(64) Figures: see FIG. 4

(54) Title: CONTROL OF BUILDING AUTOMATION SYSTEMS

(63) References cited:

(57) Abstract: The invention relates to the control of building automation systems, particularly home automation systems. A basic idea of the invention is to make control of a building automation system location dependent, particularly to implement a kind of roaming service for building automation systems in that a user may control the system with a control computer roaming between different physical locations.

In an embodiment of the invention a building automation system (10) comprises a plurality of controllable electronic devices (121-121 1), a network (14) for connecting the controllable electronic devices, -a plurality of networking devices (141, 142, 143), -a first database comprising (161) associations of the networking devices with physical locations, -a second database (162) comprising associations of physical locations with controllable electronic devices of the building automation system, and -management means being configured to detect a control computer (18) connected to the network via a networking device, to assign a physical location to the control computer by means of the first database, and provide a control computer with a control configuration for controllable electronic devices queried from the second database based on the assigned physical location.

[Continued on next page]
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CONTROL OF BUILDING AUTOMATION SYSTEMS

TECHNICAL FIELD

The invention relates to the control of building automation systems, particularly home automation systems, and more specifically to a roaming service for building automation systems.

BACKGROUND ART

Building automation systems are distributed control systems provided to monitor and control electronic devices installed in a building. Home automation systems are building automation systems for residences. Building and especially home automation may include a centralized control of lighting systems, HVAC (Heating Ventilation Air Conditioning) systems, and other systems installed in a building and for example provided for controlling energy consumption in the building, or security.

For a centralized control, a building automation system comprises a network for connecting the controllable electronic devices of the automation system, typically controller such as lighting controller, and HVAC controller. A workstation connected to the network of the building automation system may be used as central controller of a building automation system. For example, a modern networked lighting system installed in a building may be controlled with a PC (Personal Computer), which can be configured with a dedicated software to provide a user interface, which may offer some sort of desired user control in order to give a user tools to overrule the default system behaviour. For example, the user interface may contain soft switches for switching light units on or off or dim the lighting. Thus, a PC provides an attractive alternative to providing control via dedicated soft switches and controls, as it avoids the use of costly extra hardware and installation of dedicated hard switches and controls.

Moreover, such user control will become of even greater importance with the advent of LED (Light Emitting Diode) based lighting. With LED based lighting, the amount of control needed will increase for various reasons. E.g., the number of lamps in a space will increase considerably. Also, it may not only be desirable to switch on and off the lamps, but to control the LEDs in order to provide different lighting intensities and different color
temperatures. Furthermore, the lights may be programmed so that the user can switch easily between general illumination and task lighting. These changes further increase the need for a versatile user interface for controlling a building automation system such as a LED based lighting system.

SUMMARY OF THE INVENTION

It is an object of the invention to improve the control of a building automation system with a control computer.

The object is solved by the subject matter of the independent claims. Further embodiments are shown by the dependent claims.

A basic idea of the invention is to make control of a building automation system location dependent, particularly to implement a kind of roaming service for building automation systems in that a user may control the system with a control computer roaming between different physical locations. According to the invention, the location dependent control is implemented by determining the location of a control computer and by determining the controllable electronic devices of the building automation system with regard to the determined location of the control computer. For the control computer location determination, networking environment and networking services may be used such as the SNMP (Simple Network Management Protocol) in an IP (Internet Protocol)-based network of a building automation system. The determining of controllable devices may be performed by means of a particularly pre-commissioned database containing controllable devices and their associations to locations. Thus, the invention allows to control building automation systems dependent on the actual location of the user. E.g., if a user connects his notebook in his office, the invention allows to enable the control of the office lighting system. However, if the user connects his notebook in a meeting room to the building automation network, then the control of the lighting system in this meeting room is automatically enabled. And if the user connects the same notebook to the network of his home automation system, he can control the lighting system installed in his home with the notebook. Thus, the invention may improve the control of building automation systems by automatically adapting the control to the actual location of a control computer without requiring a user to indicate his location by means of manual input of a location.

