



Measure Life ... Anywhere

Release Note: OmniSense 2.2

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1. Scope

This document provides an overview of the added features and release status for Zephyr OmniSense 2.1 application software. It covers both OmniSense Live and Analysis applications and is applicable to Zephyr PSM Responder, PSM Defense and PSM Training systems.

2. Document Version Control

Version	Description
1.1	First Release
1.2	Updated Release to fix minor issues in Version 1.1
2.0	Updated to support more radios, new features and modified GUI, added restrictions on Blood Pressure and SpO ² devices
2.1	Updated to include the Z-Modem, Beep Test, Physiology Normative comparison report, Various RIDs, Various new software features and bug fixes
2.2	Updated to include Bluetooth direct to the PC

3. References

This document refers to the OmniSense Live version 2.1 and OmniSense Analysis version 2.1 software releases.

4. Definitions and Abbreviations

4.1. Abbreviations

AT	Anaerobic Threshold
BioGauge	Graphical representation of physiological parameters
BPM	Blood Pressure Meter
HR	Heart Rate
HR@AT	Heart Rate at Ambulatory Threshold
PSM	Physiological Status Monitoring
RID	Radio Interface Devices
RSM	Remote Speaker Microphone
SCL	Skin Conductance Level
SpO ₂	Pulse Oximeter
USB	Universal Serial Bus



5. Operational Requirements

5.1. Operating systems supported

Windows XP with Service Pack 3 / Windows Vista / Windows 7.

5.2. PC System requirements

512MB of memory, 100MB free disk space required, at least one USB port or serial port.

5.3. Motorola XTS Requirements

The following feature sets must be installed on the XTS Motorola radios:

- Q947 – Packet Data Interface

5.4. Firmware

All hardware such as Remote Speaker Microphones (RSM), Radio Interface Devices (RID), BioModules require a firmware update to integrate with this software release. Third party sensors do not require a firmware update.

Firmware upgrades for existing devices are included in the supplied Zephyr installation disc.

5.4.1. Zephyr Hardware

OmniSense			Firmwares						
Official Release	Date	Installer	BH	XTS Mic.	XTS Inline	TW RID	JEM RID	MBITR RID	Harris RID
V2.1	20/Aug/2010	V2.1.18	V2.2.1.0	V2.1.1.0	V1.0.9.0	V1.0.5.0	V1.0.7.0	V2.0.6.0	N/A

5.4.2. Third Party Hardware

- MyTech: HPL-108 USZ 1005232045.
- Nonin: 9560 Not applicable



6. New Features

In addition to the features released with OmniSense 2.0 the following new features and improvements were added.

Copies of previous release notes are obtainable here:

<http://www.zephyr-technology.com/releasenotes.html>.

6.1. Radio Support.

6.1.1. Bluetooth Direct

Zephyr now allows the BioModule to connect directly to any personal computer with the aid of the Zephyr supplied Bluetooth modem. Some laptops can connect without the modem but it is recommended to use the supplied modem. This direct Bluetooth connection allows for up to 7 BioModules to be monitored simultaneously on OmniSense. The Bluetooth direct connection provides full functionality with a limited range and therefore is ideally suited for close range indoor testing and monitoring of subjects. With Bluetooth directly to your PC you no longer have to add additional devices to your system to monitor subjects.

6.1.2. Z-Modem



The Z-Modem is a Zephyr developed short to medium range modem that integrates seamlessly with the BioModule via Bluetooth. It provides increased range over the existing ISM solution utilizing the 802.15.4 communication protocol. The Z-Modem can be fitted to the arm, wrist or be carried in a pocket.

The 3-LED solution provides an instant communication link status.

6.1.3. XTS Radio Interface Devices

As part of this release the software also support a new RID for the XTS radio series. This new RID the XTS Inline eliminates the need to use the dedicated fist microphone required to date and allows customers to use their preferred audio ancillaries.





6.1.4. Tactical Radio Interface Devices

Additional RID that support military tactical radios are also supported. Due to the sensitivity associated with some of these radios this information will only be made available on request.

