

# ARTIS



## MARPOSS

### GEMCMS02 | GEMVM02

### MACHINE PROTECTION COLLISION DETECTION



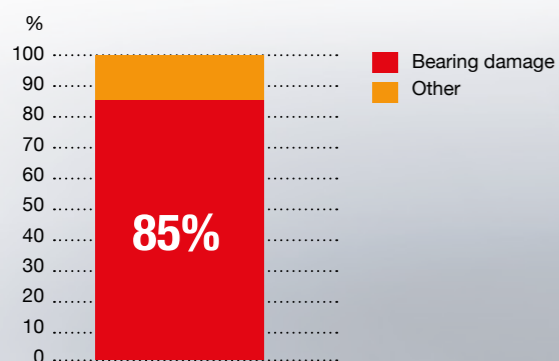
genior  
modular

# MARPOSS

# WHY MACHINE PROTECTION?

Nowadays, machines are more and more complex, dynamic and fragile. Production downtimes cause high costs and loss of sales. What is more, company image damage or loss of customers are imminent if planned deliveries are not made on schedule.

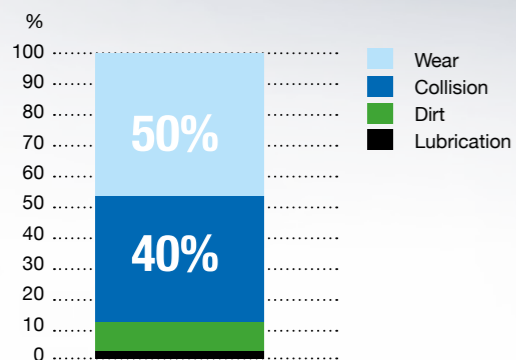
## CAUSES FOR SPINDLE DAMAGE



**85 %**  
OF ALL SPINDLE DAMAGE IS A RESULT OF BEARING DAMAGE

Source: Maschinenmarkt 6/2009

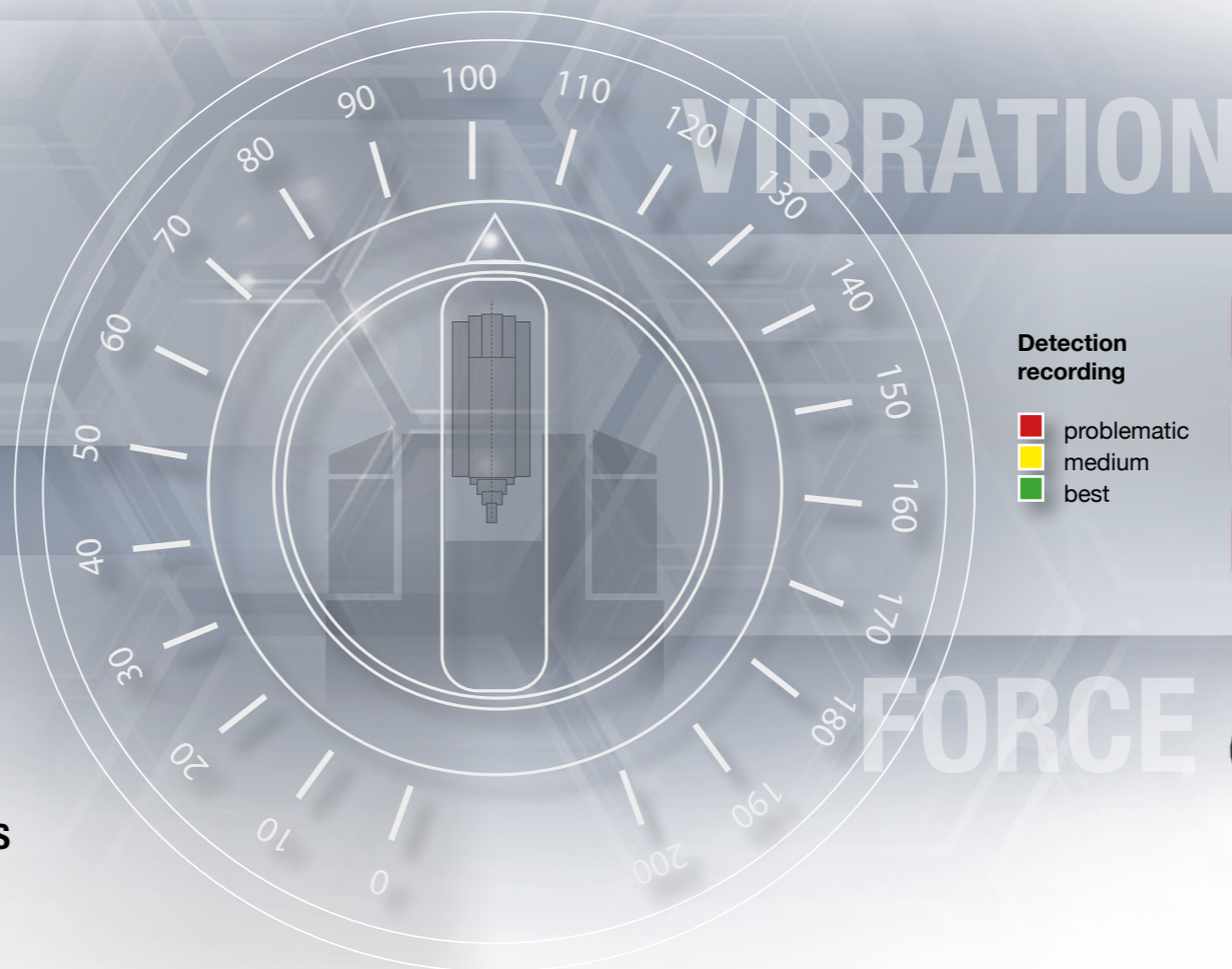
## CAUSES FOR BEARING DAMAGE



**40 %**  
OF ALL BEARING DAMAGE IS CAUSED BY COLLISIONS

