Zephyr™ Performance Systems

OmniSense 4.X

New Features

Contacts

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Version	Description
2014-DEC-10	Initial Release
2015-NOV-11	Updates for OmniSense 4.0
19-MAY-2016	Update for OmniSense 4.1

Contents

Zephyr Part #	Description	
9600.0370	Zephyr BioModule BH3 BLE	
9600.0371	QSTARZ 1300ST GPS Receiver	
9600.0367	Pebble Watch w/ZephyrME application	
9600.0368	Motorola Barcode Scanner + BRAT Software utility	
9600.0369	Motorola DS3578 Wireless Bar Code Scanner	
9600.0372	Motorola DS4208 wired Bar Code Scanner	
9600.0366	GPS 5-Bay Charge Cradle + Power Supply	

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1. Log Download Acceleration

- Log Download speeds have been increase by a factor of 8 – 10x when compared to OmniSense 3.9.7

- Some typical examples, per hour of data

Enhanced Summary Log Format	OmniSense 3.9.7	OmniSense 4.1
1 BioModule	1 min	12 sec
10 BioModules		50 sec
50 BioModules		6 minutes

Enhanced Summary & Waveform Log Format	OmniSense 3.9.7	OmniSense 4.1
1 BioModule	5.5 min	45 sec
10 BioModules		95 sec
50 BioModules		9 minutes

- The greater the number of BioModules, the greater the increase in download speed, as data is now cached on the host PC before processing into the OmniSense database

- Using the system case, BioModule logs are downloaded 10 devices at a time

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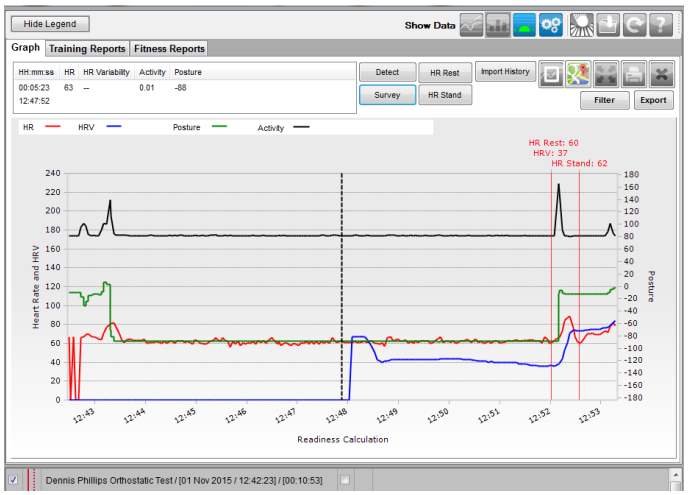
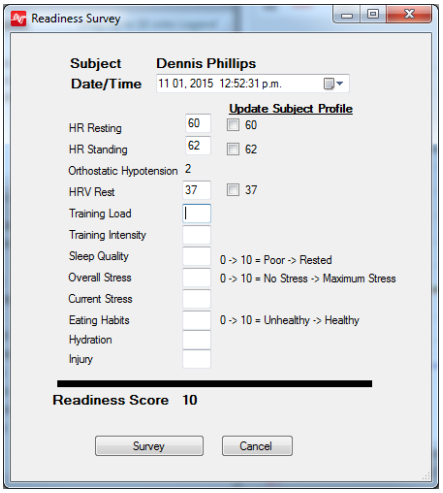
2. Readiness

A Readiness Metric, measured on a scale of 1 – 10, is now available. It is calculated based on a number of components:

- Analysis of an orthostatic hypotension test to provide resting heart rate and heart rate variability, and standing heart rate
- Completion of a survey by the subject, giving subjective 1 – 10 scores for: average 10-day training load & intensity, sleep quality, overall & current stress, eating habits, hydration & Injury.



Orthostatic Hypotension test analysis



Readiness Survey

- Individual weightings for the survey components can be customized in the Analysis Preferences settings
- Analysis can display all historical Readiness components (test + survey) as a line graph to plot subject progress
- Orthostatic Test results and Surveys completed offline can be imported from an external csv file. A future implementation will include an Android application capable of recording this data for remoting sending to the OmniSense operator.

