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LOYTEC

Express

Magazine for Building Automation

Guest Author:
Configuration instead
of Programming

New L-VIS Features:
Remote Control by
Touch or Click

Events:
Showtime for LOYTEC

**L-I/OB I/O:
Fast and Versatile!**

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L-IOB I/O: Fast and Versatile!



Guest Author: Configuration instead of Programming



Showtime for LOYTEC: Impressive Performance at International Exhibitions



We Will Manage It Together!

The market for building services engineering will continuously grow six percent per annum until 2020 – says the study “Energy and resources efficiency in property management 2011“ by Roland Berger. That’s good news, don’t you think? Everything will be all right in our industry. Sorry, but that thought is far off the mark!

Roland Berger also draws another picture in this study, a rather alarming one. Upon questioning, building owners and building operators rank facility managers and their own personnel at the top (higher than 20 percent) regarding expertise for energy efficiency in properties. By contrast, suppliers of building management systems end up at the very end of the ranking. Only three percent of building owners and operators acknowledge an automation manufacturers industry professional competence concerning energy efficiency of properties. This is a devastating figure; only building contractors score lower than our industry.

How can that be, I have asked myself, as soon as I read about these results. Our industry generates enormous saving potentials and increases energy efficiency of properties in the long term. Moreover, ROI cycles are short in comparison to other industries. The answer is obvious: Our industry’s marketing presence is poor. The fantastic accomplishments, the automation industry provides, simply are not recognized as consumer benefits by our end customers. We need more public relations and also more lobbying to make politics and legislature perceive our potential. Various associations and also standardization committees work hard, but much time is needed before these efforts become visible.

If our industry will grow the predicted six percent and if we make all efforts for our end customers to recognize us as competent counterparts in matters of energy efficiency, then and only then will our market increase.

As manufacturers we commit ourselves to a better awareness of the achievements of our industry in associations and expert committees. We go to great lengths to achieve together with our partners and customers a competent image with our end customers.

Join us in these efforts, dear customer! If our customers are happy with our solutions, all of us will do well!



Hans-Jörg Schweinzer,
CEO
LOYTEC electronics GmbH



L-IOB I/O: Fast and Versatile!

Dipl.-Ing. Alexander Bauer



Dipl.-Ing. Alexander Bauer
LOYTEC electronics GmbH

As product manager for the L-IOB product family, Alexander Bauer is responsible for the development of both LOYTEC I/O modules and LOYTEC I/O controllers. The NIC and LPA software is also among his competences. After studying electrical engineering and computer technology at University of Technology Vienna, Alexander worked as a scientific assistant at the Institute for Computer Technology for 5 years. LOYTEC has been benefiting from his experience since 2003. Besides his role as a product manager, he lead the FFF research project "TSL - Test- and Simulation Environment for the Network Controller LC709" as well as the FWF research project "HaRTOP - Hard Real-Time OSI-based Fieldbus protocol" at LOYTEC.

L-IOB means LOYTEC I/O Bus and offers a fast connection of inputs and outputs to the automation system. The key word is 'fast'. It refers to all areas of automation like communication speed, response time, installation, test and commissioning, device replacement, project planning and configuration, changing configuration, firmware update, backup and restore. This article covers the L-IOB I/O modules LIOB-10X, LIOB-15X, and LIOB-45X, which either contain a LIOB-Connect port, FT port, or Ethernet/IP interface. By default, the LIOB-15X and LIOB-45X models work as independent, LonMark® certified nodes in a CEA-709 or CEA-852 network. They can however be switched into a special LIOB-FT or LIOB-IP device mode, which – just like LIOB-Connect – offers a fast and direct connection to LOYTEC controllers.

Concept

L-IOB devices contain physical inputs and outputs and are integrated in the automation system via LOYTEC controllers (L-INX or L-ROC). They allow a fast, direct integration of the actuators and sensors needed for room control and the building's technical equipment. All inputs and outputs of the



L-IOB devices are represented as data points in the L-INX or L-ROC device and can be used transparently by the application logic, just like data points from CEA-709, BACnet, Modbus, M-Bus, KNX, etc. It is irrelevant to the application whether an I/O is controlled in a foreign device via one of the supported fieldbus protocols or a local I/O of a L-IOB is accessed directly. This guarantees maximal flexibility for both creating single logic blocks and big automation applications using LOYTEC devices. Various interpretation types allow connecting conventional sensors like e.g. temperature, pressure, humidity, luminosity, wind speed, or energy sensors. Even rather complex algorithms needed e.g. for occupancy sensors or card readers are processed in the L-IOB device, which can then deliver already processed data to the controller. Also with actuators, the L-IOB device contributes significantly to the speed of the whole system by taking over time critical algorithms e.g. for pulse width modulation or sunblind control.

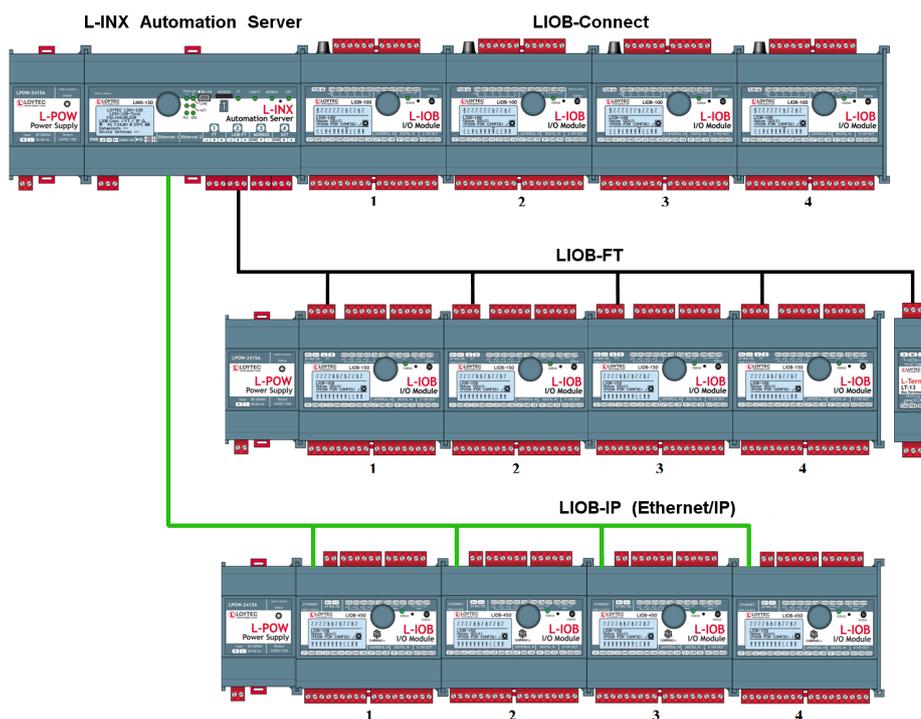


Fig. 1: L-IOB connection schemes

Connection

The physical connection of the L-IOB modules is achieved through the LIOB-Connect system, with an FT transceiver, or via Ethernet/IP. The powerful L-ROC, LINX-X2X, and LINX-X5X controllers contain all three interfaces and offer the direct connection of up to 24 L-IOB devices in any combination. The LINX-X0X and LINX-X1X controllers offer FT and IP interfaces and allow connecting up to 8 L-IOB devices.

Figure 1 depicts all available L-IOB buses, connecting 4 L-IOB devices per bus to the L-INX automation server as an example. With LIOB-Connect, the L-IOB modules are simply plugged into the L-INX devices side-by-side in a row. This ensures both power supply and the communication between L-INX and L-IOB devices, which is optimized for fast processing and short response times. Thus, installation and data connection is done with one flick of the wrist. The logic assignment of L-IOB devices is determined by the order within the device chain. Up to 4 L-IOB devices can be powered by one L-INX device. However, extending this number to 24 L-IOB devices per L-INX device

using LIOB-A2 adapters and L-POW power supplies is no problem either. For overcoming greater distances between controller and I/Os, the LIOB-FT bus or the Ethernet/IP interface can be used as alternatives. Despite the great number of inputs and outputs that can be integrated this way (over 500 per L-INX device), one can rely on fast response times in the sub-second range.

Test and Commissioning

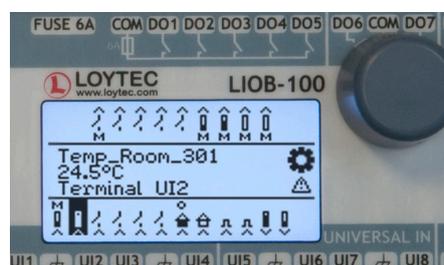


Fig. 2: L-IOB LCD-display

On-site test and commissioning of the I/Os is also fast and easy, with no special know-how required. For this purpose, a manual mode using a jog dial and LCD display exists (Figure 2), which allows testing actuators and sensors as well as simulating sensor values. Further, the status of the L-IOB devices as well as all available I/Os can be checked and manipulated in

the Web-UI of the L-INX device (Figure 3) or the Web-UI of L-IOB devices with an IP interface. As an additional alternative for testing and commissioning, all devices support the VNC protocol, which allows remote control via PCs, tablets, or smart phones.

Device Replacement

The entire configuration of the L-IOB devices is stored and kept up-to-date in the L-INX device. This ensures fast and trouble-free device replacement. In case a L-IOB device is defective, it must simply be disconnected and replaced by the new device, which is then automatically configured by the L-INX device to take over the old device's tasks. No change of configuration is required. Even accumulative values like pulse counts, energy counts, and run hours are automatically transferred from the old device to the new one.

Configuration

'Fast' is also the appropriate term in regard to configuration. All required settings are done at one central point, the LOYTEC Configurator, which is also used to program and configure all LOYTEC controllers. With LIOB-Connect, the L-IOB devices are simply added to the L-INX configuration according to their physical order. Using LIOB-FT or LIOB-IP furthermore requires assignment of station IDs. The LOYTEC Configurator automatically creates all needed configuration properties and data points of the available inputs and outputs, as shown in Figure 4.

Because of the variety of interpretation modes, a large part of processing is done in the L-IOB device itself, which again simplifies configuration significantly. For connecting an occupancy sensor for example, one must only choose the mode 'Occupancy' and setup the corresponding times ('Hold Time' and 'Debounce Time') according to the application. In the application logic, the occupancy signal is then ready-to-use without any further pre-processing required.

