

## DCA system

### Optical sensor system for measuring dynamic camber angle

The DCA system is designed for precise dynamic camber angle measurement relative to ground.

- Mounts easily onto the vehicle wheel with collets that clamp directly to the wheel nuts; collets are optionally available for most standard wheel types
- Online display and parameterization via KiCenter Software
- A DCA processor supports two sensor systems,
- Data output via CAN, USB
- For passenger cars and SUVs, truck version available on request
- Can be combined with RoaDyn wheel force transducers

#### Description

The ability to measure dynamic camber angle accurately is crucial to effective suspension design. In passenger car and truck as well as racing applications, knowledge of camber angle is imperative. Due to forces created by driving maneuvers, static camber angle cannot be assumed to correspond to dynamic camber values, which change continually as the vehicle is driven.

Using two ride height sensors of the HF series mounted on the vehicle wheel, accurate dynamic measurement of wheel camber relative to ground is at last a reality. The applied laser height sensors are proved to be accurate even in extreme environmental conditions, including intense sunlight, and high temperature and humidity, as found in India and Arizona.

The DCA system acquires dynamic wheel camber angle by comparing the relative change in height between the two sensors, as measured from the optical plane of each sensor to the surface of the road or track.

The system also provides the option to mount a Correvit SFII-P sensor for non-contact measurement of slip angle.

#### Application

- Dynamic camber measurement relative to the road surface
- Characteristic curve for camber as function of lateral acceleration
- Chassis and suspension setup
- Determination of the tire characteristics

Type 18012583, 18012584,  
18012585



#### Technical data

##### Performance specifications

Sensor position relative to wheel center	mm	62 ... 195
Max. wheel diameter	mm	≤800
Max. measurement range camber angle <sup>1)</sup>	°	±25
Accuracy camber angle <sup>1)</sup>	°	<0.5
Resolution camber angle <sup>1)</sup>	°	0.04
Moving mass at the wheel, approx.	grams	3,400
Measurement frequency	Hz	250
Working distance and range		
HF-500	mm	125 ... 625
HF-750	mm	150 ... 900

##### Signal outputs <sup>2)</sup>

Analog	V	-10 ... 10
Camber angle		yes
Height 1 and 2		yes
Wheel speed and position <sup>3)</sup>		optional
Calculated distance <sup>3)</sup>		optional

<sup>1)</sup> Values based on a basis length of 162 mm

<sup>2)</sup> All inputs/outputs are protected against overvoltage and short circuit

<sup>3)</sup> When used with wheel pulse transducer type CWPT...

## Technical Data (Continuation)

### Interfaces

CAN		2.0B
USB (Full Speed)		2.0
RS-232C		yes

### System specifications

Power supply	V	10 ... 36
Supply current	A	<0.5
Temperature range		
Operation	°C	-10 ... 50
Storage	°C	-20 ... 60
Relative humidity (non-condensing)	%	5 ... 80
Degree of protection (cable mounted)		
Sensor heads		IP67
Electronics		IP55
Dimensions (LxWxH)		
Sensor head HF <sup>4)</sup>	mm	100x20x40
Sensor head optional SFII <sup>5)</sup>	mm	100x28x40
Weight		
Sensor head HF <sup>4)</sup>	grams	155
Sensor head optional SFII <sup>5)</sup>	grams	180
Shock	g ms	50 half-sine 6
Vibration	g Hz	10 10 ... 150
Light source HF Sensors		Laser
Laser class		3R (IEC608251)
Laser power		<5
Wave length		660
Spot size (approx.)		1x2
Light source optional SFII sensor		LED-IR 850 nm laser class 1

<sup>4)</sup> Without spray guard

<sup>5)</sup> Without spray guard and protection glass

## Mounting

The DCA system can be mounted on the front and/or rear wheels using optionally available mounting collets: 17, 19 and 21 mm; 14, 20, 22, 23, 24, 26, 27, and 30 mm; other sizes on request.

When mounting the sensor system at the vehicle, the mounting distance from the lower surface of the sensor body (not including the spray guard) to the road must be within the specified range (see technical data, page 1).

