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LOYTEC

Express

Building Automation Magazine

Guest Author:
Optimization of Energy
Consumption in Existing Buildings

Project Design:
Efficient Programming with the
LOYTEC HVAC Library

Awards:
Shower of Prizes - LOYTEC is Top!

LWEB-900

The Innovative and Comprehensive Solution
for Building Management

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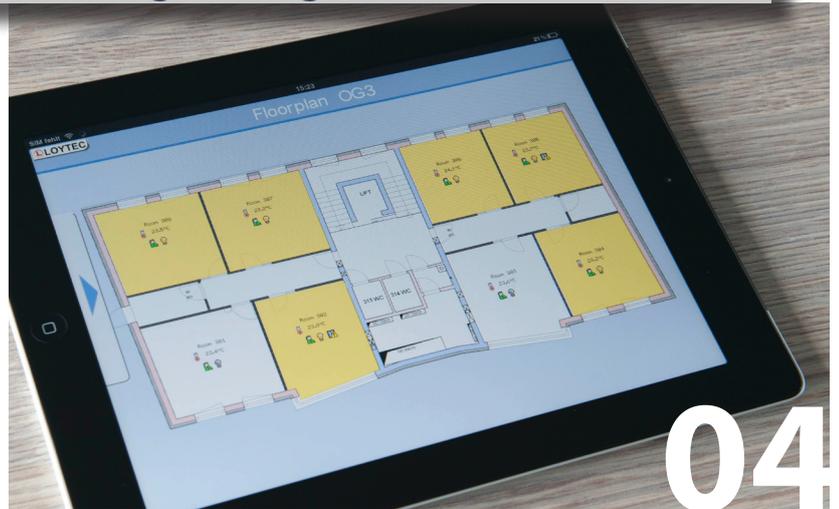
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LWEB-900: Innovative Solution for Building Management



Optimization of Energy Consumption in Existing Buildings



Review: Buildings under Control Symposium 2011



Companions and Fellow Sufferers!

“There’s life in the old dog yet”, has been said in an old saying. Modbus, LonWorks, BACnet, KNX, DALI, M-Bus have been buried many times in the past but still are fit as a fiddle. ETHERNET is highly admired but where does it hide in today’s buildings?

My introductory words might appear radical and provocative but does this situation not match reality in the normal course of life? As a global acting company we have to take on the responsibility towards our clients to seamlessly integrate all communication technologies – the buried and the prosperous ones. In this sense, LOYTEC’s L-INX controllers now integrate KNX TP1, KNXnet /IP and ZigBee PRO devices. It is the mission of our product managers and developers to supply the tools and devices in order to bring all these “multicultural” devices to life in a real-world project and to satisfy your requirements. But to create the tools and devices which allow you to finish projects successfully, efficiently, smoothly, and on-time, we need your assistance, feedback, and criticism.

Additional communication protocols are often unknown territory – also for us – and frequently need a few iterations in order to engineer them very efficiently in our devices and configuration tools. With the addition of KNX support in the L-INX controller and the LGATE-950, it is now an easy task to integrate KNX end devices in LonMark systems, BACnet networks, but also MODBUS installations and to visualize these devices via OPC in our L-WEB visualization. A complete integration into the ETS (Engineering Tool Software) is supported as well as a stand-alone workflow.

LOYTEC is planning to release devices according to the ZigBee PRO standard for wireless devices. ZigBee PRO is based on the IEEE 802.15.4 standard and operates in the worldwide approved 2.4 GHz radio frequency band. ZigBee offers strong security for the transported information with AES-128 encryption and, with its fully meshed network topology, reaches very good radio transmission ranges. The ZigBee PRO building automation profile (www.zigbee.org) defines device profiles for most of the common sensors and actuators used in building automation. ZigBee PRO is the only approved wireless solution for BACnet networks and allows creating wireless devices that talk BACnet all the way to the sensor or actuator end device. Native BACnet objects are available on these wireless end devices and can be operated from any BACnet operating workstation.

Coming back to my intro-

duction: Not enough existing protocols! In the development department as well as on the project side we have the pleasure of enjoying even more communication protocols now like the new ZigBee PRO standard. But as the saying goes: New technologies – new opportunities. It is up to manufacturers like us to work up these new technologies to a level that allows system integrators to integrate the devices with very little headache and to propitiate the building owners. I can promise you that we at LOYTEC work with great pleasure and overwhelming commitment to fulfill our part.

Thereto we need your confidence in our products and your ideas for improvements.

I am delighted to receive your feedback at dloy@loytec.com.

Sincerely yours,



Dr. Dietmar Loy

Chief Technology Officer
LOYTEC electronics GmbH



LWEB-900: The Innovative and Comprehensive Solution for Building Management

Dipl.-Ing. Andreas Döderlein



Dipl.-Ing. Andreas Döderlein
LOYTEC electronics GmbH

As LOYTEC product manager for the L-WEB System, Andreas Döderlein is largely responsible for the conception and development of the L-WEB building management system. The L-CHIP product family is also among his competences. After studying electrical engineering and computer technology at University of Technology Vienna, Andreas worked as a research assistant at the Institute for Computer Technology. LOYTEC has been benefitting from his experience since 2000.

At this year's Light+Building exhibition in Frankfurt, Germany, LOYTEC introduces the innovative building management system LWEB-900. This software integrates the whole sequence of activities, from installation of the building management system to configuring the devices through to daily operation of the facilities. Thus, a common user interface is available at all phases of the project.

Figure 1 shows a schematic representation of the LWEB-900 system. The central component is the LWEB-900 Server, which stores all configuration data in a data base and communicates with the devices of the building management system in real-time. The LWEB-900 Client is the user interface of the building management system. When a user starts the client, he has to log on to the server before receiving access. Client and server exchange data using Web services only. Due to this system architecture, remote access is easily possible in spite of firewalls and NAT routers. In addition, differences between the various

a standard Web browser, it is possible to quickly check the status of the building automation system while travelling. Here it makes no difference whether a smart phone, tablet, or PC is used.

Operating and Monitoring

In LWEB-900, all areas of a building are visualized and operated using installation schematics. Each schematic can consist of a large number of dynamic display elements which reflect the current status of the facilities. These display elements also include complex elements like alarms, trend logs, and schedules.

The configuration software to design the graphical representation of the installation is built directly into LWEB-900. It allows users to easily create dynamic graphics without requiring any programming knowledge. The same graphics which have been generated for LWEB-900 can also be displayed on a LOYTEC L-VIS Touch Panel.

Device Configuration

field bus technologies (CEA-709, BACnet, DALI, M-Bus, Modbus, KNX, etc.) are compensated and the user is presented with a consolidated view of the separate systems.

LWEB-900 manages and configures all LOYTEC devices based on a central database. The set-up of the devices can be changed very comfortably because the required configuration software is built directly into LWEB-900. It is also possible to update the firmware of all devices easily and to perform backups.

Global Connections

To monitor the building's technical equipment, there is no need to install the LWEB-900 client. Using

With LWEB-900 it is easy to connect data points of different LOYTEC devices. For this purpose, a global connection can simply be created and drag&drop can be used to add input and output data points. LWEB-900 configures all devices which

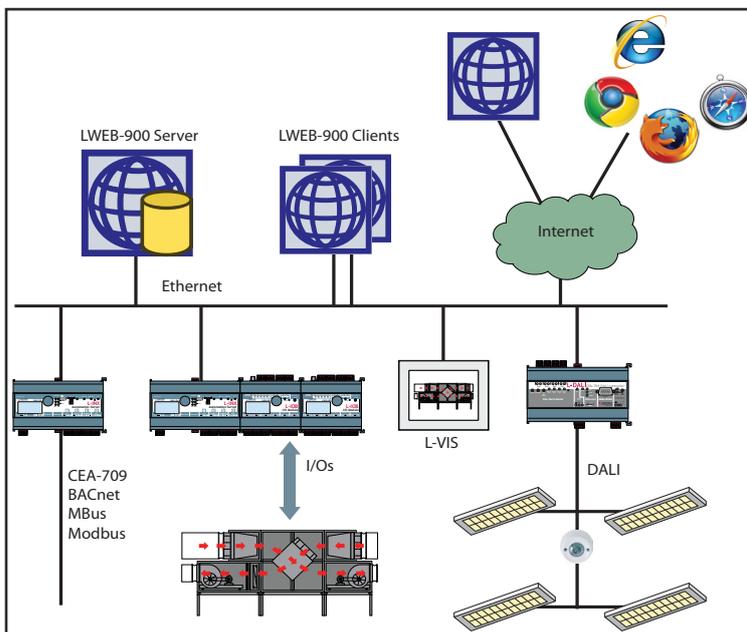


Fig. 1: LWEB-900 system architecture

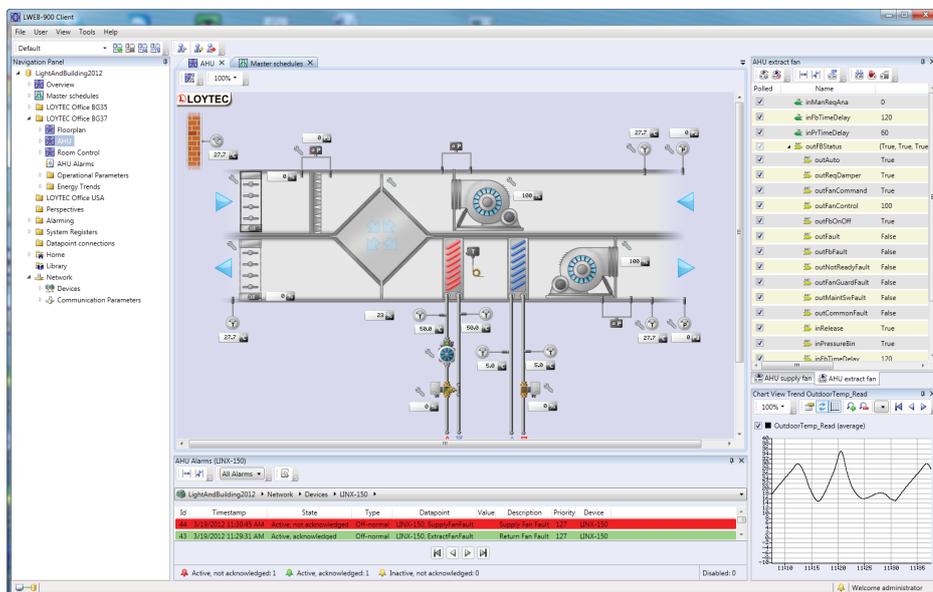


Fig. 2: LWEB-900 client visualization

are part of the global connection accordingly. After the connection has been configured, the devices exchange data directly over TCP/IP.

