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MACHINE PROTECTION

CMS-02 (FORCE)
VM-02 (VIBRATION)

genior modular

NEW PRODUCT EMO 2017

WHY MACHINE PROTECTION?

SOLUTION: MODULARITY IN MACHINE SAFETY
USE OF THE RIGHT INTELLIGENT MONITORING UNIT

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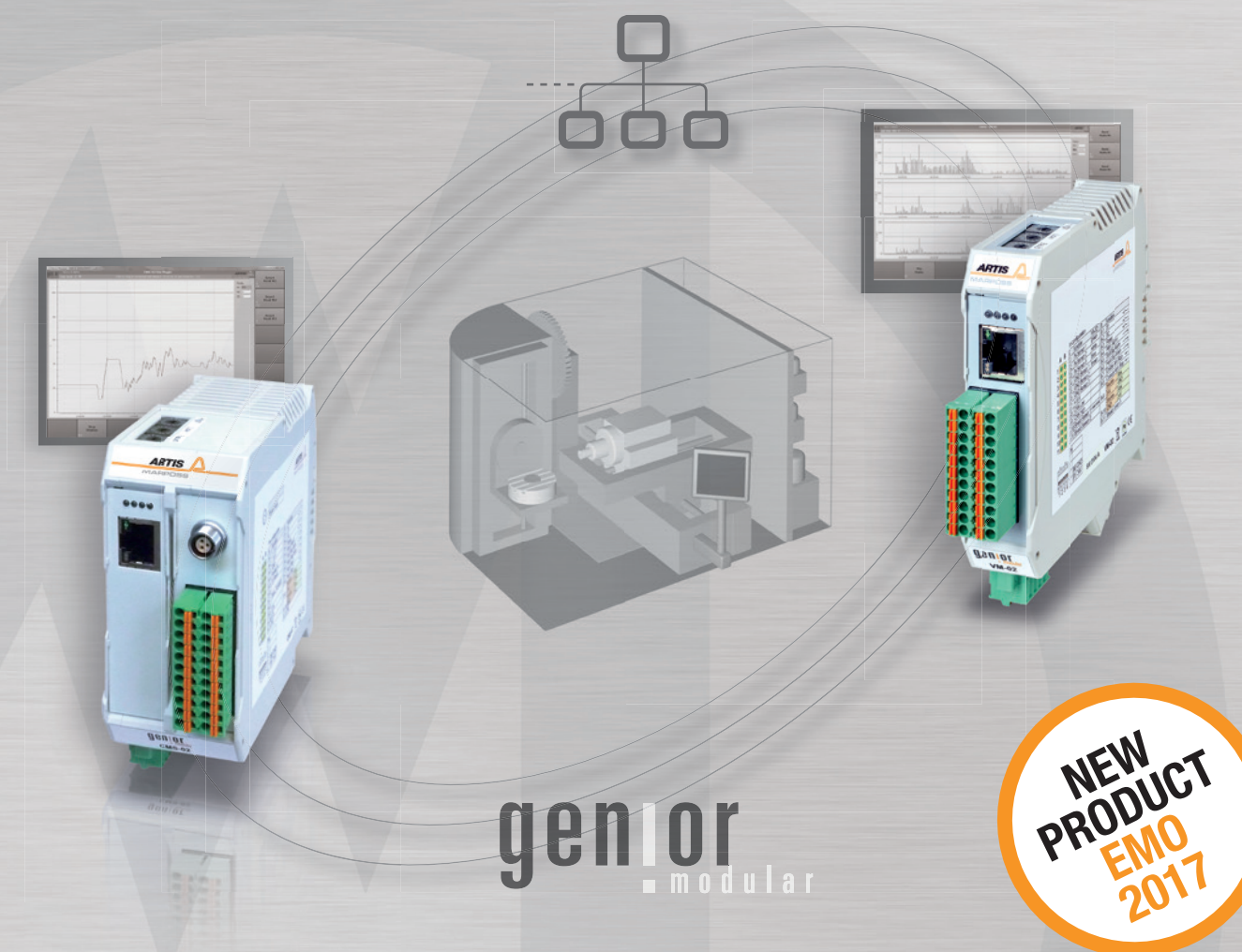
CAUSES FOR SPINDLE DAMAGE

