



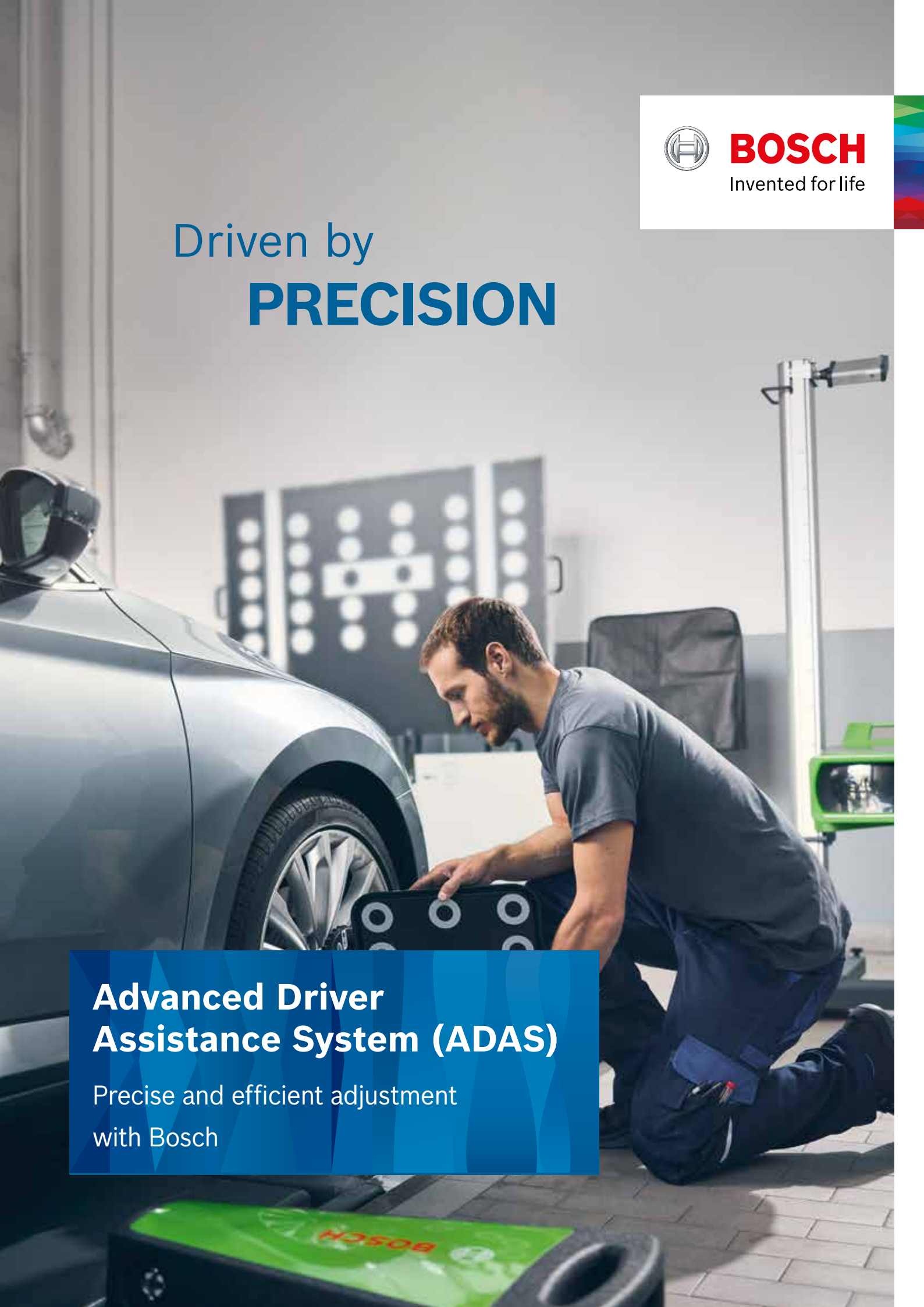
BOSCH

Invented for life

Driven by **PRECISION**

Advanced Driver Assistance System (ADAS)

