

Laboratorij za prometno-tehnička vještačenja



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SAMOSTALNI ZAVODI

ZAVOD ZA PROMETNO-TEHNIČKA VJEŠTAČENJA



Laboratory for Traffic Accidents Expertise



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INDEPENDENT DEPARTMENTS

DEPARTMENT OF TRAFFIC ACCIDENT EXPERTISE



Naziv opreme / Equipment name

Mjerač temperature PCE – 313
Hydrometer PCE – 313

Proizvođač / Manufacturer

PCE Group, Southampton, Hampshire, UK



Namjena i opis / Purpose and description

Prenosivi mjerač za temperaturu i relativnu vlagu.

Tehničke značajke opreme:

- mjerna područja: 0 ... 100 % r.F., - 20 ... + 60 °C
- rezolucija: 0,1 % r.F., 0,1 °C
- točnost: +- 2,5 % r.F., +- 0,7 °C
- spremnik podataka: 16.000 mjernih vrijednosti
- senzor: 190 mm x 13 Drm.
- baterija: 1 x 9 V PP3 blok baterija
- veličina: 186 x 64 x 30 mm
- masa: 320 g
- mjerna područja: 0 ... 100 % r.F., - 20 ... + 60 °C

Portable gauge for temperature and relative humidity.

Equipment technical specifications:

- ranges: 0 ... 100 % r.h., - 20 ... + 60 °C
- resolution: 0.1 % r.h., 0.1 °C
- accuracy: +- 2.5 % r.h., +- 0.7 °C
- memory capacity: 16.000 readings
- sensor: 190 mm x 13 mm diameter

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- battery: 1 x 9 V PP3 battery
- dimensions: 186 x 64 x 30 mm
- weight: 320 g
- operation conditions: 0 to 40 °C; <80% r.h.





Naziv opreme / Equipment name

Mjerač buke PCE -355
Noise gauge PCE -355

Proizvođač / Manufacturer

PCE Group, Southampton, Hampshire, UK



Namjena i opis / Purpose and description

Prijenosni mjerač za buku.

Tehničke značajke opreme:

- automatski raspon: 70 to 140 dB(A)
- rezolucija: 0,1 dB
- točnost: 1,5 dB
- raspon frekvencije: 20 Hz do 10 kHz
- kapacitet logera: 5000 mjesta
- frekventno procjenjivanje: A, C
- display: 25 mm LCD-display
- okolina: 5...+40 °C, ispod 80 %rH
- napajanje: četiri 1.5V LR-6/AA alkalne baterije
- izmjere: 106 x 64 x 34 mm
- klasifikacija: ANSI SI.25, ISO 1999 & BS 6402
- težina: 350 g

Portable noise gauge.

Equipment technical specifications:

- measurement range: 70 to 140 dB(A)
- resolution: 0.1 dB

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- accuracy: ± 1.5 dB (ref. 94 dB at 1 KHz)
- frequency range: 20 Hz to 10 kHz
- memory capacity: 5000
- frequency weighting: A, C
- display: 25 mm LCD-display
- operating conditions: 5....+40 °C
- power: 4 – AAA batteries
- dimensions: 106 x 64 x 34 mm
- standard: ANSI SI.25, ISO 1999 & BS 6402
- weight: 350 g





Naziv opreme / Equipment name

Mjerač debljine laka PCE-CT 28
Coating thickness gauge PCE-CT 28

Proizvođač / Manufacturer

PCE Group, Southampton, Hampshire, UK



Namjena i opis / Purpose and description

Prenosivi mjerač debljine laka.

Tehničke značajke opreme:

- mjerno područje: 0 ... 1250 μm
- rezolucija: 0,1 μm (0...99,9 μm), 1 μm (> 100 μm)
- točnost: $\pm 2\%$ or ... 2,5 μm
- prikaz: 4-znamenkasti, 10 mm LCD-display
- radni uvjeti: 0 ... +50 °C
- napajanje: 4 x 1,5V AAA-baterije
- dimenzije: 126 x 65 x 27 mm
- masa: 120 g

Portable coating thickness gauge.