%
100
90
80
70
60
50
40
30
20
10
0

85%

- bearing damage
- others
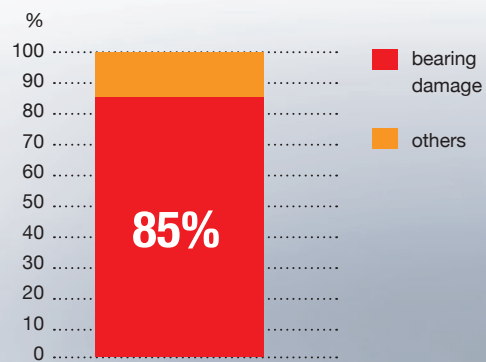
85%
OF ALL SPINDLE DAMAGES ARE BEARING DAMAGES
Source: Maschinenmarkt 6/2009

CAUSES FOR BEARING DAMAGES

%
100
90
80
70
60
50
40
30
20
10
0

50%
40%

- wear
- collision
- dirt
- lubrication
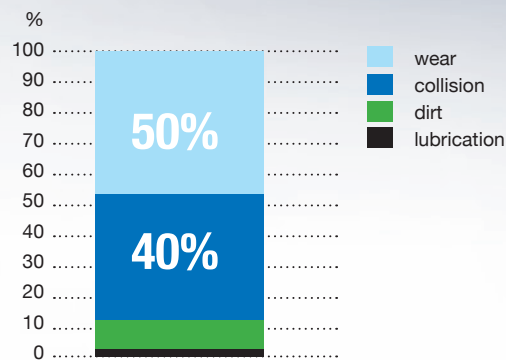
40%
OF ALL BEARING DAMAGES ARE CAUSED BY COLLISIONS
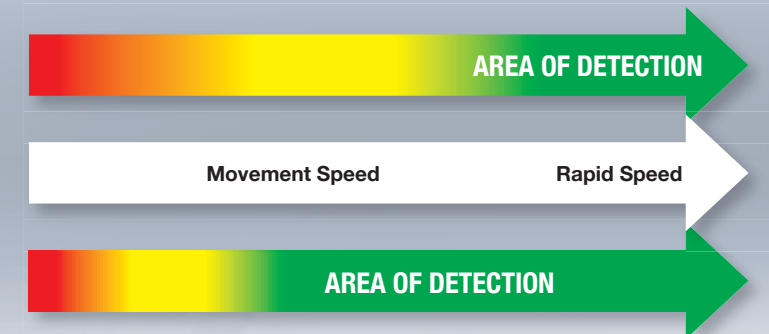Source: Maschinenmarkt 6/2009

DYNAMIC COLLISION (CRASH) DETECTION

Up to 3 axis measurement of vibration/acceleration

VM-02

Collision Detection

- problematic
- medium
- best

AREA OF DETECTION

Movement Speed   Rapid Speed

AREA OF DETECTION

CMS-02

FORCE MEASUREMENT (QUASISTATIC) COLLISION

Detection at fast and low feed rate

COMMUNICATION
Visualization (TCP/IP)

INTEGRATION CONTROL
Input/Output contacts

INTEGRATION CAN-BUS
GENIOR MODULAR System

FORCE AND / OR ACCELEROMETER
CMS-02 strain sensor, VM-03 accelerometer

PROBLEM

Collisions between moving axis and any machine element: Unwanted/unplanned touch of 2 components. Contact at (too) high speed

CONSEQUENCES:

- High costs for repair and spare parts
- Long downtimes (availability of parts and service…?)
- Production outage
- Loss of sales and profits
- Delay in delivery
- Damage to image, loss of customer
- Probably machine loses accuracy in general

DAMAGED COMPONENTS:

Tool/tool holder, tool clamping system, spindle bearings, deformation of spindle shaft, guides, axis motor, ball screw work piece damages loss of precision in general

BENEFITS

- Minimizing of subsequent damage caused by programming, setup and operating errors
- Independent of control and machine type
- Protection from the very first part: no teach cut
- Machine lifetime prolongation
- Increases machine availablity
- Allows multiple machine operation/ unattended machinery
- Easy retrofit of existing machines

