

MLD 9000

**DIGITAL HEADLIGHT AIMING TESTER:
TÜV-CERTIFIED, FOR ALL LIGHT SOURCES,
ALL LASERS (MAX. CLASS 2)**



Beissbarth MLD 9000

digital headlight aiming tester

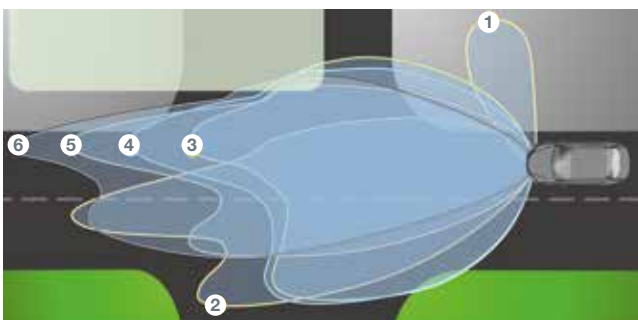


Digital headlight aiming tester with 4 lasers

Testing and adjusting headlights in the workshop

Digitization and the increase of driver assistance systems in motor vehicles also had a large impact on the lighting systems. Nowadays not only luxury class cars have intelligent LED and matrix headlights are on board. Modern lighting systems – for small cars initially mainly offered as optional extras – are often included in the standard versions after the first facelift. Therefore the demands on the workshop equipment are becoming higher and higher.

With the MLD 9000, workshops offer their customers an all-round competent servicing of modern lighting systems.



Lighting situations with modern lighting technique:

- | | |
|------------------------|----------------|
| ① Turning lights | ④ City mode |
| ② Dynamic curve lights | ⑤ Country mode |
| ③ Bad weather mode | ⑥ Highway mode |

MLD 9000 for all testing and calibration work

- Calibration of misaligned headlights during maintenance, replacement or accident repairs
- Recalibration of headlights integrated into matrix systems or driver assistance systems
- Simplification of complex adjustment work for fast workshop processes
- Device designed for future digital technologies
- Complete documentation towards customers and third parties

Ideal for all headlights

- For all light sources and vehicle types
- Glare-free high-beam systems (see page 7)
- Alignment and positioning laser (class 2)
- Optional: vertical laser (class 1)
- With optional tilt measurement
- Time-saving quick measurement
- Digital image processing in real time
- CMOS camera (5 megapixels)
- Interfaces: LAN, USB, RS 232

Digital precision

- +/-1 cm on 10 metres
- Alignment with accuracy of 1 angular minute (optional)
- Mechanical stability of +/-0.1 %



Switch and handle for alignment laser



Manual height marker on the aluminium scale (as standard). The scale is height-adjustable to compensate for the height of the vehicle set-up area.

