Multi-faced Devices - The L-INX Family of Products

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Secure Online Building Automation Systems: No Problem, if You do it Right

We have got used to live in a "Connected World". Almost everybody uses a Smart Phone or a Tablet PC. It has become part of todays lifestyle to recall information at any time you wish, to be "connected".

Likewise it is quite natural to access building data always and from everywhere, to inspect or analyze systems or system components via mobile devices.

Some of you now will reply: "That's not such a new thing. We have been doing remote system maintenance for ten years by now." Yes, this is true, of course. But: These were and mostly still are point-to-point connections from a maintenance PC via modem to the system. No trace of an "online building".

Having a building online means to access the building via public Internet – in the same way we get access to plenty of other information via our mobile devices. Technically this can't be a problem, you will say now. After all we don't give a thought when using online banking or doing our tax declaration online. Right – if the online access provider has done his homework and is regularly updating the system to meet all requirements regarding Internet security – only then the access is secure. Moreover, all end user devices should always be updated with the most current software. In this respect, everybody is the "architect of his own fortune". You see, one is only safe in the Internet when utilizing updated and maintained systems and devices. Unfortunately, we often experience different scenarios in everyday business life.

Similar situations occur when bringing a building online. The manufacturers of online automation devices as well as the planners, the operators, the system integrators, and the users have to do their homework well. The weakest link in the chain is crucial for the resulting quality level of security.

LOYTEC, a manufacturer of highly networked solutions for building automation and building management, takes its tasks in this "connected world" very serious. E.g. at least every six months we provide firmware updates for our L-INX Automation Servers to keep operating system features constantly up-to-date regarding Internet security. We implement firewalls in our devices, support access via SSL respectively HTTPS and allow the utilization of authorized SSL-certificates on the Automation Server. In addition, we provide instructions – so-called "Security Hardening Guidelines" – to enable secure configuration of the devices. In this way, all access to the devices can be shaped "safely", from installation to configuration through to operation and maintenance. Self-evidently, all LOYTEC software tools, visualizations, and the building management system L-WEB support all necessary functions for secure online access, both via mobile devices and PCs.

But the best products by themselves still don't guarantee that a system is secure in the Internet. All parties have to work together, be aware of their tasks and take the necessary steps. Continuous training regarding Internet security has top priority today. That's why we have decided to focus on Internet-Security at the Buildings under Control Symposium 2013 from October 15 to 16 in Vienna.

Hans-Jörg Schweinzer, CEO
LOYTEC electronics GmbH
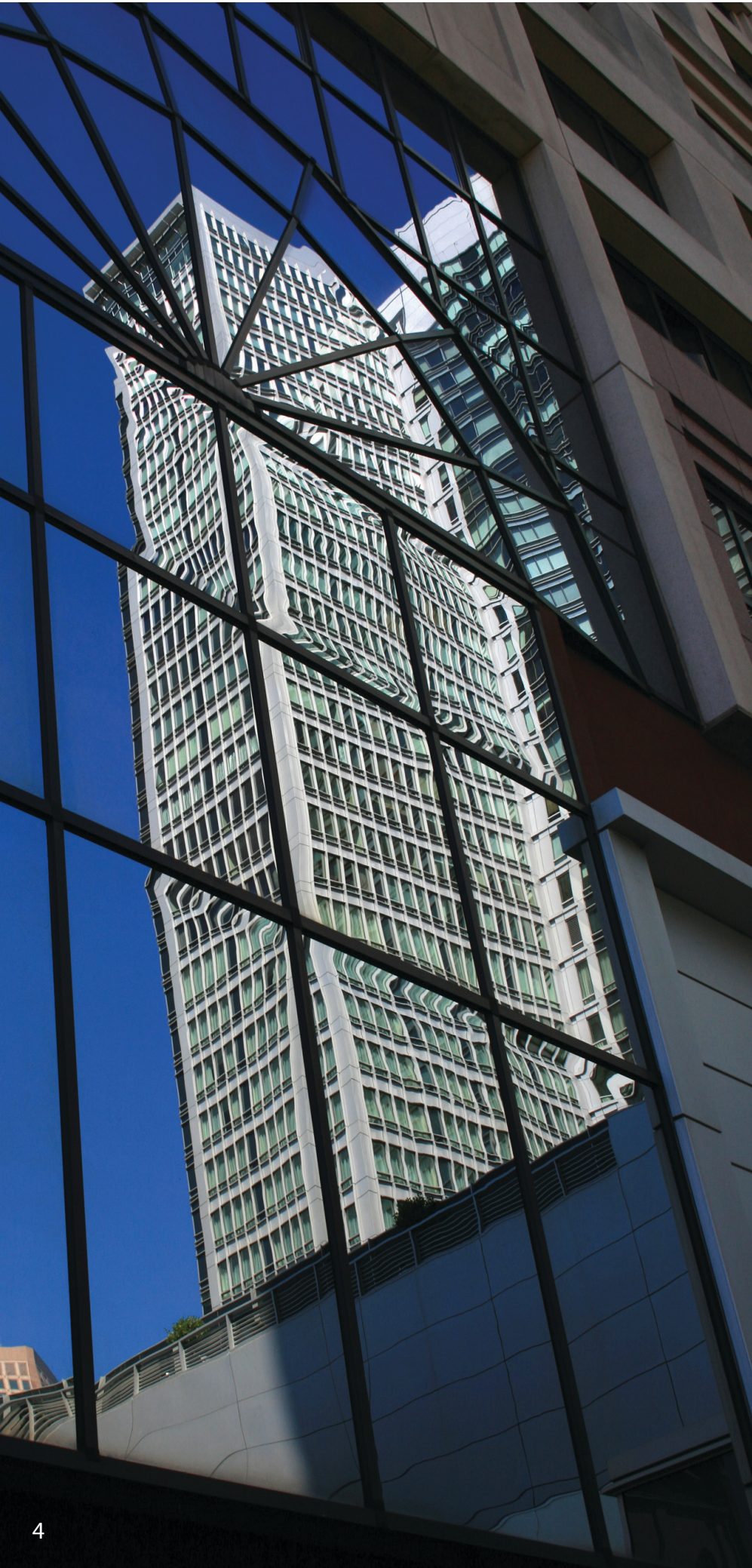
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The L-INX Fa

Dr. Stefan Soucek

The L-INX is not just an ordinary embedded Automation Server for a high-performance, reliable and secure network platform. It is a multi-faced device, which brings a high degree of integration and flexibility into projects. While scaling from small to complex applications, the L-INX can be integrated in virtually any standardized building automation system. Its philosophy is being entirely interoperable with open standards and broadly based on Ethernet/IP technology and Web services.

Building any controller logic using a freely-programmable kernel along with the corresponding graphical visualization is achieved fast and simply, ranging from plant control through heating, ventilation, air conditioning, lighting control and access control to energy management and room control. The gateway functionality eliminates worries about designing for just one system; different open systems can simply be integrated later. Installation using the built-in 2-port switch even allows daisy-chaining of L-INX devices with minimum cabling effort.

Configuration

For basic device setup, the L-INX devices offer a Web interface. Some L-INX models can also be operated on an LCD display with their jog-dial. It allows basic setup and viewing device parameters.

L-INX devices have a built-in data server which abstracts control network data based on so-called data points. These are the basis for all functions on the device, including automation functions, programmable logic, multi-protocol gateway, and visualization. Configuration of the data points is done by the "L-INX Configurator". This software is avail-

evices:
mily of Products

able from www.loytec.com free of charge and connects to the L-INX preferably via Ethernet/IP. This allows for fast and reliable device configuration as well as device backup/restore and firmware upgrade all in one tool. Data points can be created manually, by importing device templates or data point lists in CSV files, or by scanning online devices. In LonMark systems, the "Configurator" can also extract data points from an LNS database and manage bindings between network variables. The "Configurator" defines which data points shall be used on the device and allows modifying their properties. Workflows for handling large numbers of data points are assisted by copy and paste, templates, filter expressions, operations on multi-selections, and export/import of data point lists for batch-editing in Excel.
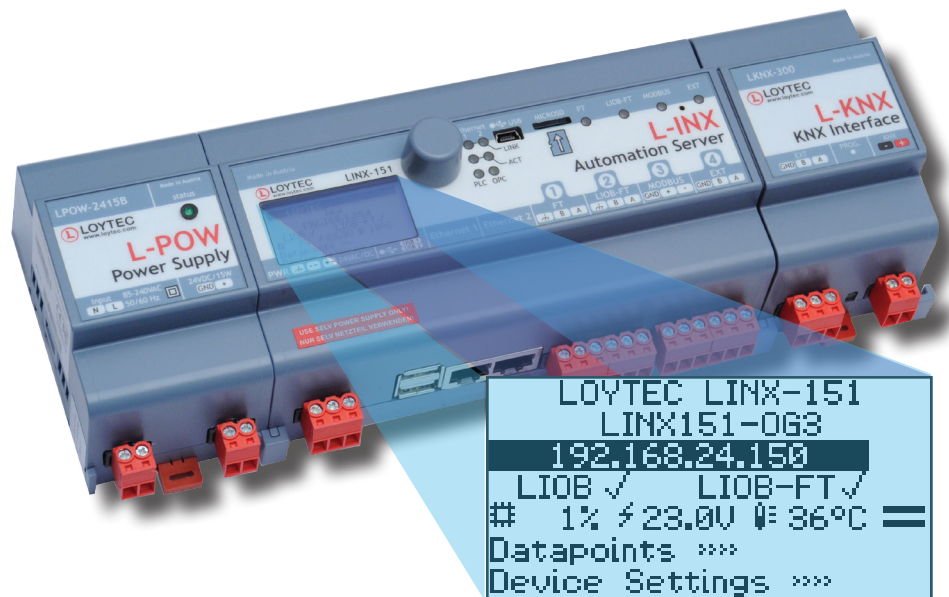
Solutions for the following tasks:

- Multi-protocol applications using data points of different technologies (CEA 709, BACnet, KNX, Modbus, M-Bus) in the Automation Server
- Directly connecting I/Os and using them as data points
- Visualization of data points on PCs and mobile devices with the LOYTEC L-WEB software or in standard OPC SCADA packages
- Various control applications using IEC61131 programs
- Meter reading via M-Bus, Modbus, and pulse counters over integrated I/Os
- Use in environments with strong security requirements
- Manual operation on the Web interface or the LCD display
- Basic automation functions (alarming, scheduling, trending, calculations)
- Sending e-mails on alarms, trend logs, or scheduled events
- Universal gateway connecting data points between any of the supported networks

Automation Server

Data points are the basic elements in the Automation Server. They are subject to alarming, scheduling, and trending (AST) functions. Generic alarms allow defining alarm conditions on any data point and report alarms to LonMark and BACnet devices. Alarms can be acknowledged and stored locally to an alarm log.

Schedules can be programmed to set data point values according to a certain time schedule including calendar-based exceptions such as holidays. The programming of the schedule can be done on the L-INX Web interface, in the "Configurator", or the L-WEB System with an easy to use Outlook-style interface.

Trend logs on the L-INX device allow recording historical data of data points. The recording can be done periodically, on change-of-value, or triggered by certain data points. Periodic recording can be aligned to wall-time, e.g., every 15 minutes aligned to the top of the hour. Some L-INX models can be extended by using an SD card or USB memory and create backups of the historical data to the external memory.

The usage of math objects allows basic calculations and the built in e-mail client allows the L-INX to transmit e-mails on certain conditions, including alarm triggers. Trended data is available in CSV format and can be transmitted as e-mail attachments.

