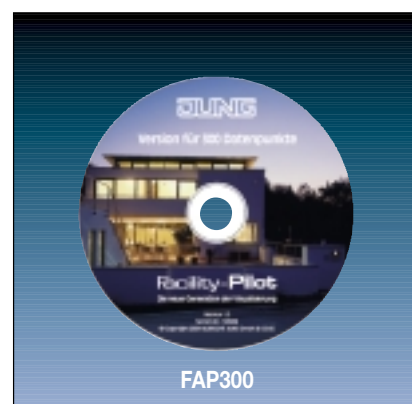
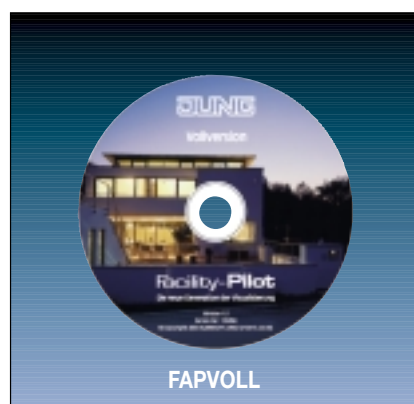


1



2

Ref.-No.

Facility-Pilot FAP

Software versions

Planner version	FAP-PLANER-GB
50 data point version	FAP50-GB
300 data point version	FAP300-GB
Full version	FAPVOLL-GB

Software versions for network application (only with the FAP full version)

For 1 – 4 PC	FAPCLIENT14-GB
For 5 – 9 PC	FAPCLIENT59-GB
For 10 – 24 PC	FAPCLIENT1024-GB

OPC editor	OPC-EDITOR
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3

System requirements

Windows versions: 98 SE, ME, 2000, XP, Internet Explorer 6, DirectX (version 9b), Acrobat Reader.
 For the installation under Windows 2000 and XP administrator rights are required.
 Internet Explorer 6, DirectX (version 9b), Acrobat Reader are delivered with the FAP CDROM.

Recommended order of installation:

1. Internet Explorer
2. DirectX
3. Facility Pilot
4. Acrobat Reader

Note: The software is locked with a software key and must be activated within 20 days after the installation !

Hardware requirements:

- Pentium IV or equal
- RAM 256 MB
- Free space on hard disk 40 GB (dependent on the data processing / archives)
- Resolution 1024 x 768
- Colours min. 16 bit / pixel
- Interface serial or USB for the application of FALCON
- Internet connection (optional) when e-mail notification used

Facility Pilot – the new open visualisation generation

The JUNG Facility-Pilot is a flexible, interactive software for extensive visualisation and control of the building system technology KNX. Its areas of application extend from many different industrial applications through to up-market residential buildings. The software consists of individual modules (Fig. A) such as the EIB editor, process model, visualisation editor and a comprehensive system control.

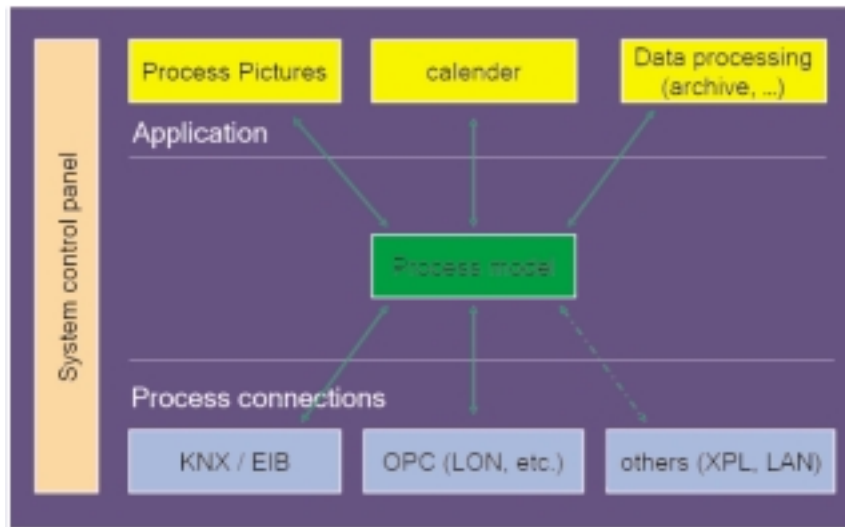


Fig. A

With the modular JUNG Facility-Pilot software system, a total solution for building management technology has been developed which opens up the topic of visualisation to a broad spectrum of users and moreover contains pioneering developmental steps as regards additional functionality such as access via the Internet. It is therefore not purely visualisation software but a comprehensive program which considerably simplifies operation with KNX and its connection with other bus systems.

