Lansmont

SAVER™ AL
Field Data Recorder

Continuous, accessible supply chain analytics

Immediate and simplified access to actionable, mission-critical data. The SAVER™ AL provides an autonomous, rechargeable platform for monitoring the movement of critical assets throughout the supply chain – allowing wireless bi-directional communication of that information to your nearby mobile device, using Bluetooth technology. SAVER™ AL provides unparalleled access and visibility to current supply chain health and hazard analytics.

Vibration | Shock | Temperature | Relative Humidity | Atmospheric Pressure / Altitude | Bluetooth | USB | Battery Life

Data access and instrument control – anywhere, anytime. Complete bi-directional communication.

- Bluetooth or USB for both moving and accessing data and reporting.
- Works with Lansmont's SaverXware software for seamless integration with existing SAVER instrument fleets.

NOTE: Continued product improvement necessitates that Lansmont reserves the right to modify these specifications at any time without notice.

Features

30 Day Battery Life

The SAVER™ AL is powered by a lithium ion, rechargeable battery. and provides continuous operation for up to 30 days. The battery is charged through the USB cable connection.

External Power

For some recording applications, 30 days may not be enough recording time. Not a problem. The ability to charge the AL's battery through the USB connection provides unique versatility. 5V power sources delivering 500mA current can extend the AL's run time indefinitely.

Temperature, Relative Humidity and Atmospheric Pressure Sensors

The AL utilizes three atmospheric sensors, providing even further event measurement detail.

Integral Mounting Flange

The AL incorporates integral mounting flanges as part of the chassis to simplify instrument attachment to product, package, or vehicle surfaces.

Wireless Communication

The AL incorporates a BLE module that enables wireless communication with the SAVER App. Configure a setup, start/stop recording, and read back data in the field using your smartphone.

Lansmont

SAVER™ AL
Field Data Recorder

Specifications

PHYSICAL

Envelope Size:	3.9 x 4.3 x 2.2 in. (98 x 109 x 55 mm) w/flanges
Chassis Material:	Polycarbonate
Weight:	10 oz. (283 grams)
Environmental:	Weather Resistant
Mounting:	4 holes on mounting flanges

DATA ACQUISITION

Sampling Rates:	800-1,600 samples/sec
A/D Conversion:	12-bit
Accelerometer Type:	Tri-axial MEMS
Acceleration Ranges:	200 g full scale
Anti-Alias Filter:	200 or 400 Hz (cut-off frequency)
3-dB Frequency Response:	0.25 Hz to filter maximum
Temperature Measurement / Accuracy:	-20° to +60°C (-4° to +140°F) ±1.0°C from +5° to +40°C; ±2.0°C from -20° to +60°C

HUMIDITY

Measurement / Accuracy:	5% to 95% RH, non-condensing ± 6% from 5% to 95% RH at 25°C
Atmospheric Pressure Measurement / Accuracy:	300 to 1100mbar ± 4mbar from 750 to 1,100mbar at 25°C

DATA RECORDING

Signal Trigger:	User-programmable acceleration (g) threshold
Signal Event Pre-Trigger:	User-programmable
Data Retention Modes:	Max. Overwrite, Fill / Stop, Wrap / Overwrite

MEMORY

Signal Events (Dynamic):	Up to 100 largest acceleration waveforms
Memory Type:	Flash
Memory Retention:	Retains data even when batteries are exhausted
Timer Events (Static):	Up to 5,000 – temp/humidity/pressure
Timer Interval:	User programmable "wake-up" interval

ENVIRONMENTAL

Temperature Measurement / Accuracy:	-20° to +60°C (-4° to +140°F) ±1.0°C from +5° to +40°C; ±2.0°C from -20° to +60°C
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 6% from 5% to 95% RH at 25°C
Atmosperic Pressure Measurement / Accuracy:	300 to 1100mbar ± 4mbar from 750 to 1,100mbar at 25°C

POWER

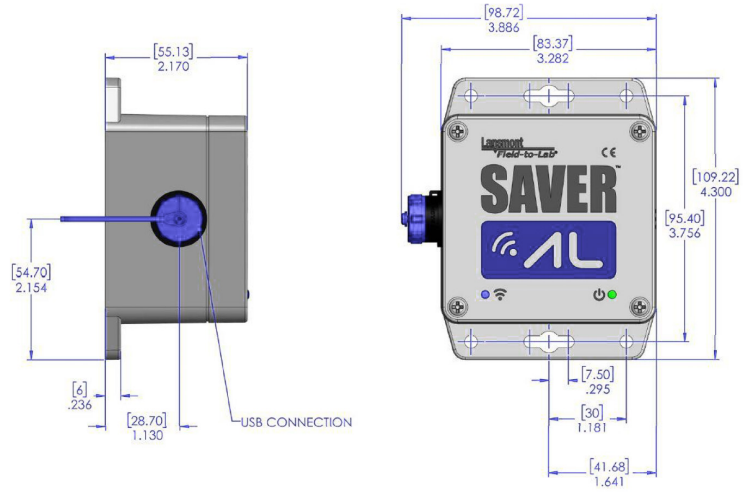
Rechargeable lithium ion battery – extended run-time options available

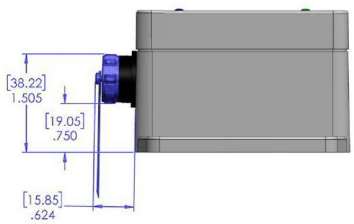
SOFTWARE / COMMUNICATIONS

User Interface:	SaverXware™ software and SAVER App
Compatibility:	Microsoft Windows® 7, 8, 8.1, 10 (32 or 64-bit)
COM Interface:	USB 2.0 compatible and Bluetooth
Data Rate:	400 kB/s (typical)

CONTROLS AND INDICATORS

LED Indicators:	Run / Stop: Green: Run / Amber: Stop
Communication:	Blue (BLE Active) Amber (Ping)
Battery Capacity:	Green (>20%) Amber (<20%)



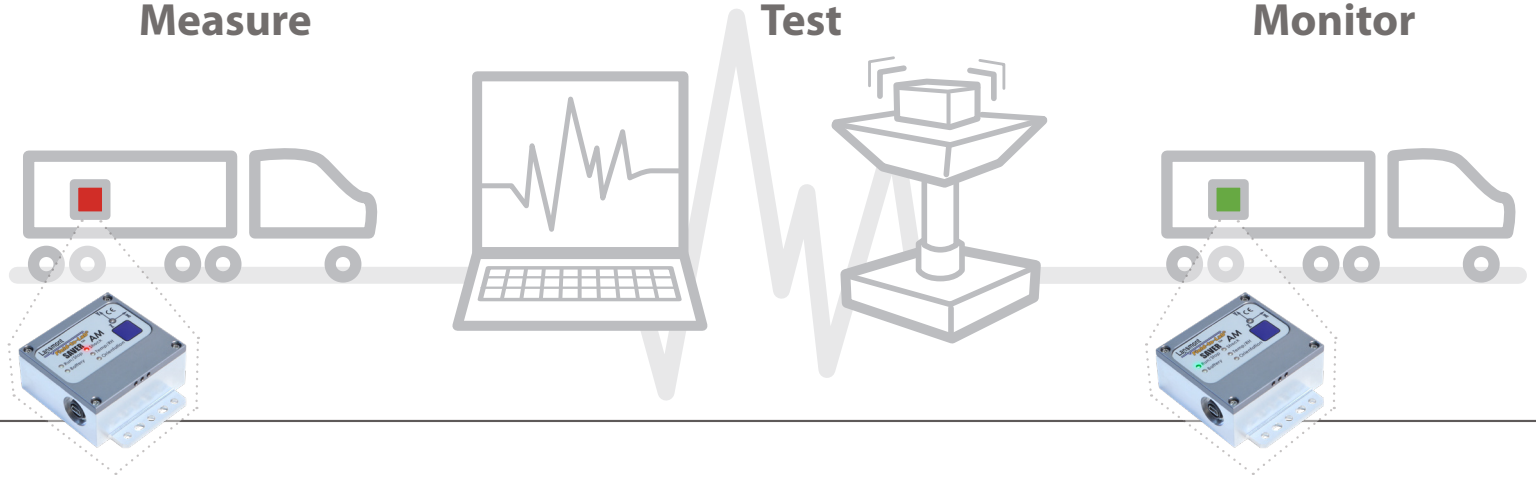


Note: Dimensions in inches [millimeters]

SAVER™ *AM*

Lansmont Field-to-Lab®

The SAVER™ *AM* is a self-powered field data recorder with an internal tri-axial accelerometer. The SAVER™ *AM* is provided with temperature, humidity and atmospheric pressure sensors, as well as both light and orientation sensors. The *AM* is powered by a USB-rechargeable lithium ion battery, providing up to 30 days of continuous operation.



