

PLC AUTOMATION

AC500 Condition monitoring

Predictable performance for your operations



Condition monitoring system CMS based on AC500

Optimize your assets with a condition monitoring system (CMS) based on the proven AC500 platform. The new FM502 module can help you to improve your operations resulting in greater efficiency and higher reliability while minimizing service and operating costs.



- Accurate protection
- High precision measurements
- Increased uptime
- Minimized service intervals



Add predictable performance and productivity

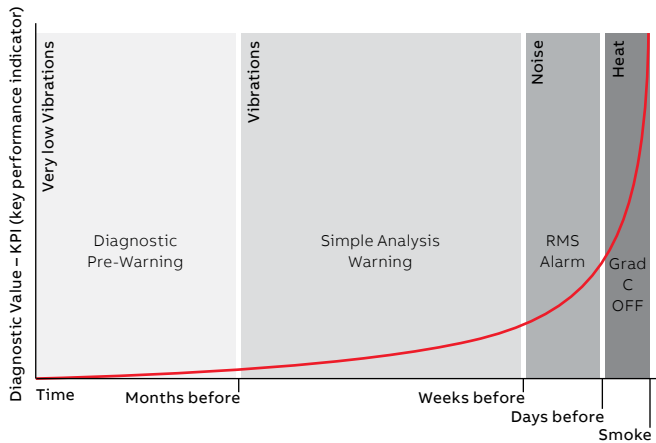
The new CMS module brings further reliability and easy integration with all kinds of machinery systems, enabling precise management of the real-time condition of your operation. This transparency takes your business and productivity to a new level with more efficient machines, predictable performance and significant reduction in maintenance costs.

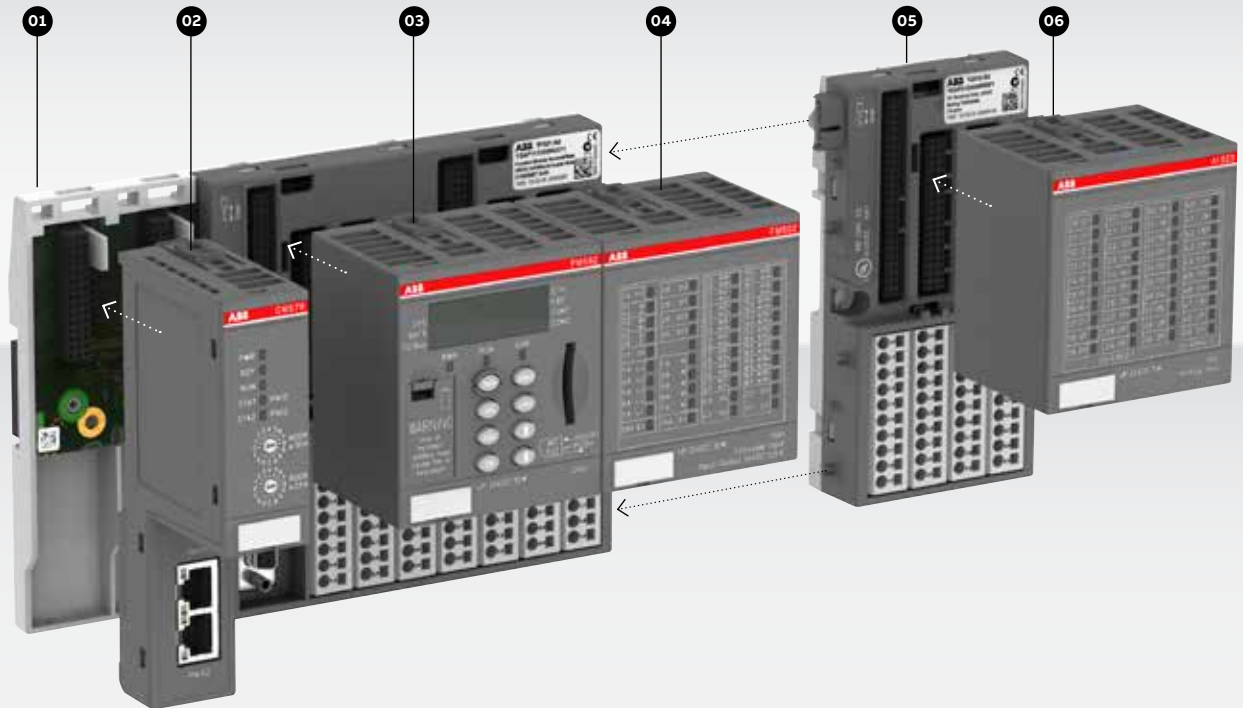
No matter whether as stand-alone condition monitoring or integrated into machine or process control, the module is perfectly suited to build optimized, self-analyzing automation solutions that simultaneously perform condition monitoring, control, protection, safety and data logger functions with one controller. The fast data logger function also contributes to consistent high quality production, due to the possibility to combine control and production information directly.