Sensor Signals

PLC

Ethernet

I/O Signals

CMS-02

HMI Human machine interface

- Premium protection solution for dynamic and quasistatic collisions
- Module for piezo strain sensor
- Measurement of stress deformation caused by process
- Immediate detection of rapid force changes
- Generates stop signal within 1 ms
- Kit consisting of sensor, module, visualization (software running on HMI; coming soon: 4.3" terminal with visu)
- Follow-up solution of Brankamp CMS (10.000 installations)
- Applicable as stand-alone solution or in combination with GENIOR MODULAR process monitoring
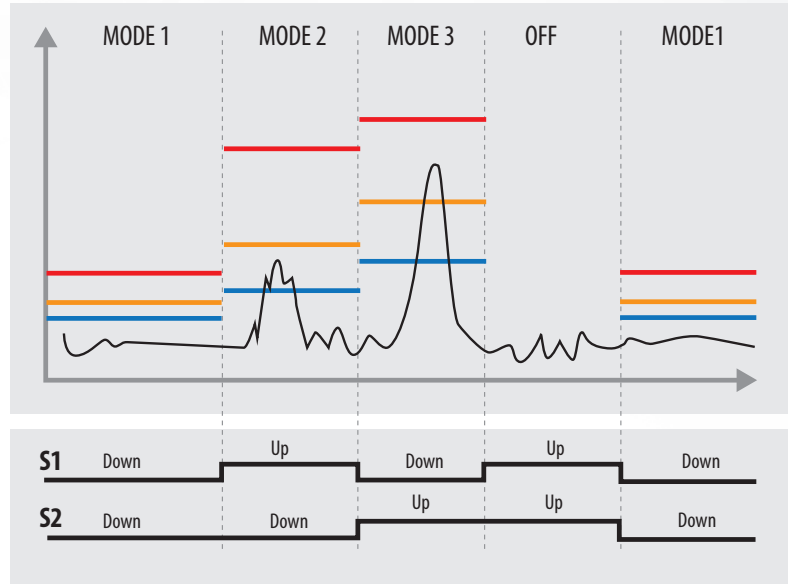
Functionalities

- 3 process modes plus off mode
- 3 different limits for each mode (alarm, soft stop, emergency stop)
- Recording of time-stamped over limit events
- Recording of process sequences (period adjustable)

SPECIAL FEATURES

- Usable for Process Monitoring (raw data) with remaining stand-alone functions: GEM integration (connection via CAN-Bus)
- Flexibility: Joint use of force, acceleration and power measurement
- Connectable to different fieldbus types through optional bus gateways (Profibus/Profinet available)
- Individual limits for unlimited number of tools via fieldbus

VM-02

Visu Plugin

Ethernet (TCP/IP)

<1ms fast output

Machine Control

Collision Table (Black-Box)
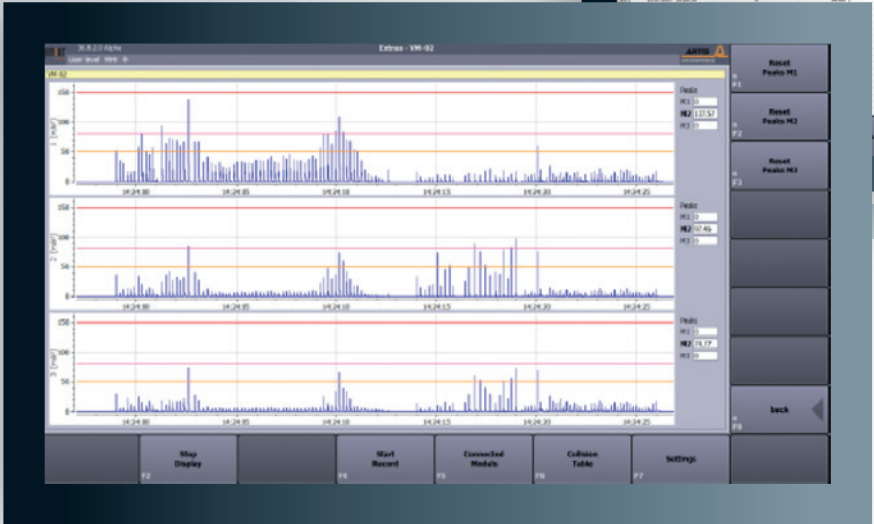
Visualization