Device templates and I/O object templates

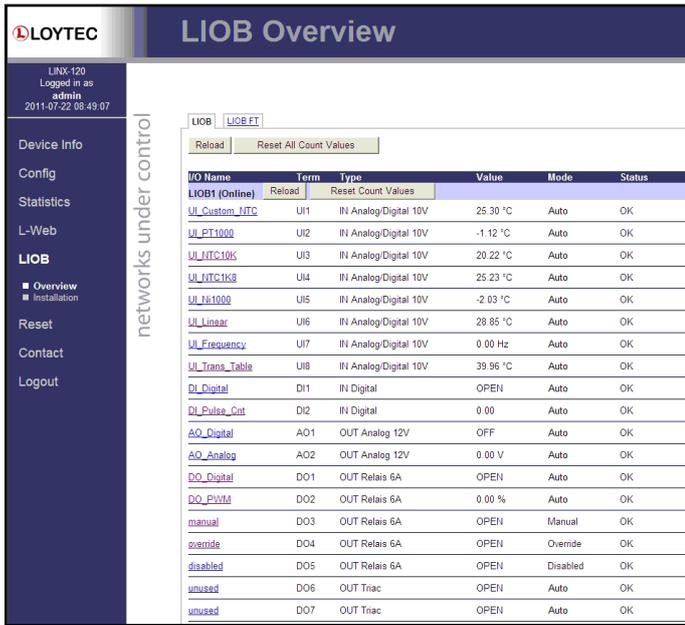


Fig. 3: L-IOB page in Web-UI

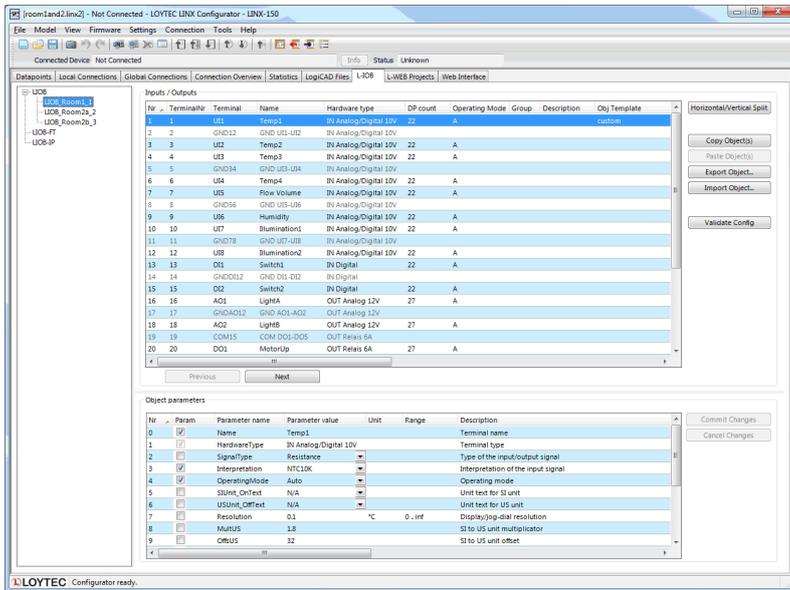


Fig. 4: L-IOB configuration

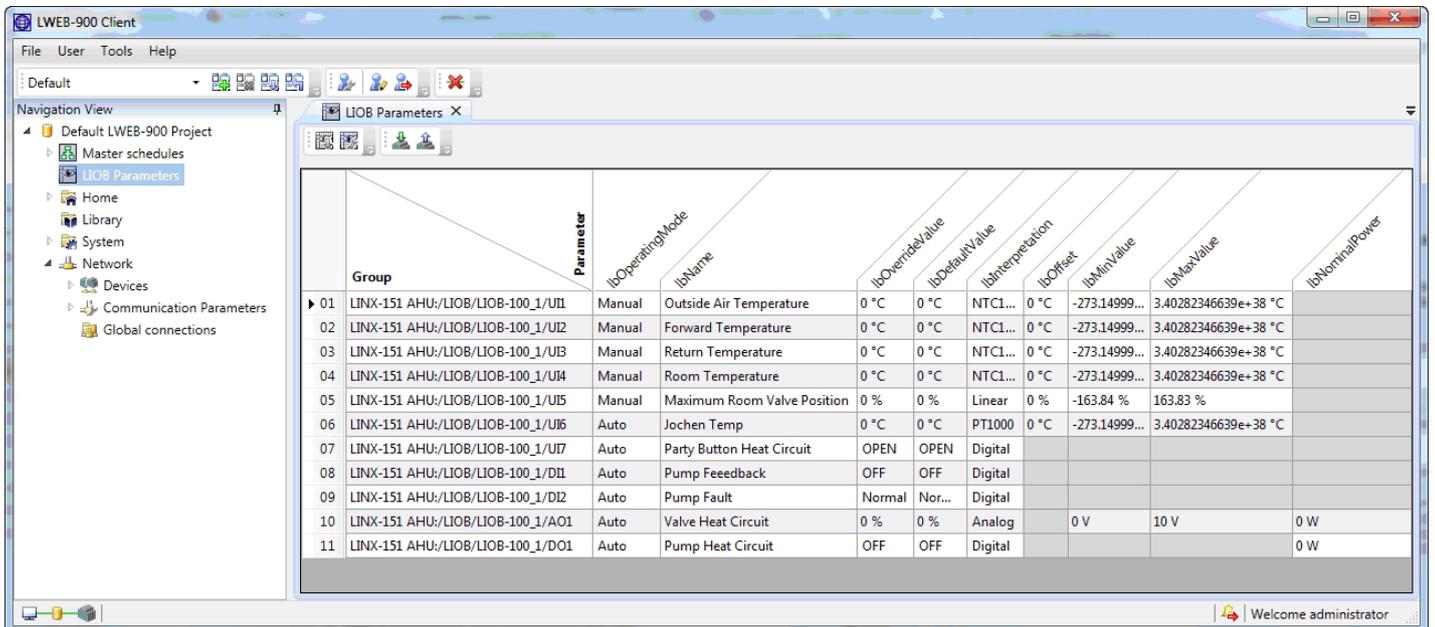


Fig. 5: L-IOB parameters in LWEB-900

further help to speed-up the configuration process. Often used I/O configurations and combinations can be retrieved anytime and also re-used in follow-up projects.

L-IOB and L-WEB

With LWEB-900, which was presented in the last edition of L-Express, LOYTEC offers a comprehensive building management system, which of course also supports L-IOB devices. It helps performing tasks like change of configuration, firmware updates as well as device backup and restore in a fast and straightforward fashion. Figure 5 shows the parameter view of LWEB-900, which allows changing all L-IOB configuration parameters of an automation system at runtime. The simultaneous modification of parameters for different inputs and outputs is possible too, even beyond device boundaries.

The device configuration part of the LWEB-900 software allows automatic, scheduled backups of the L-IOB configurations as part of the L-INX or L-ROC configuration. Further, the software notifies the user in case of new firmware versions and provides a centralized update of all L-IOB devices.

Conclusion

The L-IOB I/O modules presented in this article offer speed on all levels of automation technology, from small response times in the automation level to the speed of changing configurations at runtime. All other models of the L-IOB product family, like e.g. LIOB-18X and LIOB-48X controllers, offer these advantages too. Regardless of the model you choose, with LOYTEC L-IOB devices you always choose the fastest solution.

www.loytec.com/liob

LOYTEC Distributor Vedotec: Free and Sharp-eyed like a Bird

“There is a reason why we show a flying bird in our logo”, Piet van Veelen tells LOYTEC Express. “It symbolizes the way we work. The bird stands for freedom, the freedom to fly and for sharp eyes. While flying, the bird has a wide open view, a perfect and complete overview, and at the same time misses no detail on the ground because of its sharp eyes. To Vedotec this picture means that on

the one hand we have a complete overview of the market while on the other hand we don't overlook the individual customer with his needs.”

Piet van Veelen's company Vedotec was founded in 2002, starting in Piet's home place. Three years later the first move to a bigger building took place, 2011 the move to the current even bigger location, which is already under reconstruction right now to give more room to a better support. Vedotec aims to be THE supplier of components and technology for the building automation market in the Netherlands and Belgium. “We do this with a high scale of service, reliability, know-how, accountability and on a high ethical level,” Piet assures.

At the moment ten international brands are represented by Vedotec, among them LOYTEC since March 2012. Vedotec addresses all the bigger system integrators and system suppliers, like Honeywell, Johnson Controls, Celsius Benelux, Imtech, Cofely, Vibuco and several others, too. The company is proud of ever increasing turnover figures annually since 2009, what should culminate in doubling turnover between 2011 and 2015 according to the business plans. Among the major projects supplied by Vedotec is the Equinix data center, actually one of the biggest data



centers in Amsterdam, having 34 LOYTEC redundant L-IP routers granting 200 percent security at its disposal.

Piet started in the field of industrial automation. Soon he found out that the market for HVAC, climate control and building automation was much more of interest, so he switched over. He is a typical self made man, studied technical engineering, electronics, marketing, industrial sales, German at the Goethe Institute, PLC and SCADA programming, higher management “and some others”. During his professional life he gathered a wide wealth of experience in various positions as sales manager, product manager, account manager and sales director until at the age of 47 he really got started and founded his own company – Vedotec. Apart from his four children and six grandchildren his biggest success until now...!



www.vedotec.nl



New L-VIS Features: Remote Control by Touch or Click

Dipl.-Ing. Norbert Reiter



LOYTEC's L-VIS Touch Panels can be used as freely configurable, graphical displays to monitor and control automation systems. For many years there is an integrated VNC server available, that allows remote access to the panels over an Ethernet connection. The latest firmware revision extends the remote access feature by adding OPC XML-DA server and client functionality. This article presents the exiting possibilities of the new features and gives some tips about the configuration options.



