

BioHarness



Firmware Versions



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Version	Description
2013-MAY-30	Initial Release
2013-JUN-05	BH3 v1.3.18.0
2013-JUN-13	BH3 v3.0.7.0
2013-JUN-25	BH3 v3.0.8.104
2013-JUL-20	BH3v 1.3.19.0
2013-OCT-24	BH3v1.3.23.0
2014-MAY-01	BH3v1.3.27.0
2014-MAY-14	Added initial versions of ZephyrLIFE Home & Hospital FW
2014-NOV-22	BH3v1.4.5.0

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1. Introduction

This document initially compiled May 2013 from available historical data from production records, software release notes and SVN version control.

At the time of writing both ISM BioHarness 1.x BioModules and BioHarness 2.0 BioModules are no longer in production.

Chronological Progression of BioModules:

Version	Hardware		Radio Type	Description
1.5			ISM	Single device systems. Out of production
1.6			ISM	Multi-device systems. Out of production
2.0			Bluetooth	Out of production
3.0	9800.0153	1G	Bluetooth	OmniSense Support. Out of production
	9800.0189v6-v9g	2G	Bluetooth + ECHO	OmniSense Support
	9800.0189v9g	2G	Bluetooth + ECHO	BH3-M1. ZephyrLIFE & BioPatch Support. FDA compliant
	9800.0189.v9k	3G	Bluetooth + ECHO + BLE	OmniSense + Pebble support

2. BioHarness 3.0

2.1 Hardware

Part No:	Description	Serial
9800.0153	Bluetooth only	BHT02999 and below
9800.0189v6-v9g	Bluetooth + ECHO	BHT03000 and above
	FDA Compliant, Capacitive breathing only (strap). Black BH3-M1	BHT500xxx
	FDA Compliant Impedence Breathing (BioPatch) Black	BHT99xxxx
	FDA, Impedence Breathing, Apple, white	BHT5xxxxx
9800.0189.v9k	Bluetooth + ECHO + BLE, black	13099 – 13448,

2.2 Firmware

Date	Version	Part No.	Description
June 2011	1.0.6.0	9500.0085.v1a	
Oct 2011	1.1.3.0	9500.0085.v1b	
Oct 2011	1.1.4.0	9500.0085.v1c	
Oct 2011	1.1.7.0	9500.0085.v1d	
Oct 2011	1.1.8.0	9500.0085.v1e	
Oct 2011	1.1.9.0	9500.0085.v1f	
Nov 2011	1.1.10.0	9500.0085.v1g	
Dec 2011	1.1.14.0	9500.0085.v1h	
Dec 2011	1.1.15.0	9500.0085.v1i	Mainly bug fixes this version and prior
Apr 2012	1.1.19.0	9500.0085.v1j	Bluetooth only this version and prior
May 2012	1.3.5.0	9500.0085.v2a	Separate Image files for BT only, BT/ECHO
May 2012	1.3.12.0	9500.0085.v2b	
July 2012	1.3.13.0	9500.0085.v2c	
Aug 2012	1.3.14.0	9500.0085.v2d	GPS support
Dec 2012	1.3.15.0	9500.0085.v2e	ECG buffering
Dec 2012	1.3.16.0	9500.0085.v3a	BT/ECHO version only
May 2013	1.3.5.116	9500.0085.v3b	Impedence breathing for trial units
Jun 2013	1.3.18.0	9500.0085.v3c	GPS logging bug fix. Capacitive breathing version.
June 2013	3.0.7.0	9500.0085.v4a	Impedence breathing. Limited beta release.
June 2013	3.0.8.104	9500.0085.v4b	Impedence breathing. Limited beta release.
July 2013	1.3.19.0	9500.0085.v5a	Clock timing bug fix. Capacitive breathing version
October 2013	1.3.23.0	9500.0085.v6a	GPS data in Summary format. GPS switched to enhanced DGPS automatically on connection with BioModule.
April 2014	1.3.25.0	9500.0085.v6b	
April 2014	1.3.27.0	9500.0085.v6c	Improvements to the calibration of device RTC clock
May 2014	3.0.35.0	9501.0002.v2g	For use with ZephyrLIFE Home Android application & BioPatch
May 2014	3.0.8.111	9501.0002.v1r	For use with ZephyrLIFE Hospital ECHO system & BioPatch
July 2014	1.3.20.106		For use with PSM systems using ATX radio network
November 2014	1.4.5.0	9500.0085.v7a	GPS with ECHO. Support for BLE. Initially strap only

Firmware Updates on the BioHarness 3 are carried out using the ZephyrUSBUpdater:

Part Number	Description
9500.0088.v1a	Firmware Updater v2.0.1.10 / Multi-updater 3.0.1.1

3. BioHarness Bluetooth 2.0

BioHarness 2.0 End Of Life was announced in 2013.

