



HHR 3000 PRO

Service Manual

D01B1.2 HHR 3000 PRO

April-2013



*This documentation applies to the product HHR3000 PRO
manufactured by BioControl, Norway.*

Modifications since last documentation version:

- *version 1.0: first version*
- *version 1.1: chapter 10 added (First Diagnostics)*
- *version 1.2: chapter 5 added battery diagnostics*

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1 Safety information

The product may be opened only by authorized personnel.

The inappropriate handling of electronic component can damage or destroy the devices.

The devices can be destroyed by driving to high currents through the device, by overheating the device, by mixing up the polarity, or by electrostatic discharge (ESD).

Ground yourself with professional grounding equipment like an anti-static wristband.

2 Tools required

- Screwdriver; Phillips cross; PH1
- Hex nut driver 5mm
- Soldering iron

3 Open the HHR 3000 PRO



STEP 1

Remove the bottom screw securing the DSUB connector



STEP 2

Remove ten screws from the front of the HHR 3000



STEP 3

Turn the HHR upside down and lift off the back cover

4 Install the piggy back option



STEP 1

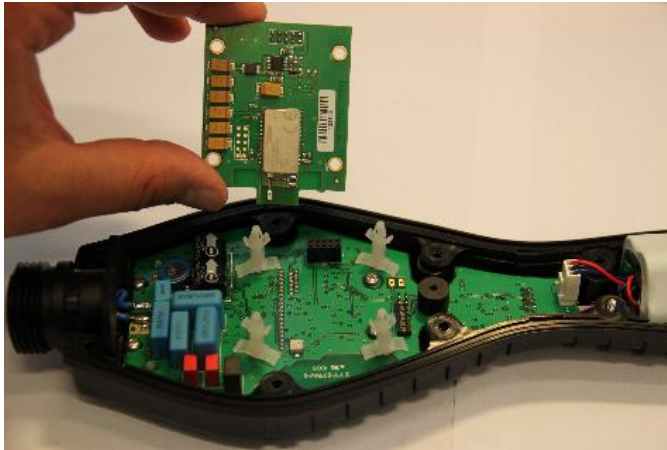
Mount four plastic spacers by pushed through the hole in the PCB



 **CORRECT**

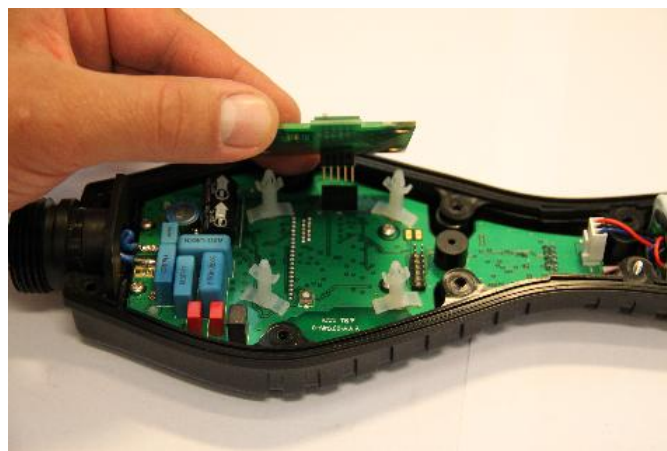


 **INCORRECT**



STEP 2

Plug one of the piggy-back board (Bluetooth / RS232 / GPRS or extra memory) onto the interface socket.



STEP 3

Be sure the connector on your HHR matches that in the piggy back.



STEP 4

Gently press down the piggy back and make sure it is locked in position

5 Battery diagnostics and replacement

The HHR-battery is a NiMH-type which implies (ad.3 in B10012):

- The battery must be (re)charged at least every 3 months. If not, the capacity will decrease, eventually the battery will go defect.
- We recommend to (re)charge HHR's at least every 3 months and to avoid storing HHR with an empty battery.
- Don't forget to periodically charge your HHR-stock!

IN GENERAL:

- Battery degrading is a slow process; it often takes a while before a user complains about low battery capacity (meaning that the HHR goes to low-bat status faster than experienced before).
- The battery voltage after charging is not a good indication of its capacity.
- Temperature significantly influences battery capacity: the operational time of the HHR at 0 °C is approx. 50% compared to operation at 20 °C.

Assessment if the battery should be replaced:

1. If the HHR is older than 3 years it is likely that the battery has much lower capacity and will be discharged very quickly. We recommend to replace the battery if HHR > 3 years old. Especially if it was used intensively (many charge/discharge cycles).
2. If the battery was not charged in a period longer than 3 months it is likely that the capacity is reduced. It is not always necessary to replace the battery, but if a customer has not charged for a long period, he must realize that the battery capacity is significantly reduced.
3. If the HHR is opened for any reason: measure the battery voltage:
 - disconnect battery from HHR
 - measure the voltage with a voltmeter (between red and black wire).

If the voltage is below 4,5V then the battery must be replaced by a new one ($V_{bat} < 4,5V$ means it is discharged too much and its life has ended).

4. Charging battery with HHR charger must result in a full battery status after 4 hours. If it doesn't: replace the battery.