Programmable Controller Logic

For projects that require controller functions, the L-INX family contains models with a freely programmable logic controller (PLC) which operates on data points. In addition to internal and network data points, the PLC can also directly access the I/Os of connected L-IOB Modules. The controller application is developed using the provided IEC-61131 compliant design tool L-LOGICAD and can implement virtually any control logic using function plans or structured text. Data points can either be input variables, output variables, or markers to the program logic. Because the data points are generic enough, the program logic can be developed once, and the control network beneath can be replaced to the needs of the project.

LOYTEC provides a library for building automation and HVAC, which contains solutions for many typical applications. This library can be accessed free of charge and is open to modification and extension by developers. The integrator still has full control over all logic parts. Using an online test function, the logic running on the L-INX can be debugged down to the last signal. Modifications to the logic program can be downloaded and instantly replace the old program without interruption.

Network Security

Network security in building automation is an area of growing concern nowadays. The migration to all-IP backbones and the usage of standard IT technologies opens new possibilities for communication. Unfortunately there are also new possibilities for intruders to exploit those components. The topic deserves special awareness since it has become common practice to expose a growing number of functions of the building over the Internet. For those applications, the big L-INX models are equipped with a number of interfaces, that are secure and offer data confidentiality and integrity.

In order to make security hardening easy for the integrator, the L-INX provides the secure mode feature. This feature can be enabled in the L-INX by flipping a switch. Once enabled, the L-INX activates a built-in firewall, which is pre-configured to block all non-secure protocols. Over one of the remaining secure channels, the "L-INX Configurator" can connect to the device and perform all necessary device configuration tasks. It is also possible to enable other specific, vital protocols with the "Configurator". The "Configurator" connects to the L-INX via secure Web services

Firewall

Server Authentication

IP Channel

Encryption
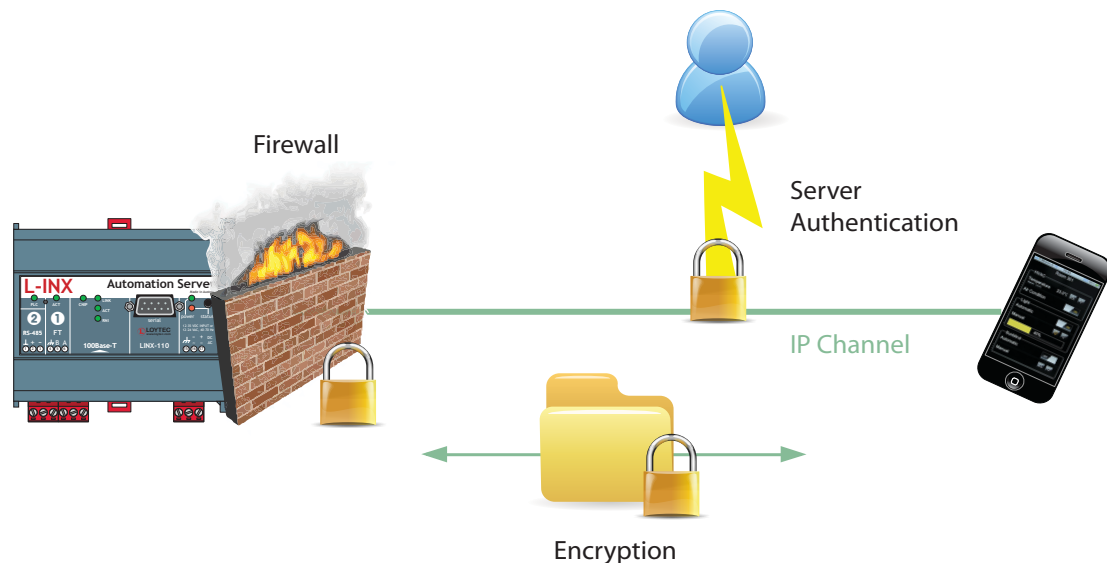
Built-In Connectivity:

- LonMark Systems: compliant with ANSI/CEA 709, ANSI/CEA 852-B, and ISO/IEC 14908, support of all types of network variables (NVs) and configuration properties (CPs), built-in router between IP-852 and TP/FT-10 in some models.

- BACnet systems: compliant with ANSI/ASHRAE-135-2010 and ISO 16484, certified as a BACnet Building Controller (B-BC), BACnet broadcast management device (BBMD), BACnet/IP to MS/TP router with slave proxy function.

- KNX systems: ETS-3 and ETS-4 database compatibility, support of KNXnet/IP or twisted-pair KNX/TP1.

- Modbus: support of Modbus RTU and TCP, master or slave, data point import via device templates or manual input, online register test.

- M-Bus: compliant with EN 13757-2 and EN 13757-3, support of different baud rates.

- OPC-UA: superior speed and security

(HTTPS) through a single open port. The same port offers the Web interface of the L-INX through HTTPS. The usage of HTTPS is widely accepted and encouraged by IT departments for security reasons. The L-INX comes with a preinstalled self-signed server certificate, which is sufficient for establishing an encrypted connection. In that mode, no clear-text messages are sent and data cannot be tampered with.
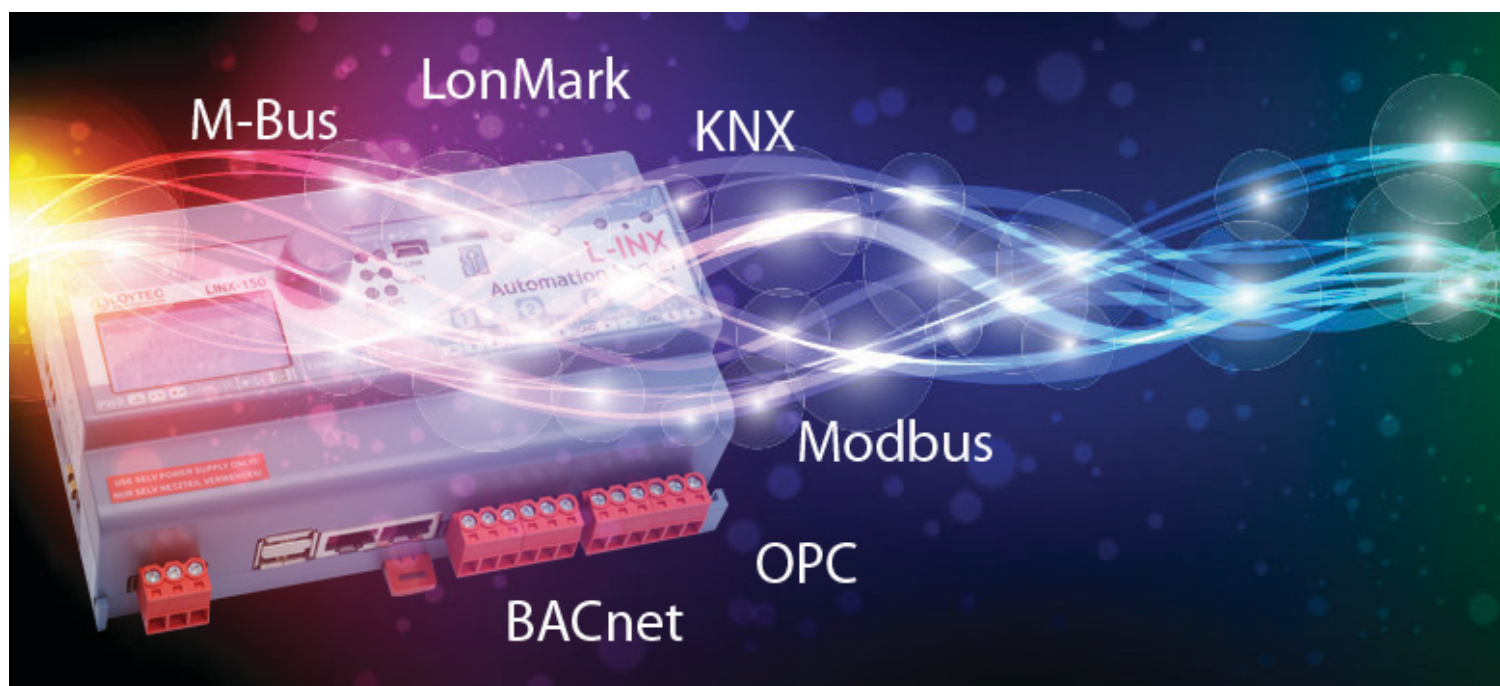
To boost authenticity, one can create an individual certificate request for a certification authority (CA) and install that signed certificate as a server certificate on the Web interface of the L-INX. The server certificate offers added value especially to mobile devices; they can verify that they are connected to an authorized L-INX server. This eliminates "man in the middle" attacks, where an attacker could spoof a server and collect data although it is not sent in clear-text.

For OPC-based SCADA and visualization packages, the L-INX implements the secure channel of OPC UA with encryption and client authentication by certificates. That makes OPC UA an intriguing choice in this aspect. In sensitive areas it is already a requirement to provide a list of security measures and document a setup procedure to the building operator (hardening guide). With the presented L-INX features, security hardening boils down to turning on the "secure" switch.

Multi-Protocol

L-INX devices provide a true multi-protocol platform. The integrator is free to decide, which networking protocol (LonMark, BACnet, KNX, Modbus, M-Bus) is used in the application, because everything is based on generic data points. If supported by the corresponding standard, protocols can also be used over IP (LonMark IP-852, BACnet/IP, KNXnet/IP, Modbus TCP).

For analyzing problems on-site, the L-INX has built-in support for remote protocol analyzer access. This includes the Remote LPA for LonMark Systems, Modbus and M-Bus logs in the "Configurator", and the new Wireshark remote interface for MS/TP and all IP protocols. The latter is especially intriguing, as no hardware modifications are necessary on-site to create packet logs of Ethernet traffic to the device.

Universal Gateway

Data points between different technologies can be connected to each other for data transfer using the universal gateway function. This is done by creating connections between data points. Connections can be local, connecting data points on the same L-INX and global, connecting data points across different LOYTEC devices over Ethernet/IP. The universal gateway has built-in conversions between base types. This includes automatic conversions between engineering units (such °C to °F). For custom conversions, adaptors can be used and stored in a library. Adaptors can even use complex mathe-

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matical calculations for implementing tailored solutions.

The smart auto-connect feature allows exposing data points to different technologies by auto-generating suitable data points in the target technology and connecting them to the original data points. Smart auto-connect can generate data points for LonMark Systems, BACnet, Modbus slave and registers. A preview allows the user to modify the proposed data point generation and define custom auto-connect templates for re-using the settings.

Manual Operation and Visualization

For manual operation, the L-INX provides a Web page, which displays a data point list. On that Web page, the user can operate data points and get informed on their status and current values. Similar functionality is available on the LCD display of some L-INX models.

