

Claims

1. Programming device for programming an implantable medical device for stimulating a human or animal heart, comprising a first processor and a first memory unit,

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characterized

in that the first memory unit comprises a first computer-readable program that causes the first processor to perform the following steps when executed on the first processor:

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- a) allowing to select one of at least two electrode lead configurations of an implantable medical device (1) for stimulating a human or animal heart (7), wherein the at least two electrode lead configurations comprise

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- i) a first electrode lead configuration in which an atrial electrode lead (4) and a right ventricular electrode lead (9) are connected to electrode lead ports (3, 8) of the implantable medical device (1), and

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- ii) a second electrode lead configuration in which an atrial electrode lead (4) and a His bundle electrode lead (14) are connected to electrode lead ports (3, 8) of the implantable medical device (1);

- b) allowing to select a first timing parameter value (17) from a first set of timing parameter values if the first electrode lead configuration is selected and to select a second timing parameter value (18) from a second set of timing parameter values if the second electrode lead configuration is selected, wherein the first timing parameter value (17) is a value of an atrioventricular interval and the second timing parameter value (18) is a value of an atrial-His interval.

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2. Programming device according to claim 1, **characterized** in that the first set of timing parameter values comprises values lying in a time range of from 40 ms to 350 ms.
- 5 3. Programming device according to claim 1 or 2, **characterized** in that the first timing parameter value (17) is preset to a time lying in a range of from 150 ms to 210 ms.
4. Programming device according to any of the preceding claims, **characterized** in that the second set of timing parameter values comprises values lying in a time range of
10 from 15 ms to 300 ms.
5. Programming device according to any of the preceding claims, **characterized** in that the second timing parameter value (18) is preset to a time lying in a range of from 80 ms to 140 ms.
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6. Programming device according to any of the preceding claims, **characterized** in that the first computer-readable program causes the first processor to prevent selecting the second timing parameter value (18) if the first electrode lead configuration is selected and to prevent selecting the first timing parameter value (17) if the second
20 electrode lead configuration is selected.
7. Programming device according to any of claims 1 to 5, **characterized** in that the first computer-readable program causes the first processor to allow both selecting the first timing parameter value (17) and selecting the second timing parameter value (18) if
25 the second electrode lead configuration is selected.
8. Programming device according to any of the preceding claims, **characterized** in that the first computer-readable program causes the first processor to transfer the selected first timing parameter value (17) or the selected second timing parameter value (18)
30 to an appliance remote from the programming device, the appliance being chosen from the group consisting of a printout, a database, and a home monitoring system.

9. Computer program product comprising computer-readable code that causes a processor to perform the following steps when executed on the processor:
- a) allowing to select one of at least two electrode lead configurations of an implantable medical device (1) for stimulating a human or animal heart (7),
5 wherein the at least two electrode lead configurations comprise
- i) a first electrode lead configuration in which an atrial electrode lead (4) and a right ventricular electrode lead (9) are connected to electrode lead ports (3, 8) of the implantable medical device (1), and
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- ii) a second electrode lead configuration in which an atrial electrode lead (4) and a His bundle electrode lead (14) are connected to electrode lead ports (3, 8) of the implantable medical device (1);
- 15 b) allowing to select a first timing parameter value (17) from a first set of timing parameter values if the first electrode lead configuration is selected and to select a second timing parameter value (18) from a second set of timing parameter values if the second electrode lead configuration is selected, wherein the first timing parameter value (17) is a value of an atrioventricular interval and the
20 second timing parameter value (18) is a value of an atrial-His interval.
10. Arrangement comprising a programming device (2) according to any of claims 1 to 8 and an implantable medical device (1) for stimulating a human or animal heart (7), wherein the programming device (2) comprises a first data communication unit and
25 wherein the implantable medical device (1) comprises a second processor, a second memory unit, a second data communication unit, a stimulation unit configured to stimulate a cardiac region of a human or animal heart (7), and a detection unit configured to detect an electric signal at the cardiac region of the same heart (7).
- 30 11. Arrangement according to claim 10, **characterized** in that the first data communication unit and the second data communication unit serve for transferring data from the programming device (2) to the implantable medical device (1) and/or

for transferring data from the implantable medical device (1) to the programming device (2).

12. Arrangement according to claim 10 or 11, **characterized** in that the second memory unit comprises a second computer-readable program that causes the second processor to perform the following steps when executed on the second processor:
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- a) receiving, with the second data communication unit, a dataset comprising a first timing parameter value (17) and/or a second timing parameter value (18),
10 wherein the first timing parameter value (17) is a value of an atrioventricular interval and the second timing parameter value (18) is a value of an atrial-His interval;
- b) setting an atrioventricular interval to be applied by the stimulation unit to the first timing parameter value (17) of the received dataset if the implantable medical device comprises an atrial electrode lead (4) and a right ventricular electrode lead (9) and/or setting an atrial-His interval to be applied by the stimulation unit to the second timing parameter value (18) of the received dataset if the implantable medical device comprises an atrial electrode lead (4) and a His bundle electrode lead (14).
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13. Arrangement according to any of claims 10 to 12, **characterized** in that the second memory unit comprises a second computer-readable program that causes the second processor to perform the following steps when executed on the second processor:
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- a) automatically detecting a presence of a His bundle electrode lead (14) connected to an electrode lead port (8) of the implantable medical device (1);
- b) causing the second data communication unit to transfer a dataset indicating the presence of the His bundle electrode lead (14) to the first data communication unit.
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14. Arrangement according to claim 13, **characterized** in that the first computer-readable program causes the first processor to perform the following steps:
- a) receiving, with the first data communication unit, the dataset indicating the presence of the His bundle electrode lead (14);
 - b) automatically selecting the second electrode lead configuration in response to receiving this dataset.
15. Method for programming an implantable medical device for stimulating a human or animal heart with a programming device (2) according to any of claims 1 to 8, wherein the programming device (2) comprises a first data communication unit and wherein the implantable medical device (1) comprises a second processor, a second memory unit, a second data communication unit, a stimulation unit configured to stimulate a cardiac region of a human or animal heart (7), and a detection unit configured to detect an electric signal at the cardiac region of the same heart (7), the method comprising the following steps:
- a) allowing to select one of at least two electrode lead configurations of the implantable medical device (1), wherein the at least two electrode lead configurations comprise
 - i) a first electrode lead configuration in which an atrial electrode lead (4) and a right ventricular electrode lead (9) are connected to electrode lead ports (3, 8) of the implantable medical device (1), and
 - ii) a second electrode lead configuration in which an atrial electrode lead (4) and a His bundle electrode lead (14) are connected to electrode lead ports (3, 8) of the implantable medical device (1);
 - b) allowing to select a first timing parameter value (17) from a first set of timing parameter values if the first electrode lead configuration is selected and to select

a second timing parameter value (18) from a second set of timing parameter values if the second electrode lead configuration is selected, wherein the first timing parameter value (17) is a value of an atrioventricular interval and the second timing parameter value (18) is a value of an atrial-His interval;

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c) generating, with the programming device (2), a dataset comprising the first timing parameter value (17) and/or the second timing parameter value (18);

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d) transmitting, with the first data communication unit, the dataset to the implantable medical device (1);

e) receiving, with the second data communication unit, the dataset;

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f) setting an atrioventricular interval to be applied by the stimulation unit to the first timing parameter value (17) of the received dataset if the first electrode lead configuration has been selected or setting an atrial-His interval to be applied by the stimulation unit to the second timing parameter value (18) of the received dataset if the second electrode lead configuration has been selected.

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