This also fits in with the complete philosophy of the system which makes it possible to set up displays for process characteristics or archives for value characteristics and events without programming; even controller functions can be configured via drag & drop. And for specialists, there is also the possibility of visualisation programming if there are special requirements which are not covered by the system as standard. The complete programming environment for BASIC scripts is a prerequisite for this.

KNX installations in private residential buildings can likewise be enhanced with the system as in the commercial sector since specific modules help to convert almost every technical requirement both quickly and economically – from the fault indication system to the entire technical building management system, culminating in the analysis of consumption data.

The navigation of the different modules is very easy due to the clear structured system control panel (Fig. B). This system control panel provides a fast overview of the whole system with the individual modules, documents and project management. The Facility-Pilot brings flexibility, greater user convenience and easy handling to bus system management. The visualisation and control assist the user with interactive help and extensive documentation.

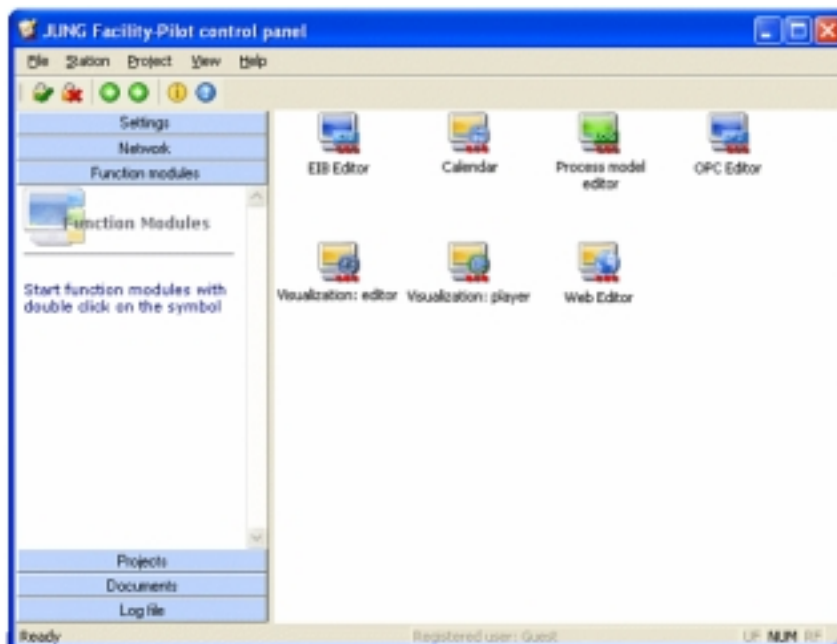


Fig. B

5 Visualization / Facility Management

When developing the system, attention was directed at economic efficiency since logic modules or year time switches can be committed in many installations as the Facility-Pilot takes over these functions. The simple operation pays off quickly for the user. Tools and assistants support the project engineers in their work while the end user has a high level of user friendliness and flexibility for his KNX installation. The technology remains discreetly hidden in the background.

Internet connection via integrated web-server will increase this convenience still further.

The visualisation is able to run on WINDOWS systems from WINDOWS 98SE to WINDOWS XP (with the exception of Windows NT). Your operating environment always retains the XP style.

EIB editor – the ETS interface

The main task of the EIB editor is to create the connection between the Facility-Pilot and the KNX. This editor can be used for a quick, convenient import of data from the ETS projects into the Facility-Pilot. For connection to KNX, the system uses the EIBA Falcon driver. No additional software is needed. The KNX group addresses can be allocated either automatically by drag & drop or manually. Start group functions make it easy for the user to stipulate differentiated start behaviour of the system (Fig. C).

