

# **SENSONICS**

Condition Monitoring Solutions for Industry



• Vibration Monitoring • Turbine Supervisory • Overspeed Protection

KEEPING INDUSTRY TURNING

# SENSONICS

## Intelligent Machinery Protection

Bearing and Shaft Vibration

Shaft and Thrust Position

Speed and Tachometer

**DN26 G3 from Sensonics...**  
...the scalable and compact solution



# The need to protect your critical plant equipment

Continuous protection and monitoring is an essential requirement for critical rotating plant across industry. Whether you are generating power, pumping essential fluids or driving process equipment – it is vital to monitor machinery dynamic behaviour and protect your process from equipment downtime.

For over 40 years Sensonics has been at the forefront in developing smart condition monitoring systems which help industry to monitor and protect critical rotating plant.

The DN26 G3 protection monitor has evolved from the highly successful DN26 series, now offering a single hardware platform for all your vibration, position and speed measurement requirements in a compact Din-Rail mount solution.



# SENSONICS



# Protecting your Critical Rotating Plant

The DN26 G3 Machine Protection Monitor is a high performance fully programmable signal conditioning unit capable of monitoring 2 Channels of Absolute Vibration, Shaft Vibration or Shaft Position. An additional third channel is available as standard for measuring speed or for use as a phase reference.

The sensor interface is programmable to accept IEPE type accelerometers / velometers, proximity probes (API 670 std), and active / passive speed probes. All sensor signals are available via a buffered interface for further detailed signal analysis.

All three measurement channels are available via a 4-20mA interface. Three alarm relays are available as standard with the option to expand to a maximum of seven. One alarm relay dedicated to module and sensor integrity, while the remaining relays are programmable across a range of selectable alarm criteria.

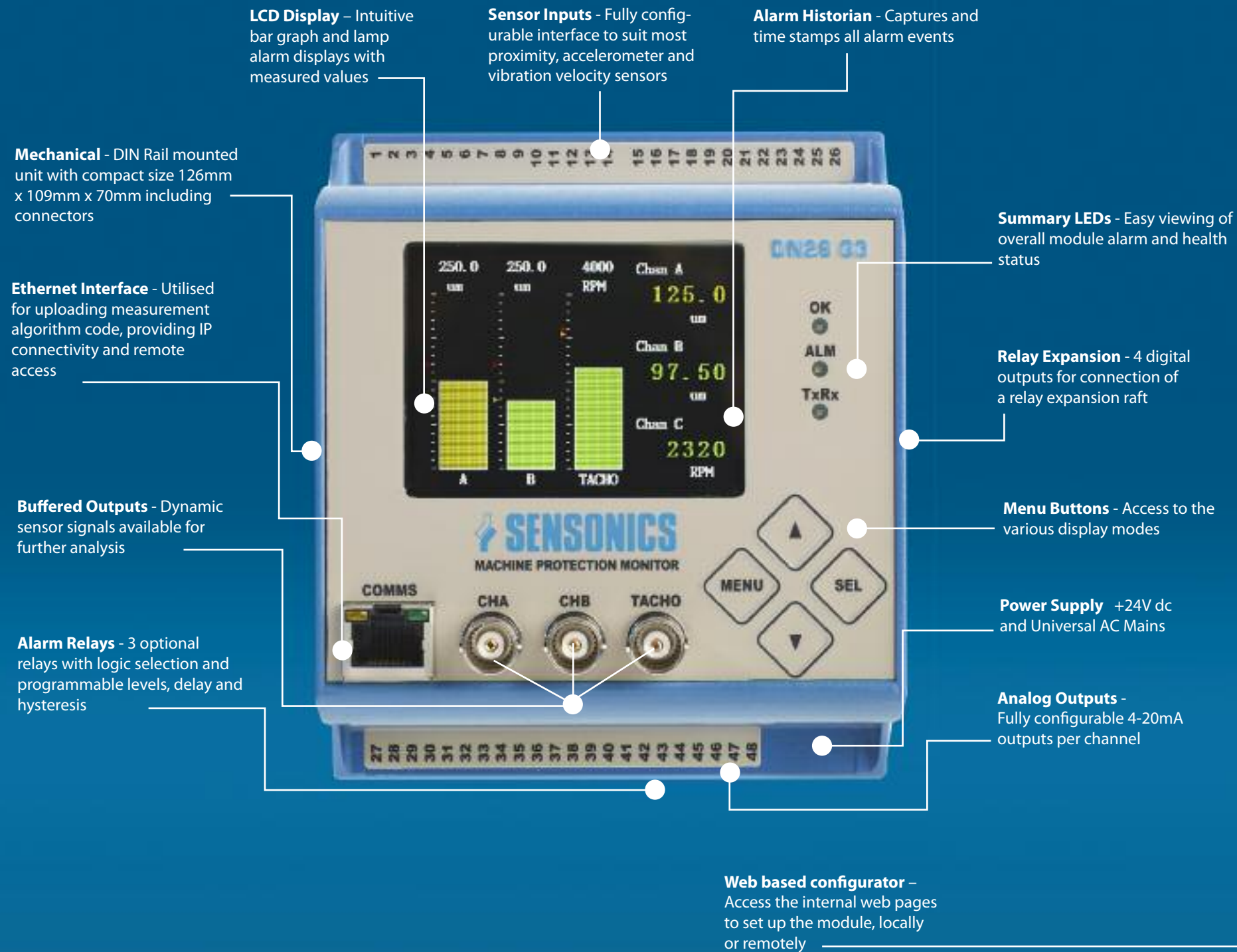
The internal web server provides for easy module configuration and IP network connectivity for remote access to the module facilities and data.

