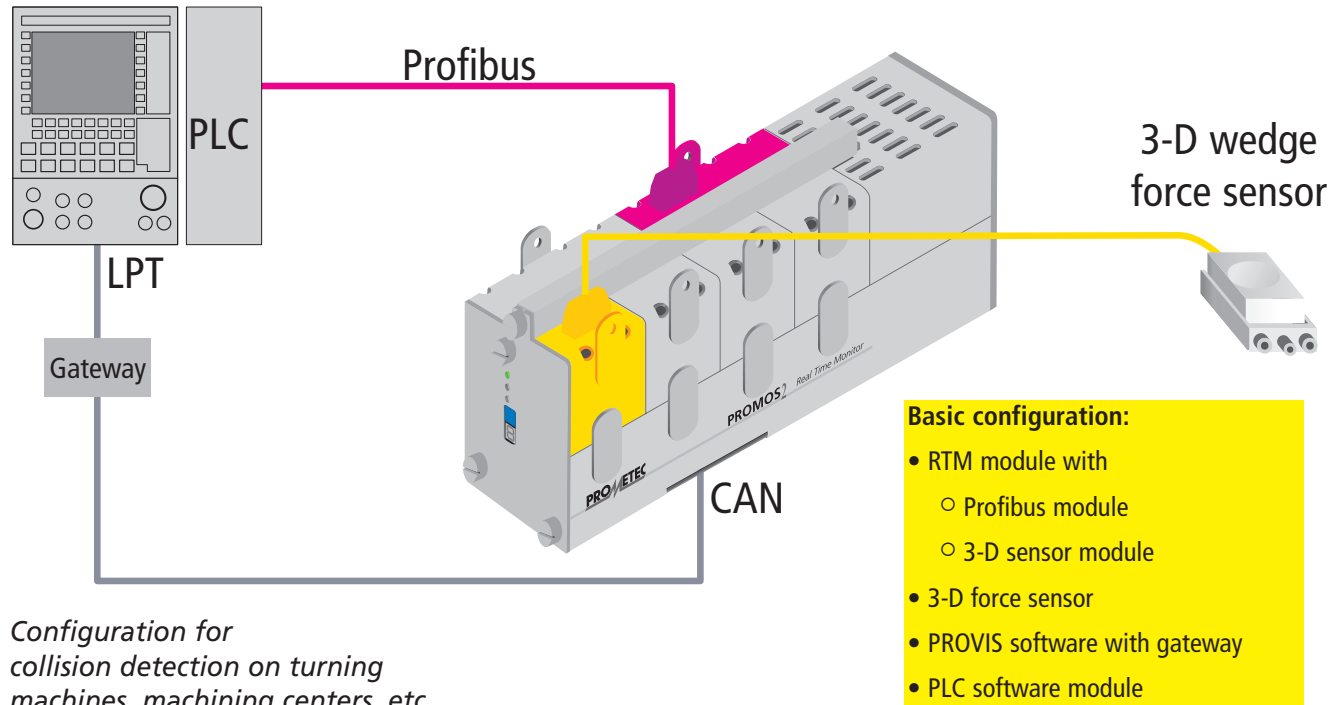


PROMOS 2 – always adaptable to your specific requirements: The Modular Approach



Configuration for collision detection on turning machines, machining centers, etc.

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 max. 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/sensor add-on
Contact detection	- / -
Empty cut detection	- / -
Breakage detection (via static limits)	- / -
Breakage detection of individual cutting edges on cutters	DSP module / Pulse sensor
Breakage detection (via dynamic limits)	DSP module / -
Breakage detection (via through limits)	- / -
Spike energy determination	DSP module / -
Wear detection (via static limits)	- / -
Wear detection (with trend analysis)	- / -
Wear detection (via wavelets)	DSP module / -
Chatter detection	DSP module / -
Spindle bearing monitoring	DSP module / Vibration sensor and vibration module
Tool / spindle vibration out of balance resp. out-of-balance-limitation	DSP module / Vibration sensor and vibration module
Workpiece balancing (turning machine)	DSP module / Vibration sensor and vibration module, pulse sensor

