

Description

Technical Field

[0001] Various examples of the disclosure generally pertain to a wireless communications network of luminaires. Various examples of the disclosure specifically pertain to a method for setting up a network of luminaires and to the corresponding entity configured to set up the network.

Background

[0002] Recently, the use wireless networks comprising a plurality of luminaires is proliferating. Furthermore, wireless communication networks for controlling the luminaires are known. For instance, luminaires can be wirelessly controlled to switch on or switch off or activate certain brightness levels.

[0003] However, due to the widely varying deployment scenarios that are observed, it has been observed that the setting up of the network of luminaires is a time-consuming and error-prone task.

Summary

[0004] Accordingly, a need exists for advanced techniques of setting up a network of luminaires.

[0005] This need is met by the features of the independent claims. Further aspects are described in the dependent claims.

[0006] According to a first aspect a method for setting up a network of luminaires is provided wherein a set up entity carries out the steps of detecting, using radio frequency identification, a radio frequency response signal from at least one luminaire. Furthermore, in the RF response signal, a luminaire identifier is determined which uniquely identifies the at least one luminaire. The set up entity determines device information for the at least one luminaire based on the determined luminaire identifier and adds the at least one luminaire to the network of luminaires based on the determined device information.

[0007] The above method facilitates the luminaire provisioning and identification for setting up the network. The RF response including the luminaire identifier helps to uniquely identify the luminaire and if the device information is determined, either from the set up device or from a database, the device information provides the required information needed to set up the luminaire in the network of luminaires. Furthermore, the RF identifier may contain additional information that allows the adding of the luminaire to the network without the need to query information from the database.

[0008] It is possible that the device information comprises, for each of the at least one luminaire, at least the unique luminaire identifier allowing the at least one luminaire being identified and addressed in the network of luminaires. The at least one luminaire is then added to

the network using the retrieved device information, a network address is determined and the luminaire is added to the network with the network address and the luminaire identifier. With the unique luminaire identifier information it is possible to find the luminaire by network scanning and give the luminaire a new network address and to transmit control data to the luminaire allowing the controlling of the luminaire in the network. Such device information can be a unique device ID (UUID), HW MAC address or another unique device identifier.

[0009] Furthermore it is possible that a position of the at least one luminaire is determined and the luminaire is added to the network of luminaires with the determined position. As luminaires are normally fixedly installed at defined positions, it can be advantageous to precisely know the position of the luminaire in space or in the environment where the luminaire is located, be it a building, a place outside a building, premises etc.

[0010] The at least one luminaire may be added with the determined position to a floor plan which indicates the position of several luminaires present in the network and which then also contains the newly determined luminaire at the determined position.

[0011] The positioning of the luminaire may be obtained with determining the position of the set up entity and the determining of the position of the luminaire relative to the set up entity. In this example the luminaire does not have to provide position data, but it is nevertheless possible to determine the position of the luminaire using the position of the set up device and the position of the luminaire relative to the set up device.

[0012] The device information that is retrieved from the RF response signal may contain authentication data allowing the identified at least one luminaire to be authenticated. The at least one luminaire may then be added to the network of luminaires after the at least one luminaire has been authenticated using the authentication data. Here the device information retrieved from the database also helps to correctly authenticate the luminaire in order to make sure that only desired and authenticated luminaires are added to the network.

[0013] The RF response signal may be a response signal transmitted from an RFID transmitter provided at the at least one luminaire wherein this RF response signal is detected by an RFID unit provided at the set up entity.

[0014] Furthermore it is possible that the determined position of the least one luminaire is displayed on a display of the set up entity, and the adding of the at least one luminaire is only confirmed when a user of the set up entity has confirmed the displayed position.

[0015] The device information as determined may contain product information with operating parameters of the corresponding luminaire to be operated correctly and safely.

[0016] Furthermore it is possible to scan the already existing network of luminaires and the luminaires should respond with the unique ID (the luminaire identifier) which is the same as in the RFID response signal so that the

mapping with the unique ID and the network address is possible.

[0017] Additionally the corresponding set up entity is provided operating as discussed above or as discussed in further detail below which comprises an RF unit which is configured to detect the radio frequency signal from the at least one luminaire. The set up entity furthermore comprises a control unit which is configured to determine the luminaire identifier uniquely identifying the at least one luminaire present in the RF response signal, retrieve from a database device information for the at least one luminaire based on the determined luminaire identifier and is configured to add the at least one luminaire to the network of luminaires based on the determined device information.

[0018] The set up entity is configured to operate as discussed above or as discussed in further detail below.

[0019] It should be understood that the features mentioned above and those yet to be explained below may be used not only in the respective combinations indicated, but also in other combinations or in isolation without departing from the scope of the invention.

Brief description of the drawings

[0020]

Fig. 1 schematically illustrates how a network of luminaires is set up using a set up entity with an RFID unit.

Fig. 2 shows a schematic view of a set up unit detecting luminaires using RFID technology and a database with configuration data.

Fig. 3 schematically shows a message exchange between involved entities for setting up a network of luminaires.

Fig. 4 shows a schematic flowchart of a method carried out by the set up entity to set up the network of luminaires.

Fig. 5 shows a schematic view of a set up entity involved in setting up the network of luminaires.