Each DN26 G3 is provided with an intuitive colour LCD display and menu drive facility to provide immediate viewing and access to the measured values and alarm status.

**Take a closer look at the features and benefits...**



## DN26 G3 Features and benefits



### Machine Measurement Modes

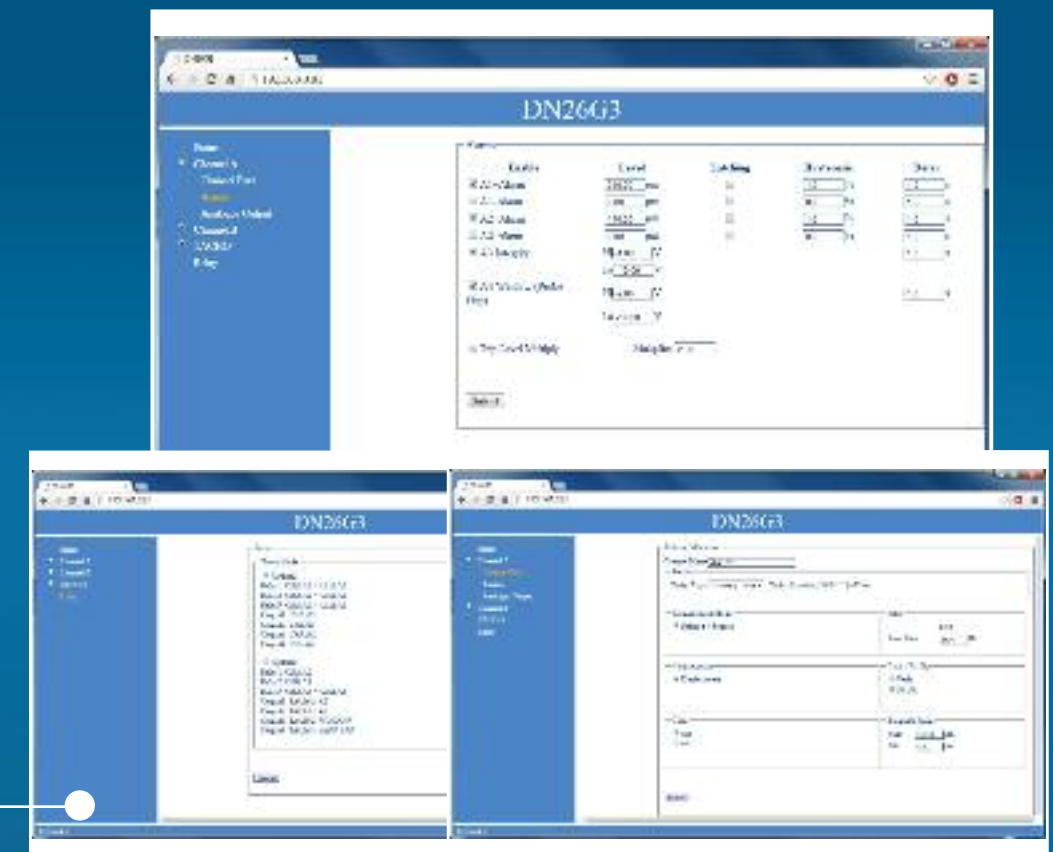
- Absolute and Relative Vibration
- Shaft Position
- Dedicated Speed & Phase Channel