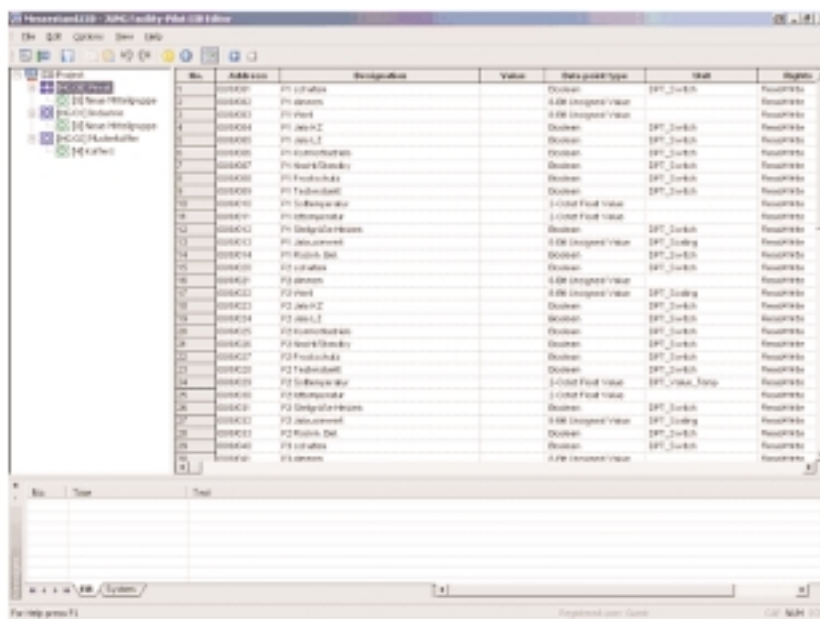


Fig. C

In addition, the EIB editor works as a diagnosis tool in the system. For example, it assumes evaluation of the KNX telegrams and shows them in plain text. This gives the user perfect control of the bus system. I.e. it is not necessary to switch over between ETS and Facility Pilot to test or record data points, everything can be done within the EIB editor module.

OPC editor – the open interface

An OPC client which analyses which OPC servers are installed in the system (there can be several) is available as an option in the Facility-Pilot package. The client reads out the data from the OPC servers and makes it available to the process model. It can execute this in parallel with the EIB Editor.

Additional data from other processes e.g. LON or M-Bus can thus be linked with a KNX installation and visualised in a simple way.

Planners and installers know that these requirements are found with increasing frequency in projects.

In practice, this can appear as follows: in parallel to the KNX process connection, an OPC server communicates with the LON devices located in the building and makes the data available via its software interface. The data is processed in the process model.

A link can now be implemented between the process variables.

The "forwarding function" (gateway function) is used for this purpose so that data is sent from LON to KNX and vice versa.

An additional gateway can thus be omitted since it already exists in the system.

A link to the Ethernet is also possible. The setpoint temperature or other parameters from control and instrumentation technology can for example be brought on the KNX.

Process model – comfort and safety with perfect workflows

The process model summarises the device data from the EIB editor or other physical connections and generates complete work-flows from individual functions. It is also possible to combine different sequences, e.g. blind control adjusted to the time of day and light conditions.

These functions (Fig. F) can also be adjusted to simulate the presence of people in the building when it is unoccupied.

The system thus also offers additional security. This aspect is reinforced if the KNX alarm system is integrated and controlled via the Facility-Pilot.

The process model requires a logical view of the project, offering for example mathematical and time-based functions, or also scenarios and workflows for lighting control and monitoring functions. The user can easily draw up his own rules for the management of his facility.

5 Visualization / Facility Management

To this end, “virtual devices” are created on the screen, archives are defined, e-mail notifications and alarm warnings are preset. If over the weekend a previously defined temperature is exceeded for example in office rooms with Facility-Pilot monitoring, the system issues a corresponding e-mail notification. Individual process data can be recorded systematically and value progressions exported to Excel spreadsheets or displayed directly as graphs or tables (Fig. D and E). In addition the process variables can be linked with other programs via DDE. These can then be used to check the energy bills.

