
CORRSYS

DATRON

Sensorsysteme GmbH



HT-500

Height Sensor

for

Non-contact distance measurement

USER MANUAL

Notes:

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Safety Instructions

Please read carefully before operating the equipment.

CORRSYS-DATRON is not responsible for damage that may occur when this system is used in any way other than that for which it is intended.

To assure safe and proper operation, all supplied equipment, components and/or accessories must be carefully transported and stored, as well as professionally installed and operated. Careful maintenance and usage in full accordance with operating instructions is imperative.

CORRSYS-DATRON equipment should be installed and operated only by qualified persons who are familiar with devices of this type.

Local regulations may not permit the operation of motor vehicles on public highways while the equipment is mounted on the exterior of the vehicle.

- Use the equipment only for intended applications. Improper application is not advised.
- Do not modify or change the equipment or its accessories in any way.
- Improper use or mounting of the equipment may affect the safety of the vehicle and/or occupants.
- The equipment must not be mounted and/or operated in any way that may compromise vehicle or and/or occupant safety.
- Equipment must be mounted firmly and securely.
- Use only original equipment, components and/or accessories included in the scope of delivery.
- Do not mount equipment, components and/or accessories near heat sources (e.g. exhaust).
- Do not use defective or damaged equipment, components and/or accessories .
- Always note correct pin assignments and operating voltages when connecting equipment to power supplies, data acquisition/evaluation systems, and/or any other applicable system or component. Equipment may be damaged if not properly connected and/or operated.
- For additional information, please call the CORRSYS-DATRON Hotline: ++49 (6441) 9282-82 or email: hotline@corrsys-datron.com.



- **Caution:** Laser radiation is emitted from this aperture!
Do not stare into beam!
Laser class 3R according to DIN EN 60825-1:2001-11



- Disconnect power from the sensor if the vehicle is stationary for extended periods.



1. Overview



HT-500

HeightSensor

*for
non-contact distance
measurement*

Art. No.	
HT-500 Sensor	13423
HT-500 Sensor (BNC)	13426

The HT-500 Sensor is designed for dynamic vehicle testing applications. E.g. for the measurement of the ride height or displacement and for the determination of pitch and roll angle.

For configuration of the sensor the CORRSYS-DATRON software CeCalWin is included in the extent of delivery.

The HT-500 Sensor uses the principle of optical triangulation. A visible red laser is focused onto the object. The reflected light is collimated onto a linear CCD-array. The distance to the object is calculated from the position of the light spot on the array. The output of the sensor is directly proportional to the measured distance.

Features

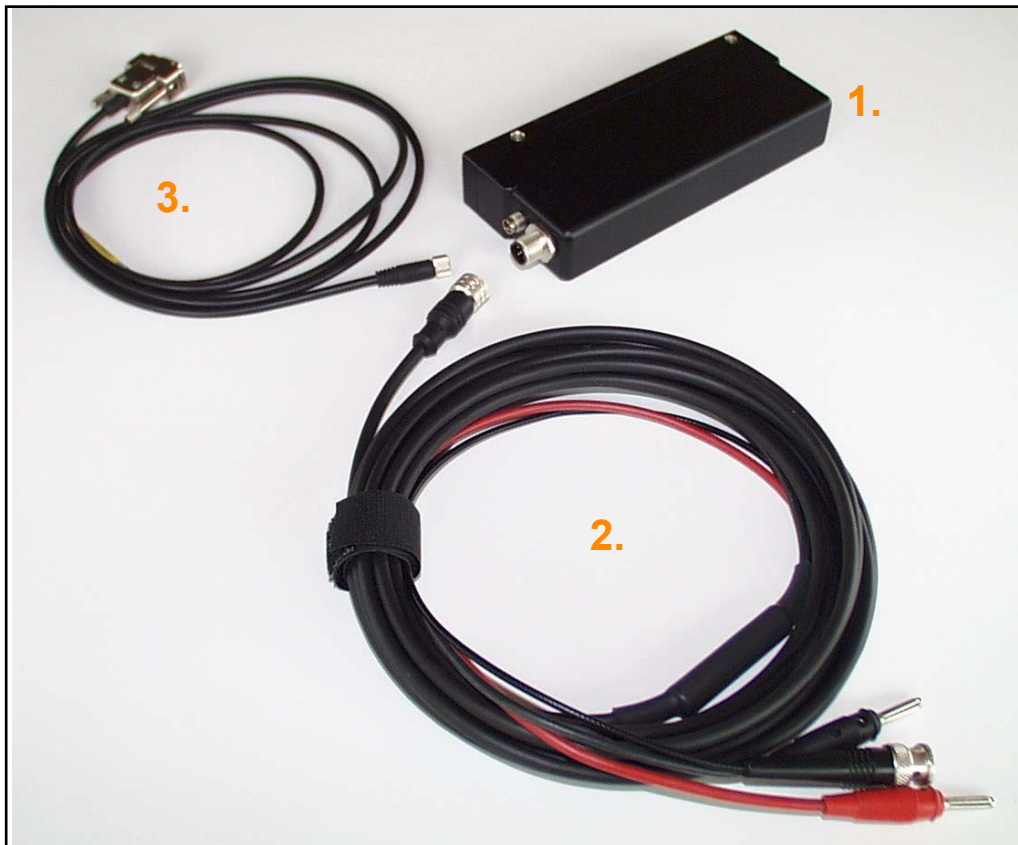
- Compact design
- Measuring range 300-800 mm
- For static and dynamic measurement
- Easy to mount
- Analog output

