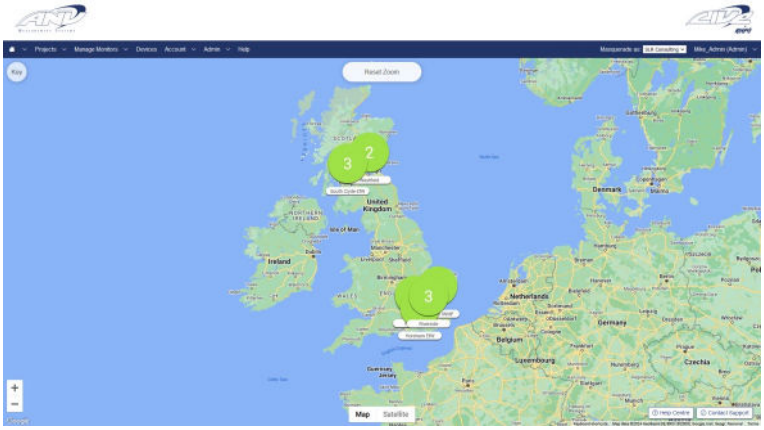


Introduction

When Live Leq, the Noise element of LivEnviro, was released in 2013 it wasn't quite the first Live-to-Web Noise system on the market. Hardly any live systems that were around in 2013 are still current but LivEnviro has remained a market-leading live-to-web system for more than 10 years. There are a number of reasons for the sustained success of LivEnviro, in particular:-

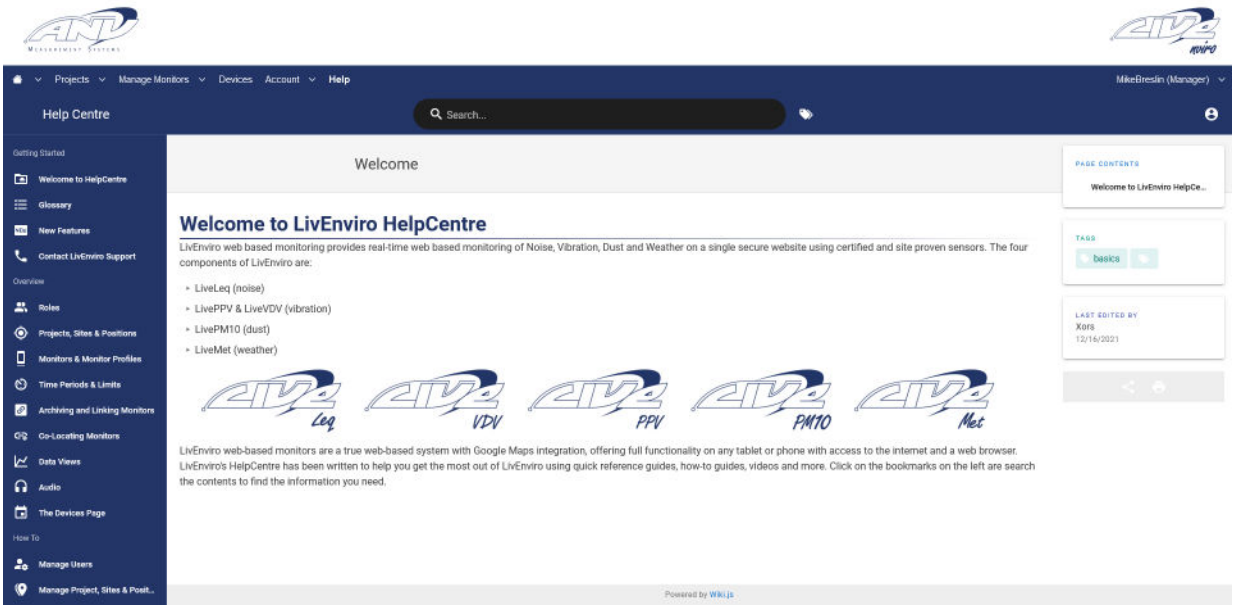
- The Live Leq Noise system had a lot of great features straight away including:-

  Being highly user-configurable;

  Well thought-out hierarchies for monitors (Projects, Sites and Measurement Positions) and User types (Managers and Viewers);

