All-in-one solution for condition monitoring

CONDITION MONITORING TOOLKIT

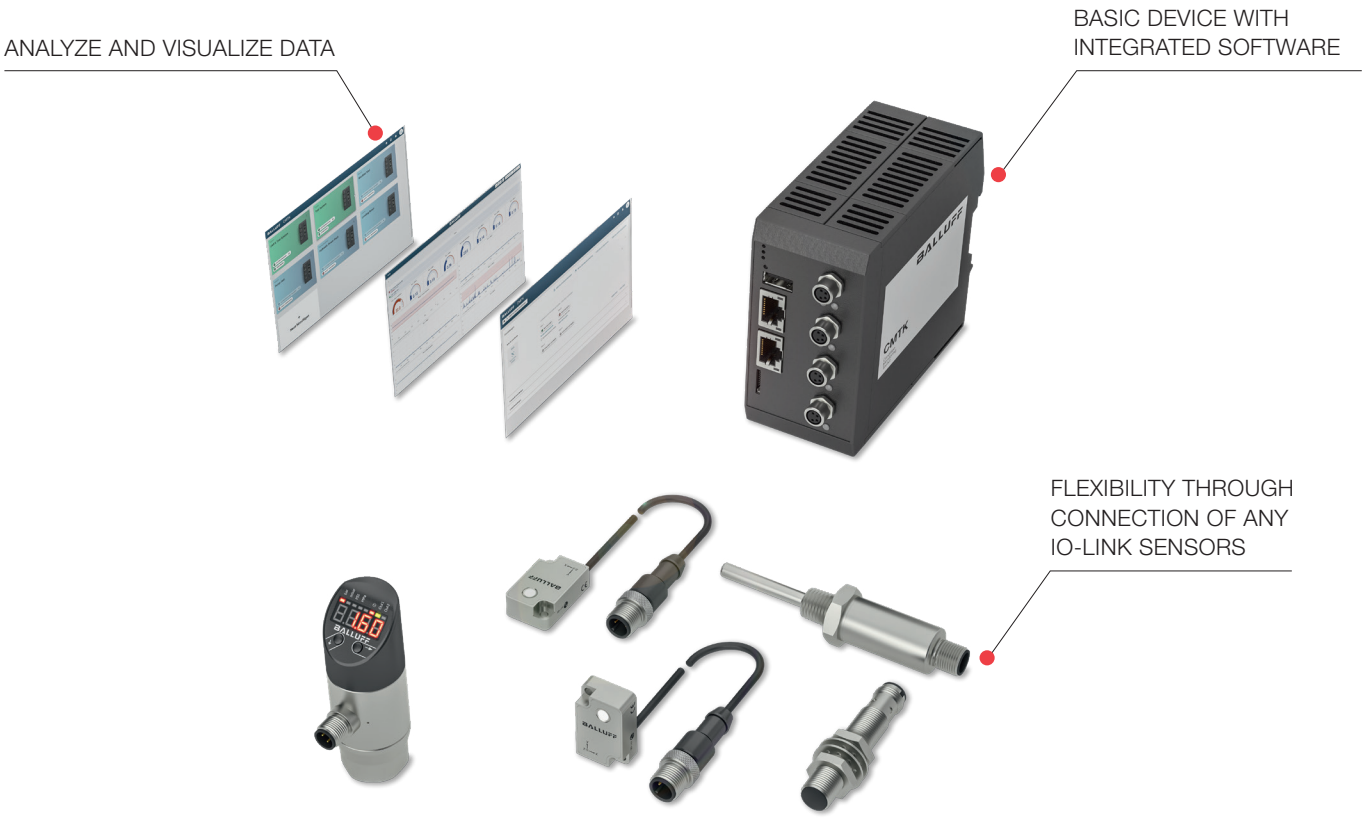
With the **Condition Monitoring Toolkit (CMTK)** from Balluff, you can avoid unplanned failures and machine downtime, which saves both costs and repair effort. The principle behind this is as simple as it is sustainable: Our monitoring sensors and systems collect and process relevant equipment performance information on a broad basis. This enables early machine and facility problem detection and alerts you to needed maintenance, allowing you to address potential failures before they occur.