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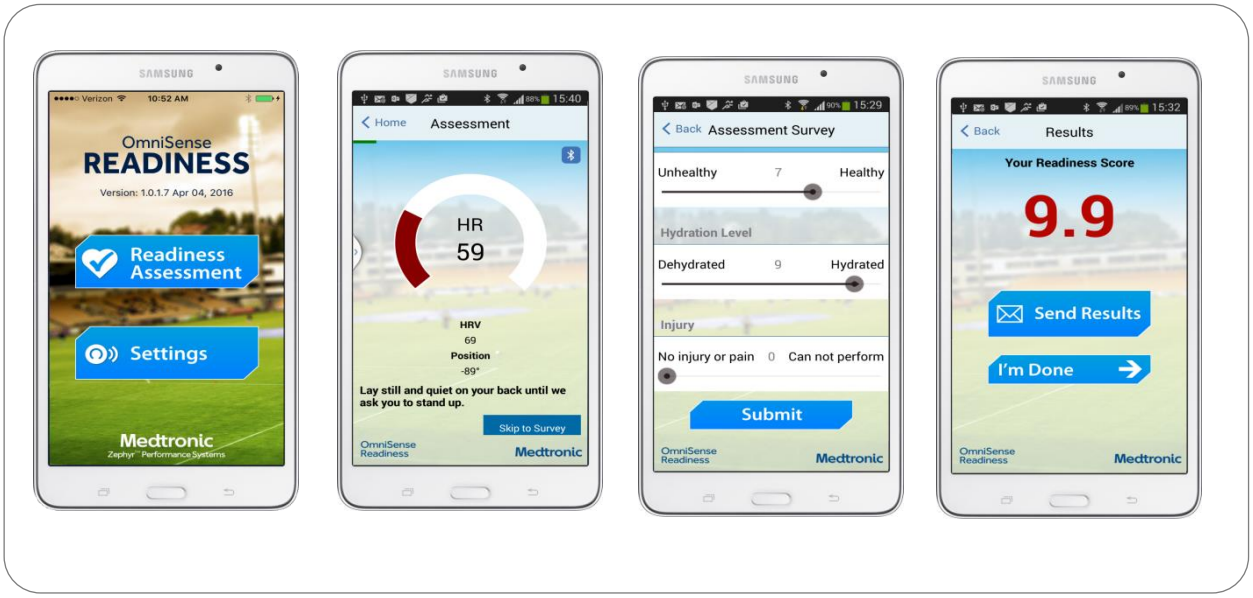
READINESS PHONE APPLICATION



- A Readiness Application is now available for Android or iPhones
- Download the App from Google Play (Android) or Apple App Store
- Subject can now complete an orthostatic hypotension test and readiness survey at home or away from a training facility
- The app will calculate their Readiness score, and email results to a recipient, for entry into the OmniSense database
- Resting and Standing Heart Rate, and Resting Heart Rate are analyzed and recorded automatically
- The subject, wearing a BioModule, follows audio instructions to complete the test.

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3. On-Board Accelerometry Analysis

Accelerometry data which was previously only available in a post-session report is now calculated in the BioModule and is available for display on the BioGauge, and included in log data.

Impulse Load	A cumulative measurement of mechanical load – the sum of the areas under the accelerometer magnitude curve for all impulses, measured in Newtons.
No. Walk Steps	Count of walking steps
No. Run Steps	Count of running steps
No. Bounds	Count of bounds
No. Jumps	Count of jumps
No. Minor Impacts	Count of minor impacts
No. Major Impacts	Count of major impacts
Average Rate Force Development	A measure of explosive power, averaged over the previous 10 steps, measured in Newton/s
Average Step Impulse	A measure of the efficiency of steps, i.e. how much energy is expended during a step. Shorter (in duration) steps expend less energy. Measured in Newton seconds.
Average Step Period	S – time duration of step
Jump Flight Time	Milliseconds – time in air for detected jump events (crouch/pause/jump)
Peak Acceleration Phi angle	Degrees from vertical of force or impact during an epoch*
Peak Acceleration Theta angle	Degrees from horizontal of force or impact during an epoch*

*Epoch is 1 / 2.5 / 5 seconds, dependent on ECHO network setting

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4. Support for up to 100 BioModules

- Two new ECHO modes are now available, selected from OmniSense LIVE > Preferences

Name	Devices Supported	Data Update Rate
ECHO_20	Up to 20	1 second (new)
ECHO_50	Up to 50	2.5 seconds
ECHO_100	Up to 100	5.0 seconds (new)

- For display of larger numbers of BioGauges, a larger monitor is recommended
- Using ECHO-20 with a 1 second data rate, live data calculations on intensity & load calculations will now match those obtained from log data.