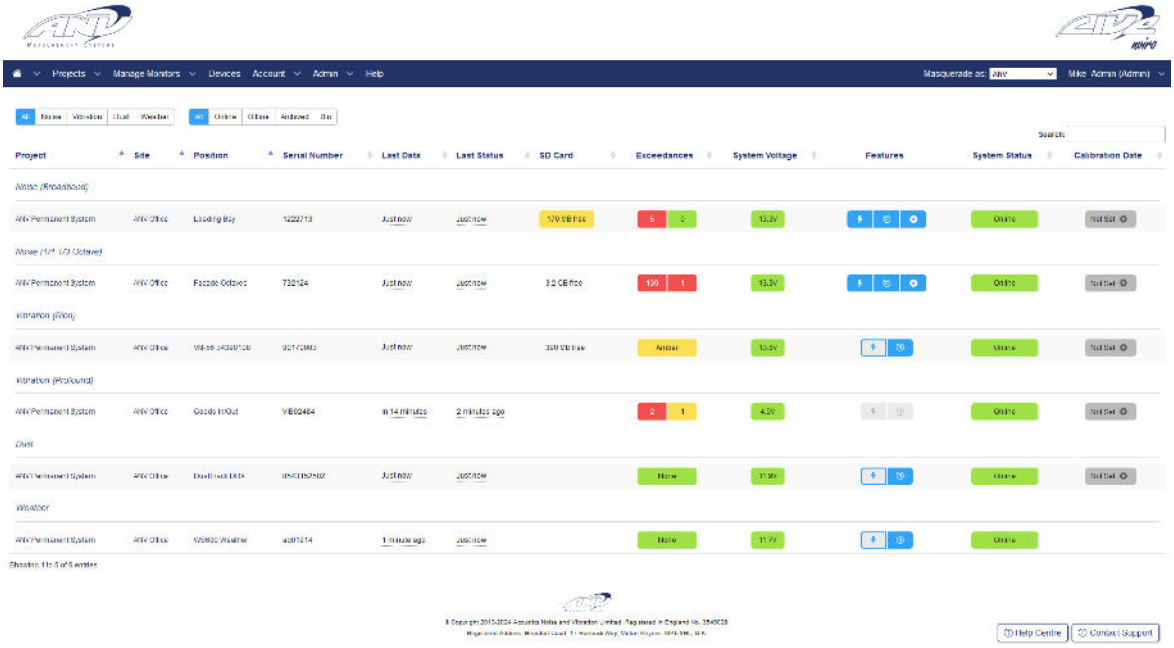
  Up to 5 simultaneous sets of Noise limits available; and

- Different limits available for every hour of every day of the week.
- The introduction of the Live PPV Vibration element of LivEnviro in 2014;
- The introduction of Live PM10 Dust and Live Met Weather in 2015 to complete the live Noise, Vibration, Dust and Weather lineup.
- (PTB) Type-Tested Noise monitors and MCERTS certified Dust monitors;
- Continual Improvement and adding of Features in response to customer requirements;
- Reliability;
- Industry-leading Customer Support; and
- On-Line Help Pages and link to e-mail Support@LivEnviro.com



Website Outline

- Noise, Vibration, Dust and Weather current and historic data (and audio for Noise) all available via a single, intuitive and logical website.
- Users with appropriate permissions can add comments to the current and historic data plots
- A true web-based system that can be fully operated from any internet connected device with a modern browser – no requirement to download or install apps or software.
- Really well-suited to managing large numbers of monitors across multiple sites.
- Equally well-suited to smaller scale projects with just one or a few monitors.
- Equally well-suited to Noise, Vibration, Dust and Weather monitoring.
- Monitors are managed from a Home Page which shows essential information for each monitor (power, signal, alert status) in either a Google Maps View or List View.

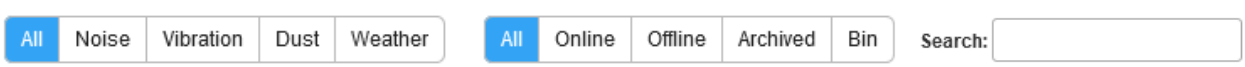


The List View Home Page is an extremely powerful and intuitive tool for managing monitors.

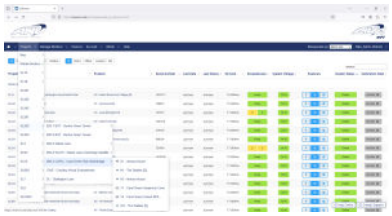
Monitors can be listed in order of : Project Name, Site Name, Position Name, Instrument Serial Number, Date/Time of Last Data or Contact with the Monitor, Exceedances, System Voltage, Online/Offline Status and Calibration Date.

The Monitors displayed on the Home Page can be filtered by type (Noise, Vibration, Dust or Weather) and whether they are Online, Off-Line, Archived or Deleted.

There's also an extremely useful search function which can be used to go straight to monitors based on any of their descriptors (e.g. Project Name, Site Name, Position Name, Instrument Serial Number)



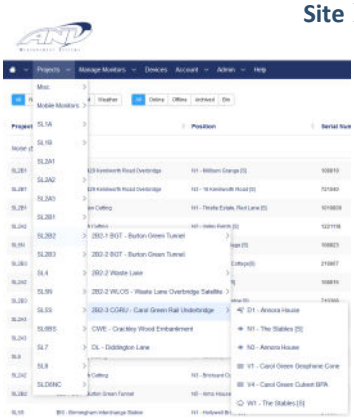
Logical and Intuitive Account Architecture



Account ➢ One or Multiple **Projects**

Project ➢ One or Multiple **Sites**

Site ➢ One or Multiple **Measurement Positions**



Measurement Position ➢ **Monitor**

- ➢ Physical Position
- ➢ **Limits** and **Alerts**
- ➢ **Current Data** and (Saved and Live **Audio**)
- ➢ **Historic Data** and (Saved **Audio**)
- ➢ **Comments** and **Notes** posted by **Users**

