## Practical experience

- in functional buildings for industry, trade and commerce
- in public buildings and communal facilities
- in residential buildings

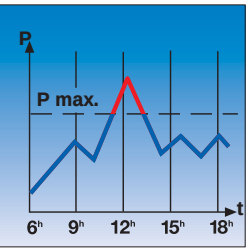
# EIB Intelligent Installation System from ABB

# A superior building installation system using the ABB i-bus® EIB

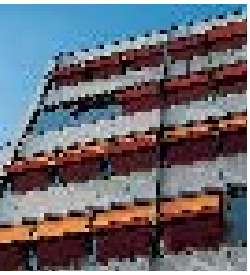
## The focal point: security, economic efficiency, convenience and flexibility

Lighting: Controlled dependent on external light, time, demand or motion

Heating: Temperature of each individual room can be controlled according to usage and demand




Load management: Avoidance of excessive power consumption during peak periods by temporarily disconnecting non-essential consumers.



Shutters: Controlled and adjusted dependent on sunlight, wind, time and demand

Electrical installation in a functional building has many requirements to fulfil. One of the key focal points is the convenience and variety of electrical control. However, the need for economic efficiency, flexibility and security as well as links to higher-level building management systems should not be neglected when planning modern installation systems in functional buildings. Lighting, shutters and heating should be controlled automatically, be co-ordinated with each other and of course be trouble-free. In addition there are functions such as monitoring, remote signalling and display of operational states as well as the temporary disconnection of non-essential services during periods of peak power consumption.

### One cable controls and directs

A modern electrical installation in the functional building sector starts with the ABB i-bus® EIB. In both large and small properties, the ABB i-bus® EIB ensures the reliable, convenient and economical operation of electrical functions.

A single, twin-core bus cable replaces the variety of cables that were customary until now and guarantees the transmission of switching and control commands. The installed system components, which give or carry out such commands are programmable and therefore allow flexible usage.

### Extension possible at any time

Dedicated to flexibility: the use of a single control cable combined with the programmable system components enables an extension of the system or a change in usage at any time.

Security: surveillance of doors and windows; monitoring by means of motion detectors and conventional sensors

Fault and process signals: recording, transmission and display of fault and process signals via auxiliary or signal switches in combination with binary inputs