Detailed Description

[0021] In the following, embodiments of the invention will be described in detail with reference to the accompanying drawings. It is to be understood that the following description of embodiments is not to be taken in a limiting sense. The scope of the invention is not intended to be limited by the embodiments described hereinafter or by the drawings, which are taken to be illustrative only.

[0022] The drawings are to be regarded as being schematic representations and elements illustrated in the drawings are not necessarily shown to scale. Rather, the

various elements are represented such that their function and general purpose become apparent to a person skilled in the art. Any connection or coupling between functional blocks, devices, components, or other physical or functional units shown in the drawings or described herein may also be implemented by an indirect connection or coupling. A coupling between components may also be established over a wireless connection. Functional blocks may be implemented in hardware, firmware, software, or a combination thereof.

[0023] Some examples of the present disclosure generally provide for a plurality of circuits or other electronic devices and processors. All references to the circuits and other electronic devices and the functionality provided by each are not intended to be limited to encompassing only what is illustrated and described herein. While particular labels may be assigned to the various circuits or other electronic devices disclosed, such labels are not intended to limit the scope of operation for the circuits and the other electrical devices. Such circuits and other electronic devices may be combined with each other and/or separated in any manner based on the particular type of electrical implementation that is desired. It is recognized that any circuit or other electronic device disclosed herein may include any number of microcontrollers, a graphics processor unit (GPU), integrated circuits, memory devices (e.g., FLASH, random access memory (RAM), read only memory (ROM), electrically programmable read only memory (EPROM), electrically erasable programmable read only memory (EEPROM), or other suitable variants thereof), and software which co-act with one another to perform operation(s) disclosed herein. In addition, any one or more of the electrical devices may be configured to execute a program code that is embodied in a non-transitory computer readable medium programmed to perform any number of the functions as disclosed.

[0024] In the following a method is explained in more detail how in a wireless network a secure and reliable method is obtained for joining or provisioning luminaires to a wireless or wired network of luminaires. The method discussed below especially facilitates the luminaire provisioning, identification and localization of luminaires during installation.

[0025] Fig. 1 schematically shows an overview how a setup entity 100 can detect a plurality of luminaires 10, 20 using RFID tags 11 or 21 connected to the luminaires. Furthermore a system database 200 comprising configuration data is provided which can be accessed by the set up entity 100 through a network 300. The network can include networks such as Local Area Network, LAN, networks, wireless networks, cellular networks etc. A user of the set up entity 100 has the set up entity which can be a portable device comprising an RFID unit or scanner 140 having a long-range RFID transmitter. In the embodiment shown each of the luminaires has a connected RFID tag such as tags 11 or 21 wherein the tag 11 or 21 may be a passive or active RFID tag. Each of the RFID

tags has a unique ID, a luminaire identifier, which may have been programmed and/or annotated in the luminaire factory assembly. The luminaire identifier is also stored in an optional database 200 which is a product database comprising configuration data which contains different data sets, wherein each dataset comprises, for each of the luminaires device information for each luminaire containing also the luminaire identifier and additional information including product information with operating parameters needed to correctly operate the luminaire and/or data such as, authentication information or data allowing the identified luminaire to be authenticated, passwords which may be needed to activate a luminaire etc.. The device information allows the luminaire to be operated and controlled in a correct way such as the operating voltage so that it is possible to drive the luminaire with the correct operating parameter providing a desired amount of light. The database 200 with the different data sets for luminaires, contains all the relevant information about the luminaires such as the provisioning and the manufacturing information, a MAC, media access control address, a driver information needed to drive the luminaire such as an LED.

[0026] The set up entity 100 can access the database 200 using a wireless or wired connection to a network 300 where an edge component 310 such as a simple smartphone and a cloud component 320 of the network is shown. The set up entity 100 comprises an RF unit 140 which is emitting an RFID signal and the RFID tags 11 or 21 respond to the emitted signal with a response signal including the unique identifier of the luminaire. The set up entity scans its environment within a distance of several meters and using the detected RFID signals and the database 200 it is possible to determine the configuration data of the corresponding luminaire needed to add the detected luminaire to a network of luminaires. As each luminaire is identified by unique identifier, it is possible to uniquely identify the configuration data in the database 200. Using the information from the database the user can then add the identified and detected luminaire to a network of luminaires. Preferably the luminaire is added to the network with the location of the luminaire. Each set up device 100 can be configured to determine its position in space, using a satellite based signal such as GPS or using any other positioning method with or without input from a user of the set up entity. By way of example the set up device 100 may be part of a cellular phone connected to a cellular network and the cellular phone or user equipment, UE, may be identified using information provided by the cellular network. Furthermore, based on the received RFID signals the set up entity 100 is able to determine the position from where the RFID signal is received. The angle of arrival method can be used for calculating in which direction the tag is located. The set up device may have at least 4 antennas in rectangular format to obtain 2 dimensional accuracy. For estimating the distance to the tag, RSSI (Received Signal Strength Indication) or speed of light can be used.

A further solution is to only use the RSSI with multiple receiver antennas in the set up device and estimate the angle of arrival based on the RSSI values on different antennas.