CMS also protects against machine failures, unforeseen sudden damage, incorrect installation, and reduces maintenance and wear. Virtually no unscheduled downtimes boost plant availability and reliability.

Advantages

- Planned maintenance rather than spontaneous repair ensures predictable performance
- Approaching damage is identified very early
- Protection against spontaneous failures and operation in critical conditions
- Reduction of costs in maintenance and lost production time
- Plant availability is increased
- Optimum utilization of the aggregates until real end of life
- Simple to use, maintain, adapt or expand





- 01 Terminal base: TF501 or TF521
- 02 Accomodating: 0 - 2 communication modules
- 03 PM592 CPU
- 04 FM502 CMS module
- 05 Expandable by I/O terminal units
- 06 Expandable by further I/O modules

AC500 + CMS = increased machine efficiency

All based on the AC500 platform modularity provides ultimate flexibility: Communication and I/O modules can be added and combined with Safety.

Expandable, robust and proven

- Stand-alone CMS or control integrated
- Expandable by AC500 communication modules and S500 I/O modules
- Proven and future proof, as based on AC500 platform
- Extreme conditions XC version available
- Fast data logger, e. g. for production quality
- Condition monitoring and fast protection (vibration, current, voltage, speed/encoder)
- FM502-CMS function module needs to be connected with terminal base TF5x1 for direct interfacing to CPU, communication modules, other I/O
- PM592 CPU to be used on same TF5x1 (data storage, signal processing or communication, C-code interface for own diagnosis algorithms, 4GB flash disk for fingerprints, indicator trending)

FM502-CMS module

- 128 MB local user memory
- 16 analog inputs, all synchronously sampled; configurable as IEPE or +-10V
- Per channel 50k samples/s, 24bit ADC, per channel adjustable sampling, start, stop, trigger
- Encoder inputs (5V or 24V) up to 300 kHz, 2 counters; 12 modes, including absolute SSI (1 MHz)
- 2 digital inputs, 2 in/outputs
- Compact WAV files delivered automatically to CPU, including synchronized encoder signals
- Input values always available for fast protection in CPU I/O image (also if no measurement is running)
- Included in Automation Builder: configuration, libraries for CMS control and WAV file handling, "Application examples" and signal processing library



Avoid spontaneous failures in critical parts, especially in rotating and reciprocating machinery.

Application descriptions

Condition Monitoring with AC500 PLC

Controller integrated or stand-alone condition monitoring

The AC500 condition monitoring module FM502 is a natural part of the AC500 platform and Automation Builder engineering suite, and can be used in different condition monitoring concepts, stand-alone or control integrated.

Due to the easy programming in PLC languages, it is usable for a variety of use cases and is especially suitable for plant, line and machine builders as easy extension of their offering.