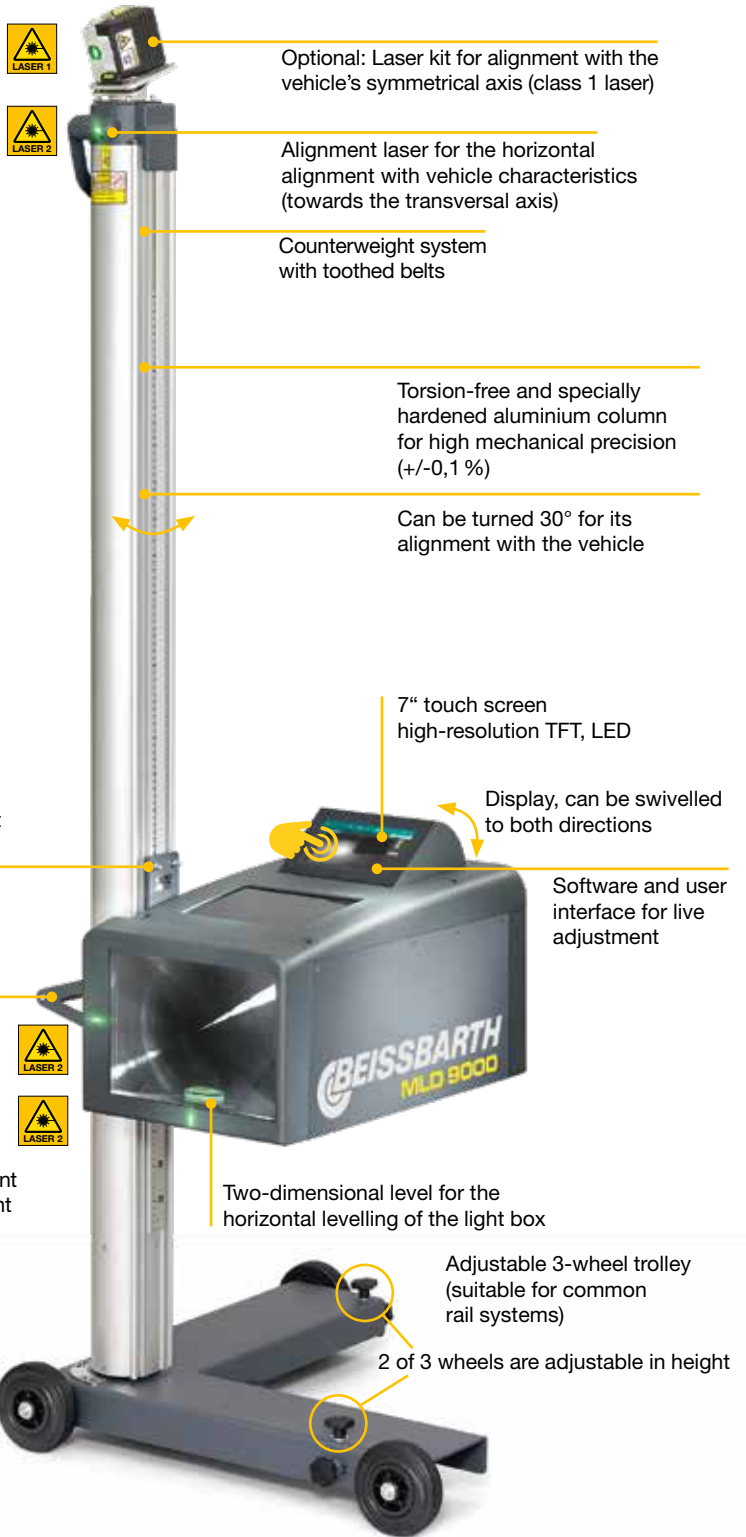


Lightweight carriage for easy one-hand operation



Cross laser: for the alignment to the centre of the headlight

For improved visibility, all laser beams are green. Max. class-2 lasers used



Optional: Laser kit for alignment with the vehicle's symmetrical axis (class 1 laser)



Alignment laser for the horizontal alignment with vehicle characteristics (towards the transversal axis)

Counterweight system with toothed belts

Torsion-free and specially hardened aluminium column for high mechanical precision (+/-0,1 %)

Can be turned 30° for its alignment with the vehicle

7" touch screen high-resolution TFT, LED

Display, can be swivelled to both directions

Software and user interface for live adjustment



Two-dimensional level for the horizontal levelling of the light box

Adjustable 3-wheel trolley (suitable for common rail systems)

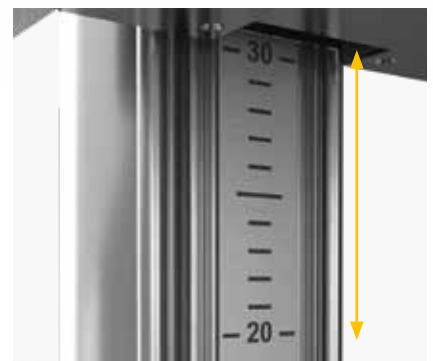
2 of 3 wheels are adjustable in height



Optional: Measurement unit fine adjustment with an accuracy of 1 angular minute



Optional: Rail system for uneven as well as official vehicle test areas



Optional: **Automatic height marker** with height sensor below the light box

Three options for uneven test bays

Rail system, inclinometer, LT B

In case the test bay for the headlight aiming tester does not comply with the regional specifications, MLD 9000 can still be used for testing if the floor conditions allow so.