### Applications

- Small to Medium Industrial Machines
- Fans, Pumps, Motors, Centrifuges and Turbines
- Shutdown Protection and Condition Monitoring
- Ideal for OEM integration

### Flexible Configuration

- Universal Module for all measurement options
- Field Upgradeable
- Programmable Warning and Danger Alarms
- Programmable Transducer Supply
- Universal Mains and +24Vdc power options
- Ethernet Communications
- Internal web server set up
- Compact size and scalable



## DN26 G3 Measurement Specifications

### Bearing Vibration Measurements

**Acceleration:** 0-100.0g,  $\pm 1.0\%$  (1Hz to 3kHz)  
**Velocity:** 0-100mm/s,  $\pm 1.0\%$  (1Hz to 3kHz)  
**Displacement:** 0 – 1000um,  $\pm 1.0\%$  (5Hz to 1kHz)  
**Low Pass Filter:** Programmable, 100Hz to 3kHz,  $>24\text{dB}$  / Octave  
**High Pass Filter:** Programmable, 1Hz to 100Hz,  $>24\text{dB}$  / Octave  
**Transducer:** 2/3 wire, IEPE programmable

### Shaft Position and Vibration Measurements

**Shaft Vibration:** 0 – 1000um pk-pk,  $\pm 1.0\%$   
**Low Pass Filter:** Programmable, 100Hz to 3kHz,  $>24\text{dB}$  / Octave  
**Shaft Position:**  $\pm 1.0\text{mm}$  std plus options  
**Transducer:** Eddy Current / Proximity Probe  
 3.94mV/um and 7.87mV/um  
 3/4 – wire system, -24V @ 40mA

### Speed Measurements

**Frequency Range:** 0.02Hz to 20kHz  
**Accuracy:** better than  $\pm 0.1\%$  of reading  
**Resolution:** better than  $\pm 0.1\%$  of full scale  
**Sensitivity:** 0.1V – 20.0V pk-pk  
**Transducer Options:**  
 Eddy Current / Proximity  
 Active / Passive Magnetic  
 TTL

## DN2601 Dual Channel Vibration Monitor



This low cost high performance signal conditioning unit is ideally suited to providing protection of many types of rotating machinery from breakdown, including turbines, motors, pumps, fans, etc. Its small size and din rail mounting format allow it to be mounted in equipment panels with other equipment or locally to the monitored machine in a junction box. Unit will fit both 35mm and G type DIN rails. The DN2601's alarms can be used to automatically trip plant and it's analogue outputs are suitable to input to DCS or other control/monitoring systems



- Input:** 2 x 2 wire accelerometers, 100mV/g sensitivity as standard. (Option for velocity transducer input available).
- Power:** 24V dc (22 – 28V dc).
- Mode:** Monitoring can be switched between acceleration or velocity.
- Display:** 3 digit LCD display switchable between channels and alarm setpoints. Display is in engineering units. (mm/s or Inch/s)
- Outputs:** 2 x 4-20 mA outputs proportional to vibration level,(1 per channel).
- Signal:** Buffered raw transducer signal available on BNC connector for analysis purposes.
- Alarms:** 2 x individually adjustable level alarms, (2 per channel).  
Alarm time delay option.  
1 x common system integrity alarm.
- Scaling:** Vibration levels are selectable on site, from a standard list, by the positioning of onboard switches.
- Filters:** High and low pass filters are selectable on site, from a standard list, by the positioning of onboard switches.