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PROMOS²



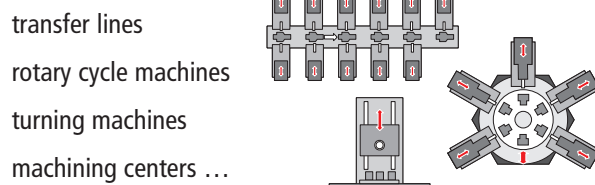
The Modular System for Monitoring of Metal Cutting Machines

- Improve productivity, process assurance and machine optimization
- Reduce scrap, Tooling and labor costs

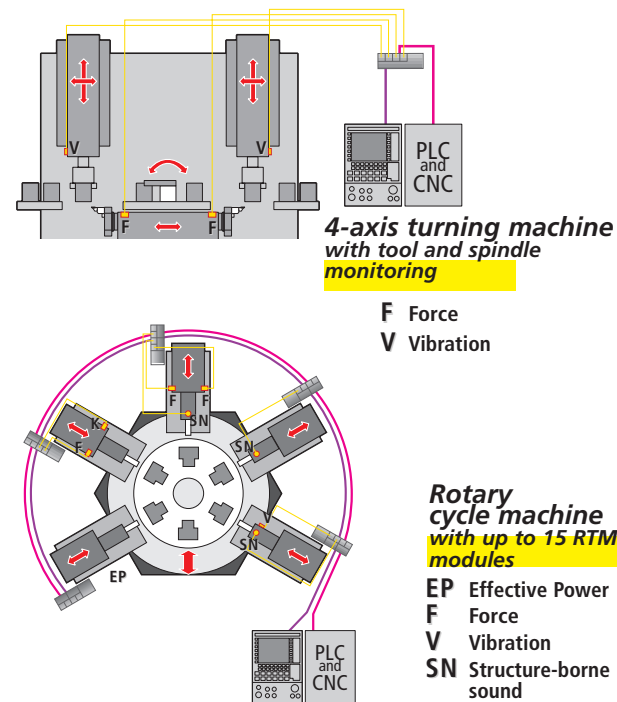
PROMOS 2: Modular Process Monitor System

- The successor to PROMOS incorporates the full scope of experience acquired from its predecessor
- Offers **compatibility** with Industry accepted Machine, Sensor, and Operator Interface protocols
- Standard Functions include **Collision, Tool, Contact- and Process Monitoring and Process-Optimization**
- Additional features include monitoring of: spindle bearings, recognition of tool- and spindle imbalance, slide condition diagnosis, Monitoring of machine components, ...**
- To expand the system requires no additional cabinet space. Functions of the base unit (collision Monitoring with data storage) may be expanded by using additional **hardware modules** or **software**
- PROMOS 2 uses the **same Operator Interface** as used in the original PROVIS Software on an Open NC platform, or existing PROMETEC Operator Panels: high acceptance by machine operators, automatic teach-in, visualization of the trend, statistics, fast installation, maintenance free, tele service

Customize for your specific application



System configuration (examples)