Parameter View

The parameter view allows configuring operational parameters, which are distributed over multiple devices, efficiently. For example, parameters for room temperature control, light control, or sunblind control can be organized in different parameter views. Each parameter view is a matrix where each cell represents a parameter. Parameters can be organized freely in the matrix, depending on space layout and function. In this way, it is possible to e.g. adjust the running periods of sun blinds across many rooms with a few mouse clicks and write the new values reliably into the corresponding automation devices.

Alarming

With LWEB-900, alarms from different sources can be visualized and managed in a uniform manner. For example, an L-DALI

device can generate alarms in case of a ballast failure or if the emergency light test

fails. On the other hand, a L-INX device controls the air handling unit and triggers an alarm the V-belt is torn or if the air filter is dirty. In LWEB-900, these alarms are presented in a common view and the user can acknowledge or lock them.

Depending on the priority of an alarm, it can trigger various actions in LWEB-900. For example, a group of people can be notified via e-mail about the alarm. Depending on the weekday and the current time, different recipients are possible and if the alarm is not acknowledged within a certain amount of time, an alternative action can be triggered.

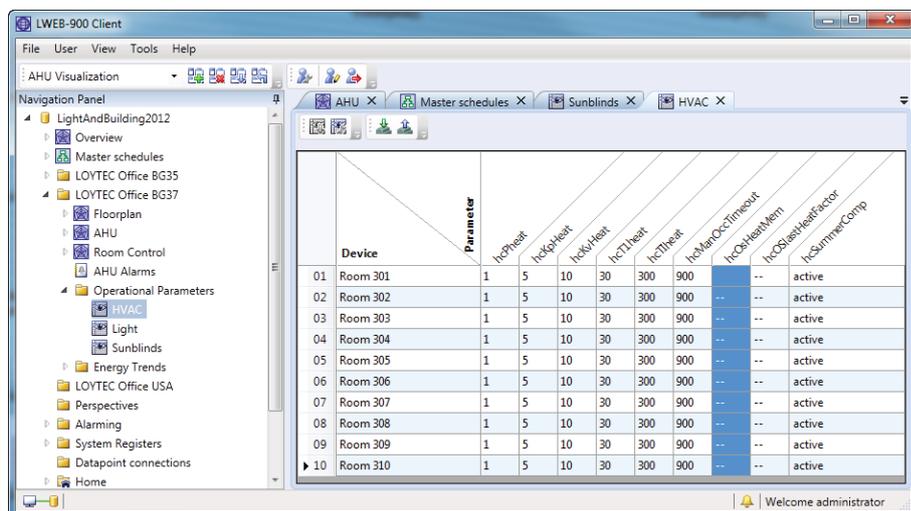


Fig. 4: LWEB-900 parameter view



Fig. 3: Visualization on mobile devices

Cover Story

Trending

LOYTEC devices can record the value of data points over time. However, the memory available on a device is limited. LWEB-900 overcomes this restriction by reading out the trend data from the devices periodically and storing everything in the database.

A user can also create ad-hoc trend logs directly in LWEB-900. This is the fastest way to create a trend log. One simply selects a data point and activates trending using the context menu. LWEB-900 periodically polls the data point value from the device and stores the value in the database.

Trend logs can be viewed either as tables or as charts. Especially for trend charts, a large number of customization options are available.

Scheduling

LWEB-900 offers the unique possibility of organizing schedules executed on different devices in a hierarchical way.

The resulting tree structure

permits defining entries which apply to all schedulers or only a subset. For example, a standard occupancy schedule can be defined for a whole building. This global schedule can be modified for certain areas of the building. The area specific entries can in turn be supplemented by room specific entries.

After the schedule hierarchy has been defined, LWEB-900 calculates the resulting configurations and downloads them to the corresponding devices. The schedules are executed decentralized in the devices to increase reliability of the system.

Multuser System

LWEB-900 provides a separate work environment for each user. A user has to log on to the system and is presented with a view tailored to his individual requirements. This is achieved with the following concepts:

- Access rights: LWEB-900 uses access control lists to define which operations a user can perform on a certain object (e.g. folders, data points, visualization view, parameter view, trend charts). To speed up the access right configuration, access control lists can be inherited from parent to child objects.

- Perspectives: Each user is assigned one or more perspectives. A perspective defines which windows are open and how they are arranged. In this way, a user can define separate

perspectives which are optimized for different tasks and quickly switch between them.

- Favorites: Like in a Web browser, a user can mark frequently used objects as favorites and thereby gains quick access to those objects.

Event Log

All events are logged by LWEB-900 in the database. Events include alarms, alarm acknowledgements, log-in, and log-out of users, change of operational parameter, change of device configuration, system messages, etc. The event log view offers a large variety of filters to efficiently analyze all processes in LWEB-900.

Conclusion

LWEB-900 is the first building management system by LOYTEC. Together with the existing LOYTEC devices, LWEB-900 is a seamless and comprehensive solution for building automation. Instead of separate tools and project files for different devices, LWEB-900 provides a common user interface for configuring the complete system.

The consistent use of Web services for data communication allows controlling LWEB-900 from remote, no matter whether there are firewalls and NAT routers or not. Moreover, service technicians can monitor and operate the building's technical equipment using the Web browser of a laptop or mobile end device when they are on the road.

www.loytec.com/lweb-900



Iberdrola Tower, Bilbao

Lighting Control with L-DALI

At Iberdrola Tower in the Spanish city Bilbao, the whole lighting system is controlled via L-DALI Controllers from LOYTEC. The emergency lighting system is tested via DALI. The concrete, steel, and glass giant at 165 meters (541 ft.) height is the tallest building in the whole Basque country, consisting of 41 floors which comprise a total of 50 000 square meters. The huge business center was finished in 2011, is designed as sustainable “green building”, and gained a LEED CS 2.0 certification.

Standard DALI Luminaries and Emergency Luminaries on the same DALI Channel

20 000 DALI luminaries - standard as well as emergency - and 5000 automated sun blinds are controlled via 70 L-DALI Controllers (280 DALI segments), and 35 freely programmable LINX-110 Automation Servers. The challenge: Standard DALI luminaries and emergency luminaries are on the same DALI channel, so that one DALI Controller has to manage both kinds of luminaries at the same time.



Monitoring and control of standard lights is done with automatic and manual light level adjustment, time depending profiles like occupancy, cleaning, and night keeping. There are alarms on lamp or ballast failures and calculated runtime hours for lighting zones. Monitoring and control of emergency lights consists of lamp value and state control, running hours in normal and emergency mode, alarms on lamp or ballast failures, battery charge status and battery failure, automatic and manual execution of function, and duration tests.



Iberdrola Tower clearly shows that combined DALI lighting control for standard and emergency lights is feasible in a very efficient and energy-conscious way with

LOYTEC’s L-DALI. L-DALI integrates the whole lighting system into a LonMark System seamlessly via Ethernet/IP (LonMark IP-852) and in addition provides a Web interface for configuration and maintenance purposes.

At the annual “Best of the Year Awards” LonMark International has awarded LOYTEC’s L-DALI Controller LDALI-3E101 “Best Infrastructure Product of the Year 2011“.



FACTS

Location	Bilbao, Spain
System Integrator	e-controls
LOYTEC Components	70 L-DALI Controllers, 35 LINX-110 Automation Servers



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.

Organizing Data Points: A Tidy House, a Tidy Mind

Today's Building Automation is based on networked data point communication. LOYTEC products are designed to handle a huge number of data points. This article describes ways and methods to keep track of the data points even in complex projects.

Dipl.-Ing. Norbert Reiter

All LOYTEC configurators use a common software module to configure and maintain data points.

Once you get familiar with the basic concepts of data point configuration, it is easy to handle data points in all LOYTEC configurators.

Therefore, LOYTEC's configuration software allows to create sub-folders below the technology-specific base folders. It is even possible to create several hierarchy levels of custom folders - a folder named "Room 1" can hold subfolders called "Light", "Sunblind" and "Heating", where the subfolders contain the data points.

In that way, the data point structure can be adjusted to project specific data point grouping and naming conventions and finding and accessing specific data points is made a lot easier (see Fig. 1).

Even if data points are organized in folders, the powerful search functions of the configurator can be used. To display only selected data points, a substring of the data point name is entered in the "Name Filter" search box. For example, a substring "LI" will find and display all data points that contain the substring "LI" in their name - this is true for data points like "Light", "Licht", but also "nviLight".

If, in addition, the option "Include subfolders" is selected, the search result will also include all items that are located in subfolders of the selected parent folder.

Therefore, LOYTEC's configuration software allows to create sub-folders below the technology-specific base folders. It is even possible to create several hierarchy levels of custom folders - a folder named "Room 1" can hold subfolders called "Light", "Sunblind" and "Heating", where the subfolders contain the data points.

Create Folder Copies

The concept of creating folders has some more advantages: It is possible to copy and paste the whole folder structure including the contained data points. In the copy, the data point names and folder names are left unchanged. Only when the names need to be adjusted to keep the naming unique, an index number is appended to the folder or data point name. A copy of the folder structure in our example will create a new folder called "Room2?". However, the subfolders "Light", "Sunblind" and "Heating" will keep their respective names. Folder structures that are created that way are perfectly suited for the template concepts of the LOYTEC visualization solutions (see article in the last issue of LOYTEC Express). In case there is a need for a different data

Use Folders to Organize Data Points

"Organisation is the last refuge of a tired mind" - this excuse can sometimes be heard when it is hard to understand a project that contains a large number of data points in a non-structured layout. But even sharp guys can work more efficiently and introduce less errors in a well-structured environment.

Because of the efficient software design and the powerful hardware, LOYTEC products can handle a huge number of data points: up to 2000 Network Variables, 1000 BACnet Server Objects, 2000 Modbus data points and a total of 40 000 active data points in a single device at a time. Without a good struc-

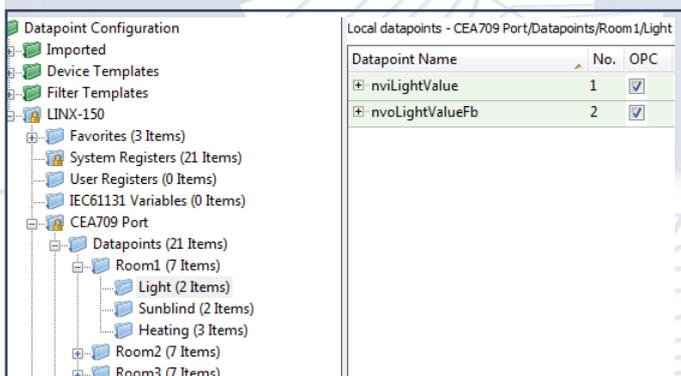


Fig. 1: User-defined folder hierarchy

point naming scheme, the option “Create copy” can be used. This option displays a dialog, where substrings in the data point names can be replaced selectively. It is even possible to enter regular expressions for complex replacing algorithms (see Fig. 2).

The copy/paste functions are not limited to a single configurator: It is allowed to copy folder structures between different configurator instances or even between different configurators (e.g. L-INX Configurator and L-VIS Configurator).