# DN2601 Dual Channel Vibration Monitor Module Ordering Information

## ORDERING INFORMATION

DN2601    **A**    **B**    **C**    **D**    **E**    **F**    **G**    **H**  
 -  -  -  -  -  -  -  -  -

**A) Input**

**A**

1 Accelerometer, 2 wire, 100mV/g.

2 Velocity transducer, 2 wire – (please provide details).

3 Velocity transducer, 3 or 4 wire – (please provide details).

**B) Output Signal.**

**B**

0 None

1 1x 4-20mA, Current O/P per channel

2 1x 0-1V Voltage O/P per channel

3 1x 0-5V Voltage O/P per channel

**C) Metric or Imperial units displayed**

**C**

1 Metric

2 Imperial

Note: Code items D, E & F can be set on site by selecting internal DIL switches

**D) Measurement range for output**

**D**

A 0-10g acceleration

B 0-25g acceleration

C 0-10 mm/s velocity

D 0-12.5 mm/s velocity, (0-0.5 inch/s)

E 0-15 mm/s velocity

F 0-20 mm/s velocity

G 0-25 mm/s velocity, (0-1 inch/s) (Standard)

H 0-50 mm/s velocity, (0-2 inch/s)

I 0-100 mm/s velocity, (0-4 inch/s)

<b>E) Lo pass filter, high end cut off</b>	<b>E</b>	<input type="text"/> 1 1 kHz (Standard)	<b>F) Hi pass filter, low end cut off</b>	<b>F</b>	<input type="text"/> 1 2.5 Hz (Standard)
	<input type="text"/> 2 2 kHz	<input type="text"/> 2 5 Hz			
	<input type="text"/> 3 10 kHz	<input type="text"/> 3 10 HZ			

<b>G) alarm delay</b>	<b>G</b>	<input type="text"/> 1 1s (Standard)	<b>H) FUW galvanic isolator</b>	<b>H</b>	<input type="text"/> 1 NO (Standard)
	<input type="text"/>	3, 5 or 10 seconds		<input type="text"/> 2 YES (no current diode)	

eg DN2601-21-32-1-EA-21-32-33-11 is **CHA - 2 wire velocity transducer, 1-5V OP, 0-15mm/s, 2kHz LPF, 10Hz HPF; CHB - 2 wire accelerometer, 0-1V OP, 0-10g, 1kHz LPF, 5Hz HPF, metric display. Both channels configured for a 3 second delay and no galvanic isolator. For duplicate channels utilise a single digit/character per parameter.**

DS 1148



**Sensonics Ltd**  
 Northbridge Road  
 Berkhamsted  
 Herts, HP4 1EF  
 United Kingdom  
 Tel: +44 (0)1442 876833  
 Fax: +44 (0)1442 876477  
[www.sensonics.co.uk](http://www.sensonics.co.uk)

# SENSONICS

Looking for the Ultimate  
Machinery Protection System?