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5. Lightweight GPS1300ST

QSTARZ 1300ST

- A smaller, lighter GPS unit is now available
- Battery capacity up to 4 hours
- High accuracy DGPS supported

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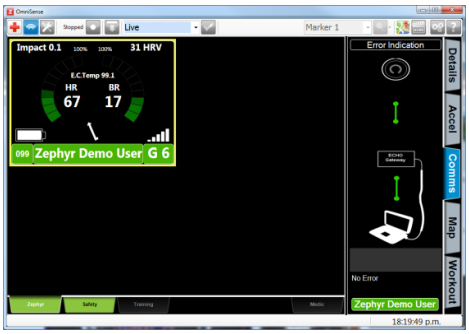
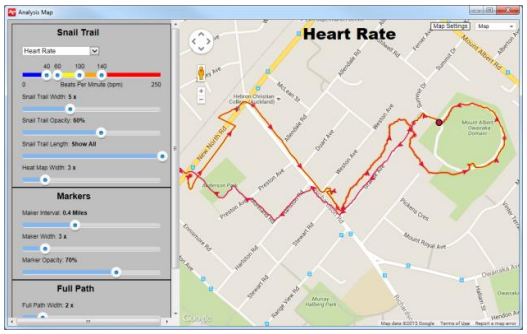
6. OmniSense Live GPS Map Window





New map toolbar button will display map or satellite view

- For subjects using supported GPS modules
- Map toolbar button will display a map with a Live 'snail trail' for selected BioGauge
- Snail Trail options:
  - Colored trail selection for
    - Heart Rate
    - %HR max
    - %HR @ AT
    - Physiological or Mechanical Intensity
    - Speed or Altitude Zones
    - ROG Safety Status
  - Slide buttons to set colored value ranges
  - Set trail width & opacity
  - Set duration of trail (minutes and seconds prior to current location)
  - Add distance markers at configurable intervals
  - Set marker size & opacity
  - Display full path prior to snail trail

- *An internet connection is required for Map or Satellite view display*

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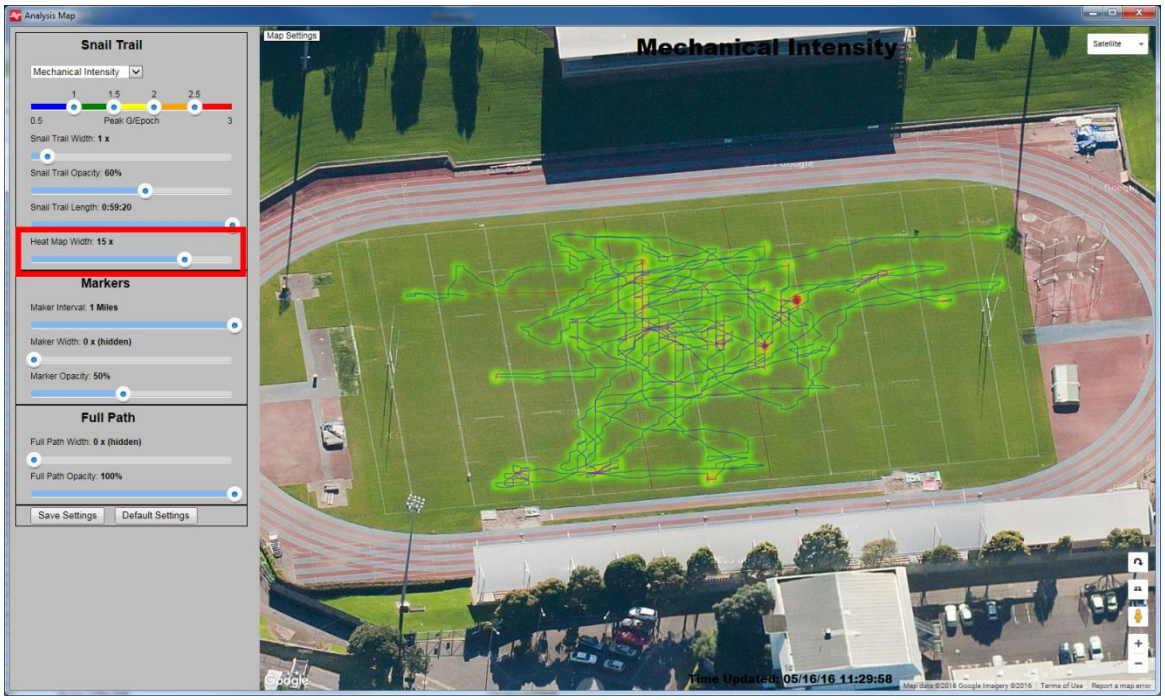
HEAT MAP



