META



# DIAGNOSTIC EQUIPMENT

Comprehensive safety systems

Equipment for the police

2013

# ABOUT THE COMPANY

For 25 years META Engineering & Production Co has successfully operated on the Russian market of automotive diagnostic equipment and specialised road safety equipment. META's work is primarily focussed on the development and production of modern hi-tech based diagnostic equipment.

META started its operations in 1988, in Tashkent, where tasked by the Chief Road Traffic Inspectorate (GAI USSR) the company developed its first environmental monitoring device — META-01 portable smoke meter. This compact and convenient instrument instantly became popular with Chief Traffic Inspectorate (CTI) and Goskomekologia (State Committee for the Environment). The next pioneering development created by META was the spectrophotometric breathalyser AKPE-01META, which is still in use and remains the only device used in Russia to test alcoholic intoxication. In the course of 15 years the Company started mass of three popular breathalyser models, including the smallest spectrographic breathalyser with an autonomous power supply: AKPE-01M, which is being supplied in the RF for 4 years now to units of DPS (Road traffic service) of the State automotive inspectorate (SAI).

At present META is an engineering & production association of enterprises producing instruments, scientific-technical and study centres, design offices and diagnostic stations. Company's production programme covers a wide range of diagnostic equipment for State automobile inspection stations and motor vehicle servicing, environmental monitoring devices, specialised equipment for the Russian Ministry of Internal Affairs and Ministry of Defense, electronic personnel and motor vehicle monitoring devices, as well as comprehensive security systems for various facilities. All serially produced systems and instruments were developed on the basis of technical tasks of the Ministry of Internal Affairs and Ministry of Defense, and are successfully used to ensure transport safety at military and civilian facilities in the Russian federation and CIS. META products were awarded gold medals and diplomas at prestigious international exhibitions and by quality programmes. In 2007, META was the winner of the All-Russian Competition 'Safe roads' in the nomination 'Best technical diagnostics devices for automotive transport' and in the nomination 'Best device for testing drivers for alcohol intoxication level (breathalyser)'. META's plants for instrument production are equipped with modern automated surface assembly line

for electronic components, high-precision machines for die and mould manufacturing, hi-tech lines for the manufacture of optical components and power-measuring sensors, quality control instruments, including RX-soldering control for chip components which ensured improvements in quality and volume of production. At all development and production stages META uses a comprehensive QM system in compliance with international standards ISO 9001-2001/ISO 9001-2000 and GOST RV 15.002-2003. Over 4000 MOT technical inspection and service facilities in Russia and CIS are equipped with instruments and stands produced by META; over 200 000 measurement devices with the name META are used to monitor environmental parameters in transport and for the evaluation of motor vehicles' technical condition according to road safety requirements in Russia and CIS. META products are successfully used in technical centres of various companies and service stations for Russian and foreign motor vehicles, such as VAZ, KAMAZ, BMW, HYUNDAI, RENAULT, KIA. Fast developing network of regional service centres META-SERVICE and technical inspection stations of our subsidiary: 'Russian technical road safety centre' demonstrate the quality and effectiveness of our equipment.

A wide network of META service centres in Russia and CIS is equipped with calibration equipment, repair documentation and testing facilities. Multilevel training system for managers and service engineers, training centres in Almata, Orel, Moscow, Zhigulevsk, Novosibirsk, and Irkutsk, annual seminars and conferences devoted to new product designs, service support and software updates enable us to build a successful business model not only through sales of META produced equipment, but also by by providing services, calibration and verification for devices deployed in the field. META values mutually beneficial cooperation and offers a flexible system of discounts and deferred payments, as well as trade credit schemes.

A wide-range production programme and on-going product updates based on the latest advancements in technology guarantee effective projects and fast return on investment.

# COMPANY'S NEW PRODUCTION PROGRAMME FOR 2013-2014

- Container and block technical inspection stations with axle load of up to 15t., based on mobile roller break tester CTM 15000U.01M bed with play detector LD – 16000;
- Mobile technical inspection stations in a trailer based on low-profile roller brake tester with axle loads of from 3 to 13 t.;
- Trailer loader for braking system testing;
- Mobile office units in trailers and quickly erected modular capsule type buildings;
- Automated driver training systems, with road markings recognition systems and compatible with GLONASS navigation system;
- Low-profile roller braking testers, with axle loads of up to 16 t.;
- Suspension and shock absorber test stands;
- Video Highway Code registration systems for traffic regulations violations at pedestrian crossings;
- Automated weight-control posts based on VA-D portable scales for weighing motor vehicles when moving and stationary;
- Transport vehicles monitoring system based on GLONASS satellite navigation with on-board safety parameters control function during transportation of special cargo and personnel;
- ALCOZAMOK driver's intoxication level monitoring system with GLONASS trackers;
- TALISMAN automated monitoring systems for personnel location and health tracking.
- New for 2013! VA-15C-2 and VA-15C-2M low-profile portable scales for control motor vehicle weighing.

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# VEHICLE TECHNICAL INSPECTION STATIONS

## based on LTK-S, LTK-M, LTK-P stationary, mobile and travelling technical monitoring lines

Turn-key station construction: design, supply, installation, technical servicing.
Professional training for controllers and experts of State MOT
Licence of the Russian Ministry of Education RO 012121 reg. N 2763 dated 25.02.11

META automated motor vehicle technical inspection kits provide the most complete set of measuring instruments and diagnostic tools for technical inspection stations and posts from one developer-manufacturer. DIAGNOSTIC CONTROL software-hardware unit ensures automatic wireless transmission of inspection results of vehicle technical condition as measurement reports, identified using registration marks which are entered from the panel of each instrument. This enables to set up a multi-post diagnostics workflow and increase line throughput five-fold. META offers LTK RK automated motor vehicle technical inspection kits with wireless connection of all the instruments to a PC via a radio communication channel. LTK RK offers a significant reduction in line assembly cost, enhances equipment reliability and prolongs operational service life. The area of wireless coverage is up to 300 m.

Completely new performance enhancing possibilities are provided by the video-registration system 'M-VIDEO', designed to automate the procedure of technical inspection using technical diagnostic means on stationary, travelling and mobile technical inspection stations. A video image of the vehicle permits on the basis of an automatically recognised vehicle registration to find information about the vehicle, vehicle owner, in the traffic police data bases, and to prevent fraudulent technical inspection results.

A photographic image of the vehicle indicating date and time, registration data and inspection results of vehicle's condition are recorded on a diagnostic card and kept until the next inspection.
PDU-Meta combined remote control panel from the LTK kit performs two functions: remote control of roller brake tester operation and electronic registration of results of visual inspection of vehicle's parameters with automatic data transmission to a central computer via a radio channel.
META offers competitive payment schemes for customers wishing to purchase its diagnostic equipment, such as deferred payment schemes, long-term credit and leasing.
Inspection stations may consider creating a JV, with META providing its equipment.

## LTK modifications:

LTK-S
full diagnostic kit including instruments and roller brake testers to check the technical condition of passenger motor vehicles and mini-buses.

LTK-M
mobile container diagnostic station, dimensions 6040 x2450 x2700 mm with hydraulic drive for lifting ramps with a motor vehicle and a heated office 7,2 m2, to check the technical condition of mini-buses and mini-lorries.

LTK-P
mobile technical inspection post on a GAZ 2705 chassis or Ford Transit. The best solution for inspection in remote areas.


META

# Functions:

- Inspection for compliance with GOST R 51709-2001 and 'Technical safety regulations for motor vehicles' during technical inspection, service and repair.
- A multi-post technical inspection line may be set up which increases throughput five-fold.
- Automatic data transfer to a central PC via wired or wireless communication.
- Display of established template for diagnostic card.
- Motor vehicle video-registration with optical recognition of vehicle registration and automatic data transfer to PC.

## "Diagnostic control" software enables:

- Networking of several LTK lines with a common entry into data base.
- Connection and data exchange among registration, search and 'Dynamic control' software bases.
- Filling in or print-out of ready diagnostic card blanks with field and form correction at customer's request.
- Automatic registration of vehicle test at the station and creation of reporting on fault types.
- Registration of payment for technical inspection and issue of technical coupons with relevant reports.
- Video-monitoring and photographic registration of vehicle external appearance, automatic recognition of registration mark, request and receipt of data on the vehicle, his/he owner for data base.
- Station audit – automatically filled in operations journal, indicating date, time and actions completed.


# DIAGNOSTIC EQUIPMENT KIT LTK

## IN ACCORDANCE WITH THE ORDER OF MINPROMTORG (MINISTRY OF COMMERCE AND INDUSTRY) OF 6 DECEMBER 2011 NO. 1677 'ON APPROVAL OF KEY TECHNICAL FEATURES OF DIAGNOSTIC EQUIPMENT AND ITS LIST' INCLUDES:

Various modifications of universal roller brake testers STM for vehicle diagnostics with axle load weight from 1.5 to 18t.
STM Universal roller brake testers may be equipped with wheel slip tester and shock absorbers stand providing a comprehensive diagnostic line which will fully comply with the requirements of leading vehicle manufacturers.



META-01 MP 0.1 smoke opacity meter of exhaust gases


Vehicle lamps light parameter meter IPF-01

EFFECT decelerometer — brake systems efficiency meter using road test method

AUTOTEST multi-component gas analyser to measure CO, $CO_2$, CH, $O_2$, NOx concentrations, and RPM during vehicle exhaust gases test

ISL-M play meter

TONIC tint meter — light transmission meter for tinted and obscured windscreens

PDU-META remote control pane

M 100 leak detector — instrument for checking braking system hydraulic drive sealing

DETECTOR NM Instrument for checking markings of assemblies and units

TTs — META leak detector to check gas system sealing

Play detectors LD-4000, LD-4000P, LD-8000, LD-16000, LD-16000P


META
AXOR
1835
META
АТК-МЕТА


СТМ

# Stationary motor vehicle technical inspection kits

## LTK-S

Stationary lines for vehicle technical control LTK-S provide compactly laid-out diagnostic equipment and roller brake testers on the floor or in a pit at customer's industrial sites at ambient temp. from - 10°C to + 40°C.

If this line is in unheated premises it is recommended to install in addition a heated office block for operators, dimensions no less than 3000x2400 x2600 mm.

Multi-post arrangement of technical control considerably increases line throughput. Recommended dimensions of industrial premises for 4-post passenger motor vehicle technical control line based on roller brake testers STM-3000M.01 and STM 3000M.02 equals 5x18 m., based on brake test stands STM-10000, STM 13000.01 and STM 13000.02, STM 16000.01, STM 16000.02 and STM 18000 – 7.5 x13.9 m.; its throughput is 20000 motor vehicles per annum.

To increase its throughput to 30 000 motor vehicles we are offering an efficient two-lane arrangement with seven inspection posts in an area of 12 x 24 m.



META OFFERS:

## 3 types of stationary technical control lines LTK-S

for passenger cars and minibuses

## 6 types of stationary technical control lines LTK-S

for passenger cars and lorries depending on brake test stands equipment

**LTK-S 3500 M** — motor vehicle technical inspection kit to test the condition of passenger cars and minibuses, including with a full drive and axle load up to 3500 kg.