...**Sentry G3** ticks all the right boxes



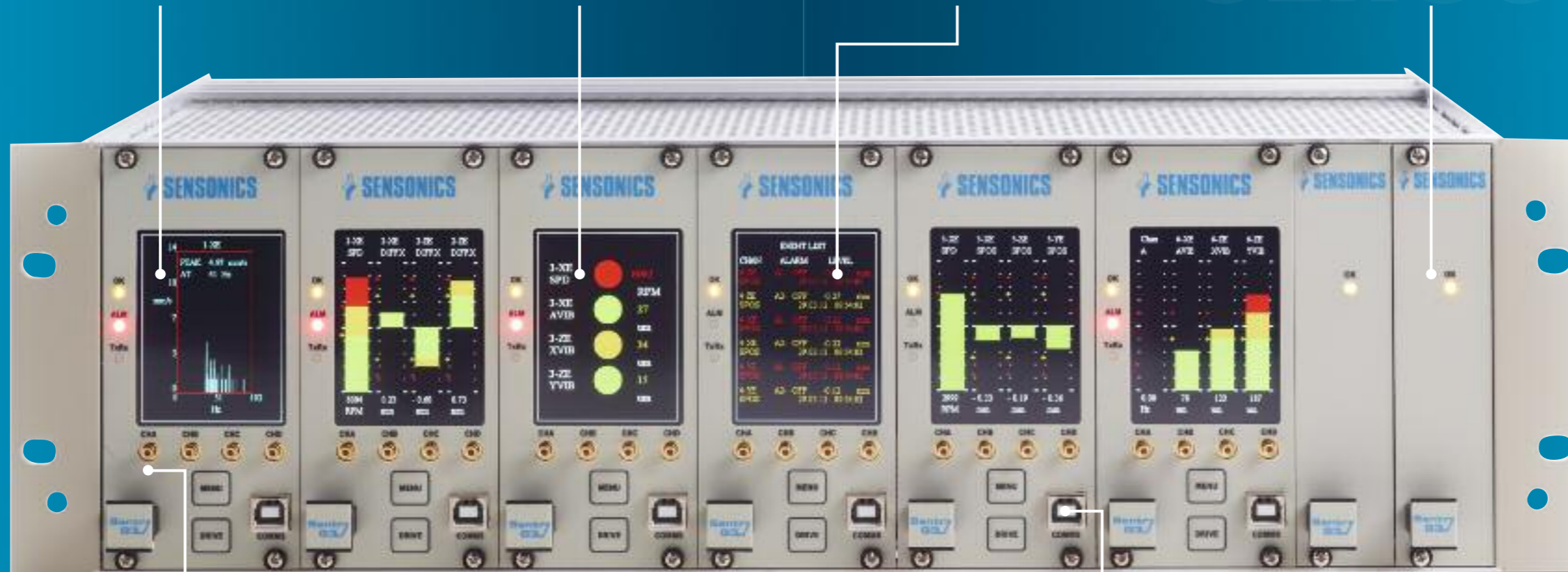


**Frequency Analysis**  
FFT display of vibration waveforms

**LCD Display**  
Intuitive bar graph and lamp alarm display

**Alarm Historian**  
Captures and time stamps all events

**Power Supply**  
Fully Redundant wide ranging solid state design



**Buffered Outputs**  
All dynamic sensor input signals are available at the front panel

**USB Interface**  
Utilised for uploading measurement algorithm code and settings



**G3 4-channel Protection Module**



**Comms Module**



**Voting Module**



**PSU Module**

## Features and Benefits

Sentry G3 is designed so that each plug-in module provides up to four measurement channels. These can be independently programmed to provide continuous monitoring and protection facilities across a broad spectrum of sensor regimes (including vibration, expansion, temperature, speed and position).

### Independent Alarms - High Integrity

Utilising the latest DSP technology, once a channel is configured and running, the resulting alarm relay and analogue output facilities remain independent from the other module functionality. This results in a scalable, high integrity configuration suitable for IEC61508 applications.

### Immediate Viewing - Easy Access

Each module is provided with an intuitive colour LCD display and menu drive facility to provide immediate viewing access to the machine parameters. Several modes of display are available including bar graph, FFT and an alarm historian.

**Power Supply**  
Universal AC input or direct +24 volt DC

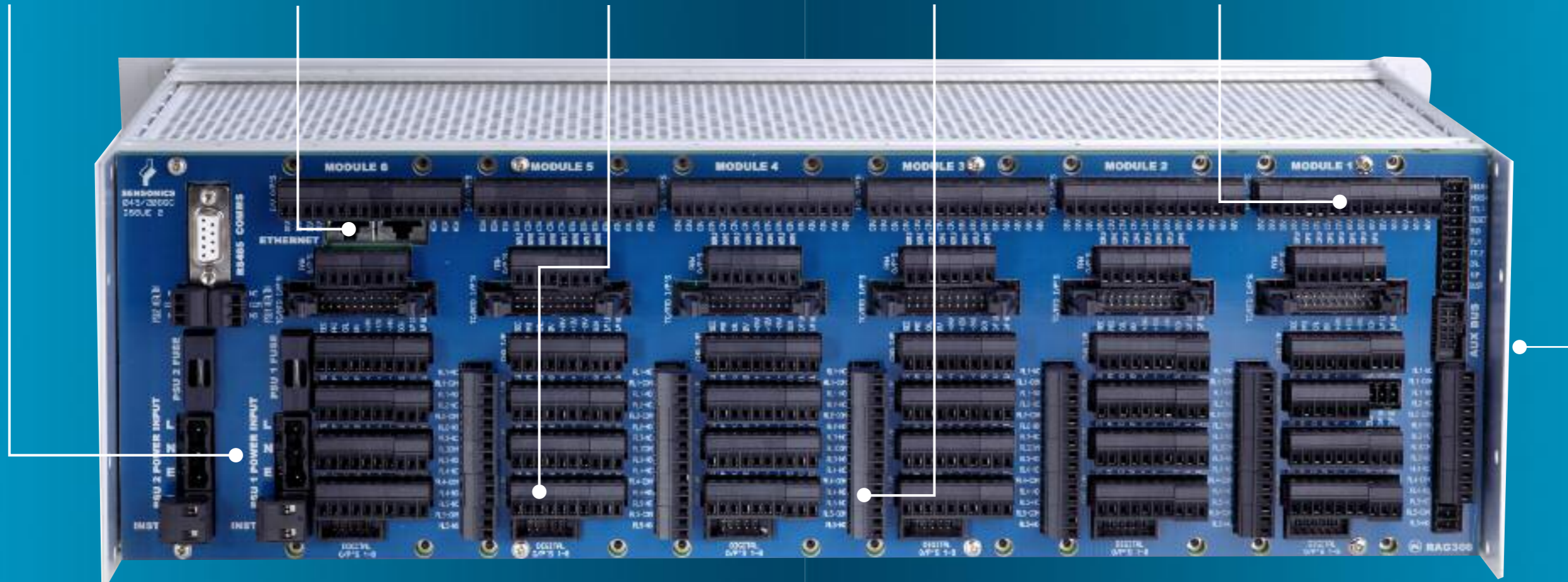
**Comms Interface**  
Modbus RS485 and Ethernet Interfaces for connection to plant systems

