VISONIK®
The flexible building management system
System description
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... is innovation through evolution – and has been for over 20 years. 

VISONIK is Landis & Staefa’s building automation and control system for sophisticated tasks in individual buildings and distributed building complexes.

Innovation through evolution

VISONIK can be deployed as an independent building automation and control system or integrated into the new DESIGO™ system generation of Landis & Staefa. The extensive system topologies offered by VISONIK allow it to be tailored for individual building requirements. With the latest advanced developments, VISONIK guarantees the long-term protection of customer investments.

Possible VISONIK system topologies with SDLC automation bus (left) and LAN (right)

The system topologies are based on the VISONIK DCS server and the BPS process stations (PRV2), NetBPS, PRV1, EKL-X with I/O modules and the TEC and DESIGO RX individual room controllers. This document provides a description of the VISONIK automation system.
Comprehensive functionality

Uniform, cross-system operation
Automation with VISONIK covers a multitude of building services disciplines in a uniform system over multiple field installations.

In addition to heating, ventilation, air-conditioning, refrigeration and electrical installations, special-purpose systems such as fire and intrusion alarms, access control and CCTV can be integrated.

Uniform operation assists the building operator in running the building at a high level of comfort and low operating costs.

Long-term expandability
The VISONIK automation system is characterised by a high degree of compatibility. It supports the integration of components from different generations. This compatibility is particularly applicable in the case of process stations, because all generations from EKL-X, through PRV1 and BPS (PRV2) to the new NetBPS can be present in the same system.

The Ethernet-compatible VISONIK servers and the NetBPS process stations constitute genuine innovations.

Validation and certification
VISONIK has been tested in accordance with EU-GAMP (Good Automatic Manufacturing Practice) and is also suitable for use in the pharmaceuticals industry (FDA, Food and Drug Administration)

Distributed intelligence
System intelligence is distributed in VISONIK. This guarantees high availability of the building services systems in case of communication failure, because all system levels continue to operate autonomously. Process execution is then supervised at the automation level or by the field-level devices. Manual I/O module operation provides a reliable means of intervention into system operation at all times.

Management level
This system level provides high-level process management and is based on graphic process visualisation and powerful programs on the INSIGHT management stations. Data is exchanged between the DCS and management stations via LAN (Local Area Network, Ethernet TCP/IP), RS232 or modem.

Automation level
At the automation level, incoming process values are converted to outgoing process commands by the control and optimisation functions in the DCS and process stations. Data communication at the automation level takes place via SDLC (Synchronous Data Link Control) or via LAN (Ethernet), RS232 or modem.

Field level
At the field level, sensors acquire the process values, and actuators influence the process. The input/output modules and the individual room control equipment are also located at this level. Data from the field level is transmitted to the automation level via bus connections (process bus, FLN and LON/LONMARK for DESIGO RX).
DCS Data and Communication Server

Task oriented
The DCS is installed at the automation level. Its client/server architecture supports the system environment with numerous simultaneous services (multitasking). All tasks are processed in real time.

The major tasks include:

- Acquisition, processing and storage of process data from the field level which is then made available to the management level
- Monitoring of the process data flow and communication lines
- Execution of high-level system functions, such as maximum demand or mains recovery programs
- Routing of alarms and fault messages to destinations such as printers, fax machines or mobile phone services

Event oriented
System and process data is acquired, processed and communicated on an event-driven basis according to the COV (Change Of Value) principle, which means that process values are only communicated within the system if an actual change (event) occurs. This ensures that there is no unnecessary burden on communication lines, so that high performance is achieved even in large-scale systems.

Co-ordination of communication

Powerful co-ordinator
The DCS is a powerful system co-ordinator which monitors the communication lines:

- to the management level, i.e. to the INSIGHT management stations
- within the automation level to the process stations and operation and display devices and, in the case of link systems, to other DCS units
- to remote DCS systems or phone segments with modem connection

The management level can be equipped with the INSIGHT management stations of DESIGO or VISONIK. In each case, the DCS provides the link between the automation and management levels.

Communication via Ethernet
Where an Ethernet network is already present, the existing network infrastructure can be shared for transmission of VISONIK data.

Remote management
Remote management combines multiple buildings via DCS to regional or national systems. Switched lines (analogue, ISDN) or dedicated lines are used for communication. The INSIGHT management stations provide full monitoring, operation and optimisation capability.
VISONIK system description

Data points and parameters

In general terms, data points are used as information carriers for process data in building control.