[0027] Fig. 1 furthermore shows a floor plan 400 of the environment in which the set up entity is provided comprising positions of the different luminaires, 10, 20, wherein each of the luminaires is symbolized a number reflecting the unique ID of the luminaire in the network. The set up entity 100 can contain a display 150 shown in Fig. 5 where the floorplan 400 can be displayed. When a luminaire such as a luminaire 10 or 20 is identified based on the RFID signal and the device information is fetched from the database 200 and the position of the luminaire is determined, the luminaire can be displayed in the corresponding floor plan at the determined position. The location in which the set up entity is provided may contain an indoor positioning system which can allow the user of the set up entity to locate the set up entity. The positioning of the set up entity 100 in the floor plan may be done by the user or may be automatically done when the position is known.

[0028] Fig. 2 shows a more detailed view how the RF unit 140 of the setup entity 100 detects RFID signals from the different RFID tags such as tags 11, 21, 31, 41 or 51 connected to the corresponding luminaires 10, 20, 30, 40 or 50. Based on the angle of the received signal the set up entity is configured to determine the position of the different luminaires relative to the set up entity 100. The estimated angle and distance may be combined with the floor plan information including relative luminaire positions in order to identify and link the real luminaire to the one on the floor plan. The algorithm may run on the device or on a cloud service. The detected RFID signal contains the luminaire identifier and by accessing the database 200 over the network 300, it is possible to retrieve device information of the luminaire.

[0029] In the following two main scenarios are discussed in more detail. In the first scenario the luminaires are not yet provisioned in the network and need to be provisioned by using the set up entity 100 which plays the role of a commissioning device. In a first step a user connects the set up entity 100 or commissioning device to network 300 which has connectivity to the system database 200. In a second step the user may determine and point the current location on the floor plan 400 or the set up entity determines its position without the help of the user. The set up entity 100 may use inertial sensors, wireless signals or any other technology for indoor positioning. In a third step the RFID scanning process is started and the set up entity may display the found luminaires and other devices with the estimated positions. In this context it is possible that each of the found luminaires may be presented on the display and blink for user feedback. In a further step the user can confirm that the identified luminaires can be commissioned. The set up entity 100 then connects to the database 200 and queries the information about the luminaires. The user can select the

provisioning method and confirms that the setup is qualified for the selected method. The set up entity 100 may connect to a system including the database using a wireless or wired connection using TCP/IP. The RFID signal received contains a luminaire identifier and using the identifier, device information for the luminaire is determined. The device information may be provided on the set up device or may be provided in the database 200. Furthermore it is possible that the set up entity 100 provides authentication information during the luminaire provisioning process such as certificates. In the next step after the luminaires have been provisioned and identified the location of the luminaire and any information related to the luminaire can be sent back to a central system including the database 200. The commissioning is finished and the luminaires are identified and located on the floor plan. The user can continue the above process while moving to another location on the floor plan.

[0030] Furthermore, as a second scenario it is possible that the luminaires have already been provisioned so that it is known that the luminaires exist. As in the first scenario the set up entity 100 scans the environment and displays the found luminaires wherein the set up entity connects to the database 200 and queries the information about the luminaires with the found unique identifiers. The database 200 has the luminaire information such as the tag ID, provisioning and manufacturing information and any other information such as, the controller or the LED driver address etc.. In the next step the user can then confirm the provided information or may verify whether the luminaire position is correct by confirming the indicated position. As the luminaires have already been commissioned the set up entity may just send the luminaire location information with the tag ID to the data base 200 which means that the information for the database is confirmed or updated based on the information received. The user can then move to the next position and repeat the process of the second scenario.

[0031] During the production process of the luminaire the RFID tag may be added to the luminaire and the product and the particular device information can be stored in the RFID tag. The tag may be placed on the luminaire in the assembly line and the RFID tag information such as the unique identifier is written into the database 200.

[0032] Fig. 3 shows a message flow between the involved entities. In step S31 a factory tool reads the configuration data of the luminaire such as the unique ID, or any other information needed to control the corresponding luminaire from the luminaire such as the LED driver hardware address, so that this information is received at the factory tool in step S32. Accordingly configuration data is requested from the luminaire in S31 and the requested configuration data is received in step S32. In the same way the unique identifier is requested from the RFID tag in steps S33 and S34. In step S35 the collected information from steps S31-S34 is stored in the RFID tag of the luminaire, and in S36 the configuration data of the luminaire is provided to database 200 where for each

luminaire a data set is stored in step S37 comprising the collected information together with any extra data that may be needed to add the luminaire to the network. During use the set up entity 100 scans the environment using the RFID unit so that the RFID signal is transmitted in step S38 with the RFID response being received in step S39 containing the unique identifier provided in the RF signal. Using the unique identifier the set up entity accesses in step S39 to database 200 to retrieve the configuration data of the corresponding luminaire. In step S40 the position of the detected luminaire is determined, wherein different options exist how this position is obtained, as will be discussed further below. Based on the received luminaire identifier received in step S39, device information is retrieved from the database 200 in step S41. In step S42 the device is provisioned meaning that a network address with which the luminaire can be addressed in the network is determined and related properties are given to the device which enables a communication in the network to reach the luminaire. In step S43 the luminaire is added to the network which can mean that additional information such as a software version of information related to licensing is stored in a database together with the network address. The network information can be stored in a different database compared to the database or factory tool used during manufacturing, e.g. in the commissioning or set up device, edge device or cloud service. Once the luminaire is provided to the network, the luminaire can be controlled via the network in a further step not shown.