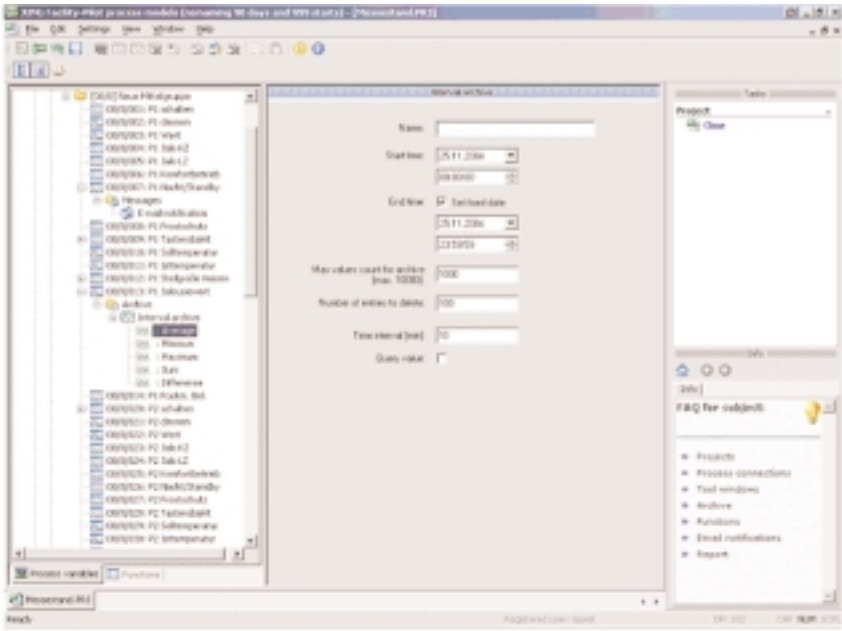


Fig. D Data processing

Values that are calculated and recorded by the process can be represented in the Visualisation Editor. Curve diagrams can also be displayed in the worksheet. The visualisation package contains the option of viewing and testing archives directly. Values are represented in table format and graphically in a diagram.

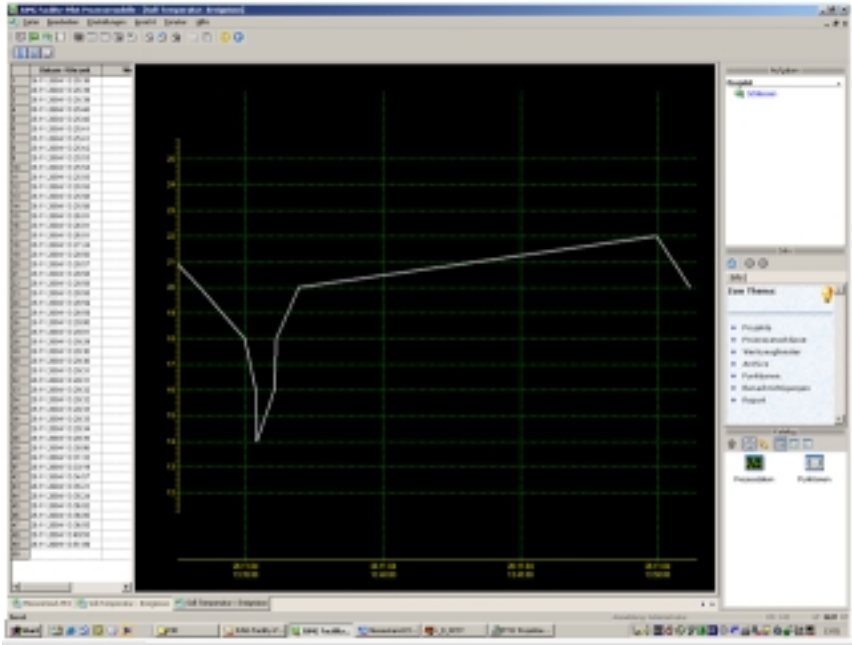


Fig. E Data recording

The functions within the process model

The available logic functions which are created in the process model are amongst others “AND”, “OR” and “XOR”. A KNX installation can be significantly enhanced through these functions. In addition to the basic functions such as ‘AND’ and ‘OR’, there is a whole range of additional functions in the system which underline its capability. When a visualisation is logically connected, you can clearly see what effect it has (Fig. F). The following functions are the more advanced ones to realize even very complex applications:

- **Scene:** A scene is a collection of commands. When it is started, these commands are sent on the bus in no chronological order in contrast to the sequence function.
- **Sequence:** In addition to the basic functions, there is the "Sequence" function, which could be described as a smart scene. I.e. a command is only executed when a specific condition is enabled. Specific loads are switched on at the press of a button, as defined in the process model. A presence simulation can thus easily be implemented. A time stamp can likewise be inserted which can be assigned to each switch or lighting fitting. With this function, it is possible to indicate the last time that someone operated a device or entered a room.
- **Forwarding:** This gateway function is a very important function if you have two different process connections for example. If you wish to use or display a value from the heating system (OPC) in the KNX installation, you have a source value which is routed to a target value (gateway functionality). A bridge is thus created in a simple way between the process connections.
- **Status function:** The status variable takes the last reported value and simulates KNX status objects if specific KNX devices for instance do not have these status objects at their disposal.
- **Gate function** which can be implemented with the IF/THEN function: The If / Then function is used to calculate the values of process variables depending on other process variables and conditions.
E.g. it can be used to configure a priority control: The value of a switch will only be sent to an actuator, when the control of the actuator by the switch has been allowed. The allowance may depend on another binary process variable.
- **Mathematic functions:** Here any basic calculation can be used within a formula. The syntax of the formula is similar to the Excel one.
- **Time delay:** For example, we switch the light on in the toilet and the fan is activated with a time delay. No further installation is required. The user has the option of setting times as required without ETS programming.
- **Automatic guard:** If you take an area of a refrigeration plant which has to be monitored, temperatures between 3° and 5° can be defined e.g. for the cold store and values of > -8° for the deep-freeze room. The visualisation takes over the task of monitoring (watchdog function) this operating state and issues an alarm when the temperature rises above or falls below the required temperatures. Specific monitoring periods can also be selected. In the event of an alarm, this is issued acoustically but it can also be routed as an e-mail (→ SMS on a mobile phone) or via fax. Alarms are verified on a list. All alarms are displayed there as "acknowledged" and "not acknowledged".
- **Counter:** If you wish to know for example how often the burner of the heating system cycles, its starting and stopping pulses are taken as the basis. You then count how long the burner is active for. The hours and minutes of the operating time can be displayed with the help of the counter as well as the average switching time. The counter elements can be used as upwards or downwards counter.

Summarized, you can say that the system offers a number of basic functions and is equipped moreover with higher value functions such as the counter or If / Then function which could be put together from basic functions but have already been implemented without any programming work. Further modules, which do not need to be built together from basic functions, are conceivable and planned, not as a basic function but as function modules. Frequently used functions are integrated in the visualisation as virtual devices.

The process model is extended for this purpose.

In general, there are no limits for these functions or basic scripts. The only limit is the configuration of the PC where the Facility Pilot is installed.