The L-WEB visualization provides an easy way to visualize the data points in the L-INX over a Web-based interface. This software is available free of charge. It is integrated into the "L-INX Configurator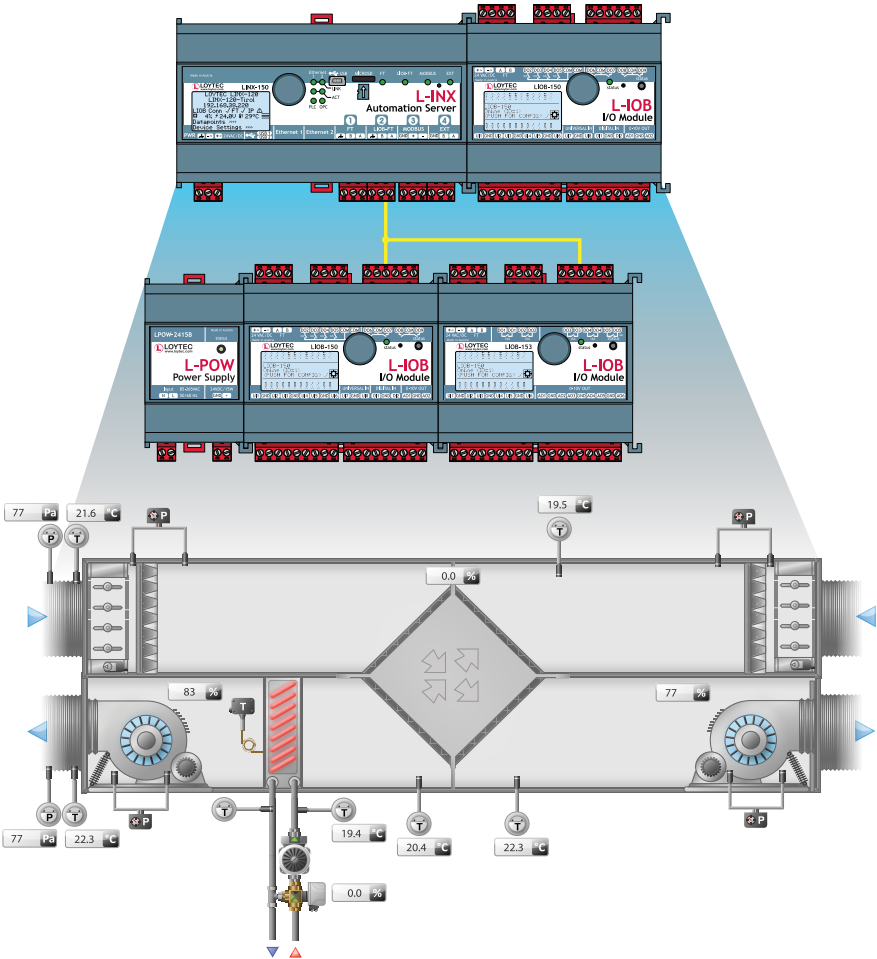" and allows designing graphical page content like it is known from the L-VIS. The resulting L-WEB application is stored directly on the L-INX device and can be accessed in Web browsers or mobile devices.

The L-INX has an embedded OPC server, which exposes a custom set of data points as OPC tags. It implements the standard OPC XML-DA 1.01, which lets OPC clients access the data points via Web services. This can be utilized by different OPC XML DA compliant SCADA applications. Some L-INX models also implement the new OPC UA binary protocol to offer superior speed and security.

Choosing a Matching L-INX

The L-INX offers a consistent and scalable platform for implementing projects with different requirements. The decision for choosing a model is based on the required protocols and functions. The largest set of functions is offered by the LINX-15x models, which are also the only models that support both LonMark and BACnet systems in one device.

Regardless of the initially chosen model, project designs can easily be migrated to other models. This ensures safe investments and provides maximum flexibility in a market with changing requirements. With L-INX devices, it is also easy to upgrade to hardened security environments.

Feature	LINX-100	LINX-101	LINX-110	LINX-111	LINX-120	LINX-121	LINX-150	LINX-151	LINX-200	LINX-201	LINX-210	LINX-211	LINX-220	LINX-221
LonMark	X	X	X	X	X	X	X	X						
BACnet							X	X	X	X	X	X	X	X
Modbus, M-Bus	X	X	X	X	X	X	X	X	X	X	X	X	X	X
KNX					X	X	X	X					X	X
With router		X		X	X		X		X		X			X
SPS (IEC 61131)		X	X	X	X	X	X	X			X	X	X	X
LIOB Connect					X	X	X	X					X	X
LIOB FT + IP	X	X	X	X	X	X	X	X	X	X	X	X	X	X
LCD display					X	X	X	X					X	X
SD card, switch					X	X	X	X					X	X
Secure mode					X	X	X	X					X	X

Control and graphical operation integrated on one device

www.loytec.com/linx

Oriental Giken Inc.:
Smart & Green Laboratory Systems with LOYTEC

Oriental Giken Inc. is a customer of LOYTEC's Competence Partner Network Corporation (NWC) in Japan. NWC is responsible for system integration in Orientals automation projects.

Energy Savings for Laboratory Equipment

The Japanese company Oriental Giken Inc. has been creating various laboratory equipments for over 35 years. In this industry the development of safe equipment is highest priority. Consequently,

considerations regarding energy saving methods have been neglected in the past. But today Oriental Giken has succeeded in developing less energy consuming systems called "Green" or "Smart Laboratory" by using LOYTEC products. The core technology is based on local ventilation according to the actual demands. Thereby LOYTEC devices are installed as distributed intelligent controllers.

Conventional Controls of Local Ventilation

Deploying fume hoods is one of the most familiar methods of providing local environment ventilation in Japan. The researchers can perform their experiments protected by the fume hood without exposing themselves to toxic gases. In Japan, the ventilation rate is regulated by the Industrial Safety and Health Act. Therefore, the constant air exhaust system was commonly used in this field. Then about 15 years ago, the VAV (variable air volume) system and about 8 years ago, the low exhaust fume hood were developed. Nowadays, the most common combination is controlling VAV by the door open-

ing level of the fume hood. Furthermore, Oriental Giken often installs up to fifty fume hoods in one single room, providing quick exhaust response and a VAV system which is controlled by aggregated fume hood exhausts. If necessary, also room pressure control is applied.

Problems of VAV Systems

There is a limitation of exhaust air flow depending on exhaust fan ability and duct size. To reduce initial and running costs, the system is designed for a maximum simultaneous usage rate between 15 % to 50 %. However, the user cannot determine the current usage rate. Therefore, if many people leave the door open, the exhaust level reaches maximum capacity and the user might be exposed to toxic gases. Moreover, instruments need maintenance. General inspections and adjustments are usually done once a year. However, if defects are discovered too late, safe operation cannot be assured. Oriental Giken developed an information monitoring system, a system for alarms when the door was left open, also including an auto close system to solve these problems by using a PLC (programmable logic controller). However, the control logic tends to be complicated and costly.

LOYTEC Solution solved the problems

Oriental Giken came upon LOYTEC solutions about one year ago and quickly

Case Study

decided to apply them to their systems. As LOYTEC devices incorporate highly scalable innovative technology, they fit Oriental Giken's most modern art of the system perfectly. LIOB-48x controllers serve as unit control of fume hoods, LINX-11x Automation Servers are used as room control of exhaust and supply air, and LINX-120 devices fit for remote monitoring of the whole system. The LOYTEC devices have different abilities but follow the same concept: A small unit is aggregated to a large, IP based, scalable system, which uses open protocols, AST (Alarming, Scheduling and Trending) functions and implemented Web Services. Thus, Oriental Giken has applied LOYTEC products instead of PLC's or dedicated controllers in its full product range. Moreover, the utilization of LOYTEC devices makes Oriental Giken's lab systems highly cost-effective.

First Step of Application

At first, Oriental Giken applied LIOB-480 devices to fume hoods, serving as unit controllers. This easily allowed for additional functions such as information monitoring, alarming when the fume hood door was left open and auto close function. Each LIOB-48x Controller at the fume hoods supports visualization via LWEB-802 accessed by iPod Touch devices. This highly cost effective solution gives Oriental Giken a decisive advantage in the strong competition on the market. In the same way, LINX-110 was applied as a Room VAV Controller.

Combination with IT Technology such as Wi-Fi and VPN

One can access the interface of fume hoods and room controllers from all over the world, only by knowing the IP address and the account. Secure connection is guaranteed by VPN technology. Through this function, Oriental Giken can receive email notifications and react immediately in case of an issue. Furthermore, the parameters of the controllers can be set or adjusted from tablet PC's and smart phones. This reduces costs and effort of both Oriental Giken and their customers. Advanced remote maintenance is also available such as preventive maintenance and predictive maintenance. Furthermore, Oriental Giken will have integrated maintenance technology due to the huge amount of data collected on the decentralized LOYTEC controllers.

Oriental Giken Showroom

Oriental Giken operates a Laboratory Design Centre in Tsukuba City where it exhibits its green lab products in a showroom for demonstration. Various equipment and several facilities are demonstrated there, such as a test room for fume hoods and room control, a clean room for clean product development, animal cages etc. LOYTEC products are exhibited under the name "Smart Lab System" or as the advanced "Green Lab System".

Oriental Giken uses this showroom not only on the actual site, but also on a remote basis with VPN connection. So demonstrations can be done easily by the sales team.

Current and Near Future Projects

Oriental Giken is now installing a fume hood and room control system at one of the biggest pharmaceutical companies of Japan using hundreds of L-IOB and several L-INX devices. The company also received a big order of fume hood, room control system, scrubber system, and central exhaust monitoring system from the most famous university in Japan which will also require hundreds of L-IOB and several L-INX devices. In this way, Oriental's smart lab system using LOYTEC products is spreading rapidly in Japan and makes laboratories green and smart.

Fume hoods, exhaust and supply VAVs, room pressure sensors, temperature and humidity sensors are implemented here. LINX-110, LIOB-450, LIOB-452 control air balance and room pressure, and calculate same time usage rate
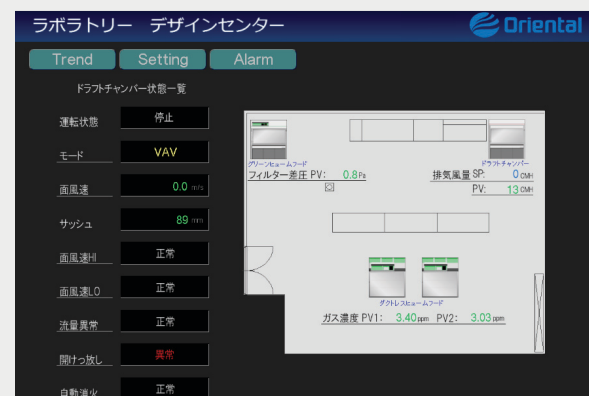
There are several types of fume hoods to absorb toxic gases by circulating air through particular filters. LIOB I/O Controllers show the concentration and delta pressure by trend graph of LWEB-802

The showroom can be monitored from IP camera of L-WEB graphic pages. Very useful to watch the actual situation.

www.orientalgiken.co.jp

Automatic Generation of Gateway Connections

The devices of the L-GATE and L-INX product family are often used as gateways. With the new "Smart Auto-Connect" function, the configuration can be created even more efficiently.

Dipl.-Ing. Norbert Reiter

When configuring a gateway, it comes down to reading in the data points in a network technology and providing them in a different technology. In most cases, one gateway side can be defined as the output side. If, for example, data points from a CEA-709 system should be connected to a BACnet control system, it is the task of the CEA-709 system integrator to read the data points from the network and provide them on to a BACnet interface.

What has been possible …

Ideally, only the CEA-709 data points have to be created, for instance by using a network scan. The creation of the BACnet data points and the connections between the two sides of the gateway can be done automatically.

This function of automatic generation of BACnet server objects has already been possible in previous versions of the L-INX Configurator. The conversion is relatively simple, because mapping a huge number of different CEA-709 data types (SNVTs) to the generic BACnet objects (analog, binary, multi-state) is possible without much effort. For example, a variable of type SNVT_temp_p is automatically mapped to an analog BACnet object, only the engineering unit (° C) of the corresponding BACnet object property must be set.

With multi-state data points, it is a little bit more complicated. In CEA-709, a multi-state data point – such as the type SNVT_occupancy - may take any value. In BACnet, the range of values is restricted to positive, continuous numeric values (1, 2, 3, etc.). For an automatic mapping, the range of values is simply shifted into the positive numeric range. A SNVT_occupancy with the values OC_NULL (-1), OC_OCCUPIED (0) OC_UNOCCU-PIED (1), … will become a BACnet multi-state object with the state OC_NULL Map (1), OC_OCCUPIED (2), OC_UNOC-CUPIED (3) …

Support Tip

… and that´s new!

