

Protect Your Machine

Crash

Vibration Overload

Unbalance

Wear

Better be safe. Safely be better.

This is what we can do for you!

With our **PulseNG** system, your machines are fully protected automatically in real time and around the clock. We are compatible with the following CNC systems: Siemens, Bosch Rexroth, Heidenhain, Fanuc, Mitsubishi ...

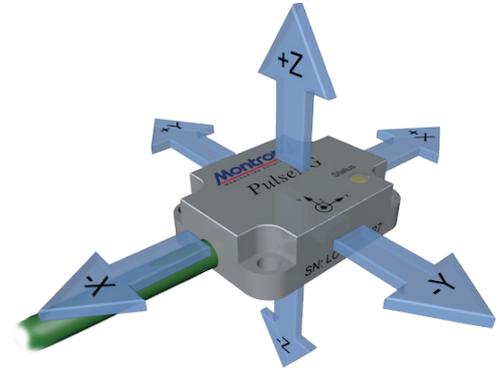
We can detect:

- High-Speed-Impact-Crash and Low-Speed-High-Force-Crash, no matter from which direction
- Overload of vibration, force and power
- Condition of machine components (ball screw, linear guide, spindle, etc.)

Response time $\geq 1\text{ ms}$ *

- Machine emergency stop
- NC Stop

* Valid for basic systems! May vary depending on the configuration.



Axes of PulseNG sensor

Variable Configurations

Basic System



(IBU-NG + **PulseNG** sensor)
Effective protection with just one sensor

Extension Solutions



(e.g. with MUX-NG + StrainLink Sensors + SLA-NG Amplifier + **PulseNG** Sensor + **PulseNG** M12 Sensor) Enhanced deliverables with combined physical measurements

Application-dependent Sensor Selection

PulseNG

- Machine protection
- Machine diagnostics
- High-Speed-Impact-Crash



3 axes acceleration sensor

PulseNG M12

- Machine protection
- Machine diagnostics
- High-Speed-Impact-Crash
- Space-saving installation