Field-to-Lab™

Measure
Measure transport hazards in the field.

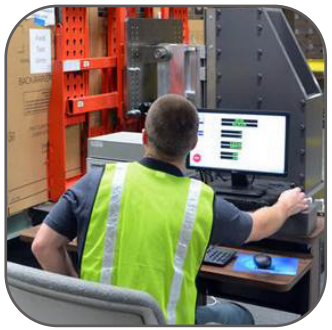
Test
Use the results to construct laboratory testing.

Monitor
Continue monitoring the field to see if anything changes.

SAVER™ *AM*

Lansmont Field-to-Lab®

FEATURES



Field-to-Lab®

Use SaverXware™ software to analyze data captured with SAVER™ instruments, and seamlessly create random vibration test profiles that can be easily imported into Lansmont TouchTest Vibration Controllers for immediate use. Only Lansmont offers this cross-platform integration.

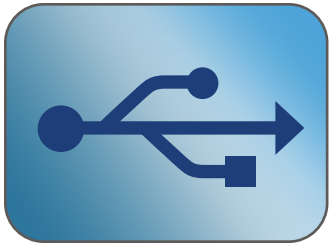
30 Day Battery Life:

The SAVER™ *AM* is powered by a lithium ion, rechargeable battery. and provides continuous operation for up to 30 days. The battery is charged through the USB cable connection.

T/RH and Atmospheric Pressure Sensors:

The *AM* utilizes three atmospheric sensors, providing even further event measurement detail. All sensors are tied to LED overlay indicators so that when a predetermined threshold is exceeded, the LED will provide immediate and constant verification of that occurrence.

OPTIONS



External Power:

For some recording applications, 30 days may not be enough recording time. Not a problem. The ability to charge the *AM*'s battery through the USB connection provides unique versatility. 5V power sources delivering 500mA current can extend the *AM*'s run time indefinitely.

Mounting Kits:

Mounting kits can make it easier to fix SAVER™ *AM*'s to vehicles or structures. Kits include mounting plates and attachment hardware. If you are attaching to a ferrous surface, magnetic mounting kits are available.

Light and Orientation Sensors:

The AM incorporates light and orientation sensors, providing useful information about an item's journey. Was the vehicle door or crate opened - was the product rotated on it's end? The AM can conclusively provide those answers.

SAVER™ *AM*

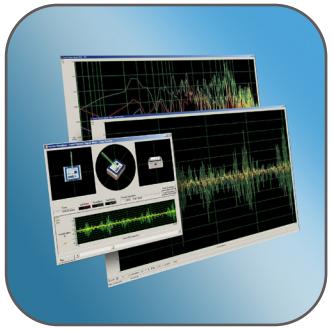
Lansmont Field-to-Lab®

SaverXware™

Each SAVER™ purchase includes Lansmont's SaverXware™, the easy-to-use software that communicates with the SAVER™ *AM* for setup prior to recording — as well as data analysis once you've collected some data. Data analysis features include drop heights, impacts, vehicle motion, vibration, as well as temperature and humidity cycles.

Measurement Setup

Users are provided with simple, standard setup gateways for common measurement applications. Advanced setup options provide complete control over all setup parameters, providing unparalleled capability for instrument users.



Data Analysis

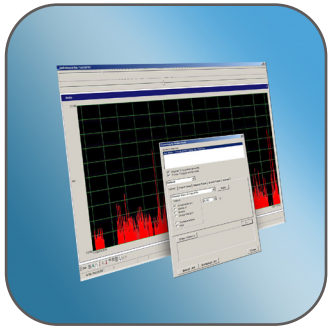
Powerful individual and multi-event summary analyses providing time-history, frequency domain, and vector visualizer playback and review.

Summary Reporting and Export

Generate user-defined project summary reports and print to document measurement results. Additionally, export the project data itself to ASCII files for analysis and reporting using universally available software applications.

Event Table and History

Multi-data files can be viewed in single, common project databases. The data file's measured events are chronologically presented in event tables, which are positioned underneath measurement Quick Histories. The Quick Histories display the captured data from the project beginning to end in one view. Corresponding event thumbnails are updated as different events are highlighted in the table.



Summary Event Selection

Extremely useful event selection options based upon acceleration and Grms levels, time occurrence, type of event and even impact type and orientation. A quick history zoom-to-summary option with user-defined range cursors is provided as an alternative summary selector.

GPS Integration

Externally captured GPS data can be imported and automatically synchronized with SAVER™ *AM* data to add further value and definition to your measurement results.

SAVER™ *AM*

Lansmont Field-to-Lab®

MONITORING APPLICATIONS

Designed for high volume monitoring applications, the SAVER™ *AM* instrument is one of the most affordable performance monitoring devices on the market, and serves as the entry-level data recorder within the SAVER™ family

Use the SAVER™ *AM* to determine when, and even where any design threshold criteria are exceeded during actual use or transport of products.

Manufacturing

Vehicles

Structural Measurements

Asset Transport

Oil Platforms

Amusement Rides

Off Road Measurements

Packages

Aerospace

Effective integration of measurement and monitoring programs provide customers the ability to:

- Characterize the dynamic and climatic hazards within a given environment
- Establish product design criteria
- Develop laboratory testing and simulation criteria
- Audit distribution channels and carriers
- Establish liability in transport damage situations
- Determine normal vs. abnormal handling and transport of your goods
- Create climatic histograms of environmental conditions (Temp/RH)

2.1.21

SAVER™ *AM*

Lansmont Field-to-Lab®

SPECIFICATIONS

PHYSICAL

Envelope Size:	2.8 x 3.6 x 1.3 in. (71 x 91 x 33 mm) w/flanges
Chassis Material:	6061-T6 anodized aluminum
Weight:	10 oz. (283 grams)
Environmental:	Weather Resistant
Mounting:	4 holes on mounting flanges for #6 screws

DATA ACQUISITION

Sampling Rates:	500 - 3,000 samples/sec
A/D Conversion:	12-bit
Accelerometer Type:	Tri-axial piezoelectric
Acceleration Ranges:	100 or 200 g full scale (selectable)
Anti-Alias Filter:	5-pole, low-pass Bessel filter 50, 100, 250, and 300 Hz (cut-off frequency)
3-dB Frequency Response:	0.5 Hz to filter maximum
Temperature Measurement / Accuracy:	-20° to +60°C (-4° to +140°F) ±1.0°C from +5° to +40°C; ±2.0°C from -20° to +60°C
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 4% from 5% to 95% RH at 25°C
Atmospheric Pressure Measurement / Accuracy:	10 to 1100mbar ± 4mbar from 750 to 1,100mbar at 25°C

DATA RECORDING

Signal Trigger:	User-programmable acceleration (g) threshold
Signal Event Pre-Trigger:	User-programmable
Data Retention Modes:	Max. Overwrite, Fill / Stop, Wrap / Overwrite

MEMORY

Signal Events (Dynamic):	Up to 400 largest acceleration waveforms
Memory Type:	Flash
Memory Retention:	Retains data even when batteries are exhausted
Timer Events (Static):	Up to 10,000 – temp/humidity/pressure/ light/orientation
Timer Interval:	User programmable "wake-up" interval

