

(19) **DANMARK**



Patent- og  
Varemærkestyrelsen

(10) **DK/EP 2073321 T3**

(12) **Oversættelse af  
europæisk patentskrift**

- 
- (51) Int.Cl.: **H 01 R 24/78 (2011.01)**
- (45) Oversættelsen bekendtgjort den: **2016-12-12**
- (80) Dato for Den Europæiske Patentmyndigheds bekendtgørelse om meddelelse af patentet: **2016-08-24**
- (86) Europæisk ansøgning nr.: **08021988.4**
- (86) Europæisk indleveringsdag: **2008-12-18**
- (87) Den europæiske ansøgnings publiceringsdag: **2009-06-24**
- (30) Prioritet: **2007-12-21 DE 102007063591**
- (84) Designerede stater: **AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MT NL NO PL PT RO SE SI SK TR**
- (73) Patenthaver: **Merten GmbH, Fritz-Kotz-Strasse 8, 51674 Wiehl, Tyskland**
- (72) Opfinder: **Vicktorius, Richard, Niehler Str. 193c, 50733 Köln, Tyskland**
- (74) Fuldmægtig i Danmark: **RWS Group, Europa House, Chiltern Park, Chiltern Hill, Chalfont St Peter, Bucks SL9 9FG, Storbritannien**
- (54) Benævnelse: **Installationsapparat**
- (56) Fremdragne publikationer:  
**EP-A2- 0 281 969**  
**EP-A2- 0 802 465**  
**WO-A1-2007/027063**  
**US-A1- 2003 050 737**



## Description

The invention relates to an installation device for building systems technology according to the preamble to Claim 1.

5

Electrical installation devices are employed in the context of building systems technology, both during initial installation and for retrofitting. It is often an important to be able to upgrade the respective installation device functionally. It has, for this reason, been found advantageous to create modular assemblies with which the existing device can be supplemented when required. A mains-powered installation device is known from the prior art, for example from EP 0 281 969 B1 wherein an assembly that functionally acts on the installation device in the form of overvoltage protection can be fastened to the rear side.

10

15

Document US2003/0050737 discloses a device according to the preamble to Claim 1.

20

In addition to conventional, wired, installation systems, there are systems in which data telegrams are transmitted wirelessly by means of radio signals from operating elements and sensors to load-switching actuators, which then supply the respective consuming unit with mains voltage through wires.

25

Special devices that are connected between consuming units and sockets for the determination of consumption data of a connected consuming unit are known. It is disadvantageous here that recording data relating to a room or building is extremely complex with this kind of non-central measuring point.

30

The object of the present invention is therefore to overcome the disadvantages mentioned above and to create an installation device, including a device system, which permits the convenient recording and control of usage data.

35

This object is achieved by the features given in Patent Claim 1. Advantageous developments emerge from the subsidiary claims.

5 The invention according to Claim 1 has the advantage that, through the connection of a wirelessly communicating module, installation devices with a fixed location that supply voltage can be upgraded when required in such a way that the exchange of data with the participants of a partial wireless system is  
10 enabled, and specific electrical parameters of individual consuming units at a device can be evaluated and controlled in a summarized manner.

This device is advantageously mounted at a central and easily  
15 accessible location, and fitted with a display unit, for example a display, and with operating elements. Various display modes exist here for visually displaying the consumption data. A particularly advantageous embodiment results from a summarized display of the data of individual  
20 consuming units, so that, for example, usage schemes related to the room or to the building are possible.

The operating elements furthermore permit remotely operable control of the parameters of individual consuming units, in  
25 order to define a specific consuming unit behaviour, in that, for example, threshold values that depend on magnitude or on time are specified at which specific visual displays are activated or the consuming unit is switched off.

30 The inputs, and the values specific to the consuming units, are converted into a data telegram, and transmitted wirelessly to the module. It is thus possible to react to changing consuming units at the consumption locations, in that settings specific to the consuming unit are predefined and stored.