The basic input functions (signalling, measuring and counting) and output functions (positioning and switching) are mapped to the following data point types:

- **DI** Digital Input Signalling
- **AI** Analogue Input Measuring
- **CI** Counter Input Counting
- **AO** Analogue Output Positioning
- **DO** Digital Output Switching (single stage and multistage)

The VISONIK data points are highly optimised for specific applications via their parameters. Parameters characterise the various properties of the data points, because they contain comprehensive, integrated functions, e.g. for limit monitoring, runtime totals and alarm handling or a definable operating mode for event processing.

Online operation

The VISONIK point/parameter model gives the user access to complex functions which are activated via "parameterisation". This simplifies handling, gives a better overview and provides the necessary versatility for efficient operation. The parameter settings are made online.

Integrated parameter functions

- Fixed or variable limit monitoring with two limit value pairs
- Runtime totals for each switching stage, with message to maintenance
- Event counting, counting of point status changes (switching frequency)
- Feedback monitoring
- Message priority
- Message suppression
- Message delays
- Error messages
- Warning messages
- Alarm management and selection of alarm and fault signalling devices
- Recording of main value changes according to cause and time
- Control of operating mode and event priority

The following examples demonstrate the functioning of point-specific parameters:

- **Limit monitoring**
  Measured values and counter values are monitored to fixed or variable limits (two limit value pairs are provided). Out-of-limits conditions are communicated as fault messages.

- **Runtime totals**
  Each switching command point can be parameterised for runtime acquisition, e.g. the times at OFF and at stages 1 through 3 are accumulated for a three-stage switching command.

- **Alarm management**
  Every data point can be included in alarm management. Important properties such as limit value, alarm priority, alarm text and output device are configured via parameters. In the event of a fault, the timestamp, cause and frequency of the fault are stored in parameters. The same applies to the user ID on acknowledgement. All events are made available for long-term storage.

- **Message delays**
  Message delays are used to prevent unnecessary alarms in case of briefly occurring, transient states. In case of a fault, no alarms are emitted until the delay times have elapsed.
  For DI points, the delay time begins with a change of state, e.g. contact changes from open to closed.
  Messages or process reactions are not initiated until the delay time has elapsed, i.e. when the change of state is stable and unambiguous.
  In the case of DO points, evaluation of the feedback signal can be delayed.

Virtual data points

Virtual data points (i.e. with no direct physical connection to I/O modules) are provided for high-level applications. Their point-specific parameters can be used, for example, for reliable implementation of the following tasks and applications:

- Buffering of calculated values
- P, PI, and PID control functions with setpoint adjustment
- Room management with room groups and zones
- Plant control with start-up monitoring and safety functions, e.g. frost protection
- Self-monitoring and online diagnostics, e.g. of data communication and operator interfaces

Virtual data points are designed for the functionality of specific applications. There is, for example, the virtual data point for the "plant control" application, which is referred to as the "plant point" (see next page).
Application points

Room management
The application points for room management with DESIGO RX or TEC are used for energy optimisation and for communication with the primary control system (plant and controller points). They provide simple, reliable operation, e.g. with setpoints and actual values, operating states and alarm states.

Plant control
The plant point provides control functions in building services systems (see illustration). Its functionality consists in periodically calculating the required plant status based on the pending plant commands originating from the optimum start/stop program, manual control operations etc. The required plant status is determined via bit influences and priorities, and is used in the operating mode table as the basis for commanding the pumps, fans and controllers, i.e. they are set to OFF when the resultant status value is 0 and ON when the resultant value is 1.

Distributed databases
A process value is stored under the corresponding parameter both in the local database of the associated process station and in the central database of the DCS. These distributed databases provide for fast data exchange between adjacent system levels. They increase reliability in case of subsystem failure. The databases are updated interactively (replicated databases).

Database access
Users can access parameter values via an operator terminal on the DCS or on a process station according to their access privileges. Both the central database in the DCS and the local databases in the process stations can be accessed.
System operation

All user inputs are entered online and processed directly by the system. This gives the user full, live access to all application points, data points and their parameters. Operations that have been specially designed for frequent use include the following:

- Data point selection and parameter editing (e.g. manual switching and positioning commands, setpoint adjustment)
- Multiple point operation
- Alarm acknowledgement
- Report generation
- Online creation or modification of scheduler programs

Multi-user operation

Users can operate the system via terminals connected directly to the DCS and via the INSIGHT management stations. Additionally, the system can be operated locally, i.e. via laptops or terminals connected to process stations.