# An intelligent system – flexible and versatile

## Know-how and practical experience provide the proof

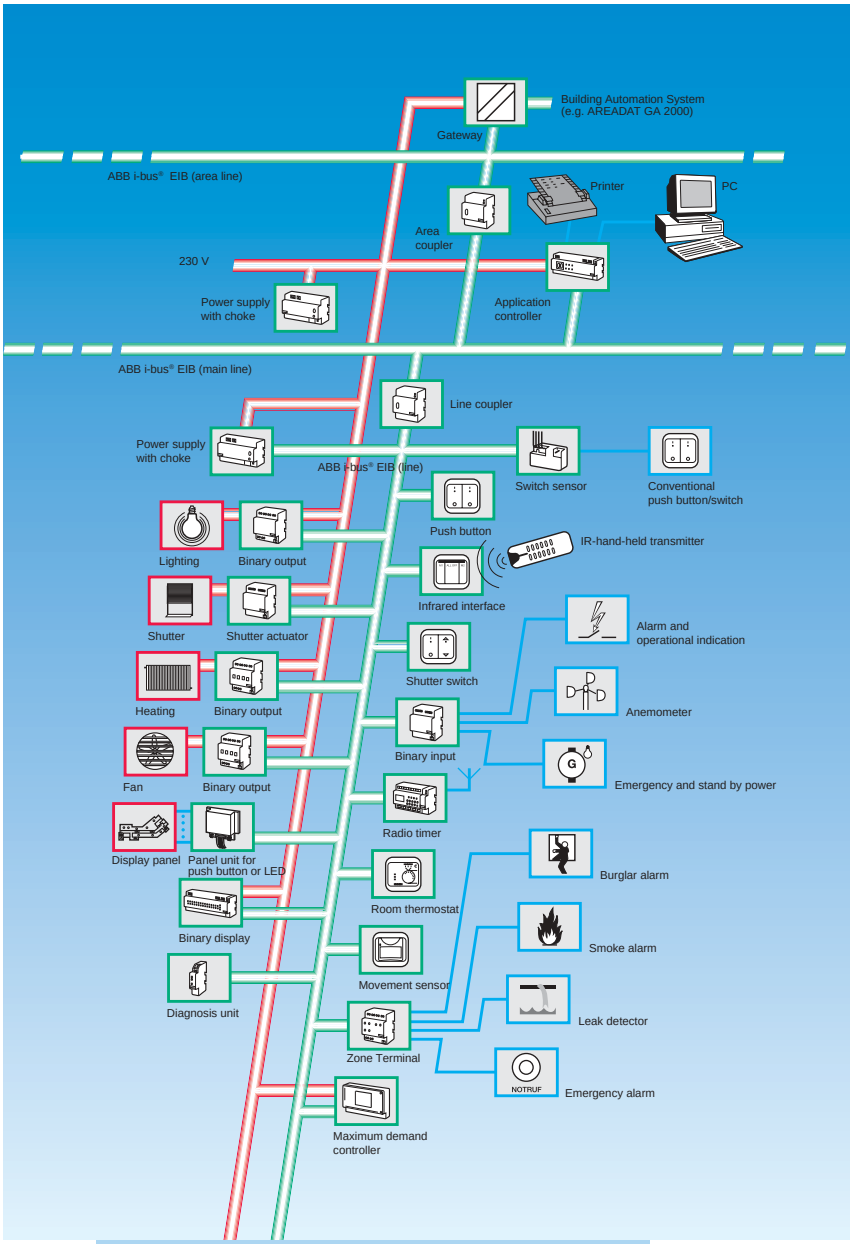



**ABB i-bus® EIB installation**
**One benefit after another**

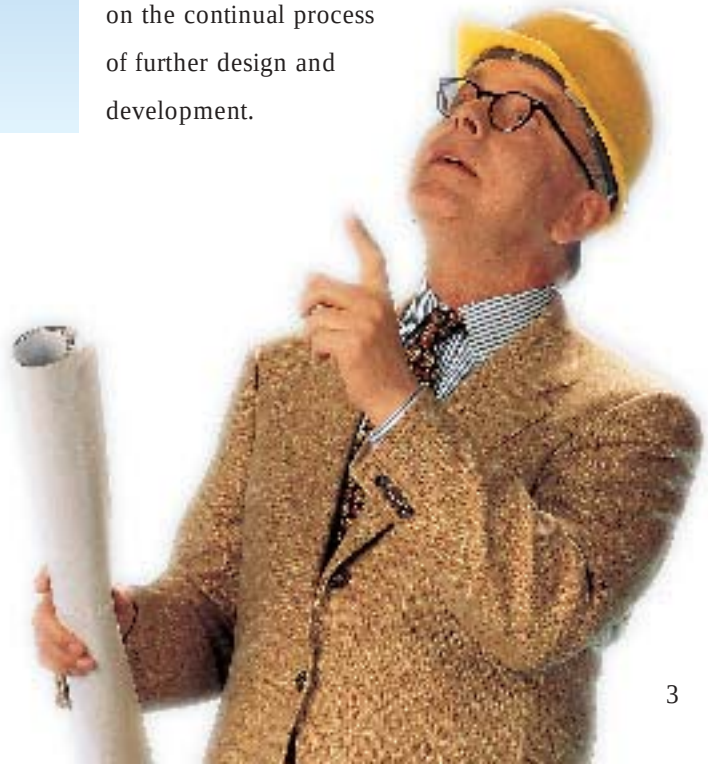
- Only a single control cable needs to be laid
- Savings in materials
- Greater flexibility for extension of the system and change of usage
- Energy savings due to maximum demand monitoring during periods of high energy consumption
- Security surveillance
- Central display of fault signals
- Straightforward wiring

### Active in the development stage

From the outset, ABB STOTZ-KONTAKT has been active in the development of programmable installation systems in bus technology. As a founder member of EIBA, ABB STOTZ-KONTAKT had a decisive influence on the standardisation of EIB.

### Experience counts

With a background of experience in fitting out various residential and commercial properties with bus systems, a comprehensive range of hardware components with a variety of application software programs has been produced. The same was true for the ABB i-bus® EIB system (with bus control cable) as well as for the new ABB Powernet EIB system (using the existing mains cable network) in achieving system technology with confidence. The experience and success of the Intelligent Installation System from ABB STOTZ-KONTAKT can be seen in the positive opinions expressed by planners, installers, electrical wholesalers and users. By working closely together, practical experience is gathered which has a considerable influence on the continual process of further design and development.



# Complex control, surveillance and maximum demand monitoring in industry

## Including remote servicing and on-line diagnosis

### Functional versatility and convenience

Joh. Stiegelmeyer GmbH & Co. KG had clear goals in mind when building their new production centre in Nordhausen. The latest production requirements for the company's products – hospital beds, bedside tables and wooden furniture for hospitals, old people's homes and nursing homes – were to be implemented in the two-storey building. Apart from a production plant and warehouses, the plans included a varnishing room, workshops, administration offices and social facilities as well as exhibition areas.

The demands on electrical installation were focused on functional versatility and convenience. Economic efficiency, flexibility and security as well as functions such as surveillance, remote signalling and display of operational states together with links to higher-level building automation systems were required.

### Flexibility enables continual further development

The electrical installation of the new production centre, initially not planned as an EIB installation, took shape during the course of the project design phase. The benefits of the ABB i-bus® EIB installation system became increasingly convincing. In particular, the cost savings owing to the maximum demand monitoring system that was to be implemented together with the flexibility of the bus technology allowing changes or extensions to the system were decisive in the contractor's decision.

# Functionality and security

In the new production centre in Nordhausen, 2 transformers of 800 KVA each were installed, with 600 - 700 kW representing the present power consumption. The EIB installation was divided into one area and 8 lines. The lines were allocated according to rooms (production plant, social facilities etc. – one line each). At present, the installed building system consists of approximately 340 EIB components. Additional applications and an extension are already planned.

The display and operator functions are carried out both centrally via panel units in the caretaker's office and also in relation to specific areas in the workshops and exhibition rooms. In addition a visual display system was implemented with the help of the visualisation software WINSWITCH. The processing of fault signals and recording of operational data together with the display of faults in the heating or ventilation system or individual production lines is all handled via the visualisation software as well as logging with a printer.

### Remote servicing and on-line diagnosis

With the inclusion of the EIB Tool Software (ETS), the visualisation and the application controller software, remote servicing and diagnosis of the installed building system is possible. The entire installation is controlled remotely via modem. Rapid fault correction and diagnosis of the installation is therefore possible at any time with the implementation of authorised electrical engineering companies. Small changes can be made without having to travel or waste time. New software can be loaded directly.

**Complex control and functionality**

The installed EIB Intelligent Installation System is used for the following functions:

- Control of the lighting – centrally in the production process – according to area and time e.g. during breaks as well as manually on-site
- Control of the shutters both manually, time- and brightness-dependent, including an anemometer
- Control of the skylights
- Control and monitoring of the sliding door operation via panel units and visualisation software
- Time-dependent control and monitoring of external doors including the speaker entry system
- Maximum demand monitoring:
  Cost savings by avoiding peak loads through time delays when switching groups of luminaires and machines

# A stage-managed showroom:
## Presentation and emotional experience, with the ABB i-bus® EIB Intelligent Installation System

### The car – a coveted object

The Mercedes-Benz dealership in Dresden presents vehicles on two display levels, with a total area of approximately 3500 m$^2$. Among these vehicles are new cars, demonstration models, second-hand cars and vans. In the sports car exhibition, which is a fixed element of the presentation, exhibits of particular significance are displayed: the racing car of the legendary Rudolf Caracciola is on show here.

### Emotionalise the object of desire

The starting point for planning the architecture and the lighting system in the showroom and administration areas was a convincing stage production of the “car”. The fundamental idea was not only to exhibit the goods but also to make their application emotionally charging. The exhibition was thus designed with an emphasis on experience; the lighting defines active and passive zones and induces

an emotional experience using accentuated lighting from spotlights and headlights.

### Lighting control with ABB i-bus® EIB

The lighting in the Dresden Mercedes-Benz dealership performs various tasks. Apart from the obligatory base lighting - each area receiving a functional and customised illumination from the stairwell to the office workspace – additional special effects must be implemented which require a sophisticated control system. Owing to the changing requirements, the highest degree of flexibility is a must.

### Bus technology is behind it

The control of the luminaires is carried out dependent on external light and operational requirements. As the lighting is switched locally via conventional push buttons or using push buttons on panel units, these are connected to the EIB via binary inputs or push button interfaces. LEDs are integrated into the panel push buttons, which give a status signal each time with the switching operation. When a certain brightness value is reached, a light value switch ensures that part of the lighting is automatically switched off.

The lighting circuits are generally switched via corresponding binary outputs. The higher-level functions: time control, light value control and direct timed switching are implemented via the application controller AKS/1.1.

# Experience a hotel atmosphere

## Combining the new with the historical

### 5 star quality

With the opening of the Friedewald “Prince von Hessen” hotel, a luxury hotel complex, beyond even a 5 star rating, was established. The hotel is integrated into a castle, part of which dates back to the 15th century. The combination of a redevelopment project and a new building project presented a complex task, where a solution was found using the intelligent installation system.