3 axes acceleration sensor

StrainLink250-DA

- Machine protection
- Low-Speed-High-Force-Crash



Strain gauge sensor

PS200-NG

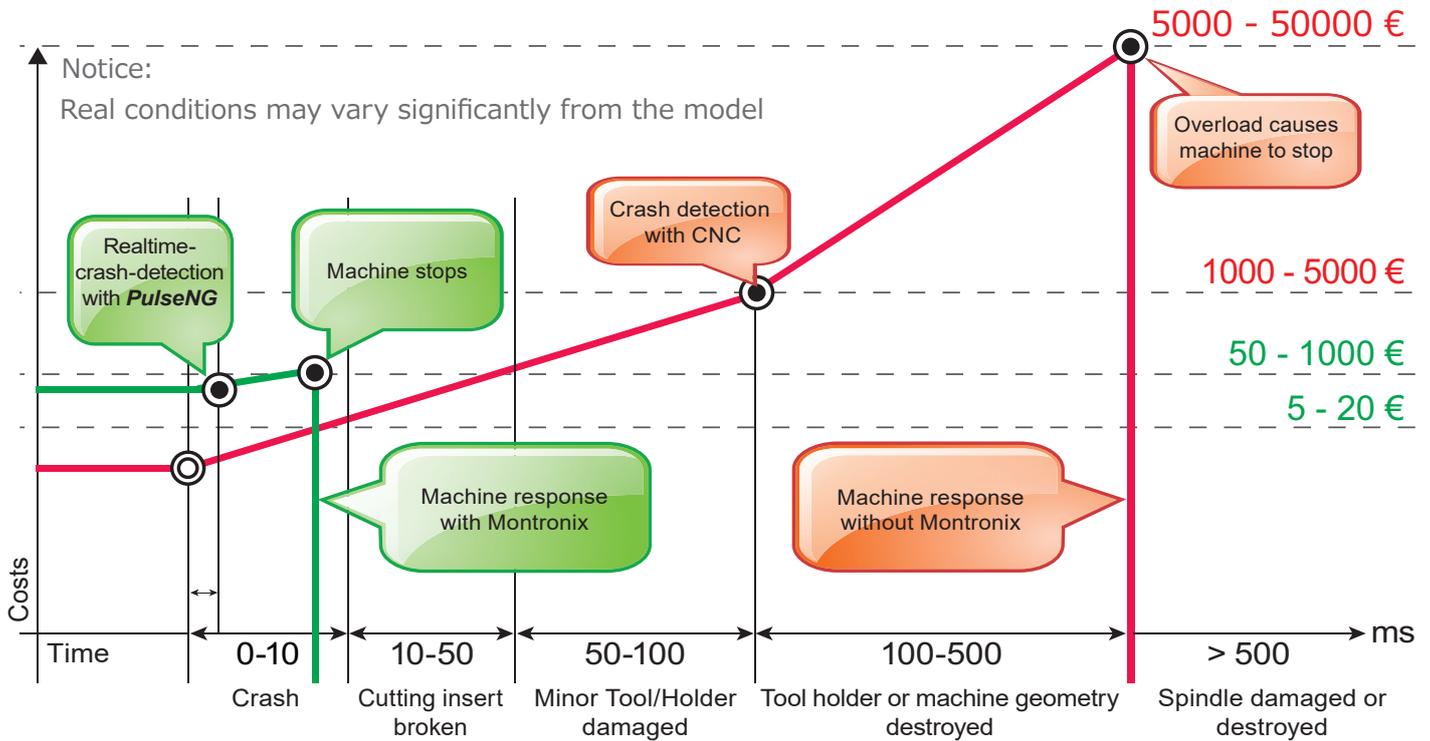
- Machine protection
- Overload



Power sensor

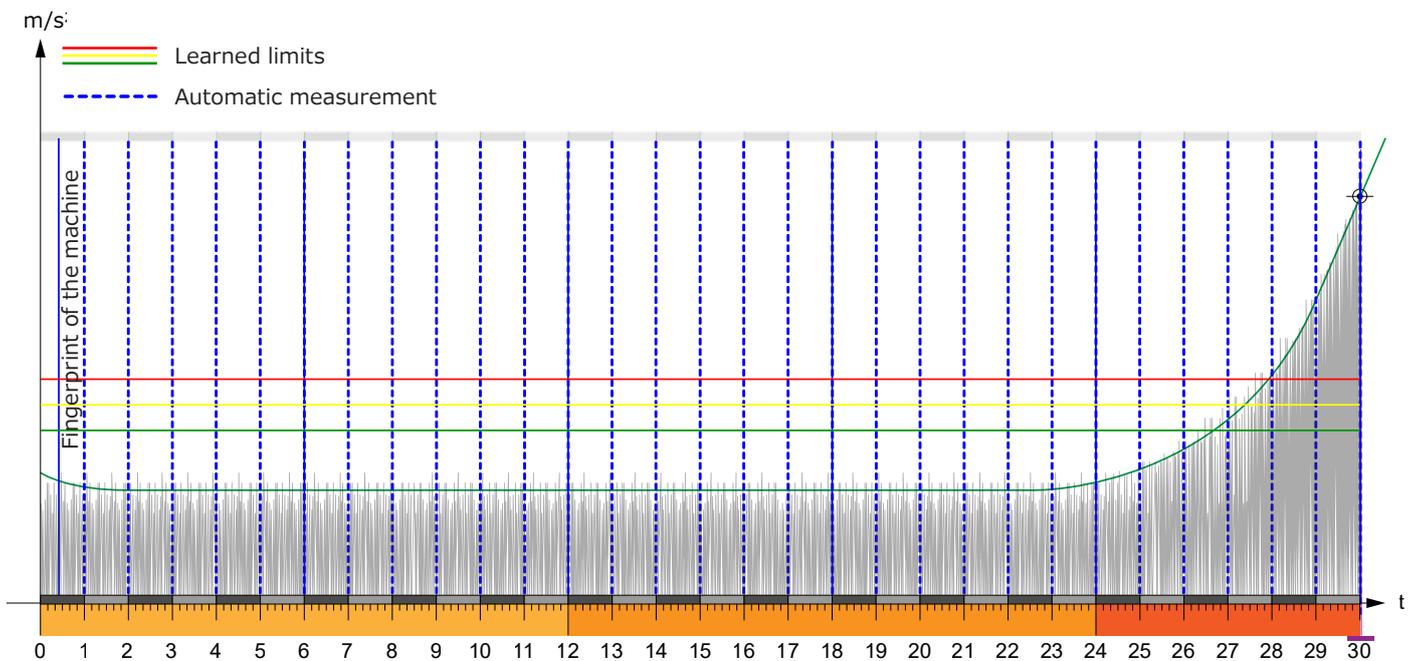
One Product - Three Solutions

Machine Protection



➔ Fast reaction – increased machine availability – enormous costs reduction

Automatic Machine Condition Diagnostics – Trend Diagram



Automated Alerts at Wear & Damages

➔ Regular automatic trend-measurements for early detection of machine wear.

Application Examples

Equal protection in different operating conditions, **PulseNG** offers Eight Monitoring scenarios. Each scenario defines one Monitoring status. Under each scenario, Three limits can be selected and set. A typical scenarios configuration is presented below.*

Scenario No.	Operating Status	Monitoring Task	Reaction
1	Rapid feed (G00)	Crash	Emergency stop
2	Feed (G1)	Crash & vibration overload	NC stop, feed rate adjustment
3	Tool change	Crash	Emergency stop
4	Wear measurement run	Condition of X-Axis	Automatic alert message