6.2. BioHarness 2.1 Support

This release incorporates the changes to support the updated performance of the BioHarness 2.1

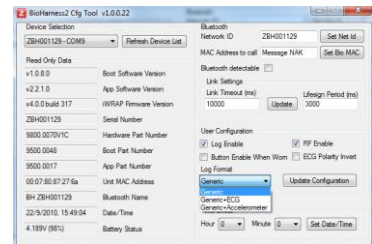
The changes include the support for 16g acceleration at 125kHz sampling rate.

This will allow users to log higher g levels associated with high impact sport and research applications. The analysis graphs are also modified to allow for 16g peak acceleration. The activity scale is unmodified and remains at 3.3g VMU.

In addition to the above the logging format is now configurable and will allow for any of the following combinations:

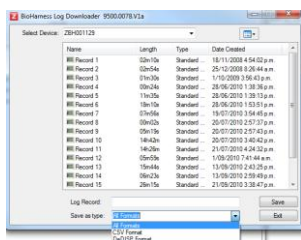
- General data on its own (default configuration format) which contains:
 - Breathing Rate
 - Heart rate
 - R-R
 - Skin temp
 - Posture
 - Activity
 - Peak accelerometry
 - Battery Voltage
- ECG and General data
- Acceleration and General data

Changing the logging format and downloading ECG and accelerometer logs is done via BioHarness Config tool. Changing download formats will erase all existing data on the BioModule.



To download data other than the generic log information the special supplied download tool must be used. This tool forms part of the Zephyr release package and is available after installation in the Zephyr directory under Tools. (no shortcut

is supplied)



This download tool supports CSV and DaDISP file outputs which are not supported by OmniSense. However it allows users to manipulate large files normally associated with research applications.

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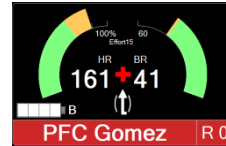


6.3. Graphical User Interface (GUI) Changes in OmniSense Live

A number of GUI changes were incorporated into OmniSense Live view. Below is a list of these:

6.3.1. Medic Tab:

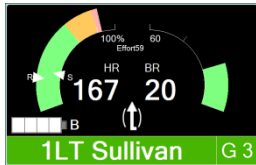
Provide flexibility on how team members are viewed when their physiological status has elevated them to MEDIC status (red for more than one minute). In previous release team members were automatically



moved to the medic tab when they reached medic status. Users now have the option to view team members in the team view and medic tab view concurrently. Team members having medic status are displayed with a red cross in the team view.

6.3.2. Resting HR

The BioGauge has been updated to incorporate a visual display of a subjects resting heart rate when lying down and standing up.



Having these two ticks a commander or trainer can very quickly determine if a subject is not recovering to his normal expected status indicating that stress or fatigue is setting in. These settings are manually entered and are not auto adjusted.

6.3.3. Heart Rate Recovery (HRR)

Heart Rate Recovery is now displayed in all versions of OmniSense. It will display the HRR value for a 30s recovery time every time that the criteria for a valid HRR has been met.

HRR values for 30s, 60s, 120s, and 180s (Bluetooth version only) are also recorded and available for review in OmniSense Analysis. These values are very useful to determine any subject's fatigue or stress level with repetitive activities e.g. if HRR recovery declines over a period of time for the same exercise it shows that the subject is not recovering back to normal and is getting fatigued and stressed, which means they will not last much longer if pushed at the same pace.



6.3.4. Upside Down Posture

Posture is now able to display subjects that are upside down.

A typical application for this feature would be when someone has fallen into a

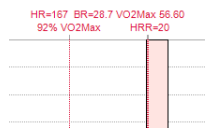


hole or through a ceiling and is trapped upside down. At a glance the commander can determine if this is expected behaviour or not. If it not expected behaviour action can be taken to rectify the situation.

6.4. OmniSense Analysis Improvements

6.4.1. Fitness Tests

Two test protocols are now supported in OmniSense Analysis, these being a beep test and a treadmill test.



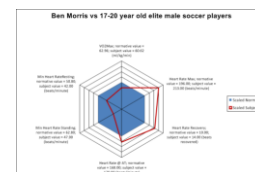
Both tests will provide the test subject's VO2 max, the heart rate, breathing rate and %VO2 max at anaerobic threshold, the 30s HRR figure. All these parameters can be saved to subject profile for comparison at a later date.