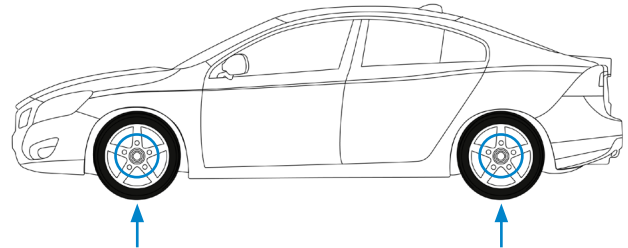


Fig. 1: Possible mounting positions: front and rear wheels

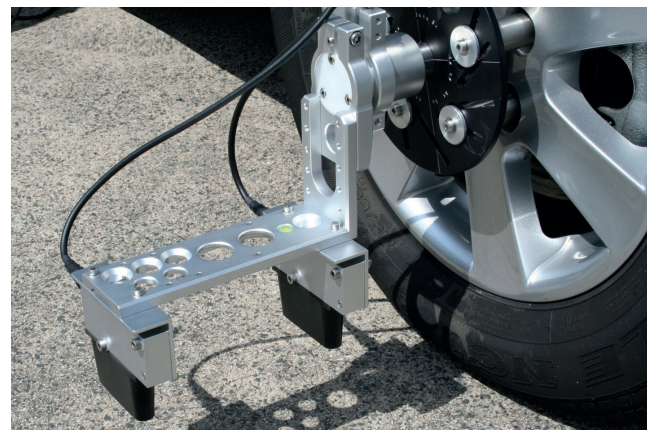


Fig 2: Mounted DCA system

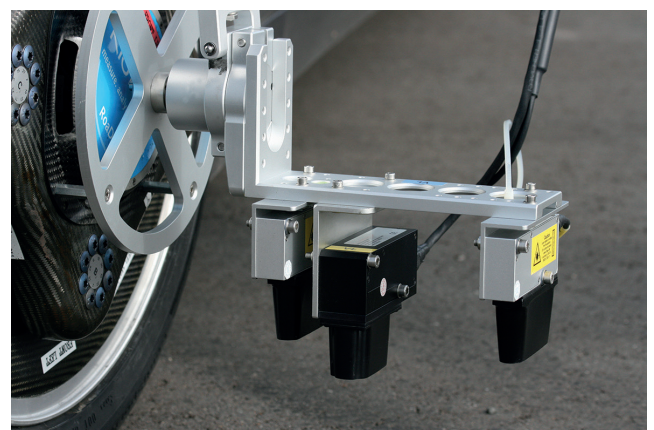


Fig. 3: A mounted DCA system with RoaDyn S625 CFR WFT and optional SFII-P sensor for measurement of tire slip angle

## Dimensions

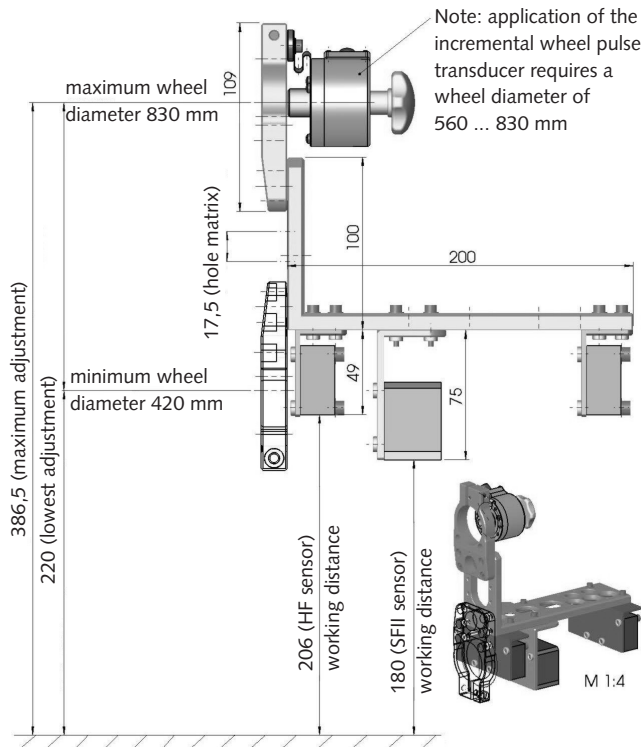


Fig. 4: DCA system dimensions, sensors (including optional SFII-P sensor) and mounting unit