[0033] Fig. 4 summarizes some of the steps carried out during the process discussed above. In step S51 the set up entity 100 detects the radio frequency signals received from the different RFID tags and in step S52 the unique identifier is identified in the received RFID signal. Using this unique identifier the device information can be determined in S53, wherein the device information can include any other provisioning information or information about a security method used to authenticate and add a luminaire to the network. In step S54 the luminaire is then added to the network with the determined information retrieved from the database. The adding of the luminaire to the network can also include determining a network address of the luminaire in the network and to provide the network address also to the luminaire, so that it is possible to address the added luminaire with the determined address. Determining in the steps mentioned above can mean fetch, retrieve, read or obtain in any way.

[0034] Fig. 5 shows a schematic view of the set up entity 100 which is involved in the embodiments discussed above. The set up entity may be a stand-alone unit or may be implemented in a user equipment or tablet connected to a cellular network and comprises an interface 110 configured to receive data from other entities and to transmit data or control messages to other entities. The interface may represent the possibility to transmit RFID signals and to receive RFID signals generated by RFID unit 140. Entity 100 furthermore comprises a

processing unit 120 which is responsible for the operation of the entity 100. The processing unit 120 can comprise one or more processors and can carry out instructions stored on a memory 130 wherein the memory may include a read-only memory, a random access memory, a mass storage, a hard disk or the like. The memory can furthermore include suitable program code to be executed by the processing unit 120 so as to implement the above-described functionalities. The processing unit 120, the interface 110 and memory 130 can be part of a control unit 105 configured to control the operation of the set up entity 100. In addition display unit 150 can be provided which can be used to display the floor plan and the identified luminaires.

[0035] Summarizing the following clauses have been disclosed:

Clause 1. A method for setting up a network of luminaires, comprising at a set up entity:

- detecting, using radio frequency identification, a radio frequency, RF, response signal from at least one luminaire,
- determining a luminaire identifier uniquely identifying the at least one luminaire present in the RF response signal,
- retrieving, device information for the at least one luminaire based on the determined luminaire identifier,
- adding the at least one luminaire to the network of luminaires based on the determined device information.

Clause 2: The method of clause 1, wherein the device information retrieved from the database comprises, for each of the at least one luminaire, at least the unique identifier wherein adding the at least one luminaire to the network comprises determining a network address of the at least one luminaire allowing the at least one luminaire to be addressed in the network of luminaires, and adding the at least one luminaire to the network with the determined network address.

Clause 3: The method of clause 1 or 2, further determining a position of the at least one luminaire and adding the at least one luminaire to the network of luminaires with the determined position.

Clause 4: The method of clause 3, wherein adding the at least one luminaire with the determined position comprises adding the at least one luminaire with the determined position to a floorplan indicating the positions of a plurality of luminaires present in the network of luminaires.

Clause 5: The method of clause 3 or 4, wherein determining the position of the at least one luminaire

comprises determining the position of the set up entity and determining the position of the at least one luminaire relative to the set up entity.

Clause 6: The method of any preceding clause, wherein the device information contains authentication data allowing the identified at least one luminaire to be authenticated, wherein the at least one luminaire is added to the network after the at least one luminaire has been authenticated using the authentication data.

Clause 7: The method of any preceding clause, wherein the RF response signal is a signal transmitted from an RFID transmitter provided at the at least one luminaire and is detected by an RFID unit at the set up entity.

Clause 8: The method of any of clause 3 to 7, further displaying the determined position of the at least one luminaire on a display of the set up entity, wherein adding of the at least one luminaire is only confirmed when a user of the set up entity has confirmed the displayed position.

Clause 9: The method of any preceding clause, wherein the device information is retrieved from a database.

Clause 10: The method of any preceding clause, wherein the device information further comprises product information with operating parameters of the corresponding luminaire allowing the luminaire to be operated.

Clause 11. The method of clauses 2 to 10, further comprising:

- scanning the network of luminaires, the network including the luminaires that have already been added to the network,
- receiving, from at least one of the luminaires already added to the network, a scanning response including identification information for the at least one luminaire,
- mapping the identification information to the luminaire identifier and the network address to identify the at least one luminaire, from which the scanning response is received.

Clause 11. A set up entity (100) configured to set up a network a network of luminaires, the set up entity comprising:

- an RF unit (140) configured to detect a radio frequency signal from at least one luminaire using radio frequency identification, the RF response signal comprising a luminaire identifier

- uniquely identifying the at least one luminaire, a control unit (105) configured to

- determine the luminaire identifier uniquely identifying the at least one luminaire present in the RF response signal,
- determine, device information for the at least one luminaire based on the determined luminaire identifier, and
- add the at least one luminaire to the network of luminaires based on the determined device information.

Clause 12: The set up entity of clause 11, wherein the device information comprises, for each of the at least one luminaire, the unique identifier, wherein the control unit is configured, for adding the at least one luminaire to the network, to determine a network address of the at least one luminaire allowing the at least one luminaire to be addressed in the network of luminaires, and to add the at least one luminaire to the network with the determined network address.

Clause 13: The set up entity of clause 11 or 12, wherein the control unit is configured to determine a position of the at least one luminaire and adding the at least one luminaire to the network of luminaires with the determined position.