Applications

The compact CORRSYS-DATRON HT-500 Sensor is designed for use in dynamic vehicle testing applications that require accurate measurement of the following variables:

- Ride height
- Displacement
- Determination of pitch & roll angle

2. Extent of Delivery



Standard delivery

1. (1) HT-500 Sensor
2. (1) Power and Signal Cable #K045-352-10-5m for article no. 13426
(1) Power and Signal Cable #K045-152-20-5m for article no. 13423
(without picture)
3. (1) RS232 Communication Cable #K045-14N-10-2m

Options/Accessories

- Transport Case
- German Calibration Service Certificate (Livingston)

3. Technical Data

3.1 Specifications

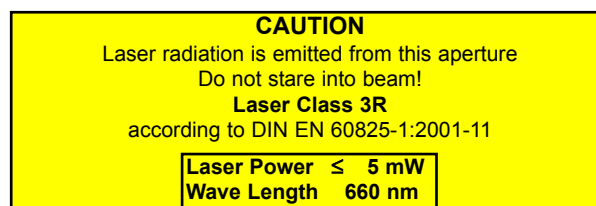
Technical Specifications

Measuring range:	300 ... 800 mm
Resolution:	0.5 mm
Linearity:	$\leq \pm 0.25 \%$
Maximum sampling rate:	1000 Hz
Light source:	Laser
Laser Power:	< 5 mW
Laser Class:	3R (IEC 60825-1)
Wave length:	660 nm
Approx. spot size:	1 mm x 2 mm

System Specifications

Output voltage:	0 ... 10 V
Power requirement:	9 ... 18 V; (90 mA @ 12 V DC)
Temperature range:	
Operating:	-10 ... 50°C
Storage:	-20 ... 60°C
System protection of the sensor:	IP 65
Weight:	500 g (without cable)
Dimensions of the sensor (l x w x h):	170 mm x 30 mm x 71 mm
Case:	aluminum

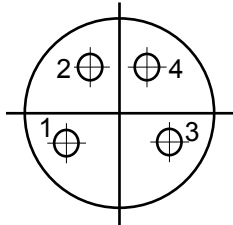
The HT-500 Sensor is compatible with the standard CORRSYS-DATRON mounting system.



3.2 Pin Assignments

3.2.1 Pin Assignment: PC (RS 232) Output

Cable: 4-pin Binder RS-232 to 9-pin D-SUB serial communication cable (#K045-14N-10-2m)

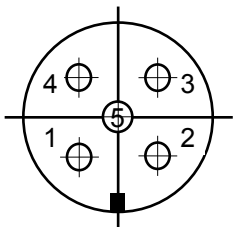


PC (RS-232)

Pin 1:	TXD
Pin 2:	RXD
Pin 3:	GND
Pin 4:	n.c.

3.2.2 Pin Assignment: Power / Analog Output

Cable: 5-pin Binder (#K045-352-10-5m)



Power Connector

Pin 1:	Signal
Pin 2:	n.c.
Pin 3:	Signal GND
Pin 4:	9 ... 18 V
Pin 5:	GND

3.3 Sensor Settings

The following parameters can be set with the help of CeCalWin.

3.3.1 Number of Averaged Values

Due to the high sampling rate and the small measuring spot, the sensor signal may be quite rough on uneven surfaces but it is possible to smoothen the Signal may by using a moving average filter. Source data are stored in a circular buffer, and new mean value is calculated each time the new result arrives; therefore, the output may regarded as a moving average.

Please note that signal detail and dynamics will decrease as the signal becomes increasingly smooth. This parameter specifies the number of source results to be averaged for deriving the output value!