ENVIRONMENTAL

Operating Temperature:	-20° to +60°C (-4° to +140°F)
Communication Temperature:	0° to +60°C (32° to +140°F)
Temperature Measurement / Accuracy:	-20° to +60°C (-4° to +140°F) ±1.0°C from +5° to +40°C; ±2.0°C from -20° to +60°C
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 4% from 5% to 95% RH at 25°C
Atmosperic Pressure Measurement / Accuracy:	10 to 1100mbar ± 4mbar from 750 to 1,100mbar at 25°C

POWER

Rechargeable lithium ion battery
Extended run-time options available

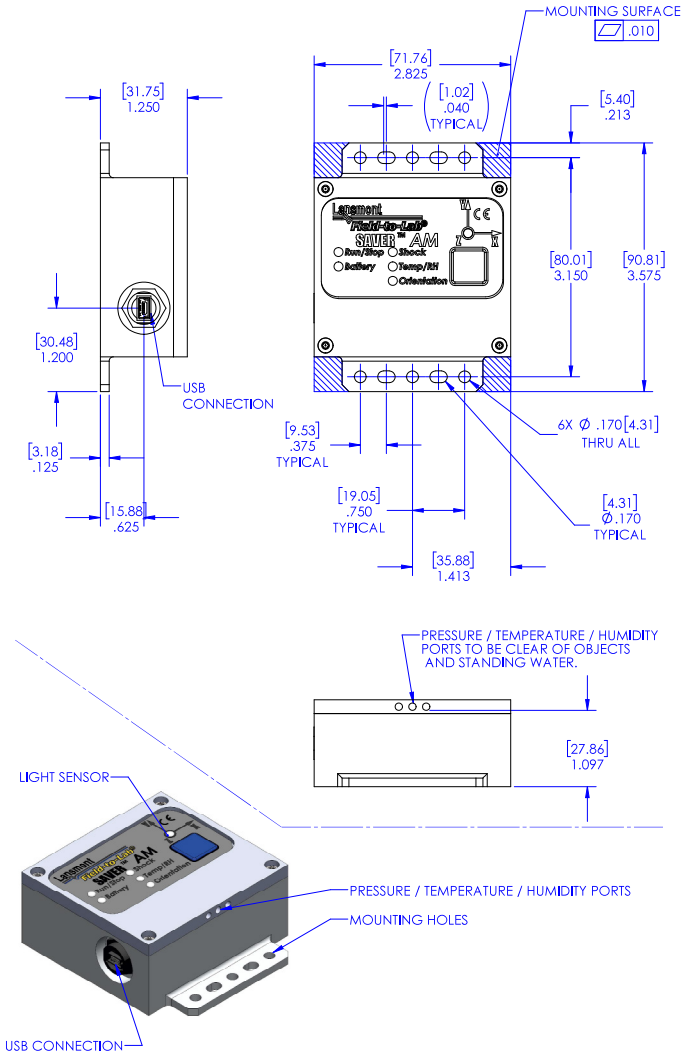
SOFTWARE / COMMUNICATIONS

User Interface:	SaverXware™ software
Compatibility:	Microsoft Windows® 7, 8, 8.1, 10 (32 or 64-bit)
COM Interface:	USB 2.0 compatible
Data Rate:	400 kB/s (typical)

CONTROLS AND INDICATORS

Controls:	Run / Stop button
LED Indicators:	Run / Stop: Green: Run / Amber: Stop Battery: Green (>20% Capacity) Amber (<20% Capacity) Shock: Red Temp/RH: Red Orientation: Red

SYSTEM DRAWINGS – MOUNTING DIMENSIONS



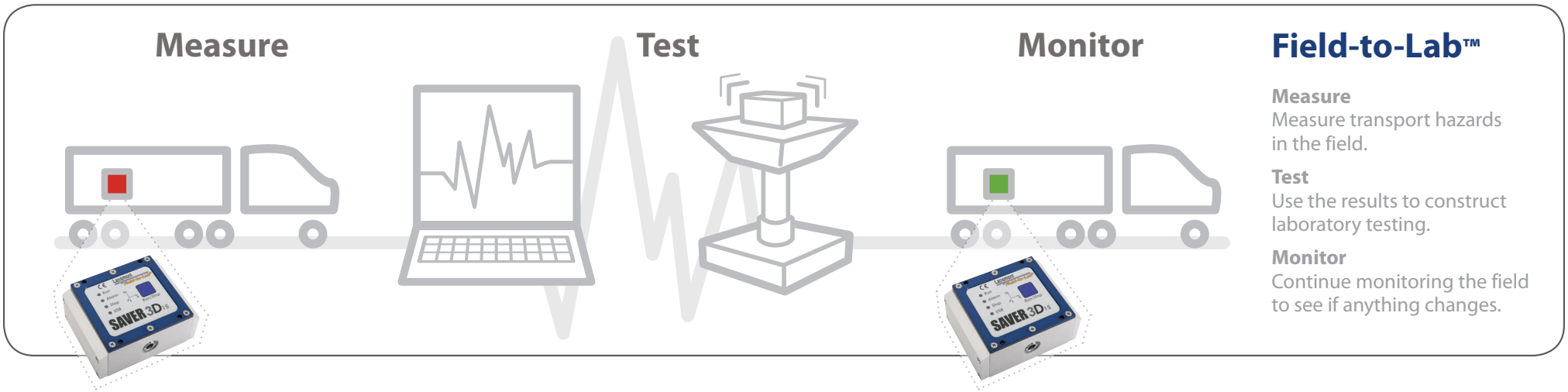
Note: Dimensions in inches [millimeters]

2.1.21

SAVER™ 3D15

Lansmont Field-to-Lab®

SAVER™ 3D15 is a self-powered field data recorder with an internal tri-axial MEMS accelerometer, possessing DC-response measurement capability. The 3D15 also incorporates temperature and humidity sensors, and USB connectivity. Powered with 9V lithium batteries, the instrument will operate continuously for up to 15 days. 16-bit resolution allows you to take precise measurements of your dynamic environment.



Field-to-Lab™

Measure
Measure transport hazards in the field.

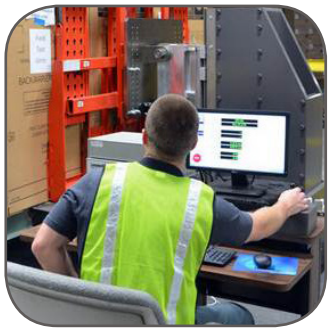
Test
Use the results to construct laboratory testing.

Monitor
Continue monitoring the field to see if anything changes.

SAVER™ 3D15

Lansmont Field-to-Lab®

FEATURES



Field-to-Lab®

Use SaverXware™ software to analyze data captured with SAVER™ instruments, and seamlessly create random vibration test profiles that can be easily imported into Lansmont TouchTest Vibration Controllers for immediate use. Only Lansmont offers this cross-platform integration.

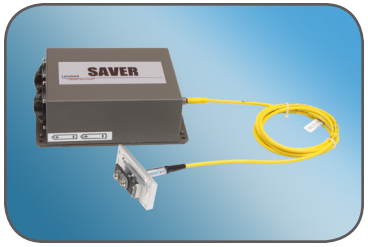
15 Day battery Life:

SAVER™ 3D15 is powered with user replaceable 9V lithium (or alkaline) batteries and provides continuous operation of the MEMS DC Response accelerometers in the field for up to 15 days.

T/RH sensor:

In addition to dynamic measurements, your SAVER™ 3D15 will also capture temperature and relative humidity conditions. Internal sensors mounted to the back side of the SAVER™ 3D15 measure and record environmental conditions per the user-defined setup.

OPTIONS

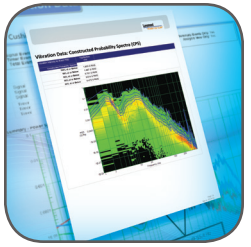


External Battery Pack:

For some recording applications, 15 days may not be enough recording time. Not a problem. Lansmont offers an External Battery Pack that extends the continuous operation time from 15 to 40 days.