35

In addition to recording the plain parameters, switching off the consuming unit by means of switching components, preferably relays, is possible. Recognition of the state of

the consuming unit is, moreover, possible, so that a distinction can be made between consuming units that are switched on or switched off, including a detection of faulty consuming units through evaluating the flow and return  
5 currents.

Consumption-dependent usage schemes can be implemented through the control facilities at individual consuming locations as mentioned above, and through the bringing together of data in  
10 one device. Signals that differ in colour can, for example, be generated depending on consumption, or the consumption costs can be displayed directly, as well as switching consuming units off depending on time and/or magnitude.

15 The electrical current and the electrical power are specific parameters of electrical consuming units, and these electrical magnitudes can thus preferably be determined and controlled using suitable measurement and switching components in the module. A particularly advantageous method of current  
20 measurement is achieved by means of Hall sensors which work without contact. The current is switched off by means of electronic relays. Processing components for the recorded parameters and for the modulation/demodulation of the data in radio signals are also integrated into the module. Threshold  
25 values, at which, for example, the module interrupts the flow of current to the consuming unit, can be defined with a programming logic. Suitable, preferably programmable, components are present for this purpose both in the module as well as in the wirelessly communicating devices.

30 Radio signals are preferably used for wireless transmission of data between the module and the further devices, since a largely secure transmission is ensured in the context of a building installation. Since the devices to be adapted  
35 constitute functionally independent assemblies, no changes are necessary at the installation device. In radio-based modules, an incoming mains voltage is converted into a suitable, lower voltage and/or other type of energy for the radio components.

Visually or acoustically acting components are optionally arranged, for the purpose, for example, of state messages.

As a rule, the adaption of this kind of wirelessly communicating module can be used in mains-powered installation devices, preferably sockets. The use in any other load-controlling actuator, such as for example in a separate switching actuator in a lamp with fixed wiring, is also conceivable. A covered installation and upgrade of existing installation devices is advantageously possible with little installation difficulty through the arrangement according to the invention. A permanent voltage supply is, moreover, enabled, so that temporary energy stores can be omitted.

The arrangement according to the invention can be implemented both in surface-mounted and in flush-mounted installations. An adaption to existing installation devices is not problematic, since an additional tap at the connecting terminals is possible at any time.

In one embodiment, the device is arranged on the rear side of the wired installation device, since adequate assembly space is available here. The use of a deep installation socket is advantageous for the installation, since easy assembly is then possible.

In installation devices of preferred design, a space-saving arrangement of the wirelessly operating device is possible. Through an advantageous component arrangement inside the existing structure of the device base, a receiving space is created here, so that the device can preferably be integrated into the device base, flush with the surface in a form-fitting manner. No additional space is needed in front of or behind the device base in order to arrange the device. A universally applicable installation device, which can be combined when necessary with a suitable device, is thus created. The generally present structure of device bases, in particular their dimensions and their fastening and contact points,

remain unchanged.

The formation of a receiving space, accessible from the front, inside the device base is particularly advantageous here, since the device base for the assembly does not then have to be removed from the installation housing. Only the corresponding front element has to be removed in order to be able to insert the device. A significant installation advantage results. In addition to this, function-specific front elements within a product series can continue to be used when exchanging an existing installation device.

The electric connection of the device is made indirectly to the supply voltage of the installation device, advantageously with a releasable technology, in particular by means of plugging, to the connecting terminals or contact elements of the installation device. Advantageously the contacting of the device occurs automatically during device assembly. The corresponding contact elements of the installation device and of the device to be adapted are arranged in a touch-protected manner. A non-releasable connection is, however, also conceivable.

One possible form of embodiment of the invention results from an electric socket with a module arranged at the rear of the device base and supplied with mains voltage by connecting terminals of the device base.

Further details, features and advantages of the invention emerge from the following description of a preferred exemplary embodiment with reference to the drawings.

Here:

Figure 1 shows schematically a device arrangement according to the invention with an installation device with a module arranged at the rear.

Figure 2 shows a further exemplary embodiment with a module arranged at the rear.