Rail system or software-based tilt compensation

Measurement of the tilt angle		Compensation by means of software	Levelled rail system
Workshop	Standard headlights	✓	✓
	Alignment with the vehicle body (DLA, Matrix)	Insufficient	✓
	Alignment with the symmetrical or driving axis (e.g. Ford ILS, Mondeo)	X	✓
General inspection	Low-beam testing at the general inspection	✓	✓
Once-only alignment saves time*		X	✓
Horizontal and vertical precision		☹	☺

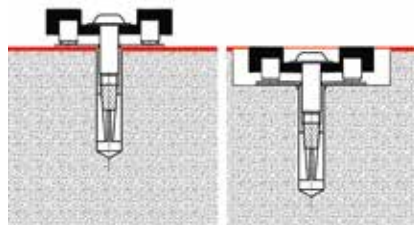
* e.g.: At the adjustment of glare-free headlight systems, the MLD 9000 is to be moved from one side to the other at least three times.

Option 1: Rail system in case of major unevennesses

In case of major unevenness at the set-up area, the high demands new intelligent light systems (e.g. glare-free high beams) place on precision can not be met solely by the inclinometer (see figure on the right). In these cases, the MLD 9000 standard rollers can optionally be replaced by steel rollers and the highly precise levelled rail system.



Rail system with MLD 9000



Above and in-ground installation



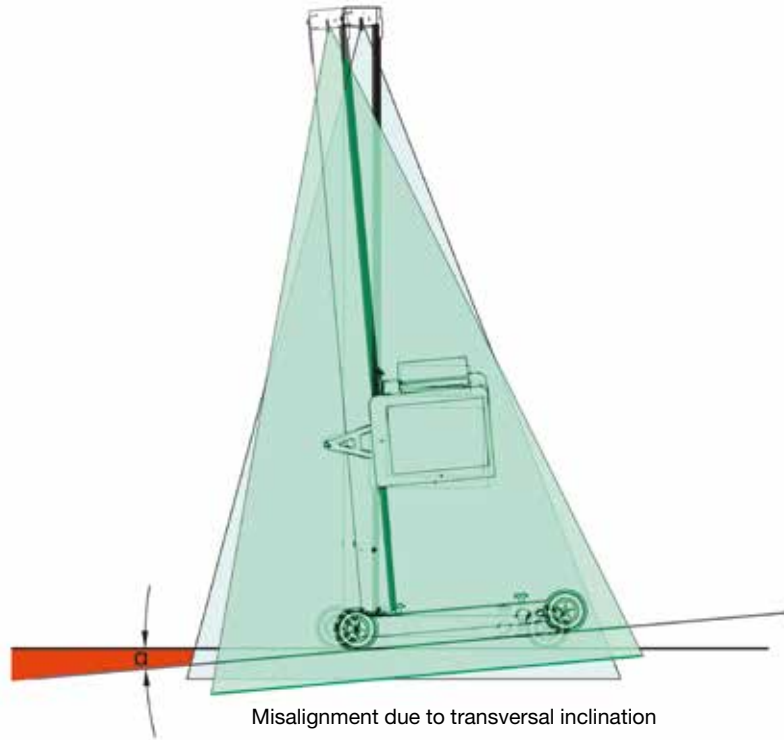
High-precision compensation

MLD 9000 can also be mounted on other common rail systems.

Option 2: Inclinometer (MLD 9000 on standard rollers) for minor unevennesses

On the standard version with rollers, the inclinometer is used to compensate inclinations of the headlight aiming tester set-up bay of up to 3%. For this purpose, the inclination is measured in both longitudinal and transverse directions. This information is used to correct the data displayed on the screen. That is, the value shown on the display will be the same as if the MLD 9000 was absolutely levelled.

Attention: The mechanical position of the alignment laser is defined by the actual position of the carriage. In some circumstances, a potential misalignment might not be compensated by the inclinometer (see illustration on transversal inclination on the right)