Keeping an eye on the condition of your machines at all times gives you the option of proactively carrying out repairs and preventive maintenance. Modern condition monitoring detects even the smallest changes quickly, reliably and cost-effectively. And you can retrofit existing machines without impacting the installed control system.

Components of the Condition Monitoring Toolkit (CMTK) solution

Our toolkit consists of a base unit (hardware) and integrated software for automated collection and evaluation of sensor data. In addition, Balluff can provide you with everything else you need for data acquisition from a single source: a wide variety of IO-Link sensors as well as all associated cables and power supplies. Up to four IO-Link sensors — including sensors from other manufacturers — can be connected per base unit. And the base unit itself does not require a connection to the machine controller. The advantage: Your existing systems do not have to be adapted, but only supplemented. This means that current controls architectures and processes remain untouched.

See for yourself: There are almost no limits to the possible applications for the CMTK.



READY FOR A WIDE RANGE OF APPLICATIONS

Condition monitoring of the entire plant

Whether it is conveyor belts, industrial robots, hydraulic units, motors, pumps or air systems, the failure of individual components in complex facilities can lead to a stop of the entire plant. Specific indicators are used to monitor the condition of each component.

Vibration monitoring, for example, is important for rotating machines, systems and individual parts because vibrations are a typical sign of increasing wear, which ultimately leads to damage and thus failure.

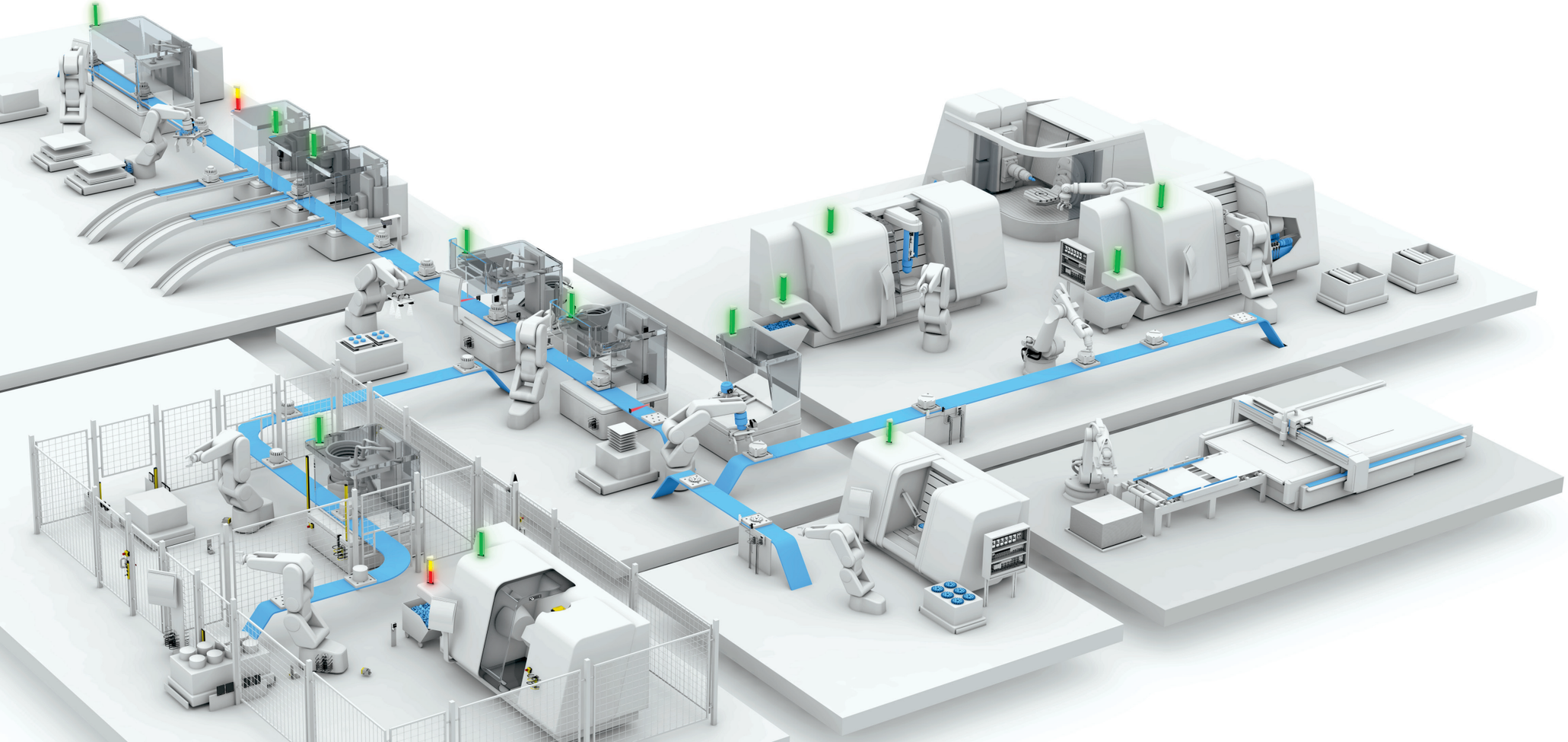
Temperature also acts as an important indicator to check the proper machine function. Sensors can be placed to measure the contact temperature on important components such as spindles, bearings or motors, but also temperatures of fluids.