### Diverse usage

When considering the plans for usage, this project clearly presented a great challenge to building installation technology. Apart from its function as a hotel with 47 luxury rooms, a large part of the complex was intended for public use in order to create a lively atmosphere in the courtyard. The hotel area is divided into 29 single or double rooms and 18 suites. In the old building there are mainly conference rooms on the ground floor and a banqueting hall with 200 seats and a 280 $m^2$ stage on the first floor.

On the ground floor of the new building, on 350 $m^2$ of usable floor space, there is the gourmet restaurant “Prinzenstube”, a café with a terrace on the castle square, another restaurant and a bar.
A health suite with sauna and swimming pool was built in the basement of the new building, covering an area of 550 $m^2$.

# Creating an atmosphere

### Technology to be experienced

The main emphasis of the installed ABB i-bus® EIB building system was the control of light scenes in the 5 star hotel. Thus with an installed capacity of 34 kW, eight different light scenes are available in the banqueting hall and three in the conference rooms and restaurants.

Using EIB, all the lighting in the corridors and stairwells is controlled via motion detectors.

Apart from all the exterior lighting, a fountain and waterfall are also controlled via the bus system.

Another interesting EIB application in Friedewald is that in the event of a fire, all the sockets in the rooms and suites can be switched off centrally via the bus. The main reason for this is the countless number of TV sets in the hotel which can represent a real fire hazard. Alarm signals are displayed both optically and acoustically.

### Possible extension of the system

It is possible to extend the installed ABB i-bus® EIB system after practical experience with the system has been gained once the hotel has opened.

In any case, the next project will be the installation of a remote control system from a central control station in nearby Rothenburg.

# Renovation of a building in several stages

## Step-by-step restoration and modernisation

The imposing administration building of the Meiningen Kreissparkasse savings bank was built in 1897 by what was the Deutschen Hypothekenbank. The banking hall, administration office as well as social facilities extend over a total surface area of approx. 9000 m$^2$ with 4 floors. The step-by-step modernisation and restoration of the entire complex began with the extension and conversion of the ground floor and the second floor. The next step was the renovation of the third floor with another storey being built onto the building as a glazed attic storey. The final step was the redesigning of the banking hall on the first floor.

### Modernisation of the electrotechnical devices

Apart from the general renovation work, a modernisation of the electrotechnical devices was carried out with the installation of the ABB i-bus® EIB from ABB STOTZ-KONTAKT. The installation had to take place during the course of normal business without this being disrupted more than was absolutely necessary. With the help of the Intelligent Installation System, the following functions were implemented:

- Lighting

The lighting control is carried out dependent on time and external light and can also be switched centrally in groups as well as manually.

- Blinds

The blinds are in keeping with the historical façade of the building. They are controlled dependent on sunlight, wind and rain.

■ Monitoring of the building installation system:
The associated components are installed centrally in the distribution board. Faults in the electrical installation from the telephone to the PC network are reported on a central display panel unit. In addition, if residual-current-operated circuit breakers or overvoltage protection devices are triggered, this is reported, thus enabling a quick reaction.

■ Fault signals:
Fault signals from the air conditioning system (heating, cooling ceiling, fans) are also displayed on the central panel unit. The existing automated fire alarm system was coupled to the ABB i-bus® EIB system for display purposes. Apart from the central display unit, a range of decentralised panel units were connected to the bus line on the individual floors, so that the security personnel can read off the actual status of the installation at any time during their rounds.

### Flexibility of the highest benefit

When the decision was made to use the ABB i-bus® EIB, a decisive factor was the great flexibility of the system with regard to later extensions. The laying of a single control cable proved to be of particular benefit here in the modernisation of an older building. As a result it was simpler and more cost-effective than installing the multitude of control cables that are required for a conventional system. The fire risk was also considerably reduced.

### Options for a further extension

The connection of a maximum demand controller is planned at a later date for implementing load management. Using maximum demand monitoring, it is possible to prevent a preset power value from being exceeded so that during periods of high energy consumption, secondary consumer devices are automatically disconnected. Effective energy savings can thus be achieved in larger properties. The later inclusion of the maximum demand controller in the ABB i-bus® EIB system poses no problems.

Practical example 5

# Flexibility and system stability

## Functionality in connection with both a new and renovated property


### Comprehensive task

During the course of the modernisation work, DEHN & SÖHNE, the renowned specialist in lightning and voltage protection systems, based in Neumarkt/Oberpfalz and themselves a member of the European Installation Bus Association (EIBA), decided on a ABB i-bus® EIB installation system. One of the decisive factors in this decision was the scale of the approximately 25,000 m² superstructure, which had been partly renovated and partly rebuilt. Another was the maximum flexibility and continual availability of the electrical installation. It was necessary to unify the requirements of different areas such as administration, production, stores, despatch and the technical department.

### A question of communication capability

The combination of a new building and renovation work required a system that had to be superior to conventional installations in many aspects. An important point was the capability to communicate with already installed electrical systems, the integration of the existing lightning and overvoltage protection systems into the bus system and the possibility of a gradual extension of the installation. The system should be simple to install and occupy a minimum amount of space.

### Superior installation

The bus installation was matched to the different uses of the building. The adaptable bus technology

was rigorously implemented in the newly built offices. The rooms with a conventional installation were retrofitted at a later date. In order to ease the subsequent modernisation to the installation system, bus cables were laid to begin with in the existing trunking.

In the final extension, there were 39 lines coming out from 5 areas making a total installation of between 1200 and 1500 devices possible. In addition, space was reserved in the distribution boards for future functions.

### Trouble-free operation

The system reliability of the bus installation is the prerequisite for the optimum execution of the production and administration processes at DEHN & SÖHNE.

- As each line has its own power supply, should a line fail, any loss of function is limited to this segment.
- The electricity supply for the lighting in the corridors and emergency lighting is safeguarded should the mains voltage fail. The lines of the uninterruptible power supply (USP), i.e. the emergency power supply or the general standby power are linked directly to the most vital bus devices.
- Individual areas of the installation can be disconnected. It is therefore possible to selectively carry out maintenance work without important control circuits failing.

**Small amount of installation work and a high degree of functionality**

The installed EIB Intelligent Installation System consists of 5 areas, 39 lines and a possible 1200 to 1500 devices in total.