**LTK-S 3000M.01** — automated universal motor vehicle technical inspection kit to test technical condition of passenger cars and minibuses, including a full drive, and axle load weight up to 3000 kg. LTK-S 3000M.01 includes a single block, low-profile brake test stand STM 3000M.01, weighing only 360 kg and not requiring building and assembly work to be installed.

**LTK-S 3000M.02** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and minibuses, including 4WD, and axle load up to 3000 kg. LTK-S 3000M.02 includes a low-profile brake test stand STM 3000M.02, comprising 2 blocks, each weighing 170 kg, and doesn't require building and assembly work to be installed. Thanks to its low weigh the stand is easily moved and enables quick rolling-out of the motor vehicle technical inspection kit on any site.


**LTK-S 10000** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and lorries as well as minibuses with axle load up to 10000 kg.

**LTK-S 13000.01** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and lorries as well as minibuses with axle load up to 130000 kg. LTK-S 13000M.01 includes a single-block, low-profile brake test stand STM 13000M.01; roller stand weight – 1150 kg. Increased dimensions of the RBT unit increase equipment service life thanks to wear resistance of brake test stand rollers.

**LTK-S 13000.02** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and lorries as well as minibuses with axle load up to 13000 kg. LTK-S 13000M.02 includes a brake test stand STM 13000M.02, comprising 2 blocks, each weighing 455 kg. increased dimensions of the RBT unit increases equipment service life thanks to wear resistance of the brake test stand rollers.

**LTK-S 16000.01** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and heavy-duty lorries as well as buses of any category, with axle load up to 16000 kg. LTK-S 16000M.0 includes a single block brake test stand STM 16000M.01, weighing 945 kg.

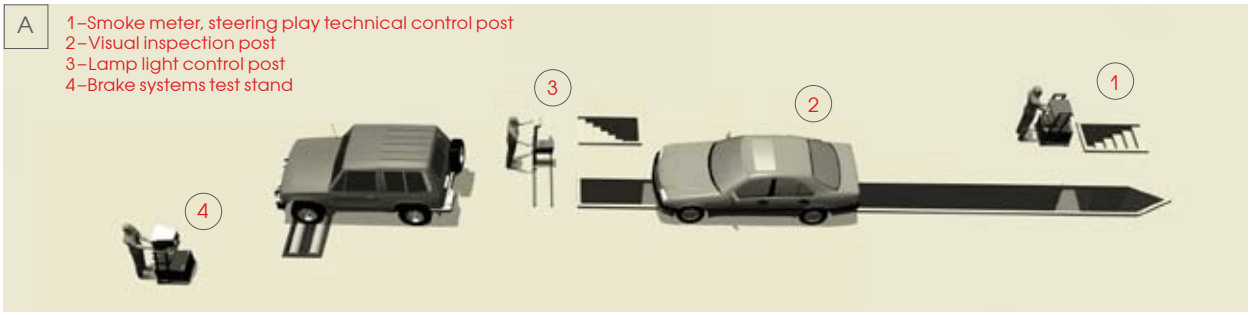
**LTK-S 16000.02** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and heavy-duty lorries, as well as buses of any category, with axle load up to 1000 kg. LTK-S 16000M.02 includes a brake test stand STM 16000M.02, comprising two blocks each weighing 600 kg.

**LTK-S 18000** — automated universal motor vehicle technical inspection kit to test the condition of passenger cars and heavy-duty lorries, as well as buses of any category, with axle load up to 18000 kg.

## Control post with single and dual lane LTK-S arrangement SCHEME

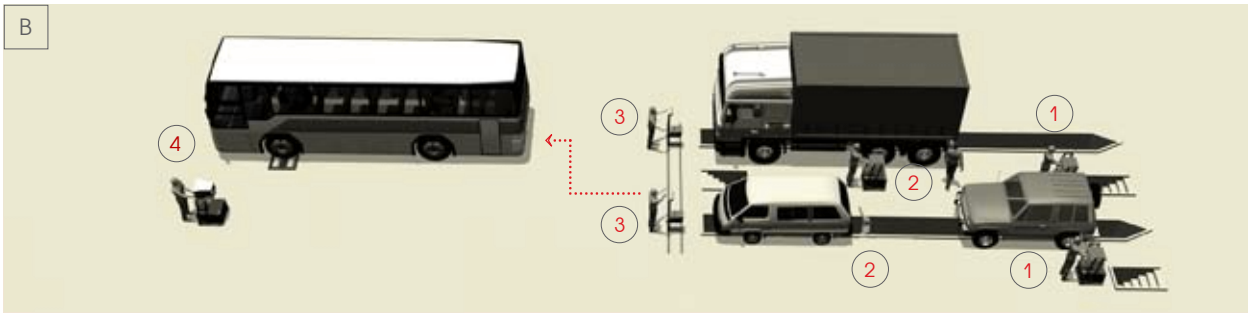
A

1–Smoke meter, steering play technical control post
2–Visual inspection post
3–Lamp light control post
4–Brake systems test stand




Dimensions of area occupied 5x18m
Station throughput – 20000 motor vehicles

B




Dimensions of area occupied 12x24m
Station throughput – 30000 cars per annum

# Benefits:

- Several motor vehicle technical inspection kits with compact lay-out and LTK network with a single entry into a common data base.
- Savings in initial investment and high efficiency thanks to a reasonable price and high throughput.
- Complete supply and line installation.
- Multi-post inspection technology with simultaneous data transmission from online diagnostic instruments to the central computer.
- Fully automated technical inspection process using diagnostic equipment ensuring high line throughput, inspection objectivity and high measurement precision.
- Easy-to-use STM remote control radio panel to simplify visual inspection.

MOTOR VEHICLE TECHNICAL INSPECTION KITS BASED ON LOW-PROFILE STANDS, DO NOT REQUIRE CONSTRUCTION AND ASSEMBLY, TURNKEY PRICE STARTING FROM 20 000 EUROS.

# LTK-M, LTK-MB

## mobile container and block motor vehicle technical inspection kits

LTK Mobile container and block motor vehicle technical inspection kits M and LTK-MB designed to check technical conditions of passenger cars, mini-buses and Light Goods Commercial Vehicles, with axle load of up to 3500 kg, 10000 kg, 13000 kg, 16000 kg and 18000 kg. Economical and effective solution which does not require significant capital investment for construction of technical inspection centre. Main Benefit – fast roll out. Equipment installed on a rigid framework of a standard container: roller brake tester, office block, foldable trestle with hydraulic drive and a full kit of diagnostic instruments equipped with data transmission channels and power supply. The line is equipped with comfortable furniture, power consumption meter and fire extinguishers.

Line setting-up at a new site does not require special site preparation and equipment adjustment. Foldable trestle measuring 3x15 m is equipped with regulated feet for horizontal alignment on the site and is corrosion protected by a zinc coating and solid polymer paint.

To expand the covered working area light knock-down awning made from profiled sheet with typical dimensions of 6000x6000x4500mm and 9000x6000x4500mm are offered.

META offers two types of mobile motor vehicle technical inspection kits: container and block.

# MOBILE CONTAINER MOTOR VEHICLE TECHNICAL INSPECTION KIT LTK-M (MSD)

## META offers 4 types of mobile container lines depending on the brake test stand installed

Made as a single block metal container (6040x2440x2600 mm) with a rigid frame which serves as a base where the office block and work section with the brake test stand installed and fixed are located. The work section is equipped with opening ramps which are activated by hydraulic drives and are used to create a horizontal area and for vehicles to drive onto the brake test stand.

**MSD-10000, MSD-13000, MSD-16000** for inspection of the technical condition of all types of vehicles with axle load of up to 10000 kg, 13000 kg, 16000 kg, including passenger cars, 4WD vehicles, lorries and buses. Universal container station with an opening roof is designed for checking any vehicle categories without height limit and with axle load up to 10000 kg, 13000, 16000 kg. When testing passenger cars and minibuses which height is 2.5 m the roof of the working section is closed and provides a reliable protection from precipitation.

If necessary the roof opens using a hydraulic drive controlled by an operator from the panel in the office section.

**MSD-3500** — Universal container inspection station to check technical condition of passenger cars, min-buses and Light Goods Commercial Vehicles with axle load of up to 3500 kg

# LTK-MB MOBILE BLOCK MOTOR VEHICLE TECHNICAL INSPECTION KIT

## META offers 5 types of block lines, depending on the brake test stand installed

Made as two separate blocks: mobile office: (dimensions 2400x3500 mm) and RBT unit of the brake test stand. Roller break tester ramps are supplied as individual section and are assembled in the place where they will be used (hydraulic drive not supplied). Height without covering tent is not limited.

**LTK-MB 10000, LTK-MB 13000, LTK-MB 16000, LTK-MB 18000** — are intended to check the technical condition of all types of vehicles with axle load of up to 10000 kg, 13000 kg, 16000 kg, and 18 000 kg, including passenger cars, vehicles with full drive, lorries and buses.

**LTK-MB 3500** — is designed to check the technical condition of all types of vehicles with axle load of up to 3.5 t.

### NEW IN 2013!

Block stations with manual drive for trestle opening, load carrying capacity 3500kg, 10000 kg, 13000 kg, 16000 kg.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| DESIGNATION | LTK-M (MSD-3500) | LTK-MB 3500 |
| | Mobile, container diagnostic station with opening roof (lifting roof) | Mobile block diagnostic station |
| Axle weight load, t | 3.5 | 3.5 |
| Based on RBT model | STM-3500M | STM-3500M |
| Track width, mm | 770-2210 | 770-2210 |
| Area occupied when set up, m | 11x6,1 | 16x6.8 |
| Height of tested vehicles, m | no limit | no limit |
| Tyes of vehicles tested | passenger cars, lorries<br>Minibuses, trailers and semi-trailers | |
| Container dimensions, mm | 6040x2600x2440 | - |
| Office block dimensions, mm | - | 3000x2400x2600 |
| Additional metal awning, mm | - | 6000x8000x5100 |

# Benefits of mobile motor vehicle technical inspection kits LTK-M and LTK-MB:

- can be used on any horizontal site with asphalt-concrete or gravel covering;
- can be used with brake test stands: STM 3500 M, STM 10000, STM 13000.01, STM 13000.02, STM 16000.01 and STM 16000.02, STM 18000;
- has a comfortable office block for operators and traffic inspector, as well as for diagnostic equipment, PC, printer, cabinet for documentation and power unit for the brake test stand;
- are installed on open sites and do not require specially adapted heated premises;
- minimal expenditure for line installation and maintenance;
- STM remote control radio console and visual inspection.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| DESIGNATION | LTK-M (MSD-10000)<br>LTK-M (MSD-13000)<br>LTK-M (MSD-16000) | LTK-MB 10000<br>LTK-MB 13000<br>LTK-MB 16000<br>LTK-MB 18000 |
| | Mobile, container diagnostic station with opening roof (lifting roof) | Mobile block diagnostic station |
| Axle load, kg | Depending on STM type: | Depending on STM type:<br>10000 kg,<br>13000 kg,<br>16000 kg |
| Basic brake test stand | As per order:<br>CTM-10000<br>CTM-13000.01<br>CTM-16000.01 | As per order:<br>CTM-10000<br>CTM 13000.01<br>CTM 13000.02<br>CTM 16000.01<br>CTM 16000.02 |
| Track width, mm | 960-2800 | 960-2800 |
| Area occupied when set up, m | 16x6,8 | 16x6,8 |
| Height of tested vehicles, m | No limit | No limit |
| Tyes of vehicles tested | Passenger cars, lorries buses | Passenger cars, lorries buses |
| Container dimensions, mm | 6040x2450x2700 | - |
| Office block dimensions, mm | - | 3000x2400x2600 |
| Additional metal canopy, mm | - | 6000x8000x5100 |

## DUAL USE DIAGNOSTIC EQUIPMENT

META — supplier of diagnostic equipment for the Russian Ministry of Defense since 1997

# SELF-UNLOADING MOBILE UNIT FOR TECHNICAL CONTROL AND REPAIRS OF MILITARY AUTOMOTIVE EQUIPMENT MKTKR

Designed to assess residual life and repair of military automotive equipment in the field. MKTKR unit is made in two transportable containers.

