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Method and Apparatus for device control by data transmission in TV lines

The present invention relates to a method and to an apparatus for device control by data transmission in TV lines.

Background

With new generation PAY TV systems using a control access system based on smart card processing, the PAY TV decoder has lost its identity. This means that all the data are addressed to a given address which belongs to the smart card and not to the decoder. These systems offer a detachable control access but loose the geographical information.

Invention

It is one object of the invention to disclose a method which enables addressing of a given decoder in a defined geographic location. This object is reached by the method disclosed in claim 1.

The invention gives a flexible solution in order to carry data for control access based on both, smart card and decoder, for PAY TV systems on PAL, SECAM and NTSC.
The information, such as listed below, is down loaded via the transmission channel:

- specific channel allocation table;
- data related to the VTR of the customer. (Using a smart card may be dangerous if used without care. The card may corrupt the data of another decoder);
- messages related to a geographic location.

To carry the data the invention uses two sets of n video lines which represent two independent data channels: channel 1 with lines M_1 M_2...M_n and channel 2 with lines 0_1 0_2...0_n. The data

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format on both data channels is identical. The data carried by the data channels are organised packets. Each packet contains two types of information: descriptor data and application data. In a receiver the data are extracted from the video lines by a processor unit called data dispatcher. The data dispatcher extracts the bit stream and performs eventual error correction algorithms independently for the two data channels. After receiving a packet from one data channel the data dispatcher analyses the descriptor data which contain information describing the target. According to this information, the data dispatcher transmits the application data contained in the packet without analysing them to the correct processor unit: either control access processor (CAP) or decoder intelligent processor (DIP).
By that means, the PAY TV system has two independent data channels where one can be dedicated to the control access system based on the smart card and the other dedicated to the decoder. Furthermore the allocation of one data channel to one process can be changed at any time because the data dispatcher analyses in real time the addresses of one packet. At one moment, the two data channels could be dedicated to the DIP or to the CAP.

In principle the inventive method consists in a device control by data transmission in TV lines, wherein two or more groups of one or more lines each contain packets of digital data, wherein each packet contains descriptor data and application data and the descriptor data are used in a data dispatcher to direct the related application data to a separate device in which the respective application data are evaluated.

Advantageous additional embodiments of the inventive method are resulting from the respective dependent claims.

It is a further object of the invention to disclose an apparatus which utilises the inventive method. This object is reached by the apparatus disclosed in claim 6.

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In principle the inventive apparatus comprises a data extractor which extracts a bit stream from video lines and forms said digital data packets which are passed to a data dispatcher, wherein this data dispatcher sends according to said descriptor data said application data either to a processor in a pay TV decoder or through a smart card interface processor and a smart card reader to a smart card.

Drawings

Preferred embodiments of the invention are described with reference to the accompanying drawings, which show in:

Fig. 1 principle of the invention;

Fig. 2 block diagram of the inventive apparatus.

Preferred embodiments

In Fig. 1 the video lines $M_1 \ldots M_n$ of a first data channel DC1 and the video lines $0_1 \ldots 0_n$ of a second data channel DC2 are arranged on a time axis 10. The descriptor data of these channels are evaluated in data dispatcher DD which directs the application data of the packets to a DIP or to a CAP accordingly.
The data dispatcher DD, the DIP and the CAP can be made from different processors or from one single processor on which run respective different processes.
This system may be extended to more than two data channels and more than two target processor units. The number of data channels can be different from the number of target processor units but there should still be only one data dispatcher.

Advantageously the invention can be applied to a VIDEOCRYPT pay TV system. Fig. 2 shows the architecture of such a device. In this device, a bit stream is extracted from the video lines 20 by a known data extractor 21 which forms the data channels. The respective data is passed to a data dispatcher 22. The data dispatcher extracts the data from the two data channels. According

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to a parameter value of the descriptor data, called header, the data dispatcher will send the application data:

- either to the DIP 26 in a pay TV decoder;
- or to a VIDEOCRYPT verifier 23. This verifier sends through a smart card reader 24 the respective conditional access data to a smart card 25 which is the kernel of the control access system. If the customer is entitled, the smart card returns to the data dispatcher 22 via the VIDEOCRYPT verifier 23 the required information for enabling the video signal descrambling.

The data dispatcher may also manage the video descrambling. Also the features related to the decoder are handled by the decoder intelligent processor DIP.

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Claims

1. Method for device control by data transmission in TV lines (20), **characterised in** that two or more groups of one or more lines each contain packets of digital data, wherein each packet contains descriptor data and application data and the descriptor data are used in a data dispatcher (DD; 22) to direct the related application data to a separate device (DIP, CAP; 26, 23) in which the respective application data are evaluated.

2. Method according to claim 1, **characterised in** that said video lines are located in the vertical blanking period.

3. Method according to claim 1 or 2, **characterised in** that said separate devices are a pay TV decoder processor (DIP; 26) and a smart card processor (CAP; 25).

4. Method according to any of claims 1 to 3, **characterised in** that all of said groups of lines have the same data format and error correction.

5. Method according to any of claims 1 to 4, **characterised in** that said data dispatcher (DD; 22) switches in real time.

6. Apparatus for a method according to any of claims 1 to 5, comprising a data extractor (21) which extracts a bit stream from video lines (20) and forms said digital data packets which are passed to a data dispatcher (22), wherein this data dispatcher sends according to said descriptor data said application data either to a processor (26) in a pay TV decoder or through a smart card interface processor (23) and a smart card reader (24) to a smart card (25).

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