Precise and efficient adjustment
with Bosch

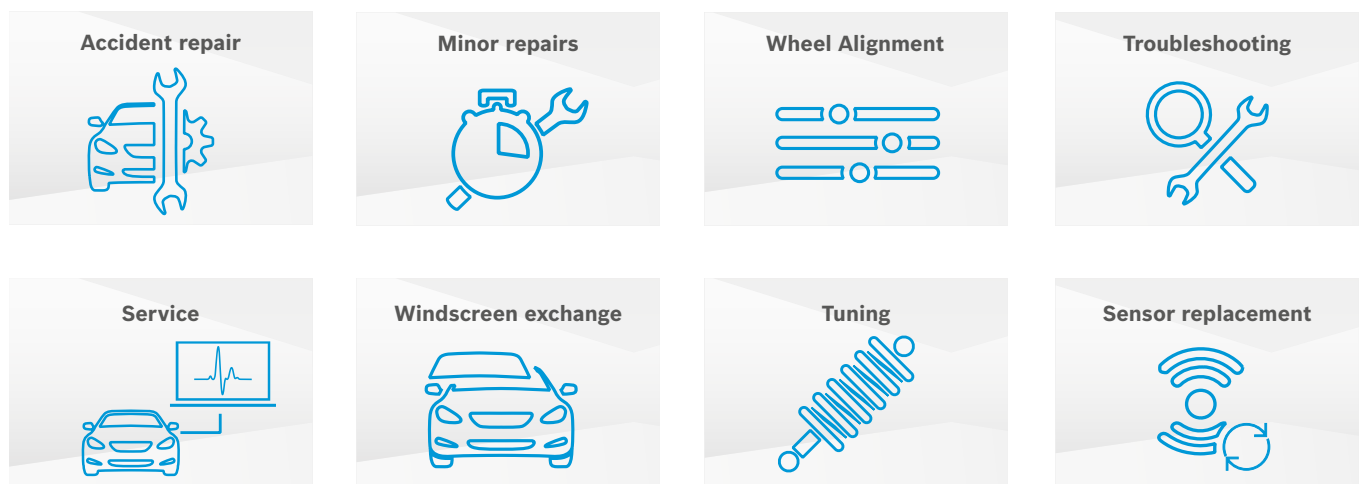


Trends for Advanced Driver Assistance Systems

Driven by the future of automated and connected mobility, advanced driver assistance systems (ADAS) are increasingly establishing themselves in a market moving towards automated driving. The fitment rate of driver assistance systems is growing very dynamically - even in the lower vehicle segments. Driver assistance systems increase safety, helping to prevent accidents.

In order to be well prepared for the upcoming challenges and developments for driver assistance systems, Bosch offers a wide range of calibration tools and devices for the workshops, covering all major European, Japanese and Korean makes.

Which use case requires ADAS services or sensor calibration?