## Composition of self-loading container MKTKR:

- office block;
- control and measurement equipment;
- STM 10000 roller brake tester;
- hardware-software unit "Diagnostic centre of military automotive hardware».

All MKTKR instruments are combined via radio communication channel with the diagnostic centre and on board information memory store.

# ON BOARD DATA MEMORY STORAGE (ODMS) — VEHICLE "BLACK BOX".

Designed to store data on technical condition of vehicles and its transmission via GSM channel to the terminal.
ODMS monitors movement of vehicles, their identification based on registration no. in order to monitor and manage their movement. During technical control ODMS registers in memory technical condition parameters of vehicles, route set in the task as files with date, time and vehicle identification parameters.
ODMS determines vehicle location using GLONASS/GPS, saves data on the route covered.

## Functions:

- Uninterrupted registration in automatic mode of movement parameters and technical condition:
  - speed of movement;
  - driver's work and rest periods;
  - information on fuel consumption and fuel top-up;
  - coolant and engine oil temp.;
  - engine RPM;
  - change of on board power supply parameters during travel and stops.
- Periodic definition of absolute coordinates.
- Storing information in flash-memory linked to date and time.
- Wireless information reading from flash memory to computer terminal.
- Automatic identification of vehicle registration no.
- Remote control of routes set out in tasks and technical condition of military vehicle.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Power supply, on board mains TC, B | 9-36 |
| TRANSCEIVER: | |
| Max. transceiver output power, MWt | 1.1 |
| Operational frequency range, MHz | 2400-2483.5 |
| Number of communication channels in frequency rangeт | 16 |
| Modulation type | DSSS |
| Speed of radio data transmission (via channel), BIT/SEC. | 250000 |
| Volume of flash memory, Mbit | 64 |
| Range of operational temp., °C | From -40 to + 85 |

Mobile technical control points
for vehicles on a GAZ 2705 chassis
or Ford Transit.

# LTK-P (PPTK TS)

# PPTK TS MOBILE TECHNICAL INSECTION UNIT

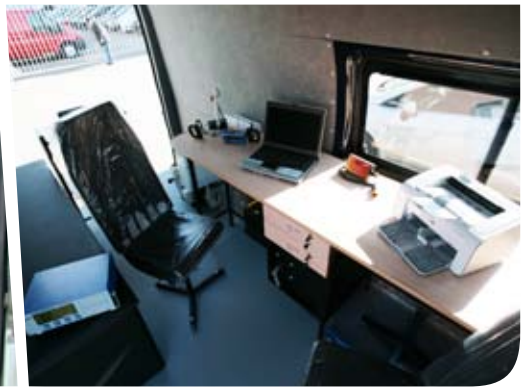
Optimal solution for technical inspection of a limited number of motor vehicles to be carried out in a remote location. Own on board power for diagnostic equipment and office appliances, a comfortable 'mobile office' with two work stations, compact and safe instrument packing arrangement in travel mode ensures total autonomy and high mobility of the technical inspection unit.



## The work compartment of PPTK TS comprises:

Work place for traffic inspector, work table with a table lamp, safe-box for important documents and equipment, pull-out document drawers, equipment connection points, rotating chair.

Operator-controller work station: work table, rotating chair, PC Notebook, printer, heater, fire extinguisher, first aid box and a locker for securing equipment during transportation.



## PPK TS comprises:

Portable rack for instruments and their connection to LTK mains; electrical panel and portable 50-metre cable coil for connection to AC mains; protective switch, electric indoor heater and a metal safe-box for documents. PPTK TS is manufactured on a GAZ 2705 or Ford Transit chassis. LTK-P 4x2, is painted using special colour for traffic inspectors vehicles according to GOST 50574-93 or other applicable standards and is equipped with a signalling loud-speaker unit SGU.

Mobile technical control points for vehicles on a GAZ 2705 chassis or Ford Transit. LTK-P (PPTK TS).

PPTK combined with STM-3000M.02 – is a comprehensive mobile diagnostic station with on-board power supply.

At present META has set up mass production of a mobile low-profile stand STM-3000M.02, which may be transported in a trailer, and carry out vehicle brake system inspection in any conditions. The trailer is equipped with a diesel generator which makes the diagnostic station completely independent in terms of power supply.

## Benefits:

- Automatic data input enables a five-fold increase in line throughput.
- Full autonomy of diagnostic instruments and office equipment operation thanks to onboard power supply.
- A comfortable mobile office with two work-stations.
- High mobility.

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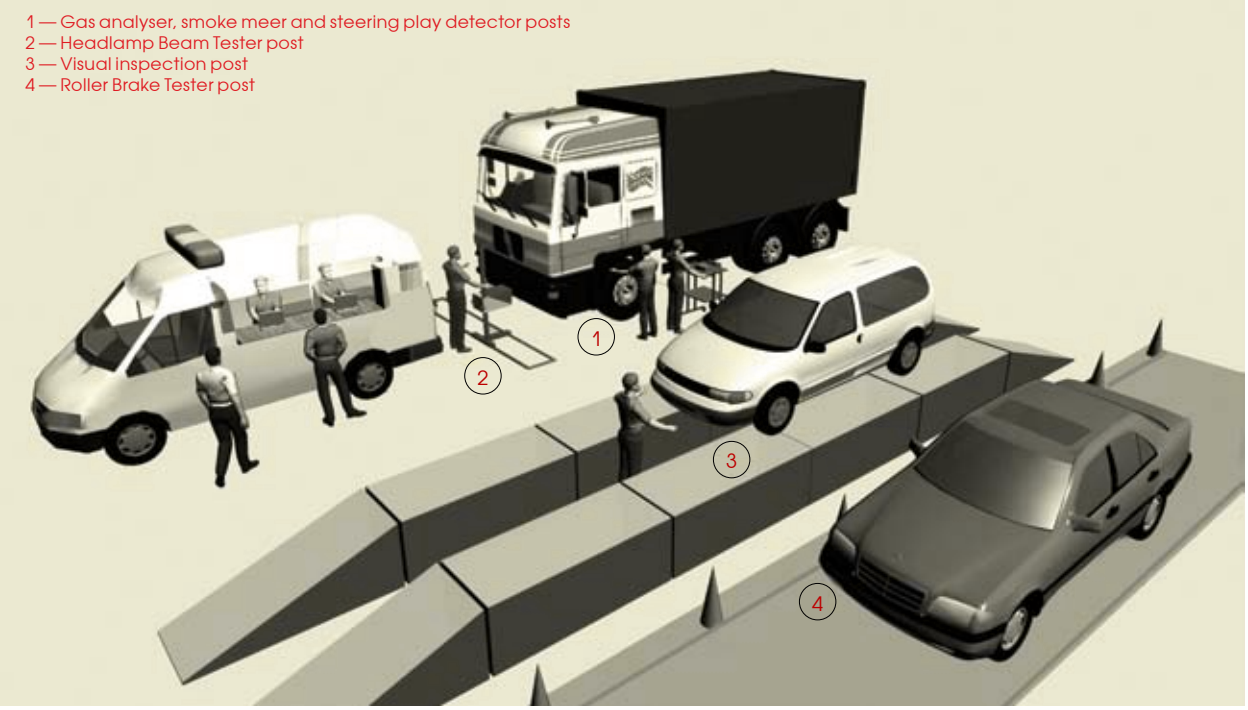
### Arrangement of PPTO control posts




Technical inspection footprint requirements: 6x120m for motorway technical inspection unit, 6x20 m for three-bay technical inspection station

# Video-registration systems during technical inspection of a vehicle

Vehicle video registration systems are designed to set up a database of photographic images of vehicles submitted for technical inspection.

META manufactures two video-registration systems modifications:

## MVK REGISTRATION SYSTEM

MVK vehicle video registration system creates a database of photographic images of the vehicles, automatically recognises and identifies vehicles from the registration base of the traffic police. During vehicle registration the video-camera switches on and a software module automatically recognises the car registrateion. The car registration is then entered into the database by an operator and linked to the relevant photographic image of its external appearance, indicating registration date and time. Based on the car registration a corresponding passport data of the vehicle is uploaded from the database to cross-check with information in the Vehicle passport.

### Benefits:

- Automatic vehicle recognition and identification from the data in traffic police data base.
- Viewing and observation of events at technical inspections stations in real time at the inspector's working station.
- Automatic vehicle video-registration as electronic photographic original with date and time link.
- Comparison of vehicle parameters based on photographic original and registration documents.
- Outside audit of State technical inspection based on photographic archive of stored images.
- Technical inspection is blocked if the vehicle registration data do not match.

