

# Much more than **you see**

Configurable **system** for **continuous monitoring  
and protection** of spindles and machine tools



**S A F E**  
S Y S T E M

# Your **safety** solution

B-Safe System was invented to expand spindles and machine tools diagnostics according to vibration and temperature analysis.

**The miniaturised system can be installed directly on your spindle guaranteeing a real-time monitoring,** as well as reducing the machine downtimes by predicting malfunctions.



## Crash protection

Immediate machine stop



## Continuous monitoring

Data recording even if the machine is turned off



## Black box

Embedded data logger



## Industry 4.0 upgrade

Information sharing

## Innovative solution

The hybrid technology MEMS 3D and piezoelectric **guarantees a complete signals analysis on a wide band.** The presence of a **microprocessor with integrated memory** allows local detection and memorisation of collision phenomena, unbalances, overloads, anomalies of the working cycle, tools wear and bearings diagnostics.



B-Safe version	X
Sensor dimensions with connector	M12x1,0 - L 41mm
Sensor dimensions with integrated cable	M12x1,0 - L 32mm
Sensor dimensions with integrated cable	M16x1,5 - L 22mm
Cable length	5m*
Integrated triaxial sensor	MEMS ±16g 1.000Hz
Integrated monoaxial sensor	piezoelectric ±50g 10kHz
Working temperature	-40÷85°C (-40÷185°F)
Shock resistance	10.000g
Connectivity	Modbus TCP or RTU on RS485

\* The B-Safe sensor is available in 3 versions to guarantee all installation types inside the machine tool:  
 Connector version, available in M12 size -  
 Integrated cable version, available in M12 and M16 sizes -

\* A wide range of extensions are available.

# Always connected



The always-connected **B-Safe HMI** is a software that allows interaction with multiple sensors at the same time and is available in different languages and layouts. It can be installed on PCs or machine tools control panels that run Microsoft **Windows 7, 8.x or 10**.



## Fingerprint

NEW

The **Fingerprint** option is a **B-Safe application intended for condition monitoring of machine tool and machine tool spindle** based on vibration analysis; it is a valuable tool for preventive maintenance. Anomalies and wear become visible. The option records the **vibration signal (RMS and FFT) in a good condition status and uses this signal to create a reference mask**. This mask is used during the lifetime of the machine to check its status, comparing the vibration generated with the reference mask. **Total RMS** is used to have a simple and fast comparison between measures. **FFT** analysis can be used to carry out further investigations.

Related options: **L10**



## Events

The advantage of the events session is to review at your spindle history **by browsing all the essential items, including alarms, warnings, check-up notes and power status through an intuitive infographic**.

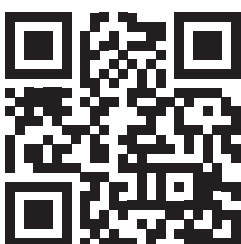
In the case of collision, the system will allow you to examine in greater detail the waveform in the 4 seconds before and 1 second after the event, highlighting the malfunction factors.

Related options: **L1 - L5**

# EVOLVE your factory

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## APP DOWNLOAD



B-Safe Cloud is the online evolution of B-Safe X System, which allows you to remotely **supervise all B-Safe sensors installed on your machine tools and monitoring their productivity status**.

Through the B-safe Cloud App you can personalise the **alerts that can be received via SMS, e-mail or push notification on smartphones**.

Moreover, it is possible to access the wide range of B-Safe features. To access B-Safe Cloud data a dedicated web portal and the B-Safe Cloud App (for both iOS and Android devices) are available.

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## Integrated sensors data

All sensor data (temperature and triaxial/monoaxial vibration) are available via MODBUS protocol and can be viewed through the B-Safe HMI in real-time.

**B-Safe HMI allows the ability to export the information at any time** so that you can manage the data in complete autonomy.

Related options: **L2 - L3 - L4 - L9**



## Statistical data and Trends

The B-Safe HMI allows setting coefficients and thresholds to adapt to a large variety of applications.

This section includes the Spindle Check-Up function, which can **monitor the real health status of your spindle.**

Additionally, these data are available anywhere via the internet with B-Safe Cloud APP.

Related options: **L6 - L7 - L8**



# Configure your system

The B-Safe System can be **configured according to your specific needs**; you just need to pick up the options you want, and you are good to go.

**L1:** Event Logbook

**L2:** Triaxial Real-Time Data

**L3:** High Frequency Monoaxial Data

**L4:** FFT Analysis

**L5:** Collision Waveform Recorder

**L6:** Historical Trends

**L7:** Spindle Check-Up

**L8:** Service Notes

**L9:** Triaxial Real-Time Data Recorder

**L10:** Fingerprint

## with B-Safe CLOUD

✓ **Data export** to the company server

✓ Post-process **manufacturing analysis**

✓ Real-time **machine monitoring**

✓ **Instant notification** of alarms



# Predictive maintenance at your service



B-Safe Spindle Check-Up function includes multiple algorithms to monitor the efficiency of your manufacturing process, intending to **maximize the productivity of your machines and the quality of your products**. The statistical analysis provided by the system gives essential support for **planning maintenance activities, according to the real use of your equipment**.

## Suitable for each application

A wide range of functions allows you to manage the whole machining process, based on **fully customisable features** as follows

Collision alarm within 1 ms	Waveform recording of the last 10 collision events
Overloading alarm	Statistical data recording
Overheating alarm	Historical trend recording
Programmable thresholds	Real-time data for process-monitoring
Sensor with integrated memory	Digital data for post-processing
Events data logging	5 days back-up battery
Fingerprint	Alignment of B-Safe Sensor axis to those of the machine

## B-Safe System accessories



Sensor

With connector or integrated cable version



Cable

Wide range of extension cables



Interface

Battery and TCP-IP connection device



TMS

Transport monitoring system



Start-up kit

Installation kit, software and user manual

## Today you can start the path for a safer company

B-Safe System is a combination of multiple advanced technologies, allowing the **realisation of an interconnected and distributed system for the analysis and supervision** of your manufacturing plant.

**SCAN**  
Go to B-SAFE site

[b-safesystem.balancesystems.com](http://b-safesystem.balancesystems.com)



Discover all information  
**[b-safesystem.balancesystems.com](http://b-safesystem.balancesystems.com)**



- **Balancing machines** for rotating components
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