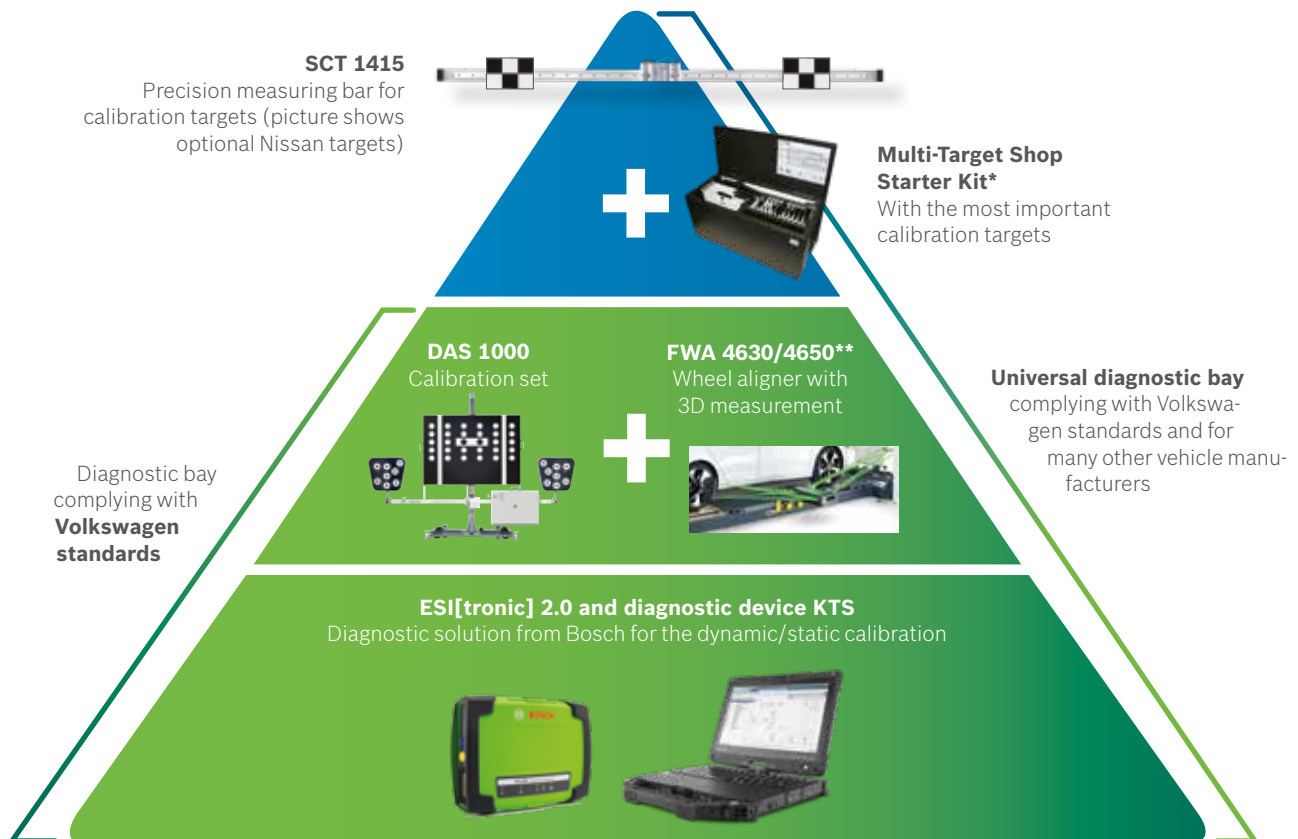


Calibration of driver assistance systems by Bosch

- ▶ **DAS 1000:** Adjustment of ACC, lane assistance system and front camera of the VW group in combination with a suitable wheel aligner (e.g. FWA 46x0) and ESI[tronic].
- ▶ **DAS 1000 + SCT 1415 + suitable calibration targets of the Multi-Target Shop:** Adjustment of ACC, lane assistance system and front camera of the VW group in combination with a suitable wheel aligner (e.g. FWA 46x0) and ESI[tronic]. In addition the front camera calibration can be performed for many vehicle manufacturers outside the VW group with the specific calibration targets and ESI[tronic].
- ▶ **SCT 415 + suitable calibration targets of the Multi-Target Shop:** Performance of the front camera calibration for many vehicle manufacturers outside the VW group with the specific calibration targets and ESI[tronic].

The professional diagnostic bay: A solution for testing the driver assistance systems

If your workshop equipment already includes Bosch 3D wheel-alignment and an appropriate Bosch diagnosis unit, you can easily upgrade by means of the DAS 1000 calibration set. This will allow your workshop to effectively perform adjustment and setup of assistance systems.



* More information on page 9
** Or with FWA 4455 (CCD)

Professional DAS service in 5 steps:

- ▶ **Vehicle reception and identification**
- ▶ **Measurement**
Quick and precise determination of the geometric driving axle through measurement of toe, camber, offset and caster/axle inclination
- ▶ **Evaluation of test results**
Adjust if necessary
- ▶ **Perform DAS service**
Position DAS 1000 at the prescribed position in front of the vehicle. All steps are program-guided and illustrated by the FWA software. Start control-unit diagnosis with the KTS and calibrate.
- ▶ **Finishing and documentation**

DAS 1000: Adjustment of ACC, lane assistance system and front camera of the VW group

ACC with radar sensor, lane-departure warning system with camera behind the windshield and night-vision systems nowadays form part of the standard equipment of many Volkswagen, Audi, Škoda and SEAT vehicles. Latest driver assistance systems (DAS) need to be maintained regularly and must be readjusted e.g. after an accident or replacement of a windshield with a front camera mounted to it. That is what we call DAS service.