Figure 3 shows a further exemplary embodiment with a module  
5 arranged at the front.

Identical components or those that work in the same way are given the same reference numbers in the following description.

10 The structure and mode of operation of the invention is described schematically below in more detail at three alternatives with reference to a device arrangement 1. By way of example here, a first electric device 2 in the form of a socket is illustrated, which is fitted with a wirelessly  
15 communicating module 3, wherein the data transmission takes place by means of radio signals 14.

The device arrangement 1 comprises a first electrical device 2 that is fastened in an installation housing 4 which is fixed  
20 in a fixed position in a building wall 5. The device 2 comprises a device base 6 surrounded on the outside by a supporting frame 7 which permits the fastening of the device 2 in the installation housing 4. A function-specific front element 8, which may have one or more parts, depending on the  
25 application, is fastened to the front side. Connecting terminals 9 and metal contact elements connected to them, into the front side of which the plug pins of a device plug, not illustrated, are pushed, are arranged in the device base 6. An earthing strap is also arranged in the device base 6, and is  
30 used to make front-side contact with a grounding contact of the device plug. A supply line 10 laid on the wall side supplies the device 2 with the mains voltage, wherein the individual lines 11 are fixed releasably in the connecting terminals 9.

35

A radio-based partial system is additionally schematically illustrated, to which, in addition to devices 12 and 13, the module 3 also belongs, between which data telegrams are

exchanged by means of radio signals 14. The data telegram contains, along with other data, parameters of the consuming unit connected to the device 2. Measuring and technical circuit components, which permit a measurement of current and/or power, as well as a switching off of the current flowing through the device 2 for the connected consuming unit, such as Hall sensors and relays, are arranged in the module 3. Processing components for the recorded parameters and for the modulation/demodulation of the data in radio signals are also integrated. The data of the module 3 and of the device 13 is evaluated in the device 12, and visually displayed through an operating and display unit. Threshold values dependent on time and/or magnitude can be defined with a program logic with which, on the one hand, specific display options can be activated and, on the other hand, the module 3 interrupts the flow of current to consuming units. Suitable, preferably programmable, components are present for this purpose both in the module 3 as well as in the device 12.

The device 3 is arranged in a free space 15 in the installation housing 4 behind the device 2. The device 3 is releasably connected through connecting contacts 16 to the connecting terminals 9 of the installation device 2, and thus also connected to the supply network. Various electronic components are arranged in the device 3, with which a transformation of the incoming mains voltage into a suitable supply voltage for the radio components is implemented. Through the arrangement at the installation device 2, the corresponding line installation and the mains voltage can also be used, and separate installation work is not required. In addition, no protruding and visually disadvantageous additional devices are necessary in the visible region of the devices 2.

According to Figure 2, an advantageous rear-side arrangement of the device 3 within a receiving space 17 in the device base 6 is illustrated. In the non-populated state, a removable cover (not illustrated) closes this receiving space 17 into which

the device 3 can be inserted in a form-fitting manner and snap-fastened. On the bottom side, the connecting contacts 16 are brought out of the device 3 with touch-protection, and can be electrically contacted with the connecting terminals 9 in the device base 6. For the assembly of the device 3, the front element 8 is removed, the device 6 released from the installation housing 4, and then the cover of the receiving space 17 is removed. The device 3 is pushed into the receiving space 17. Both mechanical latching and electrical connection to the mains voltage take place here automatically. The device base 6 which has now been populated in this way is then fastened again in the installation housing 4 and the front element 8 is mounted.

According to Figure 3, an advantageous front-side arrangement of the device 3 in a receiving space 17 of the device base 6 is illustrated. In the non-populated state, a removable cover (not illustrated) closes this receiving space 17 into which the device 3 can be inserted in a form-fitting manner and snap-fastened. On the bottom side, the connecting contacts 16 are brought out of the device 3 with touch-protection, and can be electrically contacted with the connecting terminals 9 in the device base 6.