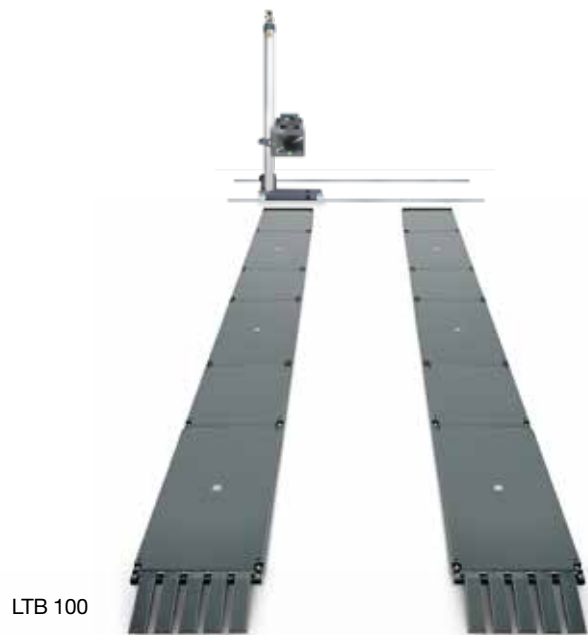


Option 3: LTB 100 – levelled test bay for uneven vehicle set-up areas

In accordance with to the general-inspection guideline, the vehicle itself also needs to be located on an even surface, Beissbarth offers the LT B 100 levelled test bay for uneven test bays.



MLD 9000 combined with the LTB 100



MLD 9000 and LT B 300 – combined with Q.DAS ADAS calibration and Q.Lign wheel alignment – ground solution as alternative for lifts

MLD 9000

Networking functions



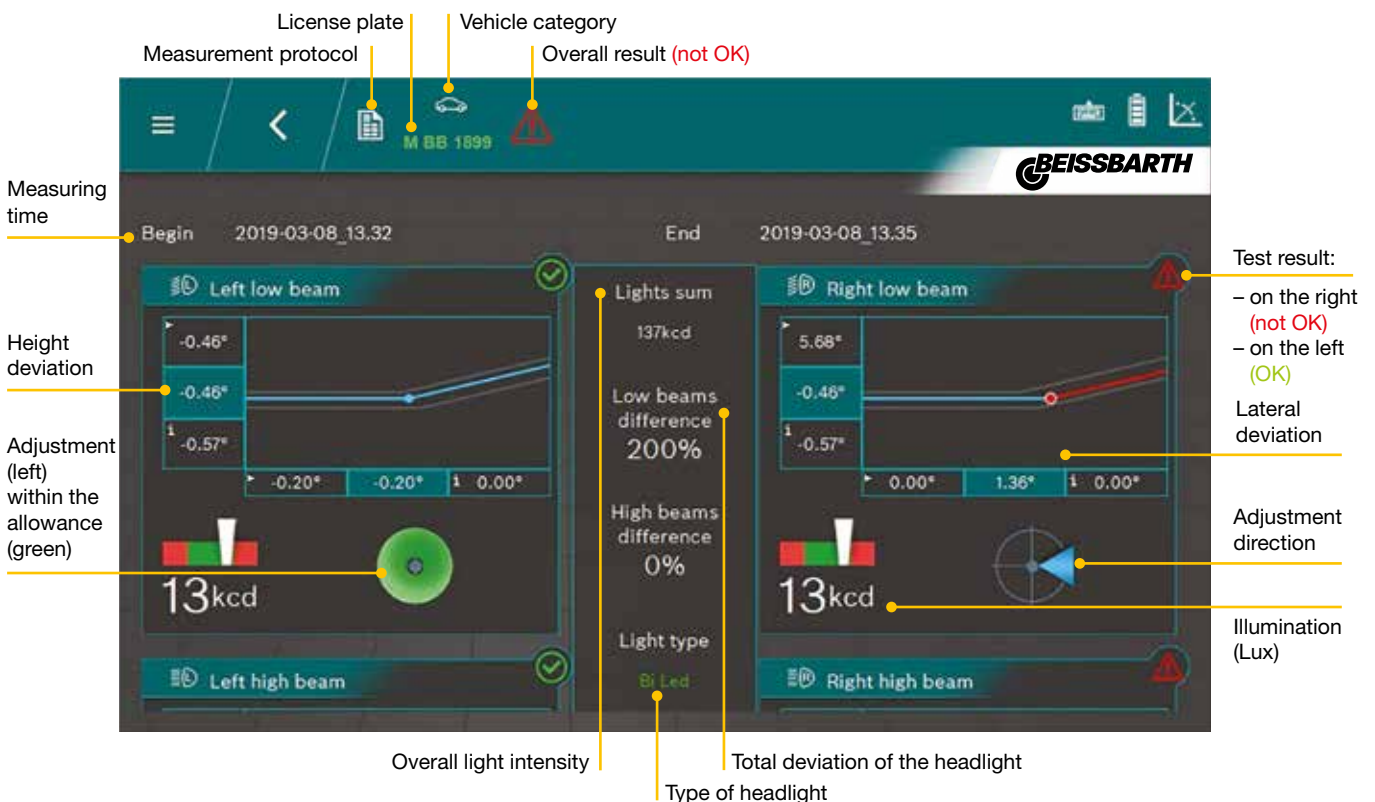
Functions:

- 1 Customer database
- 2 Archive/database
- 3 Measuring functions:
 - a) fast test
 - b) free test
 - c) official test

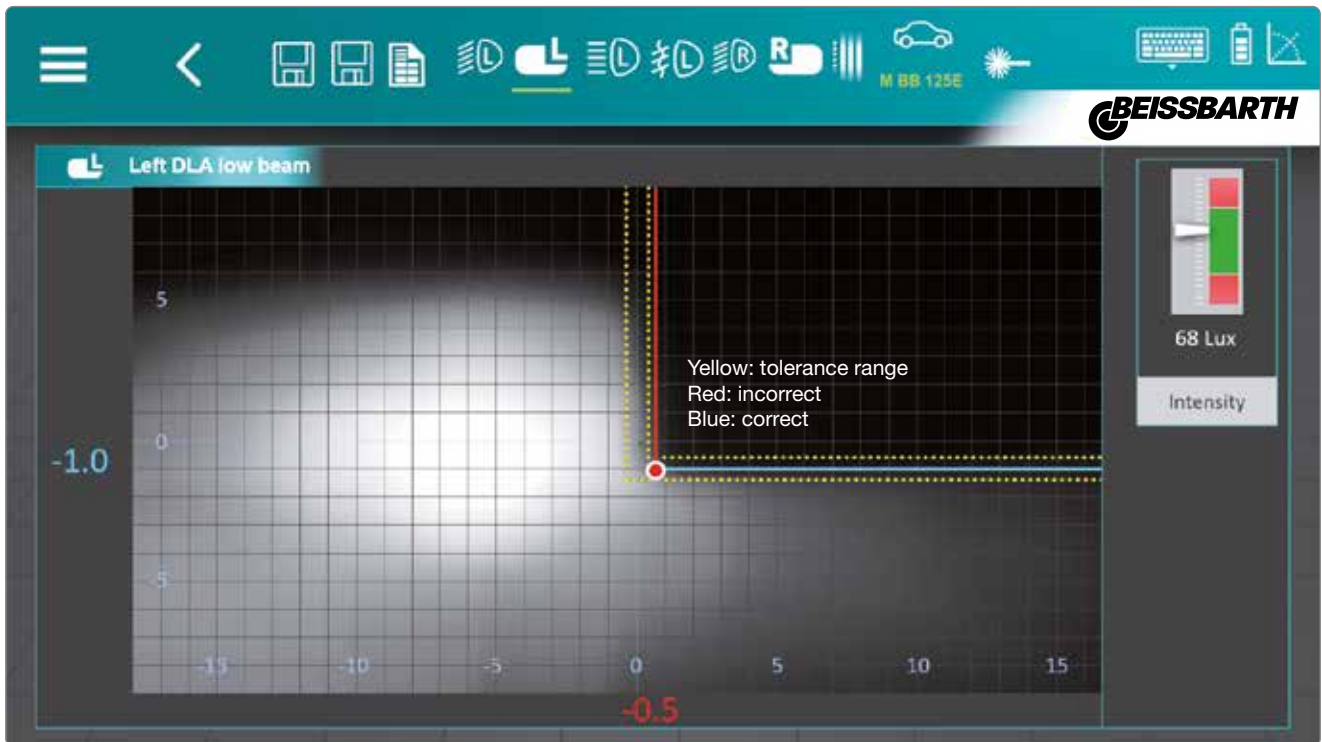
Network

- 4 Protocol printout/network data storage (FTP)
- 5 Mirrored screen/2-way communication
- 6 ASA network via Beissbarth order agent
- 7 Bosch Connected Repair