5. A charged battery will have 6-6,5V and even up to 7V shortly after charging. The HHR measures the battery voltage during charging as in chapter 10; it is not necessary to use a Voltmeter for this.

Battery replacement



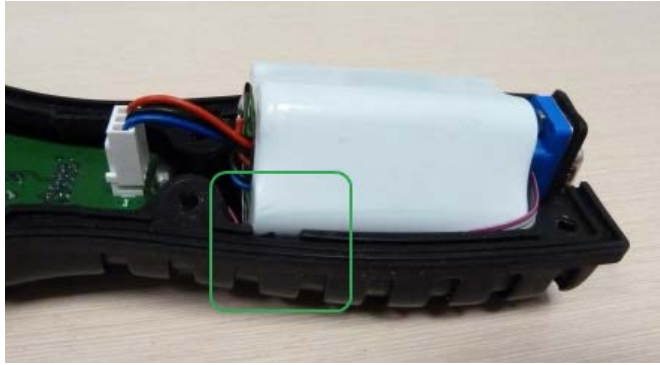
STEP 1

Disconnect the battery from the mother board.



STEP 2

Replace the battery with the new one



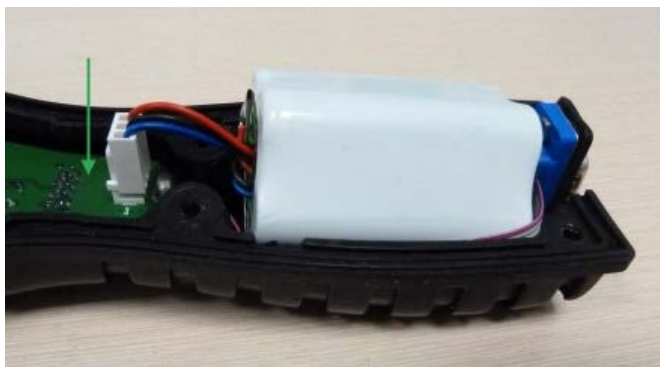
STEP 3

Be sure the flat cable is under the battery

 **CORRECT**



 **INCORRECT**



STEP 4

Connect the new battery

6 Replace the antenna connector



STEP 1

Disconnect the exchangeable antenna

STEP 2

Open the HHR

STEP 3

Disconnect and remove the battery



STEP 4

Remove screw securing the DSUB connector



STEP 5

Unsolder antenna wires



STEP 6
Remove the connector
out of the bay.



STEP 7
Insert the new connector
into the bay
Solder antenna wires

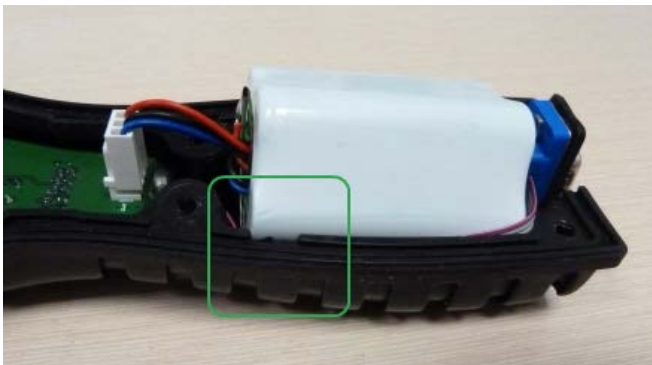


STEP 8
Put the DSUB connector
through the gasket.



STEP 9
Fasten the DSUB
connector screw

STEP



10
Insert and connect the
battery. Be sure the flat
cable is under the
battery

STEP 11
Close the HHR 3000

7 Replace the main PCB board



STEP 1
Open the HHR

STEP 2
Disconnect and remove the battery



STEP 3
Remove screw securing the DSUB connector



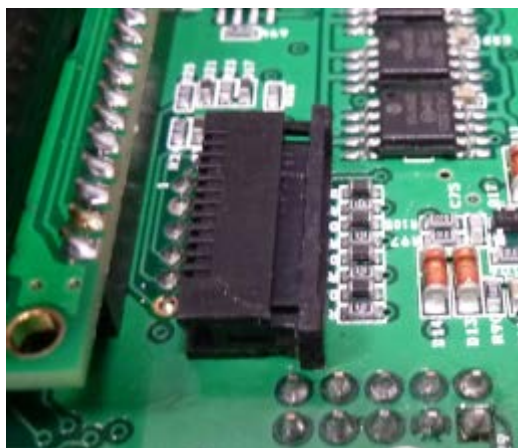
STEP 4
Unsolder antenna wires



STEP 5
Remove four screws
securing the PCB



STEP 6
Disconnect the keyboard
cable





STEP 7

Disconnect the LCD display
To remove, simply squeeze the locking device of the spacer.