Other indicators can also be monitored, depending on the equipment and potential failure modes.

Check the table to determine which type of sensor is suitable for which application.

Sensors for condition monitoring at a glance

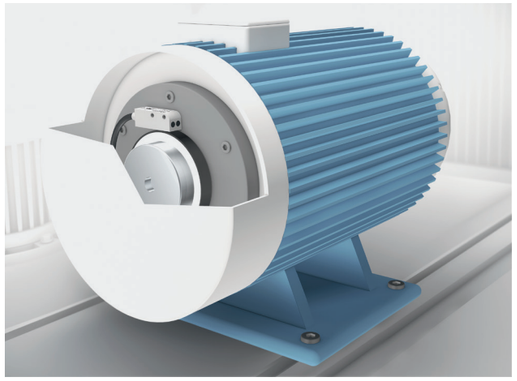
INDICATOR TO BE MEASURED	SENSOR TYPE	PRODUCTS
Vibrations, oscillations, accelerations	Condition monitoring sensors	BCM
Temperature	Temperature sensors Condition monitoring sensors	BFT BCM
Pressure	Pressure sensors Condition monitoring sensors	BSP BCM
Displacement and distance measurement	Inductive sensors Ultrasonic sensors	BES BUS
Level measurement	Capacitive sensors Ultrasonic sensors	BCS, BAE BUS
Flow rate	Flow sensors	BFF
Speed detection	Inductive sensors	BES



MONITORING OF TYPICAL COMPONENTS

Motor monitoring: Keeping electric motors highly available

To enable you to monitor and anticipate potential motor problems, the CMTK continuously records all relevant operating data, such as vibration. Through monitoring and evaluation, excessive vibration, imbalance and wear are detected at an early stage. As soon as a limit value is exceeded, you receive corresponding information immediately and automatically, in which the various measured variables are clearly visualized.
For example, this enables you to constantly monitor for overload and bearing damage, allowing you to implement maintenance measures in advance and before major problems arise. You can therefore significantly extend the service life of your motors and ensure high machine and plant availability.

