

EM-83 SCANNING VIBRATION METER



FEATURES

- True RMS measurement
- reading in mm/s or m/s²
- frequency tunable band-pass filter
- low power consumption
- two sensor options
- auto power off
- good low frequency features
- easy to use
- compact size

APPLICATIONS

- total level vibration measuring
- vibration frequency measuring
- vibration analysis

EM-83 vibration scanner unit can be used for measuring total vibration level or it can be used for detecting discrete frequency components like with analyser. The total vibration level measurement is done using a true rms detection ("rms value"). The frequency component search is enabled with digitally controlled narrow bandwidth band-pass filter. The dominant frequency components can be searched with the auto-stop feature which stops the scanning when the scanned level exceeds the trig value. The bar display helps the search by showing the currently measured (scanned) vibration level in ratio to the total level. Over-range indication warns of exceeding the measurement range of the sensor or the unit.

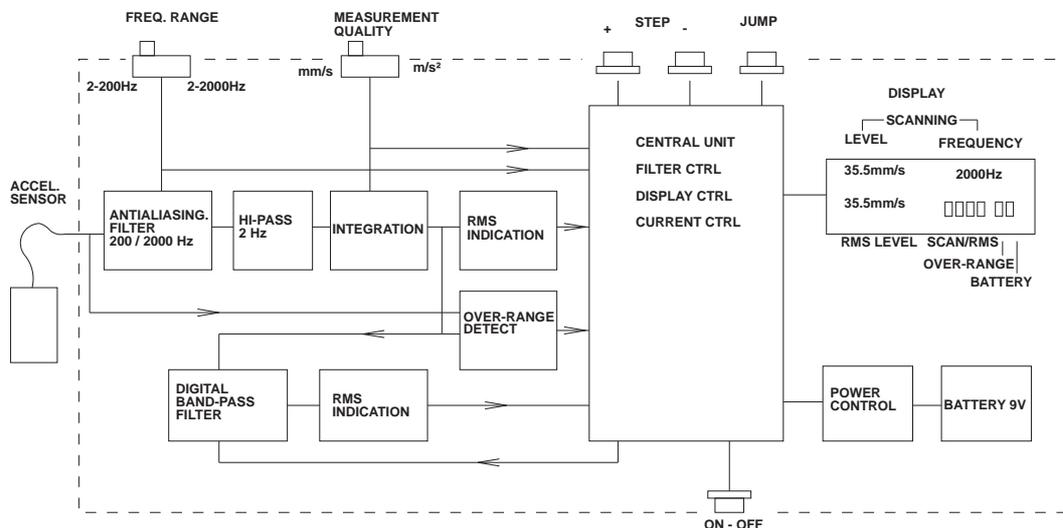
EM-83 is equipped with good low frequency features which are partially due to mem-type silicon based sensors.

The unit uses sensor types EM-82-05 and EM-82-50. Measuring ranges are $\pm 5g$ and $\pm 50g$. These sensors provide a good stability in relation to time and temperature. Sensors have also a good shock resistance.

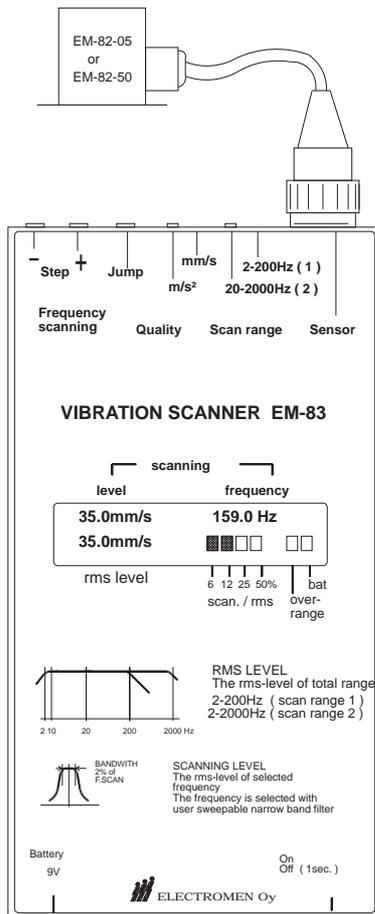
EM-83 is fairly easy to use, all readings are displayed simultaneously on the clear easy-to-read display. The unit recognizes the sensor used and autoscales the display accordingly.