The functions:

- Lighting control dependent on time, demand and external light
- Control of shutters and skylight
- Display of the status of system devices (e.g. status of the lightning arrester)
- Processing of various fault signals and monitoring (e.g. doors, rain detector and anemometer)
- Visualisation of the fault signal at the gatehouse
- Dimming of the lighting controlled by lightscenes
- Communication with higher-level building automation systems
- Communication with existing systems of electrical installations

# Saving energy as a focal point

## Intelligent load management leads to reduction in costs

### Intelligent analysis at the beginning

Werndl Büromöbel AG, a well-known manufacturer of office equipment based in South Germany, is renowned for innovative solutions. Within the framework of intensive analysis regarding the reduction of energy usage, they decided on the ABB i-bus® EIB Intelligent Installation System. On the one hand, this system would enable the implementation of load management which would in turn lower costs. On the other hand the costs for the additional supply of power could be considerably reduced.

### Reduction of energy costs

At the core of the solution was the use of a maximum demand controller from the ABB i-bus® EIB system, to which all the relevant electrical loads can be connected via the easily installed bus cable and thus be monitored and controlled.

### Task and implementation

In the production area for office furniture and the additional administration building, different loads are controlled by means of load management so that the load operation is as uniform as possible. There is therefore a threefold cost reduction: There is a decrease in the monthly maximum consumption. Less power must be allowed for generally and the fee to be paid to the electricity company when there is an increase in power above the agreed maximum is cut considerably. With the use of the programmable installation system with EIB technology, this problem was convincingly resolved.

# The result is minimisation of costs

The control function of the maximum demand controller is comprehensive. Should there be a danger of the present maximum demand being exceeded, even with so-called ”ON/OFF” lockout times, i.e. loads are not allowed to be switched, a total connected load of approx. 230 KW can be integrated into the maximum monitoring system, achieving a reduction in the monthly peak consumption down to 150 KW. This corresponds to a decrease in the "per required kilowatt" fee, which is paid annually to the value of over DM 36,000. Additioned a reduction of DM 13,000 in the consumption costs was achieved. The annual electrical operation costs were therefore reduced by approx. DM 49,000. This can be compared to the cost of installing the EIB Intelligent Installation System which is approx. DM 38,000.

**Implemented benefits and options**

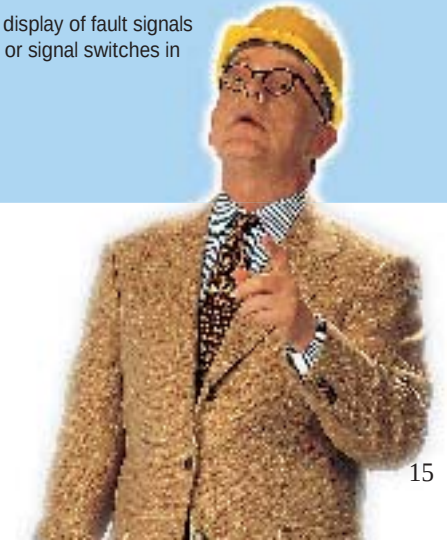
Through integration in the monitoring and control system via the bus, a series of loads no longer need to be switched manually on and off. Activation of the system at the end of the working day as well as during bank holidays and weekends, is carried out via a year time switch program. This includes e.g.:

- Opening and closing of the workshop door
- Preheating of the drying oven as well as the edge-forming machine
- Activation/deactivation of the compressed air system according to working hours and shift times (thus reduction in the operating time of the compressor)

In addition an extension of the electrical functions is possible at any time.

**System options**

- Control of the interior and exterior lighting dependent on demand, time and movement
- Individual room control of the heating system, fans and ventilators dependent on demand and time
- Control or adjustment of shutters according to sunlight, wind, rain and requirements Surveillance monitoring via door/window contacts or movement sensors
- Centralised recording, transmission and display of fault signals and operational states by or via auxiliary or signal switches in combination with binary inputs.



Practical example 7

# Optimum product presentation thanks to a high degree of flexibility

## Making selling an emotional experience

### Displayed in a favourable light

The Praktiker DIY superstore in Düsseldorf offers a wide range of products for the price-conscious shopper, on an area covering 5800 m$^2$. The building was originally constructed in the 60's as a machine room, was modified into a DIY superstore in 1995 and finally after two further changes of usage was taken over by the Praktiker company. Thanks to the proverbial flexibility of the bus system, the requirements for the electrical installation could be met during all the alteration phases.

### Functionality of the electrical installation

The task was to make the lighting, which is of particular importance for the superstore, meet the requirements and be reliable. Furthermore it should be possible to position the lights as required, so that the changing stock could be presented at its best. It should also be possible to operate various electrical functions using a remote display unit which indicates also the corresponding status of the device at any time. This includes, e.g. skylights, fanlights as well as ceiling fan heaters. Monitoring of the doors including the transmission of fault signals also had to be included.

### Solution without ifs and buts

During the installation, a proportion of the consumer devices were connected with a supply via busbar trunking systems (virtually in the form of an "energy bus") and integrated into the communications system via the EIB bus cable. The busbar trunking systems use tap-off units in which the respective central switch actuators as well as the corresponding back-up fuses are integrated.

The lighting control takes place via a key-operated switch for the staff, which is also dependent on time and external light. Fault signals regarding the emergency lighting, fire alarm, alarm, sprinkler and heating/ventilation systems are shown centrally in the manager's office on a operator/display panel and can be documented using a printer.

**Intelligent installation for an emotional selling experience**

The installed Intelligent Installation System consists of two lines with 95 devices in total.

**The functions:**

- Lighting using fixed lighting rails with luminaires tracks fitted with devices with electronic ballast
- External light: lighting control dependent on time and demand
- Remote switching: lighting, ventilation, domed lamps
- Fault signals: emergency lighting, fire alarm, alarm, sprinkler and heating/ventilation systems
- Monitoring of doors; emergency exits, revolving doors

# Energy concept for efficient use of power

## Energy-saving potential using controlled operation



### Tracking down the reasons for costs

The owners of the Hasselberg West motorway services situated to the south of Kassel could read it in black and white: electrical energy is a cost factor that should not be underestimated; especially in the hotel and restaurant business. The annual bill of 1994 was clear: 63% of the costs for energy and water was allotted to the energy consumption.

### Initial analysis

The operations building of the Hasselberg West motorway services is a flat roofed building, built in a typical 70's style. The floor area is approx. 1000 $m^2$ with the whole usable floor space of approx. 1430 $m^2$ being divided into the following zones: catering area with kitchen, laundry, offices and kiosk, cold store and storerooms, technical and sanitation facilities.

45 hot meals an hour can be prepared in the kitchen. There is a multitude of kitchen appliances available for this purpose, which are mainly electrically operated. As the established connected loads indicated, over 80% of the device loads installed in the building are located here.

The lighting systems also revealed a high level of potential for saving energy. The lighting system, with an installed load of 14.2 kW, was overrated in some areas. It was established that by optimising the system, the energy requirement in a single case could be reduced by up to 40%.