Functions
- Acceleration monitoring regarding different limits
- Recording of limit violation s in a collision recorder

Applications
- Overload detection in machine tools
- Collision monitoring in machine tools
- Documentation in the collision recorder

Properties
- Measurement of acceleration in up to 3 axes
- Fast alarm messages < 1 ms
- 3 different modes (e.g. Rapid Feed, Tool Change, Feed Active) with 3 different, configurable limits :
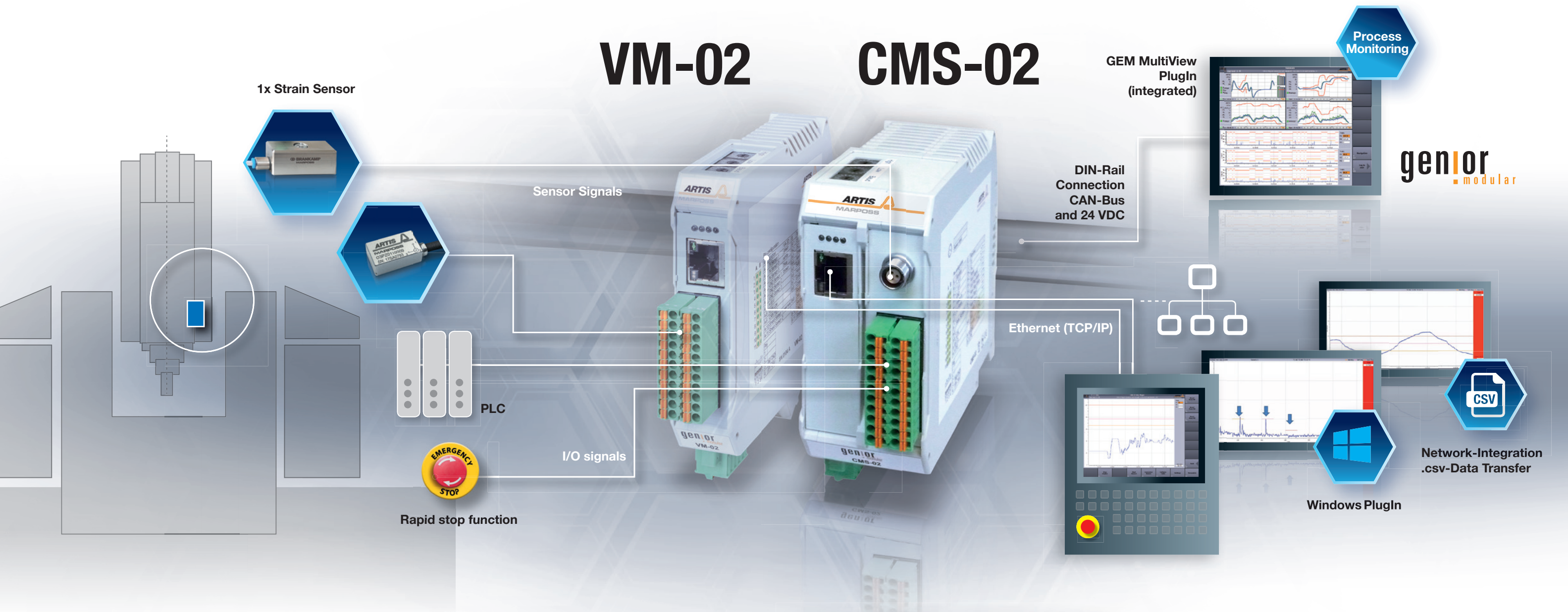 - » Warning
  - » Soft-Stop
  - » Hard-Stop

	MODE 1	MODE 2	MODE 3	OFF	MODE1
S1	Down	Up	Down	Up	Down
S2	Down	Down	Up	Up	Down

- Warning
- Soft-Stop
- Hard-Stop

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VM-02

CMS-02

1x Strain Sensor

Process Monitoring

GEM MultiView PlugIn (integrated)

genior modular

Sensor Signals

DIN-Rail Connection CAN-Bus and 24 VDC

Ethernet (TCP/IP)