5	Wear measurement run	Condition of Y-Axis	Automatic alert message
6	Wear measurement run	Condition of Z-Axis	Automatic alert message
7	Wear measurement run	Spindle condition	Automatic alert message
8	Wear measurement run	Condition of B-Axis	Automatic alert message

*recommended, however individually adaptable

■ Text Event Recorder

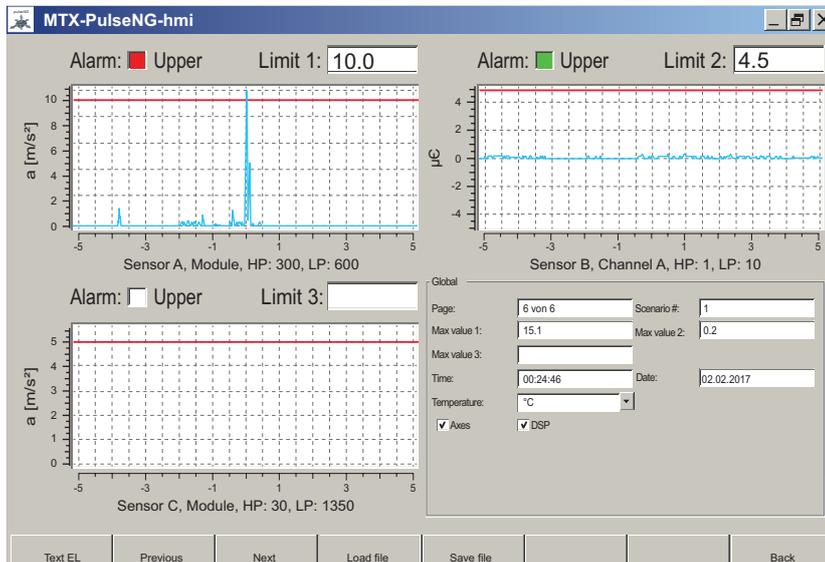
The screenshot shows the MTX-PulseNG-hmi interface. At the top, there is a title bar with the text 'MTX-PulseNG-hmi'. Below the title bar is a table with 17 columns: Index, Type, Date/Time, Unit, Scenario #, Sensor #, Sensor type, Limit #, Axes (X,Y,Z,M), DSP, Limit type, Limit, Max, HP (Hz), LP (Hz), Alarm, and Stop. The table contains 10 rows of data, including alarm events and power status changes. Below the table, there are several buttons: 'Grafic EL', 'Text EL partial view', 'Export csv file', and 'Back'. At the bottom of the interface, there is a status bar showing 'Connected with Montronix_001', 'Monitoring: [green indicator]', 'Teaching: [white indicator]', 'Scenario #: 1 / Collision', and the Montronix logo.