Clause 14: The set up entity of clause 13, wherein the control unit is configured to determine the position of the set up entity and to determine the position of the at least one luminaire relative to the set up entity.

Clause 15: The set up entity of any of clauses 10 to 14, wherein RF unit comprises an RFID unit configured to emit an RF transmit signal and to receive, in response to the emitted RF transmit signal the radio frequency response signal.

Clause 16: The set up entity of any of clause 10 to 15, further comprising a display configured to display the determined position of the at least one luminaire, wherein the control unit is configured to only confirm the adding of the at least one luminaire, if a user of the set up entity has confirmed the displayed position.

Claims

1. A method for setting up a network of luminaires, comprising at a set up (100) entity:

- detecting, using radio frequency identification, a radio frequency, RF, response signal from at least one luminaire,

- determining a luminaire identifier uniquely identifying the at least one luminaire present in the RF response signal,
- determining, device information for the at least one luminaire based on the determined luminaire identifier,
- adding the at least one luminaire to the network of luminaires based on the determined device information.

2. The method of claim 1, wherein the device information comprises, for each of the at least one luminaire, the luminaire identifier, wherein adding the at least one luminaire to the network comprises determining a network address of the at least one luminaire allowing the at least one luminaire to be addressed in the network of luminaires, and adding the at least one luminaire to the network with the determined network address and the luminaire identifier.

3. The method of claim 1 or 2, further determining a position of the at least one luminaire and adding the at least one luminaire to the network of luminaires with the determined position.

4. The method of claim 3, wherein adding the at least one luminaire with the determined position comprises adding the at least one luminaire with the determined position to a floorplan indicating the positions of a plurality of luminaires present in the network of luminaires.

5. The method of claim 3 or 4, wherein determining the position of the at least one luminaire comprises determining the position of the set up entity and determining the position of the at least one luminaire relative to the set up entity.

6. The method of any preceding claim, wherein the device information contains authentication data allowing the identified at least one luminaire to be authenticated, wherein the at least one luminaire is added to the network after the at least one luminaire has been authenticated using the authentication data.

7. The method of any preceding claim, wherein the RF response signal is a signal transmitted from an RFID transmitter provided at the at least one luminaire and is detected by an RFID unit at the set up entity.

8. The method of any of claims 3 to 7, further displaying the determined position of the at least one luminaire on a display of the set up entity, wherein adding of the at least one luminaire is only confirmed when a user of the set up entity has confirmed the displayed position.

9. The method of any preceding claim, wherein the de-

vice information is retrieved from a database.

10. The method of any preceding claim, wherein the device information further comprises product information with operating parameters of the corresponding luminaire allowing the luminaire to be operated. 5
11. The method of claims 2 to 10, further comprising:
 - scanning the network of luminaires, the network including the luminaires that have already been added to the network, 10
 - receiving, from at least one of the luminaires already added to the network, a scanning response including identification information for the at least one luminaire, 15
 - mapping the identification information to the luminaire identifier and the network address to identify the at least one luminaire, from which the scanning response is received. 20
12. A set up entity (100) configured to set up a network a network of luminaires, the set up entity comprising:
 - an RF unit (140) configured to detect a radio frequency signal from at least one luminaire using radio frequency identification, the RF response signal comprising a luminaire identifier uniquely identifying the at least one luminaire, 25
 - a control unit (105) configured to 30
 - determine the luminaire identifier uniquely identifying the at least one luminaire present in the RF response signal,
 - determine device information for the at least one luminaire based on the determined luminaire identifier, and 35
 - add the at least one luminaire to the network of luminaires based on the determined device information. 40
13. The set up entity (100) of claim 12, wherein the device information comprises, for each of the at least one luminaire, the unique identifier, wherein the control unit is configured, for adding the at least one luminaire to the network, to determine a network address of the at least one luminaire allowing the at least one luminaire to be addressed in the network of luminaires, and to add the at least one luminaire to the network with the determined network address and the luminaire identifier. 45 50
14. The set up entity (100) of claim 12 or 13, wherein the control unit is configured to determine a position of the at least one luminaire and to add the at least one luminaire to the network of luminaires with the determined position. 55

15. The set up entity (100) of claim 14, wherein the control unit is configured to determine the position of the set up entity and to determine the position of the at least one luminaire relative to the set up entity.
16. The set up entity (100) of any of claims 12 to 15, wherein RF unit comprises an RFID unit configured to emit an RF transmit signal and to receive, in response to the emitted RF transmit signal the radio frequency response signal.
17. The set up entity (100) of any of claims 12 to 16, further comprising a display configured to display the determined position of the at least one luminaire, wherein the control unit is configured to only confirm the adding of the at least one luminaire, if a user of the set up entity has confirmed the displayed position.