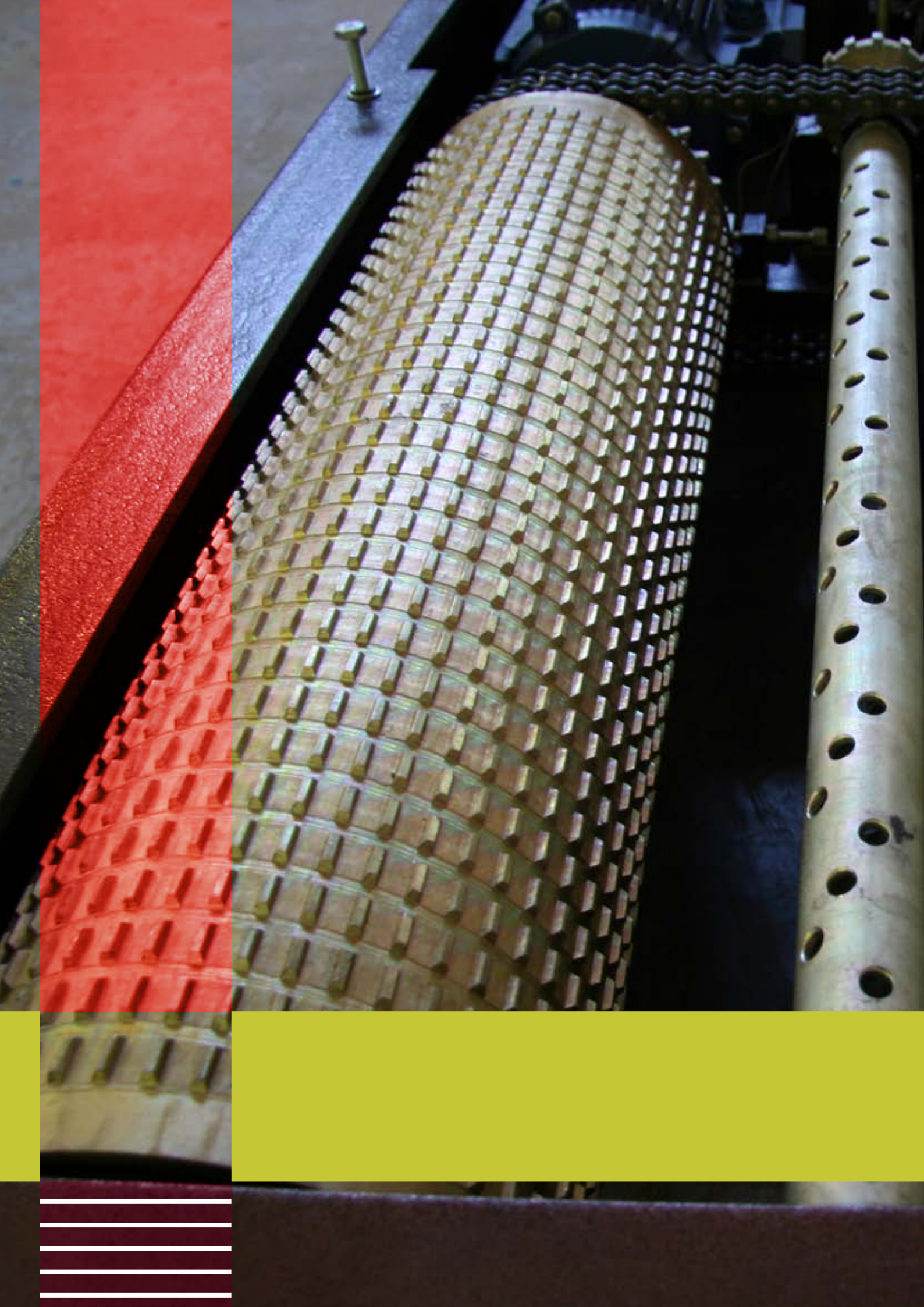
## SVR VIDEO-REGISTRATION SYSTEM

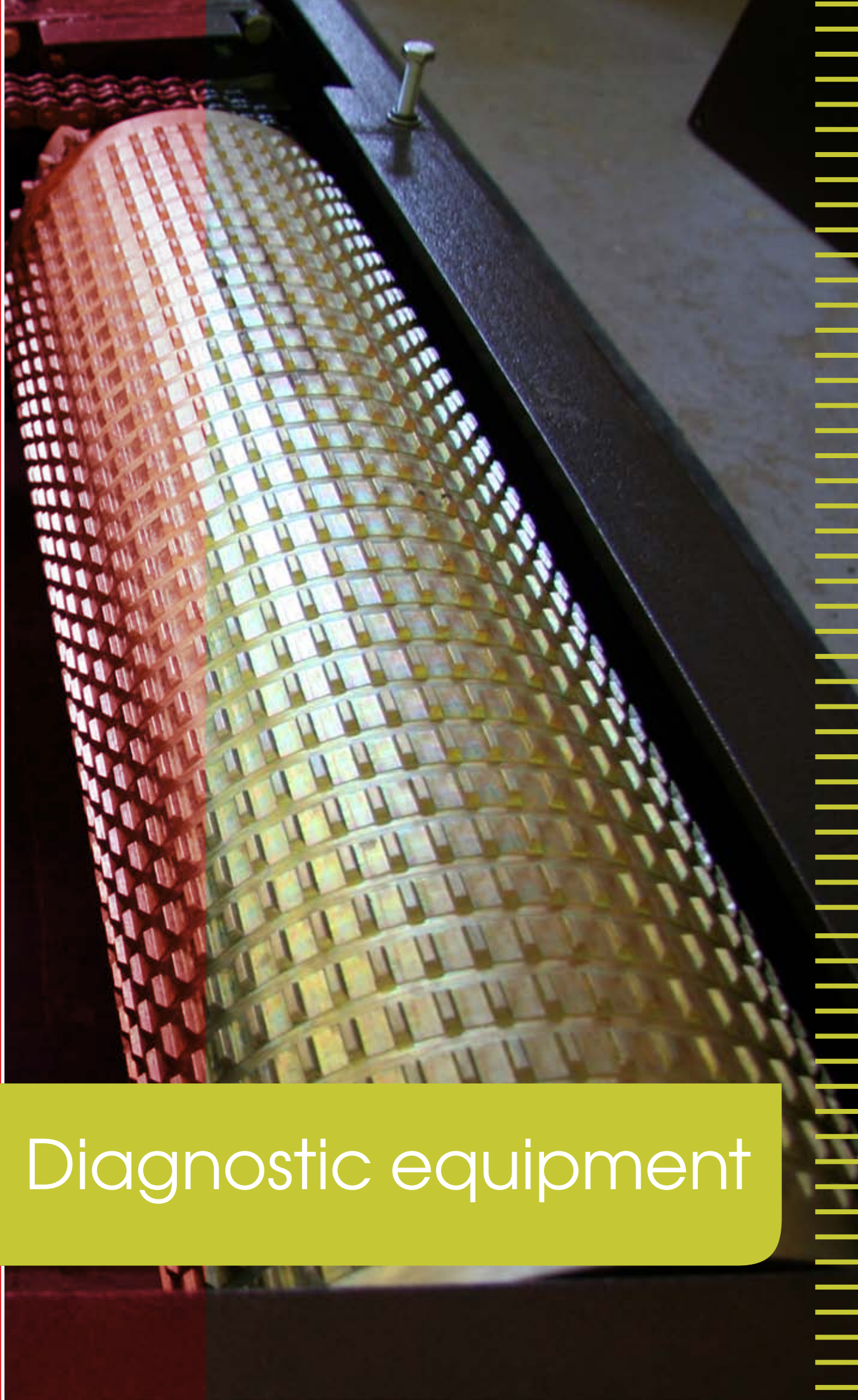
Solution that ensures economies for technical inspection stations

Vehicle video-registration system SVR enables taking photographs and videos of the vehicle, storing the vehicle images in memory.

### Benefits:

- Viewing and observation of events on technical inspections stations in real time at the inspector's working station.
- Automatic vehicle video-registration as electronic photographic images with date and time stamp.





# Diagnostic equipment

# STM UNIVERSAL ROLLER BREAK TESTERS

Universal roller break testers STM manufactured by META provide the best solution in vehicle brake systems diagnosis. In 1999, for the first time in Russia the company developed and started mass production of low-profile roller break testers STM 3500. During this period the company introduced over 20 models of roller break testers with various load carrying capacities and forces.

A large range of roller break tester models includes new modifications intended for testing motorcycle and heavy duty lorries brake systems, as well as unique low-profile portable stands which do not require the floor to be recessed to install a technical inspection station. New models of roller break testers are equipped with noiseless planetary engine reduction gear with a higher twisting rigidity and the ability to transmit high torque.

Special strain-measuring sensors manufactured by Meta ensure high precision of weight and braking force measurements during passenger car and lorry tests with axle load of up to 18 t. in a wide range of work temperatures from - 30 to +60 eC. Our block transportable roller break testers which permit the operator to carry out a quick set up of motor vehicle technical inspection kits both on sites and in existing technical inspection stations have enjoyed great popularity.

To produce wear-resistant STM roller coating META uses surface cementation and hardening to 60-62 HRC, which ensures long-term stand operation without the loss of necessary engagement with vehicle. All the components of STM roller unit are protected from corrosion by combination of a zinc coating and polymer painting. This allows Meta to supply high-quality equipment at a very competitive price.

Highly-functional software enables the display of measurement results on computer monitor, issues instructions on car movements during testing, stores data of vehicles tested, plots changes in braking force over time, and when operating in a motor vehicle technical inspection kit, transmits measurement results onto a diagnostic card.

Unlike infrared units, Meta roller break tester remote control unit uses radio frequency and therefore does not require 'targeting' on the receiver which enhances the convenience and safety during break test from the cabin of the tested vehicle.

Additional components for the STM stand are: side slip tester, suspension tester and trailer loader which permits to set up a complete diagnostic line according to the requirements of leading automotive manufacturers.

## Functions:

- Automatic measurement and brake systems parameter calculation in accordance with GOST R 51709-2001 or other applicable standards based on the following indicators: braking force achieved by vehicle braking systems; axial weight; vehicle brake pedal suppression force.
- Display of measurement results and their graphic interpretation on monitor screens and information indicator board.
- Automatic control of measurement modes based on standard programme and methodology or in radio-console manual mode.
- Print-out of measurements protocol and braking force graphs.
- Display of operator and driver instructions via monitor screen and light signalling panel.
- Automatic stand operation as part of motor vehicle technical inspection station and automatic printout of vehicle diagnostic card.
- Instruments can be added to the motor vehicle technical inspection station to increase functionality.

## Benefits:

- Vehicle self-alignment during tests, automatic on-off switching of drives when driving onto and driving off the ramp.
- Enhanced wear-resistant quality of rollers resulting from a special type of hardening and surface treatment. Roller coating is completely resistant even to studded tyres.
- Anti-corrosion protection of roller elements in STM unit by powder polymer painting.
- A wide range of working temperatures from -10 °C to +40 °C makes it possible to use the stand in unheated premises or in mobile container-type diagnostic stations.
- Dynamic measurement of wheel braking force and axle loads when braking, taking into account axial load when braking.

## STM 1500

Roller Break Tester for inspecting braking systems effectiveness and stability of motorcycles with axle load of up to 1500 kg, track width up to 198 m and wheel diameter (on tyre) from 500 to 850 mm.

## STM 3000M.01

Single block, low-profile, compact roller break tester STM 3000M.01 is designed for inspecting braking systems of passenger cars and Light Goods Commercial Vehicles of all types with axle load of up to 3 t.

## STM 3000M.02

Compact, low-profile roller break tester for testing AWD passenger cars and of mini-buses with axle load of up to 3 t, track width up from 800 to 220 mm and wheel diameter from 500 to 850 mm. Ramp height 160 mm.
Optimal arrangement version for technical control stations and mobile technical inspection stations. Supplied as a mobile option with a trailer. Thanks to RBT unit weighing 170 kg made of two parts it is easy to move the stand and this makes it possible to set up a travelling technical inspection point with a portable brake test stand which may be transported in the trailer. Recommended dimensions of industrial premises - 5 x18 m.

## STM 3500

Roller Break Tester designed to check the brake system of AWD passenger cars and minibuses with axle load of up to 3,5 t. This low budget option has no computer rack or weight sensors. This is an economic solution for those who are starting in the vehicle technical inspection business. Later on weight sensors can be added, which would ensure its compliance with requirements of GOST R and other applicable technical regulations. Recommended dimensions of industrial premises – 5x18 m..