With a single 9V battery the unit can be used up to 10 hours. Automatic power-off cuts the power after 15 minutes of idle time.

The device is housed to a durable aluminium chassis and the display is shielded with a double layers of glass.



EM-83 FEATURES AND USAGE



USE

Sensor EM-82-05 has the sensitivity of 400mV/g, maximum range is $\pm 5g$. If OVER-RANGE indication is lit, change the measuring to acceleration (m/s^2). If OVER-RANGE is still lit change the sensor type to $\pm 50G$ (EM-82-50). The unit will automatically recognize the sensor and autoscale the measurement and display. Sensor can be fixed to the measured body with screws or with magnet.

Switch on the unit with ON-OFF switch, check that BAT indication is not lit. Select the measuring quality to velocity (mm/s) or acceleration (m/s^2) and the frequency range to 2-200Hz(1) or 20-2000Hz(2).

RMS-LEVEL display indicates the total vibration level of the selected frequency range. Vibrations on certain frequencies can be searched by using the band-pass filter that lets only the selected frequency through. This frequency is shown in SCANNING FREQUENCY display and the vibration at that frequency is shown in SCANNING LEVEL display.

Scanning can be started from the beginning of the selected range (2Hz or 20Hz) or the start point can be set with the JUMP switch as desired. Pressing STEP+ switch continuously increases the frequency and AUTO-STOP function stops the scanning when vibration peak exceeds 20% of the total level.

SWITCHES

STEP (-) decreases frequency with one step. Continuously pressed the frequency decreases slowly.

STEP (+) increases frequency with one step. Continuously pressed the frequency increases slowly.

JUMP is for faster moving inside the frequency range.

QUALITY is for measurement quality select: acceleration m/s^2 or velocity mm/s

SCAN RANGE is for selecting the scan frequency range to 2-200Hz or 20-2000Hz. This affects also to the total vibration measuring range (rms-level). The total vibration level range is changed respectively to 2-200Hz or 2-2000Hz.

ON-OFF switches the unit on when momentary pressed, pressed long it shuts down the unit. EM-83 also shuts down automatically after 15min if STEP or JUMP switches are not used.

DISPLAY

The upper line shows scanned vibration level (LEVEL) and the current scanning frequency (FREQUENCY). The lower lines show the total vibration level (RMS-LEVEL) and the 4 block bar display indicates the scanned level in proportion to the total vibration level. This display helps discovering the dominant vibration peaks.

OVER-RANGE in the lower line indicates that the measurement range is exceeded. If over range occurs change the measurement quality to acceleration (m/s^2) or change the sensor to a less sensitive type.

BAT indicates that the battery is running out.

AUTO-STOP function won't stop scanning precisely in the peak of vibration so when the scanning stops the peak must be manually searched using the STEP switches and following SCANNING LEVEL display. After the peak is found continue the scanning using STEP (+) switch towards next peak.

AUTO-STOP function isn't completely full proof, as in cases where two dominant vibration peaks occur close to each other. One of the peaks can be left unnoticed if the vibration level is lower than 20% of total vibration level. For this particular reason it's important to follow the SCAN/RMS bar display which indicates the scanned frequency vibration level in proportion to the total vibration level. Also have a look at the SCANNING LEVEL display for changes in level.

The both readings, RMS LEVEL and SCANNING LEVEL indicate the effective value of vibration (RMS). The noise in scanning level is always smaller than in rms level, because the rms level includes the summed noise from the total range (2-200Hz or 2-2000Hz) as scanning level includes only the noise of a very narrow band, the noise on the currently scanned frequency.