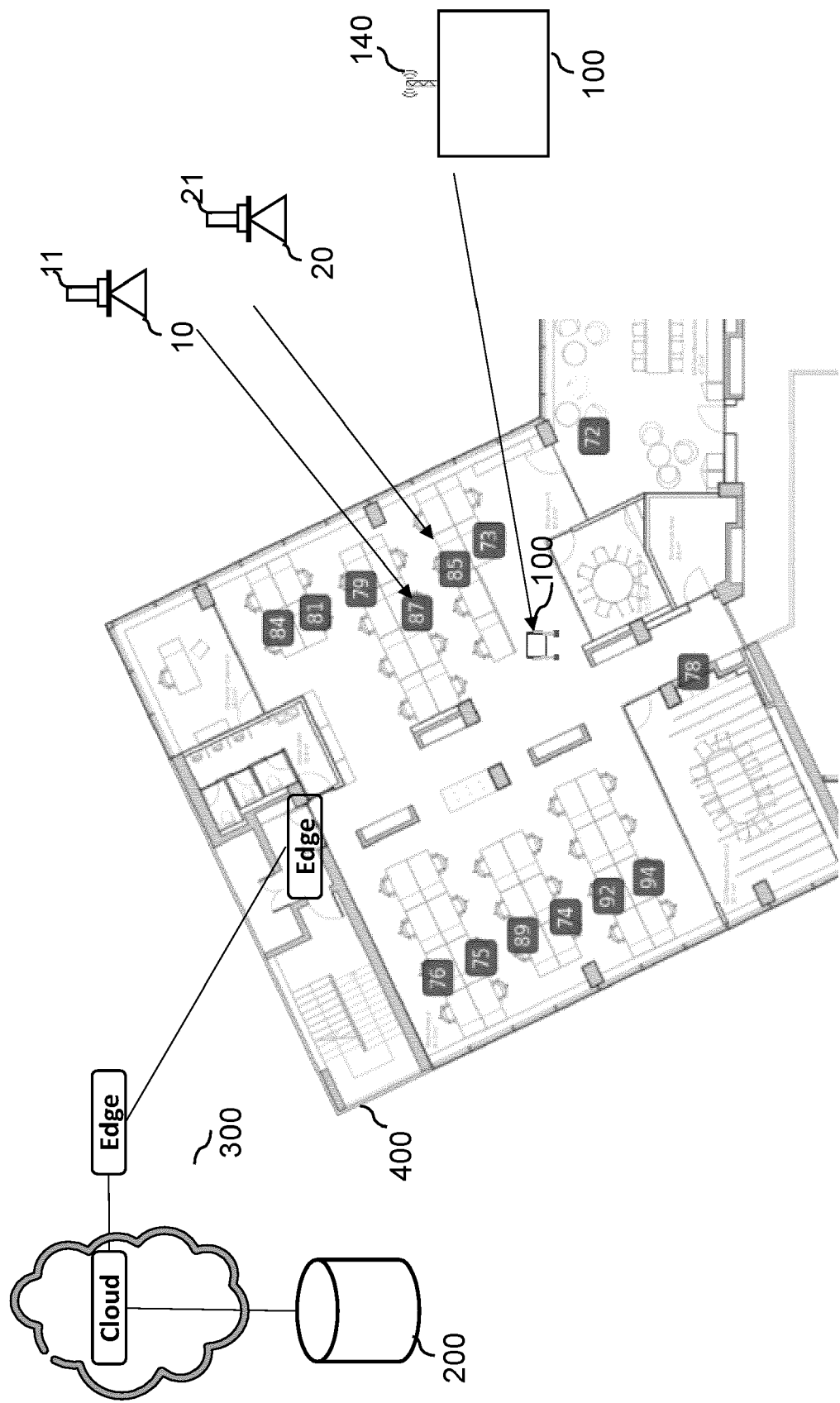
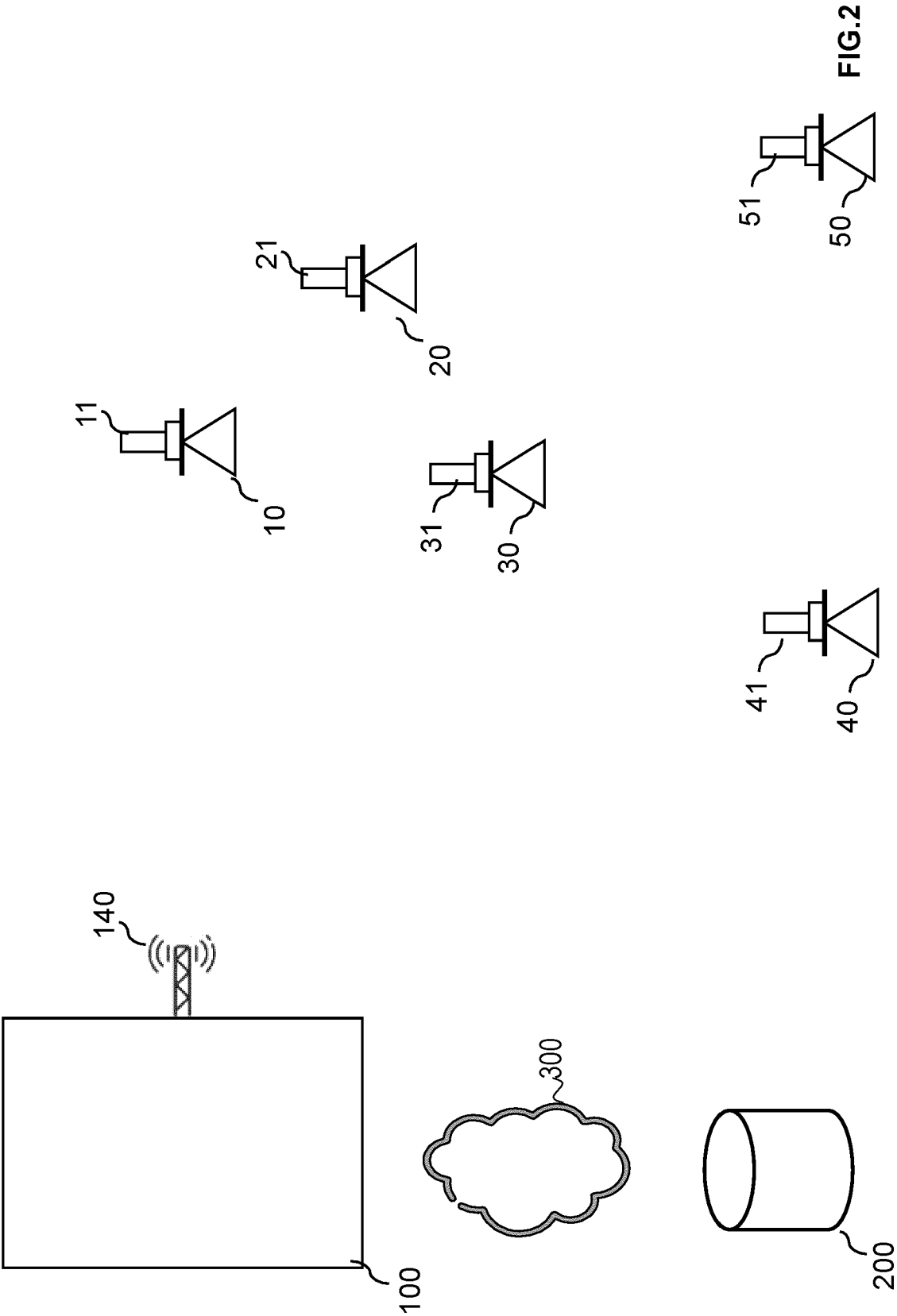


