

①⑫ **EUROPEAN PATENT APPLICATION**

②① Application number: **83306159.1**

⑤① Int. Cl.³: **G 08 C 19/00**

②② Date of filing: **12.10.83**

③⑩ Priority: **14.10.82 GB 8229352**

④③ Date of publication of application:
25.04.84 Bulletin 84/17

⑧④ Designated Contracting States:
AT BE CH DE FR GB IT LI LU NL SE

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⑤④ **Telemetry system.**

⑤⑦ A telemetry system for building services comprises at least one transmitter connected by a low voltage electric cable to at least one receiver, the or each transmitter acting on a command from actuating means to transmit or modify a signal or signals via the low voltage cable to the or each receiver, the or each receiver acting on the received signal or signals to provide an output or outputs which operate an electric circuit.

TELEMETRY SYSTEM

This invention relates to a telemetry system for building services. The invention is particularly, though not exclusively, for use in controlling the supply of electrical power to an electrical unit (e.g. luminaires, heating, etc) or for use in monitoring a condition or conditions within a building (e.g. a fire alarm).

Known telemetry systems for building services either comprise numerous cable runs between inputs and outputs which is costly in terms of cable and installation; or comprise numerous cable runs between outstations which are interconnected by another type of telemetry system which is expensive in terms of substations; or are such that only one transmitter can operate one receiver which requires arbitration between transmitters and has no guaranteed access time; or a combination of two or more of the above.

According to the invention a telemetry system for building services comprises at least one transmitter connected by a low voltage electric cable to at least one receiver, the or each transmitter acting on a command from actuating means to transmit or modify a signal or signals via the low voltage cable to the or each receiver, the or each receiver acting on the received signal or signals to provide an output or outputs which operate an electric circuit.

The low voltage cable preferably comprises at least four cores, one of which supplies power to the or each transmitter and to the or each receiver at a low

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voltage. A second core is for the signals from transmitter to receiver, a third core supplies synchronised pulse trains, and the fourth acts as a common for the others.

5 Preferably a system clock provides synchronising pulse trains to the or each transmitter and to the or each receiver, each train being an exact number of pulses of predetermined width and delay, a predetermined pause distinguishing the start of each train. The or each
10 transmitter (and hence its associated output from a receiver) has an associated pulse in the train (an address). When a transmitter receives a command (e.g. ON, OFF, etc) it awaits the start of the next pulse train, starts counting pulses, and sends a signal pulse down the
15 signal core when it counts its associated pulse in the train. When the receiver which also counts pulses on the train receives the signal pulse which corresponds to its associated pulse on the train it acts according to the command. The length of the signal pulse with respect to
20 the basic half period of the synchronising clock preferably distinguishes between different commands. Alternatively the polarity or magnitude of the signal pulse distinguishes between different commands. A predetermined sequence of command signal pulses preferably
25 indicates alternative commands.

The address for the or each transmitter and the or each receiver is preferably set by track links on a printed circuit board. Alternatively they may be set by coding switches in temporary latches by means of a

keyboard.

The or each transmitter and the or each receiver and the synchronising clock pulse train generator preferably comprises a single chip microcomputer, the
5 identity and function of which is determined by the connections on the printed circuit board. The microcomputer may have up to twenty different functions.

Preferably one transmitter is associated with one output from a receiver. Alternatively one or more
10 than one transmitter may be associated with one or more than one output from a receiver. The or each transmitter preferably has more than one input.

In the case where the telemetry system is used to control the supply of electric power to an electrical
15 unit, preferably the or each receiver provides an output or outputs to means which controls said supply. The controlling means is preferably relays and/or contactors and/or triacs which either switch the power on or off, and/or in the case of triacs reduce or increase the power.
20 Preferably the controlling means is connected by one or more isolators to its associated receiver to prevent the power supply reaching the receiver. The isolators are preferably optical isolators or relays. The or each receiver can have any number of outputs but preferably it
25 or each has eight outputs for on/off switching of luminaires, etc., or one output for dimming of a luminaire. Preferably each output controls the power supply to electrical units in one zone. The or each transmitter is preferably capable of sending four signals,

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ON, OFF, REDUCE POWER, and INCREASE POWER (where a receiver has no means for understanding the last two signals it will ignore them). In this case, the actuating means for the or each transmitter is preferably a manually
5 operated switch. Alternatively the actuating means for a transmitter may be a remote control device (e.g. by infra-red control). A transmitter may incorporate an ON - predetermined pause - REDUCE POWER - OFF for certain applications (e.g. luminaires on stairs).