## STM 3500M

Roller Break Tester designed to check the brake system of AWD passenger cars and minibuses with axle weight of up to 3,5 t. track width 800 - 2210 mm, wheel diameter from 500 to 1020 mm.

| TECHNICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| Stand modifications | Braking force measurement range, κ kN | Stand power consumption, kWt than | Weight measurement range of axle, kg | Effort measurement range on controls, N |
| STM 3500 | From 0 to 10 | 7 | from 0 to 3500 | From 0 to 1000 |
| STM 3500 M | from 0 to 10 | 7 | from 0 to 3500 | |
| STM 3000 M.01 | from 0 to 10 | 4 | from 0 to 3000 | |
| STM 3000 M.02 | from 0 to 10 | 4 | from 0 to 3000 | |
| STM 1500 | from 0 to 5 | 2,5 | from 0 to 1500 | |
| STM 6000 | from 0 to 18<br>from 0 to 27 | 10,5*1<br>9*2 | from 0 to 3500<br>from 0 to 6000 | |
| STM 10000 | from 0 to 25 | 12 | from 0 to 10000 | |
| STM 13000.01 | from 0 to 30 | 13 | from 0 to 13000 | |
| STM 13000.02 | from 0 to 30 | 12 | from 0 to 13000 | |
| STM 16000.01 | from 0 to 40 | 13 | from 0 to 16000 | |
| STM 16000.02 | from 0 to 40 | 16 | from 0 to 16000 | |
| STM 18000 | from 0 to 24<br>from 0 to 60 | 19*1<br>16*2 | from 0 to 9000<br>from 9000 to 18000 | |

Note: *1 – stand power in 1st gear;
*2 – stand power in 2nd gear

## STM 6000

Universal dual-speed single block Roller Break Tester to check brake systems of all types of passenger cars and lorries with axle load of up to 6 t., track width 900-2760 mm and wheel diameter from 500 to 1020 mm.

## STM 10000, STM 13000.01

Universal single — block-type Roller Brake Tester designed to check brake systems of all types of passenger cars and lorries with axle load of up to 10 and 13 t., track width 960-2800 mm and wheel diameter from 500 to 1020mm. Recommended dimensions of industrial premises – 7.5 x18 m.

## STM 16000.01

New single — block-type universal Roller Break Tester designed to check brake systems of all types of passenger cars and lorries with axle load of up to 16 t., track width 960-2800 mm and wheel diameter from 600 to 1200mm.. Recommended dimensions of inustrial premises – 7.5 x18 m.

## STM 13000.02 and STM 16000.02

Universal modular Roller Break Tester designed to check brake systems of all vehicle types, including heavy-duty lorries with axle load of up to 13 and 16t., track width 900-2900 mm and wheel diameter from 600 to 1200mm. Recommended dimensions of industrial premises – 7.5 x18 m.

## STM 18000

Universal two-speed modular Roller Break Tester designed to check brake systems of all vehicle types, including heavy-duty lorries with axle load of up to 18 t., track width 900-2900 mm and wheel diameter from 600 to 1200mm. Recommended dimensions of industrial premises – 7.5 x18 m.

**TECHNICAL SPECIFICATIONS**

| Tester modifications | Start time of operational mode , min. | Dimensions, mm, no more than | | Weight, kg | | Working temp. range |
|---|---|---|---|---|---|---|
| | | Roller unit | Control cabinet | Roller unit | Control cabinet | |
| STM 3500 | 15 | 2340x680x290 | 550x460x120 | 470 | 20 | from minus 10 to plus 40°C |
| STM 3500 M | | 2320x680x320 | | 550 | | |
| STM 3000 M.01 | | 2320x610x220 | | 360 | | |
| STM 3000 M.02 | | 1400x750x230 | | 170*2 | | |
| STM 1500 | | 1400x750x230 | | 170 | | |
| STM 6000 | | 2960x680x335 | 650x500x141 | 800 | 27 | |
| STM 10000 | | 2950x730x340 | 550x460x120 | 860 | 20 | |
| STM 13000.01 | | 2950x730x340 | | 1150 | | |
| STM 13000.02 | | 1800x730x320 | | 850*2 | | |
| STM 16000.01 | | 2950x730x340 | | 945 | | |
| STM 16000.02 | | 2010x800x440 | | 600*2 | | |
| STM 18000 | | 2010x810x440 | 650x500x141 | 650*2 | | |

# SIDE SLIP TESTER

Side slip tester is designed for monitoring and data acquisition on linear movement of all vehicle axles. Measurements are performed during car travel along the test plate which at that time shifts right or left, depending on lateral wheel slip. Helps to prevent premature tyre wear.

META manufactures two modifications of the side slip tester: TU-3000 for passenger cars and TU-15000 for lorries

## Benefits:

- Graphical interpretation of measurement results.
- Test results are displayed on the monitor in m/км units.


| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| DESIGNATION | Parameter value | |
| | TU-3000 | TU-15000 |
| Max. axle load, kg | 3000 | 15000 |
| Measurement range, M/km | ±15 | ±20 |
| Division value indicator, m/km | ±0,1 | ±0,1 |
| Error, than, m/km | ±0,2 | ±0,2 |
| Dimensions, than, mm, | 800x460x50 | 1000x800x100 |
| Weight, kg, than | 55 | 192 |

# SPP 2500 SUSPENSION TESTER

Suspension tester is designed for inspection of the condition of vehicle suspension. Enables objective assessment of suspension's ability to accept a load and revert to initial position as well as find out vehicle's tendency to 'slip' when wheels are at correctly positioned.

## Benefits:

- Measurement results shown in percentages.
- Test report print-out in two formats: table and diagram.


| TECHNICAL SPECIFICATIONS | |
|---|---|
| Oscillation amplitude | 6 mm |
| Oscillation frequency | 23 Hz |
| Axle load, than | 2,5 t. |
| Engine HP | 2x1,5 kWt |
| Track width | 800-2300 mm |
| Dimensions | 2500x550x350 mm |

# STM REMOTE CONTROL CONSOLE

STM combined radio-console for vehicle visual inspection and remote control of Roller Break Tester is designed for electronic recording of vehicle parameters from visual assessment. Both RBT control commands and inspection results are transmitted via radio-channel. Tested parameter is selected on the console display and an inspection result is recorded. The inspection results and vehicle registration are then transmitted to LTK central computer via radio-channel for inclusion into the relevant diagnostic card.

## Functions:

- Remote control of Roller Break Tester operation.
- Vehicle visual inspection results are electronically recorded.

## Benefits:

- Inspection results are stored in Protected memory.
- Diagnostic card automatically filled in.
- Warning messages in case supply voltage drops below normal.
- Automatic transmission of visual inspection results to the central computer via radio-channel.

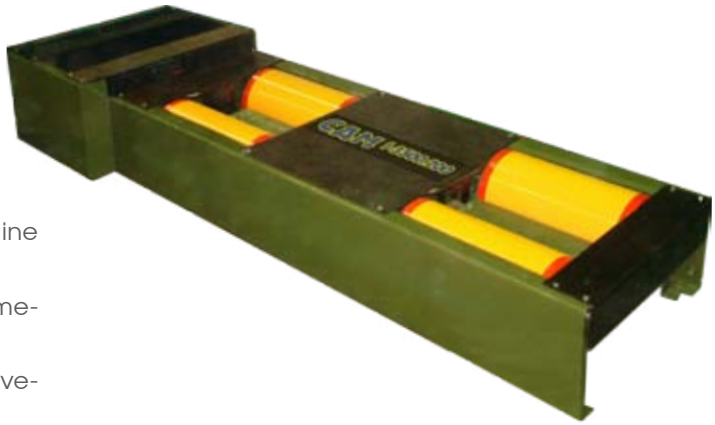

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Guaranteed coverage zone in open space , m | 8 |
| Alpha-numeric display | 2 x12 |
| Dimensions, mm | 170 x67 x22 |
| Weight, kg | 0,2 |
| Power supply to console from built-in battery | 3,6 V, 700 mA•h |
| Power supply to console receiver:<br>AC mains<br>External power supply unit | <br>220 V<br>50 Hz |

# DYNAMIC ROLLER TEST STANDS
## SDM 2-3500.200, SDM 3-15000.150, SDM 4-15000.150

Dynamic roller stands are designed for a comprehensive assessment of vehicle's technical parameters by fully imitating its travel within a wide range of speeds. The base of the stand's mechanical part is a wear-resistant, maintenance-free structure which guarantees long-term operation. The rollers are zinc-coated which ensures full protection from corrosion. Using the dynamic stand it is possible to recreate road conditions without leaving the testing facilities which saves time and money.

Dynamic stand offers error-free diagnostics to assist the development of new vehicle models and is an irreplaceable tool for assessment of mass-production vehicles coming off the manufacturer's conveyor.

## Functions:



- Vehicle acceleration on test stand up to 150 km/h. and 200 km/h, and breaking at any speed in the range.
- Monitoring the functioning of engine control unit (module) ECU).
- Assessment of vehicle transmission mechanical losses.
- Fuel consumption assessment with vehicle moving at steady speeds.
- Vehicle dynamics assessment with acceleration in the range 0 -100 km/h.
- Vehicle power parameters measurement based on acceleration dynamics.
- Visual assessment of engine cooling system ventilator operation, speedometer, lighting instruments, audible signals.
- Dynamic functional tests during driving, measurements of vehicle parameters at different dynamic driving situations in typical road conditions.

## Benefits:

- The basis of the mechanical part of the dynamic test stand is a wear-proof easy to maintain construction guaranteeing long-term uninterrupted operation.
- Using a power stand it is possible to recreate most of the road conditions for the vehicle without leaving the testing facilities. Hence test results do not depend on weather, which saves time and money.
- Graphic test process may be done both using software and remote control console.

## Roller stand control system features:

- automatic reading via diagnostic line interface (K-Line) of ECU controller passport data;
- reading via diagnostic line interface (K-Line) error codes of the built-in on-board diagnostic system to analyse presence and working order of sensors, actuators and their conformity with vehicle type;
- recording of ECU inspection results with conclusions printed out in the form of a formal report;
- automatic self-diagnostics, equipment fault larm, and recording of operator's mistakes.

# SDM 3-15000.150 4-axle drum based roller stand

SДМ 3-15000.150 is designed for scientific trials and tuning of military vehicles. SДМ 3-15000.150 is equipped with the most up-to-date measurement devices for measurement of fuel consumption, traction, temperature at various points in vehicle assemblies (up to 100 channels) etc. In addition, various temperature regimes, mountain regimes and incoming air flow speed can be modelled.
META mass produces a single-axle dynamic power roller stand SDM 1-3500.200., which benefits from a new design solution – replacement of the electrical drive by an induction brake. This innovation, with only minor changes in functional abilities, significantly reduces cost.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| | SDM 2-3500.200 | SDM 3-15000.150 |
| Stand weight, t | 7 | 50 |
| Vertical axle load, Kn | 3 | 150 |
| Number of driving axles | 2 | 4 |
| Dimensions, mm | 5500x2800x1100 | 12000x4700x1000 |
| Range of braking force measurement (tractive effort) on one wheel, N | 0-3000 | 0-30000 |
| Effort measurement range on control unit, N | from 0 to 1000 | from 0 to 1000 |
| Track, mm | 600…2100 | - |
| Max. rotation speed of driving roller, km/h | 200 | 150 |
| Range of wheel base regulation, mm | 2200…2900 | - |
| AC current 3-phase voltage, V | 380±10% | |

# MULTI-COMPONENT GAS ANALYSERS AUTOTEST

For 25 years META has occupied a leading position in the manufacture of diagnostic equipment and offers the widest range of AUTOTEST multi-component gas analysers to monitor the toxicity of motor vehicle exhaust gases.

