Monitoring & measurement

SNR INDUSTRY

Monitoring & measurement

With SNR, place your bearings under close control

Follow the cycle of life of each bearing

However perfect its geometry, and however effective the steel from which it is made, each bearing has a service life limit. Optimisation of service life requires identification of bearings state indicators and regular monitoring of any indicator changes during operation. This allows identification of damage and scheduling of corrective maintenance operations at the optimum time.

Analyse of the external causes

SNR has developed an entire range of measuring and monitoring devices to precisely analyse the environmental constraints affecting the proper operation of your installations and notably your bearings.

We also propose a range of products and services designed for vibration monitoring of rotating machines provided by our partner, 01 dB Acoustics & Vibration, a recognised expert in this area, to identify all your equipment trouble spots and remedy these one by one.

Measurements may be taken continuously for implementation of an on-condition maintenance programme, or occasionally, to perform expert analysis.

Continuous monitoring devices (On-line)

For most machines, vibration measurements are used firstly to fulfil a safety function, the objective being to shut down the machine to ensure the safety of property and people as soon as it features operating conditions impugning its integrity.
Furthermore, the aim of the maintenance function is to predict shutdowns and maintenance operations and to establish the origin of defects in order to correct these or prevent their occurrence.
Data acquisition is performed using portable devices (off-line) or using automatic on-line measurement systems, installed permanently on equipment, coupled to predictive maintenance software.

Continuous vibration analysis (On-line)*

• VIBALERT

• Mechanical "Switch" providing a simple and economic solution to protect your machines.

• TRANSMITTER, 4-20 mA

Range of vibration transmitters, 4-20mA, enabling monitoring of machines from a programmable PLC.
• Solutions suited to roller bearings and fluid bearings.
• ATEX certified versions available for the explosive zone.

• MOVI2

Single channel (VIXAL, ISO 2954) or 2 channels (ROXOR, bearing defect factor) monitoring modules).
• Protection: IP55.
• Adjustment on site: thresholds, measurement scale.
• Danger, alarm relay.
• 4-20mA and 0-10V output.

* Works realized by our partner 01dB Acoustics & Vibration

Monitoring & measurement

Continuous monitoring devices (On-line)

• MoviDin

Range of 2-channel monitoring modules to ensure protection of rotating machines.

- Compatible accelerometers, proximity probes and temperature probes.
- Displays levels.
- Assembly on a DIN rail.
- Adjustment on site: thresholds, measurement scale, frequency range.
- Integrity, danger & alarm relays.
- 4-20 mA outputs.

• MOVISYS

Multi-channel real time and/or sequential monitoring system, based on proximity probes, accelerometers, temperature probes, etc.

- 19" format industrial rack, 6U, modular (52 sensors in real time monitoring / several hundred sensors in sequential monitoring).
- Complies with the main specifications of the standards API 670 and 678, ISO 2954 and 7919.
- Automatic On-line diagnosis with Divadiag.

• MOVISCAN

Remote diagnosis and machine protection system combining 3 functions:

- Close sequential monitoring, automatic storage of measurements, diagnosis performed on site/ remotely,
- SCANBOX multiplexing units minimising wiring and installation costs,
- Synchronous analysis and acquisition on condition authorising monitoring of complex machines or machines with variable operating modes. Modem link and serial line to allow communication with process and maintenance.
  Connection of several MOVISCAN to a diagnostic station (Divadiag) installed on site or remotely.

Sensors

A large range of industrial sensors suited to the most severe environments (oil splashing, high temperature, explosive atmosphere):

- the ASH accelerometer series with integrated electronics,
- high temperature velocimeters,
- proximity sensors for journal bearing measurements.

Periodic monitoring devices (Off Line)

Through the technical proficiency and skills of our partner, 01dB Acoustics & Vibration, we are able to meet your equipment needs and also remedy any problems you may encounter with monitoring, implementation and evolution of your conditional maintenance policy.
We offer you a whole array of devices to perform periodic monitoring of your machines. Through these analyses, performed occasionally to carry out expert analysis, you could identify a large number of phenomena that cause machine malfunctions and thus remedy said.

• MULTIVIB

- Control of bearings and vibrations for vibration measurements (ISO compliant),
- Control of machine temperature and rotation speed,
- Measurement of bearing state (defect factor method®).