Source: Maschinenmarkt 6/2009

# SOLUTION: MODULAR MACHINE SAFETY USING THE SUITABLE INTELLIGENT MONITORING SOLUTION



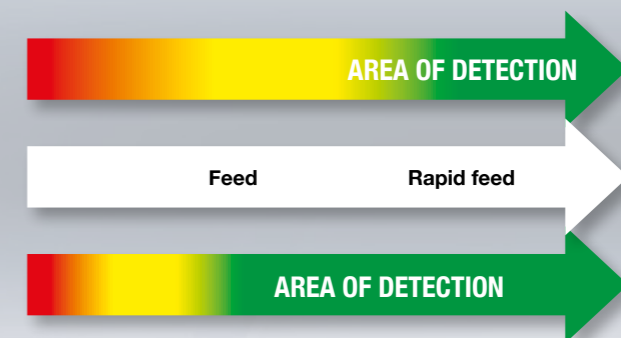
## DETECTING DYNAMIC COLLISIONS AND CRASHES

Measuring accelerations in up to 3 axes

GEMVM02

### Detection recording

- problematic
- medium
- best



GEMCMS02

## FORCE MEASURING (QUASISTATIC)

Detection at fast and low feed rate

## PROBLEM

- Collisions between moving axis and machine element
- Careless manual movement of the axes
- Incorrect entries
- Clamping of wrong tools
- Allowance fluctuations of the workpiece
- Incorrect clamping of the workpiece
- Tool overload (e.g. chip jam)