Logical and Flexible User Hierarchy

Permissions	Manager	Project Manager	Site Manager	Viewer ++	Viewer +	Viewer	Primary Limit Viewer
Add, Remove and Configure Monitors	✓						
Add Projects	✓						
Add Account Managers	✓						
Add Project Managers	✓						
Add Site Managers	✓	✓					
Add Viewers (all types) (for Monitors for which they have a Manger Role)	✓	✓	✓				
Set Limits and Alerts (for Monitors for which they have a Manger Role)	✓	✓	✓				
Add Sites	✓	✓					
Add Measurement Positions	✓	✓	✓				
Add Comments Noise, Vibration or Dust Graphs	✓	✓	✓	✓			
Listen to triggered audio and request audio for any time within the preceding 24 hours	✓	✓	✓	✓			
View Current & Historic Data and whether Limits Exceeded in Current or Earlier Periods	✓	✓	✓	✓	✓		
View all Current Data and whether any Limit Exceeded in Current Period	✓	✓	✓	✓	✓	✓	
View Current Level and whether Primary Limit Is Exceeded in Current Period	✓	✓	✓	✓	✓	✓	✓

Managers can also set up one Configurable User Type to Provide a non-standard set of Permissions

Data

ROAMING

Competitive subscription includes a Roaming SIM which automatically connects to the best network whenever the system is switched on.

Two Way Communications

Commands are sent to the Sensors and Data (+ Audio for noise monitors) and Status Reports are received from the Sensors.

Enables Remote:

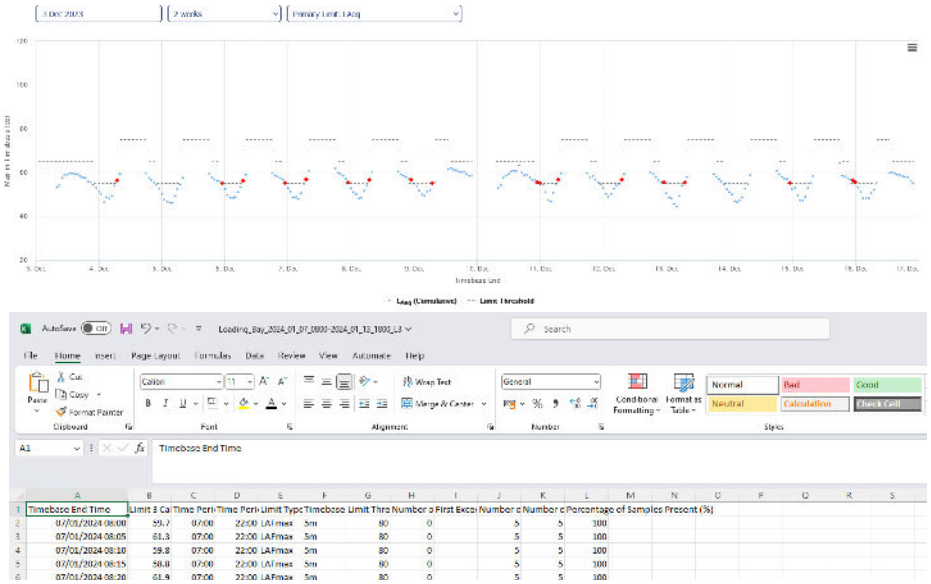
- Updates to software/firmware;
- Trouble shooting and repairs; and
- Reboot without stopping data capture.

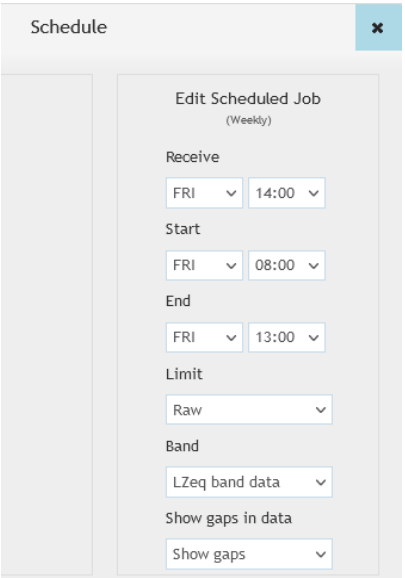
Data is uploaded to the server from the sensors at a maximum upload rate of 1 minute (30 seconds for DIN and SBR Vibration).

All Current and Historic Data available to Managers via any Internet Enabled Device with a Modern Browser

Raw and Processed Data (i.e. appropriately processed in the Time Periods selected for limits) can be downloaded as a CSV files manually or automatically using a scheduler.

