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## **m.a.x.-system**

### The principle of the system

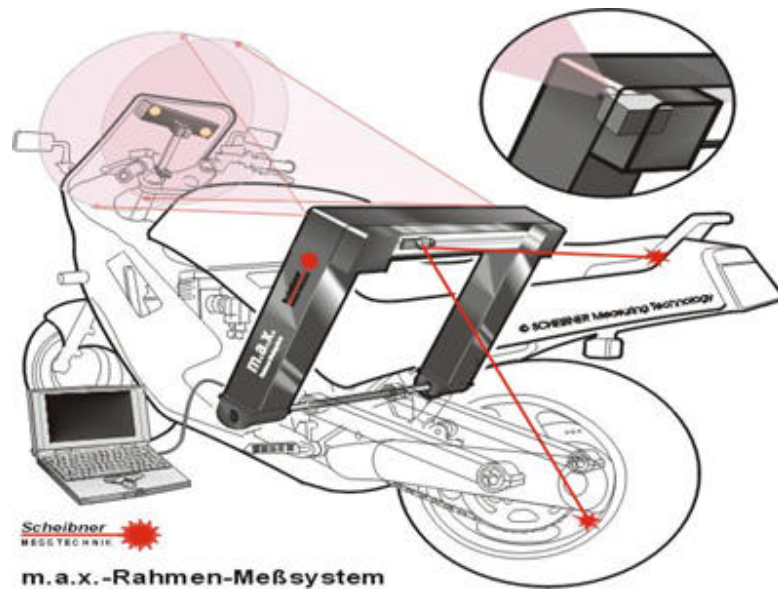
m.a.x. is a new opto-electronic system which is microprocessor controlled. The principal components are a measuring bracket with two electronic measuring cameras, the sighting or 'target' bracket with the infrared illuminated targets and an integrated microprocessor. The controlling and measuring program includes the motorcycle manufacturers reference data. The program runs on a P.C. or Laptop, which is not included with the system. The measuring cameras take the position of the targets at the front of the bike. Satellites when surveying the earth's surface use this same principal. Several measurements at different positions of the handlebar deliver the data for the microprocessor to calculate the exact steering head axis. This means no dismantling work at the front of the bike at all. An adapted laser for minor jobs such as the measuring of the frame rear and the swingarm, is included with the system. The display shows the 'easy to understand' instructions for the mounting of the gauge and the complete measuring procedure. The final documentation of the survey makes it easy to compare the results with the reference data.

### Mounting - positioning

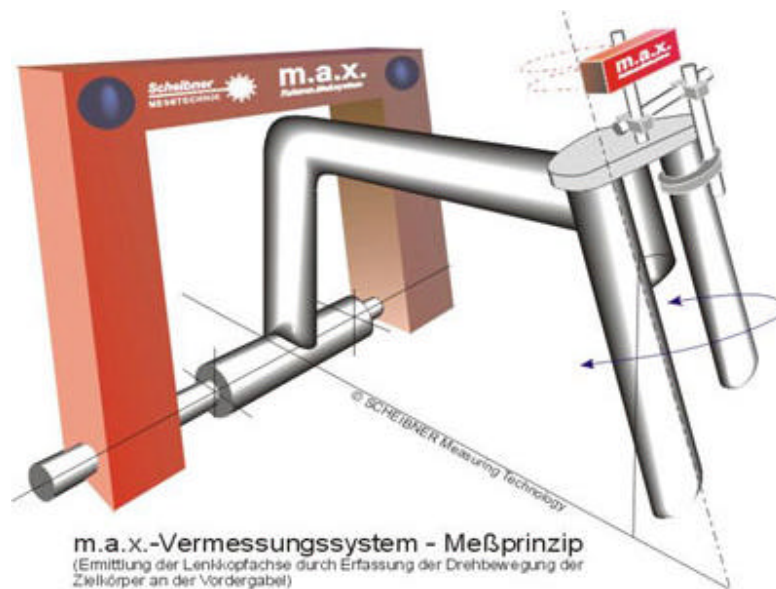
m.a.x. makes measuring motorcycle frames as easy as 1,2,3. The user doesn't even have to remove any parts and on some models only the seat has to be removed. Minimal preparation work and the computer-controlled measurement minimize the possibility of error. Ease of use is guaranteed by the guidance the user gets from the software. It is 'self explaining' and leads the mechanic or engineer through the whole procedure. A separate handbook or manual is not necessary. Help is always available with a hotkey.

### Innovative Technology

The m.a.x. system is a safety innovation produced by Scheibner Measuring Technology. Frame and chassis measurement is a necessary process to detect any kind of frame or chassis distortion. The max was designed to accomplish this with accuracy you can rely on. Workshops and engineers who are looking to the future of motorcycle repair / diagnosis need look no further than this system. It is the only system that is capable of measuring the new generation chassis (e.g. BMW RI 100, Yamaha GTS1000). For their customers it means confidence and piece of mind after an accident or when buying a used motorcycle. When exact results are needed quickly the m.a.x. will deliver again and again.