10 In the case where the telemetry system is used for monitoring a condition or conditions within a building, preferably the actuating means for the or each transmitter is a monitoring device. The monitoring device may be a smoke detector, fire detector, intruder detector,
15 etc., dependent on the needs of the system. The output or outputs from the or each receiver are preferably fed to a display device which indicates if a condition has been detected or to means which is automatically actuated (e.g. an alarm). Preferably the display device also indicates
20 the position (that is the location of the transmitter which has sent or modified the signal to the receiver) of the condition. Where the monitoring device is an intruder detector, the detector may be a beam of light or a microswitch. In all cases the display device may include
25 an audible alarm.

Preferably a central controller, which may be fitted retrospectively, provides management of the system. This is particularly useful where the system is used for controlling the switching of luminaires, as the central

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controller preferably includes a timer and mode control (e.g. for normal, security, cleaning, etc).

This invention has numerous advantages over the prior art in that power cabling runs are simplified (especially where multipoint switching is required). In the case of power supply control, smaller zones are easier to install, and can easily be changed by re-addressing the transmitters (rather than moving the power cables); where the transmitters are remotely activated, preferably by means of a hand held activator, they can be mounted adjacent the receivers; and energy management can be easily and cheaply incorporated. In all cases, there is response within the period of a pulse train (typically 1 second) between transmitter and receiver; and installation costs are reduced. This invention can also be used for hotel management, nurse call systems, etc.

This invention is further illustrated, by way of example, with reference to the accompanying drawings, in which:-

Figure 1 is a diagram of part of a telemetry system for controlling power supply;

Figure 2 is a diagram of part of an alternative telemetry for controlling power supply; and

Figure 3 is a diagram of part of a further telemetry system for detecting the existence of a fire.

Referring to Figure 1, the diagram illustrates the receiver 1 of a telemetry system which is used for the ON/OFF control of eight outputs 2. A low voltage signal cable 3 transmits control signals from a transmitter (not

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shown). Each output 2 is connected via an isolator 4 and relay 5 to an electrical unit 6 (e.g. a luminaire or group of luminaires). Each output has an address number (N, N+1,) which on receiving a corresponding signal from 5 the transmitter, actuates its corresponding relay 5. The power supply for each electrical unit 6 is supplied by a power cable 7.

An alternative arrangement is shown in Figure 2 where the receiver 8 has a single output through 10 isolator 9 to a triac 10. On receiving a signal from a transmitter (not shown) through the low voltage signal cable 11, the power supply through the power cable 12 to an incandescent lamp 13 is varied.

The monitoring system shown in Figure 3 15 comprises transmitters 14, 15, 16 connected by a four core low voltage signal cable 17 to corresponding receivers 18, 19, 20. Each transmitter 14, 15, 16 is connected to smoke detectors 21 or heat sensors 22 or both. When a fire is detected a signal is sent via the cable 17 to the 20 corresponding receiver 18, 19, 20 which indicates the existence of a fire and its position by actuating an alarm 23 or triggering a display device 24.

CLAIMS

1. A telemetry system for building services comprises at least one transmitter connected by a low voltage electric cable to at least one receiver, the or
5 each transmitter acting on a command from actuating means to transmit or modify a signal or signals via the low voltage cable to the or each receiver, the or each receiver acting on the received signal or signals to provide an output or outputs which operate an electric
10 circuit.
2. A telemetry system as claimed in Claim 1, wherein the low voltage cable comprises at least four cores, a first of which supplies power to the or each transmitter and to the or each receiver at a low voltage,
15 a second of which transmits the signals from the or each transmitter to the or each receiver, a third of which supplies synchronised pulse trains, and the fourth of which acts as a common for the others.
3. A telemetry system as claimed in Claim 1 or
20 Claim 2, wherein a system clock provides synchronising pulse trains to the or each transmitter and to the or each receiver, each train being an exact number of pulses of predetermined width and delay, a predetermined pause distinguishing the start of each train.
- 25 4. A telemetry system as claimed in Claim 3, wherein the length or polarity or magnitude of the signal pulse distinguishes between different commands.
5. A telemetry system as claimed in Claim 3, wherein a predetermined sequence of command signal pulses

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indicates alternative commands.