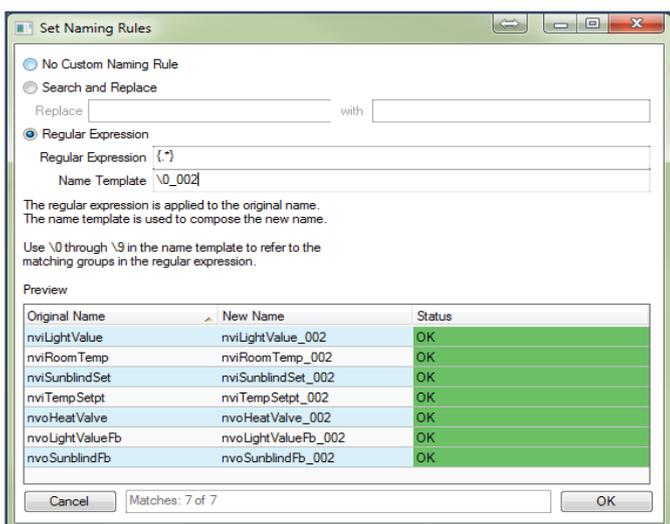


Fig. 2: Dialog to specify customized naming rules

Favorites Folders

It is often required to collect and access data points of different technologies in the same folder structure – for example a BACnet server object, a LON network variable and a LIOB I/O data point in a folder called “Room1/Light”.

For this purpose, LOYTEC has introduced the concept of Favorites folders.

What do we call a Favorite? The Favorites folder is a special base folder that allows to create a user defined folder structure just like any other technology based folder. Contrary to the common technology folders, the Favorites folder hierarchy does not hold data points, but only contains links to other data points. A new link can be created by dragging a data point into the Favorites folder. With this procedure, e.g. a link to a LON network variable can be created in the same Favorites folder as a link to a LIOB I/O data point. Of course it is also possible to edit the data point

names of the generated data point links, so that especially LIOB data point names can be adjusted to the specific requirements of the project.

The data point links in the Favorites folders are not statically connected to data points. The link to the referenced data point can be changed to a different target point, as long as the base type of the data point is the same. To explain this concept, let’s have a look at a simple example:

A PLC logic in a LINX-120 Automation Server reads the temperature from a LON network variable of type SNVT_temp_p, which is an analog data point value. Later it turns out that there is no networked temperature sensor node available and the temperature value should be read from a PT1000 temperature sensor that is directly connected to a LIOB I/O terminal. If the PLC logic does not access the network variable data point directly, but the data point is referenced by a link in the Favorites folder, it is now possible to change the link target from the original network variable to the LIOB input. For that purpose it is not required to recompile the PLC logic – it still accesses the favorite link that now points to the LIOB input and it makes no difference whether the analog value is retrieved from a network variable, a LIOB hardware input, or even a BACnet object.

Finally, the Favorites concept can also be used for a better overview of the data point values on the device’s Web-UI or the LCD

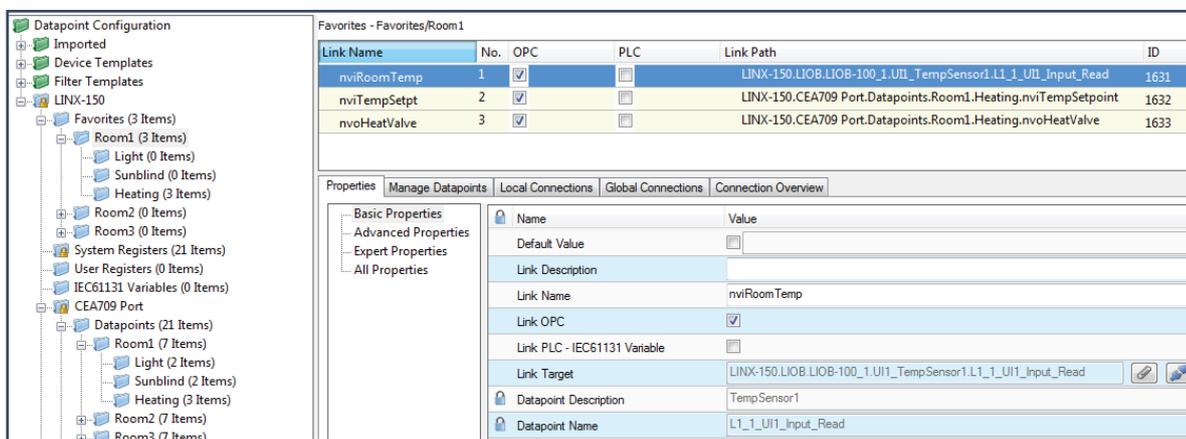


Fig. 3: Data point links in the favorites folder

display. The most important data points can be linked to favorites data points and can be accessed through a single data point source folder without navigating through the complete, often complex data point hierarchy of the device.

With the custom folder and Favorites links concepts, LOYTEC developed methods to keep the data points well organized even in big projects.

Network Corporation - Sony Corporation Sony City Osaki, Tokyo

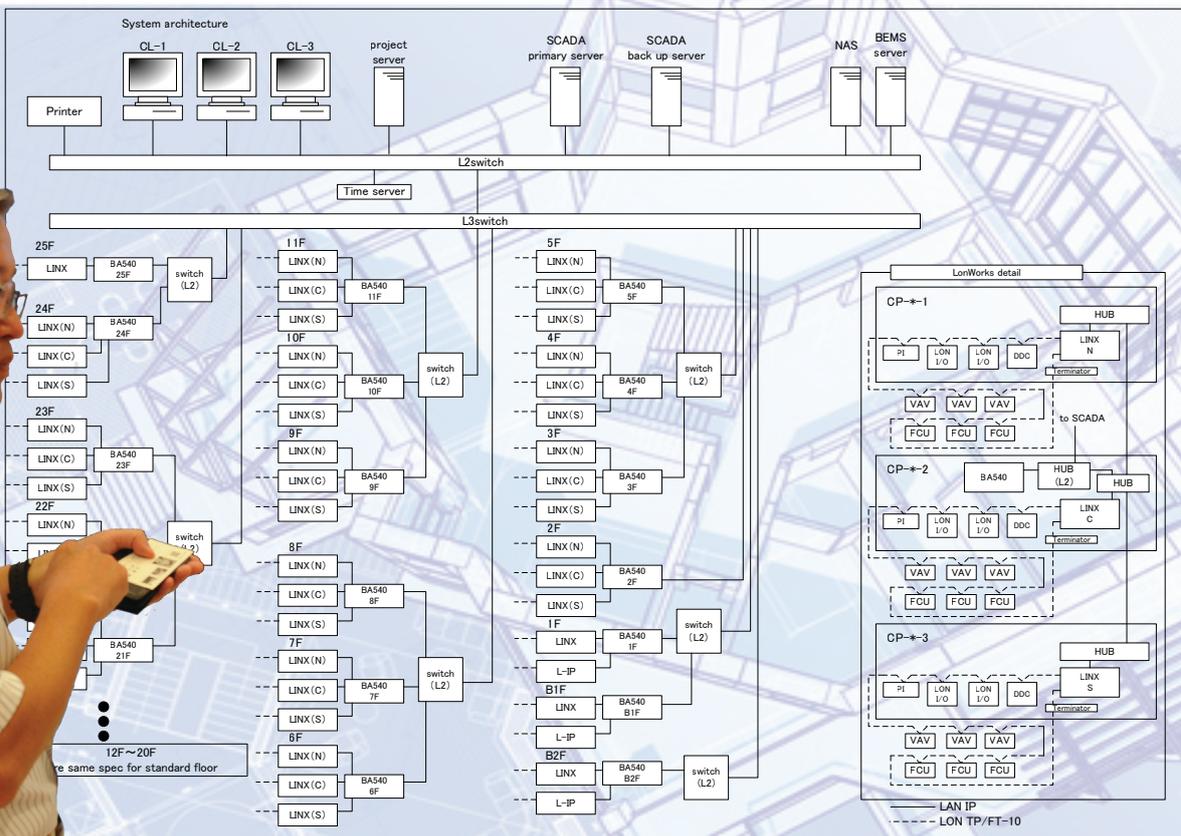
Network Corporation (NWC) was founded in 1996 by Paul Magoshi and has since become a leading solutions provider for building automation and energy management solutions in Japan.

With its headquarters in Yokohama, Japan, the company has expanded its presence internationally to South East Asia, India, China, and North America. Currently NWC Network Corporation has branch offices in Singapore and Philippines.

From its 15 years of experience in the automation industry, NWC developed the NBIS (Network Building Intelligent System), recognizing building owners need for knowing and understanding the actual energy consumption of their buildings. The system architecture of NBIS allows the implementation of an efficient, scalable, and innovative energy management system, even when working on limited budgets.

LOYTEC Competence Partner since 2009

NWC is distributing LOYTEC products for many years in Japan and in 2009 became a LOYTEC Competence Partner. The intensive cooperation between NWC and LOYTEC resulted in tailored libraries and applications for the L-INX Automation Servers fitting the Japanese market needs perfectly. Specifically, the IP connectivity of the L-INX Automation Servers, integrated AST (Alarming, Scheduling, and Trending) and their capability to be the foundation of highly scalable systems in building automation were convincing arguments for NWC to build their system architecture on the L-INX Automation Servers.



Hiroshi Kamada presents the L-INX system architecture of Sony City Osaki

Sony Corporation Sony City Osaki, Tokyo

Recently NWC has completed a project at Sony Corporation Sony City Osaki. The R&D facility is equipped with a wide range of energy-saving features that ensure an outstanding environmental performance. These include an evaporative cooling system, a high-efficiency thermal storage system and other systems which utilize solar panels and heat pumps for heating water and use natural refrigerant. Other advanced energy-saving features include the use of renewable energy including solar power and LED lighting in common areas. With more than 30 000 data points, the SCADA system is required to provide a detailed energy monitoring system for analysis and provides automated demand control.

Zone Control Built on L-1NX Automation Servers

L1NX-111 and L1NX-110 Automation Servers were installed throughout the building. They were used as zone controllers for segregation of the building to smaller, modular, and more manageable zones. A total of 93 L1NX-11x Automation Servers and 34 L-IP Routers were installed, networking more than 2900 FT-10 LonWorks Field Devices. The data points are connected to the SCADA system through the L-1NX via an IP-852 channel. Each zone's L-1NX Automation Server hosts the scheduler functions for the HVAC system and is connected to the fire protection system to create maximum comfort, efficiency, and security for the building's environment. A centralized SCADA server collates all the data into a single user interface. As the NBIS system is Web-browser based, the system can be viewed from any browser enabled device.

The Sony building is 27 floors high, was completed in March 2011, and has a built-up floor space of 124 041 square meters.