As map/satellite view zooms out, Heat map will trend to red

- Heat Map highlighting relates to <u>location only</u>.
- Heat Map shows in addition to vital signs snail trail.
- Heat track graduates from green through amber to red, according to how frequently. a location is logged (a stationary subject will show red).
- Heat track indication responds to map zoom – will trend to red as view zoomed out.
- *An internet connection is required for Map or Satellite view display*

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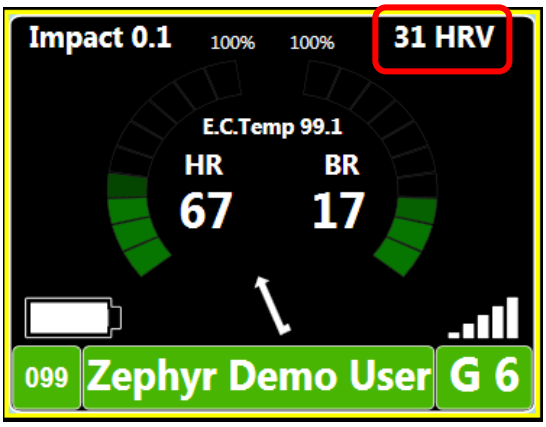
7. Heart Rate Variability Improvement



HRV displayed on a BioGauge, or on the Zephyr Pebble Application

- The algorithm for detecting and calculating HRV has been improved to provide continuous data in the presence of motion artefacts.

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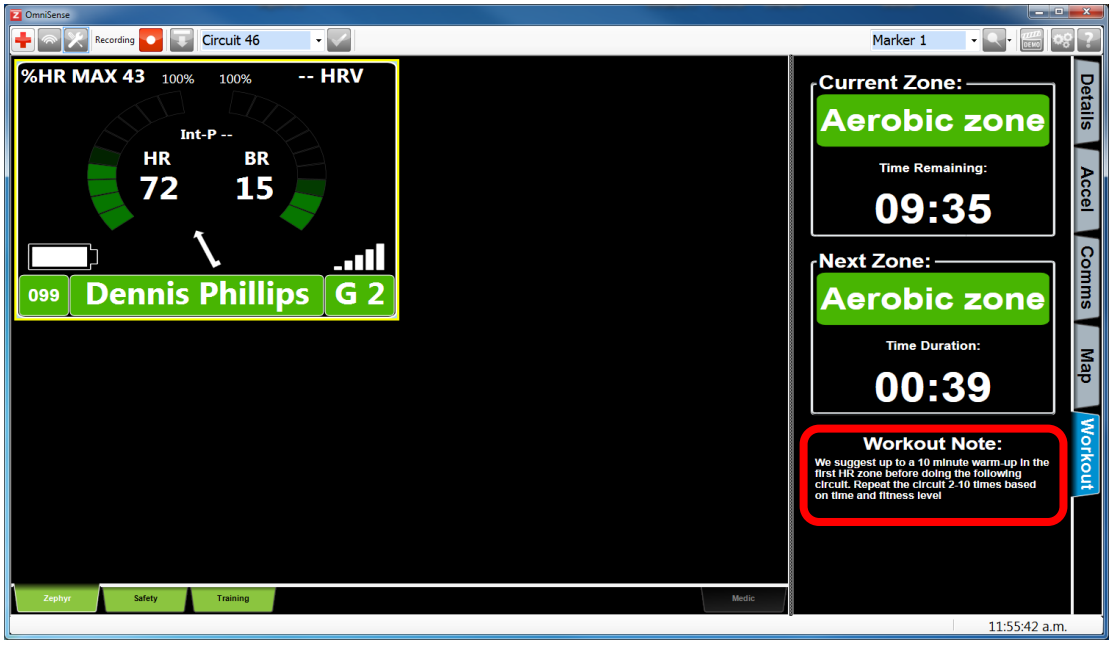
8. Workout Notes Audio



- Workout Notes are now available as audio

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9. Updated Pebble Application

Three customizable fields

- Three fields can be customized through eight optional parameters

- Heart Rate
- Respiration Rate
- Training Zones
- Estimated Core Body Temperature
- Posture
- Activity Level
- Heart Rate Variability
- Stress