Multi-component gas analysers have been in serial production since 1994. The early models were manufactured on an analogue base. META was one of the first companies to undergo modernisation to start mass production of microprocessor-based gas analysers to the introduction of new technologies the precision of the instruments increased to satisfy the requirements of European standards EURO-3 and EURO-4. In 2006 the microprocessor gas analyser cell base was replaced by chip-components and SMD-technology, which significantly improved the quality of the measuring instruments.

AUTOTEST gas analysers evolution started from 2-component CO-CH class 2 analysers and cursor indication and grew to 5-component CO-CH-$CO_2$-$O_2$-NOx analysers of zero precision class based on modern microprocessors with colour displays. Its early models differed from similar devices of other manufacturers due to their high reliability, simplicity and wide range of operating temperatures, and as a result enjoyed a good reputation in technical inspection centres, in environmental inspectorates and at motor tuning stations. Many users of the early models even today, after 15 years, still keep their 'trusted' instruments and regularly bring them for calibration and maintenance.

In its development, META created a special model AUTOTEST-LTC for technical inspection, with the transmission of results via radio-channel into the station's central computer. Today over 20 000 gas analysers are in use, including approximately 5500 units at technical insection stations. The new model 'AUTOTEST 2013' is equipped with a measurement channel for NOx nitrogen oxides based on a permanent spectrophotometric sensor instead of an electro-chemical matrix which haswith a limited service life.

Today AUTOTEST gas analysers are certified in all the CIS countries and in Bulgaria. Certification in the UK and other European countries is on-going. The device was awarded medals and diplomas for its high quality and reliability by Russian and foreign Quality Programmes.

- Gas analysers AUTOTEST have demonstrated their reliability as low cost maintenance devices, which are successfully used in technical inspection stations, vehicle service outlets and motor depots.
- AUTOTEST gas analysers are built using powerful microprocessors, allowing for high-precision measurement of five components of toxicity: CO, CH, $CO_2$, $O_2$, NOx.

**In the 1990-s, META developed a unique and economic solution for motor vehicle service outlets: a CO-CH gas analyser combined with smoke meter AUTOTEST-01.04M in one unit.**

## Functions:

- Automatic condensate discharge.
- Three-stage sample cleaning.
- Measurement of 2 to 5 components: CO, CH, CO2, O2, NOx.
- Calculation and indication of lambda parameter.
- An economic solution – an additional smoke channel for diesel engines in CO-CH-D analysers.
- Print-out of measurement results protocol by built-in printer.
- Automatic zero correction without the need to switch off the sampling device.
- Free software with graphic interpretation of toxicity measurement results.
- Interference-proof tachometer sensor.

## Benefits:

- High precision and fast operation.
- Wireless remote control and indication console.
- Electronic calibration according to Gas Mixture testing.
- Heated sample delivery system.
- Input into protocol of state vehicle number.

# AUTOTEST range of gas analyser models

Five-component gas analysers with high-precision fast action colour display for scientific research and tuning of production motor vehicles

## *Accuracy Class 0*

*AUTOTEST 02.03.P DU*

*AUTOTEST 02.03 DU*


*AUTOTEST 02.03P*

## *Accuracy Class II*


Two component gas analysers
AUTOTEST-01.02, AUTOTEST-01.02P with printer
AUTOTEST-01.02M without condensate discharge
Four component gas analyser
Autotest-01.04M
Two component gas analyser-smoke opacity meter
AUTOTECT-01.04M

Four component gas analysers
AUTOTEST-01.03 LTK for operation within LTK-META
AUTOTEST-01.03P with printer for operation within LTK-META
Autotest-01.04M
Two component gas analyser-smoke opacity meter
AUTOTEST-01.04, AUTOTEST-01.04P with printer
Four component gas analyser
AUTOTEST-01.03DU with remote control radio console

AUTOTEST 01.03 MINI
First gas analyser with an on-board power supply in the world

Block construction AUTOTEST expands application range and enhances operational convenience:
- The optical block is located directly next to the exhaust pipe, and the control panel is held by the mechanic-controller.
- Time to determine readings – 6 secs.
- High reliability of measurement results.
- Radio-console operation radius –10 m.

## *Accuracy Classes 0 and I*

Four component gas analysers
AUTOTEST-02.02, AUTOTEST-02.02P high precision, equipped with a printer, connection to remote control radio-console;

Five component gas analysers
AUTOTEST-02.03P high precision and fast operation, equipped with a printer, connection to remote control radio-console;

Three-phase sample cleaning system:
Voluminous metal-woven filter
- Moisture-repellent fine filter.
- ultrafine gas cleaning GB702.

Heated sampling system (from 6 m) for operation with gas analyser in minus temp. up to -20°C

Interference-proof tachometer sensor

Stabilised power supply source from mains 220V, 50 HZ for gas analysers

Gas analyser sampling device probe with a protective casing made of non-corrosive mesh with built-in preliminary sample cleaning filter

Oil temperature sensor

Smoke opacity optical sensor

## Gas analysers AUTOTEST I and II precision class in accordance with GOST P 52033-2003

| TECHNICAL SPECIFICATIONS | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FUNCTIONS | 01.02 | 01.02P | 01.02M | 01.03 | 01.03P | 01.03 LTK | 01.03P LTK | 01.03M | 01.03DU | 01.04 | 01.04P | 01.04M |
| Accuracy class | II | II | II | I,II | I,II | I,II | I,II | I,II | I,II | II | II | II |
| CO, % (±6%) measurement channel | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 | 0-7 |
| CH, ppm (±6%) measurement channel | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 | 0-3000 |
| $CO_2$, % (±6%) measurement channel | no | no | no | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 | no | no | no |
| $O_2$, (±6%) measurement channel | no | no | no | 0-21 | 0-21 | 0-21 | 0-21 | 0-21 | 0-21 | no | no | no |
| Lambda-parameter calculation. | no | no | no | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | no | no | no |
| Tachometer, $m^{-1}$ (±2,5%) | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 |
| Smoke opacity measurement channel, $m^{-1}$ (±0,05 $m^{-1}$, absorption coeff. 1.6-1.8 $m^{-1}$) | no | no | no | no | no | no | no | no | no | 0-∞ | 0-∞ | 0-∞ |
| Oil temp. measurement, °C (±2 °C) | 20-125 | 20-125 | no | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | no |
| «Autotest» software complete set, PC entry | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes | yes |
| Operation in LTK, software "Diagnostic control" | no | no | no | yes | yes | yes | yes | no | yes | yes | yes | no |
| Remote control panel | no | no | no | no | no | no | no | no | no | no | No | no |
| Automatic condensate evacuation/additional compressor | yes | yes | no | yes | yes | yes | yes | yes | yes | yes | Yes | no |
| Automatic zero correction with gas sample cut-off | yes | Yes | no | yes | yes | yes | yes | yes | yes | yes | Yes | no |
| Pressure auto correction/ sample consumption control | no | No | no | no | no | yes | yes | no | yes | no | No | no |
| Autom. compressor disconnection on sampling system is blockage | no | No | no | no | no | no | no | no | no | no | No | no |
| Small-size thermal printer MTP-55 | no | Yes | no | no | yes | no | yes | no | no | yes | No | no |

* M — small size AUTOTEST

## Gas analysers AUTOTEST I and 0 precision class according to GOST P 520333-2003

| TECHNICAL SPECIFICATIONS | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| FUNCTIONS | 02.02 | 02.02P | 02.03P | 02.02 | 02.02P | 02.03P | 02.03P DU | 02.03DU |
| PRECISION CLASS | I | I | I | 0 | 0 | 0 | 0 | 0 |
| CO, % (±4%) measurement channel | 0-5 | 0-5 | 0-5 | 0-5 (±3%) | 0-5 (±3%) | 0-5 (±3%) | 0-5 (±3%) | 0-5 (±3%) |
| CH, ppm (±5%) measurement channel | 0-2000 | 0-2000 | 0-2000 | 0-2000 | 0-2000 | 0-2000 | 0-2000 | 0-2000 |
| CO2, % (±4%) measurement channel | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 | 0-16 |
| O2, (±4%) measurement channel | 0-21 | 0-21 | 0-21 | 0-21 (±3%) | 0-21 (±3%) | 0-21 (±3%) | 0-21 (±3%) | 0-21 (±3%) |
| Lambda parameter calculation | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 | 0,5-2,0 |
| Ability to connect NOx, ppm (±5%) measurement channel | no | no | 0-5000 | no | no | 0-5000 | 0-5000 | 0-5000 |
| Tachometer, m-1 (±2,5%) | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 | 0-8000 |
| Oil temp. measurement, °C (±2 °C) | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 | 20-125 |
| Complete set of Autotest software, input to PC | yes | yes | yes | Yes | yes | yes | yes | Yes |
| Operation in LTK, software "Diagnostic control" | yes | yes | yes | yes | yes | yes | yes | Yes |
| Remote control panel | no | no | Special order | no | no | Special order | yes | yes |
| Automatic condensate evacuation/ additional compressor | yes | yes | yes | yes | yes | yes | yes | yes |
| Automatic zero correction with gas sample cut-off | yes | yes | yes | yes | yes | yes | yes | yes |
| Pressure auto correction/ sample consumption control | yes | yes | yes | yes | yes | yes | yes | yes |
| Autom. compressor disconnection on sampling system is blockage | yes | yes | yes | yes | yes | yes | yes | yes |
| Small-size thermal printer MTP-55 | no | yes | yes | no | yes | yes | yes | no |

# EFFECT-02 DECELEROMETER

EFFECT-02 is designed for checking braking systems in road tests for lorries, passenger motor vehicles, buses and trailer trains, as well as for electrical vehicles, trams, and trolleybuses during technical inspection. EFFECT is essential for motor vehicle technical inspection during operation and the output of motor vehicles on the line for operational control of braking system condition.
Measurement interpretation software is supplied as a set together with EFFECT-02 and it has been updated in accordance with GOST or other relevant requirements.
It is installed vertically in the motor vehicle interior on the side window or on the floor with a clip.
At present it is equipped with a Li-ion battery and pedal reinforcement sensor with a magnetic clamp.


Braking parameters are measured during road tests in accordance with GOSTP 51709 – 2001 requirements aor other relevant standards.

## Functions:

- Measuring of braking characteristics and stability.
- Graphic display on a monitor of dynamic characteristics of braking in real time with the measuring device connected to a computer.
- Input of motor vehicle parameters and categories into instrument memory and measurements protocol print-out on a portable printer.
- Calculation of braking distance standard for any speed when braking is initiated.

## Benefits:

- Compatibility with integrated motor vehicle technical inspection station and automatic transmission and logging of measurement results and motor vehicle characteristics.
- Convenient alpha-numeric display.
- On-board power supply.
- Electronic horisontal position sensor.
- Alpha-numeric display.
- Dual-coordinate accelerometer.

