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Product Manual



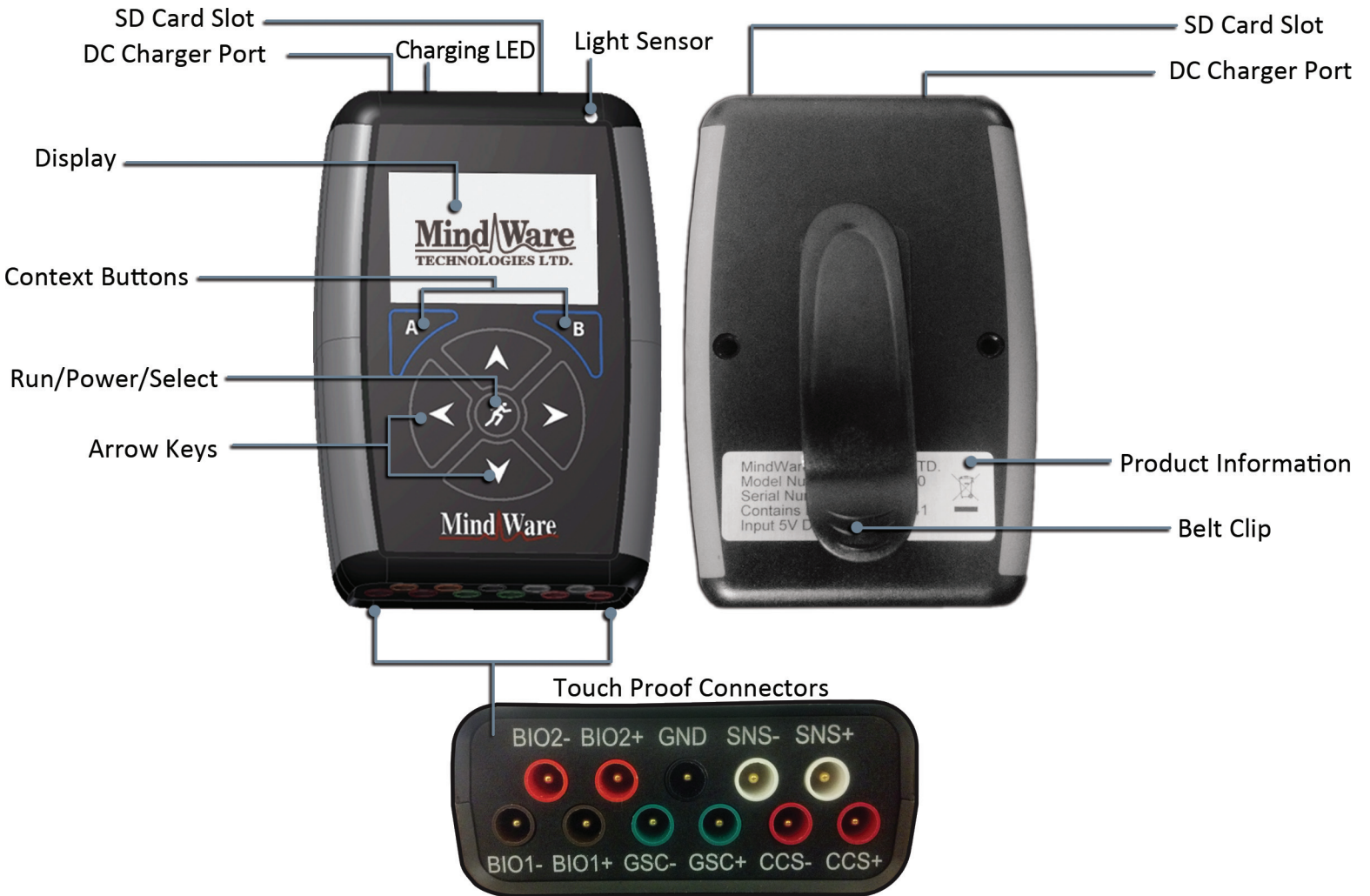
MINDWARE MOBILE

Impedance Cardiograph

Manual

MindWare Mobile Impedance Cardiograph

Product Overview



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Start-up:


1. Before use, make sure the device is fully charged using the *medical-grade power supply* included with your device. From completely discharged, the battery will take 4 hours to fast-charge mostly full and trickle until complete. Status of charge is reflected on screen by the following symbols:



Charging



Charge Complete

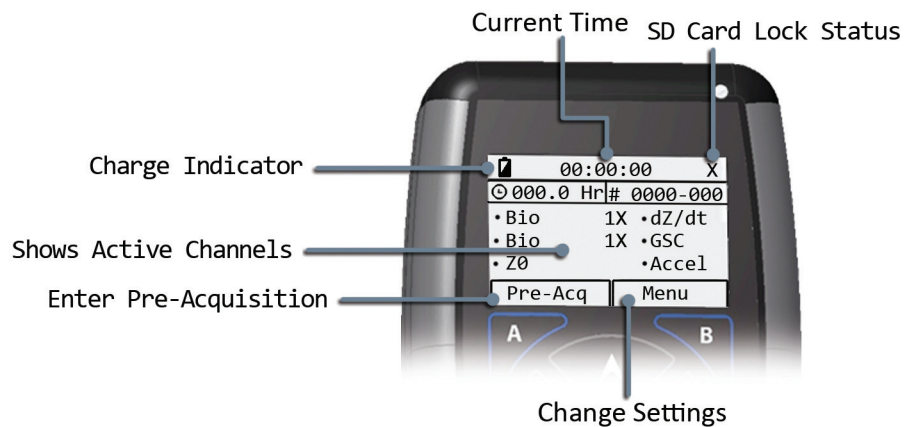
2. To power on the device, click the “Run”  button
3. Once the device has booted you have the option of two data collection modes, *Local* and *WiFi*. The device can also be shutdown by choosing the “Shutdown” tab with the left *context button* “A”.
4. Select method of data collection by using the arrow keys to move the outline around the Local or WiFi symbol and either clicking the “Run” or *right context button* “B”, to finalize selection.



Local Mode:

Local mode stores data locally on any standard SD card inserted into the device. The device includes an SD card, but any other compatible SD card can also be used (SDHC cards are recommended). Data collected to SD card can be transferred to any computer with MindWare BioLab software installed for analysis.

1. Make sure that a compatible SD card is inserted into the device before attempting to acquire data. It is suggested to check for available space on the card before beginning data collection to assure required space is available.



2. Check device and local mode settings by selecting the “Menu” tab with the *right context button* “B”.

3. On the *Main Menu* screen, choose either “*Acquisition Settings*” or “*System settings*” to view and edit settings. Going back to previous page can be done at any time by selecting the “*Back*” tab with the *left context button “A”*
4. The device can also be shut off by selecting “*Power Off*” with the *arrow keys* on the *Main Menu* screen and hitting the “*Select*” tab.
5. Choose “*Acq Settings*” to get to the Acquisition Settings screen.
6. *Acquisition #* is assigned to distinguish data from each other. The device will auto-assign the last three digits to increment with each acquisition. The first four characters are user-defined by selecting “*Acquisition #*” and using the *arrow keys* to adjust the number. When done, save changes with the “*Save*” tab.
7. Acquisition settings also lists the channels that the device can collect. These channels can be toggled *on* and *off* by selecting the channel and using the *Left and Right arrow keys* to change between *on* and *off*.
8. The gain of certain channels can also be edited by choosing the channel and using the *Left and Right arrow keys* on the “*Gain*” line found below *On/Off* option. See *Bio-channel scaling table* below



Gain	Norminal Range (V)	Theoretical Resolution (nV)
1X	+/- 2.4	286
2X	+/- 1.2	143
3X	+/- 0.8	95.4
4X	+/- 0.6	71.5
6X	+/- 0.4	47.7
8X	+/- 0.3	35.8
12X	+/- 0.2	23.8

Table 1: Bio-Channel Scaling

9. It is important to note that on the right side of the Acquisition Settings screen an up or down arrow indicates that there are more selections not visible on screen but can be reached with the *arrow keys*.
10. Once settings for acquisition are complete, return to “*Main Menu*” and select “*System Settings*”
11. System Settings contains *Date & Time Menu* as well as the “*About*” option.
12. On the *Date & Time* screen, device date and time that will be used in acquisition can be calibrated by using the arrow keys. Once date & time have been calibrated choose “*Save*” to record changes.

- 13. The “About” screen contains system information such as *Model, Firmware, Bootloader, and Serial #.*
- 14. Once Settings have been adjusted return to *Local Mode* main screen by using the “Back” tab. When on this screen, the “Pre-Acq” tab can be selected to move to the *Pre-Acquisition* screen.