Multiple INSIGHT management stations and terminals can be active simultaneously on a DCS, and operator terminals of different generations can be mixed.

In a link system, the number of management stations increases with every additional DCS.

Access security

Each user has individual password-protected access privileges which cover the following categories:

- Address ranges, e.g. building and plant-oriented ranges
- Defineable read/write access levels to system functions and parameters and for password changes
- Access privilege expiry date

System logon

All logons and logoffs of the various users are logged and saved to the statistics buffer.

User addresses

In addition to the technical address, a freely structured, 26 character user address can be assigned to each data point. The mnemonic user address specifies the data point's location by building and plant, and describes its function.

| BL1 | Block 1 |
| Flr1 | Floor 1 |
| Ven4 | Ventilation system 4 |
| Ala8 | Alarm message 8 |
| Frost | Frost protection thermostat |

Data points can be accessed via user addresses and technical addresses.

Multiple commands

Multiple commands eliminate the need for repetitive inputs, which simplifies operation. Multiple parameters of a freely definable data point set can be selected and edited simultaneously. Logical AND/OR operations can be applied to parameter names and values.

A multiple command in the "fire dampers" address range, for example, can be used to check all dampers with an active switching command input.

User input macros

Frequent inputs or long input sequences (e.g. printing of specific reports) can be programmed as macros and assigned to keyboard function keys. The corresponding action can then be initiated by pressing a single key.

Language changeover

The user language can be changed online on any DCS, e.g. from German to English.

Easy maintenance

Diagnostic programs provide for early detection and correction of technical faults. Maintenance, conversions and extensions can be performed without interrupting plant operation. Plants or plant parts are brought online or taken temporarily offline while improved optimisation programs are being loaded.
Reporting functions

Using individually compiled reports, users can perform diagnostics on the entire system. Address and time ranges as well as parameter names and values can be freely selected. The most important report types are as follows:

• Status report
  shows the current operating states and major parameters of selected points

• Fault report
  lists all points in the plant and system which are in fault and which are neither suppressed nor out of service

• Alarm report
  lists all points under alarm management and selected according to alarm status (acknowledged/unacknowledged, active/inactive) and message priority

• Maintenance report
  lists all due and overdue maintenance entries

• Room management report
  shows the operating states and major parameter values (heating/cooling setpoint, maximum, minimum and mean room temperature) of the individual rooms and room groups

Reports can be started automatically via time and date reactions or via process reactions, e.g. in case of plant faults.

Reaction programs

An automation system must be capable of intervening in the process with predefined reactions to specific events, e.g. when a safety thermostat trips or when a time/date flag is reached.

Events that trigger reactions can occur anywhere in the system. The reactions that are triggered can also have a system-wide effect. One cause may give rise to multiple reactions which in turn can be the cause of further reactions.

**Reaction causes:**
- Process value state changes
- Occurrence of time/date flags, completion of a given number of cycles, or periodic reaction (unlimited, cyclical)
- Expiry of programmed time intervals or switch-on operations which then initiate further reactions (step reactions, e.g. mains recovery)
- Occurrence of a specified runtime or date flag (initiating a maintenance message, for example).
- Occurrence of group events defined by address ranges (initiating pager messages, for example)

When the causes arise, the following reactions are initiated, depending on the requirements of the process or system:

**Reaction types:**
- Intervention in the process by switching and positioning operations
- Intervention in the process in case of fault, e.g. plant is switched to a safe operating state via sequential reactions or COLBAS utilities
- Printing of clear-text messages (alarm messages printed in red)
- Local audible and visual alarming or remote alarming via phone to alarm printer and pager
- Macro execution, e.g. reports

Reaction registers

The reactions that are to be initiated on occurrence of specific causes are entered in reaction registers for process, time, date reactions etc. Given appropriate access privileges, users can enter new reactions or edit existing ones at any time.

Enabling and inhibiting reactions

The initiation of reactions can be controlled according to process, time or priority. Reactions can be enabled or inhibited online by the user or via process, time and date reactions.