Comparison of measured values with limit values and clear red/green evaluation



Reliable adjustment of headlights with glare-free high beam*



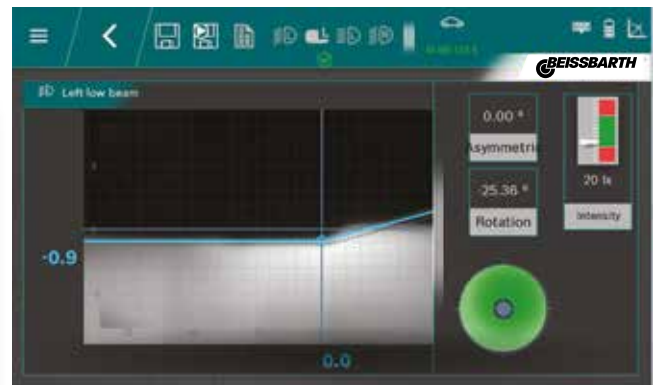
Adjustment of headlights with DLA high-beam assistant (test image control via vehicle ECU diagnosis)

MLD 9000 supports its operator at testing and adjustment of intelligent headlight systems

- Dynamic Light Assist – DLA
- Matrix
- HD Matrix 2
- ILS Ford
- Ford Matrix
- Škoda Kink
- Škoda Matrix
- Mechanical adjustment of the vertical cut-off line (e.g. DLA, ILS)
- Measurement of the vertical cut-off line via MLD 9000 software – with an accuracy of a single angular minute (e. g. in case of Matrix Beam)



Light or dark background: for varying lighting conditions and individual preferences



Low-beam cut-off line

* For the adjustment of glare-free high-beam headlights, an OBD diagnostic tester is required. For precise and reliable adjustment of glare-free high-beam headlights (vertical cut-off line), Beissbarth recommends using an accurately levelled test bay and a rail system.

MLD 9000

Complete range with all options



Digital image processing with (5 MP) CMOS camera for measurement results with live images in real time



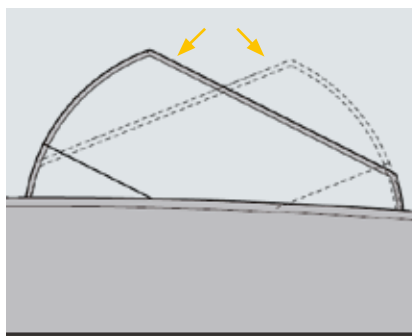
Visual and acoustic signals support the measurement procedure



7" touch screen, TFT, LED – can also be operated with work gloves



Optional: Log printer on the back of the light box



The operating panel is swivel-mounted into the light box. A single push allows the operator to switch the viewer direction – front for testing and back for for adjustment. The reading direction of the screen is switched simultaneously and automatically.






Adjustment of all types and light sources

Xenon, bi-xenon, LED, bi-LED, halogen







Typical adjustment patterns for types of headlights and light sources

Clear illustrations allow accurate headlight testing and adjustment using MLD 9000.












Light sources

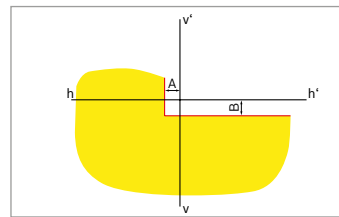
-  Halogen
-  Xenon
-  Bi-Xenon
-  LED
-  Bi-LED

Type of headlights

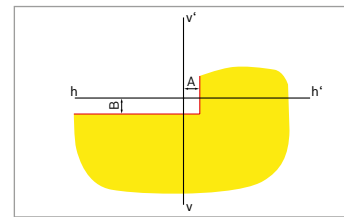
-  ECE (Europe)
-  UK (left-hand traffic)
-  symmetrical
-  US VOL
-  US VOR
-  asymmetrical 90° RHD, EU
-  asymmetrical 90° LHD, UK

Vehicle classes

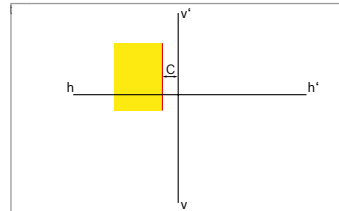
-  M1
-  M1G
-  M2, N1, N1G
-  M3
-  N2
-  N3, N3G
-  L1e
-  L2e, L4e, L5e
-  L3e
-  L6e
-  L7e