When the scanned signal has two frequency components close to each other (frequency difference $< 5\%$) the lower peak can be amplified in measurement due to the unideality of scan filter (technical data, figure 5).

EM-83 TECHNICAL DATA

EM-83

supply	9V battery
operating time	typ. 10 hours
sensor supply	approx. 9V
auto power off	after 15 min
sensor types	EM-82-05 ($\pm 5g$), (35m/s ² RMS) EM-82-50 ($\pm 50g$), (350m/s ² RMS)
measuring qualities	acceleration (m/s ²), velocity (mm/s)
measuring ranges	0.01...35m/s ² (RMS) (5g sensor) 0.1...350m/s ² (RMS) (50g sensor) 0.01...40mm/s (RMS) (5g sensor) 0.1...350mm/s (RMS) (50g sensor)
total level range	range 1. 2...200Hz range 2. 2...2000Hz
signal in scaling	scaled for sensors EM-82-xx
aux in scaling	100mV rms gives 10m/s ² reading
precision EM-83	typ. $\pm 2\%$ (159Hz)
frequency range	see figure 1 & 2 (EM-83 + sensor)
frequency step	2-5Hz step 0.02Hz 5-10Hz step 0.05Hz 10-20Hz step 0.1Hz 20-50Hz, step 0.2Hz 50-100Hz, step 0.5Hz 100-200Hz, step 1Hz 200-500Hz, step 2Hz 500-1000Hz, step 5Hz 1000-2000Hz, step 10Hz
weight	450grams + sensor 60grams
dimensions	170x110x35mm
operating temperature	0...50°C

EM-82-50, EM-82-05

supply	7...32Vdc
current consumption	5mA
operating temperature	-20...85°C
scaling EM-82-05	400mV/g
EM-82-50	40mV/g
precision	typ. $\pm 3\%$ (159Hz)
frequency range	see figure 1 & 2
measuring range	
EM-82-05	$\pm 49m/s^2$ (amplitude)
EM-82-50	$\pm 490m/s^2$ (amplitude)
noise level	
EM-82-05	0.2m/s ² (RMS)
EM-82-50	1.5m/s ² (RMS)
thermal drift	<0.05% /°C
cable	3m
dimensions	25x25x35mm
housing	IP67
weight	approx. 60grams

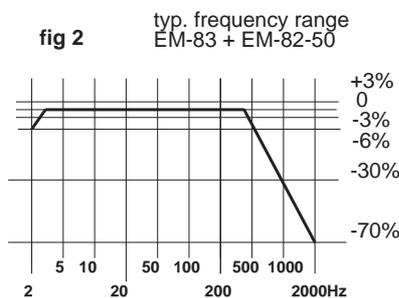
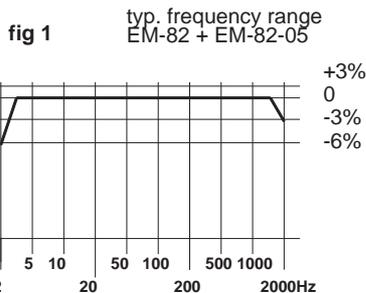
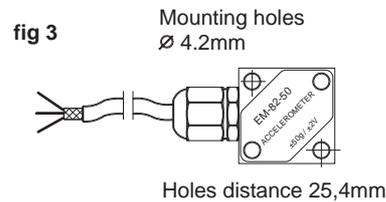
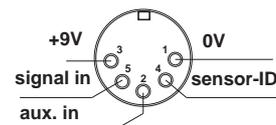


fig 4

SENSOR CONNECTOR EM-83
DIN-5 180° BAJONET LOCKING



EM-82-05 is connected to +9V, signal and 0V
EM-82-50 is connected to +9V, signal and 0V, and furthermore sensor-ID to 0V

fig 5