Scheduler functions

The DCS time scheduler functions cover public holidays, vacation and occasional special days according to the following criteria:

- Day of week or time and date oriented switching
- Summer/winter changeover (system calculates the annual time change as per EU standard)
- Operating mode switchover:
  - on special days, e.g. local and regional public holidays
  - during vacation and other irregular operating requirements
  - on public holidays with fixed or variable dates (the system calculates variable dates annually)

The local schedulers in the process stations primarily act on plant control processes. They can be supplemented by DCS scheduler functions.
Supplementary programs

Plant suppression
Faults and inadmissible plant states often produce a flood of messages and process reactions. This can make it difficult to identify the message indicating the actual cause of the fault.

With plant suppression, low-priority messages and undesirable reactions of entire plants can be suppressed. Suppression can be permanent or limited to a given time period and initiated by:

- process-dependent reactions in case of specific faults
- scheduled jobs, e.g. periodic shutdown of the plant
- manual inputs when maintenance work is due

Point suppression
Point suppression is used to suppress the messages from a small number of data points. Suppression begins as soon as a suppression time is entered under the appropriate parameter of the data point. It is cancelled when the time elapses or suppression is deactivated.

Fault counting does not include suppressed data points.

Optimum start/stop program
The OSTP program in the DCS is used to optimise room zones that are distributed in various buildings throughout the system. The room temperature is optimised according to:

- occupancy start and end
- indoor and outdoor temperature
- room type and building constants

Lighting control
Lighting groups can be switched on or off based on measured light intensity. The control program takes into account the building occupancy times and it can be used, for example, to switch on lighting for office cleaning in the evening.

Security guard monitoring
This program monitors the rounds of security staff according to times and locations. The system records if the night security guard checked in at the checkpoints (same principle as the watchman’s round).

Mains recovery program

In case of power failure, the mains recovery program activates the emergency power supply. On recovery of the mains supply, it co-ordinates the switch-on of the process stations and associated loads, i.e. the fans, pumps, chillers etc. are brought back online in sequence.

The activation of the emergency power supply and main power supply is executed according to a schedule with a fixed sequence (step reactions).

During the start-up phase, the maximum demand program can be used for load monitoring. This is necessary if the switch-on of the loads is dependent on the electrical power margin.

If the DCS and/or process stations are affected by the power failure, the date and time are resynchronised system-wide. Programs and scheduler commands not executed during the power failure are automatically executed after power return.

The automatic execution of these commands is independent of the mains recovery program.

![Function of the mains recovery program](image-url)
Maximum demand program

The maximum demand program measures energy consumption in predefined plants and buildings. The pulses emitted by electricity meters within defined integration periods are acquired via counter value modules. The resultant energy consumption is continuously compared with the contractually agreed maximum value Emax. If the program detects that Emax will be exceeded, the "sheddable loads" are shed according to their priorities.

If, in subsequent integration periods, the program detects that loads can be restored without exceeding the agreed energy consumption, appropriate loads are restored according to the reduced energy consumption. Before switching loads, the maximum demand program always considers the priority and minimum ON time and maximum OFF time of each sheddable load.

Data acquisition

Long-term logging of process values with important point information provides for offline verification of the comfort and plant conditions and appropriate optimisation of the process management, for example. Data acquisition is also particularly useful for troubleshooting in case of faults. A continuous record of ambient conditions is often required for validation purposes.

Data integrity

Acquired data is stored in a fault-tolerant environment on the DCS and protected against data loss. The DCS provides the DAP (Data Processing) applications for logging of process and system values and for calculation of minimum, maximum and mean values.

Statistics buffer

Events affecting the system and process are logged in the statistics buffer. Such events are:

- User logon and logoff
- Fault and alarm messages and acknowledgements
- Plant status messages
- Configuration changes by users
- System error messages
- Maintenance messages

The messages can be displayed and reported on various operator terminals.

Value log

Data series of any data points and parameters (measured values, positioning command values) are entered in the value log. The data series are acquired periodically (period 1 minute to 1 day) and stored with time synchronisation; the values are additionally saved as an hourly or daily mean value with minimum and maximum. Depending on the number of data series and storage cycles and on the value resolution, the storage capacity is sufficient for up to several months.
**Data archiving**
The logged events and process values can be easily exported from the DCS database and stored externally. The illustration shows the transfer of data from the VISONIK Data Processing application to the PDM database for evaluation with the supplementary ADP and CC packages.

**Data analysis and evaluation**
The data series can be analysed and evaluated in reports and trend graphics using:
- the graphical trend tool of the INSIGHT management station
- the supplementary packages ADP "Advanced Data Processing" and CC "Consumption Control"
- spreadsheet applications, such as MS Excel
- maintenance management applications

**System security**
Data transmission within the system is based on international standards and high-performance networks.