Dipl.-Ing. Norbert Reiter
LOYTEC electronics GmbH

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

Remote Access Using VNC

The L-VIS Touch devices feature an integrated VNC server. The VNC protocol (<http://en.wikipedia.org/wiki/VNC>) is an open protocol that is frequently used to view content of remote devices on a local screen. User inputs from keyboard or mouse are forwarded to and executed on the remote device. The L-VIS devices can transfer their complete screen content to a VNC client. Remote mouse control is executed on the L-VIS panel like a local touch input on the screen. To use VNC on L-VIS, the server can be simply activated in the project settings (Fig. 1). Additional configuration options allow limiting the number of concurrent VNC connections as well as setting a password to restrict the access to the VNC server. In the L-VIS project, a dedicated system register ("Remote Sessions") holds the number of currently established VNC connections. This register can be used to inform the local user of ongoing VNC connections. It can also be connected to a data log object in order to record the VNC access history

in the L-VIS device. The big advantage of the VNC access is its easy configuration – the feature simply is activated in the project settings, there are no further steps required. In addition, lots of VNC clients are available free of charge for any PC based operating system and also for smartphones and tablet computers. Accessing the L-VIS device over a VNC connection is a true remote control of the device. This means, that any user input acts like a local input on the touch screen, so that the local screen flips between pages and replays the touch and selection sounds. This sometimes can confuse people who are physically in front of the screen and want to execute local operations.

The VNC access transfers the screen like it is presented on the local touch display. It is not possible to adjust the project for other than the native screen resolution of the device. But especially for the initial device configuration, it turns out handy to see and operate the new project without being in front of the L-VIS panel.

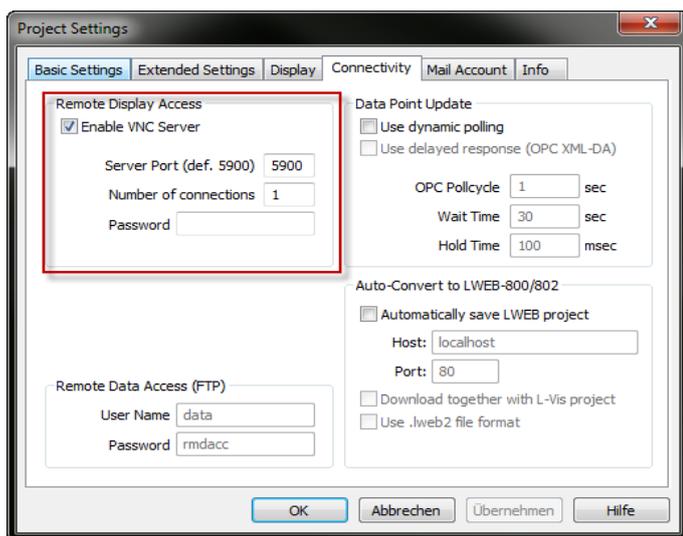


Fig. 1: Activation of the VNC Server

L-VIS - the OPC XML/DA Server

LOYTEC's LWEB-800 and the new LWEB-802 visualization also uses the L-VIS Configurator to create projects. It provides the same graphical and functional feature set like the L-VIS Touch Panels. The main difference between the two visualization solutions is the access to the data on the network: L-VIS Touch Panels are native BACnet or CEA-709 devices that use Network Variables or BACnet objects to communicate on the network. The L-WEB 800/802 visualization cannot directly access the data on the network, but it implements an OPC XML/DA client that uses an IP connection to exchange data with one or multiple OPC XML-DA servers.

The OPC XML-DA server is responsible for reading data from the attached bus and providing data on the system independent OPC level. Up to now, this function was only available in the L-INX Automation Servers, but the latest firmware revisions also

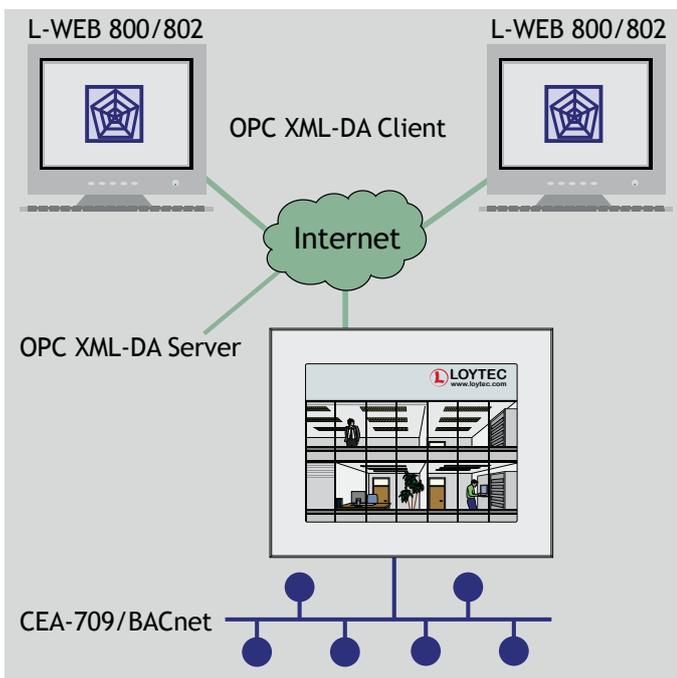


Fig. 2: L-VIS - the OPC XML-DA Server

integrated this into L-VIS and L-GATE devices (Fig. 2).

How can you benefit from the new L-VIS firmware features? In short: now you can place L-WEB projects on the L-VIS Touch Panels like on L-INX Automation Servers and view the projects using the LWEB-800 software or in a Web browser with LWEB-802. The L-VIS then accesses the network data points on the CEA-709 or BACnet network and presents the values on the built-in OPC XML-DA server – just like the L-INX Automation Servers. The most interesting point is that the project configura-

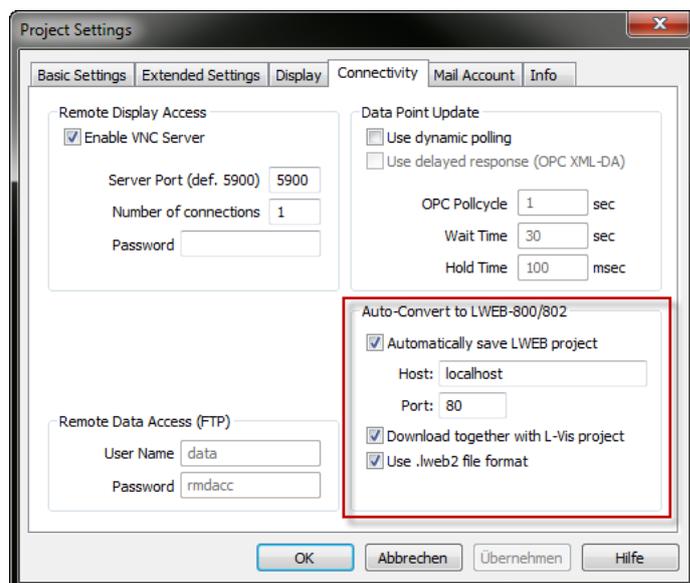


Fig. 3: Automatic generation of LWEB-800/802 projects

tion – this is, the graphic elements, the data points and the connections – are automatically generated out of the L-VIS project. All required information is already done for the L-VIS project, the L-VIS Configurator can automatically replace the Network Variable or BACnet Object data points with their respective OPC data point equivalents.

This function is enabled via an entry in the Project Settings: open the Project Settings dialog, switch to the “Connectivity” tab and check the “Automatically save LWEB project” option (Fig. 3). In addition, the IP address of the L-VIS device must be specified. Additional options allow selecting an automatic download of the L-WEB project to the L-VIS device and to generate the L-WEB project in .lweb2 format, so that the project can also be loaded by the LWEB-802 browser visualization. Now the L-VIS device can be accessed by the L-WEB 800 software like a L-INX Automation Server. Other than with VNC, the visualization via LWEB-800/802 is independent from the local screen – the remote control is not visible on the display. Fig. 4 shows the same project in a VNC connection and in the L-WEB 800 software.

Support Tip

L-VIS - the OPC XML-DA Client

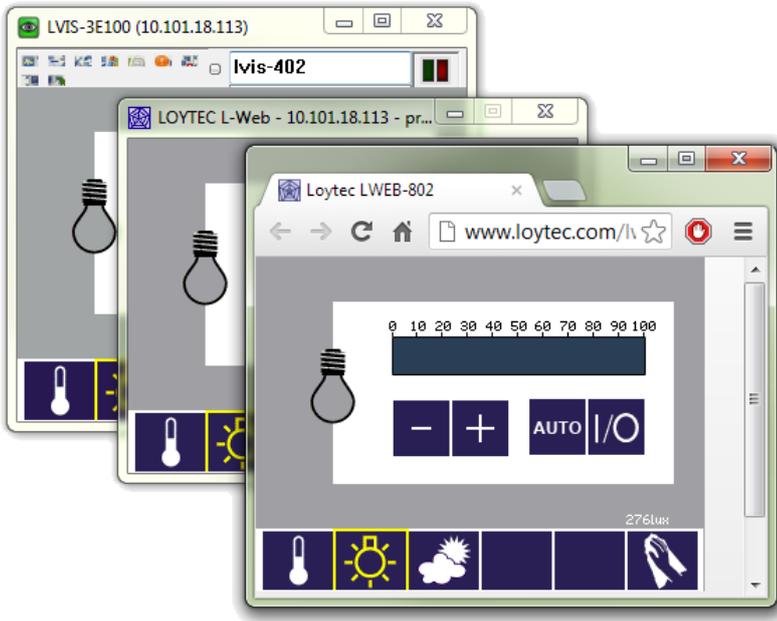


Fig. 4: Projects in VNC, LWEB-800 and LWEB-802

The latest feature in the L-VIS firmware is the OPC client functionality. This feature can be used to display data on the L-VIS screen, independent from the underlying network technology (Fig. 5). Let's have a look at a real-world application: a single air handling unit is controlled by a L-INX Automation Server. The required sensors and actuators are connected via L-IOB I/O Modules to the server. A frequency drive for the fan control features a Modbus interface and is also connected to the L-INX Automation Server. The customer wants to have a graphical, web-based visualization and in addition a local operation panel with a touch screen. For the web-based visualization, an LWEB-800/802 project is created and directly loaded into the L-INX



Automation Server. Up to now, it was possible to reuse the graphics of the L-WEB project for the L-VIS project, but all data points had to be generated in the underlying network technology

of the L-VIS. These data points had to be linked to the remote L-INX Automation Server – e.g. with an LNS network management tool. Finally, the OPC data points had to be replaced by the network data points. With the new OPC XML-DA client function, all these configuration steps are not required. Because there is also an existing L-WEB project with all the OPC XML-DA data point links, the project can simply be loaded to the L-VIS device with the L-VIS Configuration software. The data point configuration can be left unchanged, because the OPC XML-DA client configuration is already done. This means that the local control via L-VIS Touch Panel is generated without additional configuration effort.