The BA project took one year for completion.

www.netcorp.co.jp
www.loytec.com/competence-partners



Fig. 1: Energy management system Sony City Osaki

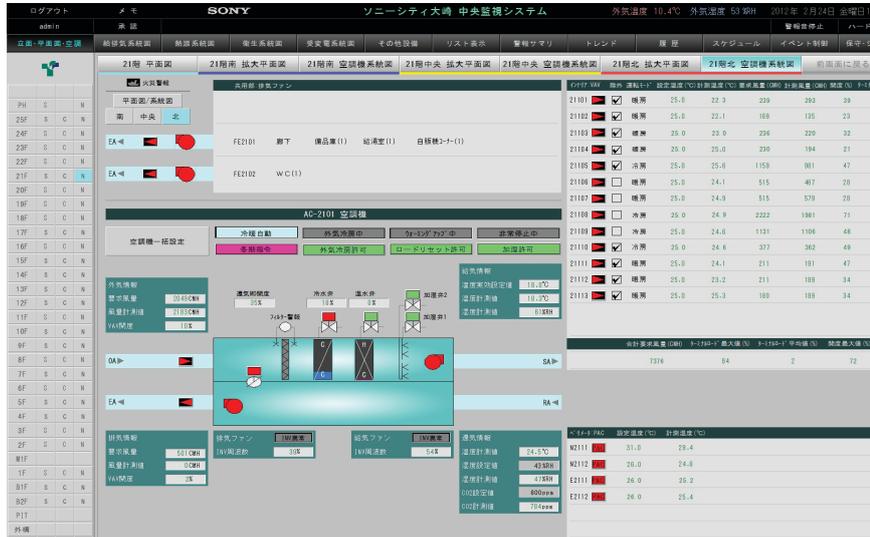


Fig. 2: Sony energy management system, AHU



FACTS	
Location	Tokyo, Japan
System Integrator	Network Corporation (NWC)
LOYTEC Components	L1NX-110, L1NX-111, L-IP



Optimization of Energy Consumption in Existing Buildings

Prof. Dipl.-Ing. Achim Heidemann

Building Automation is the Key for Economical Implementation



Dipl.-Ing. Achim Heidemann
Professor for Technical Facility Management
University Albstadt-Sigmaringen

Achim Heidemann teaches Technical Facility Management at the University for Engineering and Business Sciences in Albstadt-Sigmaringen (Baden-Württemberg, Germany). Heidemann studied automation engineering and has spent more than 20 years in various positions in the industry. Subsequently, Heidemann started a career as freelance project manager, designer, and controller. As long ago as 1999, he implemented a project with system integration design for the first time. He is consultant, surveyor, vice chairman of the technical committee for electrical engineering and building automation at VDI (Association of German Engineers), initiator and chairman of the VDI guideline 3813 "Room Automation".

Energy consumption of buildings can be significantly reduced through building automation systems (BAS). This is shown by a number of successfully realized projects. Still this potential is opened up only sparsely, because the members of the planning teams seldom have enough knowledge regarding BAS, even if they are planners of mechanical systems like heating, ventilation, or electrical engineering. If the automation solution is designed **properly** by technical planners for BAS within the context of a system integration design, amazing results are possible.

Construction, Utilization, and Energy Consumption of Buildings

The energy consumption of a building is determined by two major factors. First, the construction of the building itself with effects like transmission heat loss, solar benefits, natural lighting, and the technical systems like lighting, elevators, and air conditioning. Second to consider is the usage of the building and the user's behavior.

In constructing the building, the energy losses affected by the building were already **determined!** They are specified through the physical attributes of the parts of the building (g-value, U-value, ...) and by the mechanical design (e.g. stack losses of the

heating system). An optimization would amount to a complete building refurbishment and require considerable investments.

What the energy consumption of a building actually amounts to in the end depends on the utilization. A simple example: A building with an average room temperature of 19 °C (66 °F) consumes less than a building heated up to 22 °C (72 °F), around 18 % less on average. The user's behavior determines which temperature a room is heated up to, how ventilation and lighting is adjusted. The user can either regulate temperature manually or he can employ automation for support. If energy consumption is left to the user's manual responsibility, an appropriate awareness and time for manipulation are required. Example: Adjustment of room temperature/lighting when leaving the room or at changed incidence of daylight. Normally, no adjustments are made by the user in case the room is non-occupied, or manual entries are simply forgotten.

Summarizing one can ascertain:

1. The basic decision for the energy losses of a building during utilization is reached during the phase of design and construction.
2. The actual consumption during utilization solely depends on the user behavior.



Fig. 1: BAS efficiency categories for buildings according DIN EN 15322. Today's standard of newly constructed buildings only reaches category C.

3. The functions of building automation, especially room automation, “relieve” the user by automatically saving energy.

Automation plays the most important role in the energy consumption of buildings. This importance is reflected in the introduction of the European standard EN 15323 “Energy Performance of Buildings – Impact of Building Automation, Controls and Building Management“. Thereby a classification of buildings into energy efficiency categories determined by the level of automation is valid (see Fig. 1).

BAS efficiency class C normally complies to today's common standard of newly constructed buildings. That implies a substantial optimization potential. If you take a closer look at building projects you will realize in amazement, that only a minor part of pos-

sible savings through BAS is actually realized. Automation not only provides energy optimization but also essentially improves the user's value of the building by providing additional functions e.g. for convenience/wellness, safety, flexibility, etc.

Status of Automation during Construction Process

Within almost all industries, automation has seized a leading position during the last 20 years. It has become the basis for safety, functionality, and sustainability. Yet during construction, automation still takes an unjustified back seat. This is amazing because building automation supplements the engineering of buildings.

Design and construction of BAS usually is done with multiple separate subsystems, each trade, or mechanical engineer providing a separate system. This increases investment costs, susceptibility to errors, and most of all operating costs. Open protocols would allow a BAS solution across the

various systems, but the usual separation of automation across several systems requires considerable expenditure of coordination for the common system database and has not proved to be successful. Consequently, a reasonable implementation is only possible if the automation solution is designed from a single source. Due to the established separated culture of mechanical design, such automation solutions hardly emerge.

One can ascertain as a summary:

1. Automation is divided into separated subsystems by various engineering groups.
2. These engineers do not possess enough knowledge about complete building automation.
3. These engineers are dominated by architecture design constraints.
4. Implemented automation solutions are disproportionately expensive, in constructing the building and most of all during the following utilization.
5. Energy efficient automation solutions are only possible in a limited way.

Appropriate Design and Deployment of Building Automation

Energy and cost optimizing automation solutions are only possible if all parties involved were following a system integration plan before ordering equipment and providing services. But even in this case, a solution in part-systems remains, containing the disadvantages described above.

An economic solution, considering reasonable operation later on, will only be achieved through a **reformation of design culture**. In doing so, automation has to obtain a role appropriate to its importance. If a building owner wishes for a solution combining architecture and functionality properly, it should be reached through a dialog between building architecture and automation in the context of a system integration design (see Fig. 2).

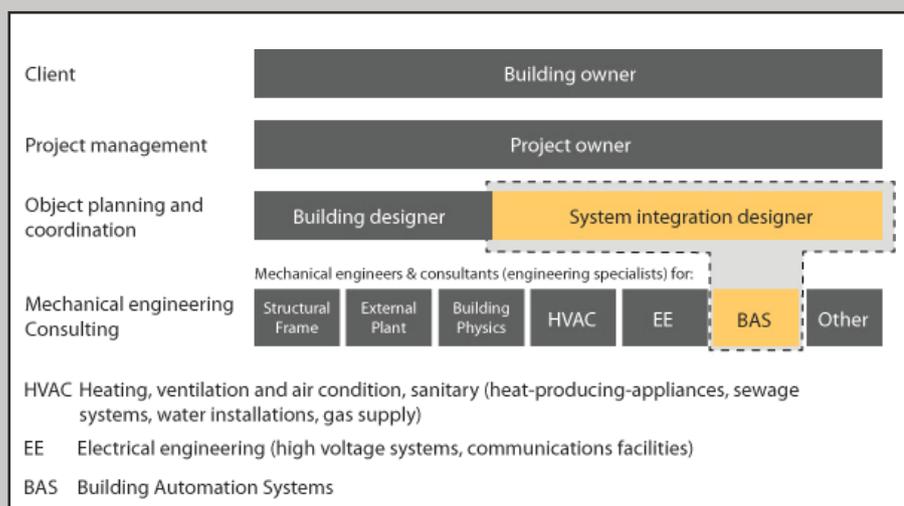


Fig. 2: Project organization with system integration design represents a new, holistic, life cycle orientated, and trade-crossing approach for designing construction building services in building projects. At the start of the project, a system integration designer takes the role of master planner for the BAS and synchronizes it with the building designer. Then, the system integration designer coordinates the mechanical engineers. The coordination of the interfaces especially to the building automation system is of great importance.

Meeting Point for the Industry



Buildings under Control Symposium 2011

October 19 to 20, 2011, LOYTEC hosted the third “Buildings under Control Symposium” in Vienna, already a popular meeting point for the industry. Numerous leading experts of the international building automation scene benefitted from the opportunity to gain firsthand detailed information about innovative products and solutions by LOYTEC. The entire LOYTEC team of development engineers was present at the event to inform the attendees about their projects and recent product developments. Current trends and events of the industry were discussed. Building automation specialists from 20 different countries attentively followed the presentations and also frequented the exhibition area.