Example DAS 1000 Version for Bosch 3D-wheel aligner FWA 4630 or 4650

- ▶ Complete DAS 1000 adjustment jig for mobile application at the workplace.
- ▶ Key-Cards for installation on the computer of the FWA 4630/4650 wheel aligner including licenses and registration of the workplace
- ▶ Two 3D measurement boards for alignment of DAS 1000
- ▶ BAT 645 high-frequency battery charger to ensure the correct battery capacity during the calibration*



BAT 645




Key-Cards for SW download



FWA 3D Targets

DAS 1000

Scope of delivery

Scope of delivery DAS 1000/800 versions	DAS 1000	For Bosch wheel aligner			Solution for glass specialists with Bosch wheel aligner	
		DAS 1000 CCD	DAS 1000 3D	DAS 1000 3D S1	DAS 800 CCD	DAS 800 3D
Carrier column with linear unit and adjustment bar	•	•	•	•	•	•
ACC/ADR laser box for passive adjustment of radar sensors	•	•	•	•		
ACC reflector mirror for active adjustment of radar sensors	•	•	•	•		
Calibration target for the adjustment of the front camera	•	•	•	•	•	•
Mobile base frame as mounting for the carrier column	•	•	•		•	•
Static base frame (XY drawbar) as mounting for the carrier column				•		
Socket wrench for the adjustment of radar sensors	•	•	•	•		
3D measurement boards for alignment of the adjustment bar			•	•		•
Software bundle for FWA 46x0+			•	•		•
Software bundle for FWA 4455+		•			•	
BAT 645 High-frequency battery charger (Q2/2018)		•	•	•		
 Order number:	1 692 000 016	1 692 000 013	1 692 000 011	1 692 000 017	1 692 000 014	1 692 000 012

Recommended Bosch wheel aligner:



FWA 4455 (CCD)



FWA 4630/4650 (3D)



FWA 4650 Kit (3D)

SCT 1415/1410: Precision measuring bar for universal calibration



SCT 1415

Comprehensive coverage of the front camera calibration will be achieved by upgrading the system with the SCT 1415. In combination with the optional calibration targets the service can be extended for all important European, Japanese and Korean vehicle manufacturers.

You simply need to mount the precision measurement bar, which is able to carry the calibration targets, on the DAS 1000 trolley and you are ready to go. Precise orientation of the trolley and the target relative to the driving axle is made possible with the FWA 4xxx program.

Three alignment methods: DAS 1000 combined with SCT 1415

- ▶ 3D or CCD wheel alignment (-> geometric driving axle)
- ▶ line laser (-> longitudinal vehicle center line)



With 3D measurement boards
(Calibration targets for Nissan
illustrated)



With CCD wheel alignment
(Calibration targets for Opel/Fiat/
Kia/Hyundai illustrated)




With 3D wheel alignment
(Calibration targets for
Mercedes-Benz illustrated)



SCT high-precision measuring bar for calibration target mounting (see page 9 for targets)

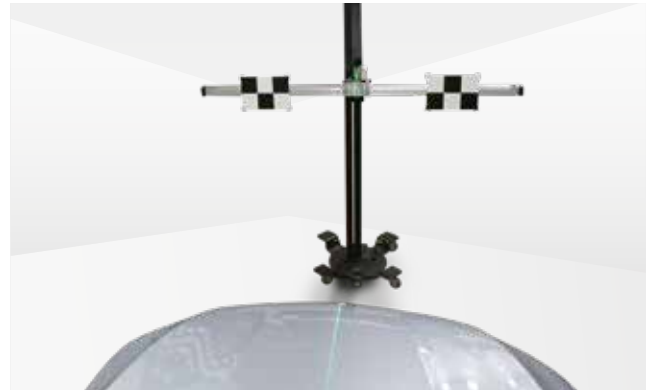


SCT 1415/1410: Scope of delivery and laser module

Scope of delivery	Entry level variant on wheel alignment bay		
	SCT 1415 S1	SCT 1415 S2	SCT 1410
Precision measurement bar	•	•	•
Mount (installed to DAS 1000)	•	•	•
Position indicator height adjustment	•	•	•
Ruler for extended height adjustment	•	•	•
Mount for large Targets	•	•	•
Universal tape measure bracket (2 units)	•	•	•
Measure bracket 5m (2 units)	•	•	•
Wall bracket for precision measurement bar	•	•	•
Keycard for Program FWA4xxx+	•	•	•
Short Manuals for vehicle specific setup	•	•	•
Laser for alignment vehicle center line	•	•	
SCT 410 Jig for 2nd measurement bay (like SCT 415 but with a simplified mounting of the measuring bar and without height ruler)		•	
 Order number:	1 690 380 101	1 690 380 100	1 690 380 123





