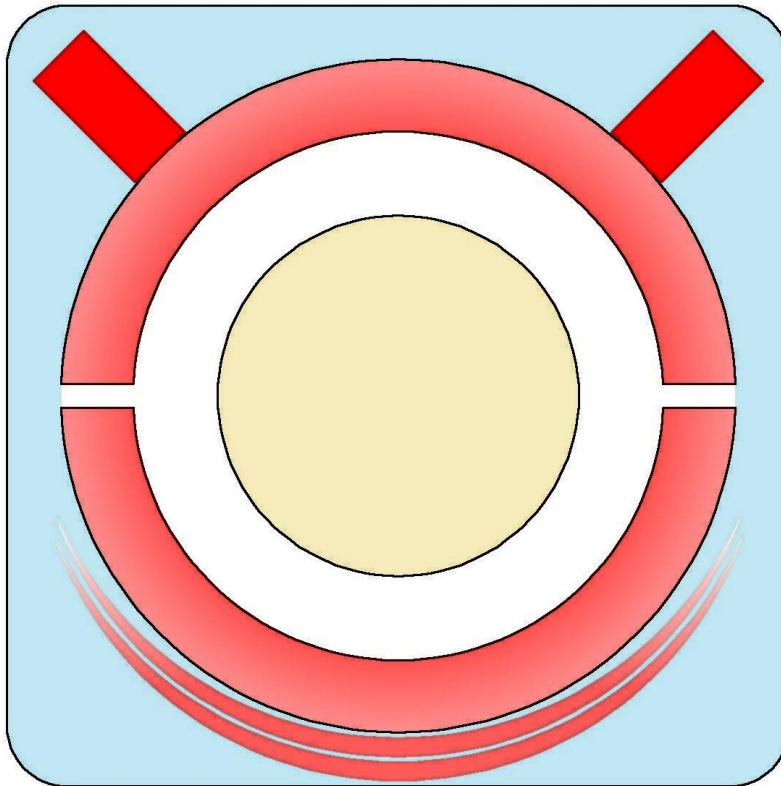


MMS 6125/..

Dual Channel Bearing Vibration Monitor for piezoelectric sensors



- Applicable for piezoelectric sensors
- Recording and storing of characteristic values of the last run-up resp. run-down
- RS 232 interface for input and output of configuration data on site
- RS 485 interface for data exchange e.g. with the epro MMS 6850 analysis and diagnosis system
- Reading out measuring data via the serial interface
- Extended self-test function for electronics and sensors
- Hot swap of boards during operation

Applications:

The **MMS 6125** Dual Channel Bearing Vibration Monitor processes signals of piezoelectric vibration sensors in accordance with VDI 2056 or corresponding international standards.

Depending on the used sensor type the following measuring ranges and modes can be selected:

Sensor for vibration acceleration:

Frequency range: 20 Hz...8 kHz

a_{rms} / a_{0-P}

Frequency range: 5 Hz...2 kHz

a_{rms} / a_{0-P}

V_{rms} / V_{0-P}

Frequency range: 4 Hz... 1 kHz

a_{rms} / a_{0-P}

V_{rms} / V_{0-P}

Sensor for vibration velocity:

Frequency range: 10 Hz...2,5 kHz

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

Frequency range: 4 Hz...1,5 kHz

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

Frequency range: 2 Hz...250 Hz

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

These measurements serve the construction of turbine protection systems. They provide signals for analysis and diagnosis systems to be further processed in field bus systems, host computers and networks.

The cards of the MMS 6000 family are suitable to build up systems for increasing performance, efficiency and operational safety of the monitored units such as steam, gas- and water turbines and to extend the machines' life times.

By means of a laptop computer connected to the RS 232 interface, parameters and operation modes of the monitor may be configured. Moreover, the measured characteristic values, the order analysis as well as data of the last run-up or run-down can be visualized.

Technical Data:

Sensor inputs:

Input impedance:
 $\geq 100 \text{ k}\Omega$
 Input voltage range:
 $-5 \dots +15 \text{ V DC}$
 Signal voltage ranges:
 MMS 6125/00
 $311 \dots 9500 \text{ mV}_{PP}$
 MMS 6125/10
 $16 \dots 450 \text{ mV}_{PP}$

Frequency ranges:
 Respectively lower and upper 3dB point

Sensor for vibration acceleration:
 High: $20 \dots 8000 \text{ Hz}$
 Med: $5 \dots 2000 \text{ Hz}$
 Low: $4 \dots 1000 \text{ Hz}$

Sensor for vibration velocity:
 High: $10 \dots 2500 \text{ Hz}$
 Med: $4 \dots 1500 \text{ Hz}$
 Low: $2 \dots 250 \text{ Hz}$

Sensor supply:

Constant current supply for piezoelectric sensors
 Supply current:
 $2 \dots 8 \text{ mA}$
 Supply voltage:
 max. 30 V DC

Control inputs:

Common logical binary inputs for both channels.