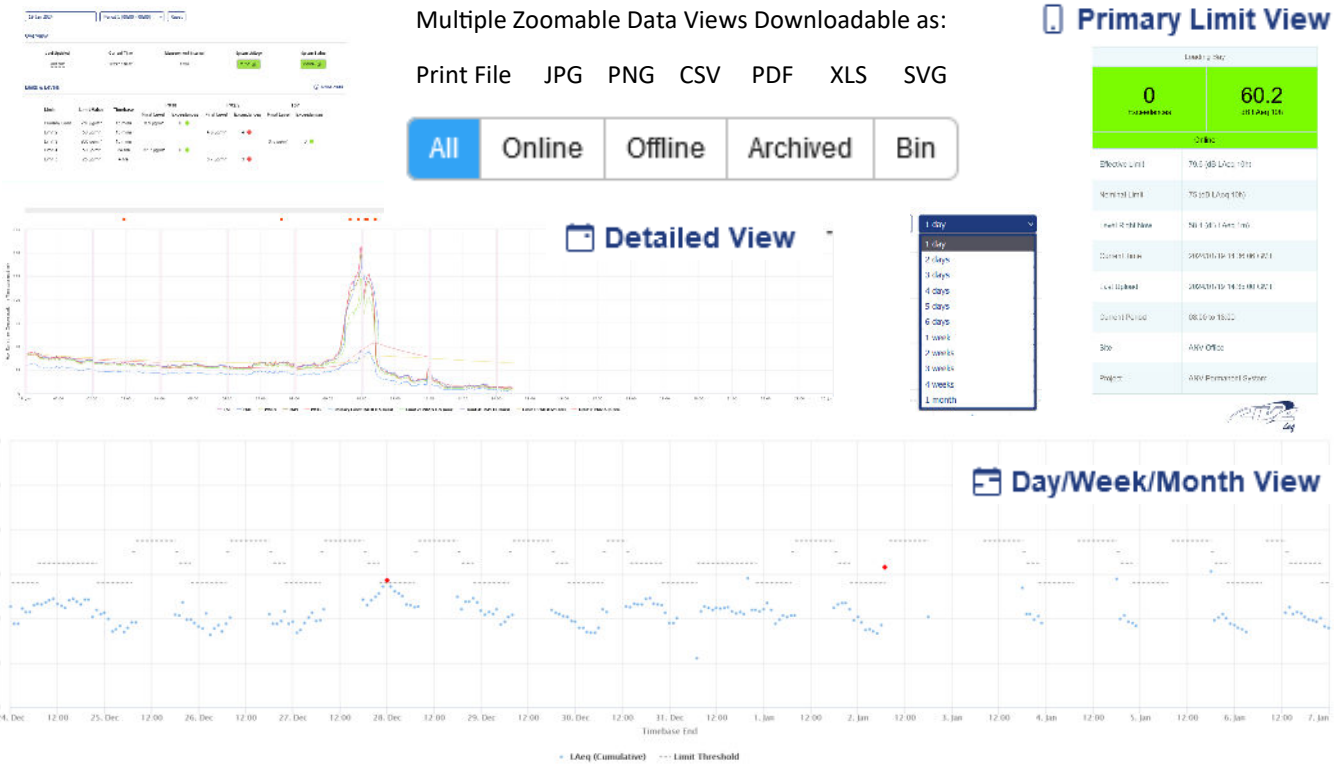
A CSV download can also be obtained from the graphs (inc. Day/Week/Month view)





Data (and Audio) can be imported into third party systems via the Live API Application Program Interface.

Data & Data Security



Data Security

The raw data, calculated data and audio files are stored to 3 dedicated LivEnviro servers at a UK physical Data Centre.

Data written to the database server is automatically mirrored to the second server. All servers are configured with RAID 10 drives. All three servers are protected by a hardware firewall.

Access to data on the web site is password-protected and the site is SSL certified HTTPS. Connection to LivEnviro is encrypted and authenticated using a strong protocol (TLS 1.2), a strong key exchange (ECDHE_RSA with P-256), and a strong cipher (AES_256_GCM). Access to the servers for support is limited to ssh from configured IP addresses. Access to the Rackspace account is controlled through two-factor authentication. Physical security is provided by the Rackspace datacentre, with limited access permitted and full protection for fire, flooding and power.

Both the webserver and the database server are backed up daily for files. The database files are excluded from the file backup. Both servers have a full weekly backup and a daily incremental backup. The mirror server also has a Linux file backup on a full weekly / incremental daily schedule. In addition, the mirror server has a full backup daily of the database, whereby the MySQL database is stopped, a full dump is performed and the resulting data is backed up to tape. The tapes are stored locally in the datacentre. Backups are retained for two weeks in all cases.

Additionally, a local copy of Noise, Vibration and Dust Data is stored by the monitors until physically deleted.

Limits and Alerts

Limits & Levels — More detail

Limit	Label	Index	Timebase	Limit Value	Level Now	ERL	Exceedances
Main Primary Limit	Insulation	L_{Aeq}	10 hrs	75.0 dB	63.6 dB	77.7 dB	0
Main Limit 2	Re-housing	L_{Aeq}	10 hrs	85.0 dB	63.6 dB	87.9 dB	0
Main Limit 3	LA Max Limit	L_{AFmax}	5 mins	80.0 dB	59.8 dB		6
Main Limit 4	Hourly 75 Leq	L_{Aeq}	1 hr	75.0 dB	54.5 dB	82.0 dB	0
Main Limit 5	Hourly 70 Leq	L_{Aeq}	1 hr	70.0 dB	54.5 dB	76.9 dB	0

- At least 5 simultaneous Limits and be set for all sensor types.
- An additional Amber Limit can be set for each limit.
- Alerts can be sent when Red or Amber Limits Exceeded
- Up to 24 sets of limits can be set for each day.
- Each day of the week can have different limits.
- Limit Names are User Configurable

Who receives Alert Emails

User	Red Alert	Amber Alert	Power Alert	Offline Alert
support user (Admin)	☐	☐	☑	☑
Tom R (Admin)	☑	☑	☐	☐

Alert Interval (mins)	Alert Voltage (V)	Offline Interval (mins)
1	12.3	10

Note: The Offline Interval must be set to a multiple of the upload interval to avoid spurious alerts - the recommended interval is 3 times the upload interval.