## CONSEQUENCES

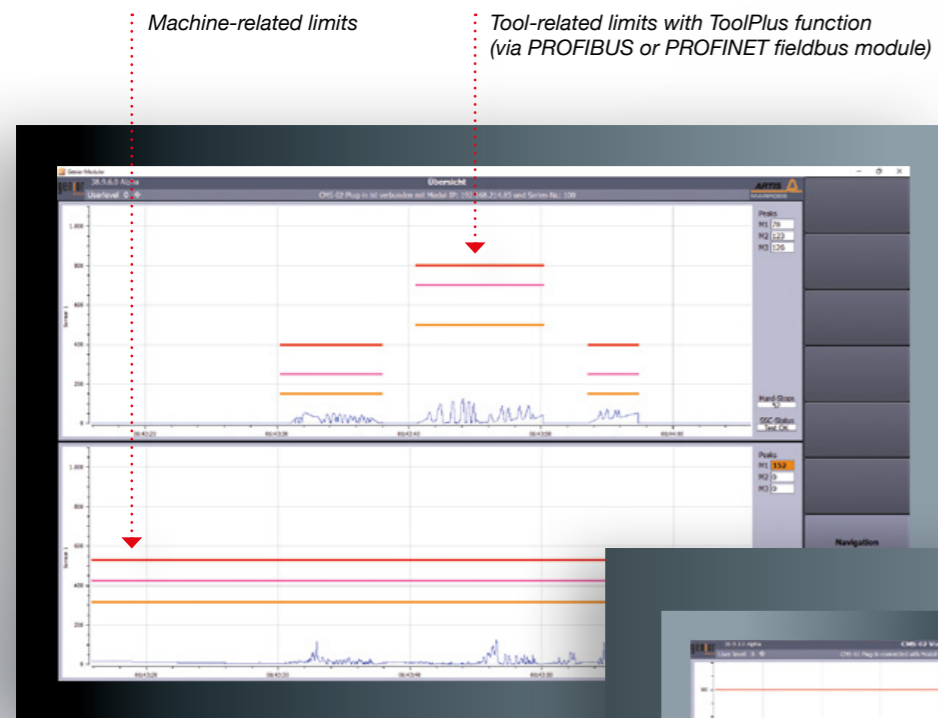
- High costs for repair and spare parts
- Possible loss of machine accuracy
- Unplanned downtimes
- Loss of production
- Increase of insurance rates and deductibles

## REQUIREMENTS

- Fast collision detection
- Fast stop of the moving axis/axes
- Indication and logging of the event
- Evaluation of event and graphic data
- Weak point analysis based on the stored data

## BENEFITS

- For use with all machine types, robots, assembly units etc.
- Simple machine integration, independent of machine controls
- Choice based on requirements (GEMVM02 or GEMCMS02)
- Permanent monitoring – always active
- Event memory: date and time of limit violations
- Tracking and analysis of stored entries
- Fast alarm output for stopping the machine axis/axes
- Can be operated stand-alone or in combination with GENIOR MODULAR

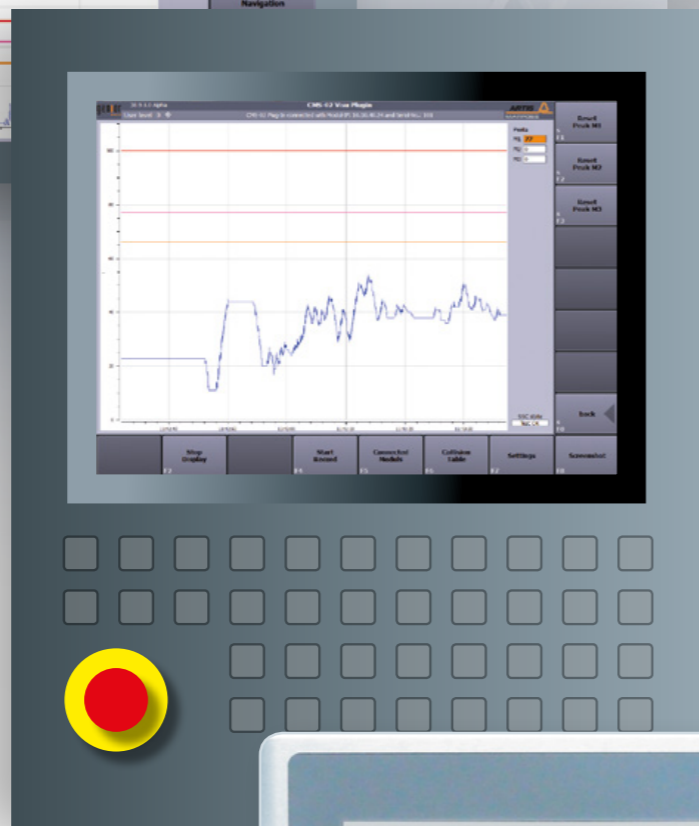


The GEMCMS02 system is a first-class all-round protection for machines and lines. It is based on a further development of the thousandfold proven BRANKAMP CMS system. GEMCMS02 detects both, dynamic and quasistatic collisions via the connected force sensors. If the set emergency limit is violated, an alarm output is set in < 1 ms. This prevents or at least minimizes damage to machines and lines.