Buildings under Control Symposium 2011

Keynote speaker of the event was Dr. Peter Palensky, who opened the course of lectures with his presentation “Predictive Controls for Sustainable Buildings”. The symposium had a focus on three topics. The first was seamless integration of open protocols, which enables LOYTEC L-INX Automation Servers to merge different communication technologies into one common “language”. Only this way synergies can be generated and highly energy efficient automation systems for buildings get implemented. Within this section, Hans-Jörg Schweinzer gave a lecture on “Seamless Integration of Open Protocols”, Norbert Reiter on “CEA-709 and CEA-852 Integration”, Stefan Soucek on “BACnet Integration”, Thomas Rauscher

on “KNX Integration”, Dietmar Loy on “ZigBee Integration”, Peter Preininger on “Modbus and M-Bus Integration”, and Alexander Bauer on “L-IOB Integration”. In addition, Norbert Reiter commented on “Alarming, Scheduling, Trending and E-Mail Notification”, Christoph Zens on “L-LOGICAD – IEC 61131-3 Programming”, Andreas Döderlein on “L-WEB Integration and L-WEB Management”, and Stefan Soucek on “Device Communication through Global Variables”. The building operators perspective was illustrated by two case studies, on behalf of which the presenters Steve Yowell (“City of Chandler, AZ, Benefits from L-INX Automation Server”) and Wayne Mason (“Lincoln Property Company, DC, Uses

Meeting Point for the Industry



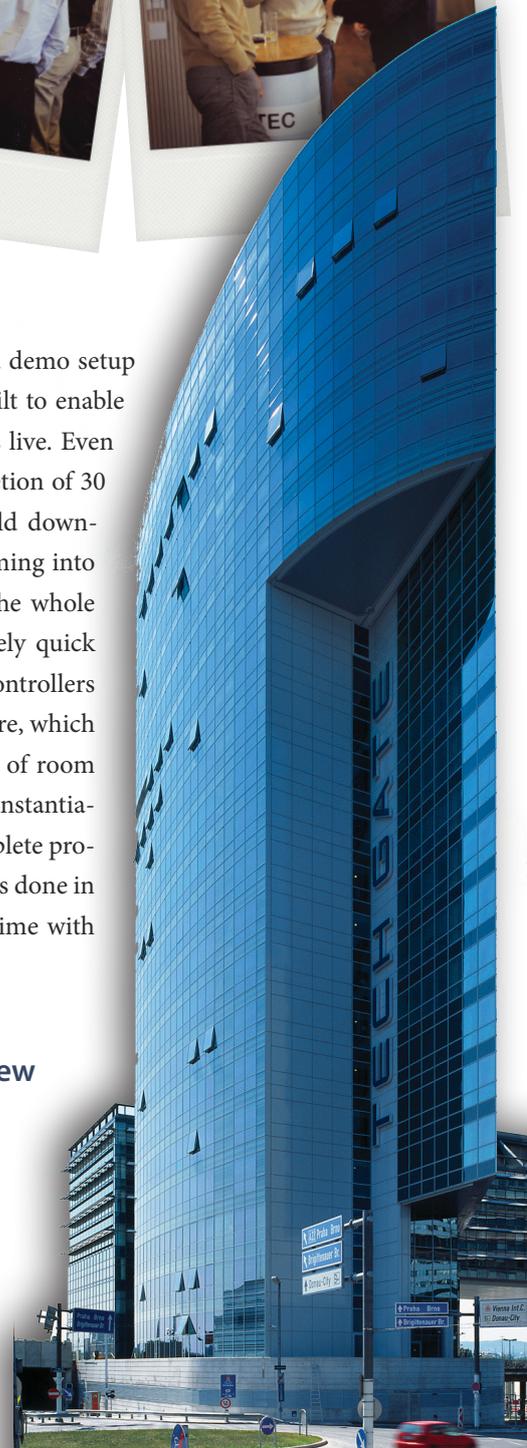
LWEB-800 GUIs“) had undertaken a long journey from the USA.

Secondly, Jörg Bröker examined modern L-DALI lighting control which covers essential functions like constant light control, sun blind control with sun tracking, identification of lamp and load errors of DALI lamps, and integration of DALI multisensors for movement, brightness, and temperature. The support of lamp burn-in duration, periodic testing of emergency lights, and the benefit of an integrated Web interface rounded off the discussion. A case study about the lighting control of Iberdrola Tower, Bilbao, completed the theoretical presentation in an ideal way with a practical installation and control of 20 000 fixtures (see page 7).

The third topic was the highlight of the symposium: L-ROC, the revolutionary world premiere for advanced building automation. Dietmar Loy commented on the new freedom in automating resized rooms through cloud control. If you move a wall, the room automation system adapts to the changed room proportions – flexibly, immediately, self-configuring, Web-based. Subsequently, the attendees could follow the creation of the automation of an entire office tower with 480 room seg-

ments. The presentation included a demo setup of 60 L-ROC devices purposely built to enable the spectators to watch the process live. Even before the projected system completion of 30 minutes (!) was over, Dr. Loy could download the entire necessary programming into all of the L-ROC Controllers for the whole building. The efficient and extremely quick programming of the new L-ROC Controllers is enabled by the L-STUDIO software, which is type based and creates instances of room types. Through simple copying (instantiation) of these “basic modules“, complete programming of an entire office tower is done in an astonishingly short amount of time with surprisingly little effort.

www.loytec.com/event-review



Efficient Programming with the LOYTEC HVAC Library

Dipl.-Ing. (FH) Jörg Welskop



Dipl.-Ing. (FH) Jörg Welskop
LOYTEC electronics GmbH

Jörg Welskop is a profound expert for HVAC automation projects with the focus on open systems. His extensive knowledge of system engineering derives from decades-long activities for various HVAC system engineering companies as a project manager and chief engineer in charge for building automation. As a graduated utility engineer and industrial engineer he enhances LOYTEC's support and trainings unit in Germany for over a year.

During the last years, the complexity of building automation systems has increased dramatically. For better energy efficiency, different applications like heating, cooling, air handling, but also room automation need to be integrated in a single system. Building owners ask for system integration based on open standards to avoid being dependent on single suppliers and to protect their investment. Modern systems are IP based and provide distributed visualization solutions based on state-of-the-art Web technologies. For today's system integrators, this means that they need to be experts in all relevant disciplines in building automation. In addition, they need good skills in various open communication standards as well as in IT technology. However, the systems still need to be implemented in a very short time and need to be cost efficient.

With the L-INX controller family, LOYTEC introduced an innovative system that seamlessly integrates all open communication standards for building automation in a single platform. The powerful and scalable hardware platform, program-

mability in a graphical function block language, and a Web-based visualization make the L-INX system a perfect solution for the needs of modern building automation.

To help the system integrator to configure and program this innovative system efficiently according to the complex project requirements, LOYTEC has developed libraries that contain function blocks for the most common requirements of building automation applications. The HVAC Function Block Library is a "construction kit" for heating, air-conditioning, and cooling technology that helps setting up control programs and visualizations.

Principles of the LOYTEC HVAC Function Block Library

The HVAC Function Block Library was developed with the following requirements in mind:

1. The function blocks have to operate with all communication standards, they need to be independent of the communication system.

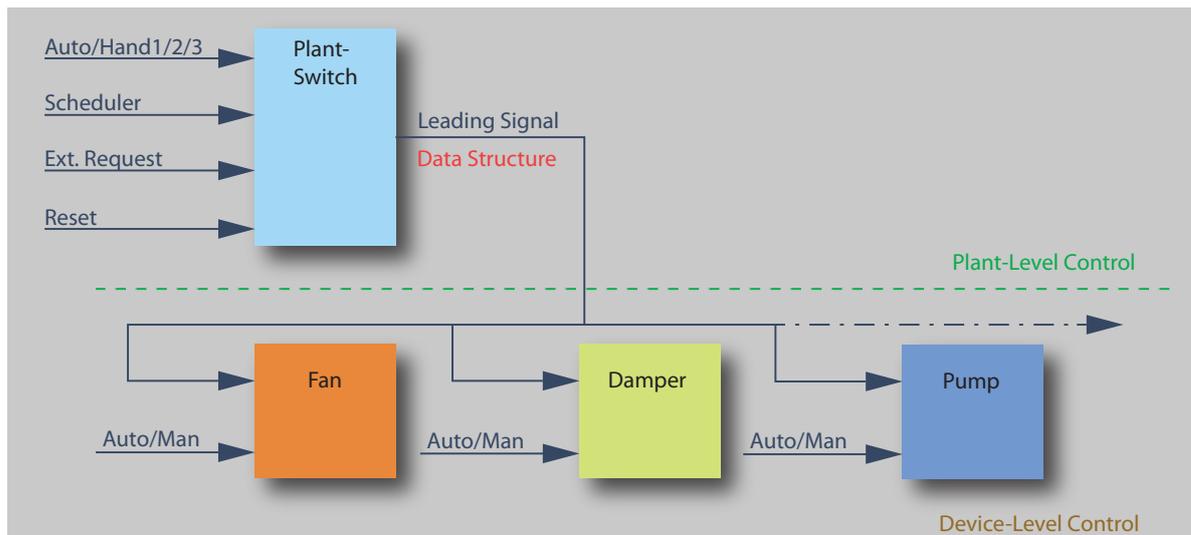


Fig. 1: Two-level hierarchy

2. The implementation of the function blocks is not read-protected, this way it is transparent and modifiable.
3. The user shall be able to create custom libraries based on the LOYTEC library.
4. Two-level hierarchy with plant-level control and device-level control for an easy to understand system structure.
5. Every actuator (pump, valve, ...) has its own, separate function block.
6. Minimize the required connections between function blocks to minimize the work effort and risk of introducing errors.
7. Efficient creation of the LINX data points, matching the library function blocks.
8. Quick and easy creation of the visualization front end with graphic objects matching the function blocks.

By using this library, the programmer is able to create a powerful program that optimally controls the system and even supports the efficient creation of graphical pages in LWEB-800 with optimized data communication.

For All Technologies – One Size Fits All!

The library implementation is not based on a single technology. The library can be used with all communication standards (LON, BACnet, KNX, Modbus, M-Bus, ZigBee). All technologies can be combined easily in the L-LOGICAD program. The connection to data points can be done in the L-INX Configurator, independent of the L-LOGICAD program. As an alternative, it is possible to create these

connections in the L-LOGICAD program directly because L-LOGICAD is able to operate with all kinds of L-INX data points. This means that it is e.g. no problem to switch a KNX light actuator using a LON occupancy sensor and to visualize the function on a BACnet operator work station.

No Blackbox

The function blocks are not read-protected. This means that the program logic is accessible to the user and can be modified or extended. It is also possible to copy parts of the function blocks to re-use functions. System integrators

can add their own functionality to the LOYTEC library function blocks and thus create custom user libraries for future projects.

Help !!

Each function block has its own extensive help that describes the functionality in detail. The documentation contains a description of every in- and output as well as the functionality of the whole block. A user manual is also available.

System-Level and Device-Level

The library is based on a two-level system hierarchy with system level and device level control. On the system level, there are only a few function blocks which implement the high level control functions of the system like scheduling, staging, fault shutdown, and manual operation. Here, the main function block is the “Plant Switch“. On the device level, the function blocks implement control functions of the actuators like fan, pump, and valve. Every device is controlled by a single, separate function block which contains all functions to control that device. The plant switch and even the device control blocks have a manual switch to perform a manual override. The blocks of the system level control are connected to the device level control blocks with a single control signal. This is a data structure that contains all main functions like reset, release, request level, start-up, and night purge. There are

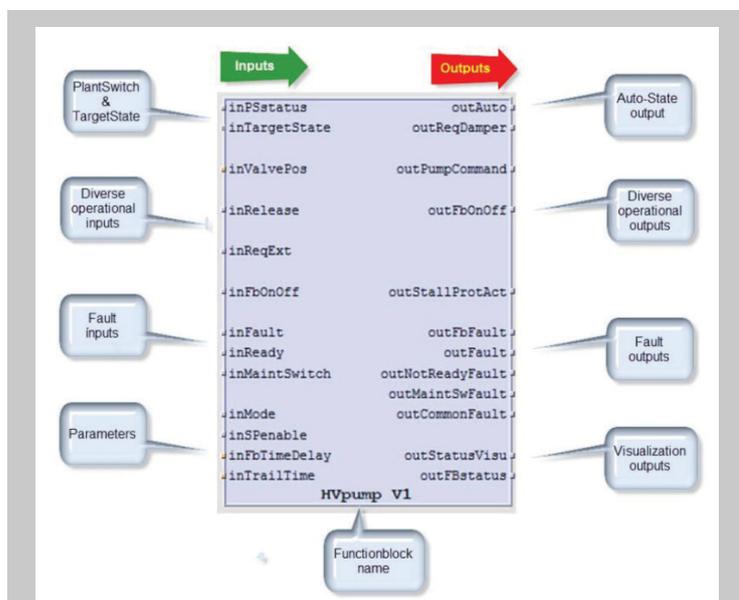


Fig. 2: Shape of a function block

Project Design

only a few connections between the device level blocks. This structure provides a good overview and avoids errors due to wrong or missing connections in the program logic. It also allows easy localization of functions when debugging or maintaining the system. Fig. 1 shows the twolevel hierarchy.

