

**PROMETEC**<sup>®</sup>  
Monitoring Solutions

You'll see more ...  
... because we see more.

# PROMOS<sup>2</sup>



**The Modular System for Monitoring  
of Metal Cutting Machines**

- Improve productivity, process assurance and machine optimization
- Reduce scrap, rework, secondary damage, idle times, tooling and labor costs.

## PROMOS 2: Modular Process Monitor System

- The successor to PROMOS incorporates the full scope of experience acquired from its predecessor.
- Though highly standardized, it offers system openness and flexibility in all regards.
- Standard functions include **Collision, Tool, Contact and Process Monitoring and Process-Optimization**. With Add-Ons, PROMOS 2 offers:
  - spindle bearing monitoring, recognition of tool- and spindle imbalance, slide condition diagnosis, Monitoring of machine components
  - expandable, without additional cabinet space: Functions of the base unit (collision Monitoring with data storage) may be expanded by using **additional hardware modules or software**
  - Operation via operator modules and/or PROVIS software on open NC stays the same as with PROMOS: control-independent, high acceptance by machine operators, automatic teach-in, visualization of the trend, statistics, fast installation, maintenance free, tele service

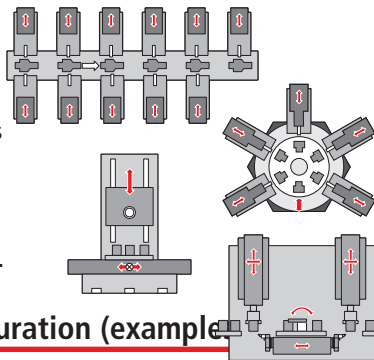
## Tailored Tool Monitoring

transfer lines

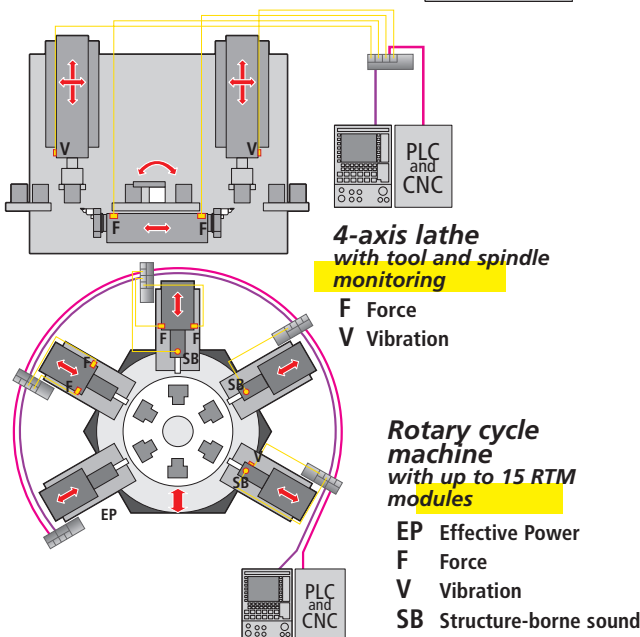
rotary cycle machines

turning machines

machining centers ...



## System configuration (example)



## PROMOS 2 reduces scrap, improves quality, reduces labor costs

### PROMOS 2

- detects collision
- prevents machine overload
- detects and minimizes tool breakage
- detects tool wear
- detects part contact
- etc. etc. ...