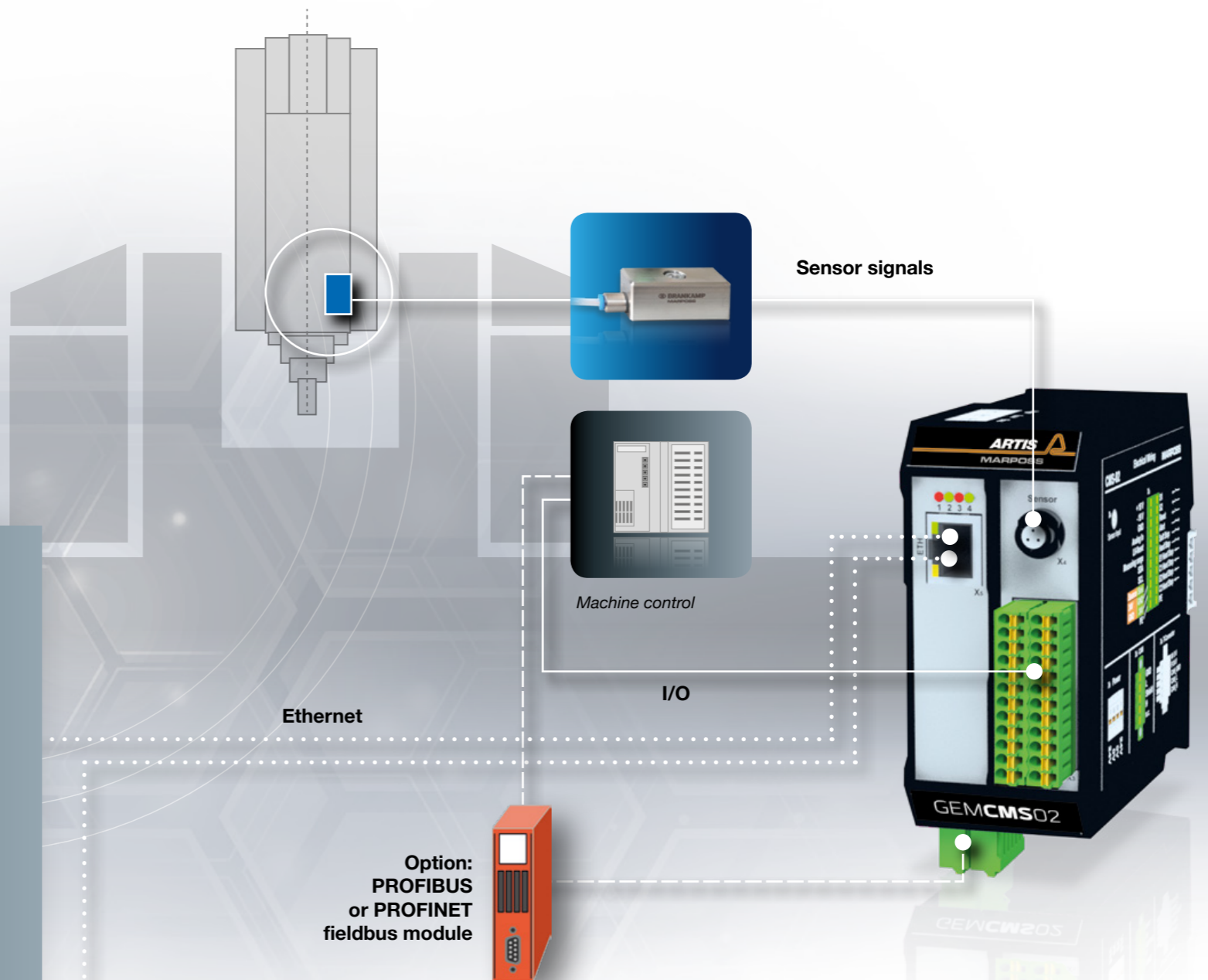
## PROPERTIES

- Applicable as stand-alone module with piezo strain sensors
- Integrated charge amplifier
- 25 kHz sampling rate
- 16 bit resolution
- Physical I/O interface (3 inputs and 4 outputs)
- 3 different operation modes
- 3 different static limits for each mode
- Fast alarm messages (< 1 ms)
- Recording of configuration changes
- Event file with signal values