Index	Type	Date/Time	Unit	Scenario #	Sensor #	Sensor type	Limit #	Axes (X,Y,Z,M)	DSP	Limit type	Limit	Max	HP (Hz)	LP (Hz)	Alarm	Stop
0001	Alarm	02.02.2017 00:24:46	a [m/s²]	2	A	PulseNG	1	Module	Average	Upper	8.0 a[m/s²]	42.5 a[m]	300	600	On	On
0002	Alarm	23.01.2017 01:31:04	v [mm/s]	1	A	PulseNG	3	Module	Average	Upper	10.0 v[mm/s]	23.0 v[m]	1	50	On	On
0003	Alarm	20.01.2017 04:13:53	v [mm/s]	5	A	PulseNG	1	X axis	Average	Upper	32.5 v[mm/s]	48.9 v[m]	40	1600	On	Off
0004	Alarm	20.01.2017 04:13:53	µC	2	B	SLA-NG	2	Channel 2	Average	Upper	2.0 µC	11.8 µC	400	600	On	On
0005	Power on	18.01.2017 00:48:44	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0006	Power off	10.01.2017 20:37:47	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0007	Alarm	09.01.2017 13:06:18	v [mm/s]	1	A	PulseNG	2	Module	Average	Upper	7.0 v[mm/s]	9.3 v[m]	400	600	On	Off
0008	Alarm	06.01.2017 01:45:26	µC	2	B	SLA-NG	3	Channel 1	Average	Upper	2.0 µC	12.1 µC	1	50	On	On
0009	Alarm	05.01.2017 14:13:58	v [mm/s]	6	A	PulseNG	2	Y axis	Average	Upper	32.5 v[mm/s]	52.3 v[m]	400	600	On	Off
0010	Alarm	04.01.2017 18:27:17	µC	1	B	SLA-NG	2	Channel 1	Average	Upper	6.0 µC	18.3 µC	1	50	On	On

- ➔ Every limit crossing will be recorded in a ring buffer, which is not editable or erasable
- ➔ The text event recorder stored in the Monitoring hardware can save up to 4000 text events, which can be exported as a csv file
- ➔ The graphical event recorder can save up to 64 graphic events (5 seconds before and after each limit crossing) - see the following page

Application Examples

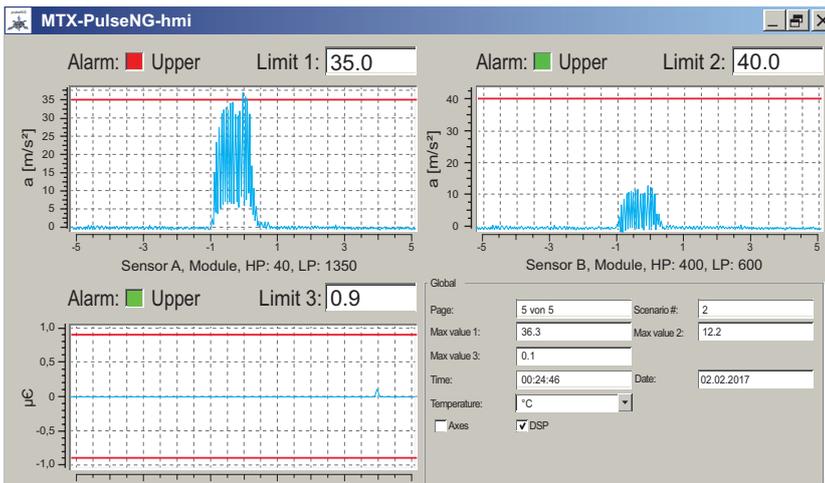
Graphical Event Recorder



Crash

- Limit 1 High-Speed-Impact-Crash
- Limit 2 Low-Speed-High-Force-Crash
- Limit 3 Spare for customer use