**Data transmission security:**
- Identification of transmission errors and automatic retransmission in case of errors
- Text messages on the transmitter side if connection is lost or not established
- Routing to alternative numbers (in case of dialup) or alternative devices if connection is engaged or disturbed

**Self-monitoring**
Watchdogs in the DCS monitor the following:
- DCS running correctly / incorrectly
- Data storage OK / defective
- Operator terminals normal / defective
- Communication lines active / inactive / defective
- Process stations responding / not responding

**RAID technology**
RAID technology (Redundant Array of Independent Disks) meets the stringent requirements on server systems with regard to data integrity, capacity and reliability.

DCS types for large-scale systems include RAID technology as standard, and it is optionally available for DCS types for small and medium-sized systems.

**Process and system optimisation**
Given appropriate privileges, users can access optimisation parameters, and continuously improve the processes and system operation.

**Tools**
Landis & Staefa uses efficient engineering tools for the entire project workflow, i.e. for planning, implementation, commissioning and service. The tools are modular, so the appropriate software is available for each task.

**Upload and download (backup)**
Backup copies can be made on the fly to various media, e.g. MO drive (magneto-optical). For added security, the DCS keeps a download-ready copy of all user programs, text catalogues and point and parameter data of the process stations in backup files.
**Graphic application**

VISONIK INSIGHT is the graphic-based management station of the VISONIK product family. The software can be installed both on a standard PC (office PC with Windows NT®) and on a DCS. The user interface has a straightforward graphic layout, providing for intuitive navigation through all system levels.

The graphic application provides for the display of dynamic plant diagrams from the DCS (with updated process values) or local static diagrams from VISONIK INSIGHT. Diagrams are selected by entering a diagram number or user address. If a partial address is entered, the corresponding overview diagram is automatically displayed. Additionally, it is possible to page through the diagram register in numerical order.

A text file, which can contain customer-specific plant descriptions or information in case of alarms, is assigned to each plant diagram.

The following update elements are used in plant diagrams:

- Status bar display of analogue values
- Symbol change: e.g. open switch – closed switch
- Colour change and flashing of a graphic object, symbol, value or text, such as:
  - Fan ON = symbol green and not flashing
  - Fan fault = symbol red and flashing

The VISONIK INSIGHT management station is used for monitoring building installations and provides for optimal operation of building services systems.

**Operation and display functions**

- Display of plant diagrams with updated process values
- Display of reaction diagrams with stored process values
- "On-screen switching", i.e. output of values to control elements or output of other commands directly from the plant diagrams
- Continuous logging of variables with the trend function
- Presentation of data processing graphics and tables
- Display and editing of schedules and special day catalogues
- Updated presentation of alarm messages, clear overview of alarm states, and acknowledgement of pending alarms
- Navigation between different functions with the current address
- Dialog with the Data Communication Server DCS and the process stations
- Display of incoming messages
- Display and operation of process and system data in VISONIK link systems (with dedicated or switched lines)
Trend applications

Online trend
The online trend application is a powerful instrument for continuous logging and presentation of process values. Up to ten current process values can be presented in a trend set, and up to three trend sets can be active simultaneously.

The value representation in the trend windows can be modified.

- **Zoom**: enlargement of an area of interest on the graphic to the full display width
- **Point settings**: modification of channel-specific information such as point address, colour, presentation type (dot, step, line diagram), scale and time span
- **Graphic settings**: modification of trend set presentation information, such as time scale, acquisition period, gridlines

Offline trend
The offline trend application displays the values acquired in the DCS on the basis of the defined data acquisition profiles (point addresses, scan rates, minima, maxima and mean values) as graphics or value tables.

- **Data loading**: graphic profiles from the DCS or stored graphics from the hard disk of the VISONIK INSIGHT management station
- **Graphic settings**: individual presentations with colours, gridlines, axis labels and legends
- **Tabular presentation**: display of data in tabular form
- **Settings for export (e.g. to spreadsheet applications)**: number of decimal places, selection of a separator for use in spreadsheets

Trend application with graphical value progression and presentation of values
Alarm application

The alarm application provides a clear overview of alarm states and simple acknowledgement of all point alarms acquired by the DCS.