For the assembly of the device 3, the front element 8 is removed and then the cover of the receiving space 17 is removed. As a result of the form-fitting and of a cylindrical extension in space, the device 3 can be pushed without tilting linearly up to the stop in the receiving space 17, which has the shape of a circular segment. Both mechanical latching and electrical connection to the mains voltage take place here automatically. Lighting elements, in order to be able to guide light signals specifically to display elements in the front element 8, are located on the top side of the device 3. The front element 8 is then mounted again. In this exemplary embodiment it is neither necessary to remove the installation device 2 nor to perform additional connecting work.

**List of reference numbers**

	1	Device arrangement
	2	First device
5	3	Module
	4	Installation housing
	5	Building wall
	6	Device base
	7	Supporting frame
10	8	Front element
	9	Connecting terminals
	10	Supply line
	11	Lines
	12	Device
15	13	Device
	14	Radio signal
	15	Free space
	16	Connecting contacts
	17	Receiving space
20	18	Operating and display unit

## Patentkrav

1. Installationsapparat til bygningssystemteknikken, hvilket installationsapparat har en apparatsokkel (6), der er fastgjort stationært i et installationshus (4), som er tilsluttet til en netspænding, og på hvilket der på frontsiden er fastgjort et frontelement (8), kendetegnet ved, at der i installationshuset (4) på apparatsoklen (6) er anbragt et aftageligt modul (3), med hvilket elektriske parametre i apparatet (2) kan detekteres og/eller reguleres, og som kommunikerer trådløst, hvor forarbejdningselementer for de detekterede parametre og modulationen/demodulationen af dataene til radiosignaler er integreret i modulet (3).
2. Installationsapparat ifølge krav 1, kendetegnet ved, at parameteren er den elektriske strøm.
3. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at parameteren er den elektriske effekt.
4. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at en til apparatet (2) tilsluttet forbruger kan udkobles ved hjælp af modulet (3).
5. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at der i modulet (3) kan programmeres tærskelværdier for udkoblingen af en forbruger, der er tilsluttet til apparatet (2).
6. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at en bestemmelse af strømmen sker berøringsfrit.
7. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at overførslen af trådløse signaler (14) sker ved hjælp af radiobølger.
8. Installationsapparat ifølge et af de foregående krav,

kendetegnet ved, at den i modulet (3) indgående netspænding transformeres.

9. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at modulet (3) er anbragt løsbart på det første apparats (2) apparatsokkel (6).

10. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at modulet (3) er anbragt på frontside eller på bagsiden af apparatsoklen (6).

11. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at apparatsoklen (6) har et optagerum (17) for et modul (3), der kan indstikkes formluttende.

12. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at modulet (3) er anbragt på frontside og i plan med fladen i apparatsoklens (6) optagerum (17).

13. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at der ved den mekaniske positionering af modulet (3) på apparatsoklen (6) sker en automatisk etablering af elektrisk kontakt.

14. Installationsapparat ifølge et af de foregående krav, kendetegnet ved, at det første apparat (2) er udført som elektrisk stikdåse.

15. Apparatsystem til bygningssystemteknikken, bestående af et flere elektriske apparater (2, 12, 13), hvor der anvendes et første apparat (2) ifølge kravene 1 til 15, og hvor apparatet (2) kommunikerer trådløst med yderligere apparater (12, 13).

16. Apparatsystem ifølge krav 15, kendetegnet ved, at parametrene kan overføres trådløst til et apparat (12) og kan visualiseres i apparatet (12).

17. Apparatsystem ifølge krav 15 eller 16, kendetegnet ved, at parametrene kan overføres trådløst til et apparat (12) og kan reguleres ud fra apparatet (12).

5 18. Apparatsystem ifølge et af kravene 15 til 17, kendetegnet ved, at apparatet (12) har en betjenings- og visningsenhed (18) med betjeningslementer og/eller variable visningsmodi.

10 19. Apparatsystem ifølge et af kravene 15 til 18, kendetegnet ved, at der i modulet (3) og/eller apparatet (12) kan programmeres tærskelværdier for udkoblingen af en forbruger, der er tilsluttet til apparatet (2).



