

INDUSTRIAL NOISE EAR - MILL MONITORING



NV100



NVMS Industrial Noise Monitors

NVMS (Noise & Vibration Measurements Systems Ltd) is an Australian company, formed in 1987, that provides high technology systems and services in noise, vibration and related fields.

Does Everything Sound OK?

NVMS Mill Monitors have found their place not only monitoring Ball and SAG mills, but also crushers and indeed any piece of plant machinery which exhibits characteristic noise during operation. Examples of this include the condition of the mill's contents and the characteristic tones produced as the steel balls hit the mill lining, or the noise produced by an ore crusher when unwanted objects are introduced.

The NVMS Industrial Noise Monitor (NV100)

NVMS industrial noise monitors are essentially electronic versions of the human ear, but without the inconsistency between operators.

Housing

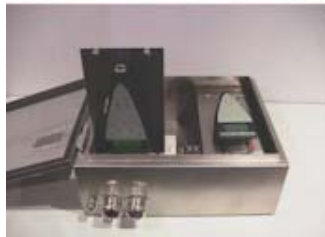
The electronics are housed in a sealed IP66 rated stainless steel enclosure and the microphone is protected by an outdoor weather proof assembly.

Power

Power is drawn from a standard 110/240V supply and the measured sound level in decibels is converted to a 4-20mA signal which can be readily accessed by DCS systems.

Sound Level Meter

At the heart of the system is a Brüel & Kjær Sound Level Meter. These world class instruments provide unparalleled performance and long term stability and reliability.



Enhanced Features

A basic version of the Sound Level Meter will provide a simple overall noise level whereas enhanced versions offer such features as octave and 1/3rd octave band filtering as well as data logging and frequency analysis.

In many instances, octave band or 1/3rd octave band filters are indispensable for plant monitoring, being able to narrow down the instrument's 'hearing' sensitivity to a particular range of frequencies. This can allow characteristic tones to be monitored which are otherwise obscured by the general background noise surrounding the equipment, you can even listen to this filtered signal with headphones.

Customised Systems

The entire solution is developed and manufactured by NVMS, which means that customised solutions based upon noise monitoring are readily available. This can include options such as a compact industrial computer to monitor, log, analyse and act upon results (eg alarm triggering, activating tape or solid state recorders, etc). The flexibility of the system is limited only by your imagination.



Multi-SLM Systems

Operators may wish to place microphones at strategic positions around the monitored equipment. Three versions of the basic NV100 are available; Models A, B and C. These correspond to enclosures containing 1, 2 or 3 SLMs. This flexibility allows several microphones to be placed as required with cables routed back to a single strategically located enclosure.

Up to 500 meters of microphone extension cable can be used to position the microphones at nominated locations.

Hostile Environments

As the microphones are typically located in hostile environments, with mud, spray and other potential contaminants, NVMS have developed the **NV100MT Hostile Microphone Housing**.



Figure 1 : NV100 MT Housing

This device protects the delicate microphone and pre-amplifier from damage and corrosion whilst providing an acoustic window (Upilex) which can be readily replaced.

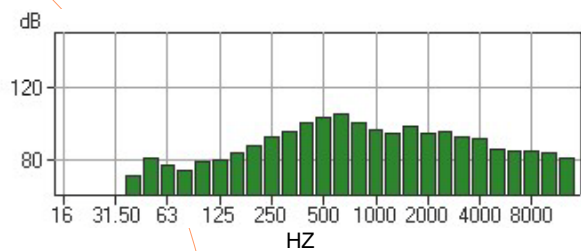
In order to determine the acoustic effect of the NV100MT a series of tests were conducted. From these results a set of correction curves were established (see below).

The protective housing affects absolute levels to varying degrees across the audible spectrum. If absolute levels are required they can be readily calculated from the correction curves. In most instances, however, this is not required since the relative sound level is of more importance than the absolute level.

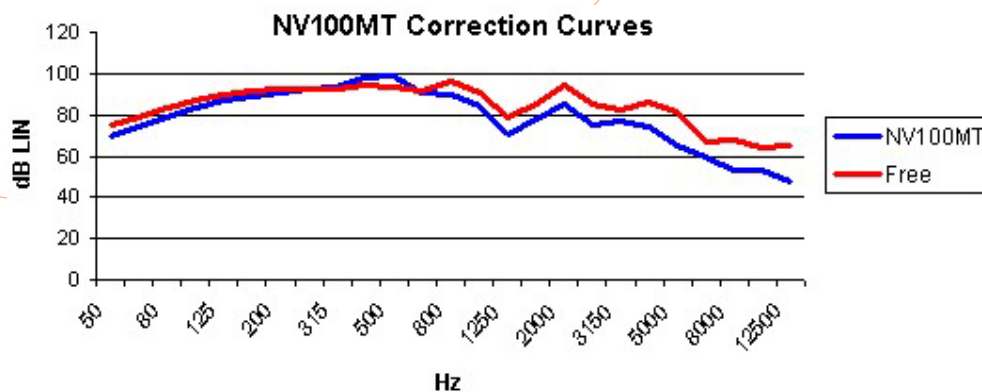
Specialist Installation

NVMS can provide these solutions either directly or through third parties who specialise in instrumentation installation and commissioning. Please contact us for further information.

NV100F Industrial Noise Ear - Full Noise Spectrum



The basic NV100 system can monitor overall noise levels or the noise level from a single octave or 1/3rd octave band, in which case the system output is converted to a 4-20mA constant current signal. The NV100F provides full frequency spectral monitoring. In this case, the system output is an ASCII string sent via RS-232 (which can be converted to virtually any telemetry protocol, eg TCP/IP). This 'text string' would typically comprise a comma separated list of noise data representing the SPL in each frequency band. This data can be trended and charted as required.





Typical Use in Mill Monitoring

Ball and SAG mills operating with variable feed rates can use the sound produced by ball / mill wall and ball / grind impact to regulate mill operation. This is achieved by determining an optimal load condition wherein the toe of the charge is receiving most of the falling material; feed rate is then regulated about this fixed sound level ensuring that tonnage is maintained in at an optimal rate.

NVMS would be happy to provide an onsite assesment at your convenience to perform comprehensive acoustic analysis of your mill or mills whilst they cycle through a range of feed conditions. From these tests a comprehensive set of measurement results are provided and compared with your logged DCS process data. From these results we can determine how appropriate the NV100 would be as a complement to your existing mill management strategies.



NVMS (Noise & Vibration Measurement Systems) is an Australian based engineering company and service provider, formed in 1987.

Working with major clients across the Asia Pacific region and beyond, NVMS provide a broad range of high technology services including:

- Sales and support of acoustic and vibration measurement equipment: portable or hand-held units, single-point or plant-wide installations, online or offline systems.
- Sales and support of condition and performance monitoring hardware and software.
- Customised hardware and software solutions.
- Site installation, commissioning and operating support for monitoring systems.
- NATA accredited calibration of sound measuring equipment.
- Occupational and environmental noise training courses tailored for individual requirements.
- Specialised training in machinery condition and performance monitoring including diagnostics

NVMS have developed a world class reputation by providing excellent customer support as well as delivering cutting edge technological solutions.

NVMS are Australian representatives for many of the world's finest instrumentation manufacturers including Brüel & Kjær, HBM and LDS. Along with their sister company SVT Engineering Consultants their workforce in WA exceeds 100 in 2009.

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