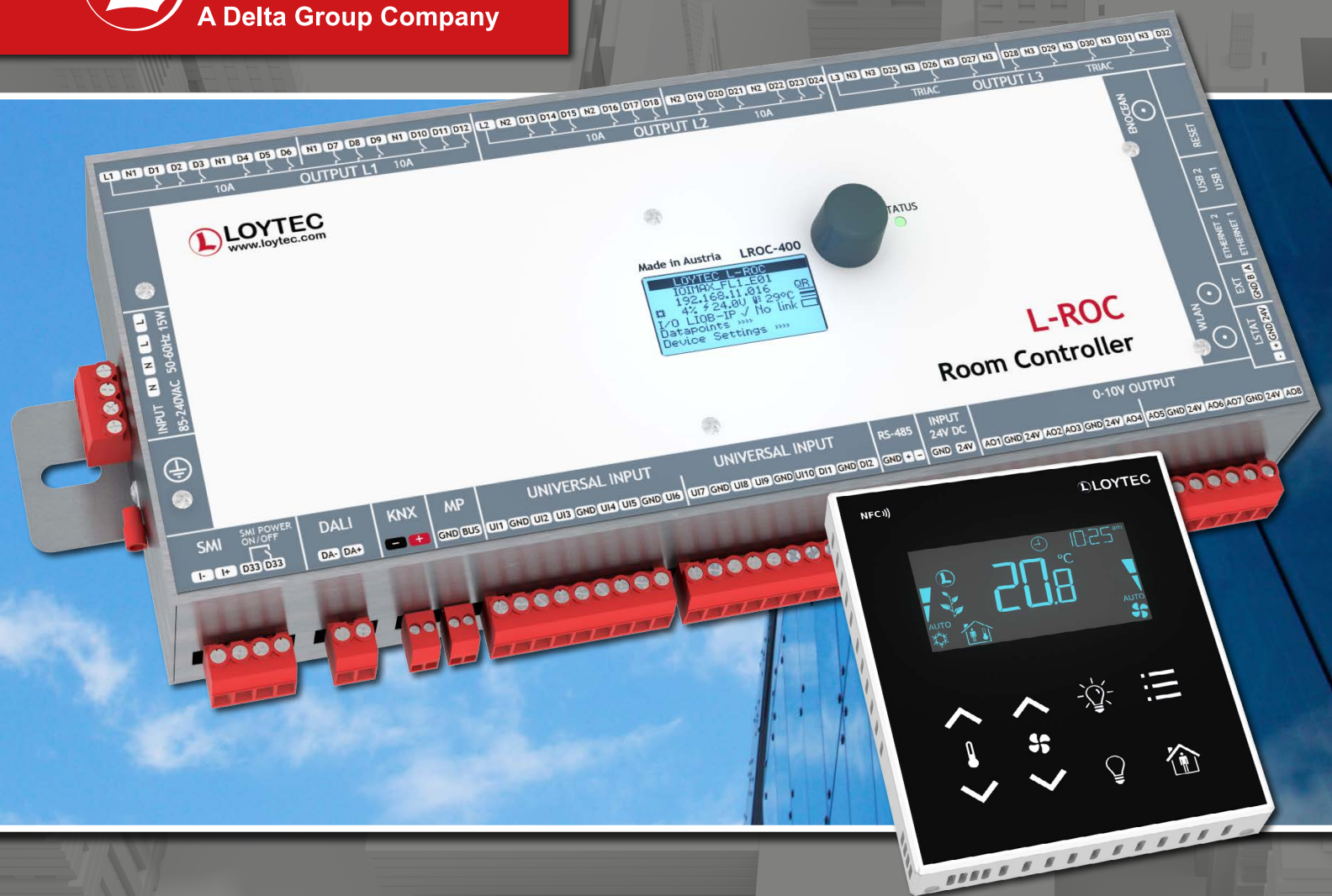
LROC-400 Room Automation.
Save Energy. Increase Comfort.

▸ Integrates HVAC, lighting control, sun blind control, and security functions

▸ Define and change room layouts in no time

▸ IP connectivity at room segment level

▸ Simultaneously integrates BACnet, LON, KNX, OPC XML-DA and OPC UA, DALI, Modbus, SMI, and EnOcean

▸ Room operation via L-STAT Network Thermostat or L-VIS Touch Panel

▸ Web-based room operation via desktop PC, smartphone, or tablet

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