### Convincing results using the ABB i-bus® EIB

At the core of the solution was the use of a maximum demand controller from the ABB i-bus EIB system, to which all the relevant electrical loads can be connected via the easily installed bus cable and can thus be monitored and controlled.

The maximum demand controller with 14 shutdown levels consisting of an optimisation computer with trend calculation, guarantees that the preset power setpoint value is precisely maintained. The installation in the manager's office guarantees that the user is kept informed about the exact status of the installation at all times.

### Rapid amortisation through energy savings

The maximum capacity in the uncontrolled system before the installation of the ABB i-bus® EIB was 181 kW, allowing a decrease in the peak power limit to 150 kW. At the second stage, the power capacity was reduced to 135 kW. At the third stage a drop in the peak load to 130 kW is planned without the daily running of the restaurant being disrupted. In total an annual reduction in the electricity costs of approx. 10% – which corresponds to DM 7999.00 – has been achieved.

This can be compared to the cost for the installation of the EIB Intelligent Installation System at DM 20,500. An amortisation of the investment costs is thus guaranteed in a period of 2.5 years.

# Modification and extendability on demand

## Integration of new processes and technologies possible at any time

Maximum demand controller

### Already almost a natural step

The Intelligent Installation System, a uniform EIB standard throughout Europe, proves its superiority daily compared to conventional electrical installations. In certain sectors, such as the equipping of rehabilitation clinics with electrotechnical devices, EIB solutions are already almost a natural choice.

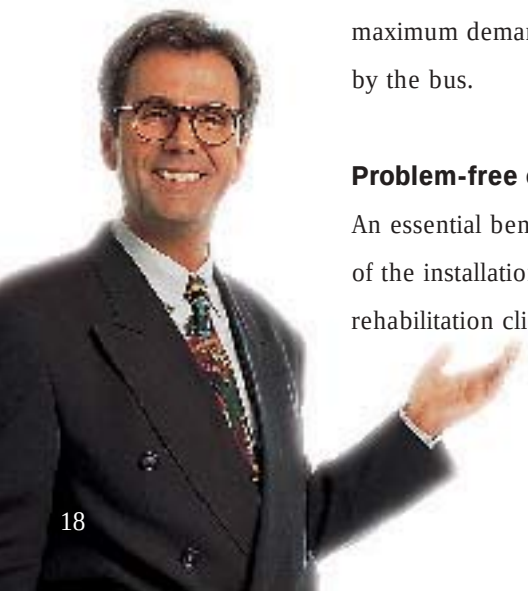
Over 25 premises have already been opened – many of these have programmable electrical installations with bus technology. This technology has been used for example in a new rehabilitation clinic in Plau/Mecklenburg-Vorpommern. In particular the functions of lighting control, fault reporting and maximum demand monitoring are brought together by the bus.

### Problem-free operation

An essential benefit is the straightforward handling of the installation system in daily operation. In rehabilitation clinics, employees are generally responsible for a variety of different activities in different areas of the building and implementing them as smoothly as possible. For this reason, it was fundamentally important when designing the bus technology, to optimise the user-friendly aspect of the system. The fact that visualisation of the operational states is possible is an outstanding benefit.

### Saving costs in daily operation

The cost benefits are especially important in rehabilitation facilities, where these savings are mainly achieved by the effective use of energy by means of the ABB i-bus® EIB installation system. Apart from lighting control dependent on external light, maximum demand monitoring in particular makes an important contribution. Through the controlled switching back or off. e.g. of rows of fans or large current-consuming devices in the kitchen area, it is possible to guarantee that the peak values agreed with the respective power supply company, are not exceeded.



# Electrical installation for an airport terminal

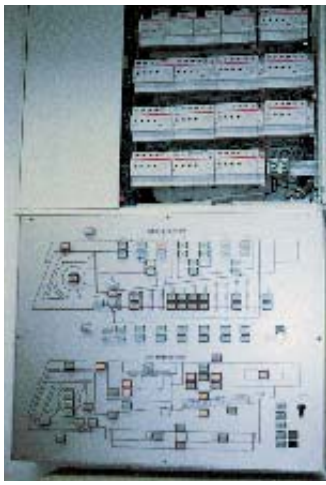
## Ready for take-off



### Growth incorporated

The Münster/Osnabrück airport was opened in 1972. Since then it has developed from a small regional airport to an international, commercial airport. The number of passengers has more than doubled in the last four years. A new terminal for checking in passengers has now been completed and is a further step in recognising the increased attractiveness of the airport. The electrotechnical building installation from ABB guarantees the operation of the system.

The terminal's ticket hall



Subdistribution with a panel unit for controlling the lighting and control circuits with the ABB i-bus® EIB

### A total concept required

Almost at the same time, a new radar tower was built next to the terminal with an adjoining operations building. This building houses the separate power supply for the air traffic control systems and the complete energy control centre for supplying the new terminal.

### Versatility in demand

The ABB i-bus® EIB building installation system takes over the control of the smoke detection/ heating/ventilation systems and the motor-driven side windows as well as the control of the lighting systems in the departures lounge, the kitchen and restaurant area and the conference rooms. Altogether 22 control panel units were installed.

# User-orientated electrical installation in a new school building

## Central functional control and optimisation of energy consumption

The new Wechmar/Günthersleben primary and secondary school in the district of Gotha, was established as a two-stage primary school and a three-stage secondary school for the catchment area of 13 local authorities. The building has been designed with two storeys and surrounds an inner courtyard covered in greenery which blends in harmoniously with the rural development.

### A convincing concept

While planning the “model school”, great value was placed on making the system as user-orientated as possible. A lift also enables disabled pupils to reach the classrooms and sports hall without any problems. Colour indicators are used for orientation in the relatively large building. In order to guarantee a high level of noise control, only corridors are allocated to the side of the building which overlooks the road.

The fault signals are displayed via visualisation software on a PC

The electrotechnical equipment should of course also fit in with this total concept. The main requirements were the latest version of the technology, the highest possible level of convenience for teachers and pupils as well as a highly energy-efficient operation.

The control of shutters, fanlights and toilet windows is carried out via the bus

### Learning in the correct light

The installed ABB i-bus® EIB system is convincing due to its versatility and the possibility of extending the system at any time.

The lighting control in the classrooms of the Wechmar/Günthersleben primary and secondary school can be carried out centrally and manually on-site, as there is a push button interface in each classroom. The lighting is also operated as brightness- and time-dependent. In the corridors, the lighting control is only time-dependent and the lights can be dimmed in the multipurpose rooms. In the adjoining rooms such as washrooms and changing rooms, the control is implemented via motion detectors as well as centrally with timer programs.

