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LOYTEC Express

Magazine for Building Automation

Guest Author:
Standardization in Building Automation – A Mixed Blessing

Case Study:
High School Wendelstein – Symbiosis of Ecology and Economy

New Functions:
Auto-generated Pages for Fast Engineering of Graphical Visualization

L-DALI: Let there be Light!

Content

Masthead

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Cover Story: L-DALI – Let there be Light!

Preview: Buildings under Control Symposium

Case Study: High School Wendelstein

We Remain True To Ourselves!

Discussions and questions abound regarding the various communication protocols in buildings. Which one shall I take, which should I specify, which will prevail, which one is more powerful, easier to maintain, which one will be long-lasting, which….? I admit, there are much more questions than workable answers to this topic on the market. But there is o n e correct answer I can give: There are many different protocols in a building today and will be tomorrow, that will have to be interconnected as a single system. IP communication gains importance and is going to become a central "carrier technology". One needs not be a prophet to predict it.

Many manufacturers are not amused by multiple protocols and the focus on IP. At LOYTEC we feel positive about the topic and make a virtue out of necessities. Having the spirit and good ideas, we meet the challenges and enjoy being able to offer highly innovative solutions.

Our product range shines with devices being "multilingual". We support the international standards BACnet, LON, and KNX. And of course we don't forget the extremely important industry standards like Modbus, M-Bus and OPC. Our concept on integration is very simple indeed. We join the protocol worlds by normalizing data points originating from the different technologies on the device level. In doing so we create a harmonized normalized data point world, being absolutely autonomous from the various protocols. Protocol independent operation and programming is the consequence – to the benefit of the user and the integrator.

Certainly in integrating different protocols and in using products from various manufacturers some technical hurdles have to be cleared. At this phase, LOYTEC products support the integrator with valuable features to detect problems swiftly and find solutions. This saves time and money in addition to calming your nerves.

All LOYTEC products which are equipped with an Ethernet port and at the same time actuate the field level of LON, BACnet, Modbus or DALI offer analysis of data exchange based on channel statistics of the field busses via the web interface. If this information is not sufficient, detailed network analysis of the field busses is onboard, or available from the IP network from remote. This allows flexible access to the system diagnostics.

LOYTEC remains true to themselves in matters of network analysis at its best. Remember: It all has begun at LOYTEC with the protocol analyzer LPA for analysis of LonMark systems.

So keep calm in your integration work and don't be shy to use different protocols in the system!

Hans-Jörg Schweinzer, CEO
LOYTEC electronics GmbH

L-DALI: Let there be Light!

Dipl.-Ing. Jörg Bröker

The LOYTEC L-DALI product line is a series of products offering full-featured DALI gateway functionality combined with powerful light controller functionalities. It opens BMS access to the DALI lighting system and allows full integration into the rest of the building automation system forming a totally integrated solution. While offering a lot of functionality it keeps installation, commissioning and maintenance simple and efficient.

Dipl.-Ing. Jörg Bröker
LOYTEC electronics GmbH

As product manager for the L-DALI product family, Jörg Bröker is master over light and darkness at LOYTEC.
The L-IP and L-Switch network infrastructure products are also among his competences. After studying computer technology at University of Technology Vienna, Jörg joined LOYTEC 12 years ago.
He made significant contributions to the development of several communication stacks, LOYTECs technology abstraction layer and LOYTECs firmware modularization concept.

Open to BMS

L-DALI controllers are available with BACnet and with LonMark interface. Whether you choose BACnet or LonMark, both offer a similar set of features and identical workflows: L-DALI provides gateway functionality to access DALI groups, but also to individual DALI ballasts. It allows to dim ballasts and groups using either ramping or fading. For groups it also offers scene control. In both cases it provides a feedback value reflecting the current dim level, no matter whether it was changed by the L-DALI or some other DALI master (multi-master operation). Further, for ballasts all DALI parameters are available to the BMS system. L-DALI also provides a full-featured lighting controller supporting constant light control (daylight harvesting) and complex presence based lighting schemes.

On the DALI side one has the choice of devices for the integration of a single DALI channel or L-DALI devices with up to four DALI channels offering a very cost effective solution for larger installations. Single channel models provide DALI bus-power and allow 85-240 V operation, while multi-channel models require an external DALI bus-power like the LDALI-PWR4-U (Fig. 1).

Support for DALI Sensors and Emergency Lighting

Features yet unmatched in the market are the support for various DALI multi-sensors and DALI self-contained emergency lights. DALI multi-sensors are a cost effective alternative to collect occupancy and lux level information: Devices are priced competitive and additional wiring effort is minimal, since the sensors are just connected to the DALI bus (power is typically taken from the DALI bus), which is

Feature	LDALI-3E101	LDALI-3E102	LDALI-3E104	LDALI-3101-U	LDALI-E101-U	LDALI-ME204	LDALI-E201-U
DALI Power Supply				X	X		X
DALI Channels	1	2	4	1	1	4	1
LON TP/FT-10	X	X	X	X			
LON IP-852 (Ethernet/IP)	X	X	X		X		
BACnet MS/TP						X	
BACnet/IP (Ethernet/IP)						X	X

Fig. 1: Different models, the fieldbus and the number of DALI channels they support

already provided for the luminaires. The L-DALI can use this sensor information for sophisticated light control solutions (daylight harvesting, etc.) and provide it to other parts of the building automation system (e.g. HVAC) as well as to the BMS.

DALI self-contained emergency lights are standardized in IEC 62386-202. Devices are available from various manufacturers. The focus here lies on monitoring the operational status of the emergency lighting system: The L-DALI allows executing various tests of the emergency lights, configuring automatic test-cycles and providing information on battery status and lamp or device failures to the BMS, making periodic manual tests obsolete. Using this standardized technology enables the system integrator to include emergency lighting solutions – previously a domain of highly specialized suppliers – in his portfolio and provide his customers with a very cost effective solution.

Efficient Installation

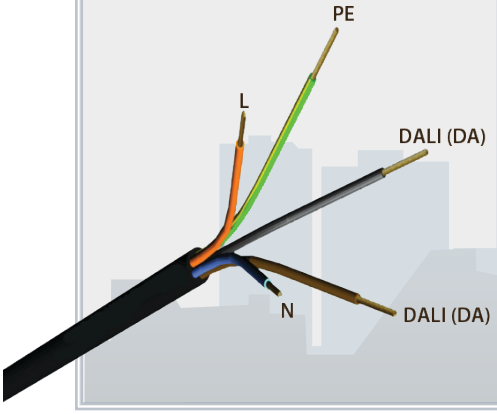
Installation of a DALI lighting system must be fast and efficient. A crucial point here is the testability of the DALI system, when the electrical contractor has finished the electrical installation. For this purpose the L-DALI devices have a simple button labeled ON/OFF/AUTO. Pressing the button once will switch all DALI ballasts to ON, pressing it again will switch all ballasts to OFF, pressing it a third time will cause the L-DALI to leave manual override. On multi-channel devices another button allows to select the DALI channel on which the test is performed.

By checking if lights go on and off respec-

DALI - The New Standard in Lighting

Modern lighting systems require solutions that are simple, low cost, flexible, and reliable. DALI was designed as a successor to traditional 1-10 V lighting solutions to meet those requirements.

Simplicity starts with installation. DALI is installed using a 2-wire free topology bus, which is typically wired together with the mains supply for the ballast in a 5-core cable. Its maximum bus length is 300 m. DALI connectors are non-polarity sensitive and have over-voltage protection, which makes DALI devices robust against wrong wiring.



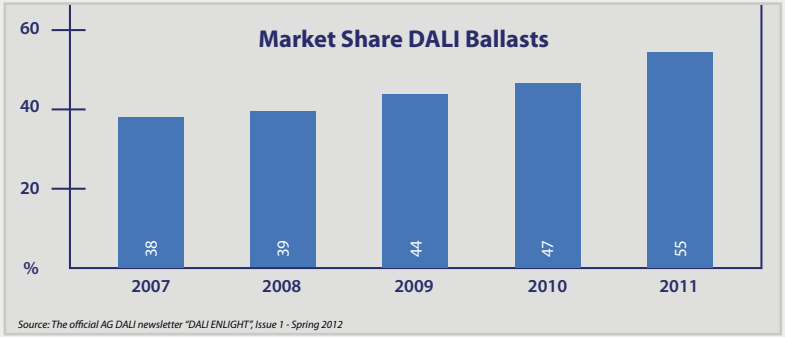
DALI is a highly flexible system. Each DALI channel can contain up to 64 individually addressable ballasts. Ballasts can be assigned up to 16 groups and can be programmed with up to 16 scenes. Therefore changes to the lighting system can be achieved by reconfiguration of the ballasts and do not require any rewiring. Finally, each ballast can provide feedback on its status (e.g. lamp failure), which eases maintenance and therefore allows reducing related costs.

DALI is a multi-master system: Ballasts can be controlled by DALI buttons and panels and DALI controllers/gateways interfacing to the building management system in parallel. That is, the lights are working, even if other parts of the building automation do not.

The DALI protocol was designed to only require low communication rates (1200 b/s), which makes it very robust and reliable. The protocol itself is standardized by the IEC 62386, which also contains related test procedures. Only DALI ballasts, which pass those tests, are allowed to carry the DALI logo.