Equipment technical specifications:

- measurement range: 0 ... 1250 μm
- resolution: 0.1 μm (0...99.9 μm), 1 μm (> 100 μm)
- accuracy: $\pm 2\%$ or ... 2.5 μm
- display: LCD with 4 x 10 mm high digits
- operating temperature: 0 ... +50 °C
- power: 4 x 1.5V AAA- batteries
- dimensions: 126 x 65 x 27 mm
- weight: 120 g

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Naziv opreme / Equipment name

Uređaj za mjerenje dinamike kretanja vozila Pocket DAQ
Device for measuring vehicle dynamics Pocket DAQ

Proizvođač / Manufacturer

DSD Dr. Steffan Datentechnik GmbH, Linz, Austrija



Namjena i opis / Purpose and description

Uređaj služi za mjerenje i ispitivanje dinamike kretanja vozila pri izvođenju tzv. *crash* testa. Uređaj je opremljen sensorima za mjerenje ubrzanja i kutne brzine vozila te može prikupljati podatke po tri osi (X, Y, Z). Uređaj prikupljene podatke snima na SD karticu što je pogodno za kasnije analize.

Device for measuring the dynamics of the vehicle is used for measuring and testing vehicle performance during crash tests. The device is equipped with sensors for measuring accelerations and angular velocities of the vehicle and can collect data from three axes (X, Y, Z). Collected data is recorded on the SD card which is suitable for later analysis.

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Naziv opreme / Equipment name

Uređaj za mjerenje usporenja i ubrzanja vozila XL - Meter
Device for measuring vehicle deceleration and acceleration XL - Meter

Proizvođač / Manufacturer

Inventure Automotive Electronics Research & Development,
Budapest, Hungary



Namjena i opis / Purpose and description

XL metar je jednostavan uređaj koji služi za mjerenje usporenja i ubrzanja vozila. Uređaj se pomoću vakumskog "priljepka" instalira na vjetrobransko staklo sa unutrašnje strane vozila. Uređaj može snimiti podatke do osam mjerenja a pogodan je za ispitivanja koeficijenta prijanjanja pneumatika te zaustavnog puta vozila.

Device for measuring acceleration is a simple device used to measure the deceleration and acceleration of the vehicle. The device is attached to the windshield with a vacuum "hanger" on the inside the vehicle. Can record up to eight measurement datasets and is suitable for testing the coefficient of adhesion pneumatics and stopping distance of the vehicle.

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Naziv opreme / Equipment name

Ručni uređaj za mjerenje duljine puta tipa M4
Handheld device for measuring travel distance M4

Proizvođač / Manufacturer

Glunz Technik GmbHw, Recklinghausen, Deutschland



Namjena i opis / Purpose and description

Uređaj za mjerenje duljine puta.

Tehničke značajke opreme:

- razred točnosti: III
- mjerni opseg: 5,00 – 9999,99 m
- najmanji podjeljak: 1 cm

The length measuring device.

Equipment technical specifications:

- accuracy class: III
- measurement range: 5.00 – 9999.99 m
- smallest division: 1 cm

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Naziv opreme / Equipment name

Uređaj za prikupljanje podataka o dinamici vozila SBX-110
Smart Black Box recorder SBX-110

Proizvođač / Manufacturer

KCI Communications, Lake Zurich, USA



Namjena i opis / Purpose and description

Uređaj služi kao tzv. eksterna crna kutija u vozilu te prikuplja podatke o putu i dinamici kretanja vozila. Ima ugrađen GPS te je u naknadnoj analizi moguće vidjeti podatke o ruti kretanja vozila. Uređaj se instalira na unutrašnju stranu vjetrobranskog stakla, a budući da posjeduje kameru može snimati i video zapis vožnje.

The device serves as an external black box in the vehicle and collects data from travel information and the dynamics of the vehicle. It has built-in GPS and the subsequent analysis can show information about the route of the driver. The device is installed on the inside of the windshield and it has a camera which can record the trip.