Alarm summary

In addition to the major point information (address, state, message priority etc.), the alarm summary (see screenshot below) also contains the following alarm information:

- Time and date of the occurrence and disappearance of the last alarm
- Number of alarms since the last acknowledgement
- Current point/alarm state visualised by the background colour
- Time and date of alarm acknowledgement as well as user ID of the person acknowledging the alarm

Alarm statistics

The alarm statistics provide tabular information on the current number of alarm states, grouped by priorities.

Individual alarms are acknowledged directly in the alarm summary. For acknowledging multiple alarms, a selection can be made by priority and time period.

Messages

The message window contains all incoming messages since the beginning of the current session. The arrival of new messages can also be notified acoustically.

An alarm message can be localised quickly and specifically because users can navigate directly from the message window to the graphic application.

Additional applications

Navigation

Navigation enables users to switch between the various VISONIK INSIGHT applications, taking the currently active address with them as the destination.

Actions from diagrams

Depending on the definition in the DCS, further actions are initiated by clicking on certain objects in the user interface, e.g. jump to a specific follow-on diagram or launch of a DCS macro (e.g. to start a report).

Reaction diagrams

Reaction diagrams, e.g. initiated by process reactions, are displayed immediately in VISONIK INSIGHT (always the reaction diagram that occurs last) and stored. Depending on programming, the diagrams are also printed automatically. All diagrams can also be displayed and printed at a later date, e.g. for process analysis.

Point operation

The parameters of a point are clearly laid out under point operation. Given appropriate access privileges, users can assign new values to changeable parameters on screen.

Calendar

The calendar application is used to edit the special day catalogue in the DCS and distribute it. The main window displays "calendar pages" each with three sequential months.

Scheduler

From VISONIK INSIGHT, new scheduler entries can be created in the process stations and existing ones modified. The entries of the selected station are displayed in an overview window.
Automation devices

Process stations

Automation devices - referred to as process stations in VISONIK - process multiple tasks simultaneously, i.e. in multitasking mode and in real time. The application programs in the process stations can be created efficiently in COLBAS\(^1\) using tools and pre-programmed functions from libraries.

\(^1\) COLBAS, Control Oriented Language for Building Automation Systems (programming language similar to BASIC)

Main BPS functions

- Freely programmable measuring, control and monitoring tasks (DDC)
- Processing of scheduler functions and application programs
- Communication with:
  - Data and Communication Server DCS
  - process and field devices
  - operator terminals and output devices
- Execution of commands entered manually via POP card (Personal Operation Process card) or PC
- Display of process values on the BPS LCD panel

The BPS process station

The BPS process station is suitable for demanding DDC tasks in building automation and control.

NetBPS process station

The NetBPS provides the major functions of the conventional BPS. However, it can additionally communicate via Ethernet, enabling existing building networks to be utilised.

I/O modules

The I/O modules provide a universal link between a process station and the process. The I/O module range includes types for all basic functions (signalling DI, measuring AI, counting CI, switching DO and positioning AO). I/O modules for proprietary components are also available, e.g. for control of smart pumps.

Standard controllers

Process stations of type BPS can be used to integrate AEROGYR RWI standard controllers for ventilation systems via the FLN bus (Floor Level Network).

DDC and communication with BPS and NetBPS
Individual room control systems

DESIGO RX ...
... is the new individual room control system with supplementary devices for lighting and blinds control.

The DESIGO RX devices are integrated into VISONIK via both the NIDES.RX interface and a BPS. The RX product range includes compact and modular controllers as well as room units that can be adapted for specific room functions. Each RX device is loaded with application software containing the control program for the room or area. Room conditions are set via parameters.

DESIGO RX devices use the standardised LonMARK protocol to communicate with each other and with LonMARK-compatible devices of other manufacturers via LON bus.

DESIGO RX is fully integrated into the VISONIK building management system, allowing high-level control functions and co-ordination tasks to be executed.

Document number CA2S3801E provides information on the DESIGO RX individual room control system.

TEC individual room controllers
The TEC (Terminal Equipment Controller) individual room controllers are incorporated into VISONIK via the FLN bus (Floor Level Network), using a BPS as FLN master.

TEC devices are designed as compact controllers with I/O interfaces for individual room management. They include a wide range of individual room control applications.