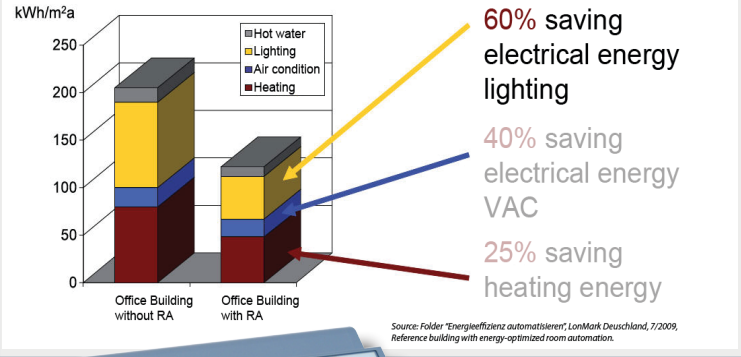
A Success Story

DALI is a continuing success story. Today DALI is supported by all major ballast manufacturers, which offer a wide range of DALI ballasts for all types of lamps (fluorescent, HID, halogen, LED, etc.). Numbers published by ZVEI show that the DALI market share of dimmable ballasts in Europe climbed to more than 50% in 2011. Due to this increased volume, prices for ballasts recently came down to the level of traditional 1-10V ballasts.



Source: The official AG DALI newsletter "DALI ENLIGHT", Issue 1 - Spring 2012

But not only the DALI market share is rising. Recent studies (e.g. "Energy Saving Lighting control systems for open-plan offices: A field study", Anca D. Galasiu et.al. 2007) show that by implementing modern lighting control solutions (e.g. occupancy based daylight harvesting), up to 60 % energy can be saved. With the increasing standards required by the various energy saving regulations (e.g. EnEV "Energieeinsparverordnung" in Germany), sophisticated lighting solutions are becoming key to achieving those goals, while even increasing occupant satisfaction. As a consequence, most newly constructed commercial buildings will be equipped with such a solution and this in turn means, they will be equipped with DALI.



Source: Folder "Energieeffizienz automatisieren", LonMark Deuschland, 7/2009, Reference building with energy-optimized room automation.

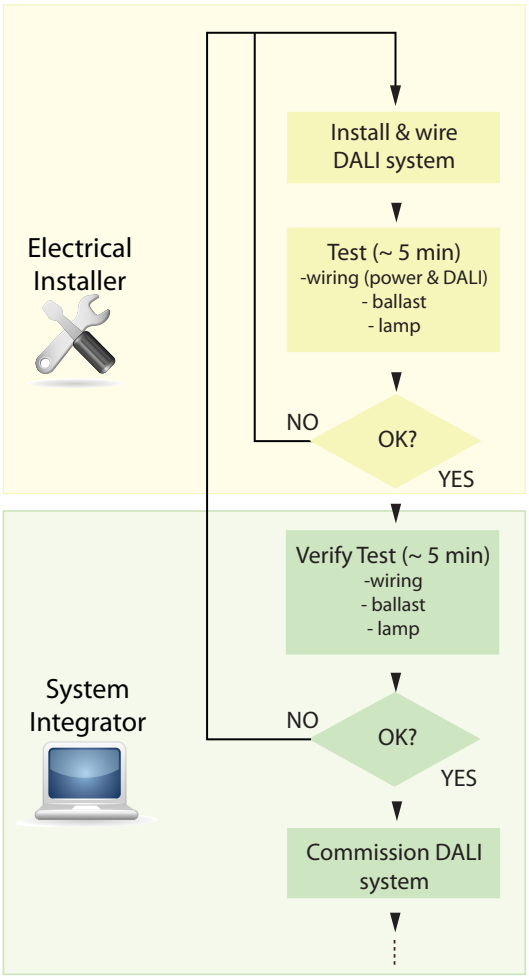
tively when pressing the button, this simple test, which takes only a few minutes, allows the electrical installer to check the wiring (mains and DALI lines), the function of the ballasts and lamps and whether all ballasts are connected to the correct channel. Similar it allows the system integrator to verify the installation before starting his work and therefore provides a clean cut between the two involved parties.

The commissioning of the DALI system (assigning and grouping of ballasts) is performed via the integrated web interface or a PC based Configuration Software. The latter also allows off-line preparation and parameterization of the installation, leaving only the scan of the DALI channel and the following assignment of the DALI devices (ballasts & sensors) for the online commissioning process. This task can be easily accomplished by less skilled personal using the web interface of the L-DALI.

Increase Lamp Life Time

After installation, dimmable fluorescent luminaires typically require around 100 hours of burn-in to reach their specified life time. During this time, lamps may only be switched to 100 % or to off, but must not be dimmed. Failing to do so will reduce the lamp life time significantly.

The L-DALI allows switching ballasts into burn-in mode, where it prevents



lights to be dimmed (e.g. using the web interface). After the individual ballasts were switched on for the configured burn-in time, they are automatically switched back to normal operation when „Burn in“ is finished. By using this feature, maintenance cycles can be significantly increased, thus reducing cost of operation.

Reduce Maintenance Cost

Staying on topic, L-DALI allows better planning of maintenance cycles by providing run-hour information for each ballast. Replacing lamps “just-in-time” further lowers maintenance costs.

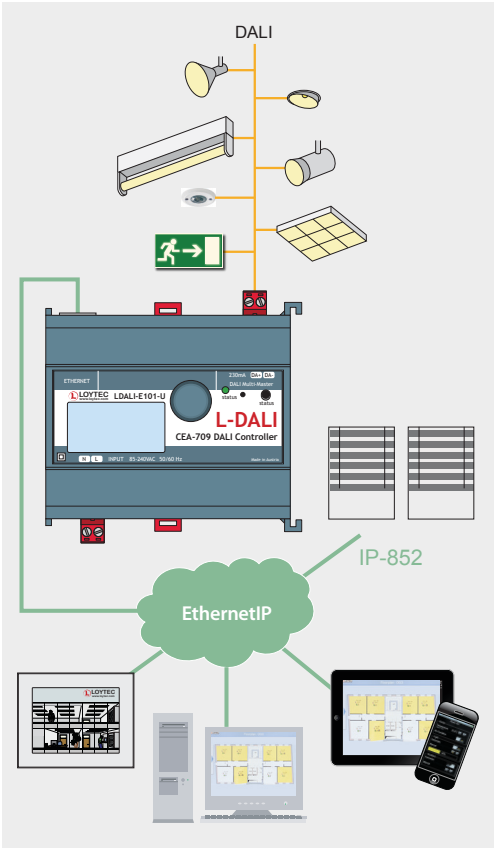
Speaking of lamp replacement: The L-DALI offers a simple way to re-integrate replaced ballasts via the web interface or via the LCD UI. The L-DALI maintains a backup of the configuration of all ballasts on the connected DALI channels. When using the replace function, the ballasts are automatically re-commissioned and the backup is used to restore the ballast‘s configuration. Execution of the function is simple enough for an on-site facility technician to perform, eliminating the need for a skilled service technician to come to the site.

Monitoring Energy Consumption

As a special feature for BMS integration, the L-DALI provides real time energy consumption information down to each group of lamps. This gives the operator and the owner of the building the added value of knowing the energy usage of each part of his building down to the room level, without any additional cost for meters. Due to the fine granularity of this valuable information it can be used for further optimizations by finding areas with increased energy usage, encouraging occupants to be “energy aware” by providing them with their energy usage or to refine tenant cost calculations.

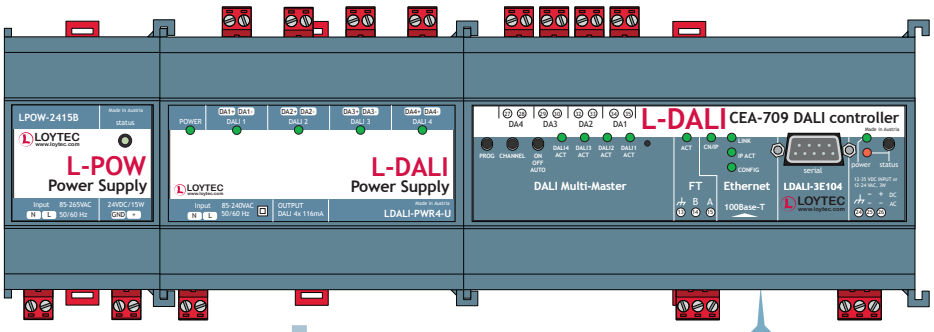
Sophisticated Fully Integrated Lighting Solutions

In addition to the lighting controller functionality, the LonMark version of the L-DALI comes with fully featured sunblind controller functionality, offering functions like glare protection and thermal optimization. Light controller and sunblind controller functionality affecting the same room or area can be linked, allowing tight integration of both systems. This improves occupant satisfaction by eliminating unwanted effects typically seen when lighting and blind control operate independently (e.g. lights switching on when blinds are temporarily closed). Further, it allows building systems, where blinds and artificial lighting are interacting, to keep the light level in a well-defined range as required in applications like conference rooms (optimal light level for video beamer) or museums (protect works of art, while offering good light for viewing).



Conclusion

LOYTECs L-DALI controllers bridge the gap between a DALI lighting system and the BMS. Ease of installation and maintainability is key. The L-DALI offers a perfect solution in these aspects, while providing an unmatched feature set. Various projects of different sizes show that the DALI technology is feasible and very efficient. As an example, the Iberdrola Tower in Bilbao (see cover page) uses L-DALI controllers to integrate around 20.000 DALI standard luminaries and emergency lights.



www.loytec.com/ldali

Support Tip

Auto-generated Pages for Fast Engineering of Graphical Visualization

The new version 4.5 of the L-VIS Configuration tool for L-VIS Touch Panels and LWEB-800/802 Visualization introduces a new function for automatic generation of display pages. This article shows how to use this feature to quickly generate projects with a customized appearance.