Optocoupler- operating modes:

"Pre-alarm (ALERT)", open circuit or closed circuit mode
 "Main alarm (DANGER)", open circuit or closed circuit mode
 Channel or module inhibit

Limit value multiplier for changing alarm limits during run-up and run-down of the machine. The multiplier is adjustable in the range:

$1.000 \dots 4.999$
 24 V Logic

Input resistance:

$> 10 \text{ k}\Omega$

Key pulse input:

1 pulse per revolution for control purposes of the system:
 24 V logic

Input resistance:

$> 30 \text{ k}\Omega$

Pulse duration:

min. $10 \mu\text{s}$ (flankengetriggert)

Voltage inputs:

Two, one for each channel
 $0 \dots 10 \text{ V}$

Input impedance:

$\geq 100 \text{ k}\Omega$

Resolution:

10 bit

Measuring modes:

General:

Each channel must individually be configured via the available interfaces. The configuration may be changed any time during operation.

Measuring modes for the dual channel mode:

Measuring of the absolute bearing vibration in either horizontal, vertical or axial direction:

With vibration acceleration sensor:

Frequency range: $20 \text{ Hz} \dots 8 \text{ kHz}$

a_{rms} / a_{0-P}

Frequency range: $5 \text{ Hz} \dots 2 \text{ kHz}$

a_{rms} / a_{0-P}

V_{rms} / V_{0-P}

Frequency range: $4 \text{ Hz} \dots 1 \text{ kHz}$

a_{rms} / a_{0-P}

V_{rms} / V_{0-P}

With vibration velocity sensor:

Frequency range: $10 \text{ Hz} \dots 2,5 \text{ kHz}$

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

Frequency range: $4 \text{ Hz} \dots 1,5 \text{ kHz}$

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

Frequency range: $2 \text{ Hz} \dots 250 \text{ Hz}$

V_{rms} / V_{0-P}

S_{rms} / S_{0-P}

Programmable measuring parameters:

- Measuring range
- Measuring unit
- Transducer sensitivity
- Warning and alarm limits
- Filter frequency ranges, see technical data sensor inputs
- Channel identification by means of KKS numbers and freely selectable designations
- Order analysis function: with function order analysis the characteristic values of 5 chosen harmonics (within range $\frac{1}{4}$; $\frac{1}{2}$ up to 10th harmonic) will be calculated with amount and phase.

Limiting value supervision:

Two separately adjustable limit values per channel.

The alarms may be disabled by means of the monitor-locking function, error messages or with an external signal.

After loading configuration parameters, the alarm function is disabled for a period of approx. 15 sec (delay time 60 sec plus alarm enable after another delay time of 60 sec).

Adjustable range of the limits:

$5 \dots 100 \%$ of f.s.d

Resolution and reproducibility:

0.1% of f.s.d.

Delay time:

0-1-2-3-4-5 s, selectable:

Switching characteristics:

with increasing signal level

Switching hysteresis:

configurable, (5 % standard) of f.s.d, effective at falling signal level

Outputs:

Two per channel, galvanically isolated via optocoupler at the rear contact strip

Switching power

$U_{max} = 48 \text{ V DC}$

$I_{max} = 100 \text{ mA}$

Suitable sensors:

MMS 6125/00:

ICP sensor, to meet the following specifications:

Sensitivity:

100 mV/g

Supply with impressed current:

$2 \dots 8 \text{ mA}$

Supply voltage:

max. 30 V DC

MMS 6125/10:

Special sensor type with a sensitivity of $5 \mu\text{A/g}$, separate charge amplifier and a temperature range of -70 to $+350 \text{ C}$.

Module and sensor supervision:

The internal module supervision comprises the following functions:

- Transducer signal within a pre-defined good range
- Wiring between transducer and module (short-circuit, interruption)
- System supply voltage within pre-defined limits
- Configuration and parameter setting OK
- Measuring values within measuring range
- Operating temperature of the module

- System watchdog

During the change from the error to the ok-state and after power-on of the module, all functions of the module are blocked for a delay time of 15s (alarm enable after a delay time of 60s).