If controller integrated

- it enables at very reasonable cost
- the best prediction horizon as it can measure online, when best measurement quality is given without scheduling production interruptions
- while continuously protecting the application in real time e.g. with the same or other sensor(s)
- Further inputs can be used as fast data logger e.g. precisely documenting process quality

Therefore it is not only able to continually check the mechanical components but also gives fast protection for spontaneous and large failures even while measuring. The condition monitoring mode creates a database internally or externally for predictive maintenance. Automatic and user assisted responses can be enabled to prevent costly consequences including total failures.

As many as 16 vibration sensors + 2 encoder counters can be connected.

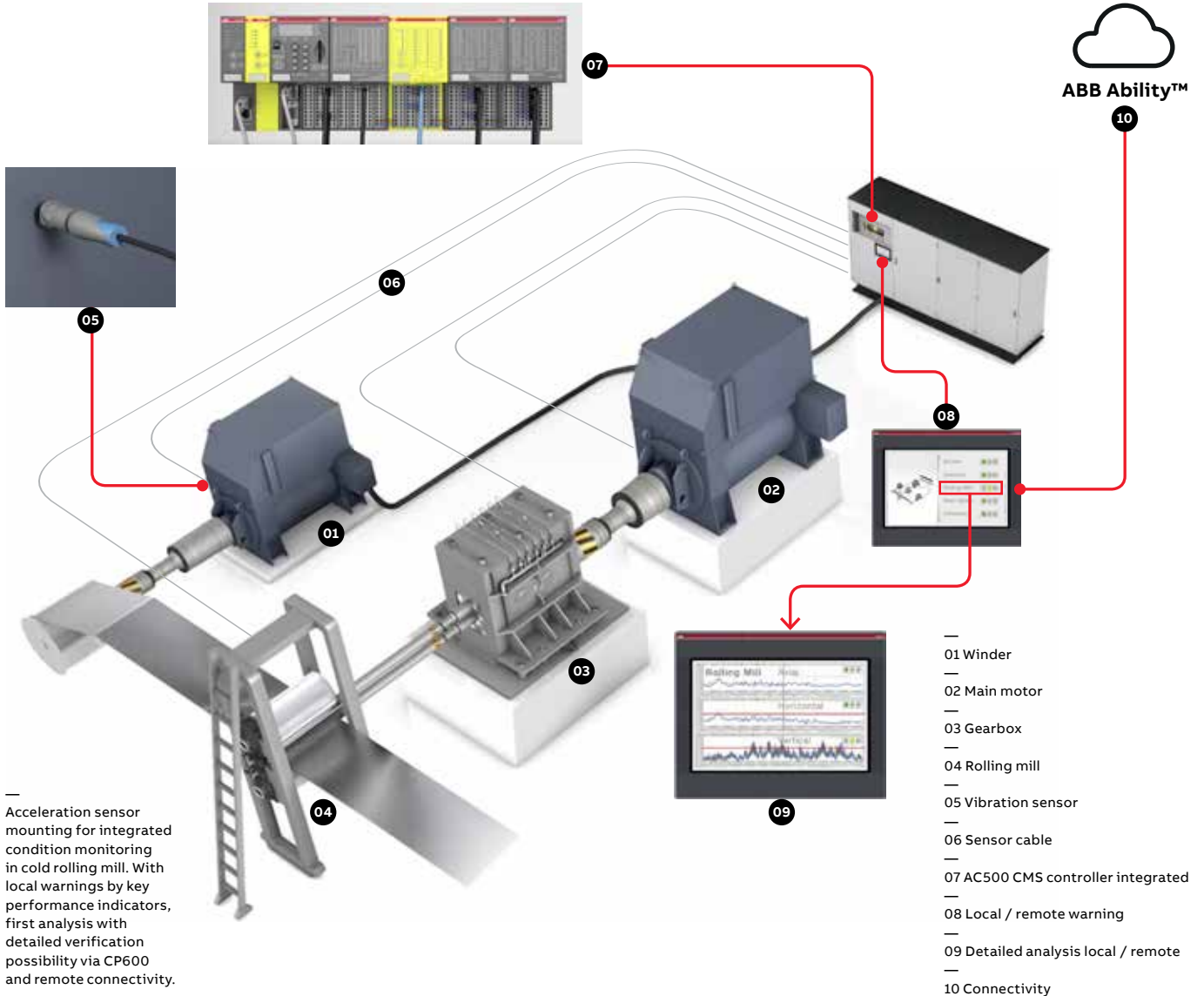
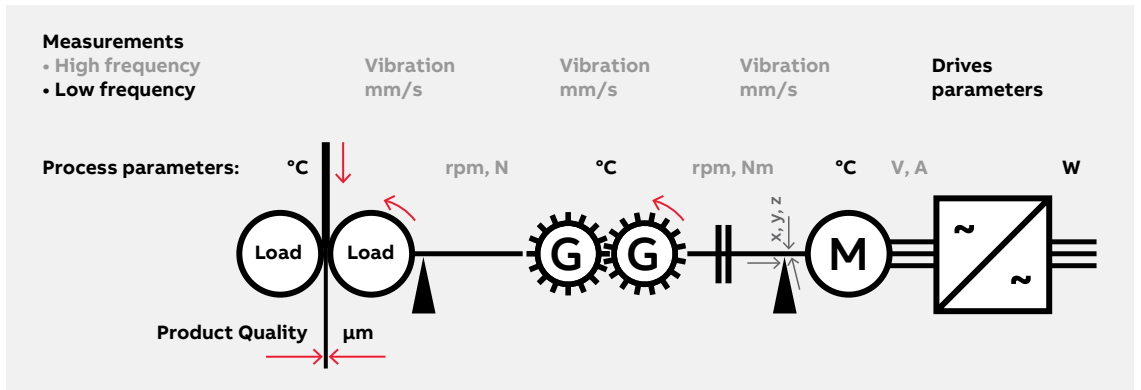
The recorded condition monitoring data can be stored in the CPU flash disk before communication or directly analyzed. Higher level indicators can be calculated and communicated to a local or remote HMI or database system.

