Brüel & Kjær Vibro

Product Specifications

VC-6000 Monitoring System
Monitoring Module – SM-610-112
4x Process, 1x Speed, 3x Axial Displacement Channels, 8x DC Outputs, 8x Relays

The VC-6000 Monitoring System hardware is used for both stand-alone safety monitoring and condition monitoring using the Compass 6000 monitoring software modules and database. The VC-6000 offers various standard monitoring modules, power supply modules and communication modules. This Product Specification describes the SM-610-112.

Applications

The SM-610 series of VC-6000 Monitoring Modules are designed to provide protective monitoring of various types of industrial machines. The SM-610-112 is specifically designed for monitoring process parameters and axial displacement of a machine. It can also be used to monitor speed.

General Description

The features and functions common to all SM-610 Monitoring Modules are briefly listed below. Please refer to the VC-6000 Product Specifications (BPS 0044) for more information.

- Interfacing with the CI-6xx Communication Modules
- High speed digital signal processor
- Relay outputs (logic controlled)
- OK-relay status indication
- Extensive local LED indication
- Flash memory for storing settings and local logbook
- High speed reaction time - 10ms
- Alarm limits with programmable hysteresis and response delay time
- Global trip multiply and override
- Extensive self-monitoring functions
- System bus interface to other modules
- Buffered vibration outputs

Inputs

- 4x process input signals
- 3x axial displacement signals
- 1x speed/phase reference signal

Outputs

- 8x analogue DC output
- 8x relays (4x Danger, 4x Alert):
  - 4x axial – 1-out-of-2 voting logic
  - 2x axial – 2-out-of-3 voting logic
  - 2x process – 1-out-of-8 voting logic

Measurements

- 7x DC – 3x axial, 4x process
- 1x RPM

Input Channel Configuration Combinations

No. of Inputs[1]	Monitoring Module – SM-610-112 4x Process, 1x Speed, 3x Axial Displacement Channels, 8x DC Outputs, 8x Relays																					Relay's
	Channel Types																		Additional Measurements			
	Dual-point Vibr.² (ISO)	DC-out	Single-point Vibr² (ISO)	DC-out	Axial Pos.	DC-out	Speed	DC-out	Rod Drop	DC-out	Rel. Exp.	DC-out	Eccentricity	DC-out	DC Input (Process, Absolute Exp)	DC-out	Bin. in	Vector³	BP	Tracking BP	2x 1oo3 for Axial or 2x 1oo2 for 2 of the Axial Pos. 2x 1oo4 for Radial
8					3	3	1	1							4	4					
	[1] The number of input signals is the sum total of the channels shown in yellow.																				

[1] The number of input signals is the sum total of the channels shown in yellow.