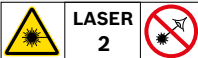



Laser module on measuring bar SCT 1415



SCT 410 is part of the scope of delivery of SCT 1415 S2 (with optional Nissan targets)

Hazard categories of laser technologies

Product	Symbol*	Laser class	Labeling	Warning
SCT 415/410/1415/1410		Laser 1M		 Laser Radiation! Do not view directly with optical instruments
DAS 1000/VAS 6430-2/VAS 6430-3		Laser 2		

*symbolic illustrations of the laser classes

SCT 415: Stand-alone solution for the multi-target shop



SCT 415: smart alternative as a secondary work bay

Universal mounting for the high precision measuring bar. Vehicle specific targets from the multi-target shop and the laser unit complete the measuring system. A computer is not required.

Perfect to calibrate driver assistance systems when wheel alignment is not required by the manufacturer.

- ▶ High flexibility due to multi-target shop (see below)
- ▶ Complete system coverage
- ▶ Quick set-up: Switching of calibration targets and their alignment towards the vehicle can be done within seconds.
- ▶ Maximum calibration accuracy due to magnetic calibration target mounting with polarised sockets
- ▶ Fine adjustment of heading, pitch and roll angles
- ▶ Complies with the specifications of the most important European, Japanese and Korean vehicle manufacturers
- ▶ Line laser for the alignment towards the vehicle
- ▶ Green laser line is visible even in bright ambient light. Alignment to the vehicle center line or its chassis is done without the aid of a computer.




Scope of delivery SCT 415:

- ▶ Professional target board fixture mounted on 4 wheeled base plate with level setting screws
- ▶ Precision measurement bar with measurement scale for accurate positioning of vehicle specific targets
- ▶ Height ruler
- ▶ 1-pager vehicle specific setup instructions
- ▶ Additional holder arm for XL Targets
- ▶ 5m Tape measure + universal bracket
- ▶ Special Line laser for jig orientation towards the vehicle center line

***Targets not included, refer to Multi-Target shop!**

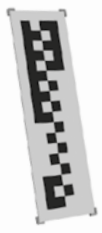
 **Order number: 1 690 380 120**

Hazard categories of laser technologies

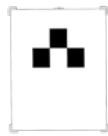
Product	Symbol*	Laser class	Labeling	Warning
SCT 415/410		Laser 1M		 Laser Radiation! Do not view directly with optical instruments

*symbolic illustrations of the laser classes

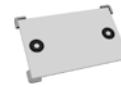
Multi-Target Shop: Calibration targets for the following vehicle manufacturers



**Calibration target
XL-Univ. for Kia/
Hyundai/Fiat**
Type 1
📦 **Order number:**
1 690 382 288



Kia/Hyundai
Type 2
📦 **Order number:**
1 690 382 320



Mazda
Type 1
📦 **Order number:**
1 690 382 318



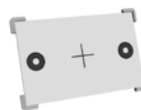
Kia/Hyundai
Type 3
📦 **Order number:**
1 690 382 316



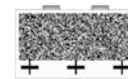
Mazda
Type 2 (Set)
📦 **Order number:**
1 690 381 234



Nissan
Type 1 (Set)
📦 **Order number:**
1 690 381 139



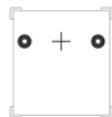
Mercedes-Benz
Type 1 (Pkw)
📦 **Order number:**
1 690 382 312



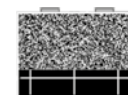
Subaru
Type 2
📦 **Order number:**
1 690 382 329



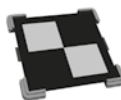
Nissan
Type 2 (Set)
📦 **Order number:**
1 690 381 140



