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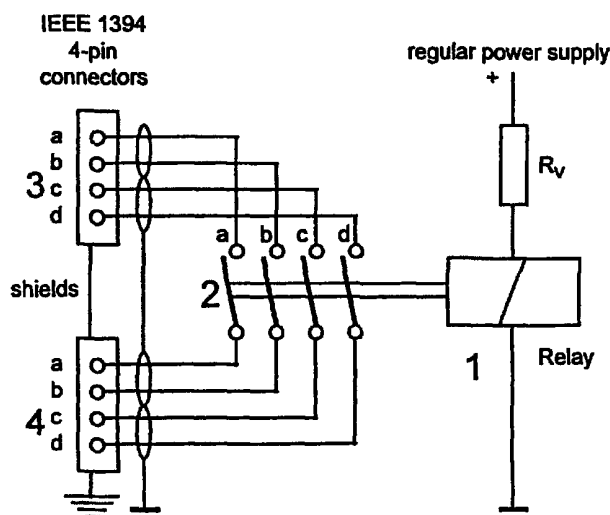
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[Continued on next page]

(54) Title: IEEE 1394 CABLE CONNECTOR WITH SHORT CIRCUIT SWITCH



a) Power-available case

(57) Abstract: In case of a loss of power supply a short-circuit (1, 2) between the corresponding pins of the two IEEE 1394 connectors (3, 4) of a device is established. Preferably this will be achieved by a relay (1) controlling switches (2). If power is available, the relay is powered and the switches are open. The device then behaves like without this extension. If power is lost, the relay 1 is not powered any longer, and the switches (2) are closed. By this way, the device simply disappears from the cluster, which will then be reorganised according to IEEE 1394 rules.

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

IEEE 1394 CABLE CONNECTOR WITH SHORT CIRCUIT SWITCH

The invention relates to an IEEE 1394 cable connector.

5 Background

The IEEE 1394 standard describes a high speed, low cost Serial Bus suitable for use as a peripheral bus or a backup to parallel back-plane buses. Highlights of the Serial Bus
10 include:

a) Automatic assignment of node addresses - no need for address switches.

b) Variable speed data transmission based on ISDN-compatible
15 1 bit rates from 24.576 Mbit/s for TTL backplanes to 49.152 Mbit/s for BTL backplanes to 98.304, 196.608, and 393.216 Mbit/s for the cable medium.

c) The cable medium allows up to 16 physical connections (cable hops) each of up to 4.5 meters, giving a total cable distance of 72 meters between any two devices. Bus management
20 recognises smaller configurations to optimise performance.

d) Bus transactions that include both block and single quadlet reads and writes, as well as an "isochronous" mode which provides a low-overhead guaranteed bandwidth service.

e) A physical layer (PHY) supporting both cable media and
25 backplane busses.

f) A fair bus access mechanism that guarantees all nodes equal access. The backplane environment adds a priority mechanism, but one that ensures that nodes using the fair protocol are still guaranteed at least partial access.

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An IEEE 1394 4-pin cable connects a pair of devices, a further device can be added by another cable attached to one of the former two, etc. - thus establishing a cluster or chain of devices. This chain contains devices which have two
35 neighbouring devices attached to them, as well as devices at the end of the chain with only one neighbour. Each device has

a mains connection, and when the device is switched off and goes into a stand-by mode, its IEEE 1394 physical layer implementation is still powered to provide certain functionality. If for example the home user disconnects the power plug of one device in a chain - e.g., the TV set - this stand-by function will be lost. As a consequence, the PHY layer functionality is lost and the chain is broken - leaving two separate smaller clusters of devices.

In order to avoid a break of the chain in case of internal power supply failure a solution is described in the IEEE 1394 standard, using a power storage device to provide power to the devices, while these devices are gracefully shutting down after the internal power supply fails. Normally the internal power supply provides power for the PHY and the power storage device. If the internal power supply fails a power fail sense line signals the logic that a failure has occurred and the load switches over to the power storage device.