FIG.1



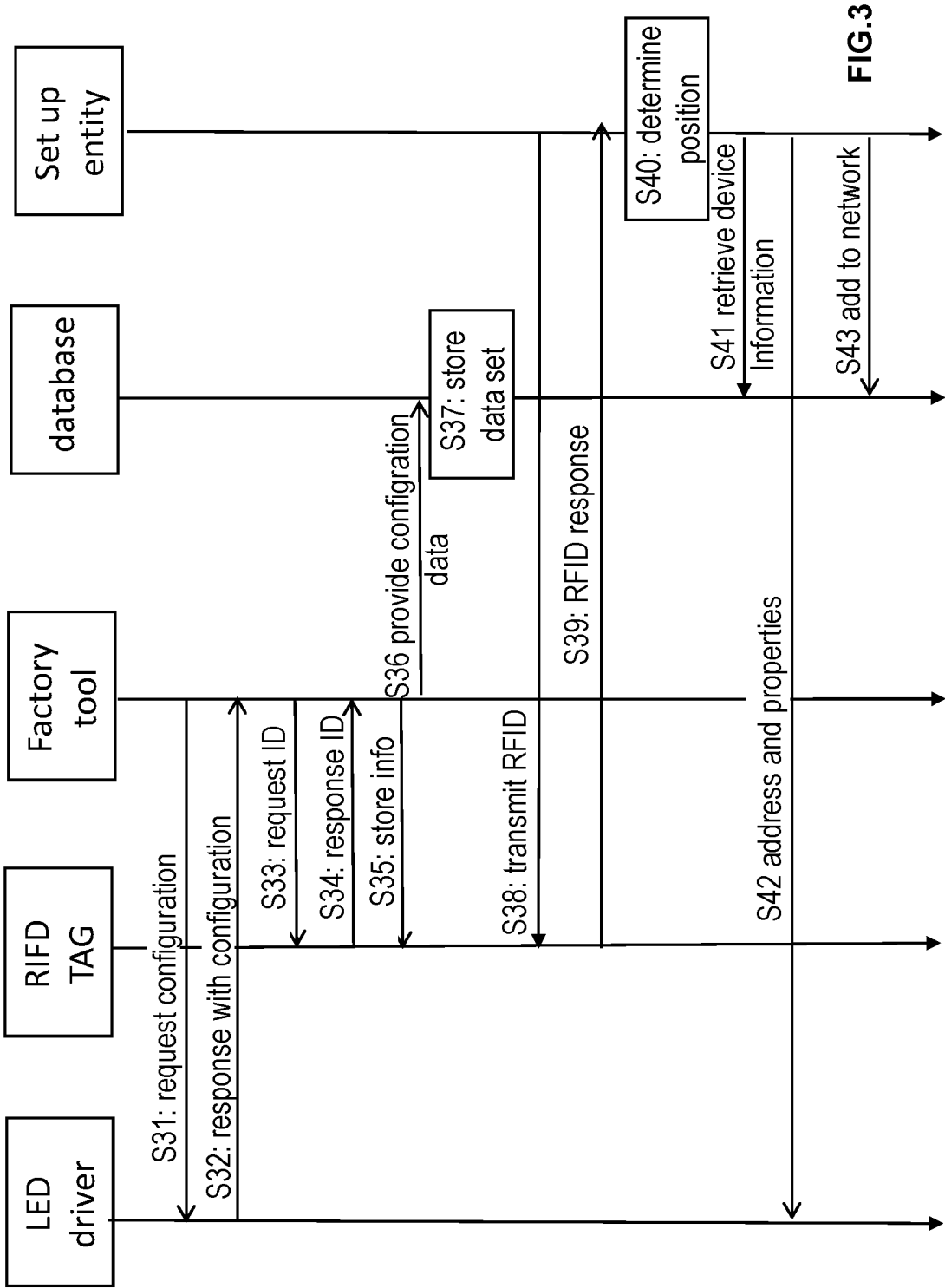


FIG.3

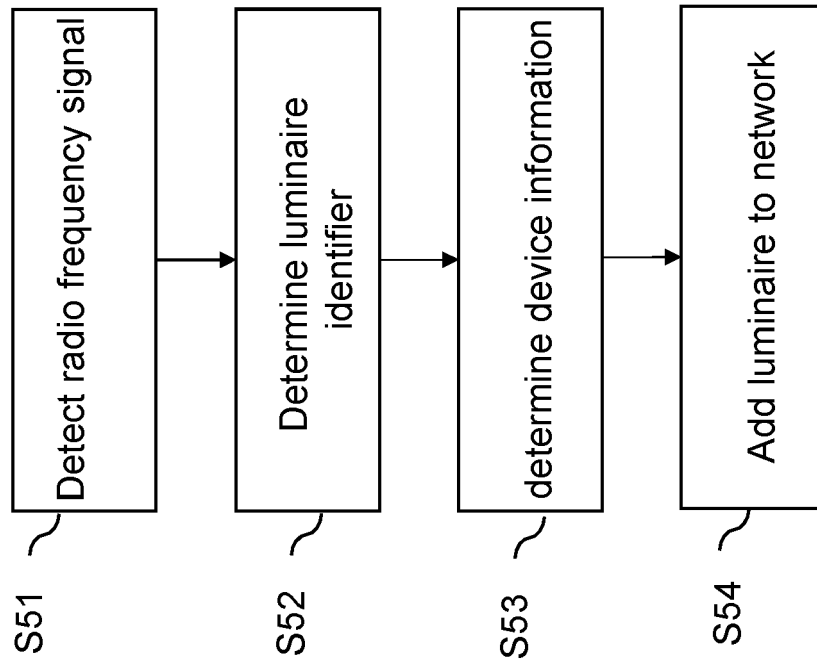


FIG.4

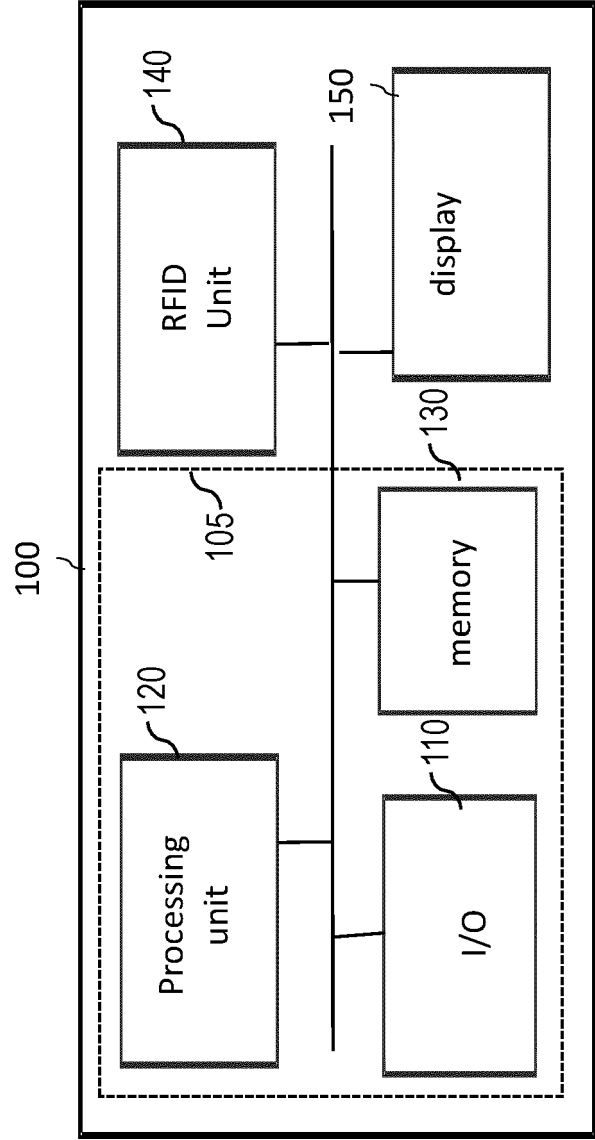


FIG. 5



EUROPEAN SEARCH REPORT

Application Number

EP 23 17 7947

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EPO FORM 1503 03.82 (P04C01)

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	US 10 346 657 B1 (ABL IP HOLDING LLC [US]) 9 July 2019 (2019-07-09) * column 1, line 47 - column 2, line 48 * * column 3, lines 26-61 * * column 21, lines 27-32 * * column 22, line 39 - column 23, line 3 * * claims 1,2 *	1-5, 7-17	INV. H05B47/19
X	US 2019/132930 A1 (PHILIPS LIGHTING HOLDING BV) 2 May 2019 (2019-05-02) * the whole document *	1-17	
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