- 15. The pre-acquisition screen shows the real time signals that are being read by the device. The channels can be cycled through by using the *left and right arrow keys*. It is a good Idea to check the signals in the acquisition screen before acquiring data. Note that the “Back” tab can be selected to return to previous screens.

- 16. Once *Pre-Acquisition* has been reviewed, data collection can begin by selecting the “Acquire” tab.



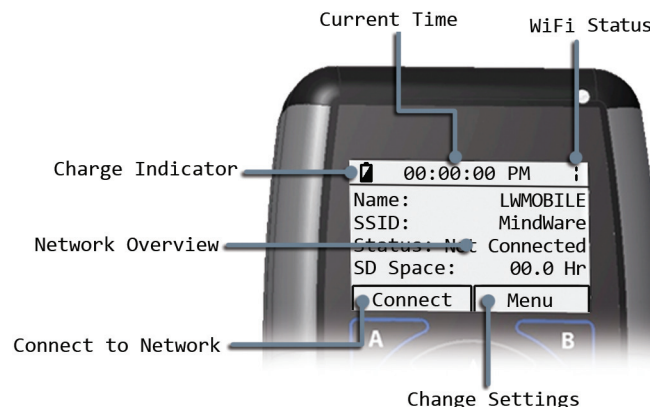
- 17. At this point, data is being recorded to the SD card. **Do not remove SD card during acquisition.**

- 16. During Acquisition, controls have been locked. To unlock them hold both the “Left” and “Right” arrow keys simultaneously.

- 17. When controls are unlocked signals can be viewed. Ending acquisition can be done on this screen by selecting the “Exit” tab. All result will be saved to SD card.

WiFi Mode:

Wifi Mode allows the Mobile to stream acquisition data wirelessly to BioLab connected to a network. This stores data to computer rather than a SD card. To do this a BioNex must be connected to a computer with BioLab installed and open. See “BioLab Set-up” for more information.



- 1. Choose *Menu* from WiFi Mode main screen by selecting it with *right context button “B”*.
- 2. This brings you to the *Main Menu* screen. Here you can change settings and power off the device by using the arrow keys and selection buttons.

3. Choose *“WiFi Settings”* from the Main Menu.
4. On the WiFi Settings screen, available wireless networks are shown. This list can be refreshed by selecting the *“Scan Networks...”* option and hitting *“Run”* or *right context button “B”*.

5. It is important to note that on the right side of the WiFi Settings screen, an up or down arrow indicates that there are more selections not visible on screen but can be reached with the arrow keys.



6. Once desired network has been found, select it by pressing *“Run”* button or *right context button “B”*. It is important to note that the *“Back”* tab can be pressed at anytime to return to the previous screen.

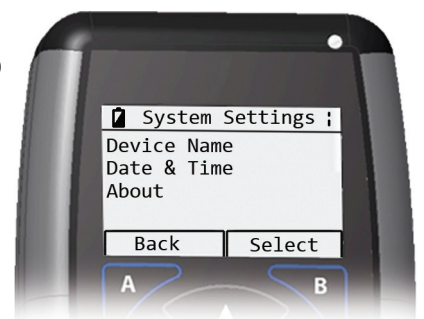
7. After selecting a network, that network’s information will be displayed. Check the information and press the *right context button “B”* to connect.

8. The device will return to the WiFi Mode main screen. Here you can check the network overview that the device is now using. (status will read *“Not Connected”*)

9. Return to the main menu by selecting the *“Menu”* tab with the *right context button “B”*

10. From the Main Menu Screen select *“System Settings”*. This screen contains *“Device Name”*, *“Date & Time”*, as well as the *“About”* option.

11. Selecting *“Device Name”* will bring up the option to edit the device name as it appears on the network. Edit by using the arrow keys. To record changes, select the *“Save”* tab with the *right context button “B”*. Saving or canceling will return the device to the *System Settings* screen.



12. *The Date & Time* screen will bring up the option to edit the date and time that will be recorded by the device. Edit date and time by using the arrow keys. Save changes with the *right context button “B”*. Saving or canceling will return the device to the *System Settings* screen.

13. The *About* screen contains system information such as *Model*, *Firmware*, *Bootloader*, and *Serial #*.



14. Return to WiFi Mode main screen by using the *“Back”* tab twice.

15. Select Connect by pressing the *left context button “A”*.

16. This screen shows device name and status of network connection. Status of connection will be “Discovery” until BioLab connects to the device (to unlock buttons and exit to WiFi main screen, hold down “Left and Right” arrow keys then select “End”).