The OPC XML-DA client feature can also be used for smaller project changes. If an additional data point of a L-INX Automation Server or a L-GATE device should be shown on an L-VIS display, only the OPC data point configuration from the target device must be imported to the L-VIS Configura-

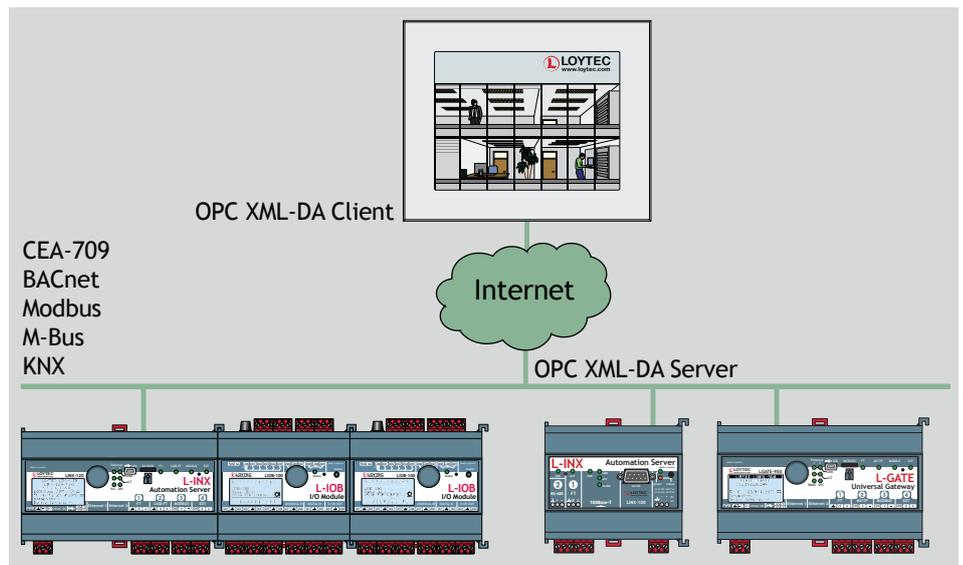


Fig. 5: L-VIS - the OPC XML-DA Client

tion software. After that, the L-VIS configuration can perform read or write access to any data point of the remote device that is exposed on the OPC level. This is possible independent from the underlying network technology – no matter if this is a LON network variable, a BACnet object, a Modbus register, a M-Bus data point or a KNX communication object. The values can be read and written without starting an additional network management tool or perform any other changes on the network configuration! The new L-VIS features can be used also in older devices by performing a free update to the latest firmware and configuration software versions 4.4.1.

www.loytec.com/support



New Compact L-DALI Controllers with Display

LOYTEC complements the existing L-DALI product portfolio with compact DALI controllers that can serve one DALI channel. Local operation is featured through the built-in jog dial and the graphic display with backlight which is well known from the L-IOB product family. The compact controllers accept 85–265VAC (50-60Hz) input and feature a built-in power supply for the DALI channel.

Versions for LonMark Systems and BACnet Networks

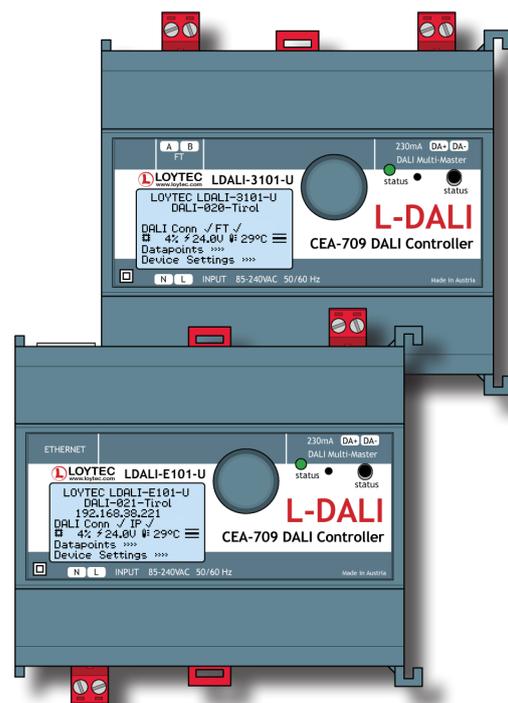
The BACnet version LDALI-E201-U features Ethernet connectivity and supports BACnet/IP. The complete device configuration can be achieved by using the built-in web server.

The version LDALI-E101-U und LDALI-

3101-U integrate the DALI components connected seamlessly in a LonMark System. LDALI-3101-U connects through its TP/FT-10 port, LDALI-E101-U features an Ethernet port connecting through LonMark IP-852 to a LonMark System. For offline configuration, LOYTEC offers a free configuration tool which can also be executed as an LNS plug-in. LDALI-E101-U can be configured online through its built-in web interface.

Full Feature Set of their “Big Brothers”

Even when compact the new L-DALI controllers provide the same functionality like their “big brothers” LDALI-ME204 and LDALI-3E10x, with fieldbus connectivity in place of Ethernet. Therefore, some features like the web server, email messaging and trend logging are not supported.



www.loytec.com/ldali



L-DALI Supports Philips OccuSwitch DALI (LRM2090/20)

In cooperation with Philips Lighting Eindhoven LOYTEC has implemented the essential features to support the intelligent multi sensor OccuSwitch DALI. The LRM2090/20 can be configured by the L-DALI configuration or the L-DALI web frontend (except LDALI-3101-U).

The L-DALI controllers support three essential functions of the OccuSwitch DALI (only L-DALI for LonMark Systems):

- Override of the OccuSwitch lighting control application
- Occupancy information evaluation

- Evaluate commands from an infrared remote control IRT 8080 and map those commands to LonMark SNVTs for:

- Sunblind control
- Fan speed control for Fan Coils
- Room temperature setpoint adjustment

The combination of L-DALI and OccuSwitch DALI shows impressively how room automation functions can span over multiple protocols. The end user does not see or feel any of this - they just enjoy a working, totally integrated lighting system.

L-IOB I/O Modules now with Ethernet/IP Connectivity

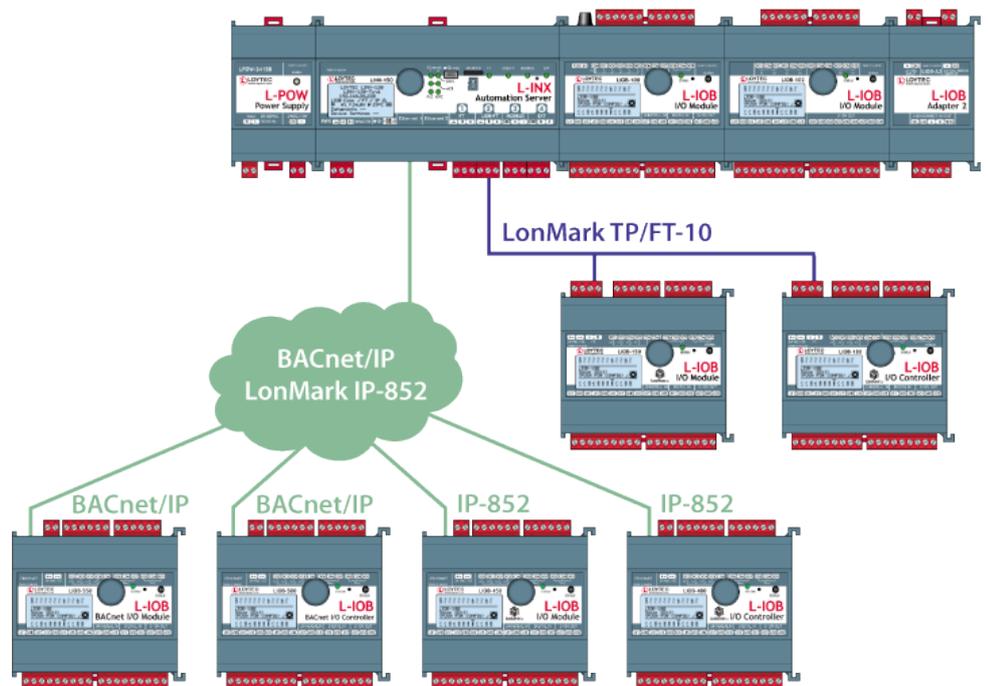
LOYTEC presents the first I/O modules LIOB-45x/55x and I/O controllers LIOB-48x/58x with Ethernet/IP connectivity. Like all other L-IOB modules, local operation is achieved through the built-in jog dial and the backlit graphical display.

The LIOB-45x/48x are LonMark certified and communicate via the LonMark IP-852 channel. The LIOB-55x/58x are BACnet/IP devices and feature the B-BC profile.

Essential Advantages through Ethernet/IP Connectivity

The advantages of Ethernet/IP connectivity span from easy cabling to configuration and testing, and even through to operation and maintenance.

Cabling is made easy through inexpensive and pre-configured standard patch cables. Oftentimes it makes more sense to use Eth-



ernet instead of a twisted pair to connect to remote I/O since this connection can be used for other applications.

When putting the devices into operation, the L-IOB built-in web server helps to test the inputs and outputs. During operation, the Ethernet enabled L-IOBs provide convincing operation with high data throughput and short reaction times. All data points on the modules can be accessed and manually overwritten through the built-in web server or the jog dial with backlit display. For maintenance, the device status can be accessed

through the web server at any time.

LIOB-IP Plug'n'Play Mode

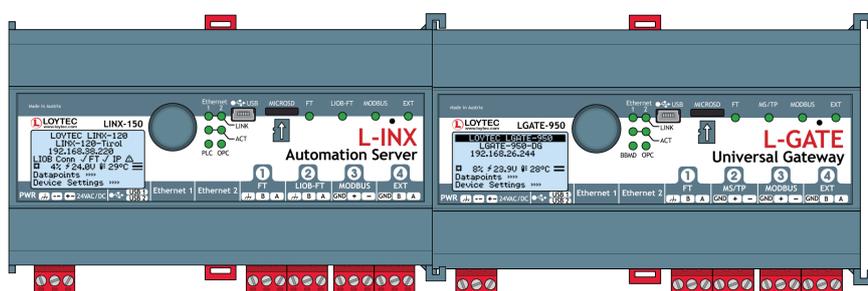
When setting the L-IOB devices into LIOB-IP mode, they automatically connect to the L-INX Automation Server they are assigned to. In this mode, all L-IOB inputs and outputs are automatically mapped into the assigned L-INX Automation Server and can be used and processed by all application on the L-INX. Plug'n'Play becomes reality!