3.3.2 Buffer Time

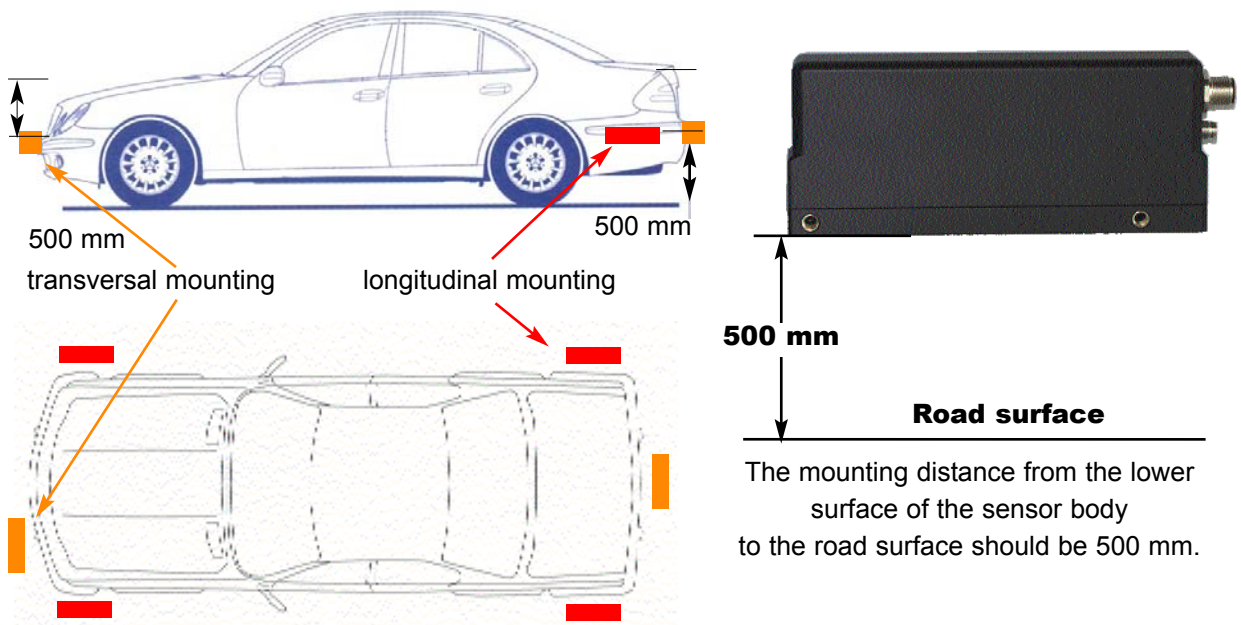
If the sensor is out of range or the laser spot is shaded, the sensor output will show a zero value. To prevent these erroneous measurements a buffer time can be set. If the sensor cannot acquire a valid measurement value, the sensor will put out the last valid value for this time maximum. As soon as a new valid value is acquired, the sensor will put this out.

3.3.3 Laser Intensity Level

By changing this parameter it is possible to adjust the sensor to surfaces with different reflection characteristics. For the most application it is recommendable to keep the default setting of "31".

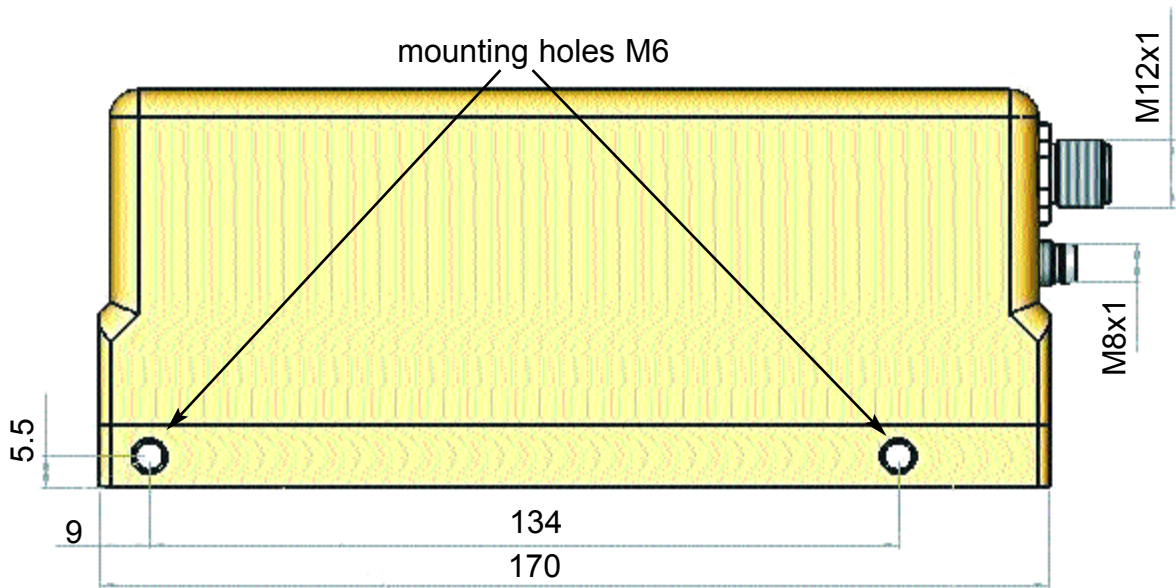
4. Set-up and Connection


4.1 Mounting Options

**Notice:**

In wet or snowy conditions, do not mount sensors directly behind the rear wheels. This will help to prevent measurement anomalies that can be caused by spray and/or blowing snow.