These applications have already been covered by earlier versions of the L-INX Configurator. The functionality for automatic data point and link generation (Smart Auto-Connect) was expanded to a great extent since the release 4.8. The automatisms are now not only available for the direction CEA-709 to BACnet, but also can be applied to all technologies and transformation directions.

Therefore, a complex management of physical units and their mapping in different network technologies was created in the background. Now the system "knows" for example, that a temperature can be a SNVT_temp, SNVT_temp_p, or SNVT_temp_f variable in CEA-709. Furthermore, the physical unit and the respective scaling are stored.

If, for example, you want to convert a BACnet object to CEA709, as a first step the physical unit will be determined from the corresponding BACnet property. Then the configuration software provides conversion regulations in a dialog box, which can be customized by the user.

Example: A scanned BACnet data point contains a temperature with the unit °F. The dialog offers a target data type SNVT_temp in CEA-709 SNVT_ temp. The user can adjust the selection in a drop-down list also for the types SNVT_ temp_f or SNVT_temp_p. Since these variables always store the temperature in °C, an appropriate conversion from Fahrenheit to Celsius will be performed (Fig 1) in the background, without further intervention of the user.

This, for instance, also works for data points mapping from source unit Wh to kWh in the target technology. Simply specifying the appropriate destination unit is enough - the rest is done by the software.

The automatic conversion does not only work between CEA-709 and BACnet (in both directions), but can also be applied to all supported network technologies. Is the gateway operating in Modbus slave mode, local Modbus register can simply be generated from CEA-709, BACnet, or KNX data points. Of course the register type (HOLD, INPUT, COIL, etc.) is configurable. A Modbus master can read the data point values that are provided by the gateway.

How it´s done

So let's have a look at the workflow for the conversion process. The complete configuration of one side of the gateway is always the initial situation. The methods available to do so are manual creation of data points, network scan, database scan, or import of data points. To convert specific data points, they can be selected in the data point list with the aid of multi-select and filter functions. Pressing the „Creating and connecting the selected items" button opens the „Auto-Generate and Connect" dialog. The source technology is already displayed (Connect from …). In a drop-down box, the target technology can now be selected from the available ports. In the lower part of the dialog (Preview results…), a list of proposed conversion templates is displayed. Identical data types are combined in one line. By expanding the line, you can still control what data points are affected by this rule. The rules can also be modified, for instance to change the target type
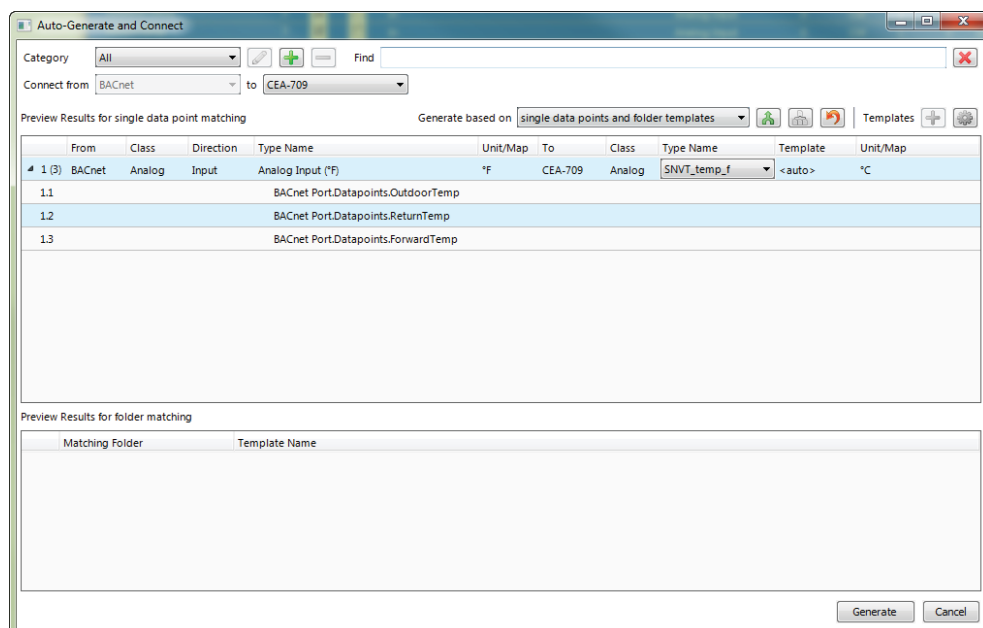

Fig. 1: Auto-generate and connect dialog

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from SNVT_temp_p to SNVT_temp. If you press the "create" button, data points and connections - based on the predefined rules - will be created automatically. The names of the destination data points are derived from the source data points. If there are specific require-ments for the naming, the easiest and fastest way is to export the data points in a CSV data file. This file can be edited in a text editor or a spread-sheet and then be re-imported after the adaption.

Fig. 2: Custom template with formula

If that is not enough ...

In most cases the automatically proposed templates for the implementation of the gateway requirements will be sufficient. But sometimes more features are necessary, such as converting a value by using a mathematical function. For such cases, math objects have been used in the past. But these are limited in num-ber and their creation cannot be automated.

Therefore, it is also possible to create customized templates. In these templates, mathematical formulas can be stored (Fig.2). These customized templates can be assigned in the selection list for creating connections. For reuse in other projects, an export and import function of these connection templates is imple-
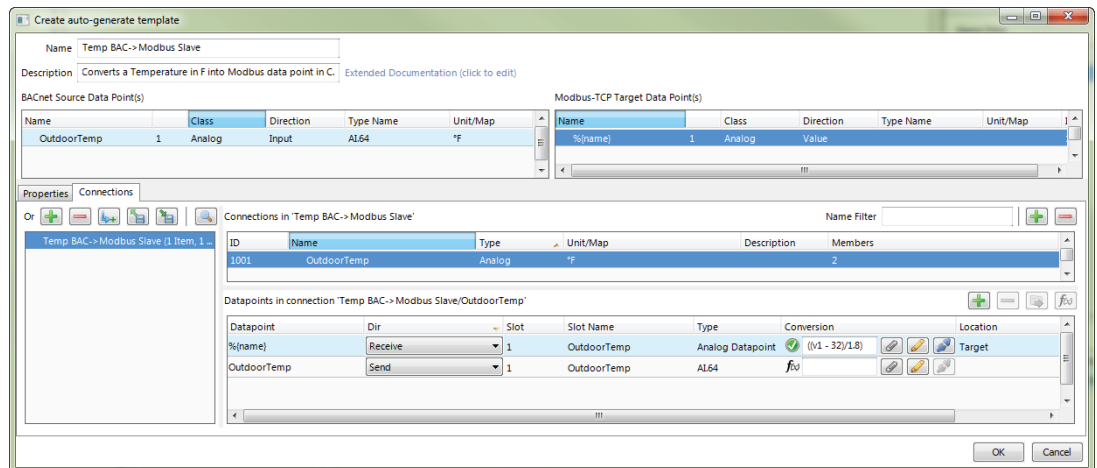
mented. Another use case for customized connection templates is adjusting multi-state data points. As described above, values of multi-state data points are usually mapped 1:1 to the target technology. Dependent on technological restrictions, a shifting of the value range is possible. Using customized templates, the mapping rules can be adapted.

Figure 3 shows an example of how values of a SNVT_occupancy are mapped to a limited area of a BACnet multi-state object.

Even more is possible - a continuing story .....

Gateway applications are probably the most complex communi-cation tasks in building automation. It is important to take char-acteristics of the different systems into account to implement the conversion of information. In KNX for example, two indepen-dent communication objects are used to control a sunblind – in CEA709 only a single variable (SNVT_setting) is used.

Even such applications can be implemented in the LOYTEC gateways – with aid of the multi-slot connection concept. But that is another story and shall be told another time ...
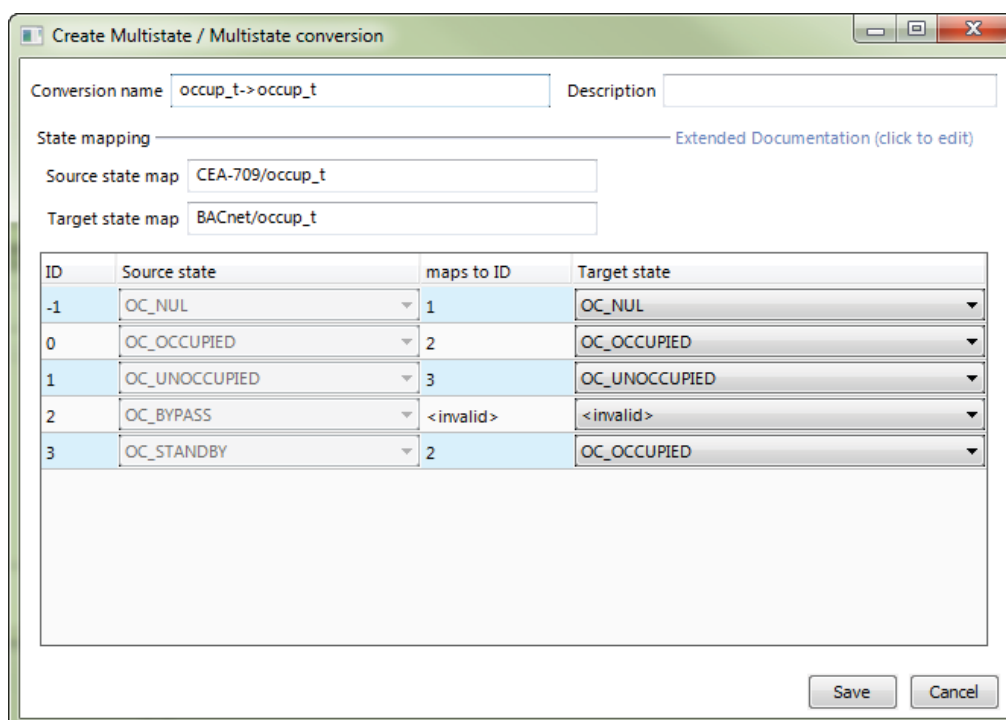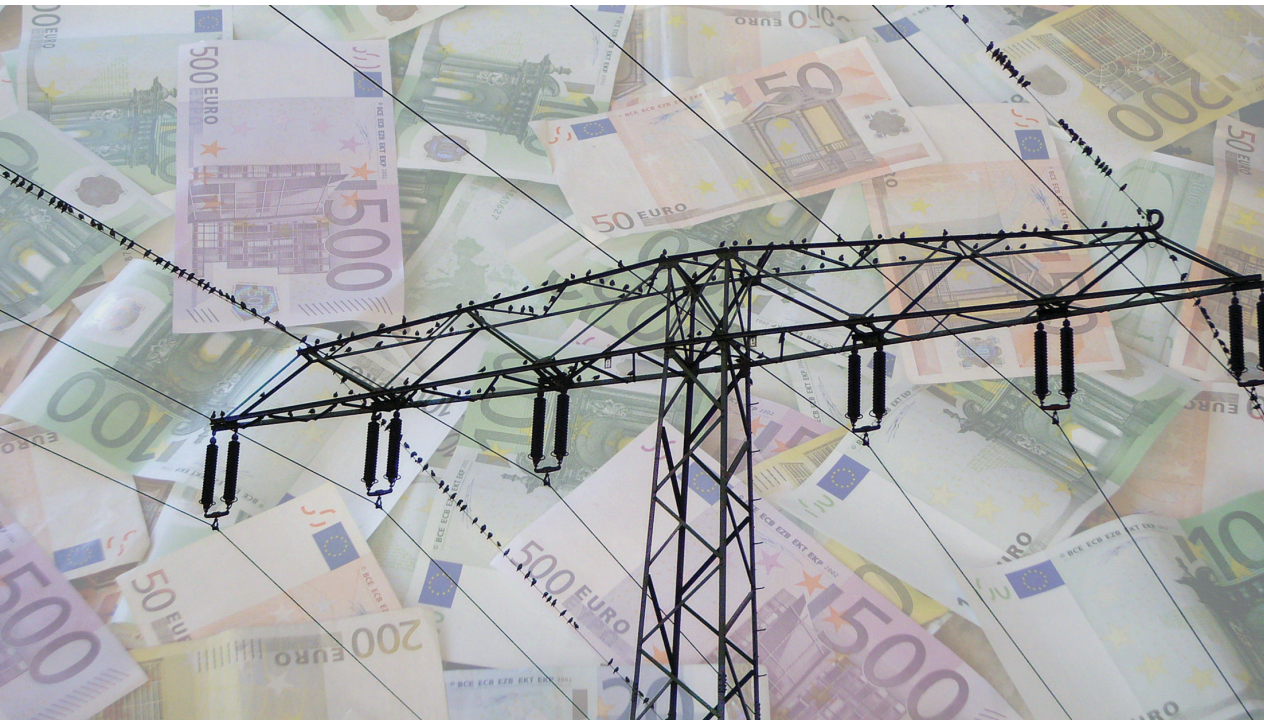

Fig. 3: Multistate conversion

Integrated "Energy Aware" Function for Efficient Energy Management

As a result of rising energy costs and national and international regulations, system integrators encounter the requirement to provide additional energy management functions more freqently when planning building automation systems, respectively retrofitting them to existing systems. Interested parties are mainly those responsible for energy of energy-intensive properties, for whom combined hardware and software solutions optimize the everyday effort as part of the energy management and thus play an essential role.