Mounting Kits:

Mounting kits can make it easier to fix SAVER™ 3D15s to vehicles or structures. Kits include mounting plates and attachment hardware. If you are attaching to a ferrous surface, magnetic mounting kits are available.



Data Analysis Center:

Trust Lansmont data specialists to interpret your data and provide you with even greater confidence. Lansmont data specialists are experts at acquiring, analyzing and summarizing data; if you need help defining parameters or protocols, we can help.

SAVER™ 3D15

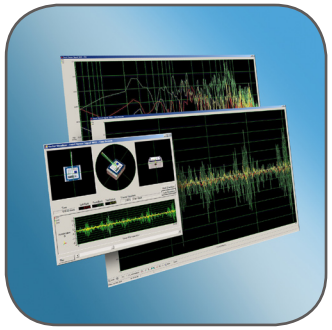
Lansmont Field-to-Lab®

SaverXware™

Each SAVER™ purchase includes Lansmont's SaverXware™, the easy-to-use software that communicates with the SAVER™ 3D15 for setup prior to recording — as well as data analysis, once you've collected some data. Data analysis features include drop heights, impacts, vehicle motion, vibration, and temperature and humidity cycles.

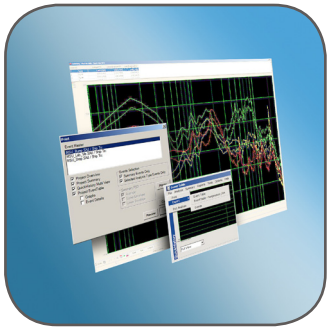
Measurement Setup

Users are provided with simple, standard setup gateways for common measurement applications. Advanced setup options provide complete control over all setup parameters, providing unparalleled capability for instrument users.



Data Analysis

Powerful individual and multi-event summary analyses providing time-history, frequency domain, and vector visualizer playback and review.

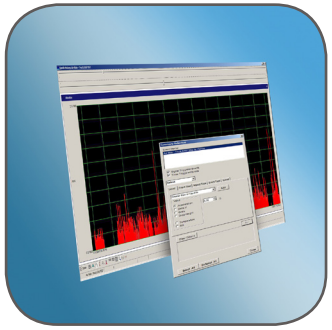


Summary Reporting and Export

Generate user-defined project summary reports and print to document measurement results. Additionally, export the project data itself to ASCII files for analysis and reporting using universally available software applications.

Event Table and History

Multi-data files can be viewed in single, common project databases. The data file's measured events are chronologically presented in event tables, which are positioned underneath measurement Quick Histories. The Quick Histories display the captured data from the project beginning to end in one view. Corresponding event thumbnails are updated as different events are highlighted in the table.



Summary Event Selection

Extremely useful event selection options based upon acceleration and Grms levels, time occurrence, type of event and even impact type and orientation. A quick history zoom-to-summary option with user-defined range cursors is provided as an alternative summary selector.

GPS Integration

Externally captured GPS data can be imported and automatically synchronized with SAVER™ 3D15 data to add further value and definition to your measurement results.

SAVER™ 3D15

Lansmont Field-to-Lab®

MEASUREMENT APPLICATIONS

There are specific applications where DC recording capabilities are required to measure low frequency energy. For instance, amusement park rides, aerospace flight applications, rail-car coupling impacts, and vehicle crash testing all contain low frequency responses with long duration, constant acceleration time histories. The 3D15, with it's MEMS DC Response accelerometers, is the right instrument to address those applications.

Rail Impacts


Vehicle Crash Testing


Aerospace Dynamics


Asset Transport


Structural Measurements


Amusement Rides


Off Road Measurements


Packages


Seismic

Effective integration of measurement and monitoring programs provide customers the ability to:

- Characterize the dynamic and climatic hazards within a given environment
- Establish product design criteria
- Develop laboratory testing and simulation criteria
- Audit distribution channels and carriers
- Establish liability in transport damage situations
- Determine normal vs. abnormal handling and transport of your goods
- Create climatic histograms of environmental conditions (Temp/RH)

9.3.15

SAVER™ 3D15

Lansmont Field-to-Lab®

SPECIFICATIONS

PHYSICAL

Size:	3.74 x 2.90 x 1.7 in. (95 x 74 x 43 mm)
Volume:	18.4 in.^{3} (302 cm^3)
Chassis Material:	6061-T6 anodized aluminum
Weight:	16.7 oz. (473 grams)
Environmental:	Weather Resistant
Mounting:	4 thru holes for #6 screws

DATA ACQUISITION

Sampling Rates:	50, 100, 200, 250, 500, 1000, 2500, and 5000 samples per second
A/D Conversion:	16-bit
Accelerometer Type:	Tri-axial MEMS
Acceleration Ranges:	5, 10, 20, 50 g (full-scale)
Anti-Alias Filter:	4-pole, low-pass Butterworth filter 10, 20, 25, 50, 100, 200, 250 and 500 Hz. (cut-off frequency)
Software Filters:	1 or 2-pole, low-pass RC post-process filters 0 to 10 kHz (cut-off frequency)
3-dB Frequency Response:	DC to filter setting
Instrument Noise Floor:	0.03 Grms typical at 500 Hz bandwidth
Dynamic Range:	80 dB typical
Measurement Accuracy:	±5% with nominal variations in temperature and frequency

DATA RECORDING

Signal Trigger:	User programmable acceleration (g) threshold
Timer Trigger:	User programmable "wake-up" interval
Pre-Trigger:	User programmable signal event pre-trigger
Data Retention Modes:	Max. Overwrite Fill, / Stop Wrap, / Overwrite
Temperature / Humidity:	Temperature and RH readings recorded for each event

MEMORY

Memory Size:	128 MB
Memory Type:	Non-volatile FLASH
Memory Retention:	Retains data even when batteries are exhausted or removed

ENVIRONMENTAL

Operating Temperature:	-40° to +60°C (-40° to +140°F) using lithium batteries -20° to +54°C (-4° to +130°F) using alkaline batteries
Communication Temperature:	0° to +60°C (32° to +140°F)
Temperature Measurement / Accuracy:	-40° to +60°C (-40° to +140°F) ±1.0°C from +5° to +40°C; ±1.5°C from -40° to +60°C
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 4% from 5% to 95% RH at 25°C

POWER

Internal:	2 lithium or alkaline 9V batteries
External:	4-D Cell battery pack
Continuous Run Times:	15 days using lithium batteries 7 days using alkaline batteries 40 days using 4-D cell battery pack (option)

SOFTWARE / COMMUNICATIONS

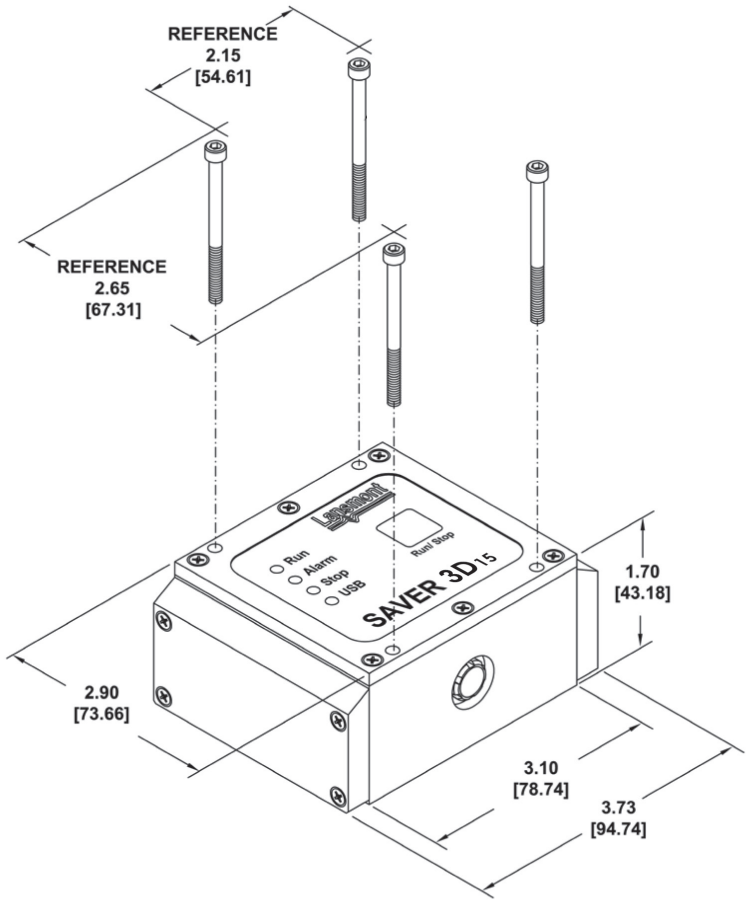
User Interface:	SaverXware™ software
Compatibility:	Microsoft Windows® XP (SP3), Vista, 7
COM Interface:	USB 1.1 or 2.0 compatible
Data Rate:	400 kB/s (typical)

