

Claims

1. An implantable medical device (1), comprising: an electronic functional device (10) for performing a function of said implantable medical device (1), said functional device (10) having an operational state for performing said function and a switched-off state, and a wake-up device (12) for transferring said functional device (10) from said switched-off state to said operational state, **characterized in** that the wake-up device (12) comprises a first timer circuit (120) for repeatedly transferring the functional device (10) into the operational state according to a first timing scheme, a detection device (121) for detecting a signal from a signal source (2) external to the implantable medical device (1), and a second timer circuit (122) for repeatedly transferring the detection device (121) into a reception state according to a second timing scheme.
2. The implantable medical device (1) according to claim 1, **characterized in** that the first timer circuit (120) is configured to periodically transfer the functional device (10) into the operational state.
3. The implantable medical device (1) according to claim 1 or 2, **characterized in** that the first timer circuit (120) comprises an oscillator circuit (125) adapted to generate a clock signal for determining a point in time to transfer the functional device (10) to the operational state.
4. The implantable medical device (1) according to claim 3, **characterized in** that the oscillator circuit (125) comprises an RC oscillator.
5. The implantable medical device (1) according to claim 3 or 4, **characterized in** that the first timer circuit (120) comprises a calibration oscillator (126) for calibrating the oscillator circuit (125).

6. The implantable medical device (1) according to claim 5, **characterized in** that the first timer circuit (120) is configured to repeatedly calibrate the oscillator circuit (125) using the calibration oscillator (126) according to a calibration time scheme.
- 5 7. The implantable medical device (1) according to claim 5 or 6, **characterized in** that the calibration oscillator (126) is formed by a quartz oscillator.
8. The implantable medical apparatus (1) according to one of the preceding claims, **characterized in** that the second timer circuit (122) is configured to periodically
10 switch the detection device (121) to the reception state for a predetermined reception period (A).
9. The implantable medical device (1) according to one of the preceding claims, **characterized in** that the detection device (121) comprises a detection sensor (128)
15 for detecting a signal from the signal source (2).
10. The implantable medical device (1) according to claim 9, **characterized in** that the detection sensor (128) is formed by a GMR sensor.
- 20 11. The implantable medical device (1) according to one of the preceding claims, **characterized in** that the detection device (121) is configured to generate a signal (P2, P2') which depends on the detection of a signal of the signal source (2).
12. The implantable medical device (1) according to claim 11, **characterized in** that the
25 wake-up device (12) comprises an inversion circuit (123) for inverting the signal generated by the detection device (121) and for outputting an inverted signal obtained by the inversion.
13. The implantable medical device (1) according to claim 12, **characterized in** that the
30 inversion circuit (123) is connected to the first timer circuit (120) to output the inverted signal to the first timer circuit (120).

14. The implantable medical device (1) according to one of the preceding claims, **characterized in** that the functional device (10), after being transferred to the operational state, remains in the operational state for a predetermined period of time for carrying out said function and then reverts to the switched-off state.

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15. The implantable medical device (1) according to one of the preceding claims, **characterized in that** the first timer circuit (120) and/or the second timer circuit (122) comprise at least one electronic component implemented in sub-threshold technology.