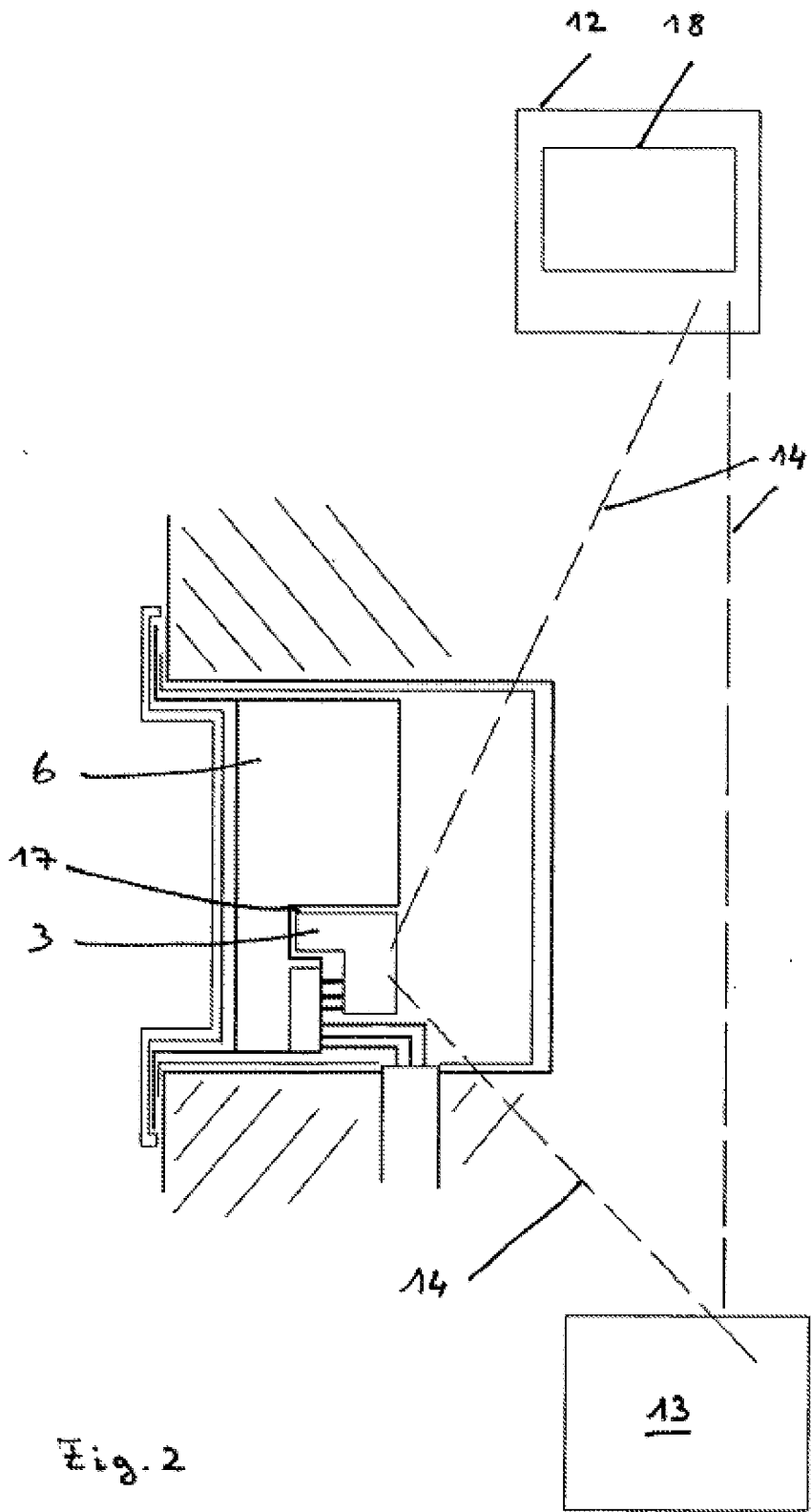


Fig. 2