Dipl.-Ing. (FH) Nils Heinrich

Since the adoption of ISO 50001 in 2011, the worldwide number of companies implementing an energy management system according to ISO standard is increasing drastically. Especially in the context of a holistic energy management system, solutions for an automatic energy monitoring obtain considerable importance. From a certain detail level in the daily work of those responsible for energy and buildings it is essential to use technical solutions for real-time monitoring of energy flows for the control of energy-efficient building operation and evaluation of implemented energy efficiency measures. Besides intuitive visualizations, processes such as automated reporting, benchmarks, and alarming provide significant added value for an efficient energy management. Here, it is a central requirement to gain prompt access to energy-related information across locations in full extent, or within the respective competences. Therefore, the basis for such functionality must be formed by a seamless interaction of instrumentation, building automation systems and a superordinate software application.

Comprehensive System Solutions through Interoperability

LOYTEC and Envidatec work together on combined system solutions that respond to the growing demands of the market and thereby define new standards in terms of interoperability between systems technology and superordinate application software. The collaboration unites long experience and core competencies in the fields of building automation, energy monitoring, and energy management. In the course of the collaboration, the product family of L-INX Automation Servers has been extended

JEVis

The JEVis system was originally developed by Envidatec GmbH as a commercial software solution primarily for use on Linux-based large systems. Since 2012, JEVis is under a free open-source license in the context of the OpenJEVis project. As part of the OpenJEVis project, the project partners pursue common approaches, for instance in context of cooperative research and development projects. The technology and innovation lead over traditional software solutions is therefore increasing.
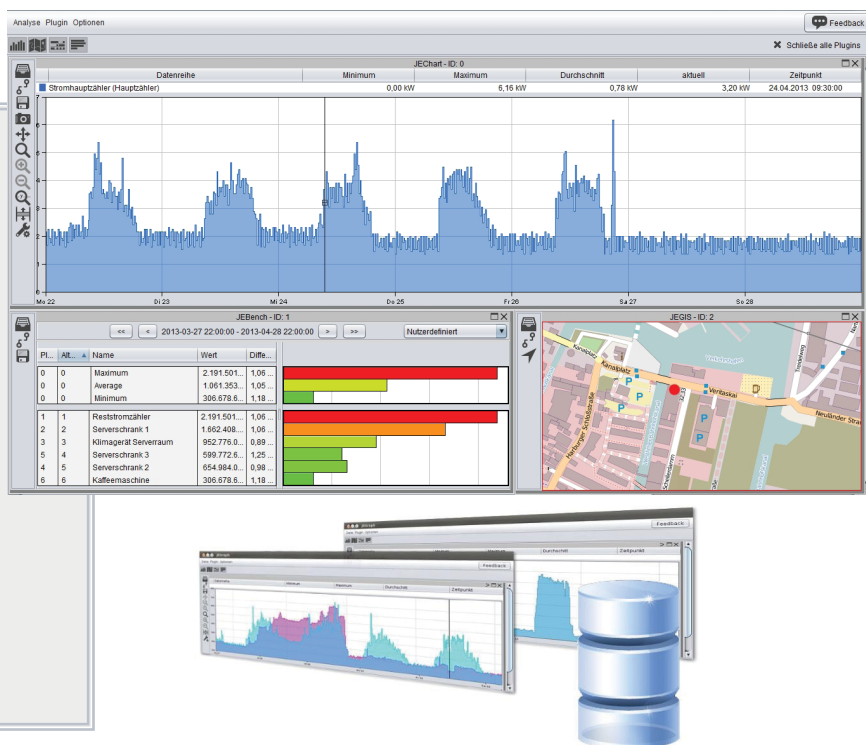
to an "Energy Aware" function. The function allows highlighting trends relevant for energy management in the L-INX configuration tool during startup or expansion of LOYTEC systems, and associates them with the Trend Description for later analyses. Through the installation process of the JEVis System, a software for energy monitoring originally developed by Envidatec, trends configured in this way can be detected automatically and created in the database. Appropriately configured consumption and operating data will henceforth be locally recorded on a L-INX and periodically transferred via a communication interface to

a superordinate JEVis system for further processing in terms of energy management. Within the JEVis System, apart from automatically recorded data, additional master data and building parameters can be added manually by the user. Depending on the system configuration, access to the data is either provided through a local JEVis server or online through the hosting service My-JEVis of Envidatec.

Integrated Value for Property Operators

The „Energy Aware" function is directly available in all current

L-INX models. By a simple firmware update, a variety of existing installations can also be expanded to the additional function. Property operators who build or already have built a building automation system with LOYTEC components can calmly face requirements which come up for example through ISO 50001. The combination of L-INX and JEVis allows not only the detection and visualization of the data, but above all the necessary compression of information, e.g. by the generation of energy indicators and the summary of energy data in automated reports. The system solution thus provides the necessary tools for continuous monitoring
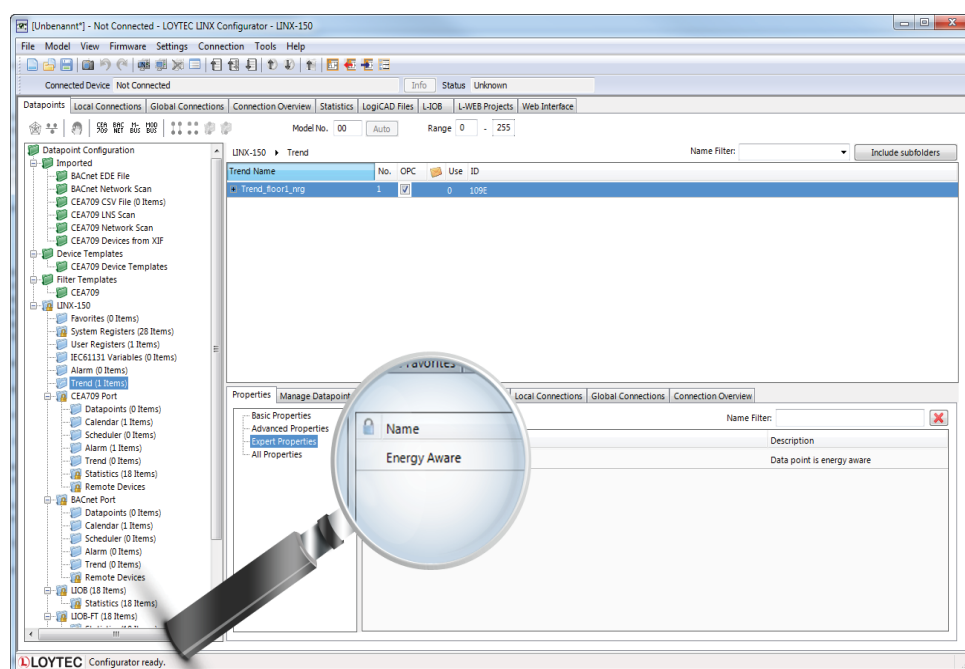
ISO 50001

The ISO 50001 standard came into force in 2011 and defines the international standard of a holistic energy management system in enterprises. The ISO 50001 complements the series of existing management systems, such as quality management according to ISO 9001 and environmental management according to ISO 14001. ISO 50001 describes the systematic approach to sustainable, measurable energy efficiency in businesses. An energy management system according to ISO 50001

Plan

ISO 50001

Act

Do

Check

provides the framework for a continuous improvement process, based on the so-called Plan-Do-Check-Act cycle. In addition to the primary goal to reduce the specific energy consumption and thus to optimize the energy cost of a property, for many companies there are legal obligations to implement an energy management system according to ISO 50001. So for example for many companies in Germany reducing the allocation to the development of renewable energy, the so-called EEG levy and the peak tax compensation for the energy and electricity taxes is connected with certification to ISO 50001.

Dipl.-Ing. (FH) Nils Heinrich
Product Manager Envidatec GmbH

Dipl.-Ing. (FH) Nils Heinrich is Product Manager of the Envidatec GmbH. The focus of his work is on the design and implementation of innovative Energy & IT products, as well as the design and integration of ISO 50001 compliant monitoring solutions for collecting and analyzing energy and operating data. As head of research and development projects in the company, Nils Heinrich is also responsible for the establishment of new innovation projects, as well as the derivation of the respective results into new products and business lines. In the context of the open source community OpenJEVis, Nils Heinrich supports the expansion of the international network to establish a free system platform.

of energy flows and the detailed success control of efficiency measures carried out in accordance with ISO 50001.

For property operators, the added value of such a system solution mainly lies in

• the collection of all energy-related data for one or more properties,

• the central evaluation and monitoring of consumptions,

• the generation of indicators for an easy assessment of the energy situation,

• the benchmarking of comparable building areas and properties,

• the alarm in case of deviations and thus a timely shutdown of the cause and the avoidance of high energy costs,

• the allocation of consumptions for cost center accounting,

• and the automatic generation and sending of energy reports.

Innovative Energy Efficiency of the Future

In the context of current research and development approaches and with the assistance of scientific partners such as the Austrian Institute of Technology, innovative system features are currently being developed, which determine the anticipated load profiles of a property using mathematical models of buildings. In the future such forecasts will be able to specify the ideal operation of a building, plan ahead the energy use and purchase as well as detect energy-related errors in the building operation.

www.My-JEVis.com   **www.OpenJEVis.org**   **www.JEVis.de**

True Customer Support:
Control Tech Supply's Five Rules

Founded in 1982, Control Tech Supply is a national wholesale distributor of building automation and temperature control products. Based in Dallas, Texas, their target market is small control contractors and mechanical contractors with a commitment to having their own controls department in the Southwest United States. Control Tech has been in the same location for more than 30 years, the 7,000 square foot facility provides adequate space for products, training, and growth in the future.

The Team of Control Tech Supply

Paul Staudt is one of the founding partners and is now the sole owner. 30 years ago, the controls industry was in its infancy, so buying product and reselling was a novel idea. Today, the controls wholesaler provides a value-added service to many segments of the building automation industry. Prompt customer service and technical support were the basis of the company's philosophy at the beginning, and remain the number one propriety today.