An embodiment of the invention provides a building automation system comprising
- a plurality of controllable electronic devices,
- a network for connecting the controllable electronic devices,
- a plurality of networking devices,
- a first database comprising associations of the networking devices with physical locations,
- a second database comprising associations of physical locations with controllable electronic devices of the building automation system, and
- management means being configured

-- to detect a control computer connected to the network via a networking device,
-- to assign a physical location to the control computer by means of the first database, and
— to provide the control computer with a control configuration for controllable electronic devices queried from the second database based on the assigned physical location.

The first and second database may be for example implemented by a server particularly being part of the network of the building automation system. The management means may be implemented by software installed on and executed by the control computer or another computer in the network of the building automation system. For example, the management means may be installed on the control computer and either being executed as a background process on the control computer or being part of a building automation management software installed on a computer and used for example when the user desires to control lighting and HVAC in his office. A control computer may be any kind of computer, particularly a mobile PC (laptop, notebook, netbook, tablet PC) or even a smartphone or PDA (Personal Digital Assistant).

The provided control configuration may comprise
- a set of controllable electronic devices being provided for control by the control computer and
- network addresses of each device of the set of controllable electronic devices.

For example, if a control computer is detected in a meeting room, the provided control configuration may comprise a set of devices installed in the meeting room such as a network projector and lighting units of the meeting room and their network addresses, while in a user's office the control configuration may comprise HVAC devices and light units installed in the office and their network addresses. In other words, a provided control configuration may be tailored to the actual location of the control computer in the sense that only electronic devices can be contained, which should be controllable by the control computer at its actual location.
The management means may be configured to create a set of controllable
electronic devices for the control configuration by selecting controllable electronic devices
from the queried controllable electronic devices depending on
- a room identification of the controllable electronic devices,
- a building identification of the controllable electronic devices,
- coordinates of the controllable electronic devices, and/or
- access control identification of the controllable electronic devices.

For example, only devices installed in a certain room may be selected by the
room identification, or only devices installed in a certain building by using the building
identification. A selection based on the coordinates for example allows to restrict the
controllable devices to a certain area around the control computer, so that the control
computer may for example only control devices in a radius of some meters. The access
control identification further allows to restrict control to devices, for which a user may have
access.

The first database may comprise associations of combinations of
identifications of network devices and port numbers of ports of the network devices with
physical locations of the end points of network cables connected with the ports, and the
management means may be configured to assign a physical location to the control computer
by
- determining the identification of the networking device and the port number of the port of
the networking device, with which the control computer is connected,
- querying the first database by using the combination of port number and identification of
the networking device for the physical location of the end point of the network cable
connected with the port with the identified port number, and
- assigning the queried physical location to the control computer.
This is helpful in a wired network, in which electronic devices of the building automation
system are connected with usually fixedly installed network cables to networking devices
such as switches, hubs, or router.

The first database may also comprise associations of identifications of network
devices with physical locations of the network devices, and the management means may be
configured to assign a physical location to the control computer by
- determining the identification of the networking device, with which the control computer is
connected,
- querying the first database by using the identification of the networking device for the physical location of the networking device, and
- assigning the queried physical location to the control computer.

When a wireless network is used by the building automation system, the identification of the networking device, for example a wireless access point or router can be used to determine a physical location of the control computer.

The management means may be configured to provide the control computer with a control configuration for controllable electronic devices queried from the second database system based on the assigned physical location by

- selecting controllable electronic device from the queried controllable electronic devices based on an identification of the control computer, a signal strength of a wireless network connection between the control computer and a wireless access point of the network, and/or coded light emitted by one or more lamps of the building automation system.

The network may be an IP-based networked, the electronic devices may have network interfaces with MAC addresses, and the networking devices may be OSI-Layer-2 and/or OSI-Layer-3 networking devices.

The first and second database can be particularly periodically merged to a single database and the management means may use the single database to assign a physical location to the control computer and to provide the control computer with a control configuration for controllable electronic devices. For example, the single database can be hosted by a database management system.