Email alerts can be sent to an unlimited number of recipients.

The alert types sent to individual users is configurable i.e. whether they receive alert when Red or Amber limits are exceeded for a specific monitor and whether they receive Power or Off-Line Alerts.

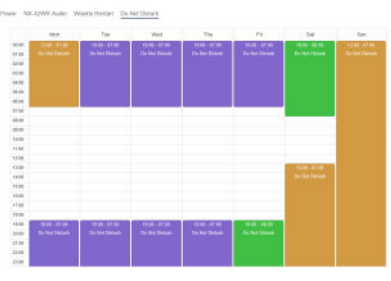
The amount of time off-line before an Off-Line Alert is generated is User Configurable.

The voltage at which Power Alerts are generated is User Configurable.

- Power Alerts are generated when the voltage to the monitor drops below the specified level
- An e-mail is generated clearing the Power Alert if the voltage recovers to above the specified level—this is to avoid unnecessary site visits when power has already been restored.

Alerts can be “snoozed” between user selectable hours - any alerts that would have been sent are summarised in a summary email which is sent at the end of the snooze period.

Power History (Zoomable up to 6 months)



Setting Snooze Alerts Periods

Connectivity History (2 days or 2 weeks)

Noise Monitors



Based on Rion NL-53 and Rion NL-52 PTB Type-Tested Class 1 Sound Level Meters and Rion WS-15 outdoor windshield protection.

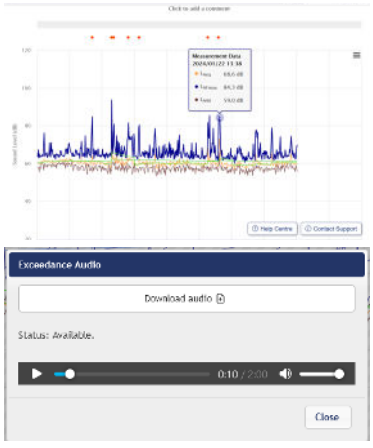
The Rion NL-53 and Rion NL-52 are excellent Sound Level Meters in their own right and can be used for attended or unattended surveys when not being used in a Live Leq kit.

Overall Broadband LAeq, LAmax and up to 5 Statical Indices can be measured.

Up to 5 Simultaneous Broadand Limits Can be Set (for every hour of the week independently)

Index	Timebase	Limit Value	Level Now	ERL	Exceedances
L_{Aeq}	10 hrs	72.0 dB	57.8 dB	78.3 dB	0

Automatic Amber Limits can be applied to LAeq-based limits and the Effective Remaining Limit (ERL) is shown both graphically and in the Limits Table at the top of the Detailed View Page.

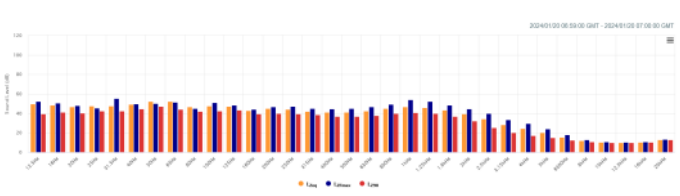


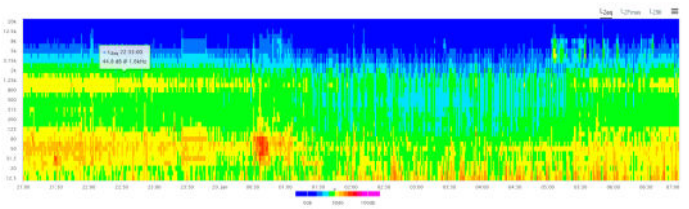
Listen Live

2 minute Audio Clips can be triggered:-

- When a Limit is exceeded (the clip covers the minute when the limit was exceeded and 30 seconds before and afterwards);
- Live on demand;
- At a user selectable Audio Trigger Level; and
- On Demand for any time within the 24 hours prior to the request.

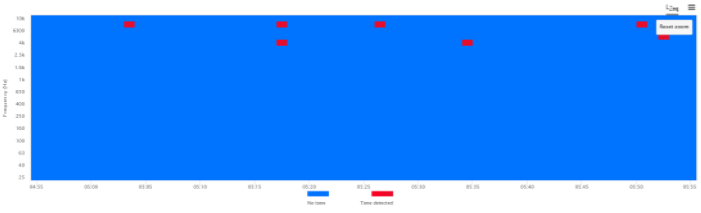
All Audio Clips can be Downloaded as MP3 Files





In octave/third octave mode:

- 5 additional frequency band-based are available;
- Sample Leq, Lmax and one (selectable) L_N displayed; and
- Spectrogram shown temporal variation of frequency content.