Extended Network Security Functions for L-INX Automation Servers

LOYTEC provides a leading role in connectivity of networked devices for building automation by implementing network security functions for the “big” LINX-12x/15x/22x Automation Servers and the LGATE-95x. Starting with firmware release 4.8, a firewall is available that can be configured or enabled through the device web front-end or through OPC XML-DA. Addi-

tionally, a secure connection to the built-in web server becomes available through https. The pre-installed certificate can be replaced by either a self generated certificate or one issued by an official authority. Thus when enabling secure connectivity, the data transfer is encrypted and when using a safe certificate, “man in the middle” attacks can be avoided.



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Eleven at Once: LOYTECs BACnet Enabled Controllers BTL-certified

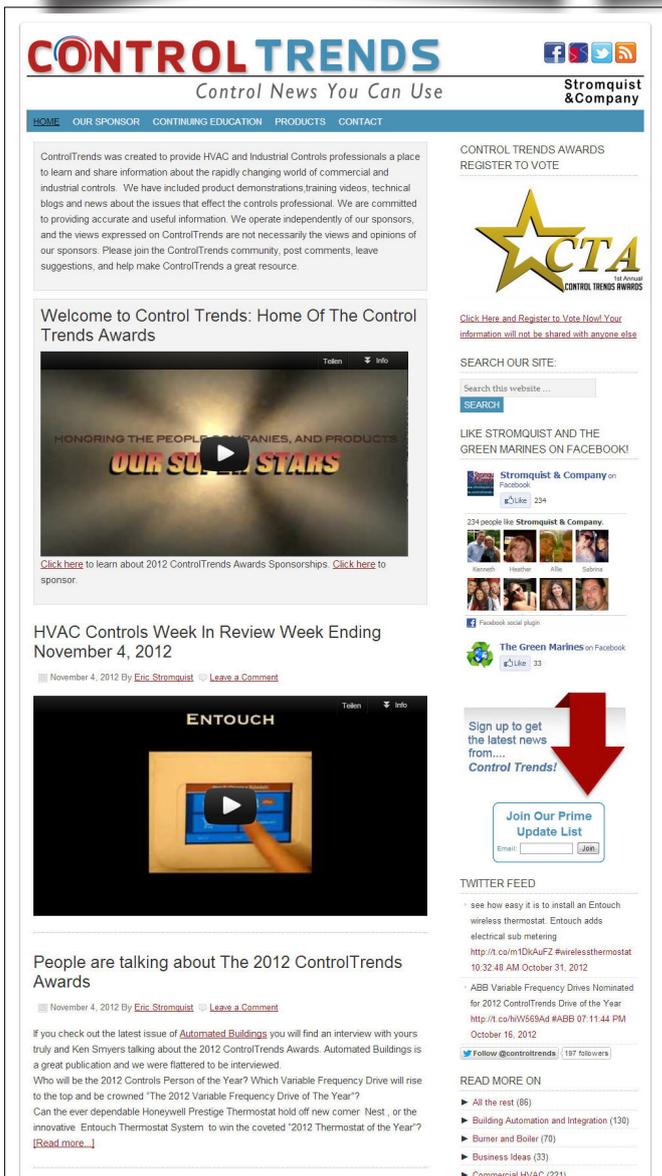
Eleven LOYTEC products are compliant with the BACnet standard ISO 16484-5/ANSI ASHRAE 135 as attested by the accredited certification authority WSPCert. Certification requires compliance of the device with the BACnet standard of the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) in all five areas of interoperability: exchange of data, alarming and event management, scheduling, trending, and device and network management.

Certified as BACnet Building Controllers (BB-C) were all BACnet enabled L-INX Automation Servers from LOYTEC and the L-GATE product line. In addition, the LIP-ME201 BACnet Router became certified as BACnet Application Specific Controller (B-ASC). Certification is a process according to the guidelines of the European Standards Commission, in which rigid technical, organizational, and formal requirements have to be fulfilled.

As a result, LOYTEC solutions can be deployed now when tenders explicitly demand a BACnet certification. For devices already shipped, LOYTEC offers a firmware update free of charge.

www.loytec.com/btl

Family-run Stromquist & Company: Strong Focus on Quality Products and Outstanding Customer Service

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ControlTrends was created to provide HVAC and Industrial Controls professionals a place to learn and share information about the rapidly changing world of commercial and industrial controls. We have included product demonstrations, training videos, technical blogs and news about the issues that effect the controls professional. We are committed to providing accurate and useful information. We operate independently of our sponsors, and the views expressed on ControlTrends are not necessarily the views and opinions of our sponsors: Please join the ControlTrends community, post comments, leave suggestions, and help make ControlTrends a great resource.

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HVAC Controls Week In Review Week Ending November 4, 2012

November 4, 2012 By Eric Stromquist Leave a Comment

Entouch

People are talking about The 2012 ControlTrends Awards

November 4, 2012 By Eric Stromquist Leave a Comment

If you check out the latest issue of *Automated Buildings* you will find an interview with yours truly and Ken Snyers talking about the 2012 ControlTrends Awards. *Automated Buildings* is a great publication and we were flattered to be interviewed.

Who will be the 2012 Controls Person of the Year? Which Variable Frequency Drive will rise to the top and be crowned "The 2012 Variable Frequency Drive of the Year?" Can the ever dependable Honeywell Prestige Thermostat hold off new comer Nest, or the innovative Entouch Thermostat System to win the coveted "2012 Thermostat of the Year?" [\[Read more...\]](#)

Stromquist & Co recently became a LOYTEC distributor for USA and as LOYTEC Competence Partner for Georgia and Florida, LOYTEC Express is pleased to introduce this new business partner.

In 1951 Bengt Stromquist began his business as a manufacturer's representative of HVAC controls in Atlanta, Georgia. The company was founded on integrity, hard work, and exceeding customers' expectations. In 1991, Stromquist expanded, opening an office in Orlando, Florida. Currently the enterprise has grown to over 35 employees, stocking 34,000 sq. ft. of inventory and representing over 40 manufacturers of HVAC controls and industrial instrumentation products.

What sets Stromquist apart from other wholesale distributors is their factory-trained staff that focuses on quality products and outstanding customer service. In addition to building automation systems, the company provides solutions for burner and boiler controls, industrial processes, and much more. Stromquist also offers

job quotes, control systems engineering, panel design and fabrication, and various industry-related training classes.

As the controls industry has evolved, Stromquist has extended its reach in the Building Automation field by dedicating more products, time, and people to provide customers the best and most up-to-date Building Automation solutions. Customers have come to depend on Stromquist's DDC Support Team for quick and reliable service. "Because the industry is always growing and changing, we believe it is extremely important for us to stay ahead of the curve. We want to be sure we know what is current and to keep our customers informed", the management is convinced.

Part of Stromquist's dedication to keep their customers up-to-date in the controls industry was devel-

oping a website specifically to do that – www.controltrends.org. As the name implies, ControlTrends is all about what is trending in HVAC controls. The site is not only for Stromquist's customers but for anyone who is involved in the industry. It provides troubleshooting tips, how-to videos, interviews with industry experts, daily blogs on products, industry news and more. What started as a source of information for local Stromquist customers has grown into a tool for industry members across the country.

“At Stromquist our primary goal is to take care of our customers and provide them the best solutions for their needs. To lead us in this goal are Sam Lindley, President, Eric Stromquist, CEO, and David Stromquist, CFO,” states Chuck Chittick, LOYTEC's contact man at Stromquist.

www.stromquist.com

Opening:



New LOYTEC Location in the US

LOYTEC Americas, a LOYTEC electronics GmbH fully owned subsidiary for ten years, has moved company headquarters to a new location in Pewaukee, Wisconsin.

With the new branch office, LOYTEC continues to expand its presence in the American market. More employees mean more customer contact, increased technical support and even more thoroughness in customer advice and sales matters. The entire order fulfillment takes place now via a new logistics center. Due to a well assembled warehouse, product delivery times will be shortened even more.

During the start-up phase LOYTEC CEO Hans-Jörg Schweinzer, assisted by Susanne Haitzinger from the Austrian LOYTEC logistics center, personally supervised the organization of the according procedures and processes on-site. “LOYTEC considers the American market a key market. Hence we take the requirements of this market very seriously. They influence the development of our product portfolio significantly. With the new branch office in Wisconsin we strengthen

LOYTEC Americas

1st Annual
CTA –
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Trends Awards



Announcing the first ever Control Trends Awards, honoring the people, companies, and products that make the Building Automation and HVAC Controls industry great. You can take part in the search for the industry's superstars by voting. For voting you have to register first at controltrends.org. The awards ceremony will be held at the end of January, 2013, in Dallas, TX in conjunction with the AHR Expo. There are 11 categories that include company and individual awards like 2012 Building Automation System of The Year, 2012 Building Automation Controller of The Year or 2012 Building Automation Graphic Tool of The Year.

The CTA Academy with over 100 world-wide members of top industry professionals was the group to nominate the people, products and companies who are worthy of receiving recognition with a CTA for 2012. Nominees were introduced during October on controltrends.org.

All about the first annual Control Trends Awards is to be found here:

www.controltrends.org



Carrie Lopez, Office Management USA, Daryl Clasen, Head of Sales USA, Hans-Jörg Schweinzer, CEO LOYTEC, Susanne Haitzinger, LOYTEC Austria (f.l.t.r)

our presence in America. With closer customer contact we establish the basis for further growth and more significant market penetration,” relates Hans-Jörg.

To update your records, following are the new contact details of LOYTEC Americas, Inc.:

N27 W23957 Paul Road, Suite 103, Pewaukee, WI. 53072

Tel: 262-278-4370, Fax: 262-408-5238

sales@loytec-americas.com

support@loytec-americas.com

www.loytec-americas.com



New LOYTEC Competence Partner Grue + Hornstrup: Ahead of Time and Highly Professional

Founded over 30 years ago, Grue + Hornstrup A/S (G+H) is a Danish engineering and full-service provider offering innovative solutions worldwide within the fields of building automation & engineering and energy & environment. G+H provides its automation and building engineering solutions to the Scandinavian market, with energy & environment solutions predominantly provided outside of Denmark.