Signal Flow Diagrams
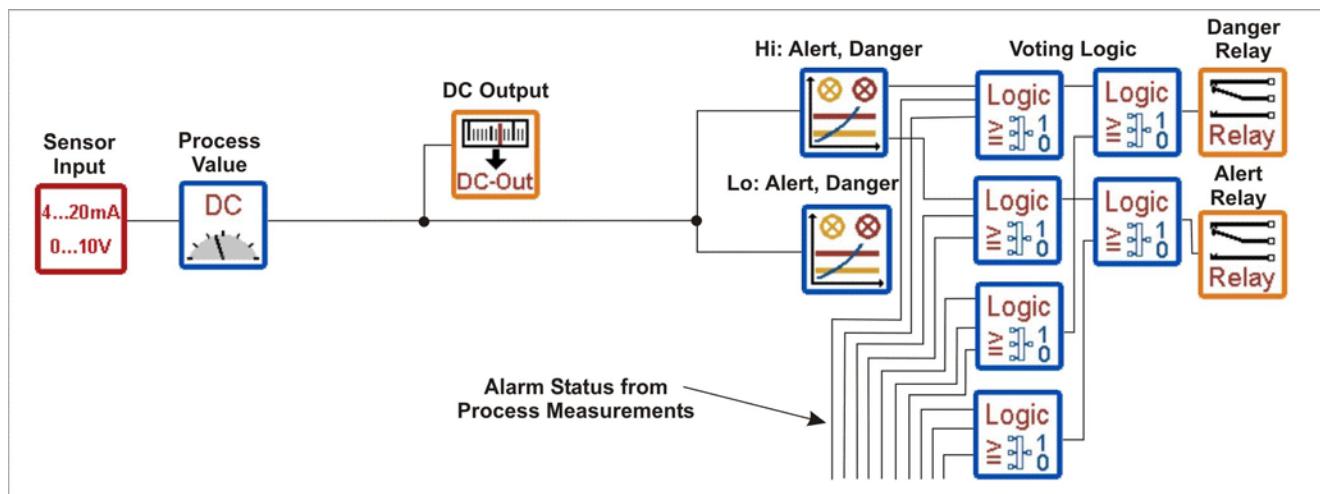
Figure 1. Process inputs (4 channels). Separate 1-out-of-8 voting logic is used for all process Alert and Danger relay control.
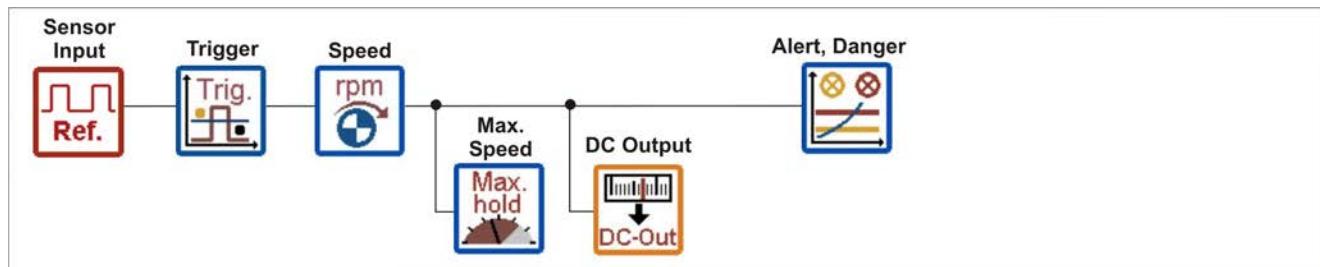
*Figure 2. Speed/phase reference sensor input (1 channel).*
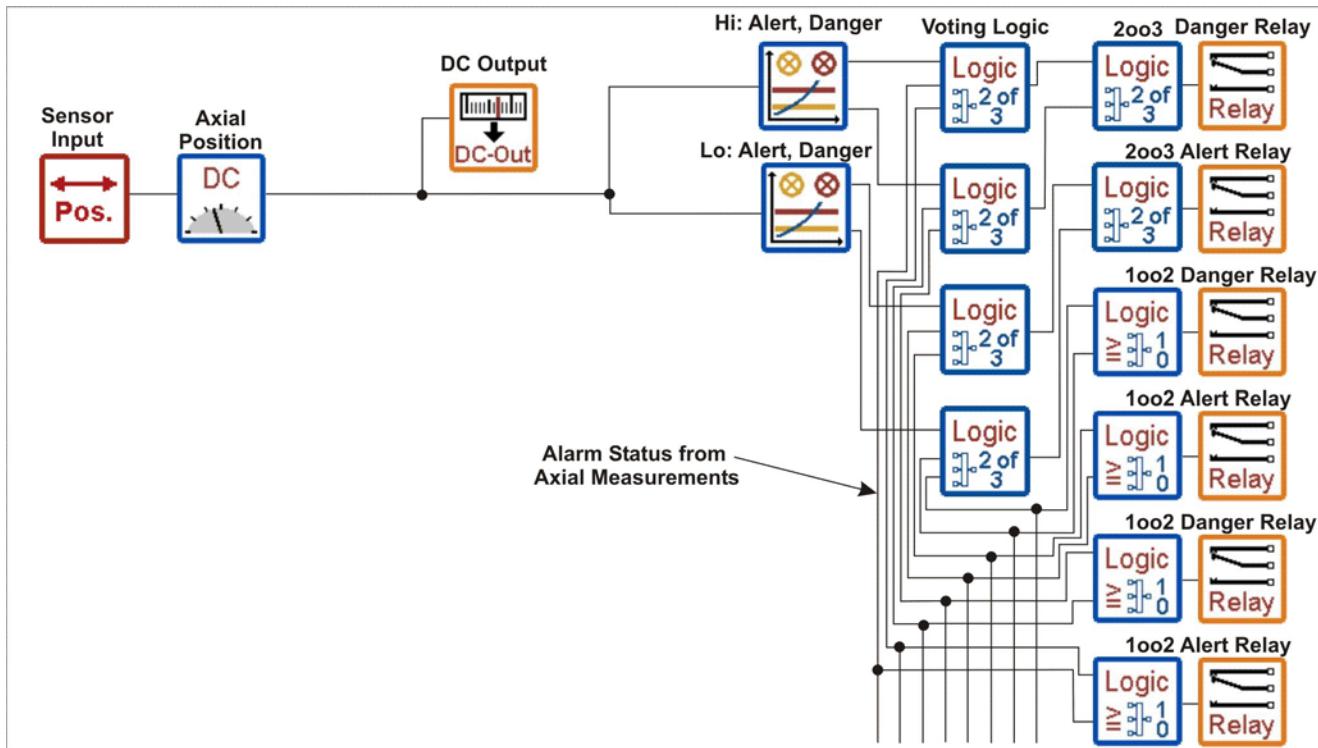
Figure 3. Axial displacement inputs (3 channels). Separate voting logic is used for Alert and Danger relay control: 1-of-2 voting logic (4 relays per 3 axial measurements) and 2-of-3 voting logic (2 relays per 3 axial measurement).