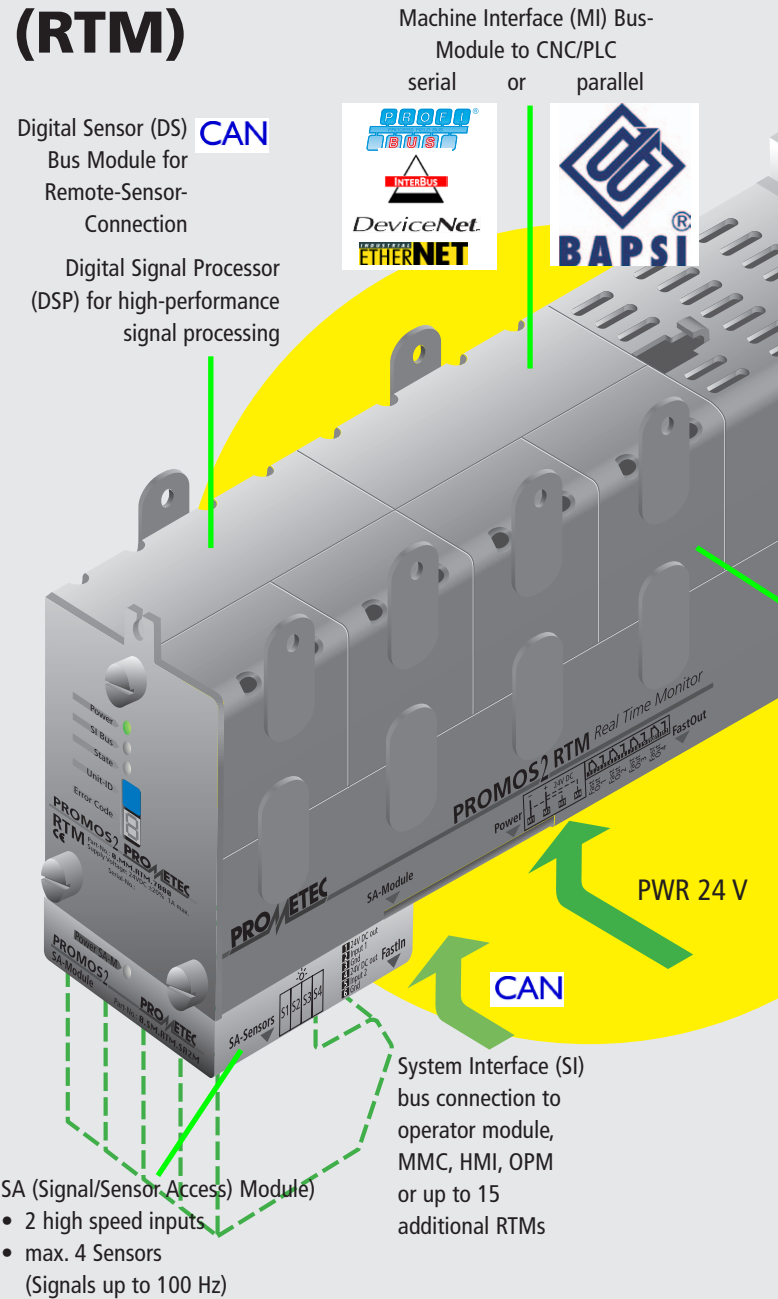
**Quality**

**Cost**

### PROMOS 2

helps you to safeguard and optimize any machining process

# PROMOS 2 – the Core of the System The Real Time Monitor (RTM)



**PROMOS 2**  
is more than just a  
Tool- and Process Monitor:

**CDR**  
**Crash Data Recorder**  
for event monitoring  
before and after machine collisions  
without any gaps  
Machine stops by fast outputs,  
faster than an  
Airbag (20 ms)

system

Space-saving  
installation  
in electrical  
cabinet

only 68 mm

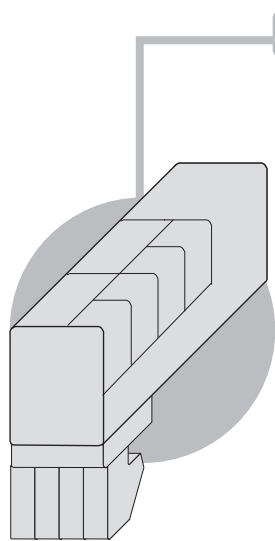
only 100 mm

max. 4 high-speed,  
SP-Sensor Modules  
(Signals up to 400 kHz)

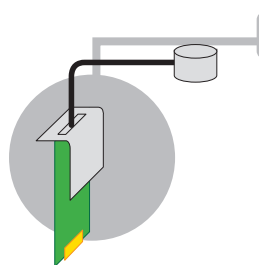
4 high-speed outputs  
(for fast and reliable  
shut-down of the feed  
drives)

\*direct plug-in sensor  
up to 20 m cable length (or  
more depending on  
sensor used); external preampli-  
fier, charge amplifier or bus  
converter may be omitted

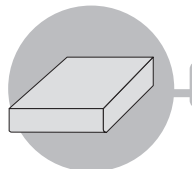
### Configuration Detail



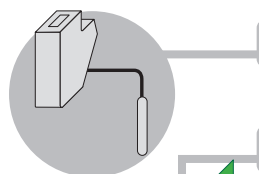
- Real Time Monitor (RTM),** the core element of PROMOS 2 – improved system integration:
  - works with all types of Machine Controls: open or closed NC
  - independent from control brand
  - no ISA or PCI slot required
  - up to four independent monitoring channels
  - simple installation in electrical cabinet (only 68 x 100 mm)
  - different mounting options
  - four slots for intelligent sensor modules and four slots for basic sensor modules
  - one slot for digital sensor bus sensors with bus terminals / bus converters
  - large number of industrial standard field bus terminals as machine interface modules for connection to CNC/PLC
  - competitively priced basic monitor (for basic monitoring tasks) - a host of add-on functions provide unlimited ability for expansion (via software licence and plug-in DSP module)



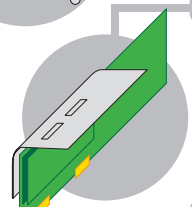
- Fast, intelligent sensor modules,** the Plug&Play direct connection:
  - up to four SP (smart-processing) sensor modules per RTM
  - direct plug-in of sensor cable connector, without external preamplifier, charge amplifier or bus converter
  - automatic module and slot identification
  - automatic digital switching of measuring range
  - automatic zero point compensation
  - anti-aliasing filter
  - signal analysis up to 2 kHz (up to 400 kHz with DSP module)