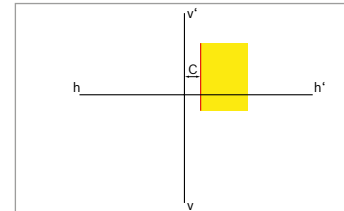
DLA headlight (left)



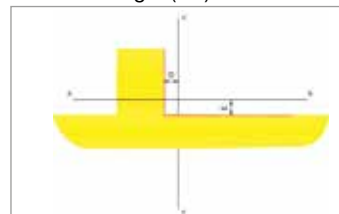
DLA headlight (right)



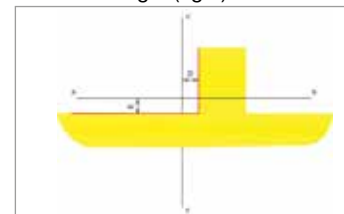
Matrix headlight (left)



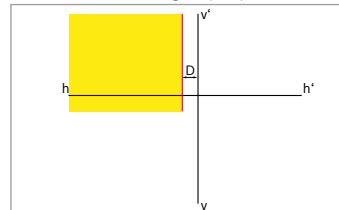
Matrix headlight (right)



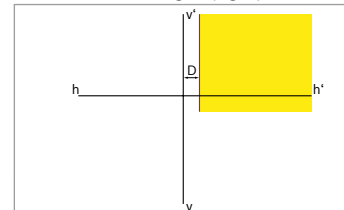
Matrix HD headlight (left)



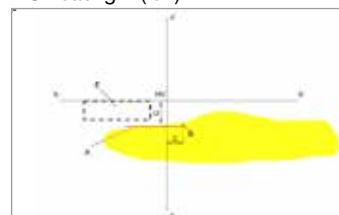
Matrix HD headlight (right)



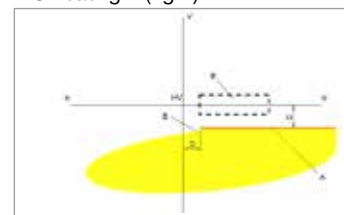
ILS headlight (left)



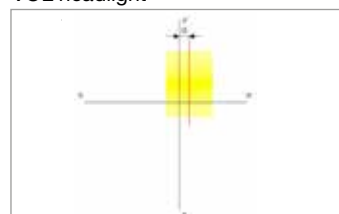
ILS headlight (right)



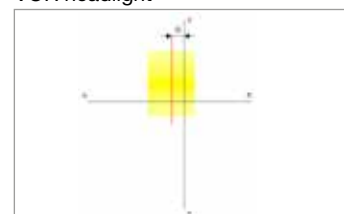
VOL headlight



VOR headlight



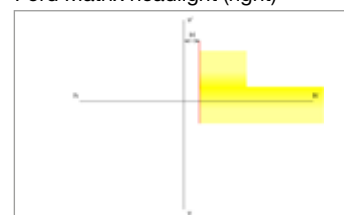
Ford Matrix headlight (left)



Ford Matrix headlight (right)



Škoda Kink headlight (left)



Škoda Kink headlight (right)

Absolutely symmetrical Upgrade: vertical laser

Optional MLD 9000 upgrade P-Assist S5

An additional vertical laser makes it easier to use the symmetrical axis as an alignment aid. An alignment pendulum at the back or a positioning device for the roof antenna serve as reference points.

(This alignment method requires a levelled rail system.)



Positioning target for the roof antenna



Positioning target for the roof antenna

P-Assist S5: Laser class 1
MLD 9000: Laser class 2

On the laser visor:
Reflector board on the pendulum

Practical pendular fixture
either with magnet clamp
or vacuum cup



Technical data

Model versions and special accessories

MLD 9000 – versions

Description	Version	Order numbers
MLD 9000 Standard	Without inclinometer RAL 7040 (grey)	1 692 104 345
MLD 9000 Standard with inclinometer	Including inclinometer RAL 7040 (grey)	1 692 104 346
MLD 9000 Standard with integrated printer	Including on-board printer	1 692 104 347



Special accessories for MLD 9000

Description	Order numbers
Rail kit (3 m)	1 692 105 080
Rail kit extension (1,5 m)	1 692 105 112
Height measurement sensor	1 692 105 278
Dust cover	1 692 105 201
P-Assist S5 vertical alignment laser	1 690 381 124
Laser clamp	1 692 105 251
Alignment pendulum	1 692 105 142
Kit (laser clamp, alignment pendulum)	1 692 105 252
Positioning device for antenna	1 690 381 292
Bosch Connected Repair	1 692 105 281
Bosch Connected Repair + WLAN stick	1 692 105 282
WLAN stick for connectivity (screen mirroring + save-to-network)	1 693 770 631

Workshop network (software/hardware)



ASA network

Optional computer software* connects to Bosch Connected Repair. By means of Bosch Connected Repair, a connection can be established with the ASA network.