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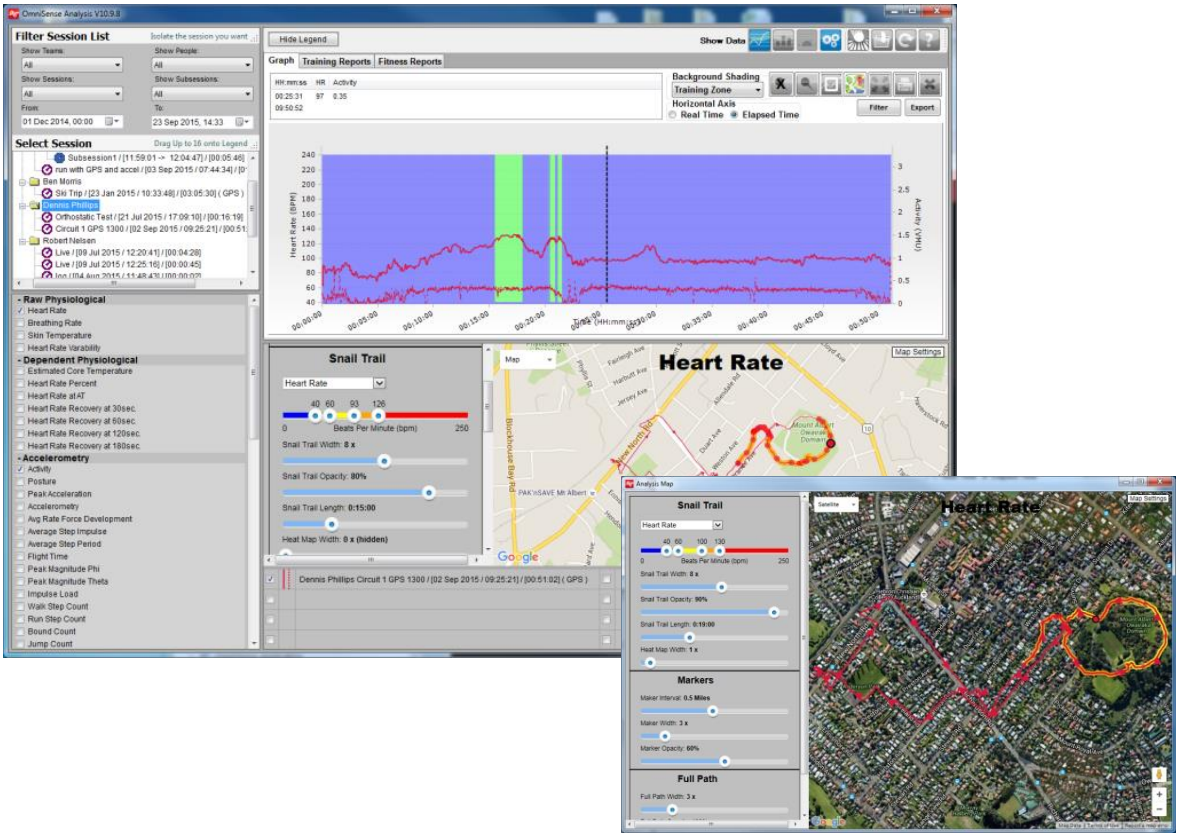
10. Analysis Main Screen with Google Maps

The main screen has been reorganized



Map or satellite view, embedded panel or separate pop up Window

- Sessions incorporating GPS data now display on a map panel, which can be viewed as an embedded panel or pop-up window, or hidden
- Internet connection needed

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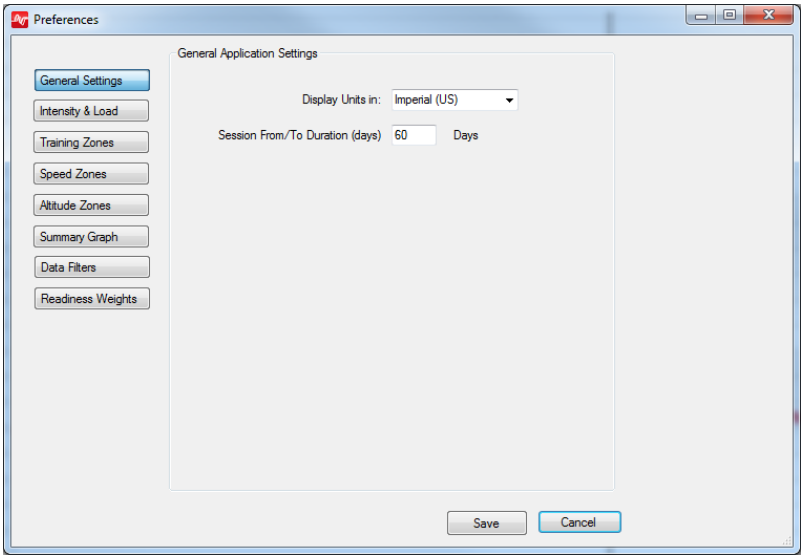
11. Analysis Preferences