Paul has a BS in Business Management from Missouri State University. His primary responsibilities include sales/marketing and company growth. He is a longtime member of the North Texas Association of Energy Engineers. Paul is married to Connie, who has had a significant involvement in the growth of the company.

Connie Staudt has been with Control Tech Supply for 19 years. As VP of Business Operations, her duties include overseeing all accounting activities, marketing and customer service. She has a Master of Business Administration and a BS in Business Administration/Sociology, both from Texas Woman's University. Connie is involved in the local ASHRAE Chapter as a member and committee chairperson.

Other key players in Control Tech are Sonny Coleman, Technical Support and Training Team Leader, Richard Bryant, Technical Support Specialist, and Amber Montijo, Accounting Specialist.

Control Tech Supply understands the true meaning of customer support services. Customer support is the provision of service to customers before, during, and after a purchase. Customer service is a series of activities designed to enhance the level of customer satisfaction – that is, the feeling that a product or service has met customer expectations. Control Tech seeks to achieve customer satisfaction by always adhering to five basic rules. These are to answer and return phone calls in a timely manner, listen to their customers and pay attention to what is being said regarding an issue, provide customers with accurate and reliable information, deal with product complaints with a good attitude and learn from them, and when speaking with a customer always strive to be helpful, courteous, and knowledgeable.
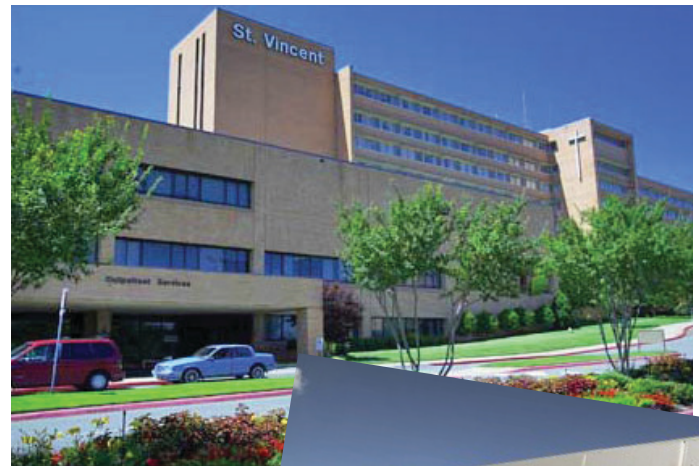
CT Supply has assisted customers to achieve success, working with LOYTEC products, on projects that include the University of Texas at Arlington, the Dallas Independent School District, Lockheed Martin, and St Vincent's Hospital in Little Rock, Arkansas.

CT Supply views customer support as an included value-added feature of the products offered. The company is available to provide programming assistance, web and graphic design, project commissioning, sales and engineering support, as well as training seminars throughout the year for the lines they carry—from beginners to advanced.

Control Tech has been a LOYTEC partner for nearly a decade, one of the first LOYTEC distributors in the United States. LOYTEC deeply appreciates all these years of exemplary service and cooperation.

www.ct-supply.com

Roger Müller, Omni Ray and
Dirk. A. Dronia, LOYTEC
(f.l.t.r.)

Omni Ray: Power of Automation
Swiss Automation Expert is New LOYTEC Distributor

The demands on infrastructure of buildings with regard to convenience, security, flexibility, and optimized consumption of energy are increasing continuously. With growing regularity, buildings have to be adjusted easily and quickly to the changing needs of their users. Products and systems of Omni Ray make possible a communication network throughout buildings, which ideally synchronizes the individual systems and also minimizes running costs distinctly.

Founded in 1950 in Zurich, Omni Ray has developed into a leading Swiss trading and service company in the field of industrial automation. The range of services offered reaches from consulting to trading through to support.

"Client satisfaction is top priority for us. We continuously strive for excellence in quality of our products and services, on-time delivery and efficient logistics. By these goals we want to be measured," defines Roger Müller, Managing Director of Omni Ray, the company's philosophy.

Quick and reliable delivery of ordered components is granted through the impressive large ware house at Omni Ray's headquarters in Dübendorf. An assortment of around 100,000 items of leading manufacturers is offered, complemented by consulting and support service of 45 highly qualified and motivated employees.

Omni Ray distributes products, entire systems, and solutions in the market segments communications technology and computing, control systems, propulsion technology, as well as automation components and building technology. Regarding services, technical consulting, trainings, integration support, commissioning, and after-sales-support, as well as repair and replacement services are offered. Client specific stock and the related logistics complete the company's range of services.

Omni Ray represents products and systems of technology leading suppliers and endeavors to specifically extend its portfolio in the field of building automation with solutions of innovative technology leaders. The partnership with LOYTEC has developed against this background. Continuous, long-term, and close cooperation is especially emphasized. In the eyes of Omni Ray this is the basis of success and a clear added value for their customers.

Moreover, through organic and acquisitive growth, the leading position in the premium market segment shall be consolidated and enlarged in the future.

Since August, the LOYTEC range of products can be ordered at Omni Ray's online shop **shop.omniray.ch**.

www.omniray.ch
www.loytec.com/distributors

Exeter University's research laboratories feature advanced lighting controls with L-VIS Touch Panels

Manchester Airport's terminal 2 features DALI lighting controls based on LDALI-ME204

www.caloncontrols.com

New LOYTEC Competence Centre:
Calon Associates Limited

Calon Associates Ltd. has become the latest LOYTEC Competence Centre, serving customers in the UK and the Republic of Ireland. Calon will use this new status to offer LOYTEC-approved training and support for the full range of LOYTEC products from

The Calon customer service team: Sarka Potter, Carolyn Wilson, Steve Pemberton, Kathryn Harvey, Donna Salisbury (l.t.r.)

its base in Runcorn, close to the cities of Manchester and Liverpool. Founded in 1997 by Managing Director Tim Sly and owned by its employees, Calon is a leading supplier of networked control components and solutions for lighting control, room control and retail applications in the UK.

Calon has been working with LOYTEC as a distributor in the UK for over ten years, selling and supporting LOYTEC products as a core part of its offer. In that time, the company has developed a strong understanding and a wealth of technical skills that will be used to help customers access advice and guidance on selection and use of LOYTEC products. "LOYTEC's products are a perfect fit within our overall offer", said Tim Sly, "and our customers trust the LOYTEC brand for products such as gateways, routers and visualization. Now we want to use our new status as LOYTEC Competence Centre to build on this reputation and to promote the LOYTEC range of programmable room controls and BMS software solutions in the UK and Irish markets".

Over the last 16 years, Calon has built up a reputation for technical excellence in networked controls, combined with exceptional customer service. The company has successfully delivered control solutions for many projects in retail, education, commercial offices, civic buildings, and health care facilities, in partnership with leading system integrators, lighting designers, and BMS specialists. A couple of examples:

Exeter University's Biosciences Department is home to world-class research on fish conservation and behaviour. Calon supplied an advanced lighting control system incorporating L-VIS Touch Panels, to allow scientists and building managers to monitor lighting and environmental conditions and adjust operating schedules in each laboratory. A link to the University's intranet means that scientists can access the information remotely, via their tablet or smart phone.

Manchester Airport is the third largest airport in the UK, handling over 20 million passengers each year to around 200 destinations around the world. As part of a commitment to reduce energy demand and have carbon neutral ground operations by 2015, Terminal 2 was recently refurbished with new DALI LED lighting throughout the building, to reduce energy consumption and improve the experience for passengers. Using a specific brief written by M.A.G's dedicated Utility and Energy team, Calon worked with leading system integrator Building Environment Controls to deliver a state-of-the-art DALI lighting control system, supplying LOYTEC LDALI-ME204 controllers linked to DALI sensors for occupancy and constant-light control. The lighting controls are integrated via BACnet to the airport's BMS and flight control systems, to automatically configure the lighting at each departure gate according to the flight departure and arrival schedules, time of day, and ambient light level.

Tim Sly, Calon Ltd.

With over 35 years of 'Open Systems' network experience in building controls, Calon's personnel have been influential on open standards bodies within building automation for many years and have a strong understanding of the technologies. This positions them to lead clients to effective control solutions that are compatible with any of the commonly encountered open standards protocols. Calon Managing Director Tim Sly advised: "We are investing in the recruitment and training of additional technical resources to allow Calon to deliver an unrivalled customer service. We believe that the new LOYTEC controls range has some unique advantages, and we want to work with LOYTEC to bring the benefits of the entire LOYTEC range to our customers".

New LOYTEC Competence Partner
Dr. Diestel: Expert for Delicate Tasks

As a medium-sized enterprise with around 100 employees, Dr. Diestel GmbH has been operating since 1991 in Rostock, North Germany in the business segments ventilation, air conditioning, refrigeration, and cleanroom technology.

The company's staff consists of specialists for ventilation, air conditioning, refrigeration, electrical engineering, and control technology. This allows customer requirements ranging from planning to delivery and assembly through to services to be fullfilled by the highly qualified technical personal. The responsible project managers have substantial influence on the energy efficiency of the systems installed during the construction phase.

A modern in-house production line for ventilation components allows Dr. Diestel shortest possible response times during the construction phase. For general services, repairs or emergencies, a service unit is available, being on stand-by duty 24 hours a day.

In addition to system engineering, research, and development in cooperation with the University of Wismar, the University of Rostock, department of mechanical and ship engineering, and the Society for the Advancement of Science, Research and Innovation e.V. Techno Trans Rostock play an essential role at Diestel. In the field of air conditioning, ventilation, and clean room technology, contributions to heat recovery in dust and fume extraction technology, the specific design of flow processes, and filter technology could be made. As a result, the engineering potential of the company could be enhanced continuously.

The product portfolio comprises cleanroom and hygiene systems for medical, pharmaceutical and industrial applications, air-conditioning systems, also for very specific purposes as laboratories, food processing plants and combined heat and power stations, extraction systems for gasses, fumes, dusts and shavings, as well as air conditioning and refrigeration systems.

The combination of planning, manufacturing, assembling, and services for air-con-

ditioning automation systems was a crucial competitive advantage in acquiring the contract for installation of the ventilation system and the associated building automation system at the newly erected Institute for Physical Chemistry of Christian-Albrechts University (CAU) at Kiel, Germany.

The laboratory building with its particular requirements for ventilation and air conditioning posed a special challenge for the experts of Dr. Diestel GmbH as well as the selected automation system, because high air exchange rates had to be achieved at low temperature tolerances limitation of humidity. The building contains two cleanrooms, over 30 laboratory rooms, two precision mechanic workshops, a welder shop, an electrical engineering workshop, a wood workshop, and a library.

The automation system aimed at connecting all major devices and displaying system conditions through a clear visualization. One demand was to integrate the automation system into the building management system provided by Kieback & Peter. New data access structures were created to enable quick distribution of malfunction or maintenance messages between users and service personnel and so allow for immediate reaction.

For implementing this task, the entire building automation project was divided into two big sections. Kieback & Peter was responsible for the execution of the primary systems (ventilation and heating). They equipped the ventilation system with a LON interface for direct data exchange with room control. The room automation system for cleanrooms, laboratory rooms, and workshops was implemented by Dr. Diestel GmbH. Diestel used LOYTEC's powerful LINX-120 Automation Servers, extended with L-IOB I/O Modules. A range of LON volume flow controllers and fire damper messaging are integrated into the IP-852 channel with L-IP Routers and hence are able to communicate via Ethernet/IP with the L-INX Automation Servers. For central data acquisition

Case Study

and reporting, the following software solutions of LOYTEC are used: LWEB-801 Server and LWEB-830 Dream Report as the reporting tool.

In particular, the following tasks are accomplished by LOYTEC components in the newly erected building of the Institute for Physical Chemistry at CAU:

- Controlling of laser exhaust: for laser exhaust, only limited contingents of air volume are available, eight concurrent exhausts at the maximum. But altogether, 23 exhausts are necessary, spread across the whole building. Through light signals, the current local status of exhaustion is indicated. In addition, the laboratory management staff has visualization at hand, enabling them to take corrective steps in case of a bottleneck.

