

three different states of the two wire databus is applied in different time slots, where a first state is for transfer of power, a second state is for transmission of signal from said base part to said ear plug part, and a third state is for transmission of signal from said ear plug part to said base part.

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When separating the power transfer from the data transfer in time the risk of noise problems is reduced. The term different time slots refer to this separation in time of power transfer and data or signal transfer in both directions. At the same time the invention facilitates a two wire databus without the need of any further electrical wires.

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A databus is here understood to be a digital communication line which can be set up for communication between different units, suitable for carrying signals in more than one direction. The databus is a serial databus, and is here also understood to be able to transfer power.

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A transducer is here understood as a device which can transfer a physical parameter into an electrical signal in the hearing aid. This definition includes an electrode being able to read a voltage potential, such that the potential in some form can be transferred to the signal processing means of the hearing aid.

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According to a first aspect, there is provided a hearing aid comprising power supply means and at least one microphone for transforming an acoustic signal in the surroundings of a hearing aid user into an electric signal, said hearing aid further comprising a base part to be arranged outside the ear canal of a hearing aid user, said base part comprising signal processing means, an ear plug part to be arranged in the ear canal of a hearing aid user, said ear plug part comprising a receiver for transmitting sound into the ear canal, said ear plug part comprising a transducer generating a signal to be transferred to said base part, and a databus connecting said ear plug part with said base part, said databus comprising two electrical wires adapted for transmission of signal to said receiver, and for transmission of signal from said transducer to said base part and said databus being adapted for providing power supply either from the base part to the ear plug part, or, from the ear plug part to the base part, through said two

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electrical wires, wherein at least three different states of the databus are applied in different time slots, where a first state is for transfer of power, a second state is for transmission of signal from said base part to said ear plug part, and a third state is for transmission of signal from said ear plug part to said base part.

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In an embodiment of a hearing aid according to the invention the transducer is an ear canal microphone for transforming an acoustic signal in the ear canal into an electric signal. Such a microphone, i.e. an internal microphone, will be advantageous during fitting, where it will be possible to detect the sound presented to the hearing aid user's eardrum directly. An internal microphone can also have advantages in daily use, e.g. for occlusion cancelation and active noise reduction.

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The transducer could also be a microphone in the concha part of the ear, but attached to the ear plug part. Such a microphone would be for detecting sounds from the surroundings to be amplified by the hearing aid. A microphone in concha may provide a more natural sound impression than a microphone in a base part behind the ear.

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aid user, where the base part comprises signal processing means. The method comprises arranging an ear plug part in the ear canal of the hearing aid user, said ear plug part comprising a receiver for transmitting sound into the ear canal, where the ear plug part comprises a transducer generating a signal to be transferred to said base part.

- 5 The method further comprise connecting the ear plug part with the base part through a databus comprising two electrical wires adapted for transmission of signal to the receiver, and for transmission of signal from the transducer to the base part, and where the databus is adapted for providing power supply either from the base part to the ear plug part, or, from the ear plug part to the base part, through the two electrical wires.

10 The method further comprises applying at least three different states of the two wire databus sequentially in different time spans, where a first state is for transfer of power, a second state is for transmission of signal from said base part to said ear plug part, and a third state is for transmission of signal from said ear plug part to said base part.

15 ~~In an embodiment of this method at least three different states of the two wire databus apply sequentially in different time spans. A first state is for transfer of power, a second state is for transmission of signal from the base part to the ear plug part, and a third state is for transmission of signal from the ear plug part to the base part.~~

- 20 Embodiments of the invention will now be explained in further detail with reference to the figures.

Figure 1 illustrates an embodiment where a hearing aid is provided with a databus between the base part and the ear plug part.

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Figure 2 illustrates the setup of a hearing aid in three different states of the databus.

Figure 3 illustrates the bidirectional digital communication through a databus, panes (a) through (k) signifying respective signals.

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Figure 4 illustrates different states for controlling the bidirectional digital communication, panes (a) through (e) signifying respective signals.

Figure 5 illustrates a phase locked loop circuit applied in an embodiment of the invention.