

wires. In this case the sound tube is replaced by electric leads, suitably encapsulated.

It has been suggested to arrange a microphone in the ear plug, at the side proximally to the tympanic membrane, for transforming sounds in the ear canal into electrical signals. Such a microphone may have many purposes during fitting and during daily use of the hearing aid. The electrical signal from such a microphone needs to be transferred to the signal processing means of the base part of the hearing aid, normally by an extra pair of wires. It has now been realized that one problem in having such a microphone is that the wires used for transferring the signal from the microphone to the base part will gather electrical noise. The electrical signal generated in the microphone is relatively weak, e.g. 5 - 10 μ V, and therefore rather sensitive to noise.

It has also now been realized that this problem is larger when a receiver is arranged in the ear plug, since the wires supplying the receiver signal, which may be 2 V at peak level, will be arranged close to the wires transferring the signal from the microphone. Therefore, it is likely that the receiver signal will induce noise into the wires carrying the microphone signal.

Another problem is that the number of wires preferably should be as low as possible in order to keep the diameter of the elongated member connecting the two parts as small as possible.

The above problems are solved by the present invention by providing a hearing aid where the signal from the ear canal microphone is transferred to the signal processing means in the base part through a serial databus connected through a data line arranged with said elongated member.

The invention is directed to 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 acoustic transmitting means for transmitting sound into the ear canal, said ear plug part comprising an ear canal microphone for transforming an acoustic signal in the ear canal into an electric signal, and the ear plug part further comprising an electronic module connected to said ear canal microphone, and an elongated member connecting said ear plug part with said base part, said elongated member comprising electrical wires adapted for providing power supply from the base part to the ear plug part, or, from the ear plug part to the base part, wherein the signal from the ear canal microphone is transferred to the signal processing means in said base part by a serial databus connected through a data line arranged in said elongated member, said databus being a one line bidirectional serial databus.

A serial 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.

In a further embodiment the synchronization between the first and the second clock frequency is performed by a phase-locked loop.

In an embodiment according to the invention the ear plug part is connected with a transducer for measuring a physical or physiological parameter. Such a transducer could be adapted for measuring temperature, blood pressure, movement e.g. acceleration, orientation, i.e. is the person lying down, electrical signals of the body, e.g. EEG or ECG. Preferably such transducer is connected to the electronic module of the ear plug part and is prepared for transferring data to the signal processing means in said base part through the serial databus.

The invention is also directed to a method for communicating between two parts of 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 two parts of the hearing aid being connected through at least two wires, which method comprises arranging a base part outside the ear canal of a hearing aid user said base part comprising signal processing means. The method also comprises arranging an ear plug part in the ear canal of a hearing aid user, said ear plug part comprising acoustic transmitting means for transmitting sound into the ear canal, said ear plug part comprising an ear canal microphone for transforming an acoustic signal in the ear canal into an electric signal, and the ear plug part further comprising an electronic module connected to said ear canal microphone. The method further comprises connecting said ear plug part with said base part by an elongated member, said elongated member comprising electrical wires prepared for providing power supply from the base part to the ear plug part, or, from the ear plug part to the base part, wherein the signal from the ear canal microphone is transferred to the signal processing means in said base part through a serial databus connected through a data line arranged with said elongated member, said database being a one line bidirectional series databus.