General Settings	Switch between Metric & Imperial Units, Set default session display
Intensity & Load	Configure Intensity 1 – 10 scale thresholds (shared with OmniSense Live)
Training Zones	Configure Training Zone thresholds (shared with OmniSense Live)
Speed Zones	Configure speed zone thresholds for background color setting on time graphs
Altitude Zones	Configure Altitude Zones
Summary Graph	Set Summary bar graph axis limits manually or leave on autoscale
Data Filters	Filter a parameter according to itself or another
Readiness Weights	Set weightings of factors in Readiness calculation

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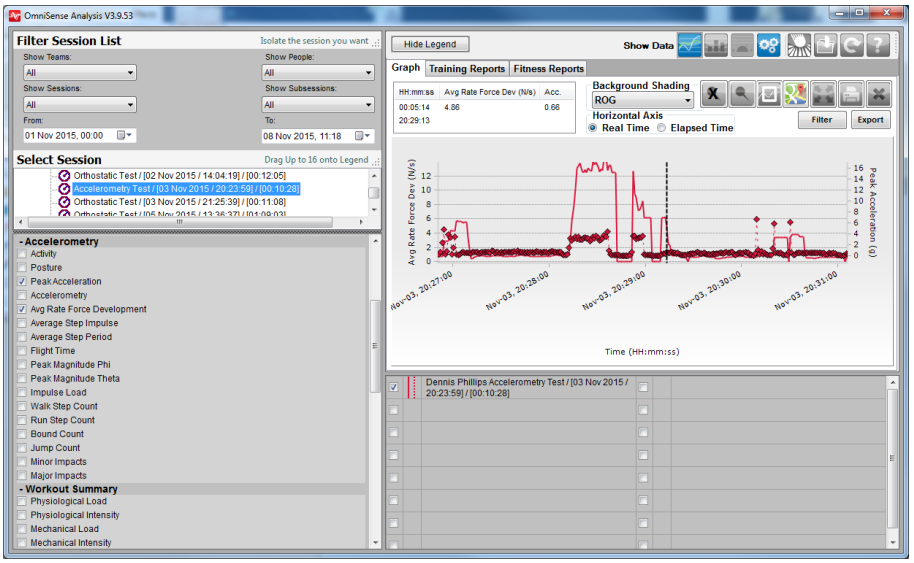
12. Analysis Accelerometer Data



- Accelerometer data, previously only available in an external Impact Report, is now integrated into the Analysis module

- Time and Summary graphs can be displayed for:

  - Peak Acceleration
  - Avg Rate Force Development
  - Avg Step Impulse
  - Avg Step Period
  - Jump Flight Time
  - Peak Magnitude Phi
  - Peak Magnitude Theta
  - Impulse Load
  - Walk Step Count
  - Run Step Count
  - Bound Count
  - Jump Count
  - Minor Impact Count
  - Major Impact Count

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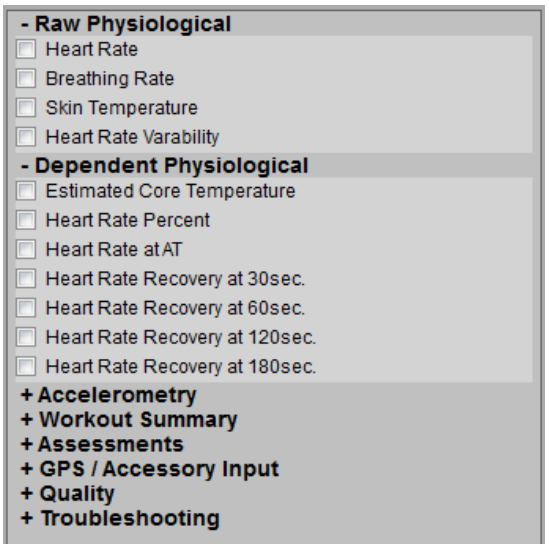
13. Analysis Parameter List Re-organisation