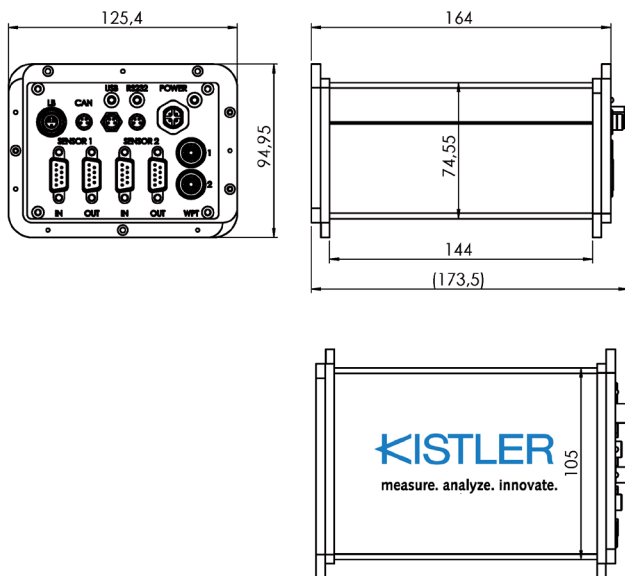


Fig. 5: DCA processor dimensions

## Included accessories

### Type 18012585

#### DCA system for 1 wheel without processor

#### Ordering no.

- |   |          |
|---|----------|
| • HF-500C sensor* with CAN, 2 x               | 18012320 |
| • Wheel mounting complete, 1 x                | 55064168 |
| • Mounting unit HF/DCA without sensors, 1 x   | 18012546 |
| • Bar double hub for wheel mounting unit, 1 x | 55063319 |
| • Hexagon wrench set, 1 x                     | 55061932 |
| • Cranked wrench key, 1 x                     | 55065078 |
| • USB stick software + manuals                | 55158846 |

### Type 18012583

#### DCA system for 1 wheel with processor

#### Ordering no.

- |   |          |
|---|----------|
| • HF-500C sensor* with CAN, 2 x               | 18012320 |
| • Wheel mounting complete, 1 x                | 55064168 |
| • Mounting unit HF/DCA without sensors, 1 x   | 18012546 |
| • Bar double hub for wheel mounting unit, 1 x | 55063319 |
| • DCA processor, 1 x                          | 55064378 |
| • Sensor cable HF, l = 5 m, 1 x               | 55064596 |
| • Power cable, l = 5 m, 1 x                   | 18012366 |
| • Connection cable CAN, l = 2 m, 1 x          | 18012482 |
| • Connection cable RS-232C, l = 2 m, 1 x      | 18012469 |
| • Connection cable USB, l = 2 m, 1 x          | 18012483 |
| • Distribution cable, l = 1 m, 1 x            | 55064423 |
| • Hexagon wrench set, 1 x                     | 55061932 |
| • Cranked wrench key, 1 x                     | 55065078 |
| • USB stick software + manuals                | 55158846 |

### Type 18012584

#### DCA system for 2 wheels with processor

#### Ordering no.

- |   |          |
|---|----------|
| • HF-500C sensor* with CAN, 4 x               | 18012320 |
| • Wheel mounting complete, 2 x                | 55064168 |
| • Mounting unit HF/DCA without sensors, 2 x   | 18012546 |
| • Bar double hub for wheel mounting unit, 2 x | 55063319 |
| • DCA processor, 1 x                          | 55064378 |
| • Sensor cable HF, l = 5 m, 2 x               | 55064596 |
| • Power cable, l = 5 m, 1 x                   | 18012366 |
| • Connection cable CAN, l = 2 m, 1 x          | 18012482 |
| • Connection cable RS-232C, l = 2 m, 1 x      | 18012469 |
| • Connection cable USB, l = 2 m, 1 x          | 18012483 |
| • Distribution cable, l = 1 m, 2 x            | 55064423 |
| • Hexagon wrench set, 1 x                     | 55061932 |
| • Cranked wrench key, 1 x                     | 55065078 |
| • USB stick software + manuals                | 55158846 |

\* Alternatively, the DCA system can be equipped with HF-750C sensors

**Optional accessories**

• Wheel pulse transducer incl. mounting	18012541
• Correvit SFII-P sensor, Type CSF2A...	18017735
• Mounting unit SFII-P for DCA system	18012510
• Connection to RoaDyn Sx WFTs, with in-board transmission	55090915
• Collets	on request
• Centering stars	on request

**Ordering code**

• DCA system, for 1 wheel, without processor, without clamps/centering stars	18012585
• DCA-1 system, for 1 wheel, with processor, without clamps/centering stars	18012583
• DCA-2 system, for 2 wheels, with processor, without clamps/centering stars	18012584