All Functions Included

On device level, every actuator is controlled by a separate function

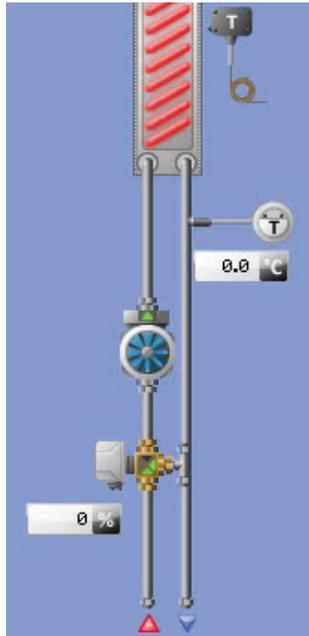


Fig. 3: Template pre-heater

block, e.g. fan, pump, valve. These function blocks include all required tasks to control the actuator. For instance on a pre-heater valve, the control signal has to be logically connected to the winter startup and the steady return temperature control providing frost protection for every operating condition. Furthermore, all essential monitoring functions have to be supported:

For instance a feedback control in case the valve has a position feedback potentiometer. Several single faults and one common fault are being generated for each actuator. High priority faults have to shut down the plant (e.g., frost protection) by logical connection to the plant switch. In this case, the plant switch performs a plant fault shutdown for all device level control blocks. For commissioning or maintenance purposes, each actuator can be manually overridden.

Fig. 2 shows a typical shape of a device level function block using the example of a pump control. On the left side, all inputs are located, on the right side all outputs. Inputs and outputs are arranged in logical groups. On the bottom right, you see the communication outputs to the visualization including the essential output *outFBstatus*. This output consists of a data structure containing all

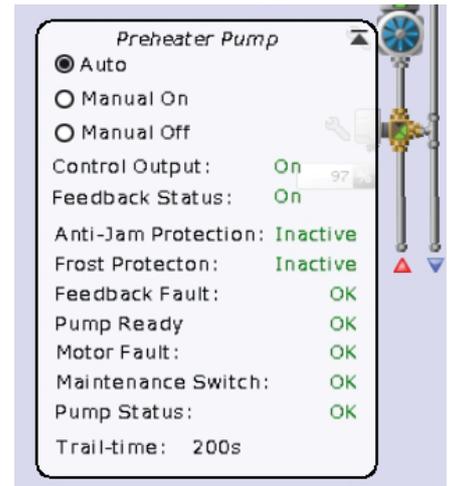


Fig. 4: Faceplate (online)

inputs and outputs of the function block. It is used to connect to a L-INX data point (user register) of the same structure that allows displaying each element of the structure as a single data point. In this way, a highly efficient and errorless coupling of function blocks and L-INX data points can be realized for further processing e.g. in the LWEB-800 visualization.

Templates for Data Points and Graphics

In addition to the function blocks, the library includes data point templates for the L-INX Configurator. By using these templates, the programmer is able to generate all L-INX data points matching the function block in one single step. This guarantees an efficient and errorless workflow.

Other important components of the library are the graphic templates for visualization matching the function blocks. The graphic templates consist of graphic symbols (see Fig. 3: pre-heater) and the detail views called "Faceplates" (Fig. 4). These templates offer ready-made graphics for LWEB-800 or L-VIS and can be used to arrange views quickly

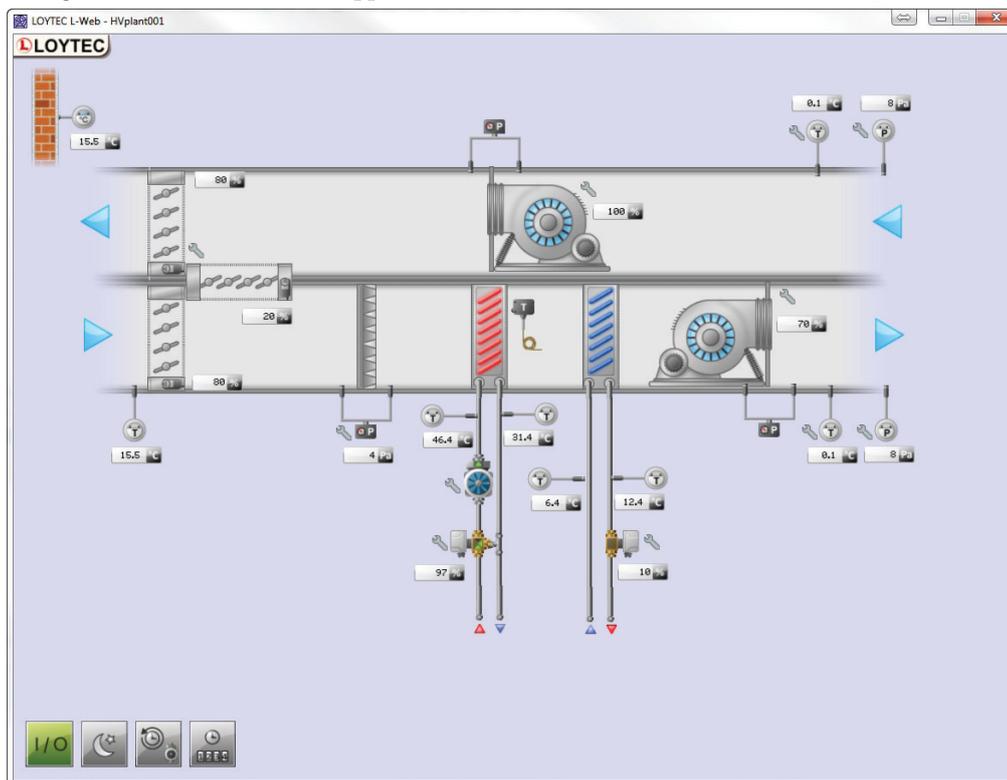


Fig. 5: Sample of a plant (online monitoring with LWEB-800)

and easily (Fig. 5). A faceplate pops up by clicking the graphic symbol and offers detailed information about the actuator. Additionally, it provides control for manual operation and all relevant configuration parameters.

The graphic symbols and the faceplates include the correct references to the L-INX data points. This enables communication to the function blocks immediately and without errors. The data point connection of the graphic is already integrated and there is no need for additional work.

In summary, the components of the HVAC Function Block Library are displayed in Fig. 6.

What's Next?

The current version of the HVAC Function Block Library contains the L-LOGICAD function blocks, L-INX templates, and graphic templates for air handling units:

- Plant switch for air handling units
- Fan control with or without frequency converter and fan guard
- Damper control: steady or switched
- Filter guard: binary or analogue (depending on the fan speed)
- Pre-heater pump and pre-heater valve with return temperature control, startup, stall protection
- Various heat recovery systems including all needed functionalities
- Pump control with or without valve position control and trail time
- Valve control
- Runtime counter
- Stall protection
- Cascade controller
- PI controller
- Sequence controller
- Pressure controller
- Limiting controller
- Switching controller (2-level)
- Analog to 3-level converter
- Night purge

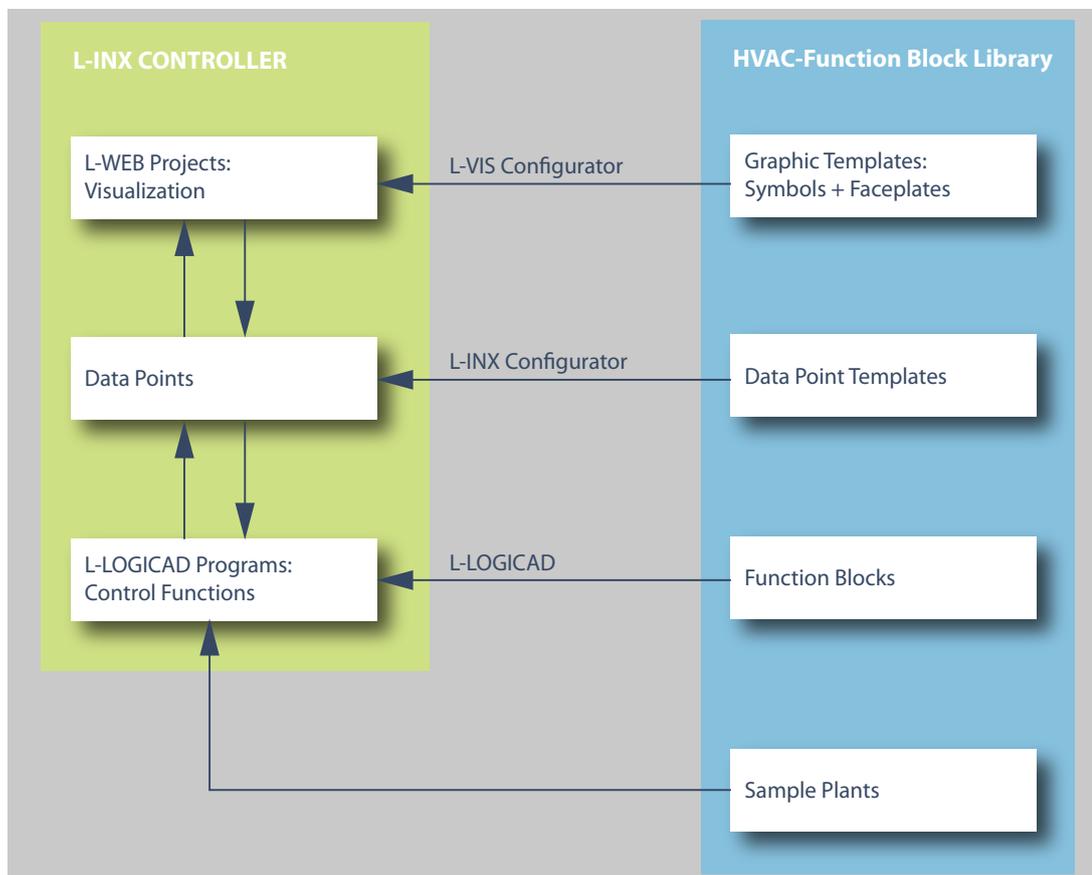
Upcoming versions will include function

blocks for heating and cooling systems. The whole range of HVAC central systems will be supported by the function blocks of the LOYTEC HVAC Library.