CONTROLS AND INDICATORS

Controls:	Run / Stop button
LED Indicators:	Green: Run Red: Alarm Yellow: Stop Green: USB cable connected

SYSTEM DRAWINGS – MOUNTING DIMENSIONS

ISOMETRIC VIEW



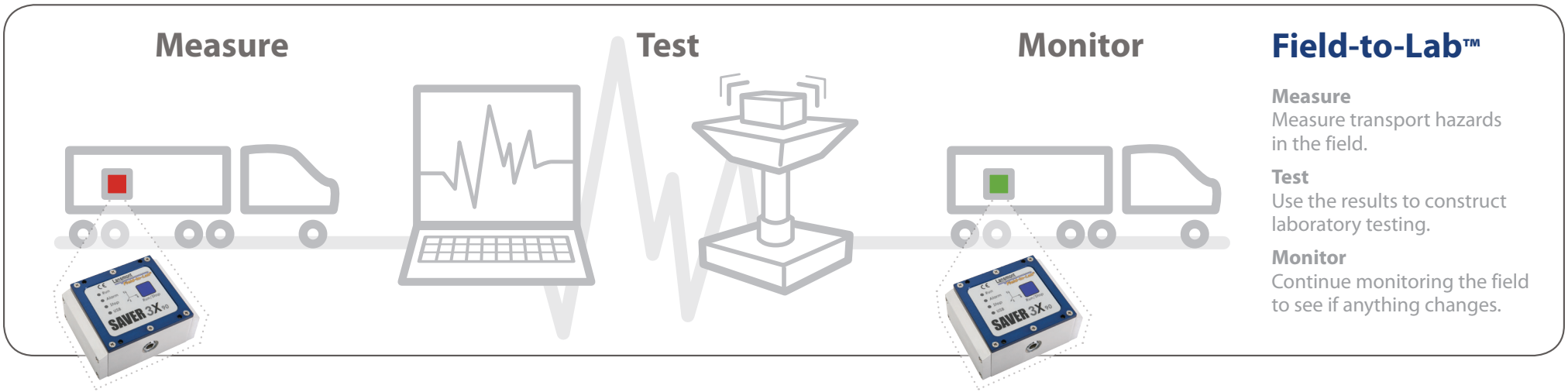
Note: Dimensions in inches [millimeters]

9.3.15

SAVER™ 3X90

Lansmont Field-to-Lab®

SAVER™ 3X90 is a self-powered field data recorder with an internal tri-axial accelerometer, temperature and humidity sensors, and USB connectivity. Powered with 9V lithium batteries, the instrument will operate continuously for up to 90 days. 16-bit resolution electronics allow you to take precise measurements of your dynamic environment.



Field-to-Lab™

Measure
Measure transport hazards in the field.

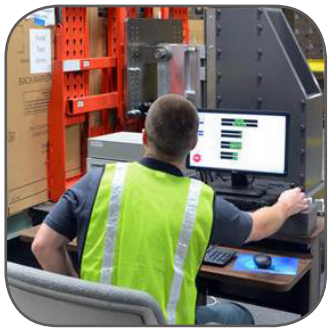
Test
Use the results to construct laboratory testing.

Monitor
Continue monitoring the field to see if anything changes.

SAVER™ 3X90

Lansmont Field-to-Lab®

FEATURES



Field-to-Lab®

Use SaverXware™ software to analyze data captured with SAVER™ instruments, and seamlessly create random vibration test profiles that can be easily imported into Lansmont TouchTest Vibration Controllers for immediate use. Only Lansmont offers this cross-platform integration.

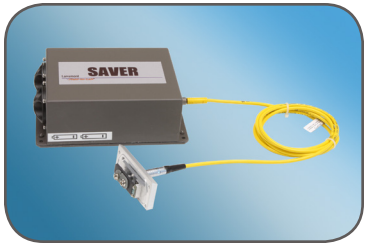
90 Day battery Life:

SAVER™ 3X90 is powered by two 9V batteries located on either side of the unit. The unit will run for 90 days on lithium batteries (45 days on alkaline batteries). Step-by-step instructions are provided in SaverXware™ for replacing the batteries.

T/RH sensor:

In addition to dynamic measurements, your SAVER™ 3X90 will also capture temperature and relative humidity conditions. Internal sensors mounted to the back side of the SAVER™ 3X90 measure and record environmental conditions per the user-defined setup.

OPTIONS

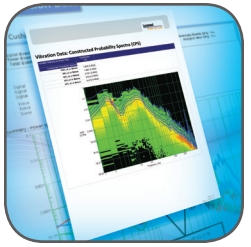


External Battery Pack:

For some recording applications, 90 days may not be enough recording time. Not a problem. Lansmont offers an External Battery Pack that extends the continuous operation time from 90 to 250 days.

Mounting Kits:

Mounting kits can make it easier to fix SAVER™ 3X90's to vehicles or structures. Kits include mounting plates and attachment hardware. If you are attaching to a ferrous surface, magnetic mounting kits are available.



Data Analysis Center:

Trust Lansmont data specialists to interpret your data and provide you with even greater confidence. Lansmont data specialists are experts at acquiring, analyzing and summarizing data; if you need help defining parameters or protocols, we can help.

SAVER™ 3X90

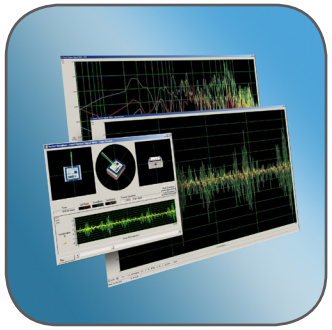
Lansmont Field-to-Lab®

SaverXware™

Each SAVER™ purchase includes Lansmont's SaverXware™, the easy-to-use software that communicates with the SAVER™3X90 for setup prior to recording — as well as data analysis once you've collected some data. Data analysis features include drop heights, impacts, vehicle motion, vibration, as well as temperature and humidity cycles.

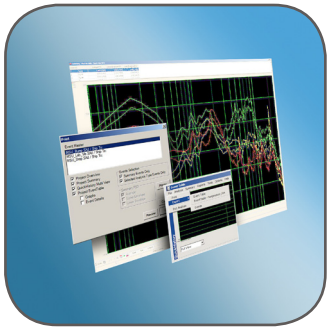
Measurement Setup

Users are provided with simple, standard setup gateways for common measurement applications. Advanced setup options provide complete control over all setup parameters, providing unparalleled capability for instrument users.



Data Analysis

Powerful individual and multi-event summary analyses providing time-history, frequency domain, and vector visualizer playback and review.

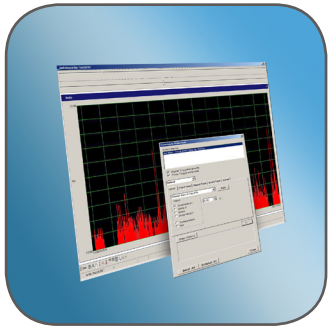


Summary Reporting and Export

Generate user-defined project summary reports and print to document measurement results. Additionally, export the project data itself to ASCII files for analysis and reporting using universally available software applications.