This device supports Skin Temperature. Later versions of firmware which supported the Summary data packet would return an Invalid value for the Estimated Core Temperature and ADC Aux channels.

Two versions of BH2.0 hardware exist:

Part No:	Description
9800.0070	SAM7SE processor. Early versions 3g accelerometer, later 16g accelerometer
9800.0151	SAM7X Processor. 16g accelerometer.

Firmware

Date	Version	Part No.	Description
			Previous versions omitted
Aug 2010	2.2.1.0	9500.0017.v1l	Configurable Logging format
Sep 2010	2.3.0.0	9500.0017.v1m	
Sep 2010	2.3.1.0	9500.0017.v1n	Improved RR calculation
March 2011	2.3.2.0	9500.0017.v1o	ECG Amplitude & noise added
October 2011	2.3.8.0	9500.0017.v2a	Support for Summary Data Packet (No summary log format) ROG2, Subject Info v2
June 2012	2.3.10.0	9500.0017.v2b	Subject info v3

Firmware Updates on the BioHarness 2 are carried out using the ZephyrUSBUpdater:

Part Number	Description
9500.0088.v1a	Firmware Updater v2.0.1.10

4. BioHarness ISM 1.5, 1.6

BioHarness ISM End Of Life was announced in April 2012.

Firmware and hardware compatibility table – legacy

Date	Product	Hardware (PCB Version)	Firmware	Preferred Upgrade Option
Pre Dec 07	V1.0	9900.0085	v1.0.0.1	Replace Device – not upgradable
Pre Dec 07			v1.0.0.2	Replace Device – not upgradable
Pre Dec 07			v1.0.0.4	Replace Device – not upgradable
Pre Dec 07			v1.0.0.5	Replace Device – not upgradable
Pre Dec 07			v1.0.0.6	Replace Device – not upgradable
Pre Dec 07	V1.5	9900.0085_v2c	v1.0.0.8	Firmware Upgrade
Pre Dec 07			v2.0.0.0	Live
Dec-07	V1.5	9900.0085_v2d	v2.0.0.0	Live
Mar-08	V1.6	9900.0085_v2d to v2g	V2.0.0.4	Live USB charge only
Aug-08	V1.6	9900.0085v2H	V2.0.0.7	Live (Polling-configurable) Earlier versions of board cannot be upgraded to v2.0.0.7 Wall charge compatible
Sep-08	V1.6	9900.0085v2H	V2.0.0.8	Improvements to BR algorithm
Oct-08	V1.6	9900.0085v2H	V2.0.0.9	Live – disable not-worn HR + BR
Feb-09	V1.6	9900.0085v2H	V2.0.0.10	Live - New SD Card Compatibility fix
Mar-09	V1.6	9900.0085v2H	V2.0.0.11,12	Live - Polling bug fixes
Jan-10	V1.6	9900.0085v2H	V2.0.0.14	HR & Breathing algorithm updates
Sep-10	V1.6	9900.0085v2H	V2.0.0.15	Const LED when logging
Sep-10	V1.6	9900.0085v2H	V2.0.1.15	Side strap
Oct-2011	V1.6	9900.0085v2H	V2.0.0.16	ECG timing bug fix
Oct-2011	V1.6	9900.0085v2H	V2.0.1.16	Side strap

Firmware upgrades for ISM BioHarness modules are performed using a standalone utility which has the firmware image file embedded.

Part Number	Description
9500.0060.v1a	Firmware v2.0.0.14 installer
9500.0060.v1b	Firmware v2.0.0.14 installer
9500.0060.v1c	Firmware v2.0.0.15 installer
9500.0060.v1d	Firmware v2.0.1.15 installer
9500.0060.v1e	Firmware v2.0.0.16 installer
9500.0060.v1f	Firmware v2.0.1.16 installer