**User-orientated functional versatility**

The installed EIB Intelligent Installation System consists of 7 lines altogether with 350 devices.

The functions:

- Central lighting control with visualisation in the whole school area as well as in the sports hall
- Control of the shutters, fanlights and toilet windows
- Central display of fault signals (including notification of the caretaker via “Cityruf”)

The lighting control in the classrooms can be carried out centrally and manually on-site. The lighting is also operated as brightness- and time-dependent

The basketball hoops hover from the ceiling as if moved by a ghostly hand

### Control of the windows included

The toilet windows which are opened and closed at certain times are also included in the complete control of the windows. Therefore, on the one hand the heating costs are reduced in the winter and on the other hand, optimum ventilation is achieved. The side windows in the gymnasium are controlled dependent on wind. If the wind strength rises above wind force 5, the windows are closed automatically.

Apart from the lighting, further functions in the gym such as opening/closing the dividing curtain and lowering the ropes are controlled via the EIB

A decentralised operation panel allows the control and displays the functions.

### Sporting activities

Apart from the lighting, further functions in the gym such as opening/closing the dividing curtain and lowering the ropes, are controlled via the EIB. A decentralised control panel enables the functions to be triggered. There is also a futuristic quality: the basketball hoops are lowered in the gym as if by a ghostly hand!

### Security due to a central monitoring system

Using the visualisation software WinSwitch, which has 10 pictures of the installation available, the following types of fault signals are displayed on a PC:

- fire alarm system
- intruder alarm system
- lift
- heating/ventilation
- frost protection of the pipes in the attic

When there is a fault, the caretaker is notified automatically via the “Cityruf” system.

# Flexibility for multifunctional building usage

## Operational reliability, ease of operation and optimisation of running costs are the focal points

### Versatile utilisation options and further development

When building of the Weserbergland-Zentrum as an administration and conference centre began, the town of Hameln took a forward-looking step. Using a flexible and functional room layout, trade fairs, exhibitions, dances, concerts, theatre productions and political functions can take place on an area of approx. 2900 $m^2$. The wide range of possibilities for dividing the hall and the adjoining rooms mean optimum use can be made of the area for conventions, conferences, training courses and seminars.

### Different room configurations

The technical and internal architecture of the hall and foyer areas has been designed for multifunctional use. The implementation of flexible partition elements produces up to 20 different usable room configurations. The installed ABB i-bus® EIB installation system corresponds in its flexibility to the versatile utilisation options offered by the building's architecture.

### From subtle control functions to complete control

The entire installation implemented via the ABB i-bus® EIB, consists of 6 lines with a total of 251 devices. 49 controllable circuits were installed in the hall and foyers for general and special lighting. They are assembled in various switching groups and apart from the usual switch and dimming functions, they are also controlled by higher-level functions. All the switching operations can be carried out via interlocking switches or miniature panel units and in addition via infrared remote control. Scenery lighting and stage lighting control is implemented via 74 circuits in total, of which 54 are controllable and 18 are direct transfers. Via a specially developed switching operation, the controllable circuits for the hall in the EIB installation can be transferred to the computer-aided lighting control system and from where they can be used without restrictions for theatre work. A parallel, manual control for rehearsals, school and club activities ensures that it is operator-controllable – even without qualified staff.

### Complete overview of the control room

The accumulated data that is dependent on wind, sun, rain, brightness, darkness and time as well as the operational states, switching operations and fault signals are collected via the bus and processed according to the programming throughout the building. A proportion of these messages is made visible on the ground plan panelboard in the entrance hall. The most important area for installation control is the control room. Here all the technical functions of the building meet. All the information can be scanned and co-ordinated on a stand-alone PC.

# Reliability and versatility at the forefront

## Integrated: automatic alarm and door control



### Safety as a special standard

Fire brigades are included among those communal projects where particular standards apply. It is however in this case a question of promptly fulfilling duties on which people's lives often depend.

At the same time the government today is much more concerned with saving money than a few years ago. The ABB i-bus® EIB installation system has been implemented when building new fire stations for many reasons: this form of electrical installation is based on a Europe-wide uniform EIB standard, it has a high degree of flexibility, is completely reliable and also very convincing due to its price competitiveness and energy-saving possibilities.

### Functional variety and central monitoring

The ABB i-bus® EIB installation system installed in the Ober-Roden fire station is used for a variety of functions:

- for lighting control
- for shutter control
- for controlling the heating and air conditioning systems
- for door control
- for transmission of fault signals and other signals

The EIB system is put together from 5 lines for the following areas:

cellar/ground floor/workshop/first floor/ vehicle bay/control centre with display panel. Convinced by the reliability of the installation technology, the automatic alarm system as well as the door control system were integrated into the complete installation.

# Integrating the latest technology into the historical

## Superior technology means that even the unexpected can be dealt with

### Rebuilding and extension

For 200 years the magnificent, bell-shaped dome of the Frauenkirche, both graceful and monumental, stood above the roofs of the old part of Dresden. On 15th February 1945, two days after the devastating bomb attack on Dresden, the gutted stone dome collapsed. The Dresden Frauenkirche is now being rebuilt in its original form and style using original materials made out of sandstone from the Elbe. The construction, which is true to the original, will cost 250 million DM and take more than 10 years to complete.

### Various planning stages

The rebuilding is not only being used to recreate the old state. An extension of the church is planned as well as additional buildings in the basement for cultural functions such as concerts.

Some unusual steps were necessary for the protection and planning of the complete building project.

- Establishment of the exact historical geometry and design of the structure by evaluating the existing drawings and photographs as well as measurement of the ruined sections and artefacts using computer-aided processing.

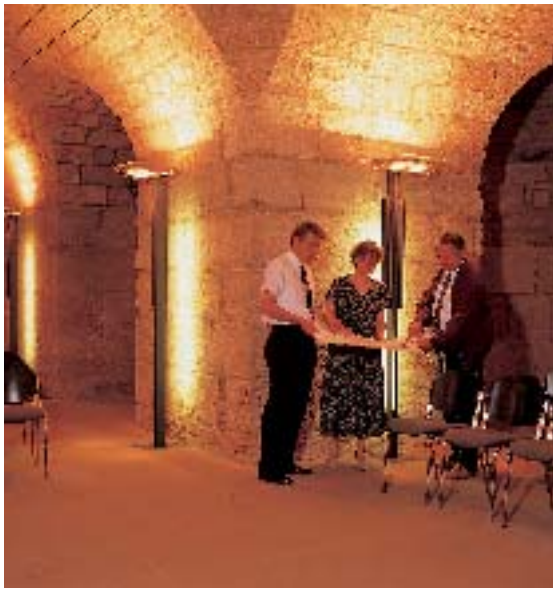
- Detailed planning of the whole sandstone design with the fitting of processed historical pieces of sandstone.
- Determination of the changes needed for future use, which arise due to the changed, extended requirements and applicable safety specifications.