Based on the need for greater building comfort and lower energy costs, the demand for building and industrial automation has significantly increased in Denmark starting in the late 1990s. In 1997, G+H was one of the front-runners of the Danish market in providing open, freely programmable building automation systems based on multi-network communication. A cornerstone in paving this new way were the Building Management Systems (BMS) provided by G+H to the 85,000 square meters of buildings located at what is currently the Technical University of Denmark - RISØ campus. Since that time, G+H has worked on increasing the level of technological application of automation in this sector. Today LOYTEC's products are a central element of the innovative total solutions provided by G+H.

New LOYTEC Competence Partner

Since 2010, G+H has utilized LOYTEC's products in its Building Management Systems (BMS) and has recently agreed to become a LOYTEC Competence Partner. Within the past two years, G+H has delivered BMS systems based on LOYTEC products to Rigshospitalet Capital Hospital, Technical University of Denmark - Lyngby campus, Confederation of Danish Industry headquarters, and COWI consultant's headquarters.



A Progressive Solution at REXHOLM

In September 2012, the construction of the new REXHOLM distribution center and warehouse was completed in Holstebro, Denmark. Internationally known under the brand “ID Identity”, the new 15,000 square meters facility is the central point for REXHOLM’s textile business in Scandinavia. The building’s electrical and mechanical systems were engineered by G+H’s subsidiary Grue + Kirkgaard, and the backbone of the BMS was engineered and supplied by G+H.

Composed of LOYTEC’s LINX-120 Automation Servers and fifty L-IOB and L-DALI modules and controllers, the BMS is divided into three primary zones which operate the electrical and mechanical systems of the entire facility. The three zones are configured to be semi-independent and consist of the facilities offices, technical rooms, and warehouse sections. The primary purpose of the BMS is to automatically control the facilities’ lighting, HVAC, fire detection, and fire/security system failures.

Through the use of the LINX-120 Automation Servers, G+H has uniquely engineered the BMS without a centralized SCADA system. This means that all functionalities are controlled and monitored by the LINX-120 Automation Servers. This configuration allows for the operation of all web-based services by the LINX-120 Automation Servers, providing to the facility operators both change and failure notifications via email and text messaging, as well as secured remote access and servicing via an internet portal.

www.g-h.dk
www.loytec.com/competence-partners

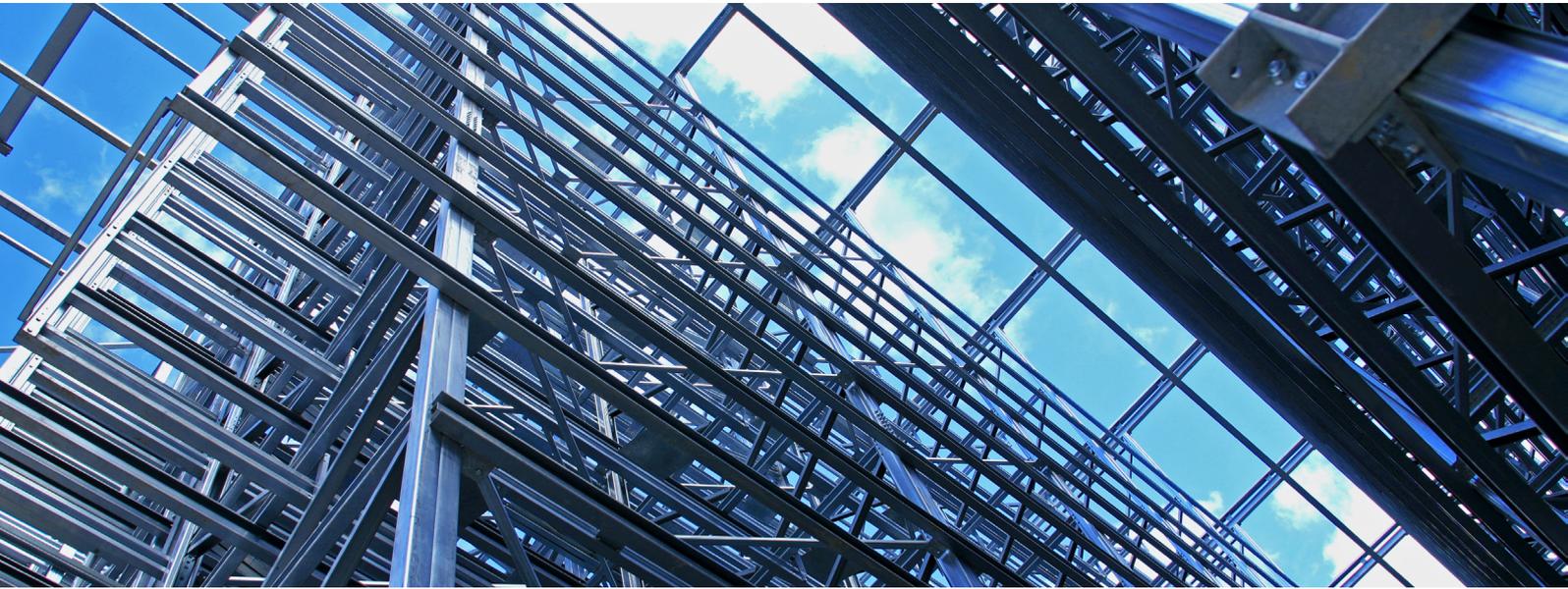


G+H management at REXHOLM: Jesper Bergenhammer Jensen, Partner/Automation, Douglas A. Marett, Partner/Energy & Environment and Kjeld Kirkgaard, Partner/Automation (f. l. t. r.)



Configuration instead of Programming

Dipl.-Ing. Martin Daublebsky



Dipl.-Ing. Martin Daublebsky
embyt e.U.

Martin Daublebsky is the founder of the company embyt with its two business units energy and building management, and project and resource management. After studying computer technology at the Vienna University of Technology, he was responsible at Eaton (formerly Moeller) in the business unit Building Automation for the development of a USB wireless gateway for Eaton's radio system. Since 2010, embyt is developing specialized software solutions for LOYTEC L-INX Automation Servers to exploit their maximum capabilities while keeping the complexity minimal for the system integrator.

A sophisticated building automation system must be adjusted individually for each project - no two projects are alike. The L-LOGICAD programmable L-INX Automation Servers cover this task optimally. But, there are specific tasks where the user wants a configurable application instead of programming with L-LOGICAD. Embyt has developed a customized solution for peak load management based on LOYTEC L-INX and L-IOB devices. The entire system configuration and the user interface are covered by an easy-to-use Windows application.

L-INX Automation Servers can be programmed with L-LOGICAD. For applications in building automation LOYTEC offers a large library of functions that already covers many standard tasks in buildings.

Making use of the library increases both the productivity and the quality of the application through reuse of well-tested elements. At the same time, the free programming capabilities create application flexibility.

No Programming Skills

The requirement of our customer was that he wanted to realize his projects with the flexible and reliable LOYTEC hardware, but without any change in the L-LOGICAD program - and the software

had to fit small projects with few I/Os as well as projects with hundreds of I/Os!

Example Peak Load Management

The project was about peak load management: For customers with load metering, the energy consumption is continuously metered in quarter-hour steps. The maximum quarter-hour value of the year will be used as the factor for calculating the pricing for power. Typical power prices in Germany and Austria are approximately 50 €/kWh. If the peak power value of a year is 200kW, the annual power price is 10.000 €.

By continuously checking the real time power consumption savings can be realized from utilizing dedicated, short switching techniques subsequently reduc-

ing the power of building loads such as air conditioning and compressors. Using the previous example, annual power peak may be reduced by 20 to 25 percent, resulting in annual savings of 2.000 € to 2.500 €.

Parameterizing instead of Programming

How do you scale such a system, so that it fits in a supermarket with two meters and four outputs as well as for a large hotel with fifty meters and two hundred outputs?

Embyt has developed an L-LOGICAD application for LINX-120/121 Automation Servers that fits up to the biggest possible system with 24 L-IOB Modules. If only one L-IOB Module is connected to the L-INX Automation Server, automatically all unused L-IOBs are disabled. At whatever physical input a meter is connected can now be parameterized via a simple Windows configuration interface. These parameters are downloaded to the L-INX Automation Server, so that it controls and regulates self-sufficiently.

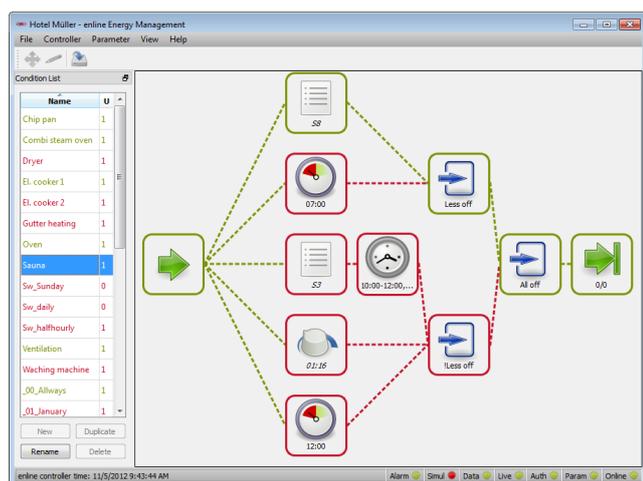


Fig. 1: A condition with its inner states displayed live

All desired trending data is recorded internally with the L-INX trending function, and trends are downloaded and stored automatically in a PC-side SQL database when connected to the PC application. There is never a lack of memory capacity and data analysis and reports can be easily generated.

The Automation

Core of the peak load management system is the ability to configure for each connected device, e.g. a refrigerator, a precise condition for when and how the device may be switched off. This configuration is also done graphically in the PC application (Fig.1). Both simple and complex conditions can be created; when an output is to be switched may be configured, depending on parameters such as the time of day, the date, the state of another input or output, or the duration, how long the output has already been turned on or off. Such conditions can even be reinserted into other conditions.