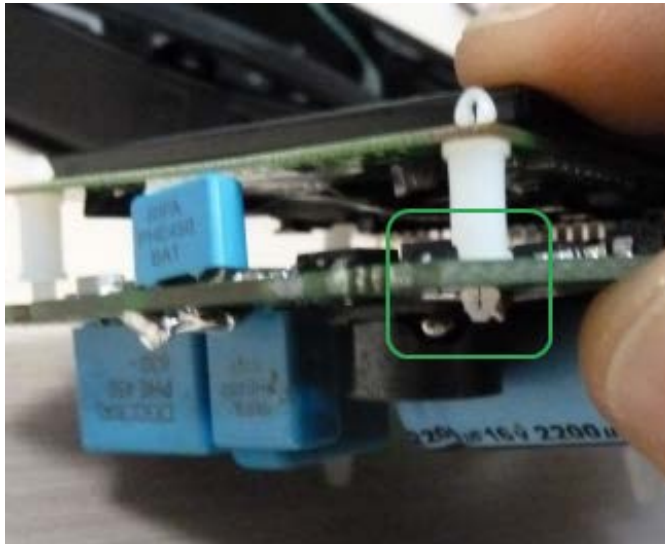
STEP 8

Replace the main PCB board with the new one



STEP 9

Insert the LCD display.
Gently press down it and make sure it is locked in position



✓ CORRECT



STEP 10

Connect the flat cable of keyboard



STEP 11

Fasten four screws securing the PCB



STEP 12

Make sure of placement LCD in right position by small movement of the PCB

 **CORRECT**

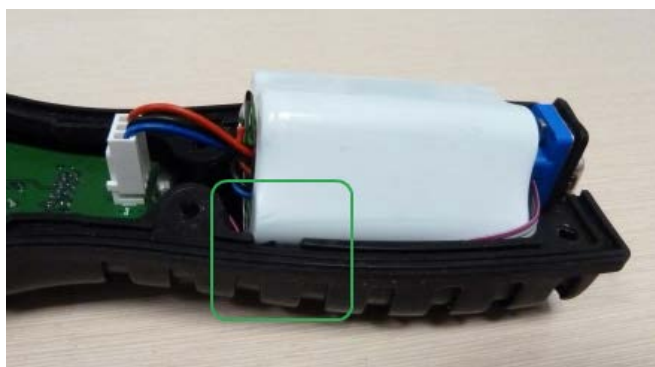


 **INCORRECT**



STEP 13

Fasten the DSUB connector screw



STEP 14

Insert and connect the battery. Be sure the flat cable is under the battery

STEP 15

Close the HHR 3000

8 Close the HHR 3000 PRO



STEP 1

Place back cover of the HHR



STEP 2

Make sure the gasket is in place

 **CORRECT**



 **INCORRECT**



STEP 3

Fasten ten screws on top of the HHR



STEP 4

Fasten the DSUB connector screw.

9 End of life



STEP 1

All external parts have to be removed from the reader



STEP 2

Remove all nuts and screws from the reader and dispose in accordance with local recycling laws.



STEP 3

The keyboard and the logo foils have to be removed from the top and bottom cover casing and dispose in accordance with local recycling laws.



STEP 4

Dispose the electronic in accordance with local recycling laws.



STEP 5

Dispose the battery in accordance with local recycling laws.



STEP 6

Dispose the gasket in accordance with local recycling laws.

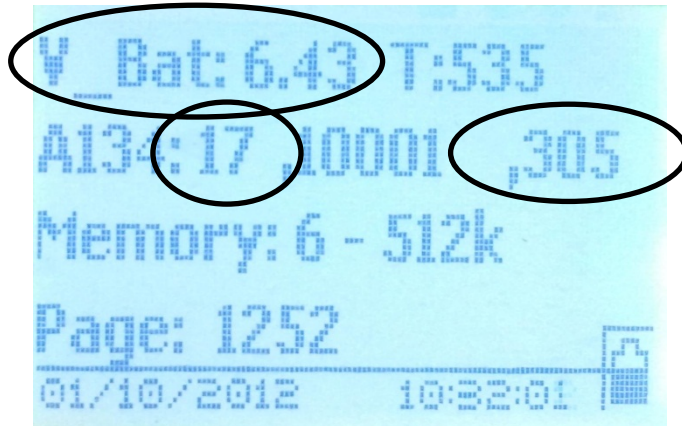


STEP 7

Dispose the plastic parts of the reader in accordance with local recycling laws.

10 First diagnostics

Download the program 'HHR3000 TEST.txt' from the section 'Community' on the BioControl website and load it onto the HHR. This shows the display hereunder, the circles indicate the relevant information.



V_Bat: Voltage on Battery (here 6.43)

It is recommended that the battery is charged at least once every three months and that the battery is replaced every two years in case of frequent HHR-use.

V_Bat should be around 5,8V to 6,5V. During charging it can go up to 7,5V. The battery should be changed if V_Bat is below 4.5V for a long period.

A134: Antenna Tuning (here 17)

Check the Antenna Tuning if the HHR does not read a transponder. Tuning has to be in the range of 4-27. This value ensures the correct alignment of the antenna.

A134: Antenna Voltage (here 305)

Check the Antenna Voltage if the HHR does not read a transponder. The Antenna Voltage has to be in the range of 120V - 420V. Different antennas have different voltages, the following antenna voltage bandwidths are 'normal':

Loop antenna: 180 – 300V

Ferrite antenna: 280 – 400V