6. A telemetry system as claimed in any one of the preceding Claims, wherein the or each transmitter and the or each receiver comprises a single chip microcomputer.

5 7. A telemetry system as claimed in any one of the preceding Claims, wherein the or each receiver provides an output or outputs to means which controls the supply of electrical power to an electrical unit.

8. A telemetry system as claimed in Claim 7,
10 wherein the controlling means is relays and/or contactors and/or triacs.

9. A telemetry system as claimed in Claim 8,
wherein the controlling means is connected by one or more isolators to its associated receiver to prevent the power
15 supply reaching the receiver.

10. A telemetry system as claimed in any one of Claims 1 to 6, wherein the actuating means for the or each transmitter is a monitoring device.

11. A telemetry system as claimed in Claim 10,
20 wherein the or each output from the or each receiver is fed to a display device which indicates if a condition has been detected.

12. A telemetry system as claimed in Claim 11,
wherein the display device also indicates the position
25 of the condition.

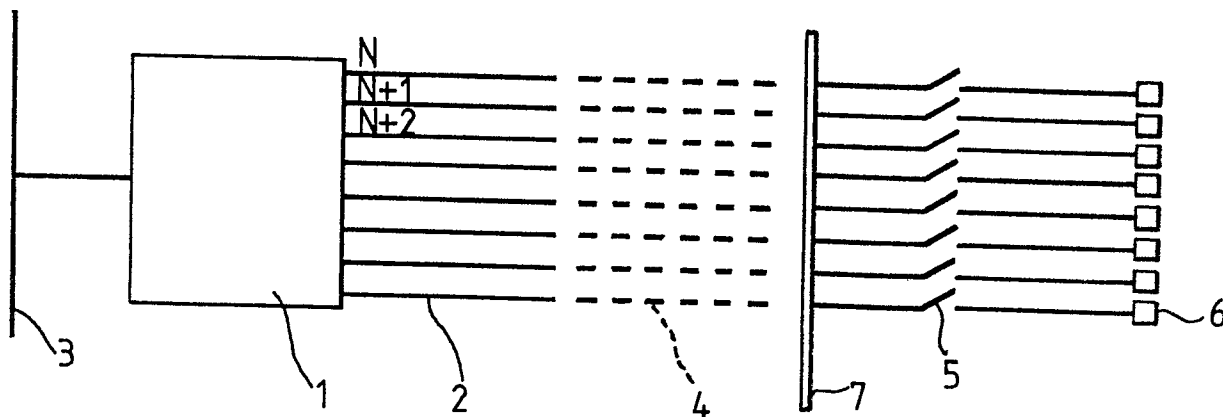


Fig.1.