The PC program again generates parameters for the parameter set that is loaded into the L-INX Automation Server, resulting

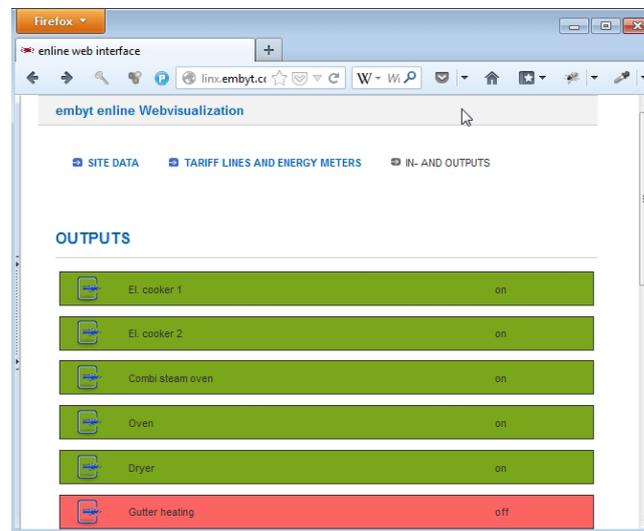


Fig. 2: A dynamic web visualization is created automatically from the existing parameters

in the desired control capability, but without any change in the underlying L-LOGICAD program.

This concept may cover many other applications, and also complex control tasks, without programming one single block in L-LOGICAD! Regarding software tools, only the free L-INX Configurator is required to download the completely ready-to-use L-INX configuration.

Even a dynamic web visualization is available without additional tools (Fig. 2). If you are interested in adapting this concept to your needs, please contact us to obtain your requirements and propose a solution: md@embyt.com

www.embyt.com

TECHNICAL

The L-LOGICAD programming was done partly with Function Blocks and partly in Structured Text. By the usage of clever data structures scaling is also done easily.

The communication between the PC program and the L-INX is done via OPC XML-DA and therefore it is possible to communicate either via the local network or via internet.

Limits on the L-INX Automation Server in the number of data points and trends had to be avoided. By "packing" data into data structures, it can be stored in a fewer number of data points. The transfer of the thousands of site parameters is done in time-division multiplexing via few OPC data points. Thousands of different trend data is stored in only a few L-INX trends, using also time-division multiplexing.

Particularly interesting data points can be displayed directly on the L-INX Automation Server, using "Favorites".

Configured alarms may be sent by e-mail, and also visualization via web browser is dynamically generated, according to the parameterization.

Quiz



Attention: Look-alikes!

Can there be Only One?

Join in with the big L-Express Quiz, try your expert knowledge and with a bit of luck win an iPod Touch. Amongst all participants who send us an email to loytecinfo@loytec.com with the four correct answers no later than January 31, 2013 we raffle a brand-new, super thin iPod Touch for music, internet and building control with LWEB-802. And now "good luck" with puzzling over the correct answers!

Question 1

What does the abbreviation **L-ROC** stand for? Does L-ROC mean



- A) the **L**unar **R**econnaissance **O**rbiter **C**amera? New images acquired by NASA's LROC, which is circling in the orbit of the moon, show that the moon's crust is being slightly stretched, forming small valleys. So the pictures give evidence of geologically relatively recent activity on Earth's moon.
- B) the **L**and **R**over **O**wners **C**lub, the oldest 4x4 club in Southern Africa, a family orientated club exclusively for Land Rover enthusiasts? One of the major benefits of belonging to LROC is that you are being trained to become a competent, eco-friendly off-road driver.
- C) **L**OYTEC's new **R**oom **C**ontroller which provides the basis for a revolutionary room automation system based on IP, which seamlessly integrates with native BACnet/IP networks and LonMark Systems at the controller level?

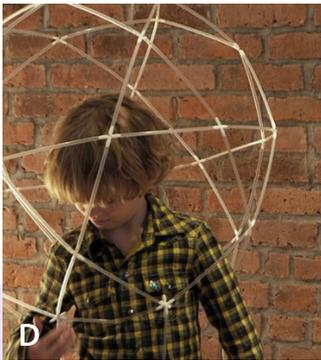
Question 2

What is meant with the term **L-INX**?



Is L-INX

- A) a Swedish-Norwegian railway company, which connected the three Scandinavian metropolis Oslo, Stockholm and Copenhagen with a high-speed rail connection from 2000 to 2004?
- B) a highly addictive online puzzle game, which point it is to connect an ever increasing number of tokens with a limited contingent of paths, which in no case may cross each other?
- C) a learning philosophy from the USA, which encourages and enables children to learn new things while having fun? The Linx Enrichment Club for kids creates and facilitates programs that are designed to help kids thrive.



❑ D) a drinking straw construction game? With LINX you can build everything from ambitious room-sized structures to intricate table-top sculptures, all using LINX connectors and standard drinking straws. It's less expensive than everything else around, extremely flexible and ultra light.

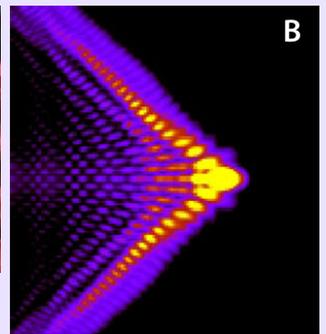


❑ E) a freely programmable, powerful automation station from LOYTEC, which supports open protocols in buildings?

Question 3

What does the word **L-IOB** indicate?

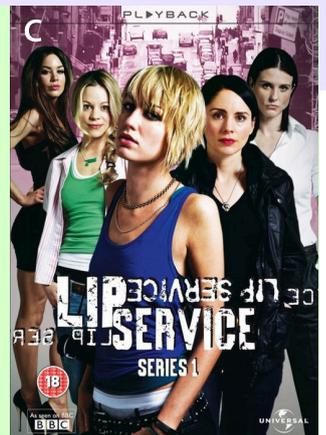
- ❑ A) Is "liob" the Old High German word for "lieb" (which means "good, nice, cozy, loved"), and later on through consonant shift became "Liebe" (love)?
- ❑ B) Does it describe a physical term in the field of photo ionization, the so-called „Laser-induced-optical-breakdown“, which can produce precise intracellular and intra-tissue effects? LIOB occurs where the breakdown threshold is exceeded, and may be manipulated to target selectively areas within tissues while minimizing damage to surrounding material.
- ❑ C) Has it to do with **L**igustrum **o**btusifolium, the blunt-leaved privet, a shrub of the olive family, whose dispersal area is in Japan, Korea and China, often used as ornamental shrub?
- ❑ D) Or does it refer to **LOYTEC's I/O Bus** Modules and Controllers, whose product families were extended significantly with new models and additional features?



Question 4

With **L-IP** do we deal with

- ❑ A) a French watch manufacturer, tracing back to Emmanuel Lipmann, who produced the first LIP stopwatch in 1896 and electromechanical wristwatches in 1952 for the first time?
- ❑ B) the abbreviation for „Lower Ignition Propensity“, used for cigarettes with reduced ignition capability? Their implementation should reduce danger of fire through carelessly discarded or unattended smoldering cigarettes.
- ❑ C) the British television serial drama Lip Service, portraying the lives of a group of lesbians living in Glasgow, Scotland? The show debuted on BBC Three on 12 October 2010.
- ❑ D) the lip tricks of skaters? Lip tricks in skateboarding are performed on half-pipes, quarter pipes and mini ramps. They require different varieties of balance on the “lip” of the ramp.
- ❑ E) or is it the so far best-selling and best known LOYTEC device, which connects CEA-709 channels through IP networks? It stands out due to easy installation and high reliability.





Showtime for LOYTEC: Impressive Performance at International Exhibitions

As in the years before, Light+Building was THE exhibition event of the year 2012 for LOYTEC. Accordingly, preparations for the “big days” in Frankfurt were undertaken thoroughly and elaborately. To give L-ROC the appropriate stage for its grand debut as a new superstar on the firmament of room automation, the LOYTEC booth – already a show standout, was reviewed for upcoming changes. Brilliant blue superstructures were joined by a demo wall directly on the main side of the stand, facing attendees and consisting of 50 live L-ROC room controllers. By means of this demo wall (in jest referred to

as the L-ROC-altar), LOYTEC CTO Dietmar Loy personally demonstrated the extremely easy and quick programming of an L-ROC project in a vivid, practical way. The corresponding presentations were displayed on a giant 70” LCD screen mounted directly above. The video of the presentation can be found at this link: www.loytec.com/lroc-video. In addition to L-ROC, the revolutionary, highly flexible room automation system, LOYTEC presented further highlights like the L-INX Automation Servers, L-DALI lighting control, the L-WEB system, and L-IOB I/O modules and controllers.

LIGHT+BUILDING, FRANKFURT



Accordingly, the team of LOYTEC product managers and development engineers, who had come to Frankfurt for support service and information of the very numerous visitors, was rather big: Apart from the company's top management consisting of CEO Hans-Jörg Schweinzer, CTO Dietmar Loy and CFO Josef Wojak, also the experts Andreas Döderlein (L-WEB), Jörg Bröker (L-DALI), Stefan Soucek (L-INX), Norbert Reiter (Support), Jörg Welskop (Training), Dirk Dronia (Customer Relations) and Daryl Clasen (LOYTEC Americas) were ready to answer all questions and requests of the competent exhibition audience. For the entire team those were rather strenuous days, but the result of this show highlight is remarkable: Apart from several hundred technical discussions with visitors to the exhibit, the foundation for numerous promising partnerships and co-operations with companies on four different continents were started at Light+Building 2012.

After springtime dominated by the international Light+Building show, a fall followed for LOYTEC which was marked by two locally important exhibitions. Starting with Intelligent Building Systems (IBS) in Paris in September, where Dirk Dronia was supported while presenting and most of all linguistically by Frédéric Dupau from LOYTEC's French development unit, through to Building Controls in Surrey, UK in October, again show-fever was scheduled. During both exhibitions, Dronia forged the bridge from future-oriented L-INX Automation Servers and L-IOB I/O Modules to versatile L-DALI lighting control, the comprehensive L-WEB system with the new LWEB-802 through to the reliable L-VIS Touch Panels and the well known LOYTEC infrastructure products.