Dipl.-Ing. Norbert Reiter

A frequently asked question at the LOYTEC support line is about the fastest way to generate a visualization and operation interface for a large number of data points in the LOYTEC visualization solutions. The main focus is on short time to generate the project, since the powerful possibilities of the LOYTEC Visualizations cannot be used sometimes because of limited time and budget.

This use case now is covered by the new version of the L-VIS Configuration tool. When following the suggested workflow, the resulting projects can satisfy the needs of even advanced customers.

Automatically Generate Pages

Starting point for the new auto-generate feature is the data point configuration and the hierarchical structure of the data points within folders. In the base configuration,

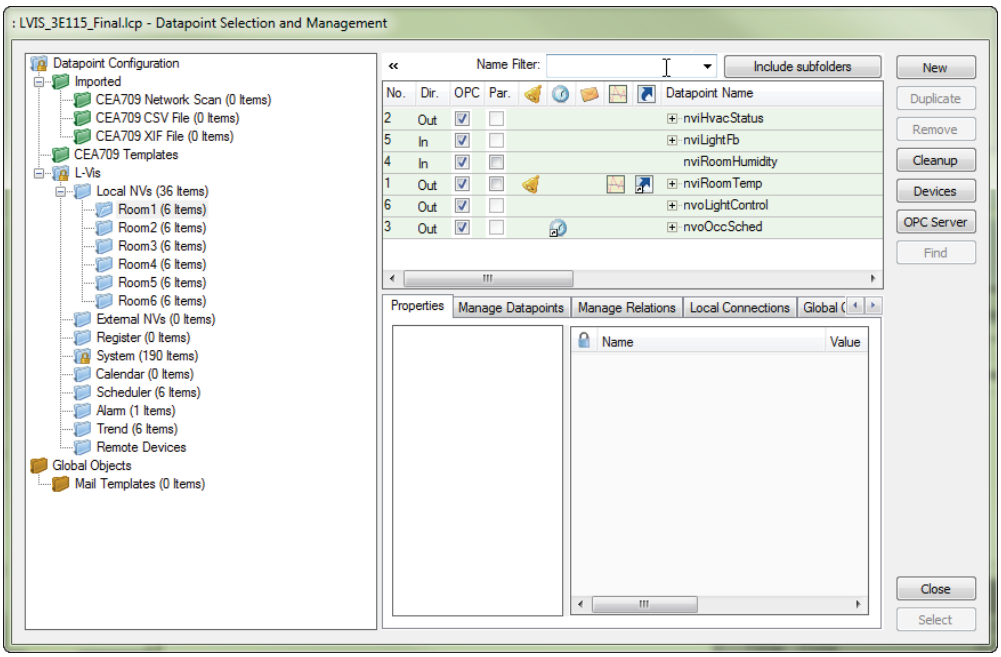


Fig. 1: Grouping of Data Points

the data points are already structured in some folders. This initial structure is based on the network technology of the data points, like network variables, BACnet objects, System data points or User registers. Also advanced objects like alarm servers, schedulers, and trend logs are placed in dedicated folders. In addition, the user can always add additional folders and create a structure layout that is based on the special requirements of his project. Other functions like the automatic creation of data points based on a network scan already collect all data points that belong to single remote devices in separate folders. The example project in this article uses network variable data points that are grouped by their room location (Fig. 1). However, the page auto-generate feature is not limited to network variables like in this example – the same functionality can be used for all data point types like e.g. BACnet objects, OPC data points or User registers.

The new L-VIS Configurator version now provides a context menu item „Add items from Data Points…" on menus and "Add Pages from Data Points…" for menu items. This item opens the "Auto Page Create Wizard" (Fig. 2). Basically it is sufficient to select a folder in the folder list and hit the "Start" button. The Configurator will create a complete menu hierarchy with attached pages. Each data point folder then is related to a separate menu entry. Subfolders are mapped to sub menus. Finally, each data point is labeled using a text field and the data point value is displayed in a number control or a text control. The automatic display is not limited to simple data points. For alarms, schedulers and trends, separate pages are generated and the according controls are created.

Further parameters can be adjusted in the Wizard dialog: the data points can be displayed in a one, two, three, or four column layout. Child data points in data structures are displayed indented to the parent item. The indentation width is adjustable. A further option specifies, for which data point direction, user inputs are accepted. The current data point path as well as the page number can be displayed in a page header line. Finally it is possible to specify a dedicated page template which is instantiated on every generated page. The page area, which is used for the displayed data, is specified by adjustable page margins.

Under the Hood….

The beauty of this new feature is that only basic function and controls are used in the auto-generated pages. There was no need to create new controls and there is also no special device firmware support required. The generated pages and controls

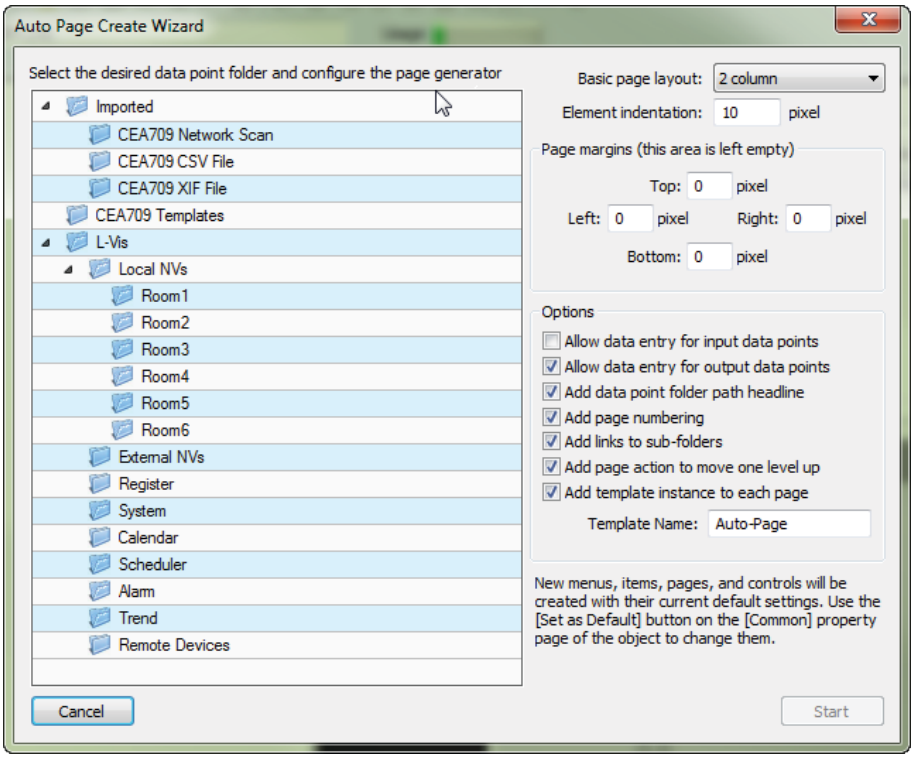


Fig. 2: Auto Page Create Wizard

remain fully editable, so that the original results can be further modified according to the needs of the customer.

To generate the project, the default settings for controls in the project are used. The appearance of the objects is influenced by properties like used font, font size, number format and color settings. These settings can be modified and adjusted for the individual object types by creating such an object, adjusting the properties to the personal taste, and then making the settings the new default on the "Common Properties" page (Fig. 3). All controls that are present in the project prior to this operation are not affected by the change of the default settings.

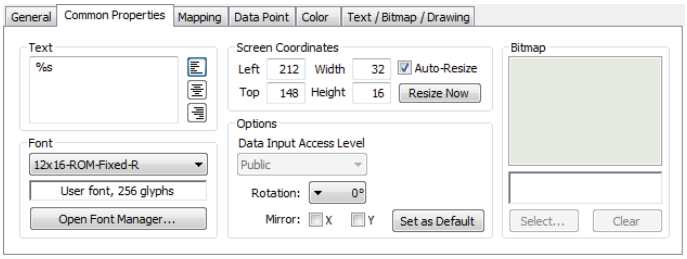


Fig. 3: Defining Default Settings for Controls

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.

The possibility to specify an auto-page template allows to further influence the result of the auto-generated pages. Possible use cases include adding a company logo to every page or adding dedicated elements to navigate between pages.

For best looking results it is recommended to adjust the default settings for the controls to one's personal style and to generate a personal page template. In many cases the resulting project then will only require minor changes to meet the customer's requirements.

