Stop-Time Measuring System NMG2

- Automatic multiple measurements with statistical evaluation
- User interface in English and German
- Measurement results in inches and mm
- Input of a machine number
- RS-232 or USB interface and built-in printer
- PC software for creating test reports and diagrams
- Actuator to release light curtains
- Integrated memory for protocol and measurement values
- Sensors for all kinds of applications

- A quick-to-use instrument in a carrying case
- Very solid, for industrial environments
- Calculation and documentation of the safety distance according to ISO 13855 (EN999)
- Velocity measurement
- Traceable ISO9001 Calibration Certificate
NMG2
Stop-Time Measuring System

Measuring system for machine safety measurements according EN ISO 13855

- Solid case equipment, built-in matrix printer
- Standstill detection down to \( v < 1 \text{ mm/s} \)
- Velocity measurement
- Calculation of the safety distance
- ISO9001 calibration certificate
- Traceability of measurement values
- RS-232 interface for data transmission
- Quick ready for use
- Actuator to release light curtains

Introduction

The NMG2 is designed to measure stop time, stop distance and velocity of power driven machinery like presses, robots and other machines with user access. In accordance with national and international safety standards machines with dangerous movements have to be equipped with protection devices. The improper placement of a protection device (2-hand control, safety light curtain and so on) will result in the potential for injury of the operator. With the NMG2 all the important measurement values such as stop-time, stop-distance and velocity are provided to calculate the minimum safety distance. The safety distance is defined in national and international standards like EN ISO 13855 (EN999). To ensure maximum safety the stop-time measurements have to be repeated periodically (6 months).

Operating principle

The measuring cable of the WS Position Sensor will be connected to the moving part of the machine with a magnetic device or a fixing screw. The Sensor sends an incremental pulse signal to the microprocessor controlled counter. The stop position can be selected by a digital encoder. If the position signal passes through the determined stop position in the selected direction a galvanic isolated contact will cause the stop of the machine and the stop-time measurement will be started. The position measurement values will be recorded until the machine has stopped completely. The two displays of the measuring device will show the measurement values of stop-time and distance. By pressing a button the velocity at the stop position can be displayed. A measurement protocol will be printed.

A velocity measurement can be made to locate the position of the maximum velocity, because the stop point should be located at this position. This measurement will determine the maximum velocity of the machine and its position.

The NMG2 can be used as a comfortable position and velocity measurement system in different applications. The measurement values can be transmitted to a PC or a Laptop via the RS-232 or USB interface. Diagrams and test reports can be produced and printed. Additional an actuator can be controlled to interrupt a safety light curtain, so that it is not necessary to insert the relay contact into the machine circuit.

Safety distance

The minimum safety distance for 2-hand guards or safety light curtains is calculated as a product of the machine stop-time and a determined maximum hand speed. The definition for the maximum hand speed differs from country to country. The actual valid safety regulations (for example ISO 13855, EN999) have to be regarded. The stop-time measurement must be made at the worst conditions of the machine to determine the maximum stop-time and the correct safety distance.
NMG2
Stop-Time Measuring System

**Suitable sensors for NMG2**
- WS2.1-2500-10-PP530-NMG: Standard sensor up to 2500 mm measurement range
- WS10-1250-10-PP530-NMG: Compact sensor up to 1250 mm measurement range
- WS19KT-5000-PP24VC-NMG: Sensor for medium ranges up to 5000 mm
- WS-KABEL-5M-NMG-PP24VC: Connecting cable for WS19KT
- WS7.5-30000-10-PP530-NMG: Long range sensor up to 30000 mm

**Accessories for NMG2**
- NMG2-MESSRAD-ENCODER-10P/MM: Friction wheel encoder to measure continuous movements (can be mounted on the magnetic stand), usable with the - MEM option only
- NMG2-AKTOR: Actuator to release light curtains
- NMG2-RS232/USB-WINSOFT: Software and cable for PC (Windows) for data transmission
- NMG2-RS232/USB-PROSOFT: Software to create diagrams and reports
- NMG2-MAGNET-MESS-STATIV: Stand with switchable magnet base
- NMG2-VAKUUMSOCKEL: Optional suction base for non-magnetic surfaces

**Operating controls of the stop-time measuring system**

- **Display**: 4 digit LED + sign
- **Measurement direction**:
- **Print on / off**:
- **Stop contact (relay)**: Mode of operation
- **Printer paper feed**: Mode automatic measurement
- **Mode Test run**: velocity at stop position
- **Mode Velocity**: Maximum velocity
- **Mode Adjust**: current position
- **Mode Velocity**: Position of max. velocity
- **Mode Adjust**: Measured stop time
- **Mode Adjust**: Measured stop distance
- **Mode Adjust**: Start position
- **Jog wheel for start position setting**: Mode of operation
- **Reset**: Option "Actuator"
- **Mode Measurement of velocity (Vmax)**: Measurement protocol
- **Printer (option)**: Measurement protocol

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**Operating controls of the stop-time measuring system**

- Display: 4 digit LED + sign
- Measurement direction
- Stop contact (relay)
- Printer on / off
- Mode of operation
- Measurement protocol
# NMG2 Stop-Time Measuring System

## Specifications

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<td>Measurement range</td>
<td>0 ... 5000 ms</td>
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<tr>
<td>Resolution</td>
<td>1 ms</td>
</tr>
<tr>
<td>Accuracy of time base</td>
<td>0,5 ms -0,05 %</td>
</tr>
<tr>
<td>Stability of time base</td>
<td>±50 ppm / K</td>
</tr>
<tr>
<td>Relay compensation</td>
<td>Time delay of release contact will be compensated at every measurement</td>
</tr>
<tr>
<td>Standstill detection</td>
<td>1 ... 10 mm/s adjustable</td>
</tr>
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</table>

### Position measurement

| Measurement range     | -9999 ... +9999 mm (depends on the sensor type). Sensor ranges up to 30000 mm |
| Determination of stop point | -9999 ... +9999 mm |
| Resolution of the measuring device | 0,1 mm (display: 1 mm) |
| Resolution of the sensor | 25 µm |
| Accuracy               | ±0,05 % f.s. ± 1 Digit |
| Influence of the temperature | ±0,005 % f.s. / K |

### Velocity measurement

| Measurement range     | -9999 ... +9999 mm/s |
| Resolution            | 2,5 mm/s |
| Accuracy              | ±2,5 mm/s |

## General

### Displays

2 x 4-digit LED with sign

### Trigger output

Logic signal 5 V, H → L at stop position

### Stop contact

NC / NO 230 V AC / 5 A

### Fuse protection of stop circuit

5 A slow blow

### Supply voltage

100 ... 240 V AC

### Power consumption

30 W max.

### Dimensions

425 mm x 325 mm x 205 mm

### Weight

10.5 kg incl. case

### Operating temperature

0 °C bis 40 °C

### Humidity

80 % R.H. max., non condensing

### EMC

According to EN 61326-1:2006

## Order code NMG2

**NMG2**

- **Model name**

- **Optional sensor 2500 mm in carrying case**

  2500

  Other measurement ranges can be ordered separately

- **Option printer**

  P = Built-in matrix printer

**Order example**: NMG2 - 2500 - P - MEM

## Consumables

<table>
<thead>
<tr>
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<th></th>
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<tr>
<td>Printer paper, 1 roll</td>
<td>NMG2-DP</td>
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<tr>
<td>Printer ribbon, 1 piece</td>
<td>NMG2-DF</td>
</tr>
<tr>
<td>Calibration</td>
<td>NMG2-KAL</td>
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</tbody>
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