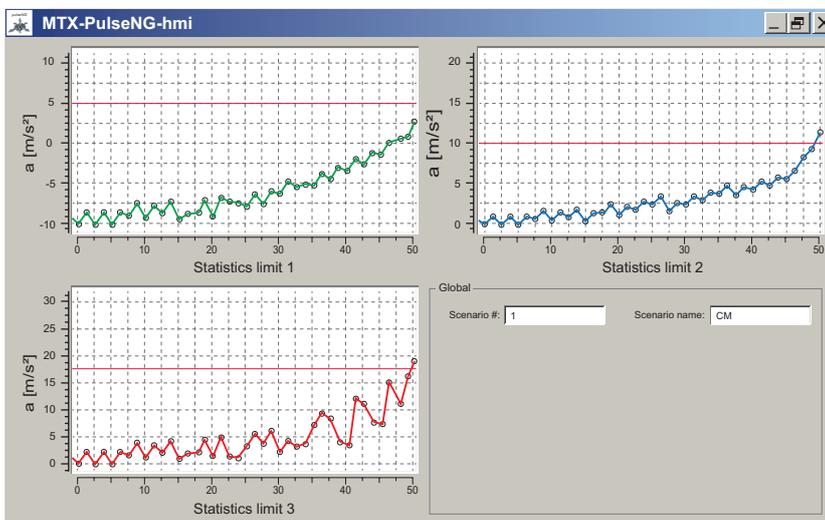
- ➔ Response time < 1 ms
- ➔ Emergency stop
- ➔ Reduce consequential damages



Vibration Overload

- Limit 1 Vibration overload
- Limit 2 Vibration overload
- Limit 3 Force overload

- ➔ Response time < 1 ms
- ➔ NC stop, feed rate adjustment
- ➔ Limits can be set individually



Automatic Machine Condition Diagnostics

- Limit 1 Health trend of (Statistics) longitudinal axis (x)
- Limit 2 Health trend of (Statistics) transverse axis (y)
- Limit 3 Health trend of (Statistics) vertical axis (z)

- ➔ Early detection of worn machine components
- ➔ Assist with preventive maintenance
- ➔ Automatic measurement run and alerts at wear detection

Model of the health trend

Industry 4.0



■ Suitable for Industry 4.0

- We will provide the collected data over your factory-network
- For a central machine management
- For an overview of all machines' condition
- For a planable preventive maintenance
- Client/Server functionality