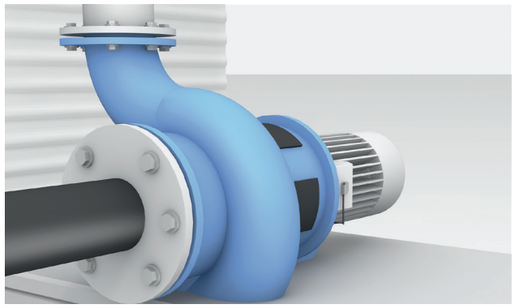


Sensors for motor monitoring

INDICATOR TO BE MEASURED	SENSOR TYPE	PRODUCTS
Vibrations, oscillations, accelerations	Condition monitoring sensors	BCM
Speed detection	Inductive sensors	BES
Temperature	Temperature sensors Condition monitoring sensors	BFT BCM

Pump monitoring: Ensure operational reliability

Vibration, temperature and pressure provide important information on the condition of the pump. With the appropriate sensors, the CMTK documents the recorded data and provides the information where it is needed. This gives you the opportunity to react immediately to deviations in these measured variables.
As a retrofit system solution, you can easily implement the CMTK independently of the control solution on pumps already installed and in use.

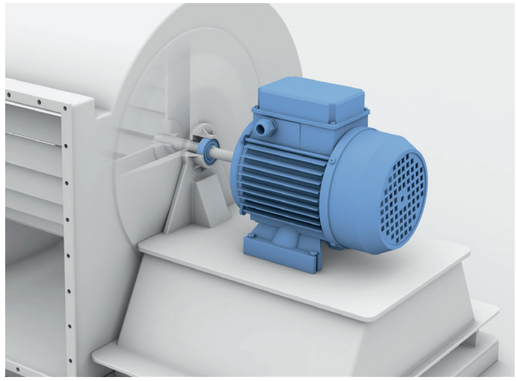


Sensors for pump monitoring

INDICATOR TO BE MEASURED	SENSOR TYPE	PRODUCTS
Vibrations, oscillations, accelerations	Condition monitoring sensors	BCM
Speed detection	Inductive sensors	BES
Temperature	Temperature sensors Condition monitoring sensors	BFT BCM
Pressure	Pressure sensors Condition monitoring sensors	BSP BCM

Fans and air systems: Consistently avoid failures

Whether pressure, temperature or speed, with the CMTK you always have all important measured variables of your fans and air systems in view. Vibration is an early indicator of fan imbalance or component wear, therefore continuous vibration monitoring enables proactive intervention before a failure occurs. Simply define limit values, and a warning will be issued if they are exceeded. You can then plan the necessary maintenance measures in advance and before problems cause significant damage and downtime.



Sensors for fan monitoring

INDICATOR TO BE MEASURED	SENSOR TYPE	PRODUCTS
Vibrations, oscillations, accelerations	Condition monitoring sensors	BCM
Speed detection	Inductive sensors	BES
Temperature	Temperature sensors Condition monitoring sensors	BFT BCM
Pressure	Pressure sensors Condition monitoring sensors	BSP BCM

IMPLEMENTATING AND WORKING WITH THE CONDITION MONITORING TOOLKIT

Requirements and possibilities

The CMTK system can be used completely independently as a retrofit solution or can be integrated into a company network. Intervention in the machine control system is not necessary. When integrated into the company network, you can conveniently access the system and the data from your workstation and even forward data to higher-level systems due to suitable interfaces such as MQTT. The software itself runs directly on the CMTK without having to be installed separately. Simply connect to the system via web browser and get started.

First steps

The software handles a wide range of tasks — from sensor setup to visualization. During initial commissioning, a setup wizard guides you directly through the first important steps, so that you can get started with data acquisition and visualization within a few minutes and set up alarms quickly and easily.

The CMTK is also equipped with a configuration wizard for Balluff condition monitoring sensors (BCMs).
With its help, you can quickly and easily set up vibration monitoring according to established standards, e.g. for motors, pumps, fans or compressors. Just plug &play!

Daily work

The system can be flexibly adapted to individual requirements. For example, you can define limit values in advance. If these are exceeded, they trigger a warning – via SmartLight or e-mail. This ensures monitoring even when the machine is running unattended. And documentation of the incident subsequently enables the origin of the error to be traced.

In addition, it is possible to implement more complex analyses by installing your own software packages directly on the device and integrating them into the existing IT infrastructure via a variety of interfaces. This allows you to choose between the existing CMTK tools and visualization or to expand the system capabilities with your own solutions.

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