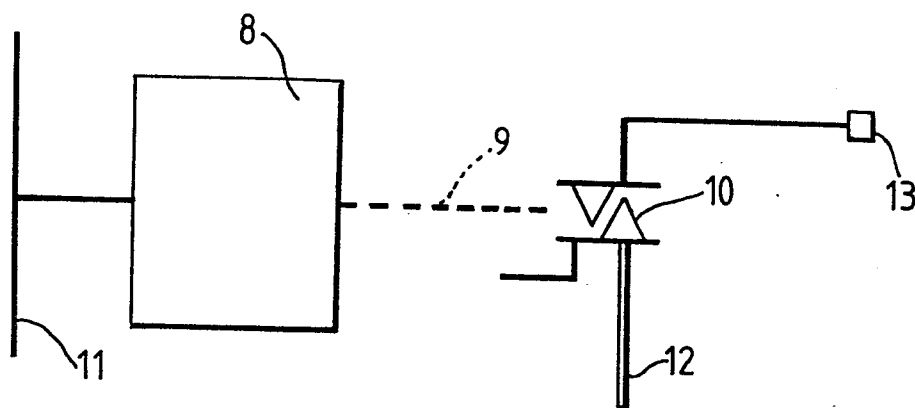
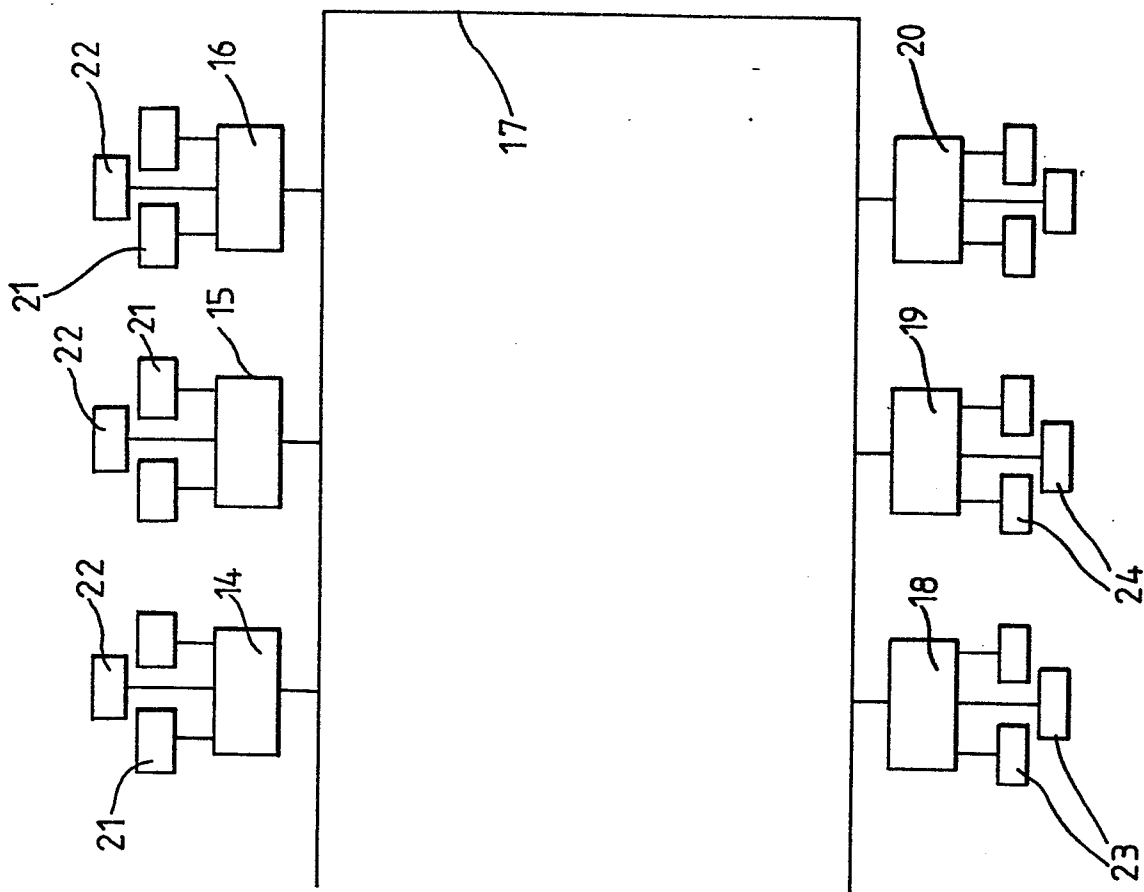


Fig.2.

Fig. 3.





European Patent
Office

EUROPEAN SEARCH REPORT

0106654

Application number

EP 83 30 6159

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int. Cl. ³)
X	US-A-4 215 276 (JANEWAY) * Column 2, line 51 - column 3, line 66; column 5, line 17 - column 8, line 16; claims 1,12; figures 1-3,9-11 *	1-3,5,7,8	G 08 C 19/00
X	FR-A-2 289 950 (INTERNATIONAL HOME SYSTEMS) * Page 3, line 15 - page 8, line 30; figures 1-3 *	1-3,5,7,8,10	
X	FR-A-2 326 101 (SIEMENS) * Page 4, line 7 - page 5, line 27; page 7, line 7 - page 9, line 35; figures 1,2,5 *	1,3,5,7,8	
X	GB-A-2 080 000 (SHORROCK) * Whole document *	1,2,10,11	TECHNICAL FIELDS SEARCHED (Int. Cl. ³) G 08 C 15/00 G 08 C 19/00
The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 17-01-1984	Examiner WANZEELE R.J.
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			