Universally Applicable

Machining Centers



Turning Machines



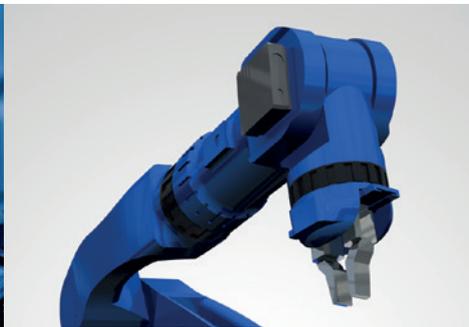
Grinding Machines



Drilling/Milling Machines



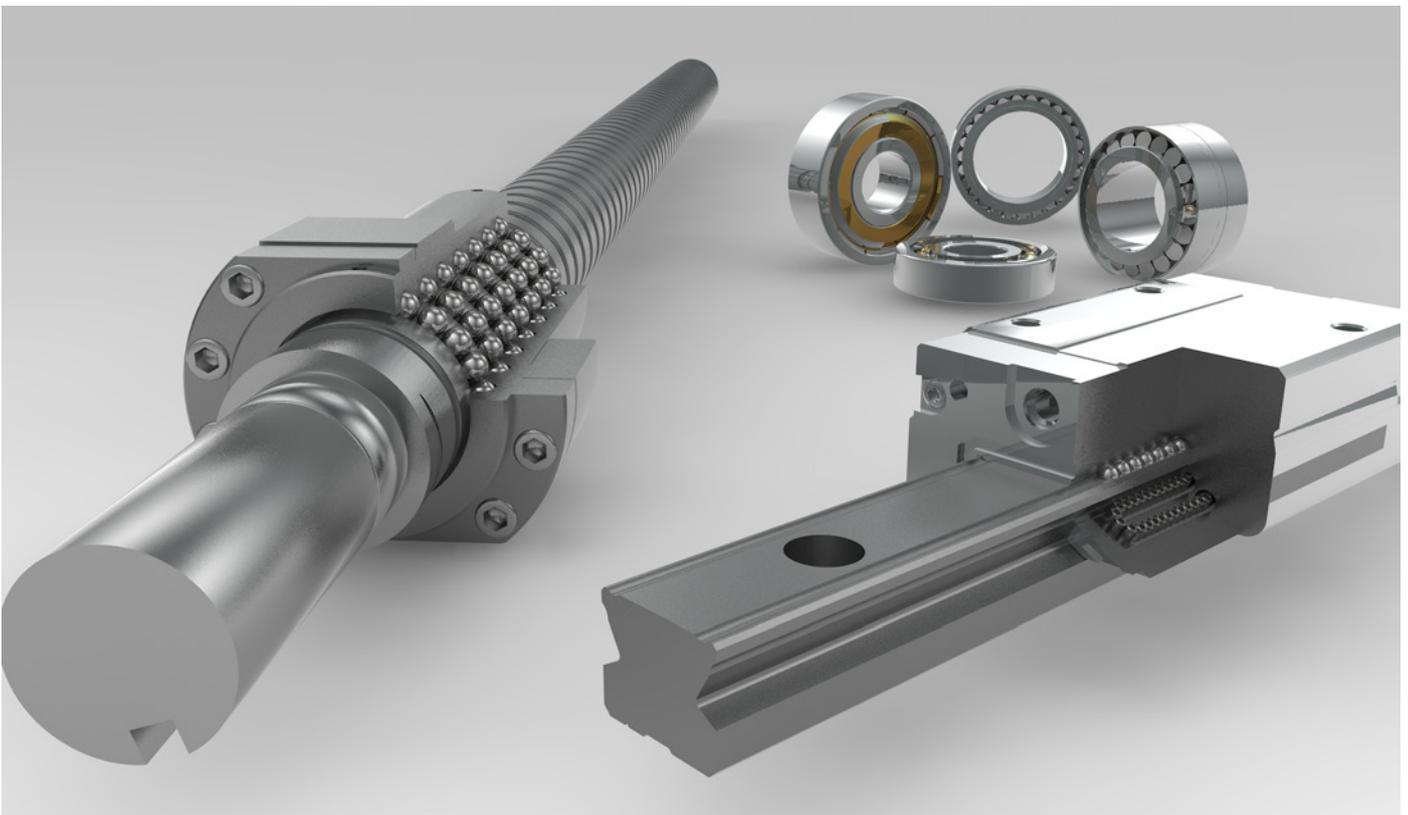
Robots



Handling Systems



Automatic Diagnostics of Machine Components



■ Product Properties

IBU-NG Interface	
Dimensions (HxWxD) in mm	approx. 121 x 42 x 120
Weight	approx. 370 g
Protection class	IP40
Response time	< 1 ms
Relative humidity	0 to 95 % noncondensing
Voltage supply	18-30 V DC

Attachable Components	
<i>PulseNG</i>	3 axes acceleration sensor
<i>PulseNG</i> M12	3 axes acceleration sensor
MUX-NG	Multiplexer
SLA-NG	StrainLink amplifier
StrainLink250-DA	Strain gauge sensor
PS200-NG	Power sensor / amplifier

■ Global Competency

Consulting from one single source, from the initial idea to a complete turn-key solution. We provide the entire workflow: Conception, installation, commissioning, training, optimization and also data for your industry 4.0!



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