Technical Specifications

The specifications given below are specific for the SM-610-112 Monitoring Module. See the VC-6000 Product Specifications for features and functions common to all SM-610 Monitoring modules.

Axial Displacement Sensor Inputs

Input voltage range .... −21.5 to −1V
Input frequency range .... DC to 20kHz
Input impedance .... >800kΩ
Gain .... 1 (±0.75%)

Common mode rejection:
    DC to 10kHz .... typically 90dB
    10kHz to 100kHz .... typically 85dB

Sensor power:
    Sensor supply .... −24VDC ±2%
    Maximum current 30mA

Process Inputs

Input current range .... ±30mA
Input voltage range .... ±14V
Input frequency range .... DC to 20kHz
Input impedance (voltage input) 200kΩ
Input current load 100Ω
Sensitivity .... adjustable
Gain .... 1 (±1%)
Sensor power .... external

Speed/Phase Reference Sensor Inputs

Input voltage range .... −21.5 to −1V
Input frequency range .... DC to 20kHz
Input impedance .... >800kΩ
Gain .... 1 (±0.75%)
Common mode rejection:
    DC to 10kHz .... typically 90dB
    10kHz to 100kHz .... typically 85dB

Product Specifications - VC-6000 Monitoring Module – SM-610-112

Sensor power:
Sensor supply .... −24VDC ±2%
Maximum current 30mA

Analogue DC Outputs

Current output:
Current range..................... 4 to 20mA or 0 to 20mA
Maximum output load 500Ω
Accuracy .... <2.4% of measured value
Offset ....<20µA

Voltage output:
Voltage range ....0 to 10V
Minimum output load 1kΩ
Accuracy .... <1.3% of measured value
Offset ....<9.5mV

Relay Outputs

Nominal working voltage.......................................24V
Maximum current 100mA

Measurements

Meas. Name	Frequency Range	Measuring Time	Detection	Alarm Limits	Measuring Range	Units[1]	Accuracy (25°C, 80Hz, 0-Peak)
DC (process)	-	Adjustable 10ms to 100s	-	2x Alert, 2x Danger	±14V	V [2]	±(9.0mV+ 1.0% of measured value)
					±30mA	mA [2]	±(0.2µA+ 1.0% of measured value)
DC (axial)	-	Adjustable 10ms to 100s	-	2x Alert, 2x Danger	2000µm	µm	±(10.0µm + 1.0% of measured value)
RPM (also Max. RPM)	Signal slope: +/- Trigger level [3] (manual or automatic): −21.5 to −1V; adjustable in steps of 0.1V Hysteresis: 0 to 25; adjustable in steps of 0.1	Adjustable 10ms to 100s	RPM	1x Alert, 1x Danger	0.06 to > 1200000 RPM RPM multiplier and divider adjustable from 1 to 99999	RPM	Speed >10000rpm: ±0.01% of measured value Speed 100 to10000 rpm: ±1 rpm Speed < 100 rpm: ±0.1 rpm (one pulse per revolution)

[1] Metric and imperial units can be used; Metric units are shown only as an example.
[2] User-defined units. Sensor input signal units indicated here
[3] Please refer to the sensor input for the allowed input signal.

Brüel & Kjær Vibro reserves the right to change specifications without notice

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