A further embodiment of the invention provides a computer being configured to implement database services for application with a system of the invention and as described herein, wherein the computer comprises

- a first database comprising associations of networking devices of a building automation system with physical locations,
- a second database comprising associations of physical locations with controllable electronic devices of the building automation system, wherein the computer is configured to receive requests for queries for the first and/or second database over a network of the building automation system and to transmit results of queries over the network to the requesters.

Such a computer may be for example installed as a server of a building automation system. However, it is also possible to use a standard IT server such as used in an office environment, which may be connected to the network of a building automation system,
particularly an IP-based network, and configured to communicate with devices of the building automation system.

A yet further embodiment of the invention provides a control computer for a building automation system of the invention and as described herein, wherein the control computer is configured
- to connect to a network of the building automation system,
- to receive a control configuration for controllable electronic devices of the building automation system, and
- to create and display a control interface for the controllable electronic devices based on the received control configuration.

The control computer may be for example a standard PC, such as a notebook, laptop, netbook, desktop, tablet PC, or PDA, smartphone or any other programmable computer. A standard PC may be configured as control computer for the purpose of the present invention by means of software implementing the functionality to connect to a network of the building automation system, to receive a control configuration for controllable electronic devices of the building automation system, and to create and display a control interface for the controllable electronic devices based on the received control configuration. The control interface may be a GUI (Graphical User Interface), which displays only controls for electronic devices of the building automation system, which are contained in the received control configuration. Thus, the GUI may dynamically and automatically change depending on the location of the control computer when the user moves from one room to another one for example in an office environment.

A still further embodiment of the invention relates to a method for providing a control configuration for a building automation system of the invention and as described herein, wherein the method comprises the following steps:
- detecting a control computer connected to a network of the building automation system via a networking device of the building automation system,
- querying a physical location from a first database, which comprises associations of networking devices of the building automation system with physical locations,
- assigning the queried physical location to the control computer,
- querying a control configuration for controllable electronic devices of the building automation system from a second database, which comprises associations of physical locations with controllable electronic devices of the building automation system, based on the assigned physical location, and
- providing the queried control configuration to the control computer.

Another embodiment of the invention provides a computer program enabling a processor to carry out the method according to the invention and as specified herein.

According to a further embodiment of the invention, a record carrier storing a computer program according to the invention may be provided, for example a CD-ROM, a DVD, a memory card, a diskette, internet memory device or a similar data carrier suitable to store the computer program for optical or electronic access.

These and other aspects of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter.

The invention will be described in more detail hereinafter with reference to exemplary embodiments. However, the invention is not limited to these exemplary embodiments.

**BRIEF DESCRIPTION OF DRAWINGS**

Fig. 1 shows an embodiment of a networked lighting control system installed in a building as an example of a building automation system according to the invention;

Fig. 2 shows an example of a first database of the lighting control system of Fig. 1 according to the invention;

Fig. 3 shows an example of a second database of the lighting control system of Fig. 1 according to the invention; and

Fig. 4 shows a flowchart of an embodiment of a method for providing a control configuration for a building automation system according to the invention.

**DESCRIPTION OF EMBODIMENTS**

In the following, functionally similar or identical elements may have the same reference numerals. Embodiments of the invention will now be described by means of a networked lighting control system as an example of a building automation system. However, the invention is not restricted to lighting control systems, but can be applied to any building automation system.

In the following, a lighting control system according to the invention and a software, which provides a light control interface on a notebook, according to the invention are described in detail. The light control interface provided by the software automatically
adapts to the location of the notebook. This roaming functionality is provided on top of an IP based lighting control system.

In an IP based lighting control system, there exist methods to find out to which port of which router a notebook connects, e.g. when the notebook boots. According to the invention, this router-ID/port-ID combination can be associated with a database of location information which associates a location such as a room number and/or physical coordinates with the router-ID/port-ID combination. Given then the physical location of the notebook, the system according to the invention can retrieve the room control configuration for the space the user is in, where the control configuration can be a room (office, space) based description of the controls that are available to actuate light units of the lighting control system (and building services in this room, such as lights, blinds, curtains, beamer, projector, screen, camera's, HVAC etc.). Additionally, the control configuration may contain the IP addresses of the controllable light units, so that the notebook can transmit commands to these units. The location of the controllable light units is entered into the system databases during the commissioning of the system. The retrieved addresses are then used to instantiate a UI (User Interface) on the notebook, from which the user can control the light units and also other building services in the room.