Event Table and History

Multi-data files can be viewed in single, common project databases. The data file's measured events are chronologically presented in event tables, which are positioned underneath measurement Quick Histories. The Quick Histories display the captured data from the project beginning to end in one view. Corresponding event thumbnails are updated as different events are highlighted in the table.



Summary Event Selection

Extremely useful event selection options based upon acceleration and Grms levels, time occurrence, type of event and even impact type and orientation. A quick history zoom-to-summary option with user-defined range cursors is provided as an alternative summary selector.

GPS Integration

Externally captured GPS data can be imported and automatically synchronized with SAVER™ 3X90 data to add further value and definition to your measurement results.

SAVER™ 3X90

Lansmont Field-to-Lab®

MEASUREMENT APPLICATIONS

Do you know what kinds of hazards your products must endure within their transport or in-use environments? The SAVER™ 3X90 Field Instrument is the right tool for thoroughly measuring dynamic and climatic conditions in manufacturing, transport, and in-use environments.

Manufacturing

Vehicles

Structural Measurements

Asset Transport

Oil Platforms

Amusement Rides

Off Road Measurements

Packages

Aerospace

Effective integration of measurement and monitoring programs provide customers the ability to:

- Characterize the dynamic and climatic hazards within a given environment
- Establish product design criteria
- Develop laboratory testing and simulation criteria
- Audit distribution channels and carriers
- Establish liability in transport damage situations
- Determine normal vs. abnormal handling and transport of your goods
- Create climatic histograms of environmental conditions (Temp/RH)

9.3.15

SAVER™ 3X90

Lansmont Field-to-Lab®

SPECIFICATIONS

PHYSICAL

Size:	3.74 x 2.90 x 1.7 in. (95 x 74 x 43 mm)
Volume:	18.4 in.^{3} (302 cm^3)
Chassis Material:	6061-T6 anodized aluminum
Weight:	16.7 oz. (473 grams)
Environmental:	Weather Resistant
Mounting:	4 thru holes for #6 screws

DATA ACQUISITION

Sampling Rates:	50, 100, 200, 250, 500, 1000, 2500, and 5000 samples per second
A/D Conversion:	16-bit
Accelerometer Type:	Tri-axial piezoelectric
Acceleration Ranges:	5, 10, 20, 50, 100, and 200 g (full-scale)
Anti-Alias Filter:	4-pole, low-pass Butterworth filter 10, 20, 50, 100, 200, 250, and 500 Hz (cut-off frequency)
Software Filters:	1 or 2-pole, low-pass RC post-process filters 0 to 10 kHz (cut-off frequency)
3-dB Frequency Response:	0.4 Hz to filter setting
Instrument Noise Floor:	0.02 Grms typical at 500 Hz bandwidth
Dynamic Range:	80 dB typical
Measurement Accuracy:	±5% with nominal variations in temperature and frequency

DATA RECORDING

Signal Trigger:	User programmable acceleration (g) threshold
Timer Trigger:	User programmable "wake-up" interval
Pre-Trigger:	User-programmable signal event pre-trigger
Data Retention Modes:	Max. Overwrite, Fill / Stop, Wrap / Overwrite
Temperature / Humidity:	Temperature and RH readings recorded for each event

MEMORY

Memory Size:	128 MB
Memory Type:	Non-volatile FLASH
Memory Retention:	Retains data even when batteries are exhausted or removed

ENVIRONMENTAL

Operating Temperature:	-40° to +60°C (-40° to +140°F) using lithium batteries -20° to +54°C (-4° to +130°F) using alkaline batteries
Communication Temperature:	0° to +60°C (32° to +140°F)
Temperature Measurement / Accuracy:	-40° to +60°C (-40° to +140°F) ±1.0°C from +5° to +40°C; ±1.5°C from -40° to +60°C
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 4% from 5% to 95% RH at 25°C

POWER

Internal:	2 lithium or alkaline 9V batteries
External:	4-D Cell battery pack
Continuous Run Times:	90 days using lithium batteries 45 days using alkaline batteries 180 days using 4-D cell battery pack (option)

SOFTWARE / COMMUNICATIONS

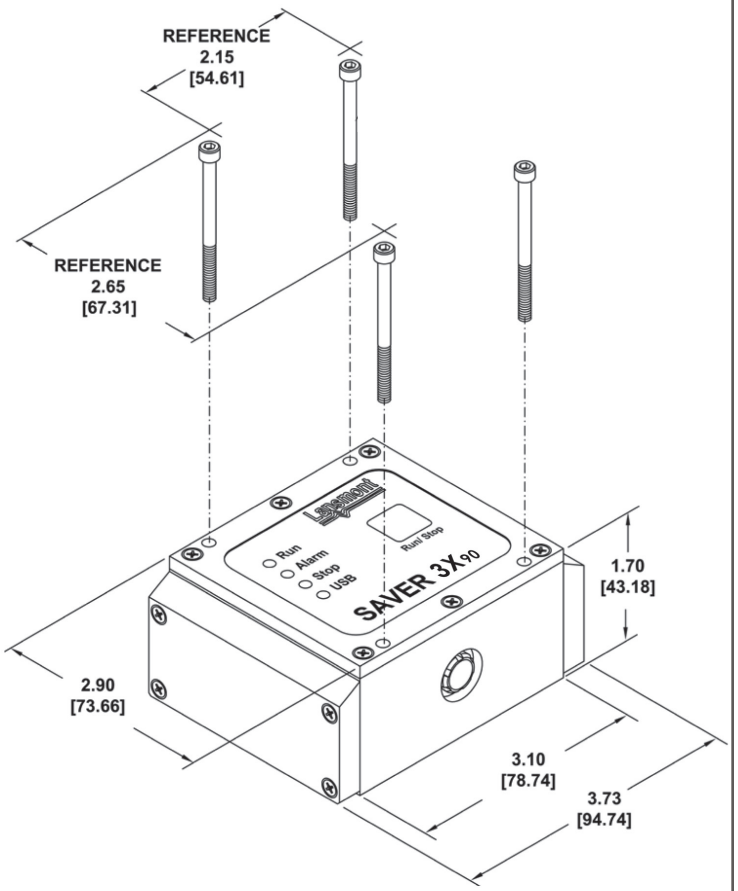
User Interface:	SaverXware™ software
Compatibility:	Microsoft Windows® XP (SP3), Vista, 7
COM Interface:	USB 1.1 or 2.0 compatible
Data Rate:	400 kB/s (typical)

CONTROLS AND INDICATORS

Controls:	Run / Stop button
LED Indicators:	Green: Run Red: Alarm Yellow: Stop Green: USB cable connected