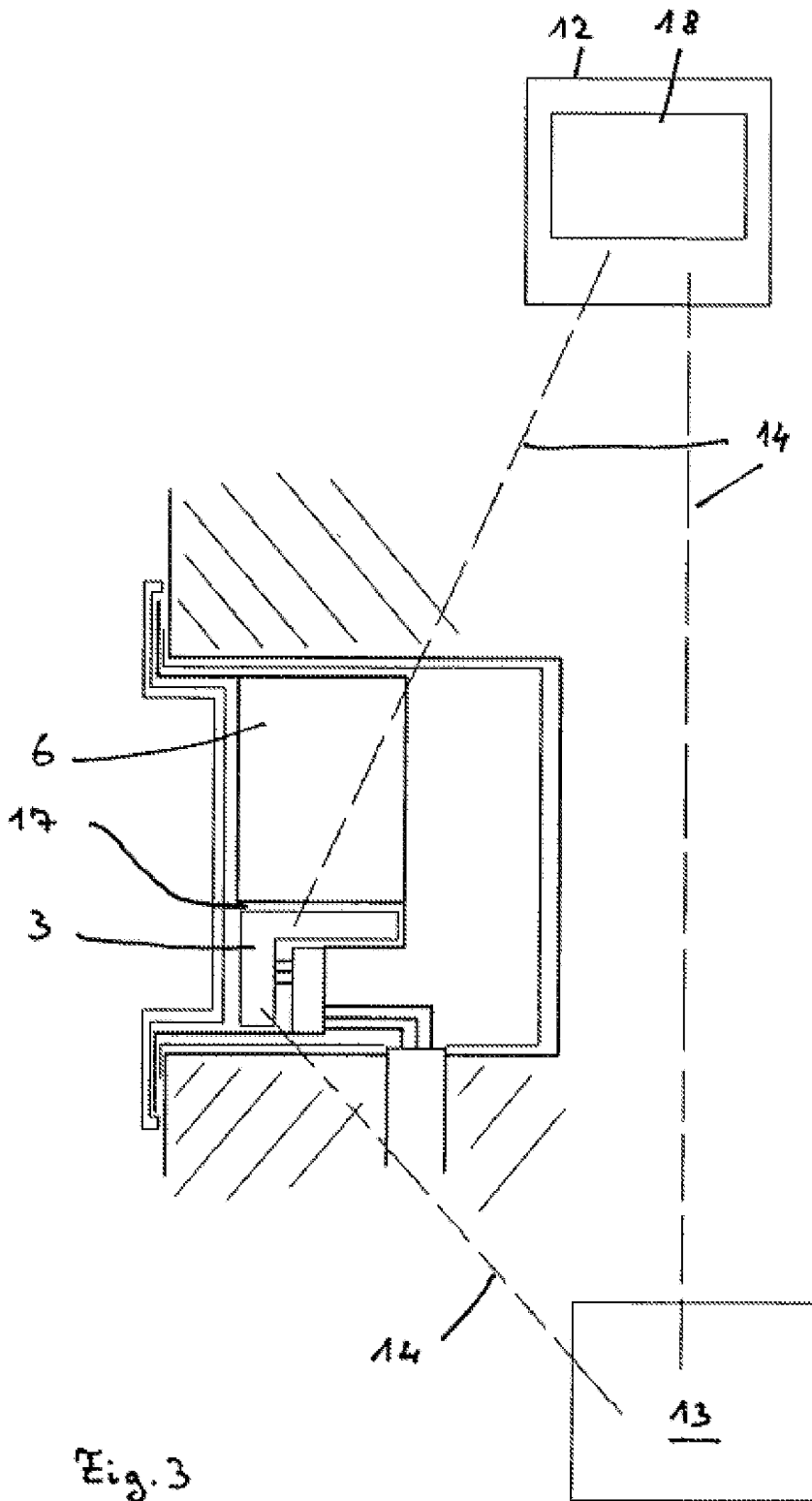


Fig. 3