TEC features include:
- Comprehensive application library with established control solutions for VAV and CAV systems, indoor air quality, chilled and heated ceilings, fan-coils and induction units
- Individual and group communication with the controllers and room devices via BPS
- Software reconfiguration of room groups, e.g. repartitioning of office space
- Assignment of controllers to energy demand points (for demand-based energy supply)

MONOGRYR, BATIGYR
Other individual room control systems that are integrated into VISONIK via BPS are MONOGRYR, which is connected by the two-wire bus of the same name, and BATIGYR, which is connected via BATIBUS.
System integration

Integration of third-party systems

VISONIK is characterised by a versatile system structure. Third-party systems are integrated via gateways or via the BPS as a CFE device (Communication Front End).

Landis & Staefa co-operates with selected partners. This gives rise to the best products and solutions, producing the greatest customer value.

The universal platform with System Gate Units (SGU) provides for simple and cost-effective connection of a wide variety of third-party systems. This enables, for example, an alarm in the third-party system to be indicated on a floor plan on the INSIGHT management station, allowing the user to quickly locate the cause of the alarm.

Integration of Cerberus security systems

Close co-operation with Cerberus allows the Cerberus fire and intrusion alarm systems to be integrated via a standardised gateway. Important interactions between the security systems and building services systems, e.g. commanding of ventilation systems to “fire” mode or unlocking of escape doors, are automated.

The relevant services, such as the fire service, are alarmed directly and autonomously by the security system.

Integration of mechanical and electrical systems

The integration of mechanical and electrical systems, such as electrical supply equipment and lighting or door, lift and escalator control, provides for uniform operation of the most varied systems and plants. This provides a comprehensive building overview, providing for optimisation of the overall process via high-level algorithms and control functions.

Centralised operation and reporting increase the security of the overall system, enabling faults to be identified and corrected quickly and efficiently.
Integration of VISONIK in DESIGO

DESIGO ... is Landis & Staefa's new system generation. Its modular, scaleable structure covers all applications, from individual buildings to distributed building complexes.

Its open architecture provides for the integration of existing SBT, Landis & Staefa automation systems.

DESIGO INSIGHT

One of the major features of DESIGO INSIGHT is the versatility provided by modular, scaleable, object-oriented software. The software is based on Windows NT®. It is user-friendly, allowing quick, intuitive operation of the system applications. Online help and ToolTips provide extra user support. The VISONIK automation system can be fully integrated into DESIGO INSIGHT.

Investment for the future

DESIGO is an investment for the future which incorporates existing systems to provide long-term protection of investments.

System description CA1S9100E provides an overview of the DESIGO building management system and its functional possibilities.

Options

- Plant Viewer / Editor
- Trend Viewer
- Log Viewer
- Pager
- Internet Log Viewer

Start Feature Set

- System Browser
- Alarm Router
- Alarm Viewer
- Time Scheduler
- Object Viewer
- System Configurator
- Basic Software

Individual enhancement of the DESIGO INSIGHT Start Feature Set is possible at any time.
Medium-sized buildings

VISONIK provides a wide variety of system design possibilities:

- Stand-alone system
- Remote management system
- Link system
- Integration system
- System for distributed buildings in regional and national networks

In medium-sized buildings, DCS types are used to which up to 50 process stations can be connected via the automation bus or via modem. The forward-looking development of the NetBPS now also provides for communication links between multiple NetBPS via LAN (Local Area Network).

The connection between the DCS and the INSIGHT management station can be made via LAN (Ethernet), RS232 or modem.

Remote management via modem

Remote management via modem provides the same comprehensive remote management and operation functions as with fixed connections.

Modem connections, of which several can be active simultaneously, are primarily used for monitoring regional and national distributed systems.

Remote management via modem is possible between the DCS and the management stations and between the DCS and individual remote process stations.

Management of process stations on remote segments is provided via modems on Enhanced Communication Units (EcuBPS).
Large building complexes

DCS in link systems

In case of large building complexes, multiple DCS units are used in a link system. DCS types to which up to 200 process stations can be connected are designed for systems of this scale.

The following communication links are possible in link systems:

- LAN (Ethernet TCP/IP)
- Automation bus
- Modem

The connection between DCS units and the INSIGHT management stations can be made via networks, RS232 or modem.

Configuration with DCS in a link system and third-party system integration

Integration system

Integration of third-party systems is possible via gateways and BPS units configured as CFEs (Communication Front End).

Important interactions between the third-party system and VISONIK are automated, e.g. an alarm in the third-party system is displayed on an INSIGHT management station, enabling the user to quickly locate the source of the alarm.