Example Projects for Getting Started

To provide easy understanding of the HVAC Function Block Library even for newcomers, LOYTEC has created fully functional example systems (sample plants). The sample plants include the complete data point configuration and visualization. The programmer is able to follow all the details of the sample plants:

- Connection of the function blocks in L-LOGICAD,
- configuration of data points in L-INX Configurator,
- coupling of data points to the function blocks in L-LOGICAD,
- arranging all elements for visualization in L-VIS Configurator,
- connecting the visualization to the data points.



Using the sample projects, the programmer is able to set up his first plants easily by modifying, deleting, or extending some parts.

Conclusion

The LOYTEC HVAC Function Library is available for LOYTEC Competence Partners free of charge. Based on the library, it is easy to realize control programs and visualizations without struggle and it is possible to create custom libraries as well.

Fig. 6: Components of the function block library

Who is Dr. Loy?

A Search for Traces in the Web

If you want to know something about somebody these days, you simply “google” them. So to get some information about Dr. Loy quickly and easily, we search the Web and get to know everything about him.

Here comes the first hit: **LOY'S - loving you to bits!** This must be it, the prudently anonymous author of these lines is thinking cheerfully. How quickly you get on! And he eagerly delves into an enjoyable reading experience. *LOY'S company provides quality!* Yes, absolutely true, that's what we are looking for. Anonymous



guesses he's made it. *The most important tasks in manufacturing comprise an orientation according to our darling's taste, highest product quality, dedication and qualified staff. We cherish customer*

orientation, we value our business partners enormously – but usually we don't name them with terms of endearment. *Quality at LOY's is also reflected in the purchase of raw materials. These originate from the best slaughterhouses of Austria, mainly from the Waldviertel. !?! What for heavens sake happened to the circuit boards? Our most important products are bovine rumen, bull's pizzle and porcine ears. All dogs love us...* Anonymous is horrified, hastily he leaves this website. Quite sure Dr. Loy can't be found here. He is known as a tamer of buildings, Anonymous has been informed, but not of ox or dogs...

A new search:

Loy: As of now we also mow steep hills with or new motor mower... ???

Very unlikely, much too little reference to building automation, Anonymous is thinking, next entry:

Cordial welcome at the elementary school Loy. *This is on our schedule at the moment: Every Tuesday we offer a healthy breakfast. Well then, enjoy your meal. History: In the year 1738 the application to erect a school building was acceded. King Christian VI. of Denmark donated a middle sized oak trunk for the school building. This probably was very helpful, Anonymous assumes. On the 7th of August twenty new kids...* No, Dr. Loy was not

blessed with that much offspring, Anonymous knows for sure. So the search goes on:

David Robert Loy is a professor, writer, and Zen teacher in the Sanbo Kyodan tradition of Japanese Zen Buddhism.

An American Buddhist? Anonymous cannot imagine that Dr. Loy's lengthy stays in the USA might have had such a spiritual impact. We continue searching:

Dr. Robert E. Loy: My interest in dentistry began at an early age. My father, returning home after the Korean War, wanted to become a dentist, but ... Wrong again! After all we know, “our” Dr. Loy is no doctor of dental surgery. Further on with Google:

LOYworld presents Roland Loy, his label LOYworld Records and his workshops for singing and stage performance on the Internet.

Anonymous has not yet experienced Dr. Loy singing his lectures on innovative solutions for building automation on stage. An artist yes, but we are looking for an artist in the technical field. The next one on the list:

Soccer scientist Dr. Roland Loy: “We are light years away from understanding Soccer.”

Anonymous gapes, he never would have thought, this could be that difficult. *Sports scientist Dr. Roland Loy has analyzed 3000 Soccer games within the last 20 years, to find out on what victory and defeat are dependent on ...* And he still doesn't understand? This, too, can't be the Dr. Loy we are searching for, for his analyses usually work out considerably faster, on any subject.



Loy Stub'n: Gourmet restaurant in Carinthia, quaint and stylish.

The homemade spicy venison-paté enjoyed a congenial partnership with a mild-sourly Waldorf salad with elderberry-vinaigrette, a prawn-apple-raviolo in celery crème soup turned out a perfect flavorful quotation of the previous course. The roasted saddle of venison in strudel dough could turn out to be a problem in the future, because it was the hardly surpassed highlight of the evening, including the cream puffs on pumpkin-black salsify salad. The dessert followed the trend to deploy lavender in all kinds of dishes, but the experiment with Tiramisu proceeded very satisfying.

Anonymous' mouth is watering when faced with the delights of this gourmet kitchen, but: The Dr. Loy we are searching for is not to be found here, although by all accounts, absolutely anonymously of course, he is said to be fond of a good meal.



St. Loys Chapel on the way to St. Arbogast was erected in 1648

The saint it was named after, Loy (French for Eligius), was born in 588 near Limoges. Under the governments of the Kings Chlotar II. and Dagobert I., he was a goldsmith and moneyer at court. He acquired a good reputation as an officer, helper of the poor, and founder of monasteries. In 639 Loy left the court, converted to the clerical estate, and became bishop of Noyon and Tournai (France) in 641. He died around the year 660...

Ergo this Loy, too, has to be dropped. But here comes the next candidate on Anonymous' screen:

Jet pilot Hannsdieter Loy reads out of his book "Sakramentisch!"

Hannsdieter Loy was amateur boxer and volley ball coach, jet pilot, commander of a bomber wing, and manager at an insurance company, before dedicating himself entirely to writing. Anonymous knows that the searched Dr. Loy is fighting rather successfully with all kinds of things, but combat sport and combat aviation – this is going too far. Bavarian expletives and selling insurance policies are unlike him – so we are wrong again.

The next hit:

Christof Loy, one of the internationally most renowned opera directors in Germany.

Well yes, directing somehow – but opera? No, not him. The following entry sounds fascinating.



Loy Krathong celebration: The Loy Krathong feast is one of the most beautiful and popular celebrations in Thailand and full of atmosphere.

On the night of the full moon of the twelfth lunar month all rivers, ponds and channels of the kingdom convert into true gardens of light. In honor of the water sprites "Krathongs" (small boats made from banana leaves and shaped like lotus) decorated with burning candles, flowers, and incense sticks are put to the water to float.

Marvelous, quite sure – but: Dr. Loy definitely is no Thai water sprite.

And then finally:

"Loy Tec" electronics GmbH

This is Dr. Loy!



www.loytec.com/management



Norbert Heger
President HGI



HGI – System Integration as a Passion

As one of the first companies in the market, HGI – Heger Gebäudeautomation Ingenieurgesellschaft, concentrated on the LonWorks technology in the mid-90s. As HGI's CEO and board member of the LonMark Deutschland e.V. (LonMark Germany), Norbert Heger had quickly recognized the advantages of an open, publicly available, and standardized communication technology.

As an innovative company, HGI is always on the lookout for available products and system solutions for building more efficient building automation systems to the benefit of their customers. It is no coincidence that HGI has quickly recognized the potential in cooperating with LOYTEC as one of the first LOYTEC Competence Partners in Germany.

Since its founding in 1995, HGI builds open multivendor systems for building automation. In 2000 the company moved to Hörstel (Nordrhein-Westfalen, Germany). HGI's core competences are wide-ranging from building electrical cabinets, room automation, HVAC automation, lighting control, and shading to entire building management systems. HGI employs 50 engineers, technicians, and skilled workers to develop individual solutions in close cooperation with the end customer. To HGI's experts, system integration is a passion. Programmers, automation engineers, and IT specialists provide transparent structures for individual buildings or connected real estate from the field level to the inclusion of IP communications and the Internet. System integration today means utilizing a variety of communication protocols and interfaces. Here HGI counts on LOY-

TEC as an innovative leader in terms of "communication" and as a reliable partner and supplier of infrastructure products, gateways, and automation stations.

HGI is a solution provider to public authorities in Germany, but has also received a nationwide reputation as a competent system integrator in the private sector. Whether educational institutions,

administration buildings, or production sites – it is a core strength of HGI to quickly understand a project with its special features and to provide the proper solutions in time even if requirements change at short notice.

The RTL Rheinhallen shall be named as a representative example for so many projects successfully managed by HGI. The RTL Rheinhallen is a building of superlatives in the literal sense: The biggest office complex in Germany, measured by its gross floor area of 160 000 square meters. Europe's biggest private TV station has moved in, the RTL media group, consisting of the channels RTL, RTL2, Super RTL, VOX, and NTV news channel. RTL media group is a customer with extremely high demands on a fail-safe building automation. Redundancy from the field level to management level, networks with thousands of network devices, hundreds of infrastructure components for building a LonMark system, and the tight schedule in combination created the highest technical and logistical demands on the system integrator. Reliability, flexibility, and innovation capacity are descriptions assigned to HGI. As these are attributes highly appreciated by us, LOYTEC is delighted to have won HGI as a LOYTEC Competence Partner.

www.hgi.de
www.loytec.com/case-studies





www.loytec.com/competence-centers

Foundation of the First LOYTEC Competence Center Distributor ZDANIA Upgraded as a Full-range Retailing Partner

LOYTEC's partnerships were enhanced with another facet. In addition to LOYTEC Distributors and LOYTEC Competence Partners there is now the LOYTEC Competence Center as a new reseller variant. Competence Centers are authorized to resell the full range of LOYTEC products, from automation products like L-INX Automation Servers, L-IOB I/O Controllers, and L-ROC Room Controllers to infrastructure products, gateways, DALI lighting controls, and touch panels. In those countries where LOYTEC cannot provide native speaking service, LOYTEC hubs emerge, providing support as well as training in the local mother tongue. Support, service, and training are brought to the customer and are managed locally much easier, because language barriers disappear. A LOYTEC Competence Center is authorized to hold product trainings in accordance to the prescribed LOYTEC standard and to certify successful attendance. Moreover, the Competence Center acquires and trains local Competence Partners. Competence Centers are important partners in the

"To us, this certification is the peak of a long-term intense business relationship."

Pawel Kwasnowski, Zdania

local markets and are in close contact with LOYTEC.

ZDANIA Managing Director M. Sc. Pawel Kwasnowski: "To us, this certification is the peak of a long-term intense business relationship. We consider it a privilege to be the first company which becomes certified as a Competence Center by LOYTEC, thus becoming an important know-how part-

ner. With LOYTEC at our side, we will set new standards for building automation in Poland".