Predictive performance for your process or machines

- Easy and cost saving integration of condition monitoring into the AC500 platform
- Early detection of mechanical damages
- Fast protection from spontaneous failures
- Even complex C-code analytics can be used locally for meaningful own performance indicators
- Leads to optimized planning of maintenance instead of fixed, scheduled service and spontaneous repair
- No additional system or fixed software for diagnostics and visualization needed
- Easy storage of the data, locally (4GB) or in remote servers and databases
- Ideally suited also for retrofit of older equipment, as it can make use of mechanical reserves of still valuable equipment



— AC500 Condition Monitoring module FM502-CMS: Controller integrated or stand-alone CMS covering a complete drive train.



— Acceleration sensor mounting for integrated condition monitoring in cold rolling mill. With local warnings by key performance indicators, first analysis with detailed verification possibility via CP600 and remote connectivity.

Example: Cold rolling mill in steel processing:

- One FM502-CMS module can execute differently configured measurements at the same time and can be reconfigured at runtime
- Several critical and unique components can be protected and condition predicted: Motors, gearbox, process (cold rolling mill)
- Production quality can be logged in parallel in real time
- Remote diagnostics expertise and detailed analysis and reports only in case of warnings

Please watch our videos on our ABB PLC YouTube channel:



www.youtube.com/user/abbplc

ABB Automation Products GmbH

Eppelheimer Straße 82
D-69123 Heidelberg / Germany
Tel.: +49 62 21 701 1444
Fax: +49 62 21 701 1382



www.abb.com/plc



www.abb.com/automationbuilder

Additional information

We reserve the right to make technical changes or modify the contents of this document without prior notice. ABB does not accept any responsibility whatsoever for potential errors or possible lack of information in this document.

We reserve all rights in this document and in the subject matter and illustrations contained therein. Any reproduction, disclosure to third parties or utilization of its contents – in whole or in parts – is forbidden without prior written consent of ABB.

© Copyright 2018 ABB. All rights reserved.
Specifications subject to change without notice.