Invention

It is an object of the present invention to disclose an IEEE 1394 cable connector, that allows bus connections to all available devices linked to the bus in case of power failure of one device.

According to the invention, this object is achieved by means of the features specified in main claims. Advantageous designs and developments are specified in subclaims.

In case of a loss of power supply a short-circuit between the corresponding pins of the two IEEE 1394 connectors of a device is established. Preferably this will be achieved by a relay controlling switches. If power is available, the relay is powered and the switches are open. The device then behaves like without this extension. If power is lost, the relay is

not powered any longer, and the switches are closed. By this way, the device simply disappears from the cluster, which will then be reorganised according to IEEE 1394 rules.

5

Drawings

Embodiments of the invention are described with reference to the accompanying drawing, which shows in:

10

Fig. 1a Bus connection implementation in power available case;

Fig. 1b Bus connection implementation in power lost case;

15

Exemplary embodiments

Exemplary embodiments of the invention are explained in more detail in the following description.

20

Fig. 1a shows an example of a bus connection implementation in power available case. A relay 1 controlling four switches 2 with contacts a, b, c, d is connected with the regular power supply already available in the respective device via a resistor R_v . All switches 2 are connected with the 4 respective pins of the two IEEE 1394 connectors 3, 4 available in the device in the way shown in Fig. 1 a. Fig. 1a shows the switch position of the relay 1 in the case of power being available to the device. In this case there is no short-circuit established between corresponding pins of the two IEEE 1394 connectors.

30

Fig. 1b shows the case where the mains connection of the device has been lost and power is not available. The relay 1 turns into its resting position closing the contacts a, b, c, d of the four switches 2. In this position the 4 respective

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pins of the two IEEE 1394 connectors 3, 4 are connected. By this way, the two IEEE 1394 cables attached to the device at these connectors 3, 4 are transformed into a new, longer cable. The powerless device disappears from the cluster it
5 has formed part of before. The cluster will now be reorganized with one device less, and will stay operational.

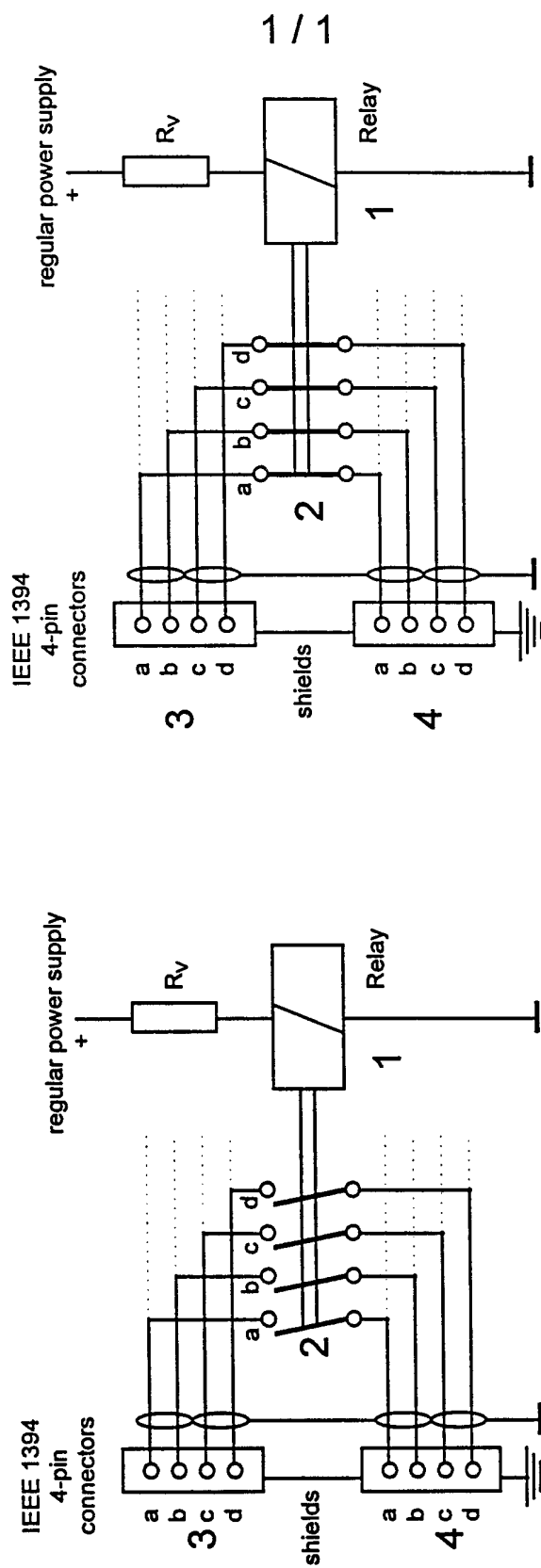
If a device equipped with the invention is disconnected from the mains, e.g. a TV set, the cluster it has formed part of
10 will still be operational.