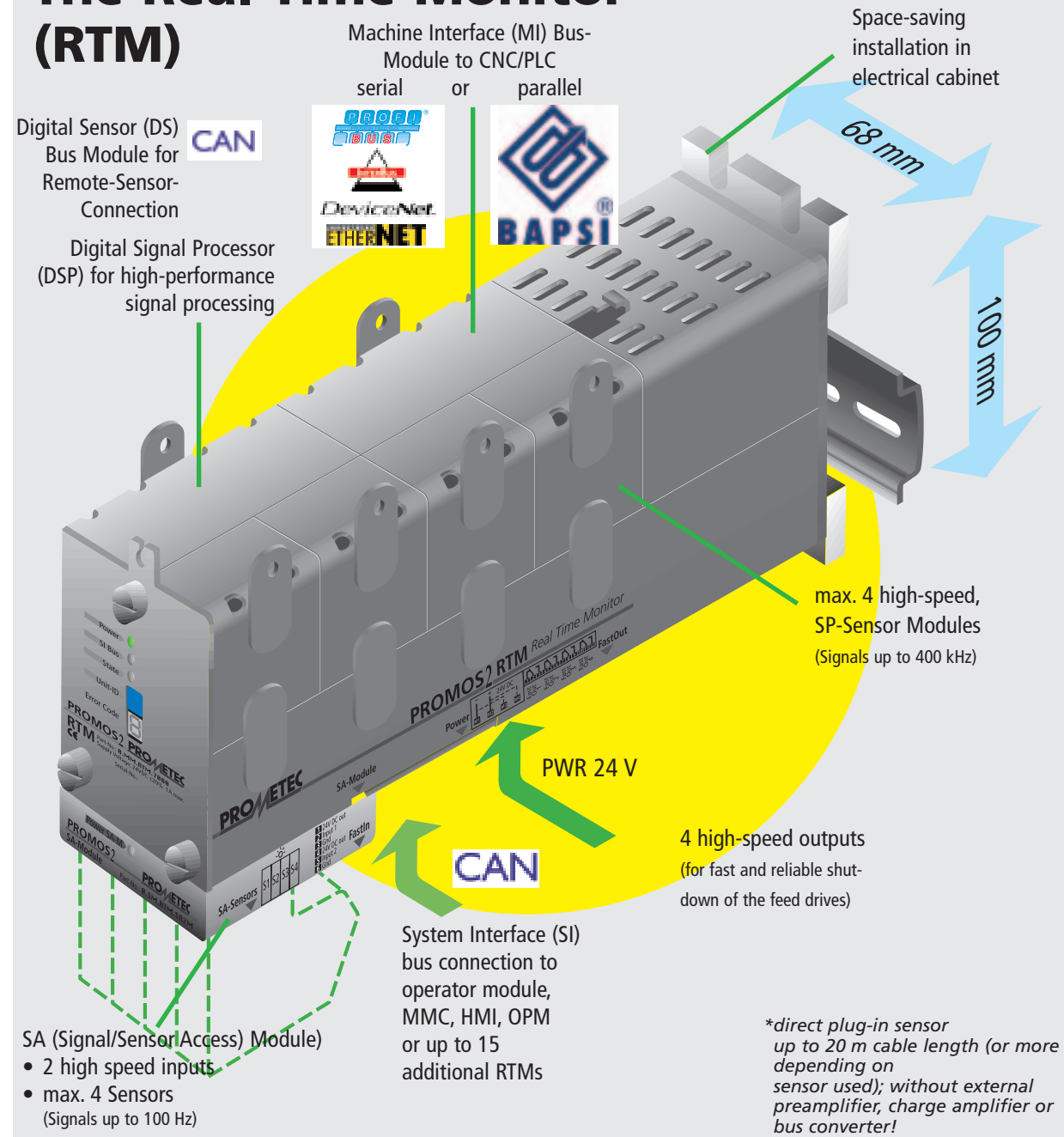


PROMOS 2 reduces scrap, improves quality, reduces labor costs

- PROMOS 2** detects collision prevents machine overload detects and minimizes tool breakage detects tool wear detects part contact etc. etc. etc. ...
- PROMOS 2** helps you to safeguard and optimize any machining process
- quality*
costs

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

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



Configuration Detail

- Real Time Monitor (RTM)**, the core element of PROMOS 2 – improved system integration:
 - suitable for integration into any machine with open or closed NC
 - works with all types of Machine Controls
 - no ISA or PCI slot required
 - up to four independent monitoring channels
 - simple to install 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 sensor modules (SA sensor modules)**, 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 and compile cycles
 - **Machine Interface Bus (MI-Bus)**, the Plug&Play connection :
 - For all common industrial standard field bus connections to PLC/CNC, such as Profibus, Interbus... etc. A parallel converter is also available
 - **System Interface Bus (SI-Bus):** integrated into each RTM:
 - The connection from RTM to one another and to the operator module - Plug&Play at all points
 - Industrial standard multimasterbus connects up to 15 RTM modules to one operator module OPM 14, OPM 25, or to PROVIS on an open NC