The example in this article refers to an LVIS-3E115 device using CEA-709 network variables, but the functions can also be used in the other LOYTEC visualization solutions. In LWEB-800 and L-WEB 802, data point values can be displayed and operated efficiently, independent from the underlying network technology. The layout of the displayed data point values depends on the structure of the target technology. Structured elements are displayed together with their child elements (e.g. in CEA-709 or KNX). If the physical unit of the data point is known by the technology, the unit string is also displayed next to the data point value (e.g. in BACnet or M-Bus). To test the new functions, the example project in this article is available for download via this link: **www.loytec.com/LVIS-Example.** This package also contains a template, that holds all relevant controls required for the page

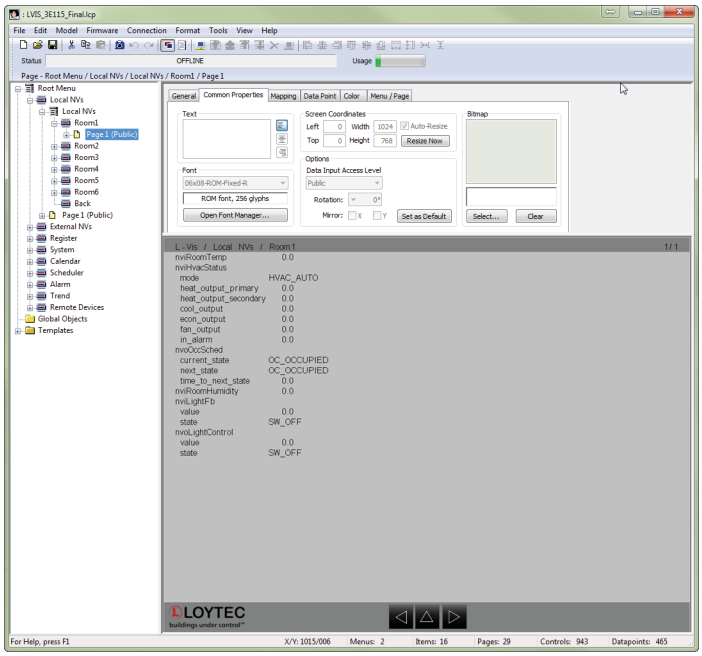


Fig. 4: Auto-generated Project

auto-generate feature. You can copy this template into your own project and adjust the settings as needed. After that, select the "Set as Default" option for each control type.

Conclusion

With the new auto-generate feature for pages, you now can configure your LOYTEC Visualization solution faster than ever before. Please try the new features – like always, we appreciate your feedback to further improve our products.

www.loytec.com/support

Save the Date!

Buildings under Control Symposium 2013

October 15 to 16, Vienna, Austria

LOYTEC is very pleased to host the fourth Buildings under Control Symposium in fall. Again, numerous experts for building automation from around the globe will meet for an exciting exchange of ideas. Two days full of lively discussions, interesting lectures, convincing reports and descriptive demo-presentations await you in Vienna.

LOYTEC is looking forward to welcoming you at this popular meeting point for the industry. So save the date: October 15-16, 2013, in Vienna, Austria. The venue of the symposium will be Tech Gate Vienna, the Viennese Technology and Science Park, where you will enjoy a magnificent view of the city from the 19th floor. We will keep you informed shortly on the details of the program via our website and in our newsletters. It will for sure be worth the visit to Vienna!

And The Winner is LOYTEC!

Best Infrastructure Product of the Year 2012

For the fourth time in succession, LOYTEC was awarded "Best Infrastructure Product of the Year" by LonMark International. As prizewinning device of the year 2012, LOYTEC's LGATE-950 convinced the judges of this renowned contest. LGATE-950 increases the power of control networks by interconnecting multiple protocols simultaneously. It can interconnect LonWorks networks to OPC, Modbus, KNX, or BACnet.

Nominations were judged based upon the following criteria: uniqueness of solution, addressing industry problems with effective solutions, openness of solution and integration into an open ISO/IEC 14908 system. Special consideration was given to energy efficiency, industry best practice solution and sustainable design principles.

"Every year we continue to be impressed with the level of innovation from our members," said Barry Haaser, executive director, LonMark International. "The dedication to innovation grows significantly and this year's winners truly demonstrated superior levels of expertise with open control networking technology based on the ISO/IEC 14908 suite of standards."

www.loytec.com/awards

Case Study

High School Wendelstein: Symbiosis of Ecology and Economy

High-tech high school, innovative model school, showcase project – perennially prizewinning, the most modern high school in Bavaria was considered a special class building from the beginning. During a construction period of only two years the county of Roth erected the three floor concrete steel construction with a gross floor area of 12,500 m² (134,548 ft²) for the substantial amount of 33 million Euro. The school has an open, friendly architecture, an inviting environment for learning. A study in contrasts; light and color, brightness and transparency, light patios and open spaces. With the impressive sports and event halls and the snug commons for up to 800 students, Wendelstein high school is a place at which more than just knowledge is conveyed.

Trend-setting Energy Concept

Wendelstein high school is characterized by its energy concept, which relies on renewable energies like geothermal heat and solar energy, on corresponding construction building physics, and the required intelligent building and HVAC automation producing low energy consumption. There were specific efficiency targets. With a limited thermal energy need of 40 kWh/m² (3.7 kWh/ft²) the school matched the standard of a low-energy house, being only scarcely above consumption levels of a passive house. The loss of heat was reduced to a minimum [specifically: 0, 30 W/m²K (0.05 BTU/hr/ft2/°F)] due to an appropriate cladding. Two simple figures only, but standing for ambitious goals.

Without comprehensive system integration and the consequent utilization of standardized communication protocols for interconnection of the systems, a concept like this cannot be implemented economically. In the Wendelstein project a LonMark System (CEA-709) is applied as integrative communication technology and all systems like HVAC, energy data acquisition, or DALI lighting control are integrated. Approximately 1,000 nodes perform their tasks reliably in the building automation network of the high school. Numerous other hardware components are integrated via DALI, Modbus and BACnet. The system integration adapted to the building and its utilization allows a secure and energy efficient operation of the facilities engineering systems.

Innovative Class Room Ventilation with L-IOB I/O Controllers

The energy concept did not only aim at savings but also at a good indoor climate. Controlled ventilation of each class room plays a decisive role at it. Already during the planning phase it was clearly evident that oxygen-deficient air in the class rooms and uncontrolled ventilation by windows left open should be prevented (windows in Europe typically are tilt openable and could be left open past the end of the day). The resulting energy waste

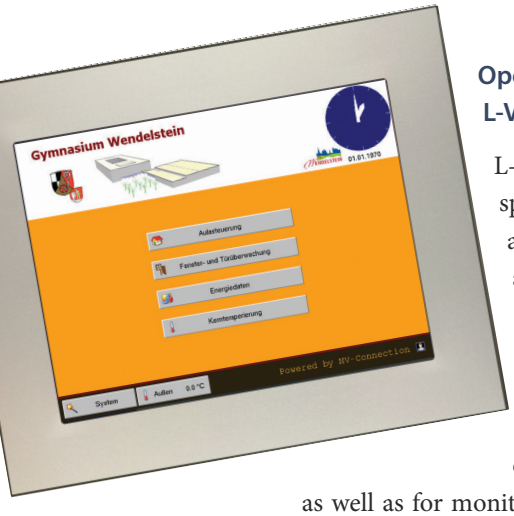
should be avoided. Now decentralized Trox ventilation devices with integrated heat recovery (Schoolair-V) provide the necessary fresh air in the rooms. Automation of the ventilation devices is managed with integrated, freely programmable L-IOB I/O Controllers by LOYTEC, communicating on the LonMark TP/FT-10 channel. Perfectly adapted to the specific requirements of the project, the L-IOB I/O Controllers inside of the almost 120 Schoolair-V ventilation devices provide a comfortable climate in Wendelstein high school.

L-INX Automation Servers Take on Tasks in Building Automation

For automation of the sun blinds, control of the concrete core cooling, demand-based lighting control of the big entrance hall, corridors and the exterior, freely programmable L-INX Automation Servers are deployed. Here the extremely short program cycle times (down to 10 ms) are advantageous with the resulting quick response time for switching the light and synchronic operation of the sun blinds. Simultaneously, the L-INX Automation Servers act as gateways for the Modbus integration of energy meters into the CEA-709 network.

Constant Light Control with L-DALI

Up to 2,000 DALI lamps are connected to L-DALI Lighting Controllers. The controllers manage constant light control in the class rooms and are able to regulate the two lighting zones (one at the window side, one at the corridor side) independently from each other. DALI multi sensors by Osram are incorporated into constant light control. The integrated gateway function of the L-DALI Lighting Controllers sends data from the multi sensors to be displayed as network variables. This way data is available for the entire building automation system. This important data is utilized in various overlapping building applications.



Operation and Monitoring with L-VIS Touch Panels

L-VIS Touch Panels are used in the sports gymnasiums by both pupils and teachers for lighting control and for stationing of the basketball hoops, still rings, and the separating curtain walls. The school building engineer uses L-VIS for regulation of the lamps in the big entrance hall and in the corridors as well as for monitoring all windows and door positions in the building.

Data Monitoring for Optimization of Energy Consumption

The facility management of the school's owner, the county of Roth, is responsible for continuous acquisition and evaluation of system and consumption data. This helps in analyzing the high schools' energy fluctuations and monitoring the systems. The aim is to optimize energy consumption permanently and to quickly detect error sources in case of deviations. Consumption data is provided by electricity meters, heat meters and water meters. Meters using CEA-709, Modbus/RTU interface and pulse counters are used. L-IOB I/O Controllers provide data from the Schoolair devices, distributed L-DALI Lighting Controllers provide consumption data from the DALI lighting system, and L-INX Automation Servers gather energy data of the solar systems via Modbus TCP.

At Wendelstein high school, the energy concept is also exploited for educational purposes. System and consumption data is made available to pupils and teachers via the IT network of the school in real time.

LonMark System

All network nodes on LonMark TP/FT-10 channels are connected via L-IP Routers to the IP network (LonMark IP-852). Due to this network system, the operator can access the building automation system and respectively the installed network nodes, local or remote at any time.

Within the LonMark System, the installed L-INX Automation Servers, L-GATE Gateways and L-DALI Lighting Controllers integrate other devices utilizing communication protocols like BACnet, Modbus and DALI and so provide seamless exchange of data between the different systems.