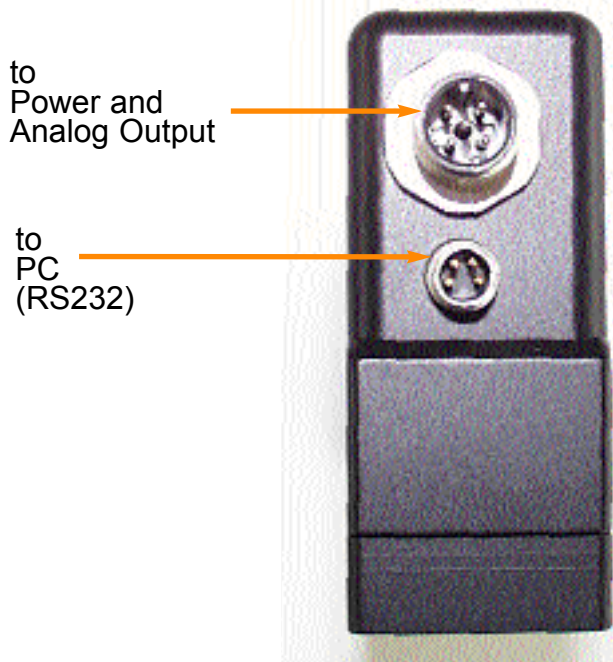
4.2 Sensor Mounting Jig



 **Caution:** For proper sensor mounting, use only M6 screws with a maximum thread engagement depth of 10 mm. The use of screws with thread engagement depths of greater than 10 mm can damage the sensor housing and will void the warranty!

4.3 Connecting the Sensor

Sensor Connections



Reverse polarity protection

The electronic unit is equipped with reverse polarity protection. In the event that polarity is inverted, the unit will not be damaged. Immediately disconnect power from the unit and correct the power supply connection.

1. Connect the sensor to data acquisition:
Connect the data acquisition with the BNC connector of the Power/AnaOut cable
2. Connect the 2 banana plugs of the Power/AnaOut cable to a CORRSYS-DATRON power distribution box (cable #K045-352-10-5m).
3. Be sure that the individual switches on each power output circuit on the power distribution unit are in the "OFF" position.
4. Start the vehicle engine and carefully connect the power distribution unit to the vehicle power supply.
5. Switch the power circuit on to send power to the sensor electronics.
6. The sensor is now ready for set-up using CeCaWin Software. Connect the PC output (RS 232) on the sensor to a PC operating CeCaWin (see **Using the CeCaWin Software Package** for complete details). Use the 4-pin RS-232 to 9-pin D-SUB serial communication cable (#K045-14N-10-2m) to make the connection between sensor and PC.

5. Troubleshooting

When troubleshooting the HT-500 Sensor begin by checking the following:

Cables and power supply

- Check all connections to determine that each is complete and that the system is connected to a power supply that provides voltage output within the specified range.
- Check to determine that the correct cables have been used for all connections.
- The following problems can be caused by incorrect or incomplete cable connections and/or connection to incorrect power supply voltage:
 - Output signals are not available to data acquisition and/or connected PC.

Operating range

If the sensor is mounted out of the recommended height range (standoff distance), no measurement signals will be output. Check and correct mounting as necessary.

Sensor lens

The sensor lens (located on the underside of the sensor housing) may occasionally become dirty, preventing proper operation. Check and clean the sensor lens regularly.

Software

- If the output signal appear to be incorrect, the sensor may have been set-up incorrectly via CeCalWin Software. Check all relevant settings in CeCalWin:

Environmental conditions

The sensor may occasionally interpret heavy spray from snow or water as part of the road or track surface, producing unexplained spikes in the output signals and/or other anomalous measurement artifacts. Sensors should be mounted away from the heaviest spray areas, especially directly behind the rear wheels.

If none of the above recommendations provides a solution, you may wish to contact CORRSYS-DATRON. Before doing so, please be ready to supply the following:

- A .ccw file saved from CeCalWin software to serve as an example of the problem or fault condition.
- The serial numbers of all relevant components.