**Sensor Inputs**  
Fully configurable interface with +24V, -24V, +12V and IEPE options

**Alarm Relays**  
Up to 3 relays per channel with voting logic

**Analog Outputs**  
Fully configurable 4-20mA and voltage outputs per channel

**19" Racking System**  
Industry Standard 3U rack catering for up to 24 channels and 2 PSU's



**Machine Measurement Modes**

- Absolute and Relative Vibration
- Shaft and Valve Position
- Speed, Phase and Reverse Rotation
- Differential and Casing Expansion
- Temperature and Process

**Turbine Specialist Measurement Modes**

- Shaft Eccentricity
- Differential Ramp Expansion
- Rotor / Stator Air Gap

**Flexible Configuration**

- Universal Module for all Measurements
- Field Upgradeable
- Hot Swappable Modules
- LPF, HPF, Tracking and Notch Filters
- Programmable Warning and Danger Alarms
- Programmable Transducer Supply
- Dual Redundant Power Supply
- Gateway Communication Module
- USB Programmable

**Overspeed Protection System**

- High Integrity 2oo3 Voting
- IEC61508 SIL-3
- Individual Channel Trip Testing
- Signal Injection Capability
- Reaction time <10ms
- Dual Redundant Power Supplies
- Fully Independent Modules



SENSONICS

# Choose the best Protection System for your Critical Rotating Plant



## **Sentry G3** the high-performance sensor conditioning and monitoring system

### Applications

- Steam Turbines
- Industrial Gas Turbines
- Hydro Electric Machines
- Electric Motors and Generators
- Centrifugal Pumps and Compressors
- Axial and Reciprocating Compressors
- Horizontal and Vertical Pumps
- Turboexpanders
- Fans and Blowers
- Centrifuges



Tel: +44 (0) 1442 876833 Fax: +44 (0) 1442 876477  
Email: [sales@sensonics.co.uk](mailto:sales@sensonics.co.uk) [www.sensonics.co.uk](http://www.sensonics.co.uk)  
Northbridge Road, Berkhamsted, Herts, HP4 1EF, UK



MADE IN UNITED KINGDOM  
PROTECTING WORLDWIDE





## Proximity Transducer Systems



**Senturion X** Series from Sensonics...  
**Proximity Probes** for Rotating Machinery

## Senturion X PROXIMITY PROBES

Designed for Reliability, Accuracy and Flexibility


"The Senturion X range of proximity probe systems consist of a calibrated probe, extension cable and driver. Utilising the eddy current principle, this combination forms a tuned circuit with the target material and variations in probe face to target distance are detected in this circuit by the driver, providing a linearised voltage output proportional to target gap. This measurement system provides highly accurate (resolution typically less than one micro-meter) vibration and relative positional measurements, for harsh environments up to 180 °C.

The driver unit offers selectable system lengths of 5 m, 7 m or 9 m, with a front panel green LED for indicating the selected option. A gap voltage monitoring socket is also provided. The cable system incorporates snap lock connectors which require no torquing and provide a shake proof solution important for heavy industrial applications.