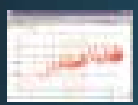
• MOVIPACK

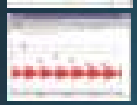
Multifunction device, ultra compact, manageable, light and ergonomic, 2 channels + trigger input; it allows the vibration control and analysis in an industrial environment.

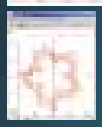
- FFT analyser, data collector, balancer, signal recorder, order analyser,
- Laser sighted pyrometer (°C) and tachometer (RPM),
- Complete set of tools to detect and analyse defects of rolling bearing machines (Defect factor, Kurtosis, Envelope) and journal bearing machines (orbit, cascade, Bode, etc.),
- Automatic identification of contact free measurement point,
- Communication by USB, RS232 and Internet (e-Route module),
- Intrinsically safe version: ATEX certified EEX ia IIC T4.

Software

Numerous software packages are available to meet your occasional or continuous monitoring needs. In a few clicks, you can enter all the data from your measurements, analyse stationary or transient signals, troubleshoot your installation failures and thus implement suitable solutions.







• Off-line / On-line conditional maintenance

e-Diag offers solutions for periodic or continuous monitoring, conditional maintenance and diagnosis of rotating machines: management of Vibration/Oil/Process/Thermography data, automatic identification of monitoring parameters defined through post electronic processing of data, advanced graphic analysis tools, single station, network or Web version.

• Expertise tools

vib-Graph is a software package designed to measure vibrations of rotating machines equipped with powerful tools to analyse all types of stationary or transient signals.

Laser-targeting thermometer

To optimize the service life of your bearings and reduce your maintenance costs, it is essential to periodically record the operating condition of your machines and bearings.
SNR proposes an efficient measuring instrument: LASERTEMP.
This laser-targeting thermometer is a high-quality pocket instrument. Very simple to use, it allows you to measure the temperature of rolling element bearings, plain bearings and other components.

Applications

- Rolling element bearings, plain bearings and lubrication system for functional monitoring.
- Bearings and other heated parts in mechanical assemblies.
- Surface temperature of gearboxes, gear cases, bearings of small and large engines.
- Industrial equipment: paper rolls, metal strip during rolling or in motion, tires in rotation, etc.
- Live components (electrical or electronic items) or any untouchable items (sterile parts, freshly painted areas, etc.).

Technical characteristics

- Precise, non-contact infrared measurement (laser aiming of the measurement area): straight forward temperature data acquisition even for dynamic processes: no influence on the object to be measured. (Caution: the red dot does not indicate the measured surface).
- Wrench-to-target ratio of 3/1. (Recommendation: hold LASERTEMP 3 to 10 ft. from the object to be measured. The further away the surface to be measured, the larger the target area surface measured.)
- Emissivity adjustment 0.20 to 1.00.
- °C/ °F switching.
- Measured temperature "HOLD" function. Adjustable audio alarm when a given threshold is exceeded.
- Storage case, low battery signal.

Temperature range	-50°C to +400°C/ - 60°F to + 750°F
Resolution	0.5°C (-50°C to +400°C) / 1°F (- 60°F to +750°F)
Precision (*) +/- 1 Digit	+/- 2 % mean value (+100.1°C to 400°C / + 212.1 to + 750°F) +/-2°C (-50°C to 100°C) / +/- 4°F (- 6 °F to + 212°F)
Ambient °C /°F (**)	0°C to +50°C / 32°F to +120°F
Storage °C / °F (***)	-40°C to +70°C / - 40°F to +160°F
Power supply	2 AAA batteries (LR03, 1.5 Volt micro-battery)
Battery service life	20 hours
Dimensions	184 x 43.4 x 19mm
Weight	80g / 2.8 ounces

(*) : Precision of +/-2°C (4°F): over a measuring range of –50 to 100°C (– 60 to +210°F), if a measurement is made at 60°C (140°F), your device may display a value between 58 and 62°C (136 and 144°F).
Digit : The electronic circuitry of digital display measuring instruments features an uncertainty of 1 digit (the digit corresponds to the last displayed figure on screen). Therefore, reusing the previous example, the thermometer can display a value between 57.9 and 62.1°C (135.9 and 144.1°F).
(**) : The ambient temperature corresponds to the device's operating temperature.
(***) : The storage temperature corresponds to the temperature that the device can sustain when switched off, without undergoing any technical damage.

Laser-targeting thermometer

Measured material emissivity

In order to obtain a precise measurement and avoid any evaluation error, it is mandatory to check the emissivity of the LASERTEMP instrument adjustment based on the table below (capacity of a material to emit infrared radiation; factor between 0 and 1).