SYSTEM DRAWINGS – MOUNTING DIMENSIONS

ISOMETRIC VIEW



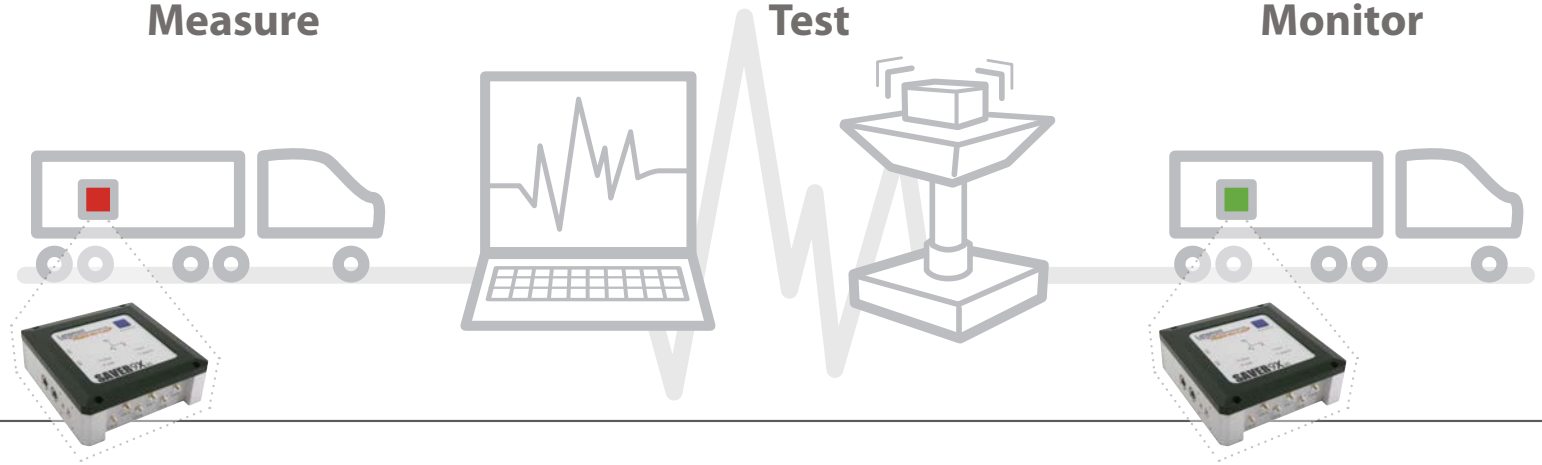
Note: Dimensions in inches [millimeters]

9.3.15

SAVER™ 9X30

Lansmont Field-to-Lab®

The SAVER™ 9X30 is a self-powered field data recorder with an internal tri-axial accelerometer, and six externally configurable channels. The 9X30 is provided with temperature, humidity and atmospheric pressure sensors and can be optionally configured with onboard GPS logging capability. Powered with 9V lithium batteries, the instrument and will operate continuously for up to 30 days.



Field-to-Lab™

Measure
Measure transport hazards in the field.

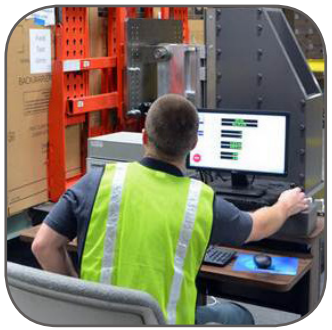
Test
Use the results to construct laboratory testing.

Monitor
Continue monitoring the field to see if anything changes.

SAVER™ 9X30

Lansmont Field-to-Lab®

FEATURES



Field-to-Lab®

Use SaverXware™ software to analyze data captured with SAVER™ instruments, and seamlessly create random vibration test profiles that can be easily imported into Lansmont TouchTest Vibration Controllers for immediate use. Only Lansmont offers this cross-platform integration.

30 Day Battery Life:

SAVER 9X30 is powered by two 9V batteries located on the side of the unit. The unit will run for 30 days on lithium batteries (15 days on alkaline batteries). Step- by- step instructions are provided in SaverXware™ for replacing the batteries.

Nine Dynamic Measurement Channels:

The 9X30 incorporates a dedicated internal tri-axial with 6 external accelerometer inputs, along with temperature, humidity, atmospheric pressure sensors. Sampling rates up to 10KHz per channel provide unparalleled portable measurement capability. The 9X30 includes built in signal conditioning for all of the dynamic channels along with selectable recording ranges and filters.

OPTIONS

9X-GPS Configuration:

Optionally configured as the SAVER™ 9X-GPS, the internal GPS hardware adds valuable location and speed detail to your measurement data. This detail is directly part of the SaverXware™ data stream, requiring an intermediate import and synchronization.

External Battery Pack:

Lansmont offers External Battery Pack options that can extend the continuous operation from one to multiple months of run time.

Mounting Kits:

Mounting kits can make it easier to fix SAVER™ 9X30's to vehicles or structures. Kits include mounting plates and attachment hardware. If you are attaching to a ferrous surface, magnetic mounting kits are available.

Data Analysis Center:

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SAVER™ 9X30

Lansmont Field-to-Lab®

SaverXware™

Each SAVER™ purchase includes Lansmont's SaverXware™, the easy-to-use software that communicates with the SAVER™9X30 for setup prior to recording — as well as data analysis once you've collected some data. Data analysis features include drop heights, impacts, vehicle motion, vibration, as well as temperature and humidity cycles.

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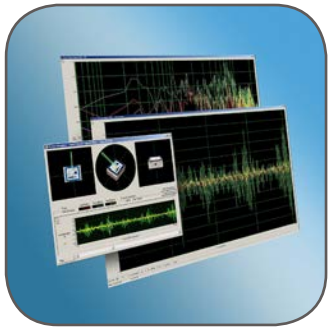

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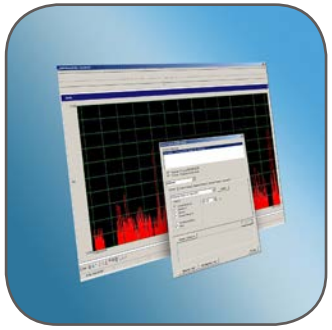

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GPS Integration

Externally captured GPS data can be imported and automatically synchronized with 9X30 events. Optionally configured as a 9X-GPS, position and speed data will automatically be directly embedded into captured data files. This adds further value and definition to your measurement results.

SAVER™ 9X30

Lansmont Field-to-Lab®

MEASUREMENT APPLICATIONS

Do you know what kinds of hazards your products must endure within their transport or in-use environments? The SAVER™ 9X30 Field Instrument is the right tool for thoroughly measuring dynamic and climatic conditions in manufacturing, transport, and in-use environments.

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Vehicles

Structural Measurements

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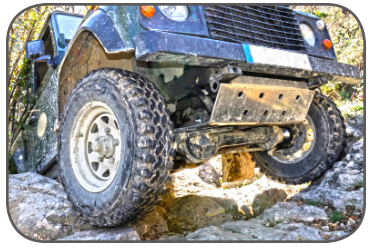
Amusement Rides



Off Road Measurements

Packages

Aerospace

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- Determine normal vs. abnormal handling and transport of your goods
- Create climatic histograms of environmental conditions (Temp/RH)

4.11.16

SAVER™ 9X30

Lansmont Field-to-Lab®

SPECIFICATIONS

PHYSICAL

Size:	5.0 x 4.9 x 1.7 in. (127 x 124 x 43 mm)
Volume:	41.2 in.^{3} (675 cm^3)
Chassis Material:	6061-T6 anodized aluminum
Weight:	35.0 oz. (1 kg)
Environmental:	Weather Resistant
Mounting:	4 thru holes for #8 screws

DATA ACQUISITION

Sampling Rates:	50, 100, 200, 250, 500, 1000, 2500, 5000 and 10,000 samples per second
A/D Conversion:	16-bit

INTERNAL CHANNELS

Accelerometer Type:	Tri-axial piezoelectric
Acceleration Ranges:	5, 10, 20, 50, 100 and 200 g (full-scale)
Anti-Alias Filter:	4-pole, low-pass Butterworth filter 10, 20, 25, 50, 100, 200, 250 and 500 Hz. (cut-off frequency)
Software Filters:	1 or 2-pole, low-pass RC post-process filters 0 to 10 kHz (cut-off frequency)
3-dB Frequency Response:	0.4 Hz to filter setting
Instrument Noise Floor:	0.02 Grms typical at 500 Hz bandwidth
Dynamic Range:	80 dB typical
Measurement Accuracy:	±5% with nominal variations in temperature and frequency

DATA RECORDING

Signal Trigger:	User programmable acceleration (g) threshold
Timer Trigger:	User programmable "wake-up" interval
Pre-Trigger:	User-programmable signal event pre-trigger
Data Retention Modes:	Max. Overwrite, Fill / Stop, Wrap / Overwrite
Temperature / Humidity / Atmospheric Pressure:	Temperature, RH and Atmospheric Pressure readings recorded for each event

MEMORY

Memory Size:	128 MB
Memory Type:	Non-volatile FLASH
Memory Retention:	Retains data even when batteries are exhausted or removed