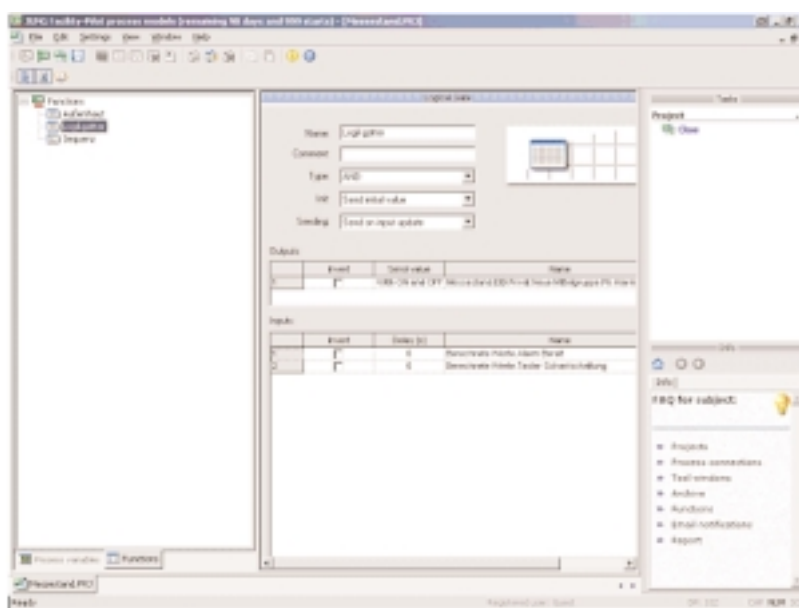


Fig. F

5

Visualization / Facility Management

Visualisation Editor

The visualisation editor presents the whole bus system as a model on the screen. The user has virtual access to devices and can make settings which apply to the bus system. The layout of the corresponding building can be shown for clear, convenient operation, and symbols for lighting, blinds or central heating can be allocated individually from an icon library. The visualisation is based on individual work sheets which can be stored in unlimited numbers in the system.

The background of the visualisation can be created with DXF, JPG, BMP, WMF or EMF formats. Thus you can offer the customer a unique visualisation which is tailor-made for his personal taste or is based on the CD/CI concept of a company.

Next to the main presentation area, the right-hand side of the screen shows a working and help section which the user can set up according to his individual needs (Fig. G).

It is very simple to work with the editor and is made even easier with functions such as undo, redo, zoom, rulers, guidelines and grid as well as several editing levels. The system is organised in three levels (planes) – the static, the dynamic and the link level, which can be shown and hidden again depending on the particular work phase.

The visualisation system is rounded off by an extensive interactive help function which the user can call up at any time.

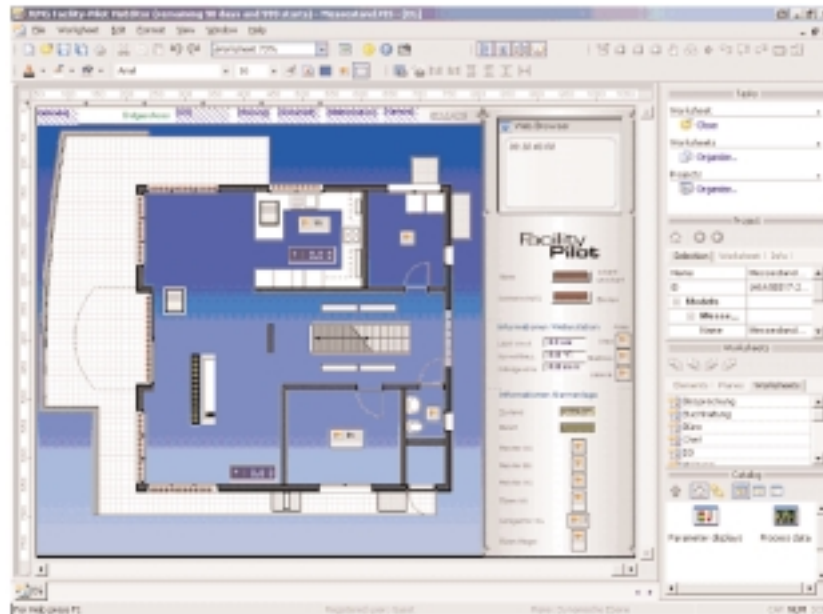


Fig. G

The visualization editor creates a report of the visualization project, the worksheets in the project, their properties and their connections to process variables. For each worksheet an image of the whole worksheet is displayed and list of the contained display elements along with their position etc.

The calendar program

The yearly calendar program is an own module for creating and configuring automatic time switch functions can be configured via drag & drop. An unlimited number of calendars can be created.

The process model to which the time program should refer is selected first of all. Then various daily programs are created for example which are given corresponding commands. In contrast to classic clocks, the system does not operate channel-specifically i.e. it is not necessary to create a unique program for each channel.

In addition, to the powerful and complex yearly calendar, a weekly timer can be implemented into the visualisation project, i. e. the customer can open the timer within the player mode and change the settings. Because it is a regular display element, similar to any lamp or push-button symbol, you can use as much weekly timer as necessary.

