

Measuring System for 3D Real Time Motion Analysis



The CMS20S universal measuring system from the CMS20 family consists of a measuring sensor, a basic unit with power pack together with a table-mounted or floor stand. The three-dimensional measuring coordinates of the ultrasonic markers can be recorded with an overall scanning rate of 200 measurements per second.

The measuring method is based on the travel time measurement of ultrasonic pulses transmitted by up to 8 miniature transmitters (markers) to the three microphones built into the measuring sensor.

The fully digitized conditioning of the sonic signals received guarantees high measuring accuracy in the millimeter range.

The results are available in real time on the PC connected. The system is thus suitable for feedback tasks in the field of medical treatment.

Depending on the scanning rate, distances up to 2 m are achievable. Time markers can be superimposed during data recording via two digital input channels.

The measuring sensor moves freely on a ball joint and can thus be easily brought into the best measuring position. Absolutely no calibration is needed in this case.

Various application aids such as a surface pointer are available for medical analyses. These are connected directly to the color coded inputs in the basic unit.

The system can be optionally extended with 4 analog channels. The system is universally applicable, e.g. for hand-arm movement, measurement of movement response, cervical spine and mandible joint analyses, but not for gait.

- Compact measuring sensor
Dimensions:
360 x 340 x 25 mm
- Simple handling; no expert knowledge required
- Real-time display of the measuring results on a PC
- 8 motion analysis channels
2 digital input channels for switches
- Miniature ultrasonic marker with wide radiation angle
- Optional
4 analog channels
Input for start/stop synchronization
- Measuring programs are available for:
data acquisition
hand-arm movement disorders
spinal column analysis
equilibrium analysis
mandible joint analysis

For further information please contact

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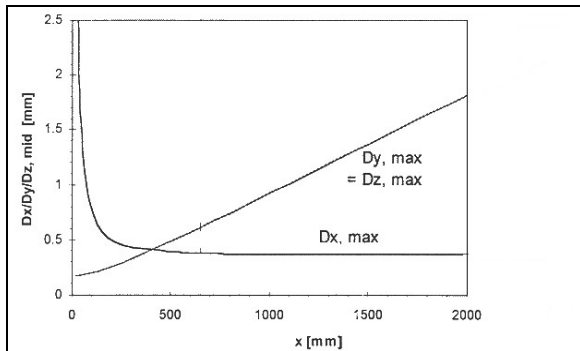
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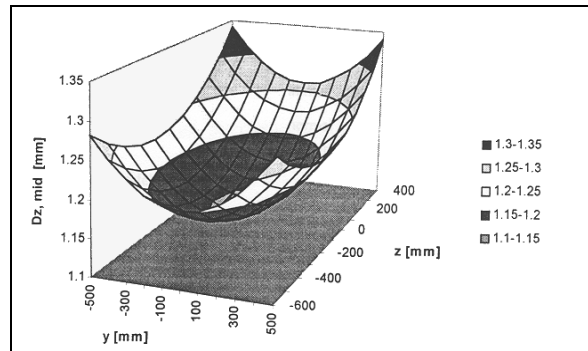
Technical Data

System CMS20S

Dimensions basic system:	75 x 150 x 266 mm (W x H x D)
Weight:	approx. 3 kg
Dimensions measuring sensor:	360 x 320 x 30 (W x H x D)
Weight:	0,7 kg
Max. number of marker channels:	8
Buffer memory:	60 KB
Digital entrances:	2
Synchronisation:	start/stop
Interface to PC:	USB
Measurement rate:	max. 300 Hz / number of selected markers
Measurement distance:	until 160 Hz - 2,0 m (max.) 200 Hz - 1,6 m new 300 Hz - 1,0 m
Resolution (program dependent):	1/10 mm – 1/100 mm (30 cm)



Error of relative coordinates after triangulation in direction x, y and z to L_0



Distribution of error in a distance of $x = 1250$ mm for z-coordinate

Optional: Analog to Digital Converter

Number of channels:	4 singles or 2 differentials
Measuring rate:	4000 Hz (for all channels)
Resolution:	8 / 12 bit (reversible)
Input voltage range:	± 5 V

Ultrasound Markers

Ultrasound markers are available in different sizes

US marker:	10 x 8 mm, 1 g
Standard cable length:	1.25 m
US marker thin:	10 x 5 mm, 1 g
Standard cable length:	0.3, 0.5, 0.75 m
Emission angle:	min. 120 degrees
Frequency:	40 kHz

A series of application devices (e.g. position pointer) are available.