HMI



IPC4 • Simple operation



# FORCE GEMCMS02

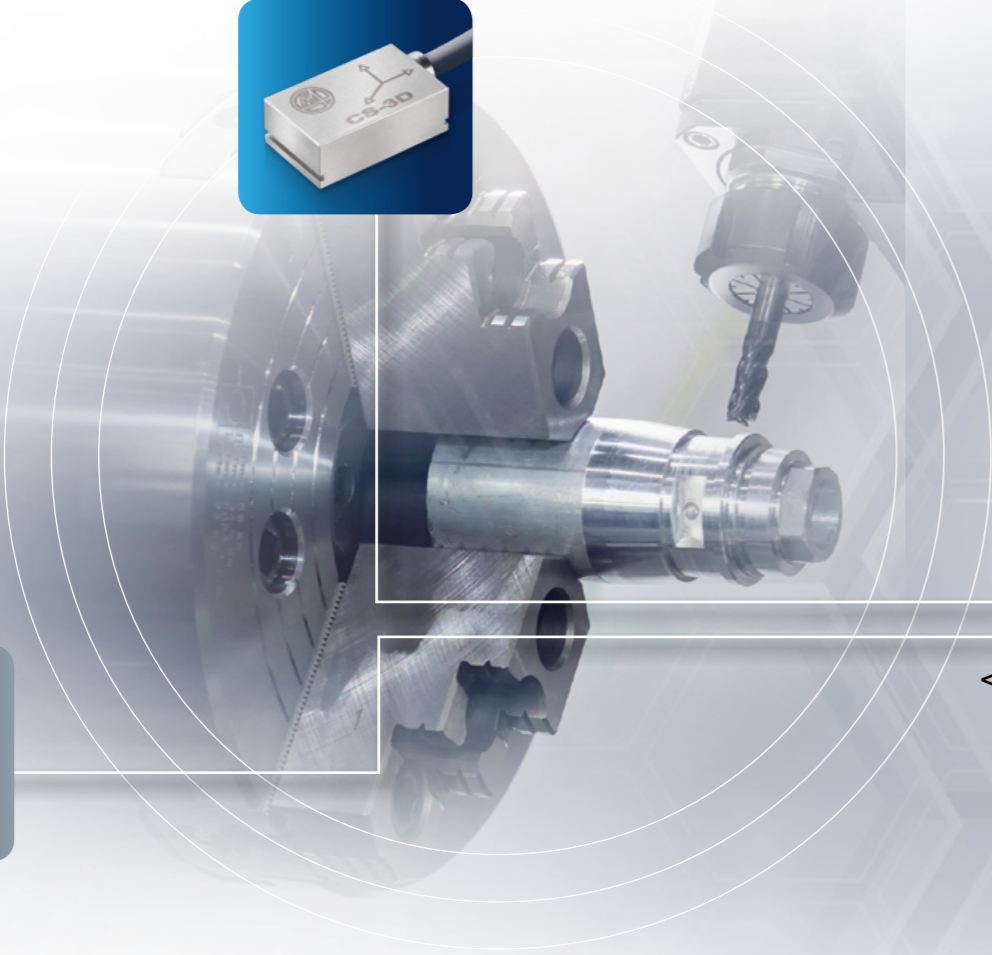
## SPECIAL FEATURES

- Compact module for simple integration into the control cabinet
- Sensor connection to the integrated charge amplifier
- Additional charge amplifiers allow sensor distances of more than 20 m
- Ethernet connection to WINDOWS or LINUX (SIEMENS TCU only) systems with installed GEMCMS02 visualization software
- Simple display and operation via the 4.3" IPC4 system – similar to the BRANKAMP CMS system
- Use of tool-related limits (ToolPlus) via PROFINET or PROFIBUS fieldbus modules
- Secure storage of all events in the event memory