System Integration by Raimund Hoyer (NV Connection)

The practically orientated energy concept was created within only ten weeks, a possibly record breaking short planning period for a project of this dimension. System integration lay in the reliable hands of Raimund Hoyer; his company NV-Connection well known in the industry to which he belongs for 25 years. Hoyer worked for twelve years as an independent system integrator near Nuremberg/Germany, as a certified specialist of LonMark Germany with excellent expertise and has gained an education as an energy efficiency consultant in building automation. For six years and being one of the first – Raimund Hoyer belongs to the circle of LOYTEC Competence Partners. "Innovative and vendor-independent system solutions for room and building automation based on the communication technologies BACnet, LonWorks, EIB/KNX, Modbus, M-Bus, DALI and SMI are customized by me. Whenever possible, I focus on Ethernet/IP as a central communication channel. Projects like Wendelstein, where it becomes impressively apparent that ecology and economy can enter a symbiosis of which especially the coming generations will benefit, are particularly important to me," Hoyer reveals to L-Express.

FACTS

Location	Wendelstein, Germany
System Integrator	NV Connection, Raimund Hoyer
LOYTEC Components	2 x LINX-100, 4 x LINX-110, 7 x LIP-3ECTB, 3 x LIP-33ECTB, 3 x LIP-3333ECTB, 3 x LGATE-900, 118 x LIOB-180, 29 x LDALI-3E101, 11 x LDALI-3E102, 4 x LDALI-3E104, 3 x LVIS-3E100, 1 x LVIS-3E115

Raimund Hoyer, NV Connection

www.nv-connection.de

PRODUCT NEWS

Built-in Remote BACnet MS/TP Diagnosis and Analysis

LOYTEC has always tried to provide many diagnostic functions in its products in order to detect and diagnose network problems as quickly as possible. In the age of the internet, a wish is to diagnose networks also remotely – no problem with the solutions from LOYTEC.

Diagnostic functions are supported by all BACnet MS/TP enabled L-INX, L-GATE, L-VIS and L-IP devices.

BACnet MS/TP Diagnosis via Web Interface

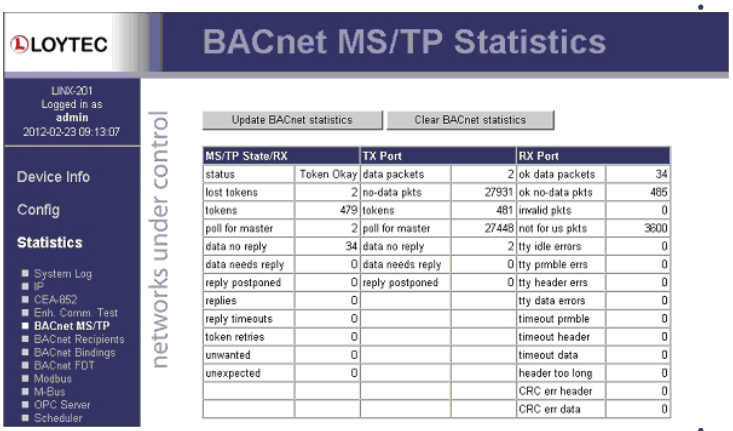
The easiest method to get an impression of the communication quality on the MS/TP channel is to look at the "BACnet MS/TP statistics" on the web pages of the LOYTEC device under the MS/TP channel to be diagnosed. The MS/TP statistics web page immediately gives notice of the current condition of the MS/TP token, shows an MS/TP bus history across the last minute and offers an indication stating the communication quality or "health" represented by a value range of 0 – 100 %. The higher the percentage, the better MS/TP communication is running between the devices on the bus.

BACnet MS/TP Analysis Using Remote-Packet Recording

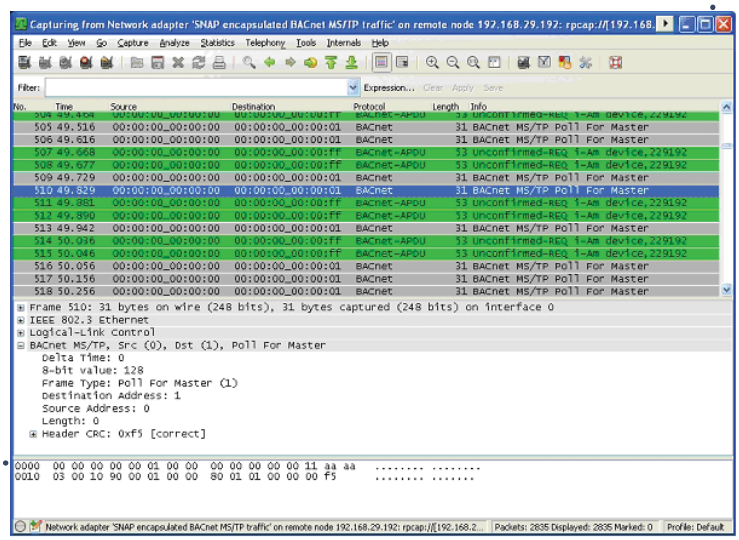
If the statistic evaluation of the MS/TP channel doesn't help to locate the problem, remote packet recording is the method of choice. Devices can capture all the data traffic on the BACnet MS/TP channel. Wireshark (www.wireshark.org) can be used for analyzing the captured packets in detail either online or offline.

In offline mode, the recording of the MS/TP data traffic is started via the web interface of the LOYTEC device. The recorded file then is downloaded via the web interface and loaded into Wireshark.

In online mode, the LOYTEC device acts as a "remote interface" for Wireshark, and after a few mouse clicks you are ready to go. After Wireshark has been connected to the LOYTEC device, the data traffic on the MS/TP channel can be watched live in Wireshark.



MS/TP State/RX		TX Port		RX Port	
status	Token Okay	data packets	2	ok data packets	34
lost tokens	2	no-data pkts	27931	ok no-data pkts	485
tokens	479	tokens	481	invalid pkts	0
poll for master	2	poll for master	27448	not for us pkts	3600
data no reply	34	data no reply	2	tty idle errors	0
data needs reply	0	data needs reply	0	tty prmble errs	0
reply postponed	0	reply postponed	0	tty header errs	0
replies	0			tty data errors	0
reply timeouts	0			timeout prmble	0
token retries	0			timeout header	0
unwanted	0			timeout data	0
unexpected	0			header too long	0
				CRC err header	0
				CRC err data	0



Smart Auto-Connect™ with L-GATE and L-INX

LOYTEC L-GATE customers for many years value the feature to automatically create and connect BACnet Objects from LON network variables with only one mouse click.

With Smart Auto-Connect™, LOYTEC has now carried the automatic creation and connection of data points in gateway applications to a new level. Smart Auto-Connect™ is able to map data points and data structures from any network technology supported by L-INX and L-GATE (BACnet, LON, KNX, Modbus and M-Bus) to the technologies BACnet (server objects), LON (statical NVs), Modbus (Slave register), and registers automatically. Smart Auto-Connect™ uses templates which determine the rules for the applied automatisms. Some of these templates are already included in the configuration tool. The user can also assemble the necessary templates for his application by himself and so map nearly all applications from rather simple to very complex rules. Complex rules can also contain calculations which are determined by the formula editor.

Typical utilizations of Smart Auto-Connect™ are the mapping of KNX data points to BACnet or LON in room automation or mapping data points from M-Bus or Modbus meters to BACnet or LON.

L-IOB with Fast Analog Inputs

For applications needing fast analog inputs, LOYTEC now offers a solution for all L-IOB devices, where an analog input can be read in only 125 ms. At this each universal input consumes a time slot of 125 ms, if it is configured as an analog input. So if for example out of eight universal inputs on a L-IOB device, three are configured as analog inputs and five as digital inputs, the analog inputs are read in 3 x 125 ms = 375 ms. Each digital input is read within 10 ms in parallel.

This feature is especially interesting when using L-IOB I/O Controllers, which support minimal cycle times of 10 ms in their logic.

And the best is: The fast analog inputs are also available for already shipped devices free of charge via a simple free firmware upgrade!

L-IOB IP I/O Controllers with Plug'n' Play I/O Extension via Ethernet/IP

Inputs and Outputs of the freely programmable L-IOB IP I/O Controllers LIOB-58x for BACnet/IP networks and LIOB-48x for LonMark systems can now be extended per plug'n'play through use of the L-IOB IP I/O Modules LIOB-45x/55x. At that, each L-IOB I/O Controller can be extended with one L-IOB Module via Ethernet/IP. The L-IOB I/O Modules can also be placed separately from the I/O Controllers in remote locations. As with the L-INX Automation Servers, the L-IOB I/O Modules are logically connected to the I/O controllers via LIOB-IP. The connected inputs and outputs are available on the I/O controller for further utilization and are displayed on the Web interface of the I/O controller.

The replacement of an I/O module is also very easy. The entire configuration of the I/O module is stored on the I/O controller and after exchange of the device is loaded onto the new I/O module automatically via Ethernet/IP – without the usage of any software tool.