In Third Octave Mode BS 4142 Objective Tonal Analysis is Carried out automatically and can be displayed with Spectrogram

Noise Monitors

A range of enclosures can be provided:-

- IP66 Steel “Permanent” cases for deployment on posts or hoardings.
- Standard or Enhanced Pelicase options; and
- Custom enclosures for unusual deployments.

A solar power system can be provided which will provide year-round continuous operation in the UK subject to a good line of sight to the southern sky.

The solar panels can be placed up to 50 metres from the monitoring position (requires additional extension option).

The microphone can be used with up to 300 metres of extension.

Gel Cell (Valve Regulated Lead Acid) and LiFePO4 battery solutions are available for extended battery powered deployment.

Microphone and Rion WS-15 Outdoor Protection can be mounted on:-

- a Solar Panel Frame with 2 Metre Pole;
- a 4 metre Telescopic Mast;
- any 25mm outder diameter pole; or
- a tripod with 1/4-20 UNC or W3/8 stud/bolt.

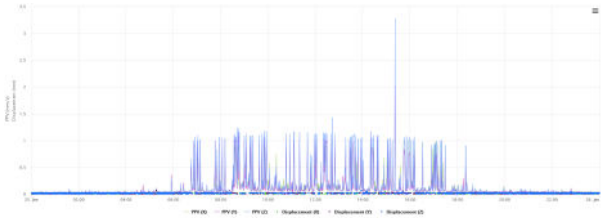
Vibration Monitors

Based on the Rion VM-56 which simultaneously measures VDV, PPV Dominant Frequency and Displacement .

The Rion VM-56 is an excellent vibration meter in its own right. With high sensitivity with a huge dynamic range it can be used for attended or unattended surveys when not being used in a Live PPV kit.

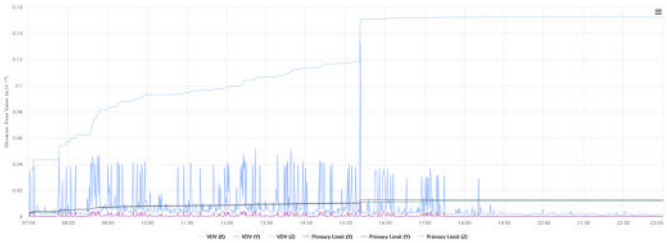
Live PPV & Rion VM-56 comply with the requirements of:-

BS 6472: 2	DIN 45669
BS 7385: 2	DIN 4150
BS 5228: 2	SBR-A
ISO 8041	SBR-B



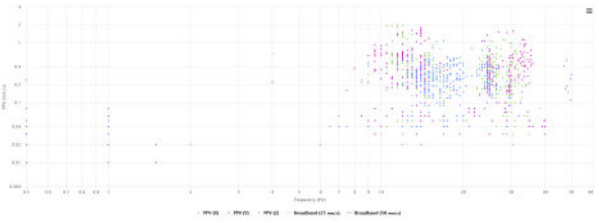
Supplied with Rion PV-83D robust, IPX7, high-sensitivity triaxial accelerometer which:-

- Measures acceleration directly for accurate and reliable evaluation of VDV;
- Is not subject to non-linearity or underestimating vibration levels if deployed off-axis.



Up to 5 VDV Limits can be set together with up to 5 broadband PPV Limits

BS 5228:2/7385:2 limits can be directly selected including Displacement for Dominant Frequency below 4 Hz



User-selected frequency-dependent limits can be defined and selected on the basis of PPV and Dominant Frequency.

SBR

$V_{effmax,30,i}$

$V_{top,i}$

f_{dom}

DIN

KB_{FTi}

$V_{i,max}$

f_{mg}

Vibration Monitors

The monitoring system is normally provided in a pelicase but alternative enclosures can be supplied

A solar power system can be provided which will provide year-round continuous operation in the UK subject to a good line of sight to the southern sky.

The solar panels can be placed up to 50 metres from the monitoring position (requires additional extension option).

The Rion PV-83D accelerometer can be used with up to 300 metres of extension.

Gell Cell (Valve Regulated Lead Acid) and LiFePO4 battery solutions are available for extended battery powered deployment.

Practical Mounting Options Available for the Rion PV-83D Accelerometer:-

- DIN Plate;
- L-Bracket for Wall Mounting; and
- 100, 200 and 300mm Ground Spikes.

Dust/Particulate Monitors

Based on the MCERTS TSI Environmental Dust Track.

MCERTS Certification up to 10 000µgm^{-3}

2 versions available:-

- PM10 only; and
- Simultaneous PM10, PM4, PM2.5, PM1 and TSP

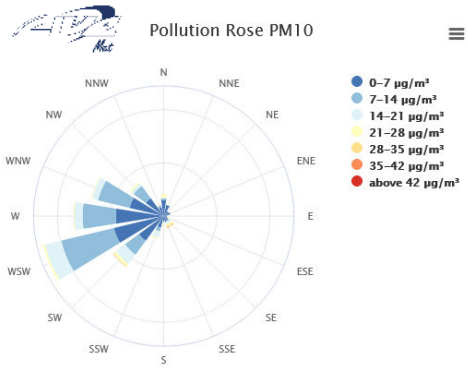
Low maintenance design: monthly visits advised for the first quarter with quarterly visits thereafter sufficient for all but the most dusty conditions.