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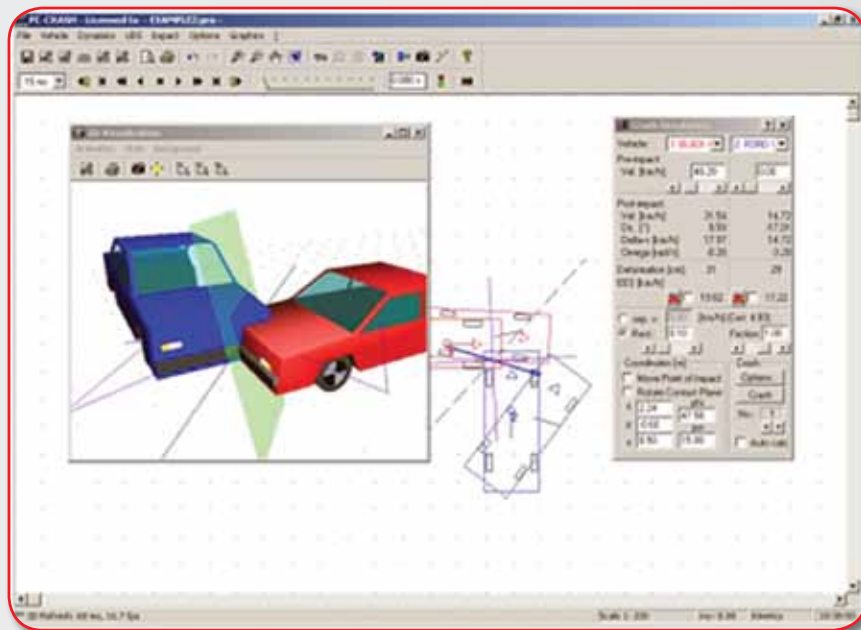


Naziv opreme / Equipment name

Program za simulaciju prometnih nesreća PC CRASH
Traffic accidents simulation software PC CRASH

Proizvođač / Manufacturer

DSD Dr. Steffan Datentechnik GmbH, Linz, Austrija



Namjena i opis / Purpose and description

Program služi za simulaciju prometnih nesreća u cestovnom prometu i omogućava preciznu analizu sudara motornih vozila i drugih čimbenika. Na temelju unesenih vrijednosti program automatski izračunava sve parametre u sudaru, a na temelju oštećenja na vozilima moguće je dobiti vrijednosti i o utrošenoj energiji u sudaru. Posjeduje bazu podataka od nekoliko tisuća vozila te simulira i kretanje pješaka ili vozača u trenutku sudara.

Program omogućava simulaciju u 2D i 3D formatu iz različitih kutova pa tako i iz perspektive vozača.

The program is used to simulate traffic accidents in road traffic and can provide an accurate analysis of motor vehicle collisions and other factors. Based on the entered value, the program automatically calculates all parameters in a collision. Based on the damage of the vehicles it is possible to get the values of consumed energy in the collision. It has a database of several thousand vehicles, and simulates the movement of pedestrians and drivers at the time of the collision. The program enables the simulation of 2D and 3D from different angles and from the perspective of the driver.

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Naziv opreme / Equipment name

Uređaj za prikupljanje podataka iz cestovnih vozila Bosch Crash Data Retrieval DLC Base Kit
Device for Retrieving Data from Road Vehicles / Bosch Crash Data Retrieval DLC Base Kit

Proizvođač / Manufacturer

Robert Bosch GmbH, Gerlingen, Germany



Namjena i opis / Purpose and description

Bosch Crash Data Retrieval (CDR) DLC Base Kit je specijalizirani uređaj koji služi za prikupljanje podataka o načinu i brzini kretanja vozila prije i u trenutku sudara. Navedeni podaci snimaju se putem Event Data Recorder (EDR) uređaja koji je implementiran u neku od računalnih jedinica vozila te bilježi sve podatke o dinamici kretanja vozila tijekom vožnje.

Bosch Crash Data Retrieval služi upravo za pristupanje EDR uređaju te omogućuje preuzimanje niza relevantnih podataka o dinamici kretanja vozila, prije i u trenutku sudara, na temelju kojih je moguće provesti detaljnu analizu prometne nesreće. Podaci koje je moguće preuzeti odnose se na brzinu vozila, status kočnica, stupanj zakretanja upravljača, promjenu brzine u trenutku sudara, status sigurnosnog pojasa i zračnih jastuka te drugih podataka koji se koriste pri analizi prometnih nesreća.

Bosch Crash Data Retrieval (CDR) DLC Base Kit is a specialized device which is used for collecting data about dynamics of vehicles before and at the moment of impact in traffic accidents. The data is recorded by the Event Data Recorder (EDR) device that is implemented in a computer unit of the vehicle and records all data about the dynamics of the vehicle during the drive.

Bosch Crash Data Retrieval is used for accessing the EDR and the retrieval of relevant data about the

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dynamics of the vehicle, before and at the time of collision, based on which it is possible to carry out a detailed analysis of traffic accidents. The data which can be downloaded is related to the vehicle speed, brake status, steering wheel angle, crash severity, the status of the seat belt and air bags, and many other parameters used in the analysis of traffic accidents.