CSV

PLC

I/O signals

Network-Integration .csv-Data Transfer

Windows PlugIn

EMERGENCY STOP

Rapid stop function

Main screen showing signal path, limits and soft keys

Changing background color provides status information at a glance
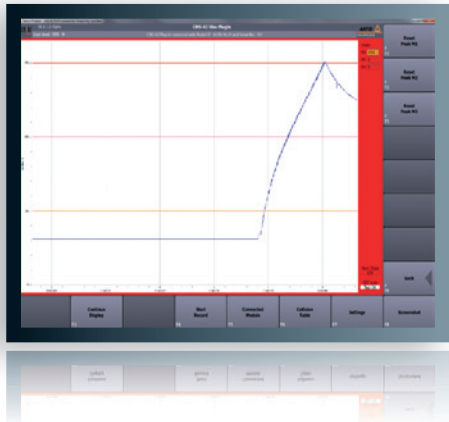
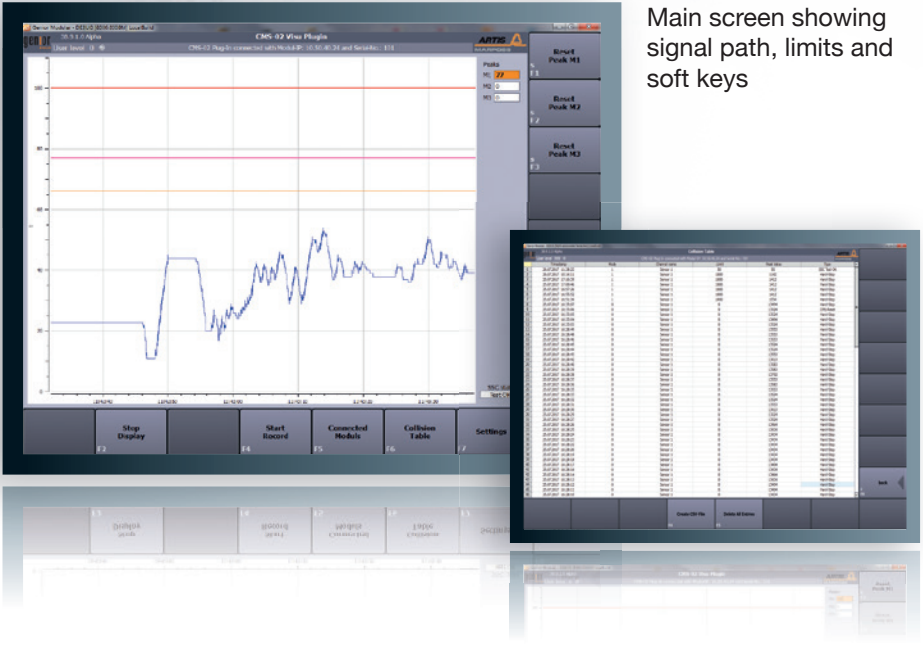## MANY SOLUTIONS – ONE LOOK & FEEL

Thought-out graphic user interface for easy operation
- Plug-in software for Windows environment
- High resolution praphic depiction
- Clear display of signal path
- 3 different monitoring modes plus selective deactivation
- 3 limits for each mode: alarm message, soft stop and emergency stop
- Display of peak values
- Collision recorder: logging of emergency stop events
- Time-scalable view of signal path (raw data as .csv)
- Time adjustable process recording after limit oversteppeing
- Simple limit adjustment
- Individual limits for unlimited number of tools via fieldbus

FROM ONE-CHANNEL STAND-ALONE SOLUTION UP TO HIGHLY SOPHISTICATED PROCESS MONITORING:
OPERATORS ALWAYS FIND THEIR WAY DUE TO CONSISTENT USABILITY.