# VIBRATION

# GEMVM02

CS-3D MEMS

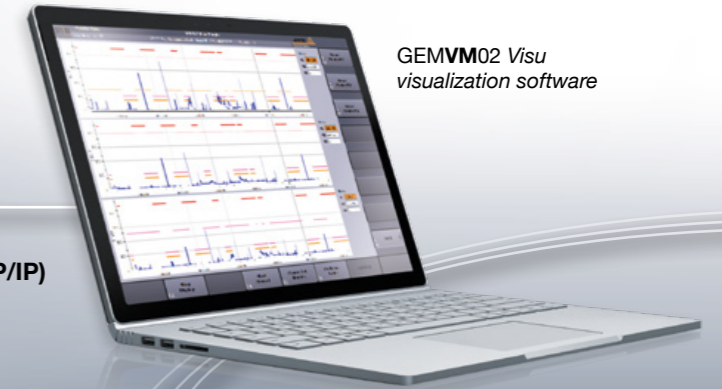


Machine control

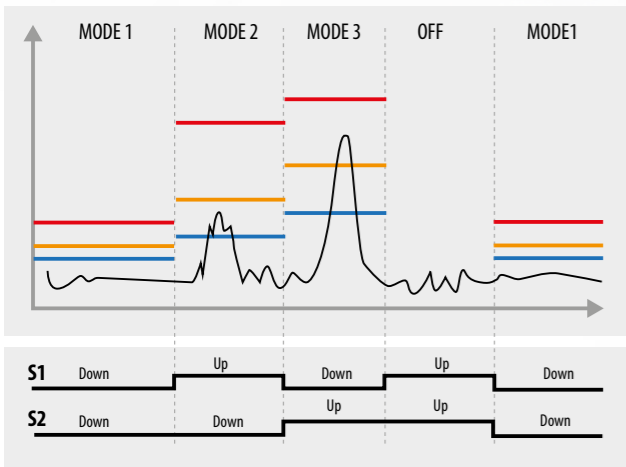
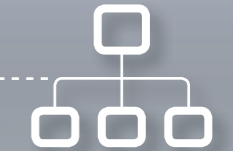
< 1 ms fast output



Ethernet (TCP/IP)



GEMVM02 Visu visualization software



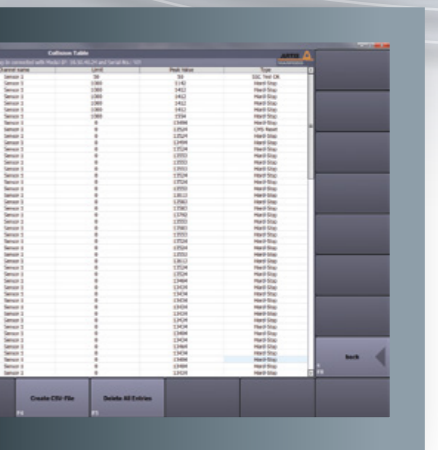
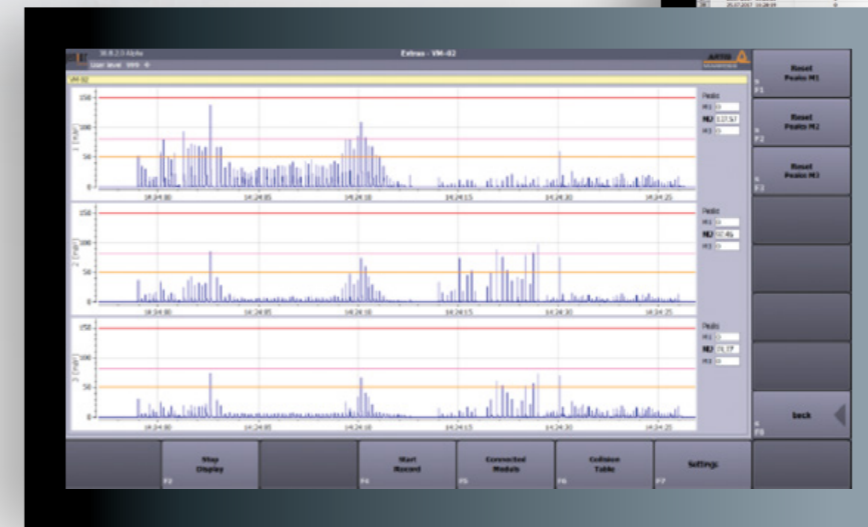
GEMVM02 operating modes

- Warning
- Soft stop
- Hard stop

GEMVM02 detects dynamic collisions via the connected acceleration sensors. If the defined hard stop limit is violated, an alarm output is set in < 1 ms. This prevents or at least minimizes damage to machines and lines.