Mercedes-Benz
Type 2 (Sprinter)
📦 **Order number:**
1 690 382 319



Subaru
Type 3
📦 **Order number:**
1 690 382 308



Toyota
Type 1
📦 **Order number:**
1 690 382 287



Honda
Type 1
📦 **Order number:**
1 690 381 143



**Calibration targets
Univ. Renault,
Smart, Infiniti**
Type 1 (Set)
📦 **Order number:**
1 690 381 142



Toyota/Lexus
Type 2
📦 **Order number:**
1 690 382 328



Honda
Type 2
📦 **Order number:**
1 690 382 297



Mitsubishi
Type 1 (Set)
📦 **Order number:**
1 690 381 218



Toyota
Type 3
📦 **Order number:**
1 690 382 355



Honda
Type 3
📦 **Order number:**
1 690 382 349



Multi-Target Shop Starter Kit 1
7 target types consisting of:
Mercedes Typ 1, Toyota Typ 1 & 3,
Mazda Typ 1, Nissan Typ 1, Honda
Type 3, XL-Universal
📦 **Order number:**
1 690 381 241

Multi-Target Shop Starter Kit 2
3 target types consisting of:
Mercedes Type 1 & Type 2,
XL-Universal
📦 **Order number:**
1 690 381 242

Note: Set = 2 targets

Professional DAS service: Calibration of front cameras

Manufacturer	Front-camera (lane assistance)				Radar-sensor (ACC, braking assistance)			
	Calibration drive	Static with calibration targets			Calibration drive	Static with reflectors		
		DAS 1000 DAS 800	SCT 1415 SCT 1410	SCT 415 SCT 410		DAS 1000	SCT 1310*	SCT 815* SCT 810*
Alfa Romeo		•				•	(•)	
Audi		•				•	(•)	
BMW	•					•	(•)	
Chrysler	•				•			
Citroën			• ²⁾	• ²⁾	•			
Fiat			•	•		•	(•)	
Ford	•				•			
Honda			• ¹⁾	• ¹⁾				•
Hyundai			•	•				•
Jaguar	•				•			
Jeep			• ²⁾	• ²⁾		• ²⁾	(•)	
KIA			•	•				•
Land Rover								
Mazda			•	•				•
Maserati		•				•	(•)	
Mercedes-Benz			• ¹⁾	• ¹⁾	•			
Mitsubishi			•	•		•	(•)	
Nissan			•	•		•	(•)	
Opel			•	•	•			
Peugeot			• ²⁾	• ²⁾	•			
Porsche		•				•	(•)	
Renault			• ²⁾	• ²⁾			• ²⁾	
Seat		•				•	(•)	
Škoda		•				•	(•)	
Smart			•	•				
Subaru			•	•				
Suzuki			○	○		•	(•)	
Toyota			•	•				•
Volkswagen		•				•	(•)	
Volvo	•				•			

¹⁾ Depending on the system, in combination with a calibration drive;

²⁾ For some vehicle types also with dynamic calibration;

○ in preparation

(+) XL reflector SCT 1310 recommended for mid-range radar

* in preparation

ESI[tronic] 2.0: Diagnostic software for controlling vehicle specific calibration and adjustment procedures

Software:



The vehicle manufacturer decides which learning method for the sensors is used. Bosch supports workshops with the right tools, test equipment and the necessary diagnostic software to perform the adjustment procedures. The ESI[tronic] actually has the following vehicle coverage to support you during the process:

- ▶ More than 17.000 model specific assignments for **radar based assistance systems**
- ▶ More than 42.000 model specific assignments for **camera based assistance systems**
- ▶ More than 24.000 model specific assignments for **intelligent lighting systems**



Accessories



Article	Order number
RSAD 100 (Mercedes)	1 690 380 004

Additional tools for the dynamic calibration of front cameras

Driven by efficiency

Bosch technologies are used worldwide in almost all vehicles. People, and assuring their mobility, is what we are focused on.

Therefore, we have dedicated the last 125 years of pioneering spirit and expertise in research and manufacturing to achieving this.

We continue to work on our unique combination of solutions for spare parts, diagnostic devices, workshop equipment and services:

- ▶ Solutions for efficient vehicle repairs
- ▶ Innovative workshop equipment and software
- ▶ The world's most comprehensive range of new and replacement parts
- ▶ Large network of wholesale customers, for quick and reliable parts supply
- ▶ Competent hotline support
- ▶ Comprehensive educational and training offers
- ▶ Targeted sales and marketing support

Find out more at:
bosch-automotive-aftermarket.com

**What drives you
drives us**

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