The information can also be imported into the team report for comparison against team members.

6.4.2. Radar Plots

OmniSense Analysis now also supports radar plots that will allow any subject to be compared against a normative file. In this release the radar plots only support physiological parameters, these being:

- VO2 max (automatic calculation from fitness tests)
- %VO2 max at AT (automatic calculation from fitness test)
- HR max (automatic calculation from fitness test)
- HRR (automatic calculation from fitness test)
- HR@AT (automatic calculation from fitness test)
- BR@AT (automatic calculation from fitness test)
- Min HR resting (from subject data)
- Min HR standing (from subject data)
- Critical Power (manual calculation)
- R-R standard deviation at rest. (manual calculation)



Where data is not available the user can manually update subject information and will be prompted to save the information to the subject data base. Information not populated will not be graphed.

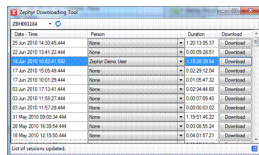


6.4.3. Team Reports

Team reports have been altered to include Max Breathing rate, duration above AT and VO2 max. All of these are automatically calculated from the selected sessions. This allows for a more complete team report where team members can be compared against each other and progress can be tracked from week to week.

6.5. Downloader

The downloader tool used with analysis has now a default setting that does not automatically select the first person on the drop down box and requires the user



to select the user first before any downloads will commence. This new feature will prevent users from accidentally assign data files to the wrong subject.

7. Fixes and Corrections

7.1. Sub Sessions

The following customer reported issues have been corrected in this release of OmniSense Analysis related to sub sessions.

- Cursors are now working on sub sessions
- Sub sessions can now be exported. When imported they will be treated as a session.
- Sub sessions can now be used to do auto detection of fitness tests parameters.

7.2. Various minor bug fixes.

Various minor bugs that did not affect system performance or user interfaces were rectified to enable a more reliable product.

8. Dropped Features

None.



9. Known Issues, Limitations and Restrictions

9.1. Known Issues

9.1.1. Installation/ Upgrade

- When upgrading from the Zephyr Team system to OmniSense 2.1 and the Team System data base was not installed in the default file location, the user must point the OmniSense installer to the “polling. FDB” file location to import the database file.
- To avoid the warnings that the Zephyr driver is not a certified Microsoft driver the Zephyr driver should be manually uninstalled prior to upgrading from any OmniSense pre version to 1.1.
- The Z-Modem driver is not Microsoft certified and may display warning messages during installation.
- The Z-Modem driver must be installed before any hardware is connected to the PC or lap top.

9.1.2. OmniSense configuration

In isolated cases when radio network type is changed, the team configuration is lost and teams must be re-assigned and redeployed.

9.1.3. Windows Related

If hibernation is enabled in the system, OmniSense could lock up when the operating system is recovering from hibernation.

9.1.4. Operational

- In some cases the user selections (teams and data grids) are lost when the user toggles from setup mode to live mode and back to setup mode.
- If the physical connection between the gateway radio and the PC is temporarily lost, OmniSense has to be restarted to continue data collection. A screen prompt is displayed to alert the user to restart OmniSense.

9.2. Limitations

- Any existing Zephyr hardware must have a firmware upgrade as set out below.

OmniSense			Firmwares						
Official Release	Date	Installer	BH	XTS Mic.	XTS InLine	TW RID	JEM RID	MBITR RID	Harris RID
V2.1	20/Aug/2010	V2.1.18	V2.2.1.0	V2.1.1.0	V1.0.9.0	V1.0.5.0	V1.0.7.0	V2.0.6.0	N/A

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- New Firmware is shipped with this release. Hardware shipped with this release does not require a firmware upgrade.
- Hibernation should always be disabled when using OmniSense.

9.3. Restrictions

No known restrictions.

10. Related Documentation

All product documentation is contained on the OmniSense installer CD under the "Documentation" folder.

Application notes on how to get the most benefit from the "Team Report" functionality is available on www.zephyr-technology.com

All updated data sheets are also available on www.zephyr-technology.com