METALS		
Material	Type/ Structure / Element	Emissivity
Aluminium	Not oxidized	0.02 < x > 0.06
	Oxydized	0.11 < x > 0.19
	Severely oxydized	0.20 < x > 0.31
	Fine polished	0.09
	Not polished	0.18
Chromium	Chromium	0.08 < x > 0.26
	Polished chromium	0.06
Iron	Oxydized	0.74 < x > 0.84
	Not oxidized	0.05
	Thin rust layer	0.70
	Rust	0.65
Cast iron	Oxidized	0.64 < x > 0.78
	Not oxidized	0.21
	Severely oxidized	0.95
Copper	Copper oxide	0.77< x > 0.87
	Black oxidized	0.78
	Corroded	0.09
	Polished	0.03
	Rolled	0.64
	Rought	0.74
	Molten	0.15
Alloy	Ni 20, Cr 24, FE 55, oxidized	0.90
	Ni-60, Cr-12, Fe-28, oxidized	0.89
	Ni-80, Cr-20, oxidized	0.87
Magnesium	Magnesium	0.07 < x > 0.13
Brass	73 % Cu, 27 % Zn, polished	0.03
	62 % Cu, 37 % Zn, polished	0.03
	Matted	0.07
	Burnished	0.40
	Oxidized	0.61
	Not oxidized	0.04
Nickel	Polished	0.05
	Oxidized	0.31 < x > 0.46
	Not oxidized	0.05 < x > 0.12
	Galvanized	0.04
Forged iron	Dull	0.94
	Smooth	0.35
	Polished	0.28
Steel	Cold rolled	0.75 < x > 0.85
	Polished table	0.00 < x > 0.14
	Soft steel, unalloyed, polished	0.10 < x > 0.12
	Not oxidized	0.08
	Oxidized	0.80
Stainless steel	Type 301, polished	0.27
	Type 316, polished	0.28
	Type 321, polished	0.18 < x > 0.49
Zinc	Usual commercial purity (99.1 %)	0.05
	Galvanized	0.28
	Polished	0.02 < x > 0.11

NON METALLIC		
Aluminum paint	Aluminum paint	0.27 < x > 0.67
	10 % Al	0.52
	26 % Al	0.30
Paint	Blue, Cu 203	0.94
	Black, Cu 0	0.96
	Green, Cu 203	0.92
	Red, Fe 203	0.91
	White, Al 203	0.94
Rubber	Hard	0.94
	Soft, gray	0.86
Oil paint	All colors	0.92 < x > 0.96
	Black, glossy	0.90
	Camouflage	0.85
	White	0.94

NOTE – The LASERTEMP emissivity adjustment ranges from 0.20 to 1.00. For objects featuring an emissivity degree of less than 0.20, use an adhesive tape of fixed emissivity (0.93) or compare with contact measurement. Do not carry out measurement on glossy or reflective surfaces.

Monitoring & measurement

Calibrated feeler gauges

In a moving mechanical system, it is necessary to maintain a functional clearance permitting free rotation, as well as compensation for thermal expansion differences between shaft and housing.
The SNR feeler gauges allow you to better evaluate bearing fit.

Applications

• Internal radial clearance measurement in spherical and cylindrical roller bearings.

Technical characteristics

- Set of 18 gauges, round tip,
- Two gauge lengths available:
  - 90mm length x 10mm width,
  - 150mm length x 10mm width.
- Hardened steel gauges,
- Calibrated to 1/100th, they ensure high precision measurement,
- Each set of gauges is protected by a steel frame and a plastic case.

Blade length (mm)	Blade thickness (mm)		
90	0.04	0.10	0.50
	0.05	0.15	0.60
	0.06	0.20	0.70
	0.07	0.25	0.80
	0.08	0.30	0.90
	0.09	0.40	1.00
150	0.04	0.10	0.50
	0.05	0.15	0.60
	0.06	0.20	0.70
	0.07	0.25	0.80
	0.08	0.30	0.90
	0.09	0.40	1.00

Also available in inch.