### SPECIAL FEATURES

- Compact module for simple integration into the control cabinet
- Sensor connection for 1- to 3-axes acceleration sensors with standard IEPE interface
- Ethernet connection to WINDOWS or LINUX (SIEMENS TCU only) systems with installed GEMVM02 visualization software
- Secure storage of all events in the event memory
- Selection of 3 different operating modes
- 3 different limits per mode



Event memory (black box)

GEMVM02 visualization

# GENIOR MODULAR PROCESS MONITORING SIMPLE INTEGRATION



MODULARITY:  
SIMPLE INTEGRATION



MultiView

## MODULAR DESIGN



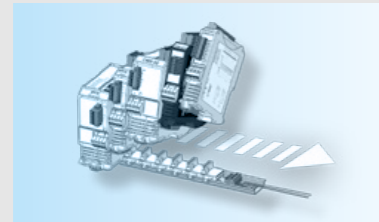
## MODULAR PROCESS MONITORING SYSTEM

- All modules can be assembled on a standard mounting rail
- Module connection via T-connector
- Up to 10 measurement channels and up to 16 measurement signals per CPU can be processed in real time
- Visualization via a plug-in for GENIOR MODULAR MultiView for WINDOWS and LINUX (for SIEMENS TCU systems)

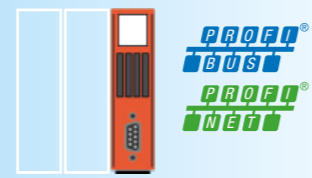
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modular