5 Visualization / Facility Management

Control via Internet by the web editor

The application to access the system via Internet or PDA with regular web browsers can be achieved by the web editor module. A user administration is created so that the areas to be protected by the Facility-Pilot are secured against unauthorised access. For security purposes, individual components of the system can only be made accessible to predefined user groups. The web editor allows to define and edit web projects without any HTML knowledge (Fig. H). A simple HTML visualisation can be configured with just a few clicks. A web server has been integrated into the web editor module which can dynamically generate standard HTML pages according to properties of devices and browsers. Sets of HTML pages are organised as “books” and can be assigned to users.

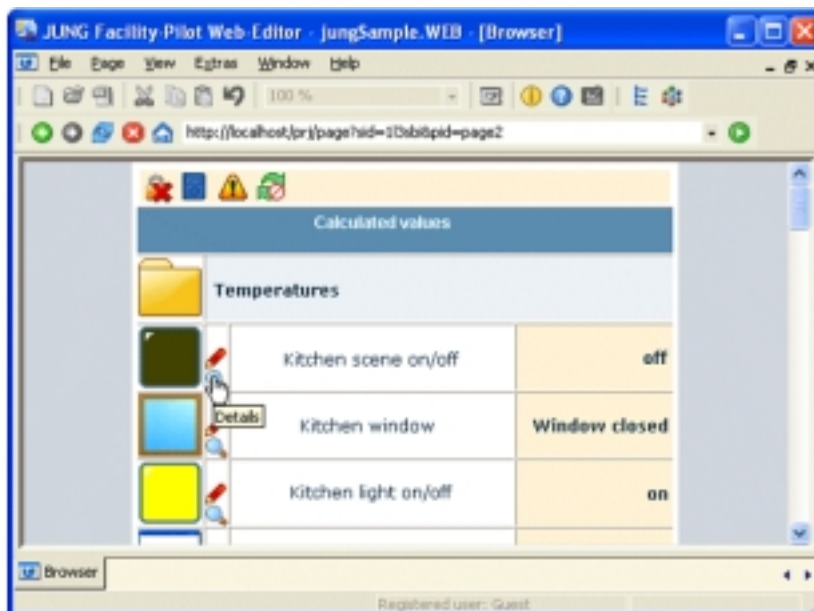


Fig. H

Network application

The network features of the Facility Pilot software are used to connect several PC's with Facility Pilot installations over a TCP/IP – network. Each PC with the Facility Pilot software installed is called a Facility Pilot station or just “station” for short. Visualisation players of several Facility Pilot stations can be connected with a process model within a remote Facility Pilot station.

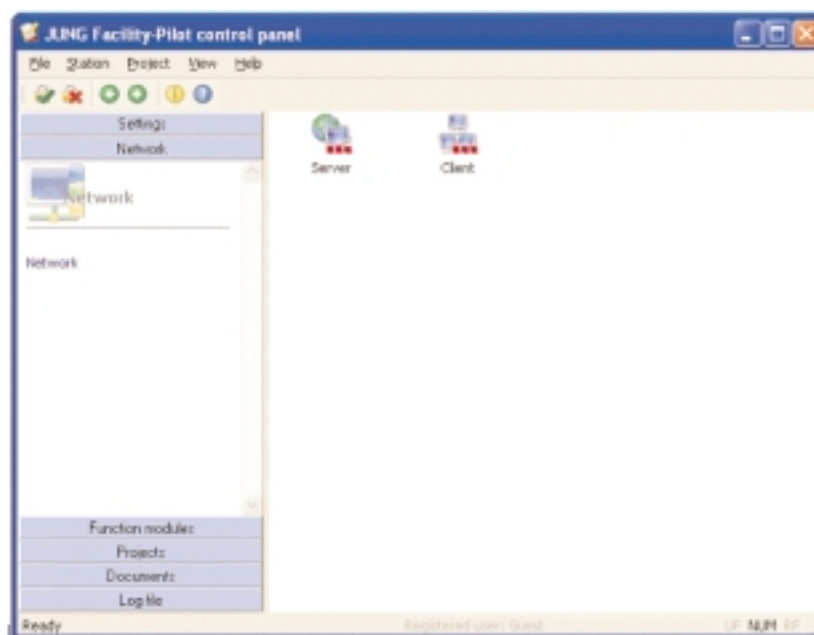


Fig. I

5

Visualization / Facility Management

The network architecture follows a client/server-model (Fig. I), with one station as the server and the other stations as clients.