Frame measurement means primarily the determination of the relationship of two axes, the steering head to the swingarm axis. **m.a.x.** is a new opto-electronic system which is microprocessor controlled. The principal components are a measuring bracket with two electronic measuring cameras, the target unit with the two infrared illuminated targets and an integrated microprocessor. The bracket is centred in the swingarm axle. The target unit is mounted on the rotating elements of the front fork. A separate PC (not included) provides the calculations and handles the measuring process.



The two targets in the target unit describe a sector of a circle around the steering head axis when the front fork is turned. The measuring cameras determine and calculate the position of the two targets. With two measurements, one to the left and one to the right, **m.a.x.** is able to determine the axis. An additional laser on the rear of the bracket allows the measurement of the rear frame and the swingarm. The position of the laser, parallel to the swingarm axis, is automatically detected by its travel on an integrated potentiometer.

**frame measurement without dismantling work**



**m.a.x.** allows the measurement of motorcycles, without removing any parts. On many bikes only the driver seat has to be removed! The measurement can be completed within 15 minutes.

***The basic steps of the measuring procedure:***

- Mounting the bracket with its centering pins into the recess of the swingarm axle.
- Fastening the target unit to the front fork with the provided clamping system.
- Connecting the PC, selecting the model from the included manufacturers data list.
- Following the instructions on the PC screen by the taking one measurement with the front fork turned left and one turned right.
- When required, position the laser at the rear of the bracket on the measuring points of the tail and the swingarm .
- The comparison between the results and the manufacturers data are shown on the screen.

## software controlled procedure

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The camera's constantly monitor the measuring procedure

### Software & Updates


The easy to use **m.a.x.** system guides the user through the whole procedure. A separate manual is not really necessary. Assistance, when required, is provided by the program. The software includes a full list of the available manufacturers data. Regular updates can be obtained on request or by agreement.

innovative and economic

**m.a.x.** is the only instrument capable of measuring the new generation of chassis (e.g. BMW R1100, Yamaha GTS 1000) and therefore is the system of the future. Measuring the bare frame is of course no problem.

The quickness with which the **m.a.x.**-system can be used, enables measuring to be carried out even in the summer season, when time is at a premium. Normal work need not be interrupted. A profitable investment is certain.

The m.a.x. – measurement report

**Scheibner Meßtechnik - m.a.x.-Rahmenmeßsystem** 

**Kunde** H. Mustermann

**Fahrzeug** KAWASAKI ZX9R ZX900C FIN: ZX900C xxxxxx km: 35.309

**Ergebnis** Der Rahmen wird als maßhaltig bewertet:  ja  nein

**Erläuterungen:**  
beispielhaftes Musterprotokoll

**Messung vom: 02.11.98**

Hauptrahmen	Sollwert	Meßwert	Abweich.	empf. Tol.	ok?	Symmetriekor. (mm):	0,0
Sturz (°)	0,00	0,12	0,12	+/- 0,30	ja		
Rahmenwinkel (°)	87,98	87,78	-0,20	+/- 0,40	ja		
Rahmenlänge (mm)	720,5	719,3	-1,2	+/- 5,0	ja		
Lenkkopfersatz (mm)	0,0	1,3	1,3	+/- 4,0	ja	Messg. Lenkkopfers.	1,2

**Rahmenheck:**

Heckversatz (mm)	0,0	3,0	3,0	+/- 4,0	ja	Messg. Heckvers.	3,0
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**Schwinge:**

Hinterradversatz (mm):	0,0	-1,5	-1,5	+/- 10,0	ja	Messg. Hinterachs.	-1,5
Verdrehung (°):	0,00	0,07	0,07	+/- 0,40	ja		
Schiefstellung (°):	0,00	0,08	0,08	+/- 0,40	ja		

**Ansicht von hinten**

**Ansicht seitwärts**

Unterschrift: .....

## **technical specifications**

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### **Dimensions:**

- Dimensions of the case with the whole equipment: 860 x 700 x 200 mm
- Weight complete: approx. 32 kg

### **Opto-electronic measurement of the basic frame:**

- 2 CCD-measuring cameras
- automatic computer controlled detection and measurement of the targets
- infrared illuminated targets
- resolution for angle measurements:  $0.01^\circ$
- resolution for measurement of distances: 0.1 mm

### **Laser measurement of the rear frame and the swingarm:**

- moveable and rotating laser detects positions automatically
- Optical output power of the laser:  $< 1 \text{ mW}$
- resolution of the integrated potentiometer: 0.25 mm

### **standard equipment (delivered with the system):**

- program to administer the protocols and the index data
- complete list of manufacturers index data
- universal mounting system to fasten the targets at the front fork
- presentable transportation case