EXTERNAL CHANNELS

Number of Channels:	6
Input Modes:	Charge and Voltage
Anti-Alias Filter:	4-pole, low-pass Butterworth filter 10, 20, 25, 50, 100, 200, 250 and 500, 1,000, 2,000, and 2,500 Hz. (cut-off frequency)

Charge Mode:

Accelerometer Type:	Piezoelectric
Input Sensitivity:	0.3 to 30.0 pC/g
Acceleration Ranges:	5, 10, 20, 50, 100, and 200 g (full scale)
3-dB Frequency Response:	0.4 Hz to filter setting
Measurement Accuracy:	±5% with nominal variations in temperature and frequency

Voltage Mode:

Input Range:	+5 volts AC or DC
Input Sensitivity:	0.3 to 5000mV/g
AC Response:	0.4 Hz to filter setting
3-dB Frequency DC Response:	DC to filter setting
Measurement Accuracy:	±5% with nominal variations in temperature and frequency

ENVIRONMENTAL

Operating Temperature:	-40° to +60°C (-40° to +140°F) using lithium batteries -20° to +54°C (-4° to +130°F) using alkaline batteries
Temperature Measurement / Accuracy:	-40° to +60°C (-40° to +140°F) ±1.0°C from +5° to +40°C; ±1.5°C from -40° to +60°C
Communication Temperature:	0° to +60°C (32° to +140°F)
Humidity Measurement / Accuracy:	5% to 95% RH, non-condensing ± 4% from 5% to 95% RH at 25°C
Atmospheric Pressure	
Measurement Range:	10 to 1100 mbar.
Measurement Accuracy:	±4 mbar from 750 to 1100 mbar at 25°C.

POWER

Internal:	2 lithium or alkaline 9V batteries
External:	Extended run time options available
Continuous Run Times:	30 days using lithium batteries 15 days using alkaline batteries, extended run-time options available

SOFTWARE / COMMUNICATIONS

User Interface:	SaverXware™ software
Compatibility:	Microsoft Windows® XP (SP3), Vista, 7
COM Interface:	USB 1.1 or 2.0 compatible
Data Rate:	400 kB/s (typical)

CONTROLS AND INDICATORS

Controls:	Run / Stop button
LED Indicators:	Green: Run Red: Alarm, Yellow: Stop, Green: USB cable connected

Optional Embedded GPS (9X-GPS):

Antenna:	External with SMA connector and magnetic mount
Data Acquisition:	GPS position recorded with every event
Run Time:	100 hours of vehicle movement on lithium batteries 50 hours of vehicle movement on alkaline batteries GPS turns off when instrument is not moving

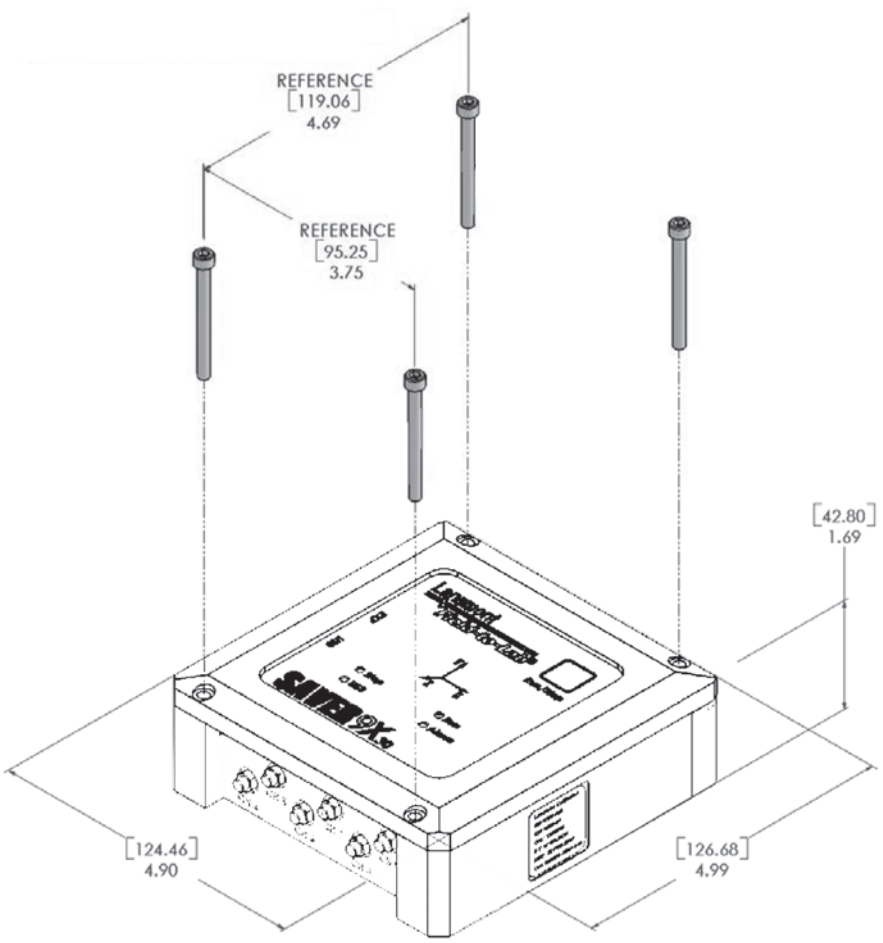
4.11.16

SAVER™ 9X30

Lansmont Field-to-Lab®

SYSTEM DRAWINGS – MOUNTING DIMENSIONS

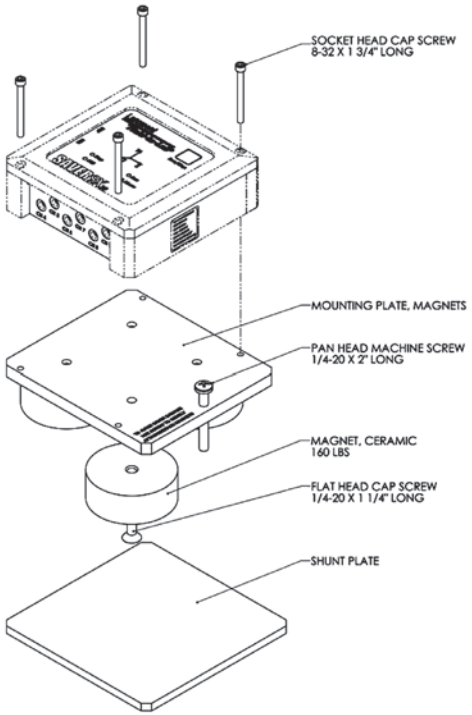
ISOMETRIC VIEW



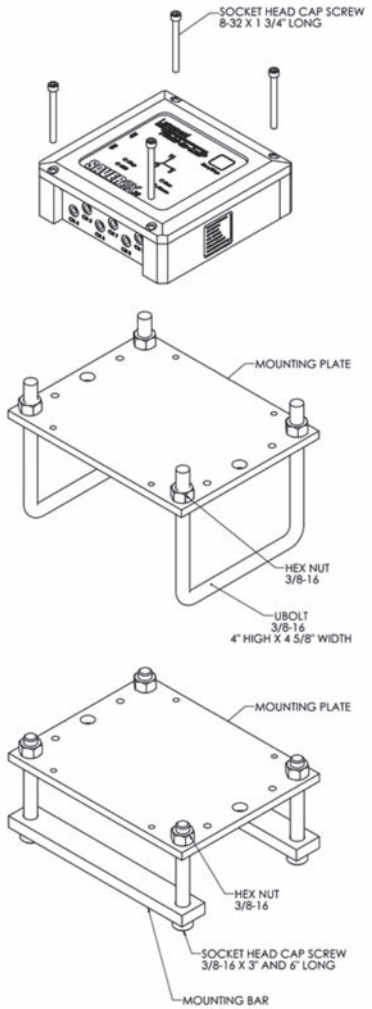
Note: Dimensions in inches [millimeters]

MOUNTING OPTIONS

MAGNET MOUNT



STANDARD MOUNT



Note: Dimensions in inches [millimeters]