- The parameter list has been reordered and divided into sections which can be maximized or minimized for ease of use.
- Accelerometer data now includes parameters previously only available by using the Impact Analysis tool and generating a report

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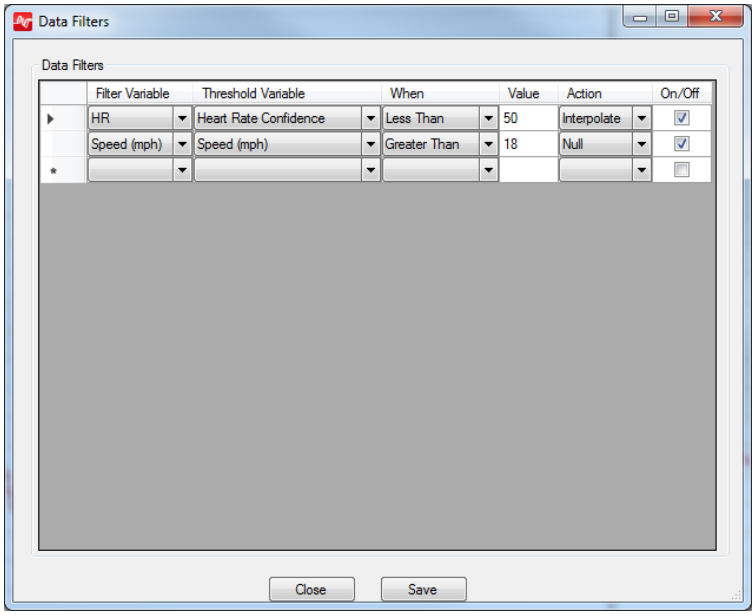
14. Analysis Data Filtering



Filter HR, BR, Posture, Activity, Peak Accel, HRV or Speed data by setting thresholds on its own or other parameter values.

Examples:

- Use Heart Rate confidence to remove unrealistic HR values (interpolate between valid values before and after invalid section). This will allow better calculation of Average HR, time in training zones and calories burned.

- Remove unrealistic high or low speed values caused by interruptions in satellite reception. This improves estimates of average speed, maximum speed, distance and time in speed zones.

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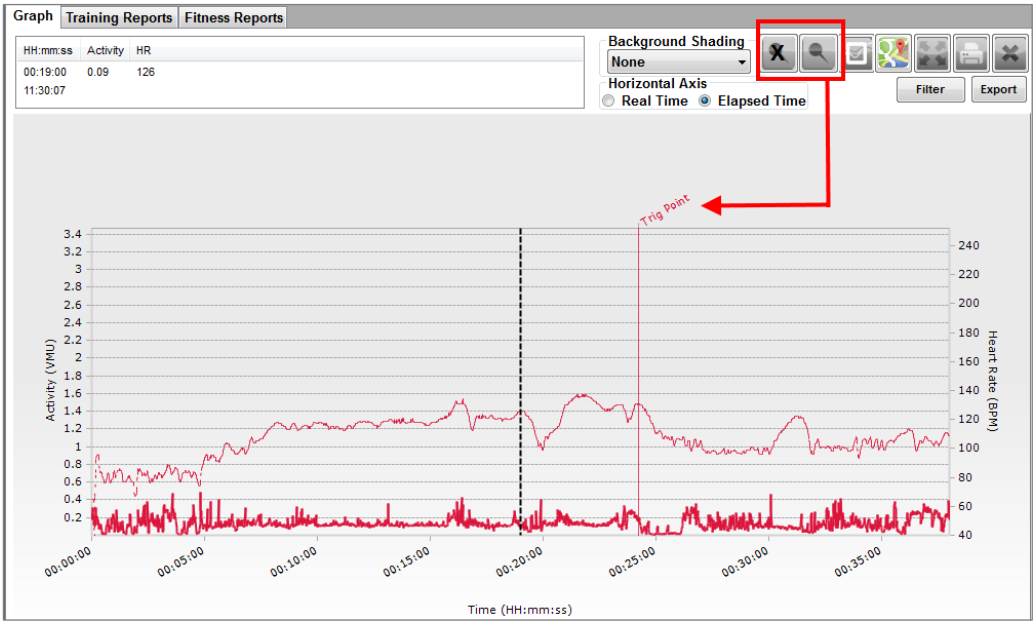
15. Analysis Markers