Guest Author

Standardization in Building Automation - A Mixed Blessing

Dipl.-Ing. (FH) Hans R. Kranz

„Standards are the priceless values that strengthen the dissemination of all new technologies and bring new ideas to market faster. The fundamental drive that sets and keeps the economy moving comes from new products and methods ...“

By Joseph Alois Schumpeter, Austrian-American economist, end of the 18th Century

The overall economic benefits of standardization in Germany, Austria and Switzerland, is on average about one percent of the gross national product [1]. Standards are documents that are created by experts in a process of mutual agreement on standardization bodies. These documents are particularly suited for disseminating technical knowledge in today‘s communications environment. Unlike patents, which are subject to intellectual property rights, the knowledge codified in standards is available to everyone at no charge. Standards define terminologies, design principles, and processes, upon which an industry may rely. With standardization comes a level of certainty as to planning, costs and legal issues; in the case of building automation, for all those involved in construction [2] [3].

Standards and Operating Policies

In some states, ISO standards are legally binding. In Europe, standards must be agreed to contractually. A European Standard (EN) is implemented in all European countries as a National Standard. Sometimes standards are regarded, however, as more of a burden - providing no added value and as a form of state intervention - but only by those who wish to bypass a „generally recognized state-of-the-art“ for business reasons, or those who have no idea of the scientifically proven economic impact.

Hardware Costs as a Backdrop

The old industry standard fair practice of intensive sales support for consultants with proprietary, often encrypted bills was intended to confuse competitors. The common hardware data point calculation does not distinguish functionally between the data point for a bathroom fan or that of a complex chiller, even if it is used to simply indicate the function on a plant schematic, a cascade control system, or a complex control chain for a cogeneration plant. This situation resulted in a fatal downward price spiral. In other words, the one who miscalculated the most got the job - and improved on it by „omit“. This is exactly where for some of these players the „curse“ of standards begins, because it becomes just that more difficult to pull the wool over the eyes of enlightened customers.

Concerted Action

The most important prerequisite for an efficient building automation system is a competent design and tender as well as clear and unambiguous documentation

[1] Der gesamtwirtschaftliche Nutzen der Normung, Prof. Dr. Knut Blind, Prof. Dr. Andre Jungmittag, Dr. Axel Mangelsdorf http://www.inno.tu-berlin.de/fileadmin/a38335100/PDF_Dateien/Publikationen/DIN_GNN_2011_deutsch_akt_neu.pdf
[2] Normative Projektbearbeitung in der Gebäudeautomation, H.R.Kranz, TAB 09-05, Technik am Bau, Bauverlag
https://dl.dropbox.com/u/57844508/Aufs%C3%A4tze/Aufs%C3%A4tze%20von%20HAK%20-%20BACnet-Geb%C3%A4udeautomation/%5B2%5D%20TAB%205%202009%20Normative%20Projektbearbeitung%20in%20der%20GA.pdf
[3] Die Anwendung der GA-Funktionsliste für die Planung BACnet-Konformer GA-Systeme“, H.R.Kranz TAB 4+5 2008.
[4] VDI Wissensforum, http://www.vdi-wissensforum.de

Fig: The ISO/TC 205 WG3 Team before 2011

of project requirements. Technical processing (engineering) is a key project cost driver since the advent of digital technology. These expenses are directly related to the required building services functions.

In a concerted campaign on the part of VDI, DIN, VDMA [German Engineering Federation], BTGA [Federal Industrial Building Services Association], GAEB [Common committee for information technology in building & construction] and AMEV [Association Mechanical and Electrical Engineering of public administration], builders, consulting engineers, GA manufacturers, and HVAC companies agreed on a definition of BAC functions and introduced them as a rule of technology and in the VOB / C DIN 18386 [procurement and construction contract procedures] for construction contracts and the GAEB standard specification for BACS. It was intended from the outset to standardize the processes for design and implementation in addition to hardware and data communications. In Part 1 of the global BACS standard, the „BACS-Function List“ (BACS-FL) is defined as documentation of the planning concept for system neutral BACS-planning. For the energy efficiency certificate, these functions are also required pursuant to EN 15232 [energy efficiency of buildings]. Contracting authorities stipulate the application of the VOB and the GAEB standard specification as a proven system for preventing corruption in the construction business.

The BACS Function List (BACS-FL) as a Worldwide Standard

Today in the BACS industry, the BACS-World Standard series EN ISO 16484 is available among the VDI guidelines 3813 (Room Automation) and 3814 (Plant Automation) as a code of practice. The guideline VDI 3814 with the BACS-FL as functions definition has gained acceptance throughout Europe (EN) and the world (ISO). The BACS-FL is the collection and allocation of standard BACS functions ranging from data points to plants and/or suppliers. It replaces the mostly incomplete prosaic descriptions of functions, which can be interpreted in any number of ways. The benefit is achieving testable project quality as well as cost accounting and cost certainty when it comes to the building automation and system integration trade.

Predictable Services

In contract documents (bill of quantities) each of these BACS functions is calculated as a complete engineering service - from technical clarification, programming and commissioning to operator instructions and documentation. This simplifies settling accounts for increases or decreases to a project. In the bill of quantities, the BACS hardware can be advertised as product neutral per mechanical equipment room by the number of required I/Os. The allocation of services (functions) to subsystems in integration projects is nearly impossible without the BACS-FL. Today, there is virtually no BACS project that does not feature interoperable communication/integration of third-party products, e.g. boilers or SCADA. The most sustainable and cost-effective solution for these tasks is using an internationally standardized communication protocol, such as BACnet (EN ISO 16484-5) or LonWorks (ISO / IEC 14908 / EN 14908); manufacturers can no longer afford to not offer standard protocols without consequences (who could see that as a curse of standardization?).

Expertise and Potential for Innovation

Clean and proper calculations under the BACS-world standard, helps keep innovation potential within the industry and protects it from undue legal expenses. In addition, a lack of expertise (curse?) is quickly evident when applying standardized functions in a tender. To remedy this, the “VDI Wissensforum” offers courses on standardized planning and tendering of building automation [4].

Finally, the legal certainty of standardization permits investments in rationalization tools (C-tools and e-commerce) for planning, tendering and engineering clearing the way for an unprecedented streamlining of planning and sales processes. And in the end, the building operator receives a system that works as advertised and planned.

Dipl.-Ing. (FH) Hans R. Kranz
Former Board Member of VDI-TGA

Since 53 years with all his heart in the building services business.
From a craftsman in heating construction to electrical engineering;from Honeywell via Schmidt Reuter Consulting and IBM to Siemens in leading positions; He always walked new technical ground: prefabricated single-pipe heating system for prefabricated houses (1966), first heating time optimizer (1970), first programmable control system (1972), controls project manager of the first mega chip plant from IBM (1975), initiator of the first communication protocol for BACS (1983). Since 1985 he has been involved in the standardization / regulation and the technical training.
Hans Kranz carries the VDI honorary plaque and Beuth Medal of DIN.

Emerging Market for LOYTEC: Middle East – Hot Spot for Building Automation

Two trend-setting events for the booming building automation market in the Middle East region took place at almost the same time in November last year. "Middle East Smart Lighting & Energy Summit" in Abu Dhabi from November 5 to 6, 2012, the well known international exposition. Also, "The Big 5" at the Dubai World Trade Center from November 5 to 8, 2012. Dirk A. Dronia attended both shows, which were visited by multitudes of relevant experts from the entire region. Dirk used the opportunity to undertake a one-week journey to the Emirates, during which he succeeded in arranging numerous face-to-face meetings with business friends.

The population of the United Arab Emirates is growing at a record pace, the urban development as well. Accordingly, the emphasis on energy efficient solutions becomes increasingly important for governments and municipalities. Lighting systems, sources, and controls used for roads transport infrastructure, public buildings such as sports stadiums and shopping malls, and private buildings need to be optimized to meet the regulatory demands and standardization. With hundreds of urban development projects and new buildings coming to fruition within the next five years, it is essential that lighting systems and sources are intelligent.

The "Middle East Smart Lighting & Energy Summit" took place in the Grand Ballroom of the famous Rocco Forte Hotel. The new landmark in the Emirate is built from curved glass and its wavy structure – with not a single straight line in sight – is an architectural masterpiece, mirroring the colors of the Arabian Gulf. For two days, Dirk actively supported the presentation of World Bridge General Trading L.L.C. from Dubai, since lately LOYTEC Distributor for the Middle East and LOYTEC Competence Partner for United Arab Emirates and Saudi Arabia. World Bridge CEO Ghasem Riazi appreciated the welcomed contribution, together the numerous requests of the many visitors could be managed much better and the LOYTEC products be showcased ideally.

Subsequently, Dirk traveled on to Dubai to visit "The Big 5", the long-standing and most significant event in the region for the building and construction industry. With a history of more than 30 years, "The Big 5" proved a magnet once again: More than 2,500 exhibitors from 70 countries, among them 27 national pavilions, showcased newest technologies, innovative solutions and attractive products. As always, the show provided an ideal business and networking platform, Dirk could benefit from in numerous meetings and discussions. The possibility for direct face-to-face talks was highly appreciated, as well as establishing relations with new business partners and cultivating and refreshing existing contacts. Dirk obviously was completely in his element, this probably will not have been his last journey to the Middle East.

www.loytec.com/competence-partner

Building Automation Conferences in Poland:

Two Days Dedicated to Energy Efficiency and Smart Buildings

On November 14 and 15, 2012, two conferences, rather significant for the Polish building automation industry, took place in Krakow. Our Polish distributor ZDANIA Sp. Z o.o., the first LOYTEC Competence Center, hosted a one-day symposium about "Seamless Integration of Communication Protocols in Building Automation". The "who-is -who" of the Polish industry was invited and attended the event in large numbers. Dirk A. Dronia, responsible for the development of international business relations, had gladly consented to hold a lecture about "Energy Efficiency in Building Automation" at the occasion. Subsequently he presented the most recent LOYTEC product updates to the interested audience and showcased the new building management system LWEB-900 as well as LWEB-802, the visualization via web browser.