Two important shows beyond the big pond will follow: Greenbuild in San Francisco in Novem-

INTELLIGENT BUILDING SYSTEMS, PARIS

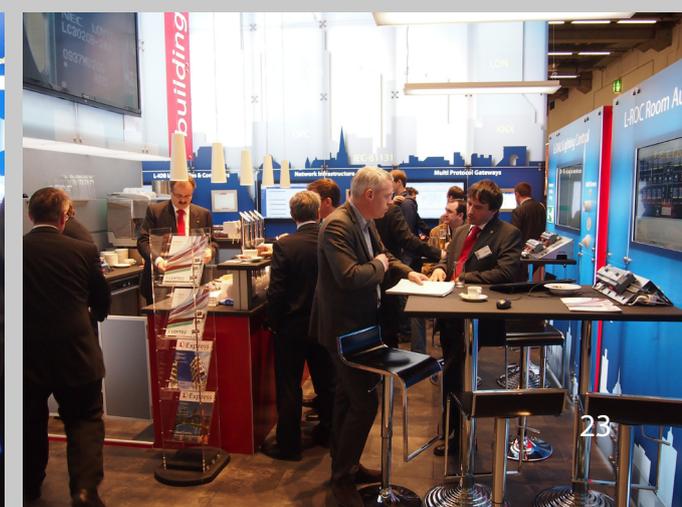


BUILDING CONTROLS, SURREY



ber and the traditional annual attendance of AHR in January, this time taking place in Dallas, Texas. Back in Europe, Climatizacion in Madrid will follow at the end of February. With ISH in Frankfurt in March 2013, a new year of exciting shows and exhibitions will start for LOYTEC.

www.loytec.com/eventreview



Topping-out Ceremony

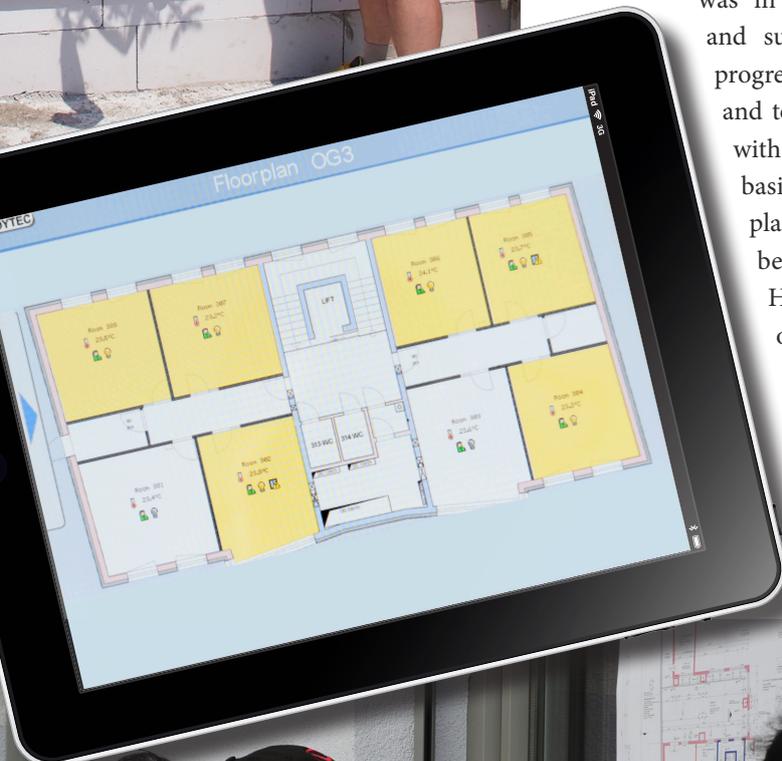
LOYTECs New Headquarters Addition almost



It was a very busy year for Dietmar Loy. After in early summer last year the first spade of earth had been turned for the annex building at LOYTECs headquarters in Vienna, Dietmar personally performed duties for the construction management of the project. There has been no day, in any wind and weather that he has not been at “his” building site to check personally if everything was in order, to coordinate and supervise the building progress, check deliveries, and to come to agreements with the foreman on the basis of the construction plans, which likewise had been conceived by him. Hundreds of times we observed him, plans in his hands, concerted disposition, at times slightly impatient, then again smiling

radiantly, because another milestone had been overcome or a problem solved. He was always in the thick of things, in the mud deep down in the 10 meter building pit or high up on the scaffolding, obviously utterly free from giddiness. Often he lent a hand himself, then in the evening came over to the “old” wing of the building drenched in sweat, took a shower and pursued his actual profession as LOYTECs CTO for a few hours more work in his office. Baby daughter Isabelle had to wait a little longer for Dad to come home.

The outcome of all these efforts is remarkable. LOYTECs headquarters tripled in size. Beneath the new section of the building, its foundation elaborately reinforced and now leaning on dozens of concrete pillars, a two-floor underground garage spreads out plus extensive new storage capacities. The four floors of office suites above among others will accommodate spacious training facilities.



at Blumengasse Most Complete

ties, laboratories, lounges and fitness rooms for the ever-expanding staff. In the yard of the newly erected building, a production section was established, so now considerable amount of new space is available for manufacturing LOYTEC devices as well as for testing facilities and logistics. In view of the continuously rising sales figures here the prerequisites have been created for the necessary higher capacities in manufacture.

After the celebration of the groundbreaking ceremony last year, it was high time to throw another party regarding the construction of the new building. So on August 9, LOYTEC's management invited the building team, staff and friends for the topping-out ceremony. On this nice cozy summer evening the party went on with much chitchat and

laughter accompanied by delicious food from the grill, draft beer and a fridge full of refreshing "Almdudler" (a must during your next visit of Austria, if you don't know it yet). Finally also Dietmar Loy - relaxed and content - enjoyed his building site.

During the coming winter, interior fixtures and finishing of the façade will be accomplished, and likely next spring another party will be held: the ceremonial opening. L-Express will of course keep you updated.

www.loytec.com



Partner Maker Dirk A. Dronia: People have Priority

For eight years, LOYTEC's sales frontline can't be imagined without him and for an impressive twenty two years, Dirk A. Dronia moved adeptly through the building automation industry in various functions. A bustling agent at shows and exhibitions, a reliable counterpart with handshake quality in negotiations, as a precise co-operation partner, Dirk feels committed to the proverbial German efficiency. Dirk is a service provider in the best sense of the word, who still performs his service to the customer with great enthusiasm. Customers appreciate this dedication. Always on the move, constantly a little restless, he never loses sight of his supreme professional authority and its wishes, needs and concerns: his "King", the customer.

"I want technically impeccable and trend-setting solutions for our customers, which open up new possibilities and are in line with market requirements", Dirk states emphatically. He considers himself a client advocate and today is responsible for Partner Relations and Distribution at LOYTEC. He loves to communicate and meet with people. One's human side must be shown," Dirk smiles and specifies: "We do not cooperate with companies, but with people". Dirk is working for LOYTEC on the composition of a high-end, worldwide partner network consisting of hand-picked, carefully selected partner companies. For the

network well cultivated and most of all face-to-face

contact is paramount. He is serious with the term "partner", he means it. "At it we are not about customer-supplier relations. In a true partnership people always have priority." Dirk wants the term partnership to be understood right, as honestly and straightforward as he means it. "Our client and us – that's a closely linked unity. Our customers are the most important components for our company, you may never forget that. You have to scrutinize their situation, analyze it exactly, to be really able to focus on their requests, their problems and needs," Dirk makes a passionate plea and thinks of himself as a pivot in caring, supporting and informing of "his" clients. "They have to rely on us, that we break new ground, have our finger on the pulse of the time in developing, or even a step ahead."

Why he ended up with LOYTEC, L-Express wanted to know from Dirk, after quite a few stages in customer care and support, training, sales and marketing at other companies (incidentally three of them merged with Schneider group by now). In the first place he, being somewhat an old hand in building automation, was attracted to the young start-up company LOYTEC, the related dynamics, the "infinite perspectives, the gigantic potential". Afterwards it was always meeting new challenges, that "you were able to actuate things and that no routines arose". Today, eventually partner communication has become his passion. His goal to establish an international network of hand-picked competence and distribution partners, who operate successfully in their local markets and are proud to belong to the exclusive club of LOYTEC partners, also meets Dirks delight in an international occupation. Learning about foreign cultures, seeing the bigger picture, opening up one's horizons – these, too, are part of those things Dirk cherishes with LOYTEC.



LOYTEC Training Schedule

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

www.loytec.com/trainings



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™)

Jan 14, 2013	Apr 09, 2013	Jun 24, 2013
Feb 11, 2013	Apr 22, 2013	Sep 23, 2013
Mar 05, 2013	Jun 03, 2013	

LTRAIN-GRAPHICS

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

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

Jan 17, 2013	Jun 06, 2013	Sep 26, 2013
Feb 14, 2013	Jun 27, 2013	Nov 07, 2013
Apr 25, 2013	Aug 29, 2013	



LTRAIN-GATEWAY

Gateway Applications and Data Point Management (2 days)

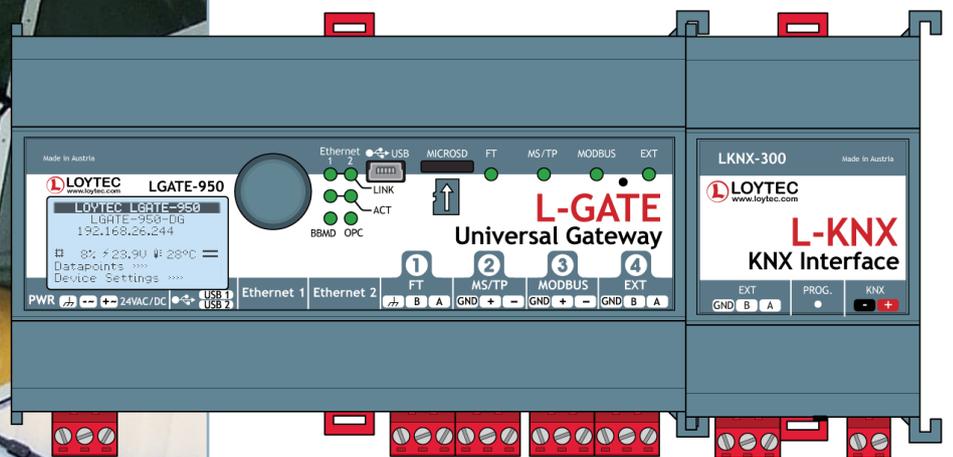
- LOYTEC data point concept
- CEA-709, BACnet, M-Bus, Modbus, OPC XML-DA
- Local and remote AST™ functions
- Building gateway applications with L-GATE, L-Proxy, and L-INX

Feb 05, 2013	Apr 16, 2013	Oct 01, 2013
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