Now, an embodiment of a lighting control system according to the invention implementing the usage scenario is described. It is assumed that the lighting control system is based on IP networking technology. This IP based system may interconnect the IT infrastructure and the lighting units or devices and thus allows lighting and building automation control via a notebook or computer. Also, it is assumed that appropriate software is available to actually control the lighting and building automation systems, provided that the binding between the notebook and the lights and building automation systems has been made. Such a system can be extended with the functionality to make the binding between the computer and the lights and building automation systems. To enable the roaming functionality, the lighting control system can be extended with software to make the appropriate binding. This software can run on a remote central server, but also on the notebook, which then can use central databases kept on a central server.

Fig. 1 shows an IP based lighting control system 10, which comprises as controllable electronic devices several light units 121-121 1, which are installed in different rooms of a building. In Fig. 1, light units 121-123 are installed in an office, light units 124-129 in a meeting room, and light units 1210-1211 in a floor. Each light unit 121-121 1 is electronically controllable and connected to an IP-based network 14 of the lighting system.
The connections of network 14 can be wired and/or wireless. The network 14 must not be exclusively provided for the lighting system, but can be also used by IT equipment of the office environment such as workstations, servers, network printers, projectors etc.

The network 14 further comprises network devices 141-143, which are OSI-Layer 3 routers (or OSI-Layer 2 switches) as applied in LANs (Local Area Networks). OSI-Layer 3 routers store internally in a SAT (Source Address Table) associations of their ports to source devices, connected to the ports. For example, network device 141 may store in its SAT MAC (Medium Access Control) addresses of the light units 121-123 and the respective port-IDs. Also, the network devices 142 and 143 store internally in their SATs the MAC addresses of devices connected to their ports and the respective Port-IDs. Alternatively, the network devices 141-143 may be also special network devices such as lighting system controllers, which can be connected to light units for controlling the units via a dedicated lighting system protocol and also have an Ethernet connector for connecting with a LAN. For example, such a special network device may control the light units using DALI (Digital Addressable Lighting Interface), but use IP for communication with other network devices, computers, and servers.

The lighting system 10 further comprises a server computer 16 connected to the network 14. Server 16 means any kind of computer, which is able to communicate with other devices connected to the network such as the network devices 141-143 or another computer. The server 16 executes a management software which maintains a first database 161, which associates a router ID and port number or ID with a physical location.

The management has also the functionality to associate a MAC address with switch ID and port number. The association indicates that this MAC address can be reached via this port number of the switch identified by this switch ID. There are several ways to achieve this.

The management software can make this association using the SNMP (Simple Network Management Protocol) protocol. With the SNMP protocol, it can inspect the MIBs (Management Information Bases) for each port of each router. From these MIBs, it can be read off whether a message from this MAC address has passed this port of this router. Thus, the management software can find out via which port of which router the specified MAC address can be reached.

This query can also be implemented, e.g. by initiating an agent in the router that indicates to the management software that new activity is detected on one of its ports.
It is also possible to use LLDP-MED (Link Layer Discovery Protocol - Media Endpoint Devices). Port specific locations can be inserted in the network devices using the SNMP. These can then communicate this information using LLDP-MED as soon as end point devices are attached to ports of the network device. The end device, for example a notebook serving as control computer of the invention, then receives its location, and uses this location to bootstrap the process of obtaining a control configuration: the list of lights and automation building systems that it will control.

The management software further keeps a second database 162 of controllable electronic devices associated with physical locations. Such information is usually recorded on commissioning the lighting control system 10 for use and is usually available in professional environments such as offices, hotels, retail environments, etc.

The databases 161 and 162 can be combined in a single database, for example hosted by a SQL based database management system (DBMS) executed by the server 16 and controlled by the management software.