- The entire balancing of the laboratory is visualized by the L-WEB software. This enables quick intervention in case of failure.

- Simple, slow volume flow controllers are integrated into the

laboratory balancing system. Among others, they ascertain the actual air volume for the exhaust units and register the position of the manual throttling at the bottom of the exhaust units. If there are several exhaust units in one room, the room balancing is no longer vague due to the unknown position of the manual throttling. Moreover, previously, one would have required to uphold a higher pressure level within the exhaust air system, which in further consequence would have led to more energy consumption. An example: Previously, with three exhaust units, the inaccuracy could measure up to 300m³/h. This can lead to problems when opening or closing dense smoke control doors.

- Control of power-driven fire dampers (BSK) is accomplished by a separate L-INX Automation Server, interacting with BSK-LON modules. The modules are installed decentralized near to the relating fire dampers in the building. These modules are aggregated via several LON TP/FT-10 channels, packed via L-IP Routers and integrated into the IP-852 (Ethernet/IP) channel. The fire dampers are monitored separately and can also be sent
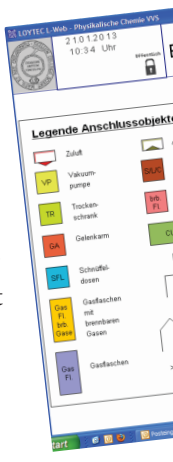
FACTS

Location	Kiel, Germany
System Integrator	Dr. Diestel GmbH, Project Manager Oliver Baron
LOYTEC Components	2 x LINX-120, 6 x LIP-3333ECTB, 16 x LIOB-150, 3 x LIOB-151, 1 x LIOB-100, 1 x LIOB-101, LWEB-801 Server, LWEB-830 Dream Report

into a maintenance cycle individually with one click. The results are displayed immediately. The conditions of the fire dampers are recorded continuously, so that events or malfunctions can be recorded and analyzed all the time.

Dr. Diestel sums it up: "In using an autonomous integration platform, the L-INX Automation Server, we could react adequately and quickly to the comprehensive interface for implementing peripheral systems of building engineering that you also find in other building projects and that is being specified only in the course of the building progress. This includes building functions such as lifting systems, and chillers. Through open communication of all involved parties demanding tasks could be implemented with the available technology to the satisfaction of the customer."

www.dr-diestel.de

PRODUCT NEWS

L-DALI: Improved Usability

The wide range of LOYTEC L-DALI Controllers now supports a feature, which allows internal binding of multi sensors and groups of lamps to constant light controllers. This works without having to start any LON or BACnet tools.

Maximum Efficiency

L-DALI maps constant light controllers, lamp groups, and sensors (for motion/ occupancy and brightness) to communication objects. In the LON models these are LonMark objects, in the BACnet models, BACnet objects. If for example you want to connect a constant light controller with a brightness sensor and three motion detectors (occupancy) to control a lamp group, you can configure the required connections of the objects with only a few mouse-clicks in the L-DALI device (see figure). Configuration is possible either via the Web interface or, for the LON models, additionally with the L-DALI configuration tool.

Considerable Saving of Time

In using this method, distinct saving of time in engineering is guaranteed. The connections can be created without using a LON binding tool or using BACnet client-server mappings. Both in LON and BACnet, the existing communication objects remain fully functional.

## L-INX Automatio and L-GATE Gate with Integrated Server

Now even more performance and network security is provided by the OPC UA (unified architecture) server on the LINX-12x/ 15x/22x and LGATE-95x devices. The increase of performance is reached by utilizing OPC UA binary format. In this way, data containers become significantly smaller compared to XML. Additional network security is ensured by deployment of the Secure Channel with OPC UA, which allows encryption and authentication by certificates for clients. OPC UA is particularly interesting in security sensitive sectors.

### OPC UA – a Standard for the Future

The OPC Foundation (**www.opc-foundation.org**) promotes the

L-IOB IP Modules with Dual Ethernet from Now on

LOYTEC pushes communication via Ethernet/IP further into the field level. The LIOB-55x/58x family of products for BACnet/IP and the LIOB-45x/48x family of products for LON/IP, are now equipped with two Ethernet ports, and a built-in Ethernet switch. Up to twenty devices can be daisy-chained in an Ethernet ring this way. Cabling of the devices is easily done with prefabricated, cheap Ethernet patch wires – plug-in and done. The distance between two modules can amount up to 100 m. So the full extent of the ring can add up to 2,000 m.
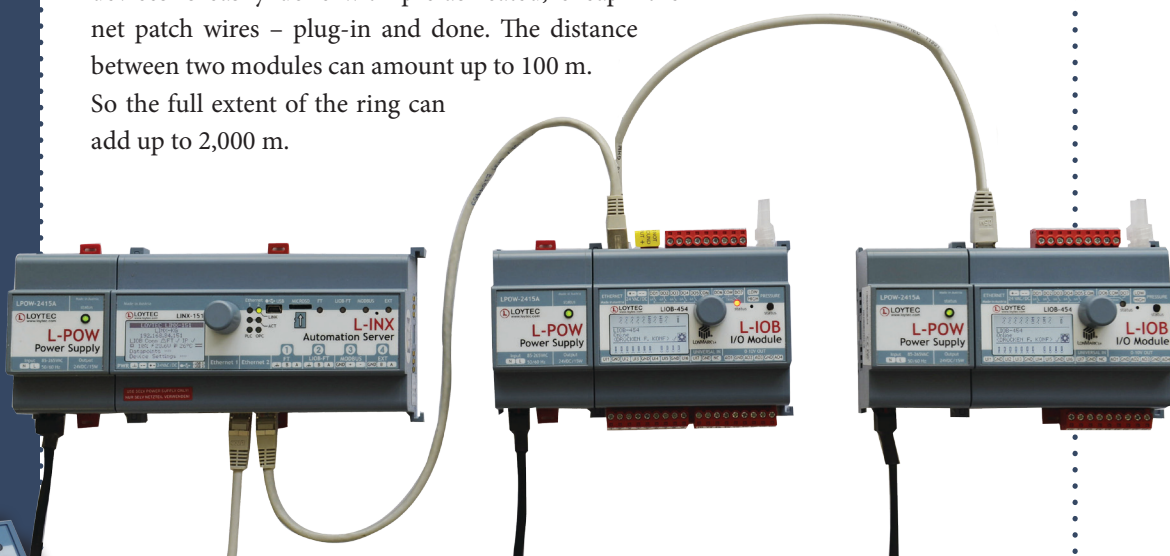
on Servers
eways Now
OPC-UA
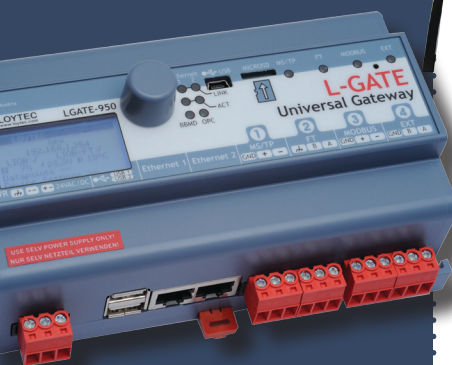
OPC UA standard as the single, future standard in the OPC world. Therefore a large number of manufacturers have committed themselves to this standard and already offer solutions on a broad basis. So it seems that the age of OPC DA (based on the Windows COM interface) is eventually phasing out.

Rapid Spanning Tree Protocol Guarantees Security of Communication

The Ethernet ring ideally is connected with two separate Ethernet switches to the building network. It is important to utilize switches, which support the rapid spanning tree protocol RSTP. In case one of the devices in the ring fails or the Ethernet ring is broken – e.g. by unplugging an Ethernet cable – this is recognized by the Ethernet switches. The two resulting Ethernet segments now are operated separately by the two Ethernet switches. Communication between all still working devices is maintained.

Different Combinations of Devices in One Ethernet Ring

This concept is particularly advantageous when exclusively using LOYTEC devices with two Ethernet ports. Besides the already described L-IOB devices, this includes some versions of the L-INX Automation Servers, L-VIS Touch Panels, and L-DALI Controllers.

Ethernet Simple as a Bus Now

With this concept, the usage of Ethernet down to field level becomes highly attractive. In using prefabricated Ethernet patch cables error sources tend to zero and costs remain comparable to bus cabling.

The advantages of Ethernet/IP clearly prevail.

LOYTEC Headquarters:
Moving into the New Building has Begun

As maybe not all of our readers know, all LOYTEC devices are manufactured at LOYTEC's headquarters in Vienna, Austria. Due to the continuous expansion of the enterprise and the increased market demand for LOYTEC controllers and infrastructure products, the production team headed by Dr. Richard Schmalek had already been suffering for quite some time from lack of space. Finally moving into the new production hall is what everybody had been eagerly waiting for. On July 25th, the day had finally come: The manufacturing department was the first unit to move into the new LOYTEC building.

Everything had been planned with military precision, as there was a time slot of only two days for moving the workstations of the production team, the machine park, and the stock. Particularly delicate was the process of moving the sensitive production equipment from its former position on the first floor of the "old" wing to the new location. Due to the dimensions and weight (five tons) of the five large machines placement machine, stencil printer, vapor-

phase soldering machine, automatic optical inspection, and selective soldering system, this was only possible in using large-sized windows and the help of a specialized fork lifter. Carefully, one machine after the other was heaved to a small wood pedestal inside the room in front of the big window, then lifted by the fork stacker, softly pivoted outside, lowered down and finally driven to the new position, now at ground-level. After about five hours, the tricky transportation was finished. By the next Monday morning, all machines could commence operation in the new production hall. The staff members now have significantly more space available – and therefore vitally improved conditions - for doing their precision work. Optimized processes in the production flow will lead to even shorter delivery periods and even less error rates.

After a small renovation, the newly increased support team (see article on page 30) will now move into the rooms in the "old" wing of the building. The test laboratory headed by Dr. Stefan Holzer will

Up-and-coming Talents: Trial Session at LOYTEC

finally have enough space to spread out all its equipment and tools.

Next, the LOYTEC training facilities and education department will move to new, significantly larger rooms. In further consequence, this will lead to an increased capacity of this division. Thus, our customers and partners will benefit from an even wider range of training opportunities in the future. L-Express will keep you updated.

www.loytec.com

"Papa, what are you doing at your work?" A question quite certainly posed to all parents among the readership of LOYTEC Express by their offspring. And there you are, having a lot of explaining to do, especially if Mom's or Dad's tasks in their everyday professional life are rather sophisticated and intricate.

"A trial lesson is the best answer," LOYTEC Head of Production, Richard Schmalek was thinking. For a whole day long, he allowed his and Head of Finances, Josef Wojak's children to "assist" in the production department.

The kids liked it immensely; they were at work with great eagerness and acted astonishingly dexterous. In the course of one single day, the four of them helped to prepare and label packaging material for at least 1,500 devices. Afterwards they proudly presented their day work to CTO Dietmar Loy and were highly praised by him. It goes without saying that papa Richard had his eye on the kids at all times and as always rigorously took care of every stroke of work. "Next holidays we will come back again for sure," the young "interns" promised excitedly when saying good bye.

Christoph, 11, Thomas, 7, Karo, 8, and Michael, 11 years
– busy bees in the production unit (f.l.t.r.)

Rojpaiboon Equipment Co. Ltd.
Bangkok/Thailand

L-TRAIN:
Because No One is Born a Master

As all of you know well, skill comes with practice and "learning by doing" is considered to be one of the most effective methods of reaching mastership.