System specifications:

- Data and Com. Server: up to 20 Data and Communication Servers in a link system
- Process stations: up to 200 process stations (BPS, NetBPS, PRV1, EKL-X) per DCS
- Data points: up to 10'000 data points per DCS
- Communication: INSIGHT management station ↔ Data and Com. Server DCS LAN (Ethernet TCP/IP) RS232, public telephone network, ISDN (via modem)
**Distributed buildings**

The INSIGHT management stations manage and monitor distributed buildings in flexibly designed structures. Existing networks and communication links are utilised to save wiring costs.

Fixed LAN (Local Area Network) and RS232 connections are used for buildings situated in close proximity to each other.

In case of geographically more remote buildings, the public telephone network, ISDN or WAN (Wide Area Network) are used.

State-of-the-art communication technologies are used for data transmission. These place only a small load on the communication lines, so coexistence with other applications on the same network is not normally a problem.

Transparent access to the individual buildings ensures a clear overview at all times, even in case of buildings distributed over a wide regional area.

**System specifications:**
- Data and Com. Server: up to 20 Data and Communication Servers in a link system
- Communication:
  - INSIGHT management station <--> Data and Com. Server DCS
  - LAN (Ethernet TCP/IP)
  - WAN (TCP/IP, FDDI, X25, etc.)
  - RS232, public telephone network, ISDN (via modem)
### Technical data

#### Management level data transmission

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS232 interfaces</td>
<td>Transmission speeds for modems to INSIGHT</td>
<td>as per requirements</td>
</tr>
<tr>
<td>Local Area Network</td>
<td>Transfer protocol</td>
<td>TCP/IP</td>
</tr>
<tr>
<td></td>
<td>Network</td>
<td>Ethernet</td>
</tr>
<tr>
<td></td>
<td>Transmission speed</td>
<td>10/100 Base T</td>
</tr>
</tbody>
</table>

#### Automation level data transmission

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDLC automation bus</td>
<td>System bus protocol</td>
<td>SDLC/FSK</td>
</tr>
<tr>
<td>RS232 interfaces</td>
<td>Transmission speeds for terminals, printers, modems</td>
<td>as per requirements</td>
</tr>
<tr>
<td>Local Area Network</td>
<td>Transfer protocol</td>
<td>TCP/IP</td>
</tr>
<tr>
<td></td>
<td>Network</td>
<td>Ethernet</td>
</tr>
<tr>
<td></td>
<td>Transmission speed</td>
<td>10 Base T</td>
</tr>
</tbody>
</table>

#### Data transmission to the field level

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Process bus, P-bus</td>
<td>Transmission speed</td>
<td>62500 bps (fixed)</td>
</tr>
<tr>
<td></td>
<td>Transmission level as per</td>
<td>manufacturer's specification</td>
</tr>
<tr>
<td>Floor Level Network, FLN bus</td>
<td>Transmission speed</td>
<td>19200 bps (fixed)</td>
</tr>
<tr>
<td></td>
<td>Transmission level as per</td>
<td>RS485</td>
</tr>
<tr>
<td>MONOGYR bus</td>
<td>Transmission speed</td>
<td>1024 bps (fixed)</td>
</tr>
<tr>
<td></td>
<td>Transmission level as per</td>
<td>manufacturer's specification</td>
</tr>
<tr>
<td>Connection to BATIBUS</td>
<td>Transmission speed</td>
<td>max. 9600 baud</td>
</tr>
<tr>
<td>BPS to PNB interface</td>
<td>Transmission level as per</td>
<td>CCITT V.28</td>
</tr>
<tr>
<td>Connection to LON bus</td>
<td>Transmission speeds</td>
<td>max. 9600 baud</td>
</tr>
<tr>
<td>BPS to NIDES RX interface</td>
<td>Transmission level as per</td>
<td>CCITT V.28</td>
</tr>
</tbody>
</table>

#### Technical data for VISONIK INSIGHT, DCS, BPS and NetBPS

The following datasheets provide product-specific data:

- CM2N8570: VISONIK INSIGHT, conformity fulfilled
- CM2N8558: DCS: type PLD6..., conformity fulfilled
- CM2N8305: BPS, NetBPS, conformity fulfilled

#### Quality standards

Landis & Staefa has ISO 9001 and ISO 14001 certification.
VISONIK development has been tested as per:
- GAMP: Good Automotive Manufacturing Practice
- Bootstrap: Capability Maturity Model (CMM, measures the degree of maturity of a software development unit)