The server is connected to the technical process. Clients query process states from the server, to change process states they send commands to the server.

A typical application of this new network features is the connection of several touch panels with a server.

The network protocol is based on TCP/IP and requires authentication with a user name and a password.

Multiple client stations can be connected via TCP/IP to one server station. The maximum number of clients depends on the capabilities of the server, hardware and operating system. In some cases it may be preferable to use a WINDOWS server version.

In most cases, network traffic caused by the Jung Facility-Pilot software will be quite low, since not much more than changes to the process states and keep-alive telegrams will be transmitted, In particular no graphics need to be transmitted, since the visualisation project is running at the client.

XPL editor for audio applications

There is an increasing desire to combine home and building automation with streaming of digital music. For instance lighting and music control can be integrated in scenes, which can be selected at the push of a button from anywhere in the building.

One of the best systems for audio streaming over IP networks is the Squeezebox-system from the company Slim Devices, Inc. (Fig. J).

Audio streams are transmitted over Ethernet or wireless (IEEE 802.11) networks from a server with the open-source SlimServer software to Squeezebox music players, and in turn controlled by the Facility Pilot XPL editor.

Supported audio streams are for instance Internet Radio, MP3, WAV, WMA and Ogg Vorbis.

We strongly recommend not to install the SlimServer software at the PC running the Facility Pilot system, since the SlimServer could impair the proper operation of the automation system.

The XPL editor of the Facility Pilot system controls the SlimServer and in turn the Squeezebox music players via the XPL data protocol, which is standardised by the XPL project.

Among other possibilities, using the XPL editor, push buttons and dimming functions can be used to control volume, playlists etc., or messages can be displayed at the music player's display. For the indication of tracks or playlists KNX front end devices as FD RCD, colour touch panel, etc. can be used.

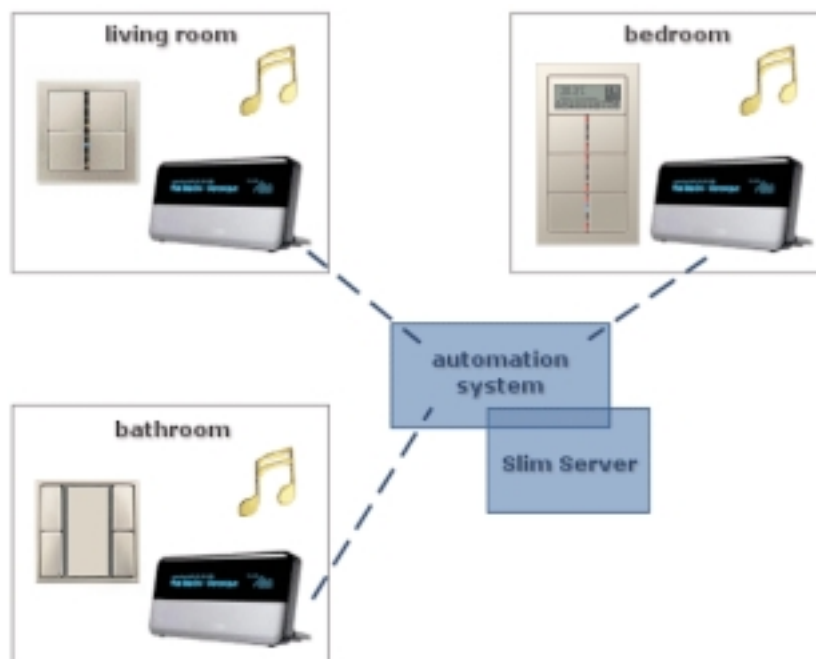


Fig. J