The double screened cable offers robustness in combination with high immunity to interference and optional stainless steel convoluted armour is available for applications or environments where cable protection is paramount."

### Key Features

- Switch selectable system cable lengths 5 m, 7 m and 9 m.
- LED indication of selected length.
- 3.5 mm socket for gap voltage monitoring.
- Double screened cable for high noise immunity.
- Snap lock and shake proof cable connection.
- Low profile driver for easy local integration to machine (Din rail mount opt).
- Excellent repeatability on replacement of probe, extension or driver.
- Compliant with standard API 670.
- Hazardous Area Approved. 

## STRAIGHT MOUNT PROBES

- Suitable for shaft vibration and shaft / thrust position measurements
- Robust stainless steel threaded case in various lengths and threads
- Encapsulated tip impervious to oil or water ingress
- Measurement ranges of 2.5 mm, 4.0 mm and 8.0 mm
- Supplied with free running locknut for forward or reverse mounting
- Intrinsically safe options available
- Choice of cable lengths with or without armouring connecting directly to driver unit or to extension cable
- Operating temperature range, -30 °C to +180 °C



## REVERSE MOUNT PROBES

- Suitable for shaft vibration and shaft / thrust position measurements
- Robust stainless steel threaded case with integral locknut
- Measurement ranges of 2.5 mm and 4.0 mm
- Suitable for reverse mounting in to a standard probe holder
- Encapsulated tip impervious to oil or water ingress
- Intrinsically safe options available
- Choice of cable lengths with or without armouring connecting directly to driver unit or to extension cable
- Operating temperature range, -30 °C to +180 °C



## DISC PROBES

- Suitable for a range of rotor expansion and shaft position measurements
- Robust stainless steel body with 2 or 3 mounting holes
- Measurement ranges of 2.5 mm, 4.0 mm, 8.0 mm, 12.0 mm, 18.0 mm, 25.0 mm and 30.0 mm
- Encapsulated tip impervious to oil or water ingress
- Range of adjustable bracketry available for standard and dual probe mounting for steam turbine differential expansion measurement applications
- Choice of cable lengths with or without armouring connecting directly to driver unit or to extension cable
- Operating temperature range, -30 °C to +180 °C



## EXTENSION CABLES

- Available in 'tuned' lengths of 4.0 m, 6.0m and 8.0 m. With or without stainless steel convoluted armouring
- Excellent system repeatability on replacement of extension cable
- Double screened cable with snap lock connectors



Ordering details appear on relevant probe data sheets

## DRIVER UNITS

- Universal driver for 5 m, 7 m and 9 m systems with LED indication
- Low profile for easy local integration, either baseplate or DIN rail mount
- 3.5 mm audio socket for gap voltage monitoring during set up
- -16.0 Vdc to -28.0 Vdc power supply range
- API 670 compliant interface
- Operating temperature range -30 °C to +90 °C



Ordering details appear on relevant probe data sheets

## PROBE HOLDER

- Enables the replacement of probes without re-calibration
- Available in an aluminium or stainless steel enclosure with various machine mounting threads
- Internal adjustment of probe insertion depth
- For use with 8mm diameter reverse mount probes
- Applications include shaft vibration and shaft axial position up to insertion depths of 300mm



Standard features of

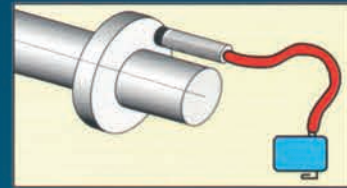
## Senturion X Proximity Probes

- Rugged Industrial Design
- Conforms to API standard 670
- Universal driver for 5 m, 7 m and 9 m systems with LED indication of selected length.
- Integral 3.5 mm audio socket for gap voltage monitoring
- Wide power supply tolerance -16.0 VDC to -28.0 VDC
- Linearity better than  $\pm 1\%$
- Frequency of operation DC – 10 kHz
- Interchangeability error of  $< 5\%$
- Radiation resistant and high pressure options available
- Double screened cable for high noise immunity
- Probes sealed to IP67
- DIN rail mounted driver
- Stainless steel convoluted armour option
- Probe operating temperature range  $-30\text{ }^{\circ}\text{C}$  to  $+180\text{ }^{\circ}\text{C}$
- Driver operating temperature range  $-30\text{ }^{\circ}\text{C}$  to  $+90\text{ }^{\circ}\text{C}$