Fig. 2 shows a table of the first database 161, which associates a Router-ID and Port-ID with a physical location. This physical location identifies the physical location of the end point of an Ethernet cable that is connected to the respective port of the router identified by the ID. Typically, this information is recorded during installation of the Ethernet cables and routers. Alternatively, such association can be obtained by a procedure involving manual input. The table of the first database 161 shown in Fig. 2 comprises 3 columns, one for the Router-IDs, one for Port-IDs, and one for the physical location of the device, for example the light unit connected to a port with the respective Port-ID of a router with the respective router-ID. In Fig. 2, the reference numerals of the network devices 141-143 are entered in the table as Router-IDs. The table comprises a line for each Router-ID/Port-ID combination, which is used in the network 14. The last column contains the physical locations of the devices or light units connected to the respective ports of the routers.

Fig. 3 shows a table of the second database 162, which contains associations of physical locations with controllable electronic devices, i.e. the light units. In the left column of the table the physical locations are contained of the light units, the device-IDs of which are contained in the right column. Thus, the second database 162 determines for each physical location a set of controllable devices at the respective location. For example, for locations outside the office and the meeting room, the second database determines only the light units installed in the floor as controllable devices.
As shown in Fig. 1, a notebook 18 of a user is located in the office at physical position x4, y4. The notebook 18 is docked and connected to the router 141 via an Ethernet jack that is available in the room. In order to associate the notebook with one or more of the controllable devices of the lighting control system, using the location of the notebook and the location of the devices, a binding process is provided according to the invention. The binding process is implemented by a software, which can run on a remote central server, but also on the notebook. The actual rules of association will depend on the situation. Thus, for some situations, it is appropriate to code location via a room number, and have the notebook control all lights and building automation systems in a room. In some situations, building identification provides the coding of location and the notebook may control all lighting and building automation systems in the building. In yet another application, the location may be coded via geometrical coordinates, and the notebook may be used to control all lights and building automations systems that are within a certain distance, or that are e.g. closer to this notebook than to any other notebook for controlling the lights and building and automation systems.

Fig. 4 shows a flowchart of the software implementing the binding process. The software runs on the notebook 18, which is connected as shown in Fig. 1 via an ethernet cable to the router or switch 141. When the the notebook boots in step S10, it can determine in a following step S12 its MAC address associated with a Router/Switch-ID and Port-ID combination, with which the notebook is connected (as shown in Fig. 1 Router-ID 141/Port-ID 4). In the following step S14, a database query to associate the location of the notebook's MAC address with its physical location is created by the software and transmitted over the network 14 to the server 16. The query contains the Router-ID/Port-ID (141/4) combination associated with the notebooks MAC address. The management software executed by the server 16 queries from the first database 161 by using the received Router-ID/Port-ID combination the associated physical location (Office x4,y4). The queried physical location is returned by the database 161 in step S141. With the queried physical location, a query of the second database 162 maintained by the server 16 is created in order to obtain a set of controllable light units in step S16. The IDs of the light units (121, 122, 123) controllable at the physical location Office x4, y4 are returned in step S161 by the second database 162. In the last step S18, the control configuration comprising the IDs of the controllable light units (121, 122, 123) is then entered into the user interface for controlling the lighting control system 10. The user interface may for example show graphical controls for controlling parameters of the light units 121, 122, 123 in the office such as lighting intensity, color, hue
and so on. It is also possible that the system uses other information to improve this binding process. E.g., a user ID can be used to refine the binding process, so that e.g. the user has control over the task light in the office space, but not over the lamps available for general illumination.

In Fig. 1, a further notebook 182 is connected wirelessly to the network 14 via the router 143, which contains a wireless access point (AP). Now the first database 161 can infer the location of the AP 143 with which the notebook 182 associates. However, this does not give the location of the notebook 182 as the AP 143 may provide connectivity to users in a number of rooms, so that the location of the notebook 18 cannot be directly inferred from the location of the AP 143. The invention comprises various methods to deal with this situation, for example:

The system presents the user with a superset of controllable devices and the user can zoom in to the right set. For example, all controllable lighting units within a certain range, particularly the wireless range of the AP 143, or with the physical location of the AP 143 are contained in the control configuration so that a user of the notebook 182 can select the units, which he wishes to control.