- Custom Markers can now be added to a session in OmniSense Analysis, as well as OmniSense Live

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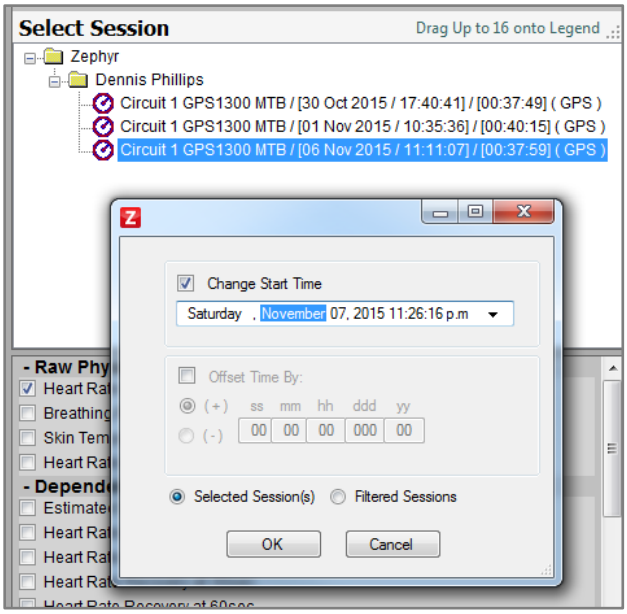
16. Analysis Change Session Date / Time



- Change session date and/or time for one or all sessions displayed.

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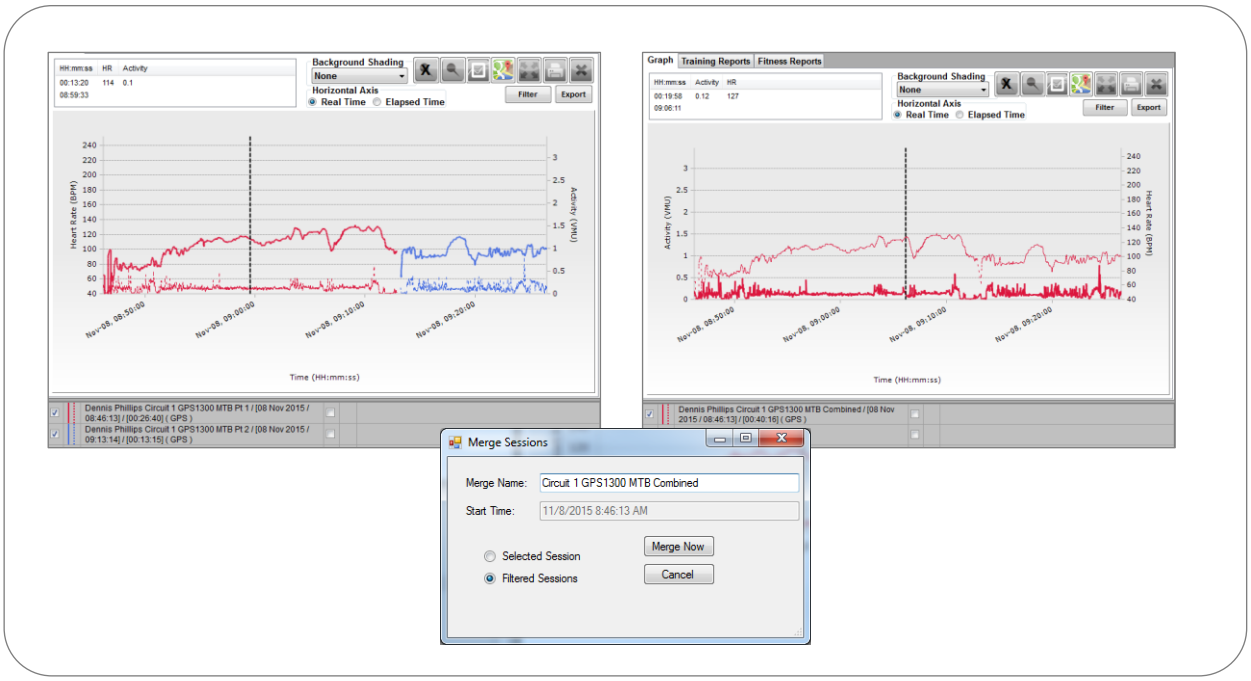
17. Analysis Session Merge



- Merge one or more sessions together
- Use to turn sequential sessions into ne contiguous session
- Combine Live and Log data from a session to fill any gaps in Live data

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