Therefore, training is a vital cornerstone of LOYTEC's business philosophy. Especially the extensive L-INX training courses, called LTRAIN-LINX, take on an important role. Successful graduation is one of the preconditions for taking part in the LOYTEC Competence Partner Program. But even more essential from our trainers' point of view, is to learn the optimum handling of LOYTEC's powerful Automation Servers right from the start – without bothering with needless detours, dead ends or troubles. The successful implementation of a project right from the beginning and the ability to work efficiently with the controller – these are the priority objectives of the three day LTRAIN-LINX courses.

LTRAIN-LINX covers an overview on the configuration of the L-IOB I/O Modules, the creation of IEC 61131-3 applications,

testing and debugging of applications, and the use of AST (Alarming, Scheduling and Trending). Usually a L-INX training is combined with a directly ensuing two day visualization workshop: LTRAIN-GRAPHICS imparts the creation of L-VIS and L-WEB projects with the L-VIS/L-WEB configuration tool, the creation of a distributed visualization based on L-INX and L-WEB, and efficient project design in using templates. Altogether, five intense and instructive days in the course of which the participants not only benefit from theoretical instructions by our well experienced trainers but also have a lot of opportunities to try out real project work with the devices. Enough time for "socializing" is provided through common lunch and evening meals.

Training courses take place in English and German at LOYTEC's headquarters in

Vienna. Registration can easily be done on our website, where you will also find the current training schedule.

But there is an exception to every rule: In case a larger number of employees from a company shall receive training, training on-site is available on request. To allow for a successful L-INX training at the customer's location, purchase and setup of the required training device configuration is coordinated and supervised beforehand by the LOYTEC trainer. In this way it is ensured that the training set-ups are ready for use when the instruction starts and meet all requirements for an efficient training course.

Trainer Jörg Welskop (L-Express has introduced him in detail in issue number 2, published in April 2012) already had several of such "guest trainings" on his schedule this year and as a result, almost
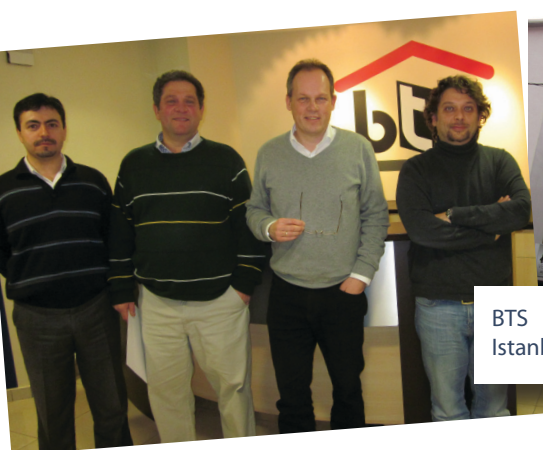
BTS
Istanbul/Turkey
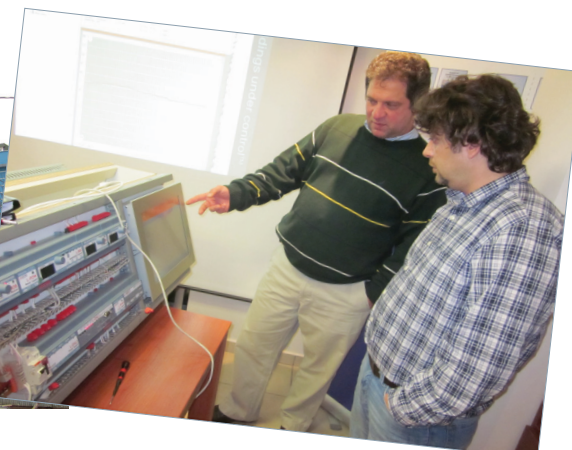
went on a small training world tour. From January 28 to February 1 he visited BTS in Istanbul for a week of L-INX/L-VIS training. BTS is deeply committed to industrial systems and covers all sections from planning to programming and installation through to commissioning. In addition to the training lessons, Jörg gave BTS a hand with their current project, a hot water supply for a power plant, where pumps

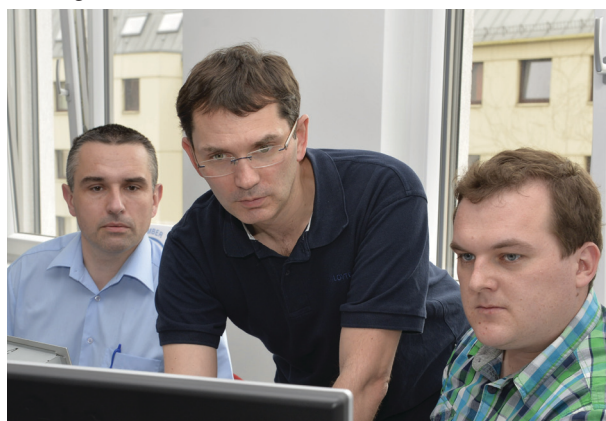Network Corporation Yokohama/Japan

and heat exchangers were to be controlled by L-IOB I/O Controllers. What had just been learned before could be put into practice immediately under Jörg's beady eye, the programming worked out properly. Jörg has not only kept the skillfulness of his hosts in best memory but also their cordial hospitality.

Jörg's next station, from February 11 to 15, was in Yokohama at Network Corporation (NWC), LOYTEC's long-term Competence Partner in Japan. Here too, fascinating new projects were waiting for Jörg. For one thing he could convince a Chinese NWC business partner, who is the global leader for rice finishing machinery, that a L-INX can not only control buildings but due to its sequential control is ideal for such machines. The tremendous speed – ranging in hundred milliseconds – which the L-INX can reach through

its sequential control, predestines it for such tasks. From now, on giant machines for rice treatment will be controlled by L-INX. The Chinese business partners were deeply impressed and delighted.

For another thing, Jörg could demonstrate for the first time the advantages of Smart Auto-Connect in the context of a project that NWC is working on for Mori Building Co., Ltd. (the office tower Toranomon Hills, a new landmark of Tokyo, completion 2014). Within only a few minutes, work gets done automatically that otherwise would require about one week when done manually and moreover would be relatively prone to errors. The LON network variables are generated automatically and the local connections are applied automatically with the correct variable declarations.

Immediately afterwards, from February 18 to 22, Jörg went on to Bangkok to visit Rojpaiboon Equipment Co., Ltd. Meanwhile a certified LOYTEC Competence Partner, the company has made significant contributions to the automation of the new Bangkok airport, with the highest tower on earth and considered to be the most modern airport of Asia. In the course of further extension of the airport - aiming at more than doubling the capacity to 100 million passengers and 6.4 tons of freight until the end of 2015 - Rojbaiboon now prepares for follow-up orders. Jörg tried his best to encourage the engineers of Rojpaiboon with concentrated knowledge transfer for the coming tasks.

Also at LOYTEC's USA-affiliate, product trainings take place regularly. In Spring

and Fall (most recently in September), Head of Support, Norbert Reiter travels to Pewaukee, WI, for a weekly training sequence. There, at the new LOYTEC office premises, also a separate training room is available. Norbert, with about 1,800 training lessons held for estimated 450 attendees, a real training veteran, recommends:" Training participants benefit mostly if working on a respective project rather shortly after the training. Only then their freshly acquired knowledge can be consolidated lastingly." L-Express asked Norbert what his training courses are focusing on and he explained: "Supported by our trainer, the customer becomes acquainted with the ideal workflows. As our products are really powerful, sometimes there is more than one way leading to the targeted goal. So we try to point out the best one. Our intention is to open the shortest and most efficient way into the world of LOYTEC for our customers. Within the context of a small training project they can try out all the various features. It is very important for our clients and for us that the correct handling of our devices is well understood!"

By the way: As well-informed sources

revealed to L-Express, Norbert is working on a new concept for LOYTEC trainings. Most of all, he is planning a new type of training aimed at advanced users who already have relevant product experience with LOYTEC. LOYTEC Express will keep you updated.

www.loytec.com/training

New Faces:
Power Boost in LOYTEC Support

With a lot more manpower, recruited over the last few months, the team of LOYTEC Head of Support Norbert Reiter is well-stocked again. LOYTEC Express takes the opportunity to introduce the new staff members to our readers.

Last April, Danijel Nuic started to work as Support Engineer at the LOYTEC headquarters in Vienna. Since earliest childhood he has shown a vital interest in all technical matters. Driven by his curiosity to find out how things work, he took apart radios and other electrical devices with the gloves off. At the age of ten he demolished his first computer. Disassembling worked perfectly then, reassembling not yet. He learned that later on during his education in EDP and network engineering at the Higher Technical Institute (HTL) in Vienna-Spengergasse. Afterwards, when gathering first professional experience at an electrical engineering company, Danijel's deep interest in building automation arose. On his own initiative, he began training to become an audited and certified KNX partner. This was kind of a "starter drug". Danijel, 27 years old today, soon wanted more, bigger projects, more complex BA-topics. He started looking for a new challenge and found it at LOYTEC. Here he can live his enthusiasm for electronics. As a maniac fusspot, he tinkers on every device (nowadays, nothing more gets demolished), and can not stop until a problem is solved. He is delighted in assisting others. As an enthusiastic service provider with IT background, his talent for establishing contact and his gift for languages are very useful for him. Danijel's focus is on support by phone. In-between, there still remains time for doing some projects like e.g. writing new solar altitude functions for programming sun blind control.

One month later, Dietmar Schaffer joined the LOYTEC Support team. 40 years old and born in Burgenland (a province of Austria) he completed his education as an electrical engineer at the Higher Technical Institute (HTL) in Pinkafeld. Afterwards he started to study business administration for two years but lost interest in this "dry" issue. Dietmar, named "Didi",

Fred Arnold

Danijel Nuic

Dietmar Schaffer

started working and gained professional experience at two renowned manufacturers of switches, sensors and sockets, at first in the support unit, later on in the training department. There he had his first contact with bus systems. Didi is also an audited and certified KNX partner. Finally, a company merger became the trigger for changing to Philips lighting solutions. But for Didis taste, the new job was too far off from servicing the customer. He wanted more direct contact with other people, wanted to bring forward his well developed abilities in supporting and assisting customers. In this situation, a former school mate had the right tip for him: LOYTEC is always looking for good people. Didi was hired on the spot. Besides his support tasks, an additional focus lies on updating and completing the LOYTEC video tutorials. In the future, he might also be deployed for training sessions, e.g. in the field of L-DALI. The ability to explain complex subjects in an easy way also counts among his strengths.

LOYTEC's US-affiliate has also got an addition to the support unit. In August, Fred Arnold joined the team. Fred brings in an enormous treasure of experience originating from 34 years of working in the industry and he is looking forward to starting something new again. After graduating as a bachelor in Engineering Mechanics at the University of Wisconsin, Fred was with Honeywell for a couple of years, working as an Application Engineer. There he started to concentrate on programming and designing of electronic controls, but did customer training as well. More engagements at renowned US companies followed as a Controls Systems Specialist. Moreover, his range of activities was expanded to sales and support tasks. During his career he has supervised a great many projects as responsible project manager, some of them even award-winning. Doing the job "from start to finish", the full-length involvement in a project is especially important to him. Fred knows the US industry well and also the differences between the European and the American way of approaching things. "I am good at working with people and teaching them. I am generally good at programming and I have a deep technological knowledge of the industry," Fred sums it up. Now he will develop yet another skill: Learning German. In spite of his grandfather's and wife's German roots, his ability to talk German soon got lost after schooling. Fred's persistence and his relaxed tenacity will change this before long.

www.loytec.com/support

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™)

Oct 21, 2013, Nov 11, 2013, Nov 25, 2013

LTRAIN-LGRAPHICS

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

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

Oct 24, 2013, Nov 14, 2013, Nov 28, 2013