### Complex electrical planning

Different planning phases, which were divided up into individual steps and represent a period until the year 2003, document the size and task of the project. Using the latest technology, attention to historical detail is maintained and at the same time justice is done to the present requirements of convenience and safety.

The base of the church in the historical cellar vaults was completed in August 1996. Arranged in the shape of a horseshoe around the vaulted cellar roof, the function rooms such as a public anteroom and cloakroom, dressing rooms for artistes including rest rooms, technical departments for building installation, heating etc. are located here. The task of the ABB i-bus® EIB installation system is to create a link between the electrical engineering in the new part with that of the vault – with a conventional lighting system and special lamps. The main power supply is carried out via two ABB transformer substations, one of them for normal operation and one for standby and peak load supplies. A diesel generator unit (100 kVA) guarantees the three-phase power supply.

# Flexibility for all eventualities



A burglar and fire alarm system also had to be installed as well as a smoke alarm and heat extractor. Inlet points needed to be taken into account for the telephone as well as for TV and audio transmissions via plug-and-socket outlets in the vaulted cellar roof with direct access from a microphone. A pump unit serves in an emergency if Dresden does its second name of “Florence on the Elbe” credit.

### Intelligent control

The implemented ABB i-bus® EIB installation system intends for the lighting control to be carried out in two steps:

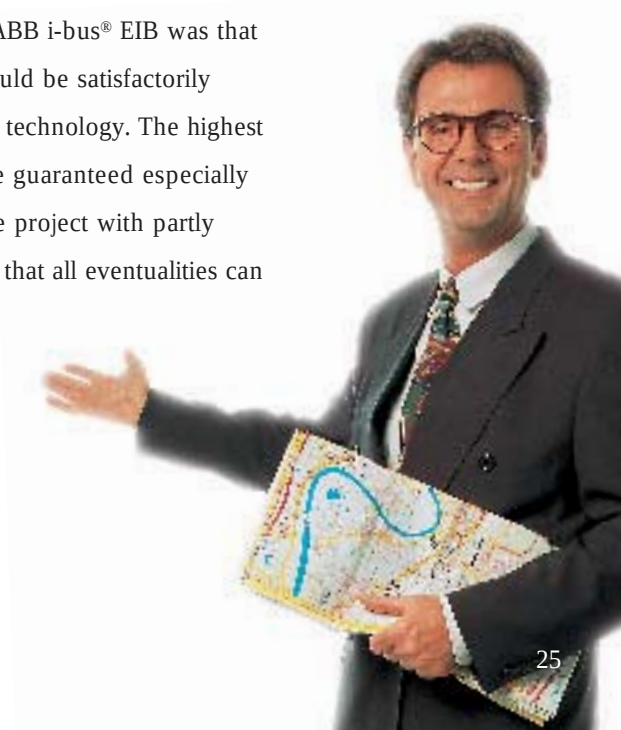
- minimum lighting (orientation lighting, lighting for the cleaners)
- normal lighting

The interfacing of lighting control switching states for special lamps in the historical cellar vaults was carried out via EIB binary inputs/outputs: four inputs, four outputs.

The implementation of a central panel unit for the operation and visualisation of the system and instantaneous functional states is planned in later building stages.

An existing fire escape is monitored via the bus. By monitoring the door, it is guaranteed that it can be used at any time but at the same time any unwanted access is prevented.

The uniform opinion of the planning experts regarding the use of the ABB i-bus® EIB was that all the functional tasks could be satisfactorily resolved using this system technology. The highest level of flexibility must be guaranteed especially in the face of such a huge project with partly unforeseeable changes so that all eventualities can be taken into account.



# Extension of an existing residential building making it a considerably more attractive place to live in

## Modern conveniences and security

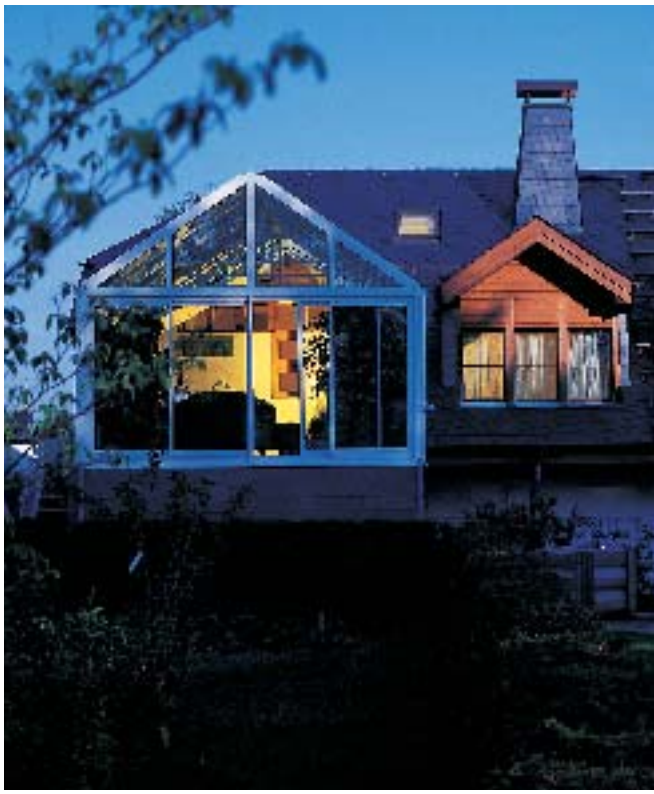
At the touch of a button, produce light moods or with comparatively little effort monitor doors, windows and fanlights: These are arguments which correspond exactly to the desire for a high level of comfort and additional security.

### A demanding task

Within the framework of a comprehensive extension, the client Mr. Werner Kaps in Sulms-Oberbiel near Wetzlar converted his existing home built in the 60's into a property with an extremely high residential value. Werner Kaps wanted to integrate the idyllic location of the property with a spacious garden right on the edge of the woods. He was primarily concerned when extending or rather building another storey onto the house while achieving the highest standard of comfort and security possible as well as an effective use of energy.

### A property that is attractive to live in

The structural requirements also corresponded to demands beinging placed on the building installation – above all on the electrical installation. The wishes of the client would only have been possible using conventional technology with a considerable amount of effort, particularly for laying the cables. The result: the building concept would have experienced considerable cutbacks, particularly in light of the interior architectural effect.



**Little installation work required but a high level of convenience**

The installed Intelligent Installation System consists of three lines and a total of 114 devices.

