electrodes and the electronic circuit during a testing period. The EEG monitor is adapted for analyzing the signal resulting from the signal generator for identification of faults in the electrode part.

According to a first aspect, there is provided a personal wearable EEG monitor comprising an implantable electrode part with at least two electrodes adapted for measuring an EEG signal of a person, said electrode part comprising an electronic circuit arranged in a housing with each electrode arranged external to said housing, said electronic circuit being adapted for receiving an analogue EEG signal from said electrodes and being provided with an analogue to digital converter for converting the analogue EEG signal into a digital signal, said electrode part comprising a testing circuit for testing for faults in said electrode part, wherein said testing circuit comprises a capacitor coupled in serial connection to at least one of said electrodes, a test signal generator for providing a test signal, said test signal generator being adapted for being coupled between said electrodes and said electronic circuit during a testing period, wherein said EEG monitor is adapted for analyzing the signal resulting from said signal generator for identification of faults in the electrode part.

Examples of the testing for faults in the electrode part could be to test if there is leak current, if the electrodes are broken so that there is no connection, or if the capacitor is broken.

In an embodiment of the EEG monitor the test signal generator is arranged between the electrodes and the analogue to digital converter, and the EEG monitor is adapted for analyzing the analogue to digital converter input signal resulting from the signal generator for identification of faults in the electrode part.

In an embodiment of the EEG monitor the signal from the analogue to digital converter is transferred to a digital signal processing unit also arranged in the electrode part.

In an embodiment of the EEG monitor a resistor is arranged across the input of the analogue to digital converter. This enables measuring the impedance between electrode and tissue.

In an embodiment the EEG monitor is adapted for identifying a charging or discharging function at the analogue to digital converter input and thereby detecting a current leak. The charging or discharging function will be from the charging or discharging of the capacitor.

In an embodiment of the EEG monitor the implantable electrode part comprises a coil for an inductive coupling to a non implantable part, the inductive coupling being adapted for transfer of data and power.

In an embodiment of the EEG monitor the test signal generator provides a square wave test signal with frequency between 25 and 40 Hz.

According to a second aspect, there is provided a method for detecting leak current in an implanted EEG monitor part according to the first aspect, comprising the steps of providing a test generator signal, subtracting the estimated test generator signal from the signal at the analogue to digital converter, low-pass filtering the resulting signal in order to suppress EEG and Noise components, transforming the signal into a logarithmic domain, fitting the signal to a straight line, determining the interception with y-axis of the straight line, and determining if leak current is present and above a threshold.

~~In a further aspect the invention may relate to~~Also disclosed is a method for detecting leak current in an implanted EEG monitor. This method comprises the steps of

- providing a test generator signal,
- subtracting the estimated test generator signal from the signal at the analogue to digital converter,
- low-pass filtering the resulting signal in order to suppress EEG and Noise components,
- transforming the signal into a logarithmic domain,
- fitting the signal to a straight line,
- determining the slope of the straight line,
- determining if the slope is below a set threshold, and
- determining if leak current is present.

In an embodiment of the method the low-pass filtered signal is downsampled in order to reduce the calculation complexity.

In an embodiment of the method the step of transforming the signal comprises taking the power of the signal or taking the absolute value of the signal and then taking the natural logarithm of the power signal or taking the natural logarithm of the absolute value of the signal.

It is known, e.g. from WO-A1-2010/124738, to have an EEG monitoring system comprising an implantable part and an external part. The implantable part, suitable for being subcutaneously positioned behind the ear of a person in need of EEG monitoring, comprises a subcutaneous EEG electrode having a plurality of active areas separated by isolators. The electrode is connected to an electronic circuit. The EEG electrode has at least two active areas. Often these active areas are simply referred to as electrodes. This is also done below. The electronic circuit preferably comprises an A/D converter, a data packet controller, a communications controller, and a voltage regulator. The electrode is connected to the input terminals of the A/D converter via electrode wires, the communications controller, if present, may be connected to a first communications coil, and the voltage regulator, if present, may be connected to a ceramic capacitor. The