The system uses supporting information to decide on the right subset of devices that it binds to the control application running on the notebook of the user. Such supporting information can be

The ID of the user, for example a login of the user on the notebook 182.

Signal Strength of the wireless signal received from the notebook 182 by the AP 143.

Coded light emitted by some of the lamps in the space.

The invention may contain various refinements and extensions: for example, the system can manage the control of the actuators dynamically, so that e.g. a user can control all lights in his office, as long as he is alone. However, he can only control the task lights specific to his desk as soon as an office mate has connected his note book to the network. This will facilitate the sharing of an office.

The present invention may form the basis of a software service in which software is provided to support the described roaming service, e.g. for an office environment in which IP based lighting networks have already been installed. For the owner of the office, such software could be a cost attractive solution to provide the user advanced control of the lighting system, and overcomes the need to purchase (and install) more dedicated switches and user interfaces to control the light. For the user, it is convenient to have one UI which adapts itself to the available lights in the environment, so that he or she does not have to deal with a multiple of
user interfaces. Also, such an interface need not be confined to lights, but could also include e.g. blinds, projectors, HVAC functions further increasing the benefits for both the office owner and the office user.

The present invention can be applied to all kind of building automation systems and enables an improved control in that the user interface for a building automation system on a control computer may be adapted to the location of the control computer. Thus, the present invention may be applied to create a roaming control service for building automation systems, for example IP-based lighting control systems.

At least some of the functionality of the invention may be performed by hard- or software. In case of an implementation in software, a single or multiple standard microprocessors or microcontrollers may be used to process a single or multiple algorithms implementing the invention.

It should be noted that the word "comprise" does not exclude other elements or steps, and that the word "a" or "an" does not exclude a plurality. Furthermore, any reference signs in the claims shall not be construed as limiting the scope of the invention.
CLAIMS:

1. A building automation system (10) comprising
   - a plurality of controllable electronic devices (121-121),
   - a network (14) for connecting the controllable electronic devices,
   - a plurality of networking devices (141, 142, 143),
   - a first database comprising (161) associations of the networking devices with physical locations,
   - a second database (162) comprising associations of physical locations with controllable electronic devices of the building automation system, and
   - management means being configured
     —to detect a control computer (18) connected to the network via a networking device,
     -- to assign a physical location to the control computer by means of the first database, and
     -- to provide the control computer with a control configuration for controllable electronic devices queried from the second database based on the assigned physical location.

2. The system of claim 1, wherein the provided control configuration comprises
   - a set of controllable electronic devices being provided for control by the control computer and
   - network addresses of each device of the set of controllable electronic devices.

3. The system of claim 2, wherein the management means are configured to create a set of controllable electronic devices for the control configuration by selecting controllable electronic devices from the queried controllable electronic devices depending on
   - a room identification of the controllable electronic devices,
   - a building identification of the controllable electronic devices,
   - coordinates of the controllable electronic devices, and/or
   - access control identification of the controllable electronic devices.

4. The system of claim 1, 2 or 3, wherein
   - the first database comprises associations of combinations of identifications of network
devices and port numbers of ports of the network devices with physical locations of the end points of network cables connected with the ports, and
- the management means are configured to assign a physical location to the control computer by
  - determining the identification of the networking device and the port number of the port of the networking device, with which the control computer is connected,
  - querying the first database by using the combination of port number and identification of the networking device for the physical location of the end point of the network cable connected with the port with the identified port number, and
  - assigning the queried physical location to the control computer.

5. The system of any of the preceding claims, wherein
  - the first database comprises associations of identifications of network devices with physical locations of the network devices, and
  - the management means are configured to assign a physical location to the control computer by
    - determining the identification of the networking device, with which the control computer is connected,
    - querying the first database by using the identification of the networking device for the physical location of the networking device, and
    - assigning the queried physical location to the control computer.