Small size thermal printer MTP-55

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| Control range of steady deceleration | Jsteady m/sec2 | 0-9,81 |
| Control range of pedal Rp | N | 98-980 |
| Braking distance control range St | m | 0-50 |
| Control range of initial braking speed Vo | km/h | 20-50 |
| Control range of recalculated braking distance standard St | m | 0-50 |
| Control range of braking system operation tsr | Sec. | 0-3 |
| Max. permissible main relative error of steady deceleration | % | ±4 |
| Max. permissible main relative error of pedal effort | % | ±5 |
| Power supply form DC mains (on-board vehicle) | V | 12±2 |
| Power consumption, | Wt | 2 |
| Dimensions and weight of electronics unit, | mm, kg | 206x75x38; 0.4 |
| Dimensions and weight of effort sensor, | mm, kg | 135x95x70; 0.5 |
| Range of operating temperatures | °C | from -10 to +45 |
| Average service life, | years | 6 |

# NEW! TRAILER LOADER

Intended to test the working capacity of the inertia braking systems of trailers and passenger motor vehicles during technical inspection and at technical service stations during repair and operation. Produced in two modifications: stationary and portable.

| SPECIFICATIONS | | |
|---|---|---|
| | Stationary | Portable |
| Force range of trailer push, N | from 0 to 3700 | from 0 to 3700 |
| Established measurement accuracy of push force, % | ±5 | ±5 |
| Dimensions, mm | 720x420x240 | 760x2105x500 |
| Weight, kg | 30 | 15 |

# META-01 MP
# EXHAUST GASES SMOKE METER

META-01MP smoke meters were developed and entered into mass production in 1989.

Early smoke meter prototypes were manufactured on an analogue base with an arrow indicator and were called compact smoke meters KID-1 and KID-2 (1988 models). At present META has introduced new models based on microprocessors, making it possible to introduce new functions to the smoke meter in accordance with international standard requirements of EEC UN and the environmental GOST R 52160-2003.

The patented original design of the optical sensor, independent power supply, small dimensions and low weight ensured the META-01MP smoke meter's well-deserved popularity.

As early as 1991 it was awarded a gold medal at the International exhibition EXPO – 91.

During the period of its mass production a wide range of smoke meter models for all diesel types were manufactured – from diesel locomotives to tractors and from marine to stationary power units based on standards and methods which enable smoke measurements private and governmental customers.

Measurement of results and their processing using special algorithms based on well-tested methods, real time and expanded memory for 40 measurement results, optical measurement protection from air flow pollution – these are just some of the new technical solutions which have enhanced the value to the customer and expanded the scope of use of the META-01MP smoke meter.

At present META manufactures portable smoke meters with a photometric base of 0.1 and 0.2 m and automatic recalculation for a 0.43 m standard base as well as high-precision stationary 0.43 META-01MP smoke meters with a physical photometric base of 0.43 m.

## Portable motor vehicle smoke meters META-01MP 0.1 META-01MP 0.2

- Automatic calculation of smoke concentrations according to measurement results, compliant with GOST 52160-2003, GOST 17.2.2.02, GOST 50953-96 and other relevant standrds, for all types of motor vehicles.
- The photometric 0.1 and 0.2 bases are adjusted to the 0.43 base.
- Automatic zero correction and pollution control of optical elements.
- Telescopic optical sensor handle.
- Temperature control in the optical channel.
- Recording of the results and printing of the reports in various diesel operating modes, date, time and motor vehicle license plate.

### Compact MTP-55 thermal printer

Additionally, the customer may order a portable compact printer powered by the vehicle's on-board electrical system for printouts of measurement results.

## Stationary smoke meters of the META-01MP 0.43 models for motor vehicles, and META-01MP 0.43T smoke meters for locomotives, marine and river vessels

- Interface with central station computer via RS 232 protocol.
- High precision and reproducibility of the results.
- Portable optical unit with an on-board-battery.
- Multi-function remote control.
- Classic photometric base of 0.43 meters.
- Operational modes selection from the remote control unit with alphanumeric display with backlight.
- Real-time clock to time-stamping functionality.

**TECHNICAL SPECIFICATIONS**

| | META-01MP 0.1<br>META-01MP 0.2 | META-01MP 0.43 |
|---|---|---|
| Range of smoke measurements<br>in units of reduction factor, %<br>in units of absorption factor, $m^{-1}$ | <br>0-100<br>0-∞ | <br>0-100<br>0-∞ |
| Limit of allowable absolute error<br>with an absorption factor of 1.6-1.8, $m^{-1}$,no more | ±0,05 | ±0,05 |
| Photometric base of instrument, m leading to | 0,43 | 0,43 |
| Range of operating temperatures, °C | -20 +50 | -20 +50 |
| Overall dimensions, mm:<br>instrument unit<br>optic sensor<br>control station | <br>220x75x40<br>35x35x1500<br>- | <br>640x190x310<br>-<br>220x75x40 |
| Mass, kg<br>instrument unit<br>optic sensor<br>sampling device<br>control station<br>smoke control module | <br>0,4<br>0,6<br>-<br>-<br>- | <br>-<br>-<br>1,0<br>0,4<br>10 |
| Electric supply:<br>self-contained power supply (accumulator), B | 11,1 | 12 |
| Display | alphanumeric with lighting | |

# MOTOR VEHICLE HEADLIGHT BEAM TESTER IPF-01

Headlight beam tester IPF-01 has been commercially available since 2002 and is an indispensable tool for monitoring, diagnosis and control of motor vehicle lighting devices in accordance with GOST R 51709-2001 or other applicable standards.

The new design of the instrument, the use of a membrane keyboard, an updated element base, an extended measurement range and a built-in battery have improved the consumer properties of the updated device. For metrological support of IPF-01, a standard ETO-2 illuminator was developed and is now commercially available.

IPF-01 is a modern, effective device for testig the parameters of light coming from headlights of motor vehicles which are in service, under manufacturing and after repairs and is used in various motor vehicle related enterprises and motor vehicle factories, as well as during technical inspections of motor vehicles.

IPF-01 is certified for use in the CIS countries and Bulgaria.

## Functions:

- Measures the angles of the light beam coming from headlights of motor vehicles.
- Measures the intensity of external light devices.
- Measures the time from the turning on of turn signals until the actual light appears.
- Measures the frequency of turn signal flashes.

## Benefits:

- A wide range of measured characteristics of lighting devices.
- Optical recognition of a motor vehicle's license plate, the subsequent storage of measurement results for transfer to an LTK computer.
- Self-powered.
- The device can be used at mobile inspection sites with smooth asphalt or cement floors, as well as in stationary inspection sites of fleet operators.
- Transfer of measurement results to a central computer.
- Works as part of LTK-META.


| TECHNICAL SPECIFICATIONS | |
|---|---|
| Range of slope angle measurements of light/dark boundary of a lamp light beam in a vertical plane | from 0°00' to 2°20' |
| Limits of allowable absolute error of slope angle measurements of light/dark boundary of a lamp light beam in a vertical plane | ±0,1% |
| Limit of allowable absolute error of the optic camera unit of the measuring instrument in a horizontal plane | ±30' |
| Range of measurements of the strength of light from external light sources | from 200 to 125000 kd |
| Limits of allowable fractional error of measurements of the strength of light from external light sources | ±15% |
| Dimensions of the entry port of the measuring unit objective lens | 233x170 mm |
| Range of repetition frequency of flashes of turn signal lights | from 1 to 2 hz |
| Limits of allowable absolute error of repetition frequency ranges of flashes of turn signal lights | ±0.1 hz |
| Height of the measuring unit lift | from 250 to 1600 mm |
| Range of operating temperatures | from -10 to +40 °C |
| Power supply<br>from dc source<br>from built-in accumulator battery | <br>from 10 to 14 V<br>from 3.5 to 4 V |
| Mass, | 20 kg |
| Average term of service, | 6 years |

# ISL-M CONVERTERS FOR MEASURING ANGLES OF ROTATION

The versatile ISL-M device is designed to measure the total degree of play in steering mechanisms of motor vehicles and tractors at the start of rotation of the wheels in accordance with GOST R 51709-2001 or other applicable standards.
Mass production of the ISL-M measuring device began in 2002. The first model was an instrument unit with an optically mechanical rotation angle of the registrar, mounted on a telescopic capture and a heavy wheel-driven motion sensor.
In the process of implementing new innovational solutions, the design of the registrar angle of the steering wheel was reversed and a gyro angle sensor was introduced. Replacing the optical-mechanical sensor of the steering wheel and using a new non-contact inductive sensor for a motion- controlled wheel led to a 100% increase of measurement accuracy, and the size and weight of the device decreased significantly as a result.
Using gyro angle meter allows to eliminate the need for a spring-loaded rod attached to the glass, which greatly simplified the design of the capture mechanism. The built-in motion sensor NiCd-battery has been replaced by a LiION-battery.
The gyro angle sensor, the proximity sensor, the motion-driven wheels and a powerful microprocessor provide a combination of high precision and reliability, as well as the ability to operate the instrument at a wide range of operating temperatures.
The capability to connect the device to external wireless LTK adapters has been added. There is also a new model which comes with a built-in radio module, allowing you to work with a fully wireless technical inspection station without the use of external adapters.
The 2013 model has an extended range of measurement.

# Functions:

- Measures and displays the results of a single measurement of the total angle of play in the steering mechanism.
- Automatically calculates the average value of play based on several separate measurements.
- Saves the results of the last measurement.
- Inputs the license plate number of the motor vehicle.
- Work as part of the LTK automated technical control

# Benefits:

- High accuracy and reliability of the device as a result of the application of the non-contact steering wheels motion sensor and an electronic gyro angle sensor.
- Saves measurements results even when power is turned off.
- Powerful microprocessor.
- Self-powered by an on-board rechargeable battery.
- Ability to save the results of the last measurement.
- Conducts automatic transmission of measurement results to a central computer.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| | ISL-M | ISL-M.01 |
| Range of measurements of steering wheel position, degrees | 0÷50 | |
| Limits of allowable absolute error of total play measurements, degrees | ± 0,5 | |
| Speed of steering wheel's return with measurement, rev/s | 0,1 | |
| Number of single measurements in the average of measured value, cycles | 2÷9* | |
| Time of one measurement of total play, s | 4 | |
| Allowable dimensions of steering wheel, mm | 360÷550 | |
| Power supply from dc source, V | $12{,}6\ ^{+2}/_{-4}$ | $4{,}2\ ^{-1,2}$ |
| Power intake in normal conditions, W | 5 | |
| Conditions of instrument operation: ambient temperature, °C | от -10 до +40 | |
| Overall dimensions, mm<br>instrumental unit<br>wheel motion sensor | <br>460×110×110<br>310×200×135 | <br>460×110×140<br>- |
| Mass, kg<br>instrumental unit<br>wheel motion sensor | <br>3<br>3 | <br>3<br>- |
| Mean time between failure, hr | 6000 | |
| Average term of service, years | 8 | |

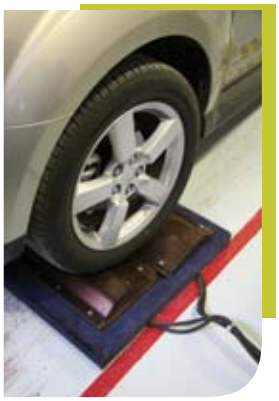
# PLAY DETECTORS
## LD-4000, LD-4000P, LD-4000R, LD-8000 LD-16000, LD-16000P, LD 16000R

Play detectors are designed to monitor backlash/ back-play in the joints of the steering and suspension motor vehicles with an axle load of 4 tons, 8 tons and 16 tons. The platforms of the back lash/back-play detector simulate all possible loads and are transmitted to the steering and suspension mechanisms of the motor vehicle as it moves. The low platform height clearance detector allows you to check motor vehicles with even very low ground clearance.