Since the two cables attached to the device form one new longer cable now, the "new" cable should not exceed the longest cable length that still allows IEEE 1394 operation in
15 the given situation. The invention helps in all cases where this length is not exceeded. Without the invention, the cluster would be broken at the point of the disconnected device.

20 Instead of a relay with switches also electronic switches can be used.

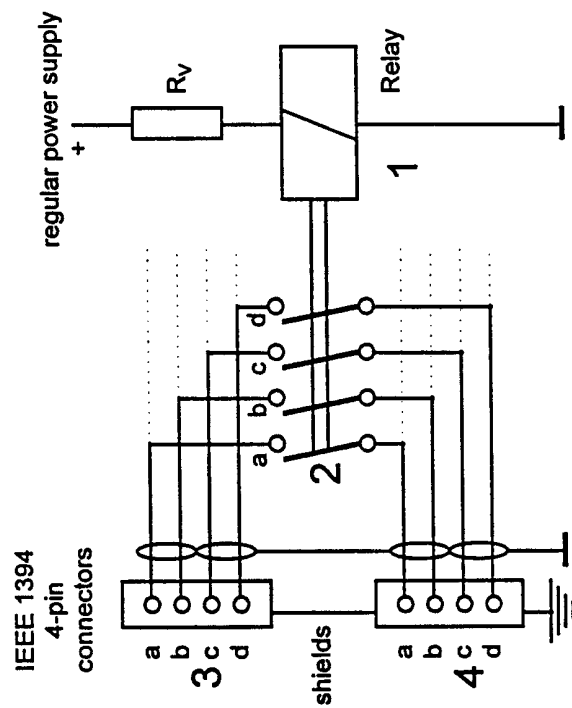
Claims

1. Device having a power supply and at least two IEEE 1394
cable connectors with data lines or data lines with
5 additional power supply lines, characterised in that the
pins of the connectors (3, 4) are connected to
corresponding short-circuit switches (2), which short-
circuit switches (2) are controlled by the power
availability of the power supply.
10
2. Device according to claim 1, wherein the short-circuit
switches (2) are part of a relay (1).
3. Device according to claim 1, wherein the short-circuit
15 switches (2) are designed as electronic switches.



b) Power-lost case

Fig. 1b



a) Power-available case

Fig. 1a

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 H04Q11/04 H04R23/02

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)

IPC 7 H04Q H04R

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)

WPI Data, PAJ, IBM-TDB, INSPEC

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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A	LIMBACH H P: "IEEE 1394 - DAS TOR ZU MULTIMEDIA" RADIO FERNSEHEN ELEKTRONIK, vol. 46, no. 9, 1 September 1997 (1997-09-01), page 54, 56 XP000736155 ISSN: 1436-1582 page 56, right-hand column; figure 3 ----	1
A	WO 98 33189 A (SONY TRANSCOM, INC) 30 July 1998 (1998-07-30) ----- -/--	

☒ Further documents are listed in the continuation of box C.☒ Patent family members are listed in annex.*** Special categories of cited documents :**

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INTERNATIONAL SEARCH REPORT

International Application No

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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INTERNATIONAL SEARCH REPORT

Information on patent family members

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