ZDANIA's appointment as the first LOYTEC Competence Center took place within the context of the symposium "New Trends in Building Automation Systems", which was hosted last December by ZDANIA in Krakow, Poland. The symposium attracted numerous leading experts of the Polish building automation industry for brisk exchange of ideas. In a series of lectures, host Kwasnowski gave a comprehensive overview of modern automation solutions by LOYTEC. Special highlights were the L-INX Automation Servers in combination with the L-WEB building management system.

www.zdania.com.pl

LOYTEC Pilot Jörg Welskop: Safe Navigation between Development and System

Jörg feels good. With a broad smile in his likable face he tells LOYTEC Express why: “Bringing forward my own ideas, helping shape developments in a highly innovative environment ... it’s real fun here.”



Dipl.-Ing. Jörg Welskop, a skilled HVAC system engineer, has been with LOYTEC for about one year and feels like having come home. For one thing he is doing his favorite pastime to make a living (“Programming was always more fun to me than project management“), for another thing he successfully meets new challenges (“Conducting trainings is completely new for me, but I have always liked to associate with people – in a cooperative and non-authoritative way”).

Jörg has two main responsibilities for LOYTEC: Training and support. And he has also developed the HVAC function library. This library serves for programming the L-INX and L-IOB Controllers. For the programming tool L-LOGICAD, Jörg has created function blocks and components which realize the various applications of the system. The connection to the visualization is also included. So the programming is done rather quickly and the risk of errors is minimized (s. page 16 et seq.).

“The L-INX and L-IOB Controllers are system number fourteen I have programmed during the 25 years of my career.” And the main emphasis of this career was always on automation projects for HVAC systems focused on open protocols.

Jörg got to know LOYTEC better when he first attended a L-INX training about two years ago. Now he regularly holds training sessions and provides attendees with tips based on his wide experience. His expertise

is highly valued. Whether he is questioned about the perfect setup of a visualization project or the ideal L-INX configuration for a special application – Jörg knows the concerns and desires of system engineers closely and he also knows the best solution. “I’m coming from the user’s side and therefore I’m able to look at the problems of our customers from the system engineer’s point of view. The system engineering has to fit, otherwise you will not get anywhere with the control system.”

Jörg has utilized his control bag of tricks on many projects of various sizes: the airport expansion in Vienna, Daimler-Benz in Stuttgart, the Red Cross in Münster, a school project in Nuremberg and others. “I am like a pilot in the projects of our customers, the bridge between development and system”, states Jörg, defining his actual task. “The goal of our L-INX education is to master the controller independently, with all its complex functions. Later on, during the following projects of our customers, I delve into the details of the problem and in close cooperation with the customer put together the perfect, tailored solution for automation.”

Jörg values the technical dialog and extensive communication with “his” customers, because the users of our L-INX Automation Servers and L-WEB Systems should be able to implement the varied capabilities these systems offer as easy as possible into powerful building automation systems. Jörg pilots them on the right path.

“It’s real fun here!”

Jörg Welskop, LOYTEC

www.loytec.com/support

MPBAS: Building Automation Integrator for Southwest US market



Steve Yowell
President Mechanical Products BAS Inc.

Mechanical Products Building Automation Systems Inc. (MPBAS), is an innovative company that has been serving the State of Arizona, USA, since 1986. When company president Steve Yowell investigated the LonTalk protocol, he committed MPBAS to this approach. MPBAS believes open system technology offers their customers a truly open control solution, allowing them to choose MPBAS on merit and not by force. MPBAS earns their customers, not holding them hostage with proprietary systems. Every engineer, service technician, and sales employee at MPBAS has been trained and certified to provide their customers the best service and support in Arizona. Every technician has extensive experience and training in the HVAC industry. The staff knows control systems and also understands the equipment controlled. Several key MPBAS employees are Certified Energy Managers (CEM). Intimately familiar with the energy performance of buildings, they offer design assistance for energy savings.

MPBAS has installed over one thousand open systems Arizona-wide, utilizing dozens of third-party manufactured products which give their customers completely open system architecture, while using best products available today.

MPBAS' buildings have received BOMA

"We provide building automation the way you want it!"

Steve Yowell, MPBAS

and Governor Awards for Energy Improvements, US Government Energy Star Certifications, and LEED Certifications.

Quality automation systems with good mechanical experience allow for good customer relationships. The city of Chandler, AZ, recently completed renovating and providing automation for 15 buildings in the city with updated automation systems. Buildings with antiquated, obsolete control systems were updated to the latest in open systems technology. MPBAS provided a LOYTEC based solution bringing together global functions in one loca-

tion and local operation and control at each building. Of note here is MPBAS' technical expertise. During conversation with the city of Chandler, Vice President Kevin Estep was informed of network difficulties at an installation from a different contractor utilizing some LOYTEC components. As a LOYTEC Competence Partner, Kevin volunteered assistance which immediately identified the issues on-site for the city. Soon the network issues were resolved with the clear direction from MPBAS. MPBAS now serves as a technical expert for the city of Chandler providing network analysis and problem identification on building automation systems installed in the past by other firms. For MPBAS installations, city managers can access any building in the area from a management map provided by MPBAS. All building data is quickly available for monitor and control.

The Phoenix area is in good hands with the staff Steve has assembled over the years. A thoughtful and disciplined approach in providing automation solutions to their customers is the result.

www.mpbas.com



Shower of Prizes: LOYTEC is Top! Four Awards in Three Months



Presentation of the Energy Globe by Brigitte Jank, president of the Viennese Economic Chamber

In the course of the last months, a true shower of prizes poured down on LOYTEC. It started with the Energy Globe Vienna on October 17 last year. The Energy Globe Awards are among the most renowned ecological prizes worldwide and brought forth a record breaking number of participants last year: More than 1000 sustainable solutions from 115 countries contested for one of the desired trophies.

The award is dedicated to projects which utilize resources sparingly or use renewable energies. LOYTEC was able to win the regional contest in Vienna with L-WEB. The considerable energy saving potential when using L-WEB in building automation was crucial for the jury's decision.



Maria Fekter, Secretary of the Treasury, honors LOYTEC as Austria's Leading Company

Only ten days later, LOYTEC was among the winners again and was awarded Austria's Leading Company. Incredibly, for the fourth time, LOYTEC had been able to obtain a top position among Austria's business elite and to win this well-recognized and prestigious competition. LOYTEC was awarded winner in the federal state of Vienna and third place in the overall ranking throughout Austria. Within the rating, the most important financial ratios of the last few years were compared, bonus points were added for sustainability.

The next victory followed only one month later: Winner at Mercur, the innovation award of the Viennese Economic Chamber. LOYTEC was awarded the favored prize for the innovative



Mercur: Josef Wojak and Andreas Döderlein with Brigitte Jank, president of the Viennese Economic Chamber

L-WEB System and an energy saving application at the school district of Decatur, Indianapolis, USA. All submissions were assessed by the renowned and independent Institute for Industrial Science.



Hans-Jörg Schweinzer and Dietmar Loy with Barry Haaser, LonMark International

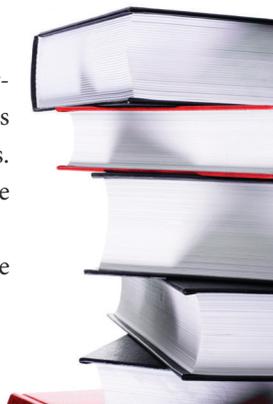
Finally LOYTEC's shower of prizes culminated in the presentation of the "Best of the Year Awards" by LonMark International. Within the context of this year's AHR EXPO in Chicago, LOYTEC's L-DALI CEA-709 Controller was awarded "Infrastructure Product of the Year 2011" on January 24, a trophy LOYTEC was able to gain for the third time in succession. Nominations from around the world were judged based upon the following criteria: Uniqueness of solution, addressing an industry problem with an effective solution, openness of solution, and integration into an open LonMark system. Special consideration was given to energy efficiency, best practice solution for the industry, and sustainable design principles.

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/training



LTRAIN-LPA

Network Design and Troubleshooting (2 days)

- CEA-709 network protocol basics
- CEA-709 network analysis with the LPA protocol analyzer
- Troubleshooting CEA-709 networks
- CEA-709 network design with L-IP and L-Switch

October 4, 2012

LTRAIN-DALI

Lighting Control with L-DALI (1 day)

- Introduction into the DALI system
- Integrating DALI sensors into CEA-709 and BACnet systems
- Using advanced features of the L-DALI Controller

May 24, 2012
October 23, 2012



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™)

May 8, 2012	October 9, 2012
June 19, 2012	November 13, 2012
September 18, 2012	December 11, 2012

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

November 6, 2012

LTRAIN-LCORE

L-CORE Training (2 days)

- L-CORE internals, design-in, tools
- Everything for a jumpstart of CEA-709 and CEA-852 networks

May 3, 2012	September 13, 2012
July 19, 2012	November 22, 2012

LTRAIN-GATEWAY

Gateway Applications and Data Point Management (2 days)

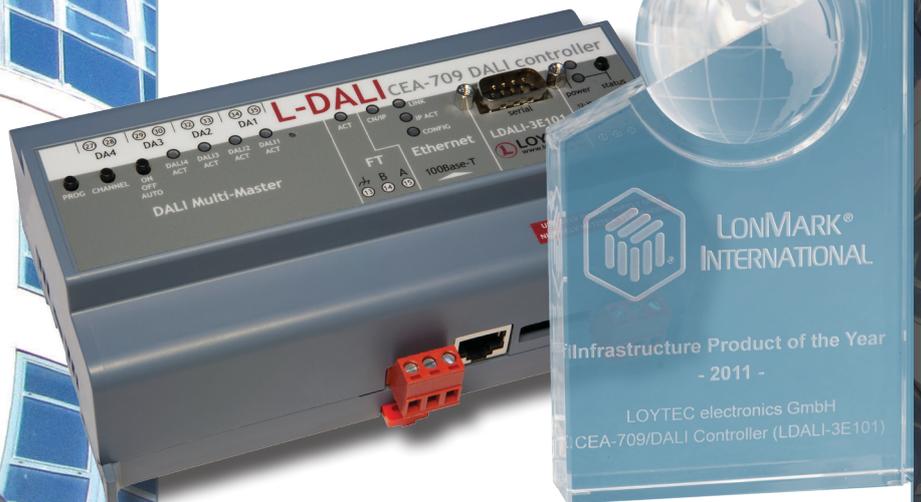
- LOYTEC data point concept
- CEA-709, BACnet, M-Bus, Modbus, OPC XML-DA
- Local and remote AST™ functions
- Building gateway applications with L-GATE, L-Proxy, and L-INX

June 5, 2012
November 28, 2012

Innovative Building Automation

L-DALI controllers manage DALI lighting systems and integrate the DALI protocol seamlessly into LonMark® systems and BACnet® networks.

Functions like constant light control combined with blind control ensure comfort and save energy.



Providing efficiency during operation, L-DALI contains an integrated Web server which allows for installation, maintenance and even periodic testing of DALI emergency lights with logging.

 **LOYTEC**
buildings under control™