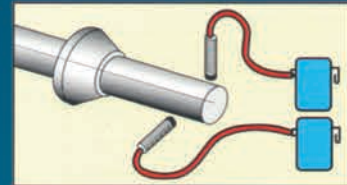
### Applications

- Steam Turbines
- Industrial Gas Turbines
- Hydro Electric Machines
- Electric Motors and Generators
- Centrifugal Pumps and Compressors
- Axial and Reciprocating Compressors
- Horizontal and Vertical Pumps
- Turbo Expanders
- Fans and Blowers
- Centrifuges

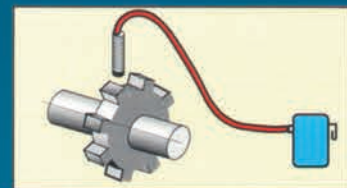
Shaft axial position measurement, thrust wear, differential expansion



Shaft radial vibration, eccentricity, relative vibration, X&Y monitoring



Speed, zero speed



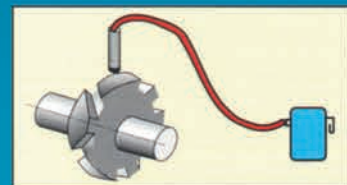
Phase reference angle, reverse rotation



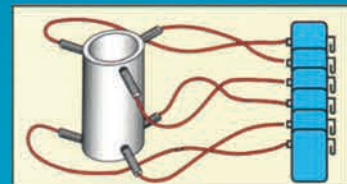
Tapered shaft axial position, (4, 2 & single probe systems)



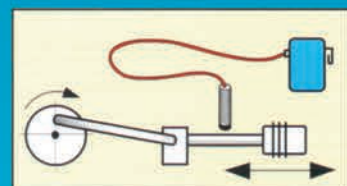
Shaft axial position using triangulation patterns



Alignment



Reciprocating compressor Rod Drop monitoring







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For over 40 years Sensonics has been at the forefront in developing smart conditioning monitoring systems which help industry to monitor and protect critical rotating plant.

The Senturion **X** proximity probe system has evolved from our established Senturion range, now offering a universal driver concept in addition to various other features and enhancements.

## Other products in the Sensonics range

- Accelerometers, Velocity Sensors, LVDT's, RVDT's and Seismometers.
- DN80 series of proximity probe systems offering relative shaft vibration, shaft axial position and rotational speed measurements with direct processed 4-20mA outputs.
- Sentry G3 and DN26 G3 machinery protection systems offering a universal platform for all vibration, position, temperature and speed monitoring requirements.



Tel: +44 (0)1442 876833 Fax: +44 (0)1442 876477  
 Email: [sales@sensonics.co.uk](mailto:sales@sensonics.co.uk) [www.sensonics.co.uk](http://www.sensonics.co.uk)  
 Northbridge Road, Berkhamsted, Herts, HP4 1EF, UK

Designed & produced by: [www.harveycomms.co.uk](http://www.harveycomms.co.uk)



**MADE IN UNITED KINGDOM  
 PROTECTING WORLDWIDE**



# Linear Position Sensors

## LVDT's

Sensonics offer a range of both AC and DC type LVDT transducer systems for precise position monitoring. Suitable for a wide range of applications, such as valve position, machine case expansion and structural deformation our designs are industry recognised for their robustness and long term reliability.

- Measurement range from 2.5mm to 600mm
- Stainless steel construction with sprung loaded, guided or free core arrangements
- HC036End or Side exit connector or cable with optional conduit
- Mechanical connections through roller, ball or rod end bearings
- Operating temperature range from -40 °C to +220 °C
- Submersible and specials suitable for high pressure environments



# SA Seismic Switches

## Monitoring and protection systems

Sensonics SA range of seismic safety switches provide seismic protection for all critical assets such as oil & gas, nuclear and hydro-electric installations or wherever effective seismic protection is required. These switches provide triaxial vibration detection and are ideal for protecting vulnerable structures from ground borne vibration events and incorporate a range of shutdown options, depending on the application.

### High integrity seismic protection

- Seismic switches
- Digital seismometers
- Recording and replay systems
- Alarm voting systems
- On line test facilities through unique seismic sensor design
- IEC61508 and IEEE344 approved systems