A highlight of the symposium was the ceremonial presentation of a diploma certificate to Mr. Justyn Jelonek from Wikotech P.W. s.c., who had won the title "Best Integrator of LOYTEC Products in Poland 2012". Gladly Justyn Jelonek, a LOYTEC Certified Professional, took over the certificate out of the hands of ZDANIA CEO Pawel Kwasnowski and Dirk Dronia.

The following day was characterized by "Inteligentny Budynek" (Intelligent Buildings), the leading journal for building automation in Poland, hosting a congress with accompanying exhibition about "Open protocols in Building Automation". Within the context of his guest speech Kwasnowski took the opportunity to thoroughly explain the LOYTEC business model and LOYTEC product solutions to the expert audience.

www.zdania.com.pl

New LOYTEC Catalog: Products 2013/14

No more waiting: Now the new LOYTEC Product Catalog is published! Brimming with innovative news and proven evergreens (reliable old growth product) from the LOYTEC product workshop. You will find a complete overview of the entire LOYTEC product range in it. Detailed descriptions of all L-INX Automation Servers, L-DALI Controllers, L-IOB I/O Modules and Controllers, L-ROC Room Controllers, L-GATE Gateways, L-IP Routers, L-VIS Touch Panels, the L-WEB Building Management System, and much more are displayed, richly illustrated, on more than 140 pages. It is the most comprehensive LOYTEC Catalog ever and urgently needed, as its predecessor Products 2011/12 is fully out of print.

As of now you can find the new Product Catalog for download on the LOYTEC website: **www.loytec.com/productcatalog**. If you wish a printed copy, please order at sales@loytec.com (and don't forget to state the post address and number of copies you wish). Enjoy reading our exciting new catalog!

LOYTEC Present at Mega Shows in USA

LOYTEC has presented its service portfolio at two big events for sustainable building, energy efficiency, HVAC and building automation in recent months.

From November 14 to 16, 2012, Greenbuild 2012 took place in San Francisco, CA, at the Moscone Center. Greenbuild is the world's largest conference and expo dedicated to green building. Almost 900 exhibitors representing 90 different countries showcased their skills and accomplishments to 25,000 visitors. A unique stomping ground for experts dedicated to sustainable building from all over the world coming together for four days of outstanding educational sessions, renowned speakers, green building tours, special seminars and networking events. Launched in 2002, Greenbuild is the ideal space to learn about the newest, most groundbreaking green building products, services, and technologies. LOYTEC attended Greenbuild for the first time. The presentation was part of an Austrian group exhibition initiated by the Austrian Economic Chamber. The increasing demand for energy efficient and sustainable building solutions in the US and the growing interest in the according European technologies and experiences was reflected in the brisk visitation of the LOYTEC booth.

Named as the world's largest HVACR marketplace and repeatedly setting new records, this is a show where LOYTEC is a regular guest: We are speaking about AHR Expo, this year in Dallas, TX, from January 28 to 30. It is a place where 1,900 leading manufacturers from all over the world showcase their products to 33,000 visitors from 131 different countries. Here the HVACR industry meets to buy, sell, network, and learn. For three days this show is the hub of the HVAC world and its automation. No other event still drives the HVACR industry forward more to meet the demands of modern, smart, and efficient solutions. Accordingly, the LOYTEC booth was staffed prominently. Daryl Clasen, Head of Sales LOYTEC Americas, was actively assisted by the LOYTEC top management Hans-Joerg Schweinzer and Dietmar Loy, having come all the way from Europe, in supporting the numerous visitors of the booth.

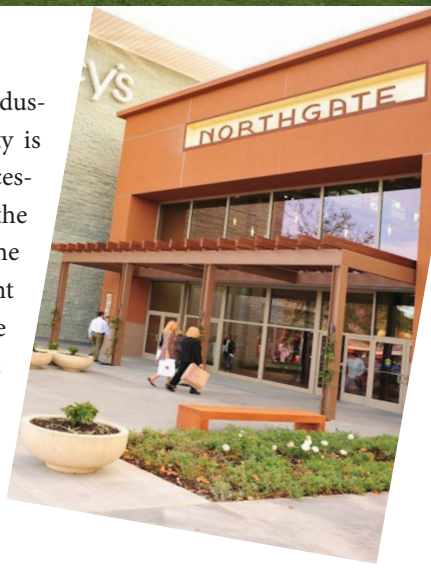
Greenbuild San Francisco

AHR EXPO Dallas

Trinity – Successful with the Best Possible Solutions

Trinity EMCS Inc. provides solutions for building automation, retrofitting legacy and pneumatic systems, and installing DDC controls in new buildings to make buildings more energy efficient! Operating in the Greater San Francisco Bay Area, the company specializes in integrating different open protocols and therefore is excited to partner with LOYTEC, an expert on the subject.

Trinity was founded in 2008 by Robin James and Phil Hervé and now has three offices with over 15 employees. In an industry that is dominated by men, Trinity is led by a woman who has been in the HVAC controls industry for over 20 years. Robin received a first class education and strong leadership training at both the United States Naval Academy and then in the U.S. Navy following graduation. She entered the HVAC controls industry in 1990 working for several companies like e.g. Belimo in leading positions. In 2008, when she was president of a local DDC Controls Contractor, she realized that she had the business knowledge and technical know-how to start her own company. So together with her founding business partner Phil Hervé she formed Trinity EMCS Inc. Phil is a Baltimore Maritime Academy graduate with over 30 years' experience in the DDC controls world. And Robin's senior manager and business partner Mike Coover has been in the DDC controls industry for over 25 years. This senior management team has created a strong foundation for Trinity to build upon.

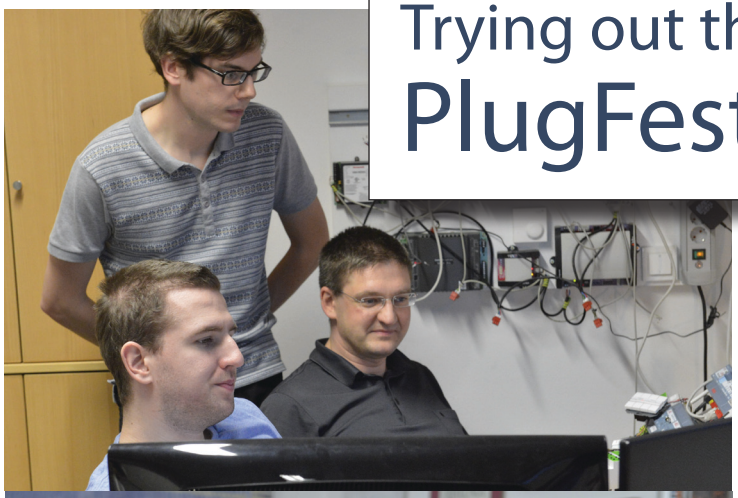


As the building automation industry continues to change, Trinity is poised with the experience necessary to meet the demands of the future. Building owners want the flexibility to integrate different control systems using multiple protocols and native BACnet products into a single building automation system. This is reflected in several projects Trinity has managed in using LOYTEC devices. At Northgate Mall in Terra Linda, a new BMS had to be installed during a renovation project. Lighting and HVAC of the Mall was updated completely. With the installation of several L-GATE devices, 14 large roof top units had been successfully interfaced from LON to BACnet. For the City of Oakland Art Center 'Studio One', a LON based system had to be connected with the BACnet software of the community. Again an L-GATE device proved a perfect solution. At present Trinity works on a project at Ukiah Campus in the Mendocino Community College. Again a LON system needs to be mapped to BACnet controllers and a lighting system also shall be integrated. Thanks to the close cooperation with LOYTEC Americas Head of Sales Daryl Clasen, the tasks can be fulfilled and LOYTEC gladly welcomes Trinity as a new LOYTEC Competence Partner.

Trinity Team: Extensive experience in building automation controls

Studio One Art Center, Northgate Mall, Ukiah Campus

Trying out the Customers Point of View: PlugFest at LOYTEC



For an entire week, LOYTEC product developers were joined for a big PlugFest. This was not a boisterous party that was held at the LOYTEC facilities from November 19 to 23. On the contrary, during this time the development teams headed by Norbert Reiter carried out an exciting role reversal and eagerly undertook the otherwise unfamiliar role of the customer.

There was specific reasoning behind this exercise. "Developers usually work much focused on details," Norbert explains "This can result in losing sight of the big picture, the automation of the entire building including all kinds of systems. At the PlugFest the developers act the part of the customers and so experience on a practical level as a user how to get along with devices developed by them or their colleagues. The developers switch from theory to practice and come to realize a quite different, sometimes surprising view on the LOYTEC devices. We consider this crucial and vital enrichment."

Following the example set by the annual BACnet PlugFests in the USA, which have been attended several times by LOYTEC staff members, numerous LOYTEC devices were connected for an extensive and practical field test. Do they behave smoothly with each other? How do the devices "feel" in practical usage? Can software and devices be operated intuitively? Are the workflows fluent enough? And is there potential for improvement?

The process was as follows: In the course of a joint briefing for the whole team two task forces were formed, one lead by Andreas Döderlein, the other one headed by Stefan Soucek. Both teams had to fulfill a task conceived by Norbert Reiter. Task number one for Andreas' team aimed at a complete update of the entire automation system

of the corporate office building Blumengasse 35. On that one needs to know that LOYTEC utilizes its own building as kind of a test lab where on each floor varying applications are implemented. All findings won out of these long-term test runs immediately influence the work of engineers and developers. Now during the LOYTEC PlugFest, all these devices and functions should be brought to an up-to-date-level and some new developments, not yet on the market, should be included.