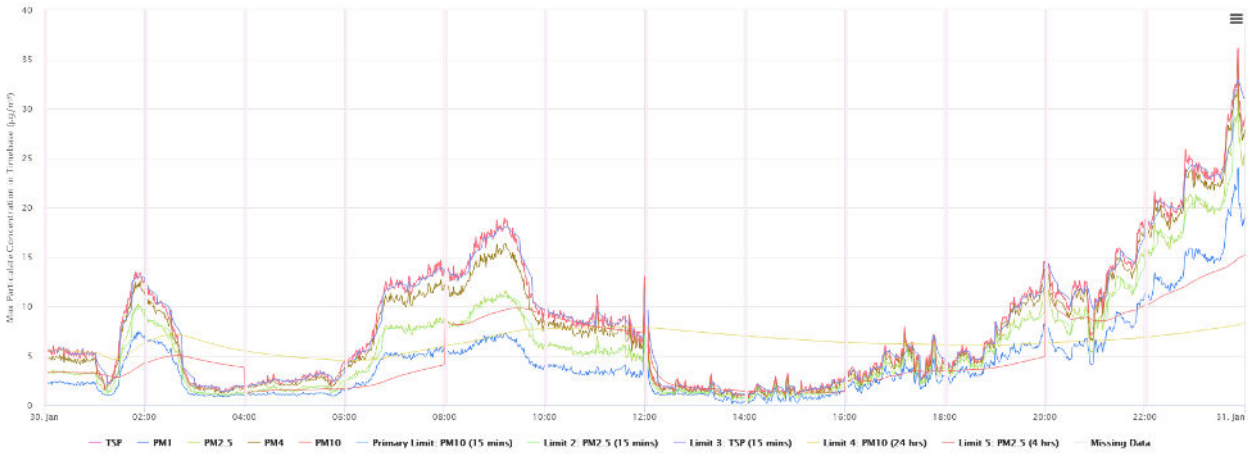
Well-defined and simple on-site maintenance procedure.

3 and 5 year bumper-to-bumper warranties available with annual laboratory calibration included.

Periodic Auto-Zeroing to Minimise Drift.

Pollution Roses for Last Hour and Measurement Periods when linked to





Dust/Particulate Monitors

Hardware supplied in a weather resistant metal cabinet which can be mounted on a hoarding or pole.

A solar power system can be provided which will provide year-round continuous operation in the UK subject to a good line of sight to the southern sky.

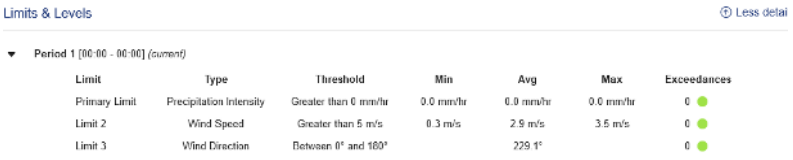
The solar panels can be up to 50 metres from the monitoring position (requires additional extension option).

In order to achieve MCERTS particulate monitors have to incorporate a pump and an inlet heater so it is difficult to run them for long periods on battery power. A portable 100 Ah battery solution can be provided which will run the unit for 3 days and multiple portable batteries could be installed to achieve longer periods of autonomy.

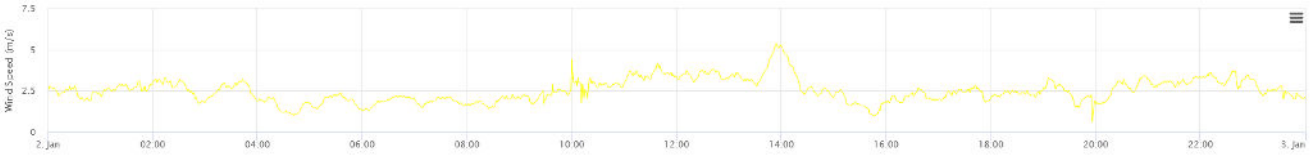
Weather Monitors

Based on the Lufft WS600 Weather Station

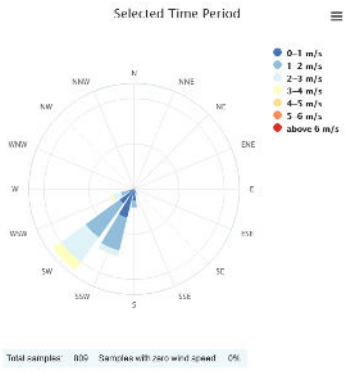
Available as both a self-standing live- to-web weather monitor or as an add-on to:-

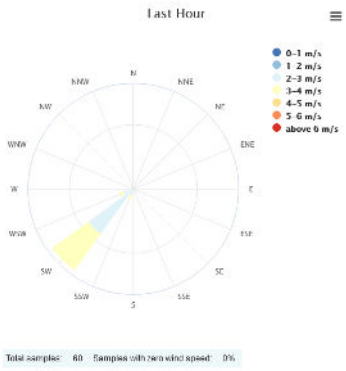


Alerts can be set for ranges of weather parameters (e.g. windspeeds above a specified level and/or wind direction between two compass settings and/or precipitation rate, temperature etc.).