The functions:

- Control and dimming of the lighting in all the rooms
- Heating control in individual rooms
- Control of the shutters (including automatic control via wind sensors)
- Control of the skylights (including automatic control via rain sensors)
- Control of the external lighting which is also designed as a complete security lighting system
- Control of the alarm system in all the living quarters via motion detectors

In addition there is a central alarm switch in the bedroom. All the functions can be switched in the lounge and and bedrooms by means of infrared technology.

### Relieving the strain on the environment

Conserving power is of primary importance when saving energy.

As the heating control is specific to each individual room, it is applied where the energy consumption in the house and flat is at its highest: in warming the room. The advantages of individual room control can be fully utilised using EIB technology – up to external operation via remote control units and for the transmission of fault signals.

### Unlimited creative freedom

The possibility of carrying out straightforward conversions and retrofits of the building installation, which is of primary importance in the commercial sector, also has its benefits in residential buildings.

Frequently the room usage is changed, the lighting is renewed or amended and an increasing number of additional electrical consumer devices are acquired. Changes or extensions to the electrical installation can be implemented with the ABB i-bus® EIB without any problem. Moreover: the possibility of connecting household appliances with bus capability is only a question of time.

# Varied functions for personal use, convincing technology for presentation to the customer

## Two different tasks linked together

### Working and living with a high level of functionality

Heinz Georg Holl uses a 1330 sqm property in an industrial estate in Bobenheim near Ludwigshafen both as a place of work for his business and as a home for his family. The company, Holl Elektro-Technik GmbH takes up around 320 sqm of the commercial building. It consists of two offices, a storeroom and workshop as well as staff and social facilities.

In the direct vicinity – and linked via bus technology – is the two-storey residential building with an attic conversion and a cellar. In addition to the living space of approx. 250 sqm, there is a self-contained flat occupying approx. 60 sqm in the basement.

### Increased security and convenience

In the residential part of the building, the main aims were to show the stylish and tasteful interior décor in a favourable light, to make it possible to use the electrical functions in comfort and at the same time to guarantee an increased standard of security.

**Greater convenience and functional variety**

The EIB Intelligent Installation System installed at Heinz Georg Holl's property is used for the following functions:

**In the office building**

- Central switching of lighting, blinds and fanlights
- Daylight-dependent control of continuous rows of luminaires in the workshop
- Control of lighting and blinds in groups for demonstration purposes
- Constant light control planned

**In the residential building**

- Control and dimming of lighting in all the rooms/choice of various lightscenes
- Switching of lamps as required via motion detectors
- Control of blinds (opening/closing dependent on time and external light)
- Panic switching of all the interior and exterior lighting
- Temperature control in individual rooms
- Central visualisation of technical faults
- Connection to the intruder detection control centre
- Control of the garden irrigation system

As a qualified electrician and being enthusiastic about innovation, Heinz Georg Holl planned from the beginning to fulfil two different tasks at the same time. One is that various electrical functions are implemented for the safe, convenient and energy-saving use of power in the home and the workplace.

### Creating comfort and making electrotechnology conceivable

Customers should also be able to experience electrotechnology. With this objective in mind, Heinz Georg Holl decided on an installation with the ABB i-bus® EIB installation system. He used the compatibility with other EIB system components as well as the interface with an ABB alarm system. Its signals were used in order to trigger additional electrical functions via the EIB.

The blinds open and close dependent on time and external light

Increased security due to the burglar alarm system being connected to EIB technology

### Connection of the burglar alarm system to the EIB

In the event of an alarm at the ABB intruder detection centre, all the shutters close immediately. Thanks to EIB technology, pre-programmed lighting operations are activated simultaneously. This applies both to the interior – dependent on external light – and the exterior. The patio door blind is automatically closed with each external activation of the alarm system when leaving the house and opened when it is deactivated when returning during the day.

The alarm signal is carried out in addition to a corresponding bus system component via a telephone to a defined external site. Using the same interface, the householder can also scan various switching states in the electrical installation from outside. All the central functions in the business premises can be operated from the home.

## Water for the garden

A particular gimmick of this inventive electrician is that, thanks to EIB, he can control the solenoid valves in the cellar used for watering the garden from the tap in the basement. The level of the rainwater tank will also be made visible via the EIB. It can be immediately detected whether there is sufficient rainwater available without the need for expensive tapwater.

## Nocturnal wandering in comfort

The fact that Heinz Georg Holl is able to consider the needs of his guests and that he is able to support his ideas actively using modern bus technology, can be seen in the automatic light control system in the attic for occasions when guests visit the toilet during the night. A special push button in the guest room automatically produces the following switching operations:

- The wall lights in the guest room are switched on with dimmed brightness (20%) for orientation
- There is lighting in the passageway in the adjacent studio with 40% brightness
- Dazzle-free, sequenced lighting is activated on the staircase. The lighting in the hallway at the bottom of the stairs is also switched on at half its usual brightness by means of motion detectors
- The light above the mirror in the guest bathroom is switched on

Another push button action causes the lighting to be switched off automatically once the person has returned to the guest room.

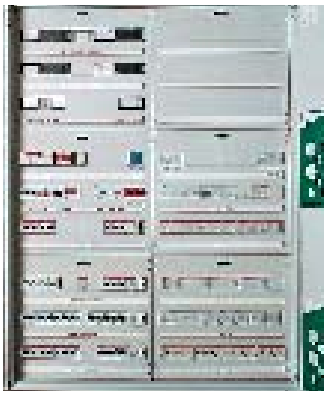
When the sky lights are opened, the fan heaters are automatically switched off during warm periods

## Saving energy and creating clarity

In the office premises, a central circuit is implemented for the convenient control of lighting, shutters and fanlights. The continuous rows of luminaires in the workshop are controlled by a light value switch that is dependent on daylight. The EIB system has also an energy saving effect as when the skylights are opened during warm periods, the fan heaters are automatically switched off. The switching states of the ABB burglar alarm system as well as the central switching function of the office building are transferred to the residential building and the necessary clarity is therefore achieved. Group controls of lighting and blinds are programmed for demonstration to the customer.

A bus-controlled constant light control system via dimmable devices with electronic ballast is planned for the offices.

Daylight-dependent control of the rows of luminaires in the workshop



Control cabinet with conventional and EIB devices

## Endless possibilities

Thanks to the innovative enthusiasm of the householder and the technical flexibility of the ABB i-bus® Intelligent Installation System, ideas for applications and extension possibilities are “almost” inexhaustible, a further step could soon be made. Currently Heinz Georg Holl is already considering an EIB-supported building visualisation using a PC which would make the switching states visible and influenced directly by clicking the mouse.

# EIB Intelligent Installation System from ABB

## ABB Powernet EIB
## and ABB i-bus® EIB

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