6. The system of claim 5, wherein the management means are configured to provide the control computer with a control configuration for controllable electronic devices queried from the second database system based on the assigned physical location by
  - selecting controllable electronic device from the queried controllable electronic devices based on an identification of the control computer, a signal strength of a wireless network connection between the control computer and a wireless access point of the network, and/or coded light emitted by one or more lamps of the building automation system.

7. The system of any of the preceding claims, wherein
  - the network is an IP-based networked,
  - the electronic devices have network interfaces with MAC addresses,
  - the networking devices are OSI-Layer-2 and/or OSI-Layer-3 networking devices.
8. The system of any of the preceding claims, wherein the first and second database are particularly periodically merged to a single database and the management means use the single database to assign a physical location to the control computer and to provide the control computer with a control configuration for controllable electronic devices.

9. A computer (16) being configured to implement database services for application with a system of any of the claims 1 to 8, wherein the computer comprises:
- a first database (161) comprising associations of networking devices of a building automation system with physical locations,
- a second database (162) comprising associations of physical locations with controllable electronic devices of the building automation system, wherein the computer is configured
- to receive requests for queries for the first and/or second database over a network (14) of the building automation system and to transmit results of queries over the network to the requesters.

10. A control computer (18) for a building automation system of any of the claims 1 to 8, wherein the control computer is configured
- to connect to a network (14) of the building automation system,
- to receive a control configuration for controllable electronic devices (121-121 1) of the building automation system, and
- to create and display a control interface for the controllable electronic devices based on the received control configuration.

11. The computer of claim 9 or 10, further comprising
- management means being configured
  -- to detect (SI2) that a control computer (18) is connected to the network (14) via a networking device (141),
  -- to query a first database (161) in order to obtain a physical location of the detected control computer (SI 4),
  -- to query a second database (162) in order to receive controllable electronic devices (SI 6), and
  -- to create a control configuration for the received controllable electronic devices (SI 8).
12. A method for providing a control configuration for a building automation system of any of the claims 1 to 8, wherein the method comprises the following steps:
- detecting a control computer connected to a network of the building automation system via a networking device of the building automation system (S12),
- querying a physical location from a first database (SI4), which comprises associations of networking devices of the building automation system with physical locations,
- assigning the queried physical location to the control computer (S141),
- querying a control configuration for controllable electronic devices of the building automation system from a second database (SI6, S161), which comprises associations of physical locations with controllable electronic devices of the building automation system, based on the assigned physical location, and
- providing the queried control configuration to the control computer (SI8).

13. A computer program enabling a processor to carry out the method according to claim 12.

14. A record carrier storing a computer program according to claim 13.

15. A computer programmed to perform a method according to claim 12.
### FIG. 2

<table>
<thead>
<tr>
<th>Router-ID</th>
<th>Port-ID</th>
<th>Phys. location</th>
</tr>
</thead>
<tbody>
<tr>
<td>141</td>
<td>1</td>
<td>Office x1,y1</td>
</tr>
<tr>
<td>141</td>
<td>2</td>
<td>Office x2,y2</td>
</tr>
<tr>
<td>141</td>
<td>3</td>
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### FIG. 3

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FIG. 4

S10 - Notebook boots

S12 - Notebook address associated with switch-ID/port-ID

S14 - Data base query to associate location with notebook address

S16 - Data base query to associate control configuration with notebook address

S18 - Control configuration entered into user interface on notebook

Data base 1: Switch-ID/port-ID -> location

Data base 2: location -> lamp ID
### A. CLASSIFICATION OF SUBJECT MATTER

INV. G05B15/00 H04L12/28 H04W64/00

### ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

### B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G05B H04L H04W

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, WPI Data

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

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  * "A" document defining the general state of the art which is not considered to be of particular relevance
  * "E" earlier document but published on or after the international filing date
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Date of the actual completion of the international search: 18 April 2012
Date of mailing of the international search report: 02/05/2012

Name and mailing address of the ISA/European Patent Office, P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk
Tel.: (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer: Jui Ilo, Olivier J.
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