# OVERVIEW

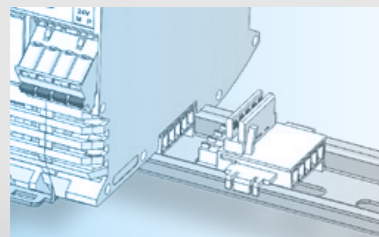
## MACHINE INTEGRATION



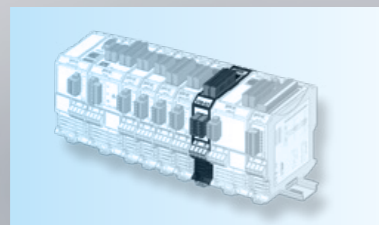
Modularity



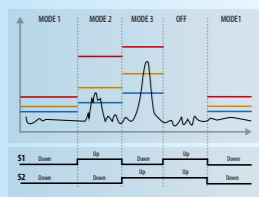
Fieldbus connection



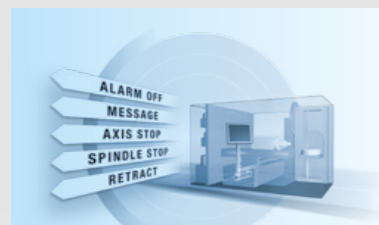
Standard mounting rail



Module integration



Definition of operating states

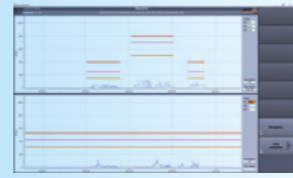


Signal handshake

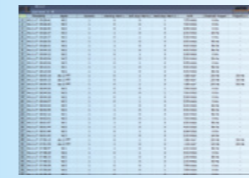


Sensors

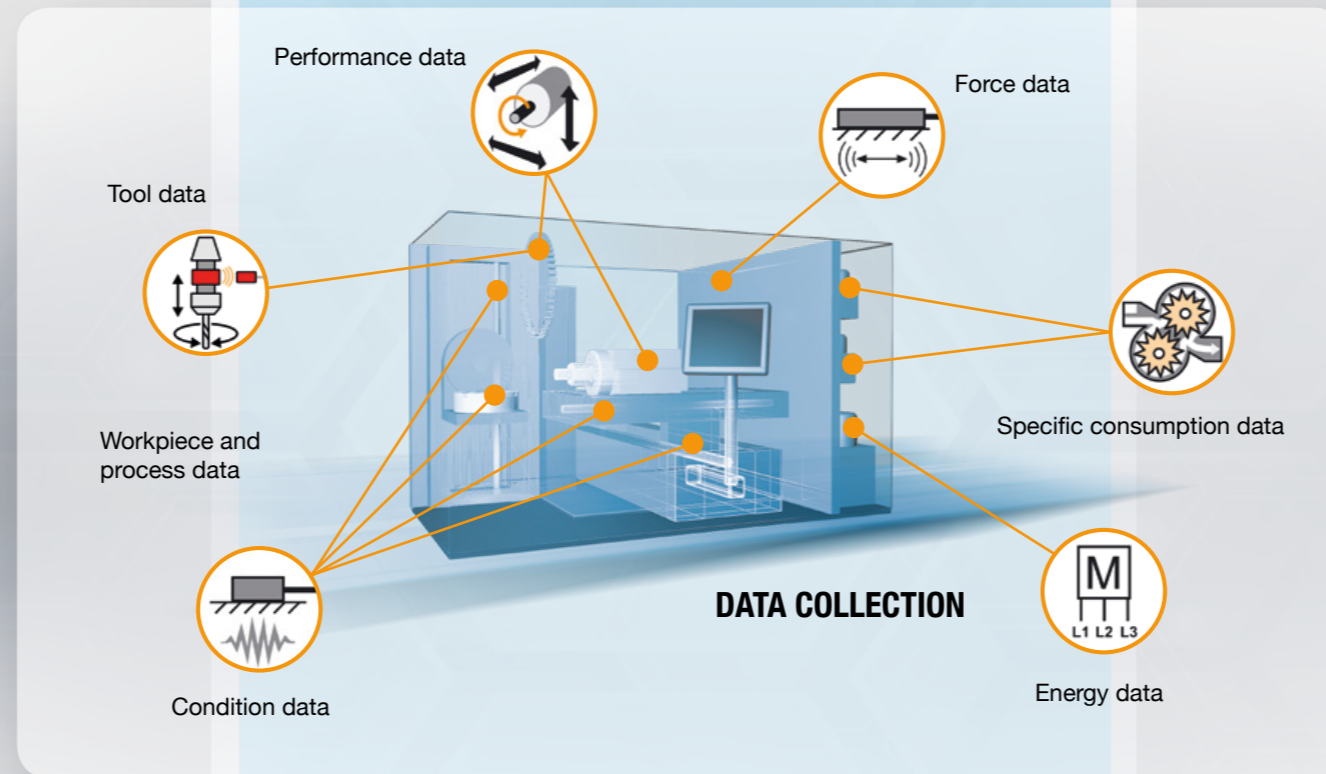
## MONITORING STRATEGIES



Tool and machine limits



Event memory (500)

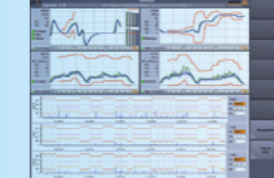


ToolPlus function



Simple operation 4.3" operator panel

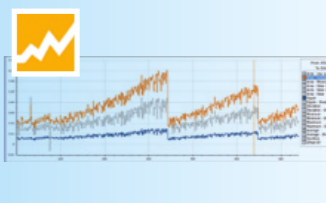
## GENIOR MODULAR DATA MANAGEMENT



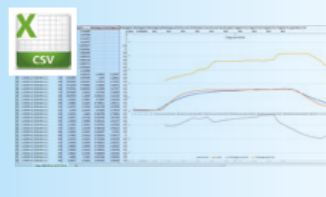
MultiView

Online machine overview

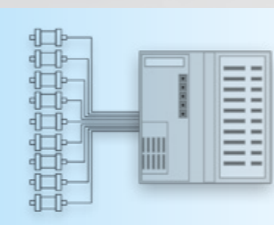
Alarm report



Trend report



CSV export

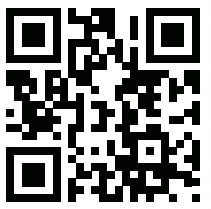


Digital torque



INDUSTRY 4.0 SMART DATA

Specific data recording



For a full list of address locations, please consult the Marposs official website [www.marposs.com](http://www.marposs.com)

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