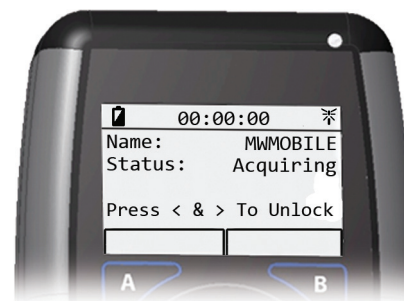
17. Follow the steps bellow to connect BioLab to Device:

Configuring BioLab:

1. BioNex device must be connected to computer and powered on. Open BioLab
2. In *BioLab Configuration*, go to *Acquisition Source* dropdown menu and choose either *Ambulatory Wi-Fi* or *BioNex & Ambulatory Wi-Fi*.
3. When *Network Device Detection* window appears, click button next to the device name given to that unit. It may take a few minutes for a Mobile unit to be detected. (If device not shown, check network settings on ambulatory)
4. When *Channel Setup* appears, choose up to 4 channels.
5. Click *Connect*, then *Connect* again on *Device Detection Window*

18. Once BioLab connects to device, the Mobile will leave discovery status and begin *Acquisition Mode*.


19. The Acquisition Screen means that the device is now reading signals. It is a good idea to preview the signals in BioLab before beginning data collection



21. During Acquisition controls have been locked. To unlock them hold both the “Left” and “Right” arrow keys simultaneously.

22. When controls are unlocked, acquisition can be ended by selecting the “End” tab. However, it is recommended to control the acquisition from BioLab.

Other Important features:

- In case of an unlikely system freeze, device can be powered off with the  “Run” button. First, disconnect the charger then hold down the “Run” button until device screen has visibly shutoff (approximately 12 seconds). **Note, this is not a safe alternative to a soft device shutdown found on the “Main Menu” screen.**
- Wire leads are inserted into the marked and color coded *Touch Proof Connectors* found on the base of the device.
- During acquisition, controls have been locked to prevent unintended interruption by subject or event. To unlock device, hold both the “Left” and “Right” arrow keys simultaneously.
- To conserve battery life, the device uses a light sensor that will dim screen when needed
- Up to 8 Mobile units can be connected to BioLab simultaneously.
- Each unit can have up to 4 channels of acquisition

Important Information

FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. this device must accept any interference received, including interference that may cause undesired operation.

Within the 5150 to 5250 MHz band (5 GHz radio channels 34 to 48) the device is restricted to indoor operations to reduce any potential for harmful interference to co-channel MSS operation.

Any changes or modifications NOT explicitly APPROVED by MindWare Technologies could cause the module to cease to comply with FCC rules part 15, and thus void the user's authority to operate the equipment.

IC COMPLIANCE

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions:

1. This device may not cause interference, and
2. this device must accept any interference, including interference that may cause undesired operation of the device.

Within the band 5150 - 5250 MHz the operation of this device is restricted to indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems.

CONFORMITÉ AUX NORMES D'IC

Cet appareil est conforme à la(aux) norme(s) RSS sans licence d'Industry Canada. Son utilisation est soumise aux deux conditions suivantes :

1. Cet appareil ne doit pas causer d'interférences et
2. il doit accepter toutes interférences reçues, y compris celles susceptibles d'avoir des effets indésirables sur son fonctionnement.

Dans la bande de fréquences 5150 - 5250 MHz, le fonctionnement de cet appareil est limité à une utilisation à l'intérieur pour réduire le potentiel d'interférences brouillant les systèmes satellites mobiles d'un même canal.

Safety

Warning Regarding Medical and Clinical Use of MindWare Technologies LTD Products.

MindWare Technologies LTD products are not designed with components and testing for a level of reliability suitable for use in treatment and diagnosis of humans or as critical components in any life support systems whose failure to perform can reasonably be expected to cause significant injury to a human. Applications of MindWare Technologies LTD products involving medical or clinical treatment can create a potential for death or bodily injury caused by product failure, or by errors on the part of the user or application designer. Any use or application of MindWare Technologies LTD products for or involving medical or clinical treatment must be performed by properly trained and qualified medical personnel, and all traditional medical safeguards, equipment, and procedures that are appropriate in the particular situation to prevent serious injury or death should always continue to be used when MindWare Technologies LTD products are being used. MindWare Technologies LTD products are NOT intended to be a substitute for any form of established process, procedure, or equipment used to monitor or safeguard human health and safety in medical or clinical treatment.



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