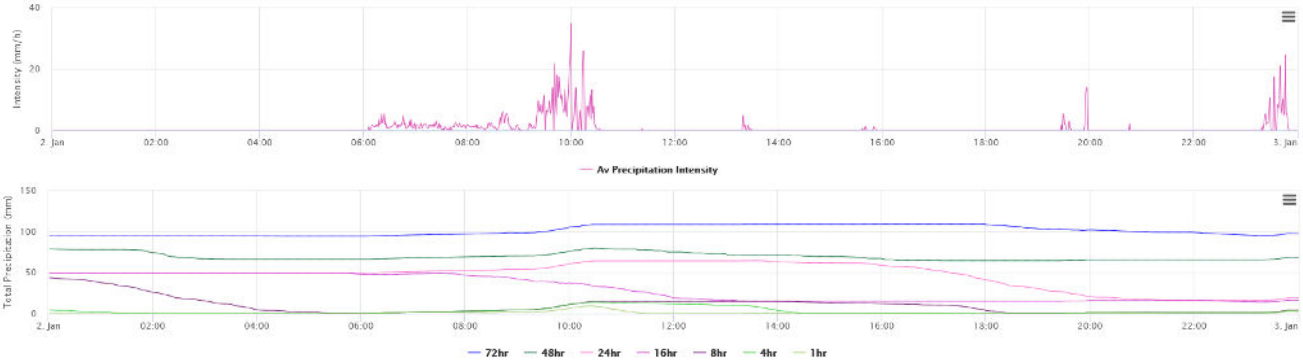


Wind Roses show windspeeds and direction for the last hour and the full measurement period.





Current and Historic Precipitation Rate (and Type) and Accumulations for 1—72 Hour Periods



Additional Parameters: Temperature, Pressure, Relative Humidity and Dewpoint

Windspeed, Wind Direction and Precipitation Rate can be shown on Noise or Dust Data Pages

Weather Monitors

Windspeed and direction measured with ultra-sonic transducers

Precipitation rate and type measured using Doppler Radar

Automatic Orientation Using Electronic Compass

As a self-standing live-to-web weather station:-

- a solar power system can be provided which will provide year-round continuous operation in the UK subject to a good line of sight to the southern sky; and
- Gell Cell (VRLA) and LiFePO4 battery solutions available for extended battery powered deployment.

As an add-on to a Live Leq Noise Monitor:-

- No separate subscription is required
- the solar power system can be upgraded provide year-round continuous operation in the UK subject to a good line of sight to the southern sky; and
- Gell Cell (VRLA) and LiFePO4 battery solutions available for extended battery powered deployment.

As an add-on to a Live PM10 Dust Monitor:-

- No separate subscription is required; and
- the solar power system can be upgraded provide year-round continuous operation in the UK subject to a good line of sight to the southern sky.

Customer Support

Help Centre | Contact Support

ANV Measurement Systems have been supporting customers for over 20 years and we have an industry-leading reputation for customer support.

There's online help available on the LivEnviro website and a direct link to send our LivEnviro Support Team an e-mail.

But we know how urgent it can be. When you're on site, for instance, and you need help—Call Us on 01908 642 846.

We aim to have at least one member of the LivEnviro Support Team available between 09:00—17:00 Monday—Friday.

Out team has a wide range of skills and experience including:-

- Several experienced Corporate Member of the Institute of Acoustics (MIOA) for expert advice on measurement of Sound and Vibration;
- Technicians and Engineers who are experts and experienced in:-

Institute of Acoustics sponsoring organisation

- ♦ Supporting LivEnviro;
- ♦ Diagnostics and Repair;
- ♦ Calibration;
- ♦ Installation of Monitors;
- ♦ Maintenance of Monitors; and
- ♦ Specifying, Installing and Supporting Solar and Battery Power Solutions.

BMTA
The British Measurement And Testing Association

Calibration

ilac-MRA UKAS CALIBRATION 0653

Calibration has been a fundamental element of the Products and Services offered by ANV from Day 1.

ANV can provide calibration for all the LivEnviro Sensors: Noise, Vibration, Dust/Particulates & Weather.

Send the kit to us or arrange for us to collect it and we'll do the rest.

ANV have been calibrating Sound and Vibration Instruments for over 20 Years.

UKAS (and traceable) sound/acoustics calibration & traceable vibration calibration is carried out at ANV's laboratories.

ANV's sound/acoustics calibration standard turnaround time is 5 days.

Dust/Particulate Monitor Calibration is provided by TSI at their UK UKAS Accredited Laboratory 20064.

We aim to turn round Dust/Particulate Monitoring Calibration in less than 2 working weeks.

We have to return weather monitors to Germany for Calibration and this can take a little longer (3—4 weeks).