The second task for Stefan's team consisted of the preparation of several projects for diverse applications. For this purpose, controls for hot-water boiler and ventilation systems were fitted, and new gateway functionalities were tested.

Work progress of both groups was reviewed and discussed in periodic meetings, interim results were recorded, and resulting steps decided. Quickly the process developed its own dynamics, leading to rather exciting and sometimes surprising turnarounds during the progress of the projects. The intense communication and interaction between the members of staff working together closely evolved in a palpable effect of team building. As we say in German: Seeing past the edge of one's own plate became possible, a deeper insight of little-known problems of other colleagues could emerge.

What concrete results did the PlugFest show from Norbert's point of view? "We have addressed many issues, achieved numerous smaller and bigger optimizations. The test data base is more practice-oriented now due to more reality-closeness. The result is that usability was improved. On the whole we could achieve better practical workflows for our customers and sharpen the insight of our developers for the view point of our clients. Slipping from the boots of the theorist into those of the customer is a beneficial experience, which allows you to see the bigger picture."

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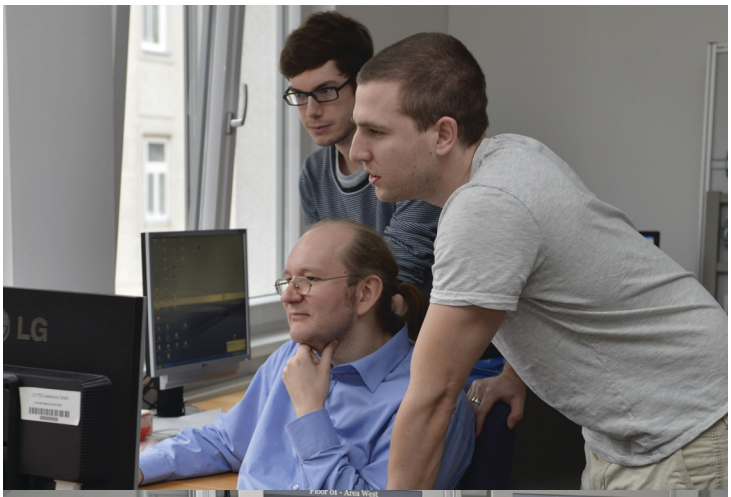
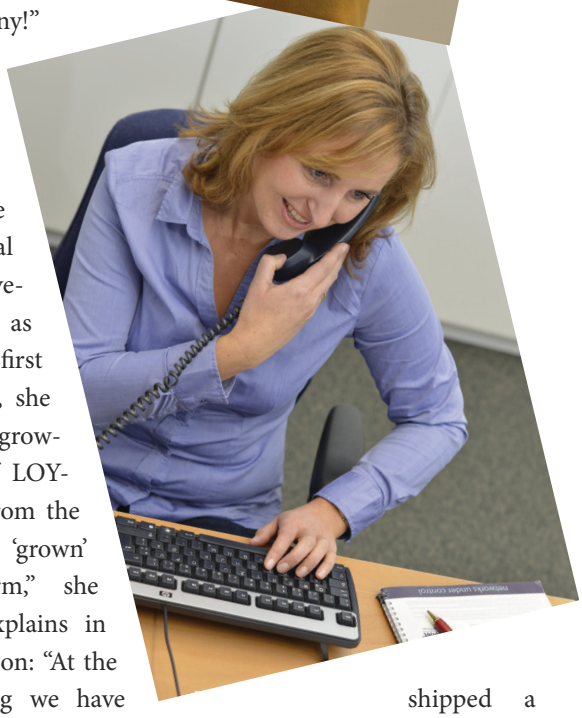
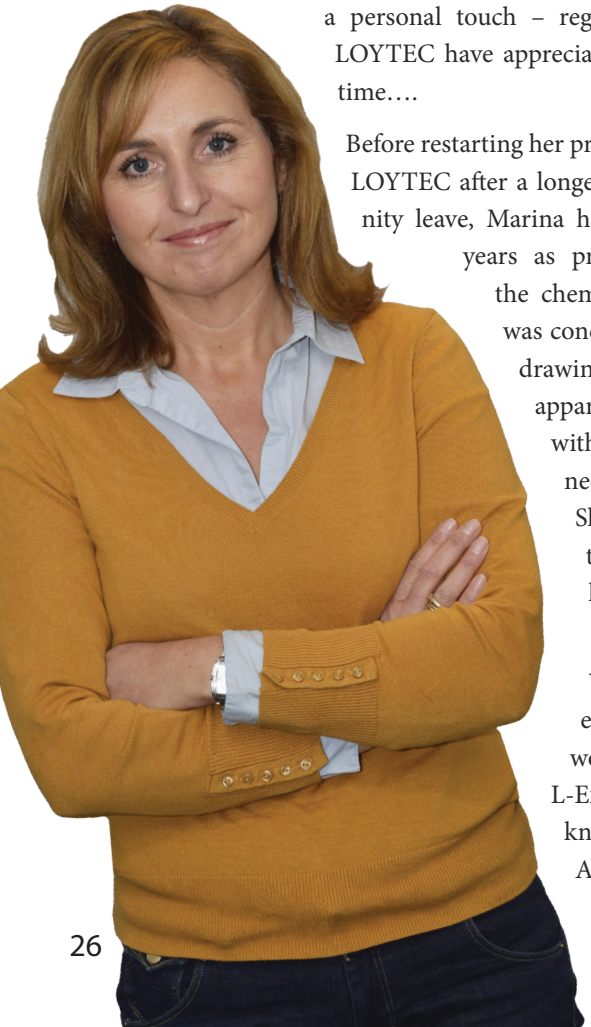


Tough and Competent: Logistics-Queen Marina Steinbacher

Early in her life she learned to battle her way through in a men's world, as technically oriented companies mostly still are. Back in the days when she was one out of only four (!) girls which attended the HTL (Higher Technical Institute) in Vöcklabruck, Upper Austria, to study mechanical engineering and operating technology together with 600 boys. We talk about Marina Steinbacher, today mom of two and for exactly ten years working at the LOYTEC logistics and export center. There she is responsible for optimized stock-keeping thanks to her economic background but is also engaged in customer administration, especially for customers of LOYTEC Americas. Quote request, order fulfillment and supervision of delivery dates are her core tasks. Because of her dedicated, likeable ways she grew dear to many of our customer's hearts. Her goal is to answer every request in the shortest time possible, competently, and reliably. Marina meets this challenge anew each day. The methods Marina has developed have created a reliable, consistent, and confident point of contact to LOYTEC customers, which gives her great satisfaction.



She aims at a straightforward collaboration with a personal touch – regular customers of LOYTEC have appreciated this for a long time….



Before restarting her professional career at LOYTEC after a longer period of maternity leave, Marina had worked several years as project manager in the chemical industry. She was concerned with design drawings for brewery apparatuses as well as with industrial engineering and sales. She benefits from the technical basic knowledge even today.

What excites her especially about her work for LOYTEC, L-Express wanted to know from Marina. And like a shot she answered:" I particularly like working for a successful company!" The company's success which she contributes to daily became her personal sense of achievement. And as one of the first staff members, she witnesses the growing success of LOYTEC almost from the start. "I have 'grown' with the firm," she smiles and explains in vivid comparison: "At the very beginning we have shipped a few devices per day, today we deliver several pallets full of devices per week to customers all over the world. Sharing such a dynamic development makes me proud!"

Inventory and logistics is a special matter for Marina. Always keeping an eye on the inventory, registering what is missing, and making reliable forecasts about the anticipated development of inventory "is very important to an operations engineer like me. We want to guarantee a smooth course of business and prompt delivery. In order to do so, optimized inventory is an inevitable requirement. By the way, "optimized inventory" does not mean "filled to the brim", L-Express learnt at this occasion. And another credo escorts her ever since in her LOYTEC-life: lifelong development. "Continuous learning is enormously important!", Marina is convinced and her demanding assignment for LOYTEC gives her plenty of opportunity to do so.

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LOYTEC Training Schedule

All trainings take place at the LOYTEC headqarters 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.

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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™)

Apr 09, 2013	**Jun 24, 2013**	**Nov 25, 2013**
Apr 22, 2013	**Sep 23, 2013**	
Jun 03, 2013	**Nov 04, 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

Apr 25, 2013	**Aug 29, 2013**	**Nov 28, 2013**
Jun 06, 2013	**Sep 26, 2013**	**Dec 19, 2013**
Jun 27, 2013	**Nov 07, 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

Apr 29, 2013	**Oct 01, 2013**	**Nov 07, 2013**

Attention Look-alikes: One has Won!

Within the context of the quiz in the last issue of L-Express we have introduced numerous look-alikes, or rather, name-sakes of LOYTEC products to you. None of them were invented – they all do exist in reality. It's amazing, what can be hiding behind one and the same label. So the question, if there can only be one, in this case clearly has to be answered with NO. But they are still unique; the L-INX, L-ROC, L-IOB, and L-IP from LOYTEC. Unique in their world of building automation, but you know this anyway, don't you?

Thank you very much for the large participation in our raffle. But only one could win the iPod Touch: Congratulations to Dipl.-Ing. Nils Heinrich from Envidatec in Hamburg, Germany. Have much fun!

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