Calibrated feeler gauges

Verification of clearance reduction

• Spherical roller bearings with tapered bore

Bearing bore (mm)		After fitting					
		C0 (J0)		C3 (J30)		C4 (J40)	
		Gauge to use (mm)		Gauge to use (mm)		Gauge to use (mm)	
>	≤	yes	no	yes	no	yes	no
30	40	0,02	0,03	0,03	0,04	0,04	0,05
40	50	0,02	0,03	0,03	0,05	0,05	0,07
50	65	0,03	0,05	0,04	0,06	0,06	0,08
65	80	0,03	0,05	0,04	0,06	0,07	0,09
80	100	0,04	0,06	0,05	0,07	0,08	0,11
100	120	0,05	0,07	0,07	0,09	0,10	0,13
120	140	0,06	0,09	0,08	0,11	0,11	0,14
140	160	0,06	0,10	0,09	0,13	0,13	0,17
160	180	0,06	0,10	0,10	0,15	0,15	0,20
180	200	0,07	0,12	0,10	0,15	0,16	0,22
200	225	0,08	0,13	0,12	0,17	0,18	0,24
225	250	0,09	0,14	0,13	0,19	0,20	0,27
250	280	0,10	0,16	0,14	0,21	0,22	0,29
280	315	0,11	0,17	0,15	0,22	0,24	0,32
315	355	0,12	0,19	0,17	0,25	0,26	0,34
355	400	0,13	0,20	0,19	0,27	0,29	0,37
400	450	0,13	0,20	0,20	0,28	0,31	0,40
450	500	0,16	0,24	0,23	0,31	0,35	0,44
500	600	0,17	0,26	0,25	0,34	0,36	0,46

Europe

FRANCE

SNR Paris
40, rue Jean Bleuzen
B.P. 49
92174 Vanves Cedex
Tél. 01 40 93 66 00
Fax. 01 40 93 66 10

SNR Lyon Europe*
Le Florentin - 71, chemin du Moulin Carron - B.P. 8
69570 Dardilly
Tél. 04 78 66 68 00
Fax. 04 78 66 68 20

DEUTSCHLAND

SNR WÄLZLAGER GMBH
www.snr.de

40472 Düsseldorf
Wahlerstraße 6
40437 Düsseldorf
Postfach 33 04 10
Tel. (0211) 6 58 06-0
Fax. (0211) 6 58 88 86

33719 Bielefeld
Friedrich-Hagemann-Str.66
33701 Bielefeld
Postfach 17 01 45
Tel. (0521) 9 24 00-0
Fax. (0521) 9 24 00 90

70597 Stuttgart
Tränkestraße 7
70574 Stuttgart
Postfach 70 04 16
Tel. (0711) 9 00 64-0
Fax. (0711) 9 00 64 99

UNITED KINGDOM

SNR UK
Cheltenham
P.O. Box 828
Cheltenham
GL 52 3WE
Tel. (44) 1242 574 679
Fax. (44) 1242 525 753

ITALIA

SNR Italia
Milano
Via Keplero, 5
20019 Settimo
Milanese (MI)
Tel. (02) 33 55 21
Fax (02) 33 50 06 56

ESPAÑA - PORTUGAL

SNR Rodamientos Ibérica S.A.
Madrid
C/ Llanos de Jerez, 22
Polígono Industrial
28820 Coslada
Tél. 91 671 89 13
Fax. 91 673 65 48

*EUROPE
Subsidiaries excepted
Fax. 04 78 66 68 21

Amériques / Americas

USA

SNR Bearings USA
Atlanta
4600 K Highlands Pkwy
Smyrna, G.A. 30082
www.snrbearings.com
Tel. (770) 435-2818
(800) 232-1717
Fax. (800) 742-5215

AMERICA LATINA

SNR Argentina
Buenos-Aires
Viamonte 1145 - Piso 11
1053 Buenos-Aires
Tel. (54) 11-4 372-1272
Fax. (54) 11-4 372-0088

SNR Intermondial (Overseas)

Annecy
1, rue des Usines
74000 Annecy
France
Tél. (33) 4 50 65 93 60
Fax. (33) 4 50 65 93 75
Fax. (33) 4 50 65 93 76

MAROC

SNR Maroc
Casablanca
73, bd Moulay Slimane
Ain Sebaâ Casablanca
B.P 15873 Casa-Principal
e-mail : info@snr.ma
Tél. (212) 22 66 76 80
Fax. (212) 22 66 51 66

SNR
INDUSTRY

Siège social : Rue des Usines - 74000 Annecy - FRANCE
RCS Annecy B 325821072 - Code NAF 291H
www.snr.fr