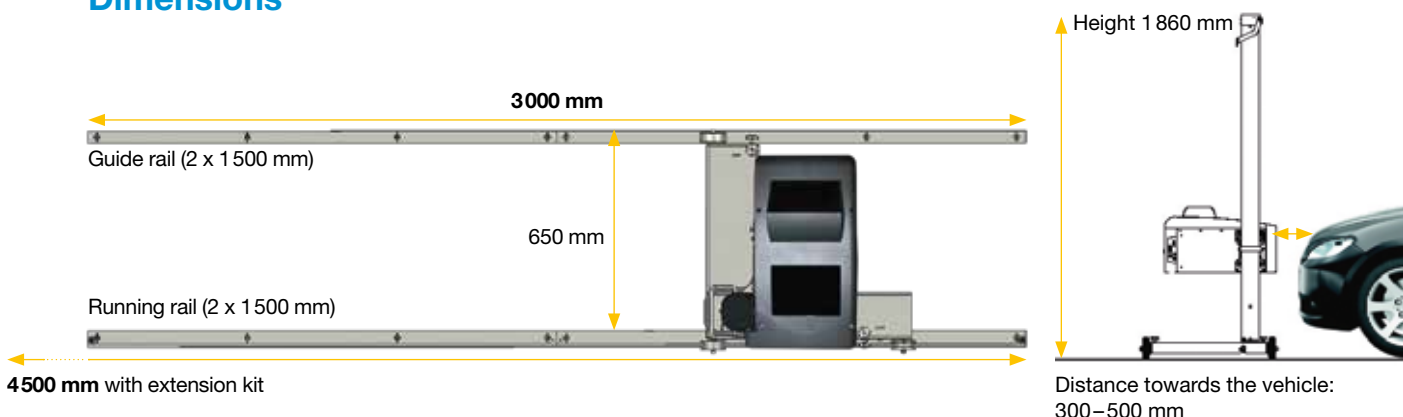
*In preparation: information concerning the availability at the retailer in charge



MLD 9000 interfaces

- Serial RS 232 interface
- 2 x USB ports (updates, WLAN adapter, log output)
- RJ45 network interface (live firmware update)
- Charger connection

Dimensions



Technical data

MLD 9000

Messbereich		
Orientation	Top and bottom	- 8 % – + 8 % (- 800 mm – + 800 mm)
	Right and left	
	• Low beam	- 10 % – + 10 % (-1 000 mm – + 1 000 mm)
	• High beam	- 10 % – + 10 % (-1 000 mm – + 1 000 mm)
Intensity	Candela	0 – 150 000
Illumination	Lux / 1 m	0 – 150 000
	Lux / 25 m	0 – 150 000





Measuring units	
Intensity	Candela
Illumination	Lux / 1m ; Lux / 25m
Orientation	% ; cm/10m ; °

Operating conditions	
Adjustment lens centre	240 – 1 500 mm
Plug voltage	100 – 240 V / 50 – 60 Hz
Battery voltage	12 V

Certificates	
CE, TÜV, EMC, FCC	

Safety information / laser warning:

Please note applicable safety regulations concerning laser handling!

Product	Laser category	Symbol	Labelling
MLD 9000	Laser 2 Cross laser inside the light box and alignment laser on the top of the column		
MLD 9000 P-Assist S5	Laser 1 Optional vertical laser (mounted onto the column)		

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TÜV certificate in line with StVZO § 50:
MLD 9000 is TÜV-certified by prototype technical release examination in accordance with the directives for testing headlight adjustment/test equipment (German Road Traffic Type-Approval Law StVZO § 50 paragraph 5 – TPN 100148827).