„A green LED on the module front indicates the "Channel clear" state. During an error state, this LED is switched off, during the delay period it flashes.

The states for both channels are output to the connecting strip at the rear via optocoupler for the purpose of galvanically isolation

$$U_{\max} = 48 \text{ V DC}$$

$$I_{\max} = 100 \text{ mA}$$

Reasons for module disturbances can be read out in detail via the communication interface. This permits the technicians to remove the reason for the fault immediately.

Signal outputs at the rear connector:

Connecting strip:

according to type F48M, DIN 41612 communication interface RS485

One current output per channel, proportional to measuring range and chosen variable.

Nominal range:

0/4...20 mA

open circuit and short-circuit proof

Permissible burden:

≤500 Ohm

Resolution:

16 Bit

Precision:

±1% of f.s.d

Settling time:

0...10 sec, adjustable in steps of 1 sec. separately for each channel

One voltage output per channel, proportional to chosen variable and measuring range.

Nominal range:

0...+10 V

open circuit and short-circuit proof

Load resistance:

≥10 kOhm

Resolution:

8 Bit

Precision:

±1% of f.s.d

One voltage output per channel, proportional to the dynamic part of the signal.

Nominal range:

0...20 V_{pp}

Open circuit and short-circuit proof

Load resistance:

≥10 kOhm

Frequency range:

0,1 Hz...5 kHz (±20 % -3 dB)

Accuracy:

±1% of f.s.d

Operating elements at the module front:

Two sensor signal outputs, independently from each other, one for each channel:

The signals are proportional to the sensor signals and can be tapped at the SMB sockets on the module front.

Range: ±12 V

Load resistance: ≥100 kOhm

Internal resistance: 1 kOhm

Frequency range:

dynamic carrier frequency output with superimposed displacement signal.

2 green LED's:

indicate "Channel Clear" separately for channel 1 and channel 2

4 red LED's:

indicate pre and main alarm separately for both channels

1 Mini DIN diode socket:

RS232 interface for connection of a computer for configuration and data interchange with the module.

Handle:

To pull out and insert the module and for labeling purposes.

Power supply:

Redundant supply input via two supply inputs, decoupled via diodes. At least one supply input is required for the supply of the module.

Supply voltage:

18...24...31.2 V DC

according to IEC 654-2, class DC4

Power consumption:

max. 6 W (max. 250 mA at 24 V)

Other supply voltages can be realized with additional system power supplies.

System design:

At standalone operation, unlimited number of modules.

Max. 31 modules / 62 channels may be operated at one RS 485 bus.

If more modules / channels are necessary, e.g. with an MMS 6815, another RS 485 bus must be installed.

Environmental conditions:

Protection class:

module: IP 00 according to DIN 40050

Front plate: IP21 according to DIN 40050

Climatic conditions:

according to DIN 40040 class KTF

Operating temperature range:

0...+65°C

Temperature range for storage and transport:

-30...+85°C

Permissible relative humidity:

5...95%, non condensing

Permissible vibration:

according to IEC 68-2, part 6

Vibration amplitude:

0.15 mm in range 10...55 Hz

Vibration acceleration:

16.6 m/s² in range 55...150 Hz

Permissible shock:

according to IEC 68-2, part 29

peak value of acceleration:

98 m/s²

nominal shock duration::

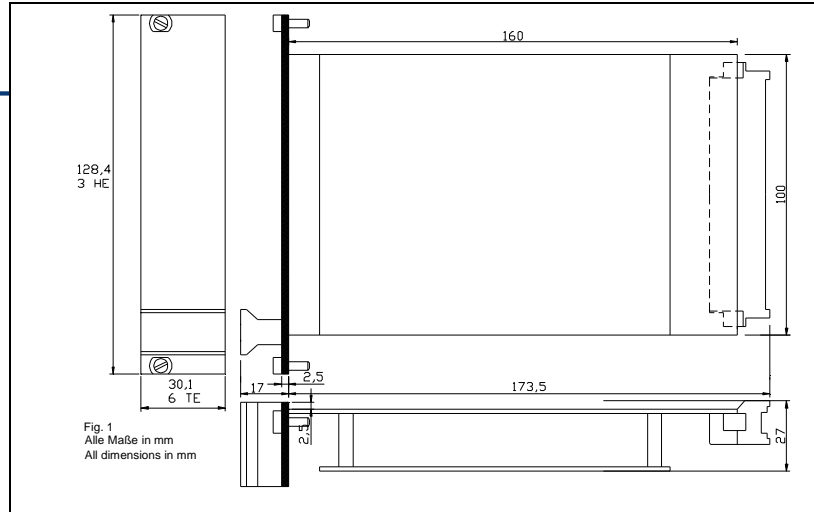
16 ms

EMC resistance:

according to EN50081-1 / EN50082-2

Dimensions:

PCB/euro card format according to DIN 41494 (100 x 160 mm)
 Width: 30,0 mm (6 TE)
 Height: 128,4 mm (3 HE)
 Length: 160,0 mm
 Net weight: approx. 320 g
 Gross weight: approx. 450 g including standard export packing
 Packing volume: approx. 2,5 dm³
 Required space: 14 monitors (28 channels) per 19" frame



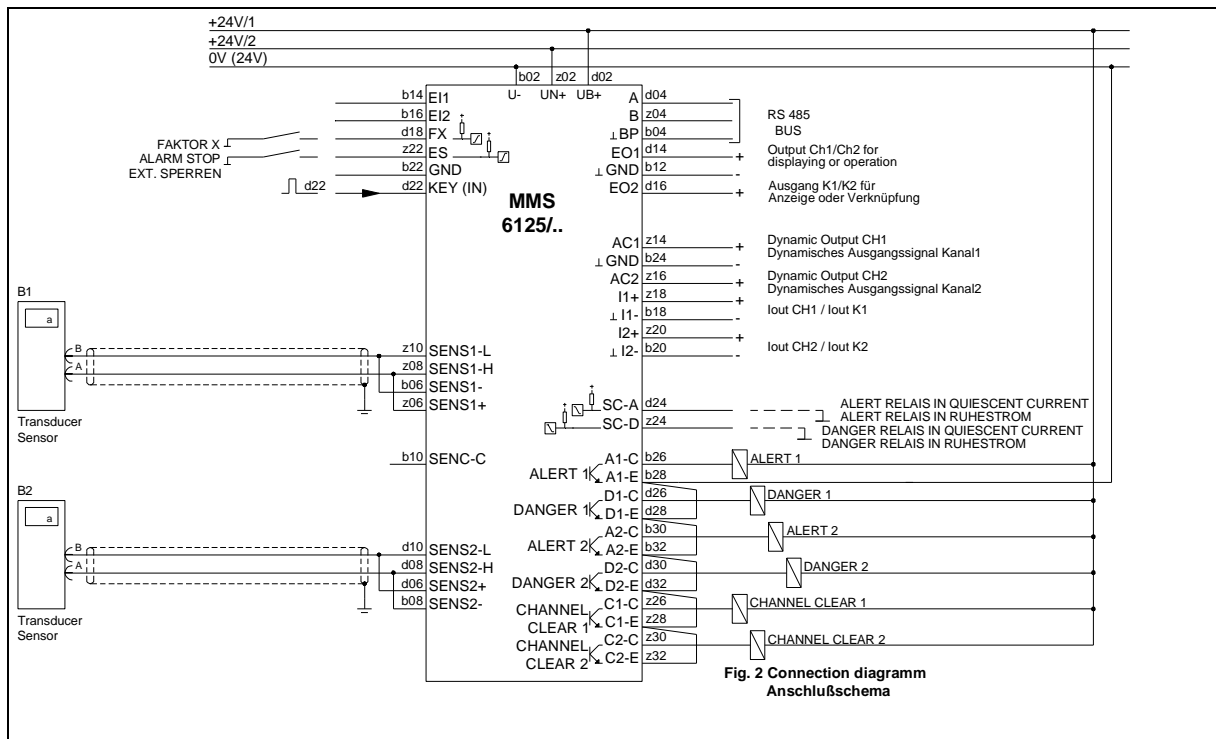
Requirements on configuration PC:

Configuration of modules is made via the RS 232 interface on the module front or via the RS 485 bus by means of a computer (laptop) with the following minimum specifications:

Processor: Intel Pentium®, 500 MHz
Interfaces: one free RS 232 interface (COM 1 or COM 2) with FIFO type 16550 UART

Capacity of hard disk: 30 MB
Required working memory: 32 MB RAM
Operating system: Windows® 98, NT 4.0, 2000 oder XP

Connection diagram:



Order number:

MMS 6125/00 Dual channel bearing vibration monitor for piezoelectric sensors	9100 - 00069
MMS 6125/10 Dual channel bearing vibration monitor for piezoelectric sensors	9100 - 00068
MMS 6910 W Operating accessories.....	9510 - 00001
consisting of: operating and installation manual, configuration software and various connection cables	

The F48 M male connector has to be ordered separately, depending on the required wiring technology

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