Collision table
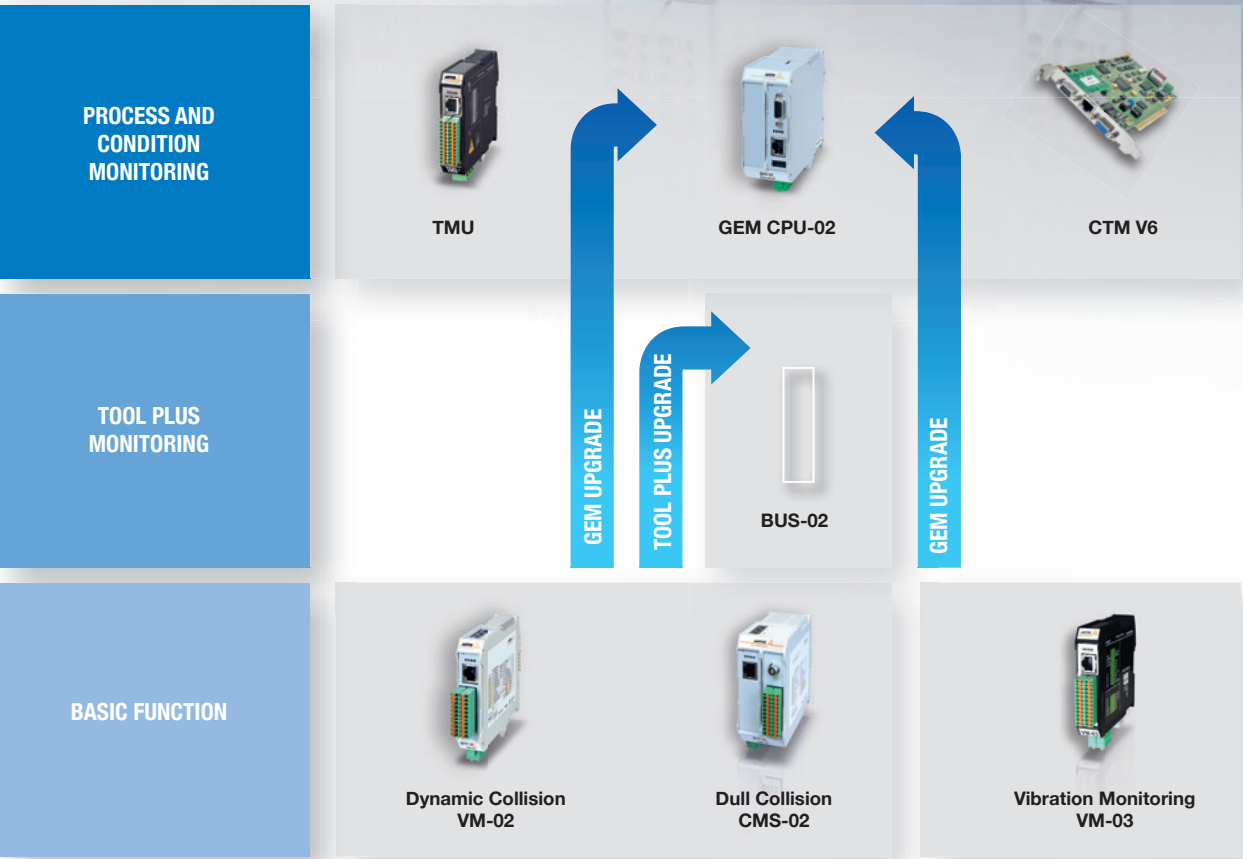Overview of stop events with valuable information: date, time, limit, peak value

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24VDC
CAN-Bus

MODULARITY:
EASY INTEGRATION

MODULAR CONCEPT

PERFORMANCE

PROCESS AND CONDITION MONITORING

TMU

GEM CPU-02

CTM V6

TOOL PLUS MONITORING

GEM UPGRADE

TOOL PLUS UPGRADE

GEM UPGRADE

BUS-02

BASIC FUNCTION

Dynamic Collision
VM-02

Dull Collision
CMS-02

Vibration Monitoring
VM-03

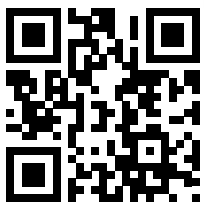## THE USE IN THE GENIOR MODULAR PROCESS MONITORING:

- All functions remains active
- The raw data of the signals will be used in the monitoring strategies
- The visualization can be integrated into GEM MultiView

genior modular

A detailed address list
is available at
www.marposs.com

Other brochures
for downloading available
www.artis.de

09/2017