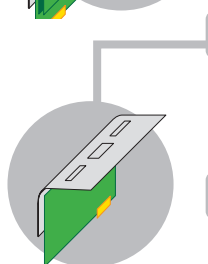
- Sensor/Signal Access Module (SA-M)**
  - 4 optional slots for "basic" SA sensor modules
  - 2 high-speed inputs



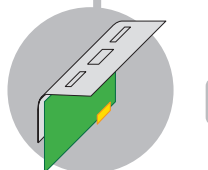
- Basic Sensors,** because not all sensors require measuring range switching or zero point compensation, and not all sensors supply high frequencies



- Digital Sensor Bus (DSB),** slot for connection of digital sensors to the DSP coprocessor card:
  - connection of bus-capable or intelligent sensors with bus converters, e.g. on CANopen
  - this possibility already exists for SIEMENS control systems via the Profibus, compile cycles, and synchronous actions

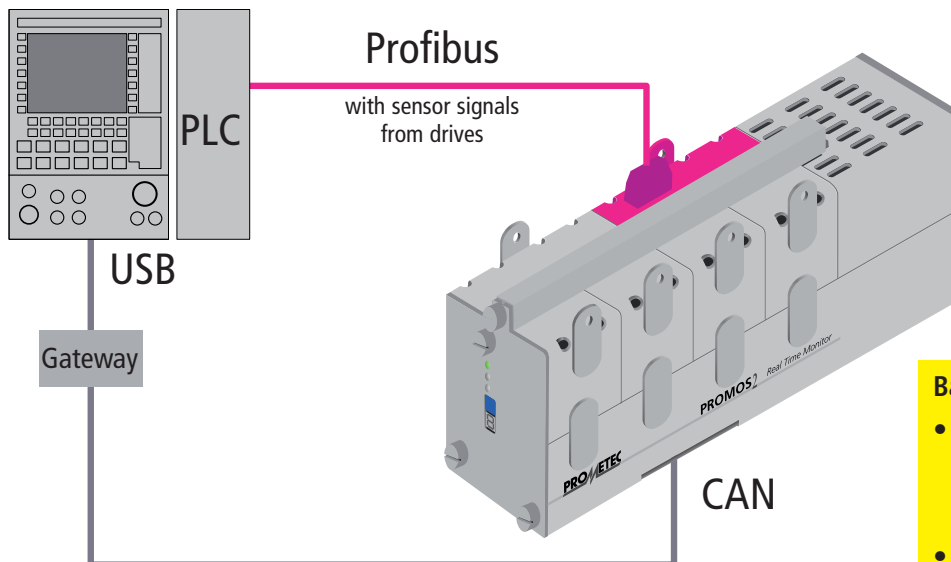


- Machine Interface Bus (MI Bus),** the Plug&Play connection:
  - For all common industrial standard field bus connections to PLC/CNC, such as Profinet, Profibus, Interbus... etc. A parallel converter is also available



- System Interface Bus (SI Bus):** integrated into each RTM:
  - The connection between RTMs and to the operator module - Plug&Play at all points
  - Industrial standard multimasterbus connects up to 15 RTM modules to one operator module OPM 15 or to PROVIS on an open NC

# PROMOS 2 – always adaptable to your specific requirements: The Modular Approach



Detection of missing holes or drills for drilling operations from a diameter of 2 mm\* in aluminum

\*size dependent on nominal spindle power

Configuration for tool monitoring on machining centers by reading from current values

### Basic configuration:

- RTM module with
  - Profibus Module
  - sensor signals software
- monitoring software
- PROVIS software with gateway
- PLC software module

### None of the stated add-ons require additional space in the housing!

Should your scope of monitoring tasks increase, additional sensors and functions can be incorporated - for a maximum of 4 channels per RTM.

Should this still not be sufficient (e.g. for rotary cycle machines), up to 15 RTMs (= max. 60 channels) can be connected to a single operator unit and one control system.

If 2 x 4 sensors are not sufficient for one 1-channel RTM, a parallel RTM can be connected via the CAN bus.

Desired function via software licence	Hardware Add On	Sensor Add On
Contact detection	–	–
Empty cut detection	–	–
Breakage detection (via static limits)	–	–
Breakage detection (via dynamic limits) up to 1:4 at turning operations	–	piezoelectric force sensor
Bruch-Erkennung (via dynamic limits/AGC) up to 1:160 at turning of large parts	DSP Module	piezoelectric force sensor
Breakage detection (via through limits)	–	–
Wear detection (via static limits)	–	–
Wear detection (with trend analysis)	–	–
Wear detection (via I <sup>2</sup> feature)	DSP Module	VBS sensor
Chatter detection	DSP Module	VBS sensor
Spindle bearing monitoring	DSP Module	accelerometer
Tool/spindle vibration out of balance resp. out-of-balance-limitation (TSD, Tool Seat Detection)	DSP Module	accelerometer and impulse sensor

Subject to technical modifications  
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