## Hydraulic axle play tester LD-4000

This device was designed for visual and sensory evaluation of gaps in the steering and suspension vehicles with an axle load of up to 4000 kg. It is used by transport companies, technical inspection centres and service stations, as well as during regular technical inspection of motor vehicles.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Maximum load on platform, kg | 2000 |
| Run of platform, mm | 50 |
| Movement power mechanism of movable platforms | Hydraulic |
| Motion control | Manual, remote |
| Power supply, V<br>total<br>control station | <br>~380 (+10%/-15%) three-phase<br>12±2 |
| Dimensional specifications of platform, mm | 600x500x66 |
| Mass, kg | 60 |
| Conditions of product operation:<br>ambient temperature, °C | <br>from -10 to +40 |



LD-4000

## Pneumatic axle play tester LD-4000P, 16000P

This device is designed to inspect the shock absorber and supports, ball joint suspension of the engine, the support arm, the rod end bearing set, etc. Used by transport companies, technical control centres and service stations.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| Maximum load on platform, kg | 2000 | 8000 |
| Maximum axle load, kg | 4000 | 16000 |
| Run of platform, mm<br>left/right<br>front/back<br>diagonal | <br>55<br>60<br>80 | <br>76<br>82<br>111 |
| Movement power mechanism of movable platforms | Pneumatic | Pneumatic |
| Motion control | Remote | Remote |
| Power intake, kW | 2,2 | 2,2 |
| Power supply, V | 220 ±10% | 220 ±10% |
| Dimensions of movable platforms, mm | 805x630x25 | 925x700x34 |
| Dimensional specifications of platform, mm | 860x930x200 | 1060x1114x311 |
| Mass of one platform, kg | 86 | 185 |

LD-16000P

LD-16000

# Hydraulic axle play tester LD-8000 and LD-16000

This device is designed for visual and sensory evaluation of gaps in the steering and suspension vehicles with an axle load of up to 8,000 and 16,000 kg. Hydraulic axle play tester is used by transport companies, technical control centres and service stations, as part of the general complex technical inspection of the motor vehicle, as well as for mandatory regular motor vehicle technical inspection. Axle play tester is designed for indoor operation and can be installed on the car-jack, as well as in auto repair pits.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| | LD-8000 | LD-16000 |
| Maximum load on platform, kg | 4000 | 8000 |
| Run of platform, mm | 80 | 80 |
| Motion control of movable platforms | Manual, remote | Manual, remote |
| Power intake, kW | 2,2 | 2,2 |
| Hydraulic oil pressure, MPa (max) | 16 | 16 |
| Power supply, V<br>— total<br>— control station | <br>~380 three-phase<br>12/24 | <br>~ 380+10%-15% three-phase<br>12±2 |
| Dimensions of movable platforms (length, width, thickness), mm, no more<br>— large<br>— small | <br>900x750x20<br>430x750x56 | <br>900X750x26<br>430X750x59 |
| Dimensional specifications of buried portion of the product platform, (length, width, height) mm | 900x750x130 | 900x750x130 |
| Mass of movable platform, kg | 190 | 214 |
| Mass of stationary platform, kg | 217 | 231 |
| Conditions of operation: ambient temperature, °C | from -10 to +40 | from -10 to +40 |

# Hand-held axle play testers LD-4000R and LD-16000R

This play detector is designed to test shock absorbers and supports, ball joint suspension, engine mount support, arm suspension, steering rods, wheel bearings, etc. of passenger motor vehicles. The product is used by transport companies, technical control centres and service stations.

| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| | LD 4000R | LD 16000R |
| Maximum load on platform, kg | 2000 | 8000 |
| Rod force | 600-650 kgf | 1900 kgf |
| Lever force | 20 kgf | 35-40 kgf |
| Length of lever | 1.7 m | 1.7 m |
| Run of platform center:<br>— diagonal, mm | 80 | 80 |
| Movement power mechanism of movable platform | manual | manual |
| Dimensions of movable platform (length, width, height), mm | 805x630x25 | 925x700x34 |
| Dimensional specifications of platform, (length, width, height) mm | 860x930x200 | 1060x1114x311 |
| Mass of platform, kg | 75 | 160 |
| Surrounding air temperature | from minus 10 to plus 40 °C | from minus 10 to plus 40 °C |

# TONIC WINDOW TINT METER


The TONIC window tint meter was designed for use on tinted and shaded glass and has been commercially available since 2005. It is an indispensable tool for technical inspection of motor vehicles. The device can be used by various technical services, traffic police and the Ministry of Transport as a means of enforcing technical control requirements for road safety. It can be used for inspection by diagnostic centres, control centres for safety of road transport, and companies performing the work of tinting of motor vehicle windows, as well during technical inspections of motor vehicles.


## Functions:

- Measurement of light transmission of both neutral and coloured glass.
- 10 hours of continuous operation with a battery charge display.
- Memory results of the last three measurements of toning.
- Input of the license plate number of the motor vehicle into the instrument measurement protocol.
- Transfer of measurement results to the LTK computer.

## Benefits:

- Self-powered by on-board rechargeable battery.
- Accuracy of measurement is independent of the thickness of the glass.
- Auto-tuning of the standard baseline of measurement and ability to sound alarm if the thresholds of light transmission are non-standard.
- Fully automated measurement and documentation of results.


| TECHNICAL SPECIFICATIONS | |
|---|---|
| Range of measurement of light transmission | 4 – 100 |
| Increment of readings, % | 0,1 |
| Limits of allowable absolute error, % | ± 2,0 |
| Thickness of test glass, mm | up to 20 |
| Preparation time for measurement, sec | 20 |
| Power supply, V (accumulator battery Li-ion) | 3,6 |
| Current consumption, A | 0,16 |
| Time of continuous operation without recharging, h | 10 |
| Dimensional specifications, mm<br>measuring unit<br>battery charger<br>light | <br>180x90x45<br>80x70x30<br>95x35 |
| Mass, kg<br>measuring unit and light<br>battery charger | <br>0,5<br>0,05 |
| Conditions of operation: ambient temperature | from -10 to +40 °C |

# TC-META
# LEAK DETECTOR


Portable TC-MATE leak detectors have gained well-deserved popularity in the market of diagnostic equipment. Being small-sized, self-powered, easy to use and accurate has accounted for stable consumer demand.

Leak Detector TC-Meta is a portable device indicator for detecting leakage of flammable gases and vapors which may be present in gas appliances and fittings for industrial and domestic use in residential and industrial buildings. It detects such substances as methane, propane, butane, acetylene, ammonia, gasoline, alcohol, and many others.

Over the past few years, the device has been modernized with the extension of its indication range and the introduction of a digital display.

## Functions:

- Detection of gas leaks during routine checks of the technical conditions of vehicles, as well as gas leakage in pipelines and at other times when you need to quickly detect the presence and location of a gas leak.
- Results are displayed on a digital display with backlight.


## Benefits:

- The device comes with an extension cord, providing convenience for checking in hard-to-reach areas where possible leakage of combustible gas may be present.
- Self-powered from an internal rechargeable battery.
- Can be used with headphones to facilitate operation in noisy areas.
- Has a switchable highly audible alarm.
- The housing is made of impact-resistant polystyrene.


| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| TITLE | UNIT OF MEASUREMENT | VALUE |
| Range of controlled concentrations (propane)<br>LFL*<br>portion | % | <br>from 0 to 60<br>from 0 to 1.02 |
| Device's warm-up time | s | 50 |
| Operating time | s | 10 |
| Power supply from independent accumulator | V | 1,4 A*ч |
| Current consumption | mA | 250 |
| Charge control of accumulator battery | V | with a decrease to 3 V |
| Dimensional specifications | mm | 210x75x45 |
| Mass, | kg | 0,80 |

* LFL — Lower Flammability Level per GOST P 51330 19-99

# LTK HARDWARE AND SOFTWARE SYSTEM

The hardware and software TCL system was designed for automatic transmission of results of the evaluation of technical condition of cars to the central computer in the form of measurement protocols. These results are identified by serial numbers that are entered on the panel of each unit.

## Benefits:

- Allows for data collection, transmission and storage of measurement data via wired and wireless communication channels.
- Allows for multiple combinations of circuit diagnostics, increasing the capacity of the line five times.
- Communication with the computer via radio channel allows you to disconnect devices from the PC and transmit data from a distance of up to 300 meters.

# BRAKE ACTUATOR TEST KIT

The M 100 test kit for checking pneumatic brake actuator system by META is the most efficient and reliable means for diagnosis of pneumatic and pneumatic-hydraulic brake systems of all types. Special pressure gauges provide for high accuracy measurement of air pressure in the indicating points, and on the control terminals of pneumatic brake actuators and help control of air leakage.

**M-100**

## Functions:

- Measures air pressure in the indicating point of brake actuators.
- Measures air pressure in the control outputs of the drive.
- Incrementally verifies the technical condition of the pneumatic actuator.

The set consists of five MPZ-UU2 gauges (measuring range of 0-10 kg/cm$^2$, accuracy class 1.5. AUSS 2405-88). The gauges are labeled 1, 2, 3, 4, and 5 and have interconnecting hoses.

**M-100-02**

# TF-01 HEADLIGHT BEAM TESTER

Headlight tester TF-01 is designed to aid in setting up and testing of car headlights when controlling the technical condition of the external lighting of vehicles.

## Benefits:

- A wide range of measured characteristics of lighting devices.
- Self-powered.
- The device can be used at mobile inspection sites with even asphalt or cement floors, as well as at stationary by motor vehicle fleet operators or garages.

## The headlight tester can measure the following parameters:

- The angle of the light beam of headlights of cars;
- The intensity of external light devices;
- The time lapse between when the turn signal is turned on until the appearance of the light;
- The frequency of the flashes of the turn signal.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Type of device | stationary, portable |
| Method of determining slope angle of light beam | according to position of light/ dark boundary on the device's screen relative to layout |
| Height of the measuring unit lift, mm | 250-1200 |
| Range of readings for the slope angles of light beam in a vertical plane, angle minutes | 0–140 |
| Dispersion of readings for the slope angle of light beam in a vertical plane, angle minutes | ± 15 |
| Range of readings of the strength of light from external light sources, kd | 0-20000 |
| Dispersion of readings of the strength of light from external light sources, % | ±15 |
| Amount of compensation from a flash of external light sources, kd | 10 |
| Power supply — from accumulator battery | 3.7 V 1600 ma *hour |
| Dimensional specifications of device, mm | 1380 x 650 x 524 |
| Mass of device, kg | 18 |

# DETECTOR NM DEVICE FOR TESTING OF LABELING DATA COMPONENTS AND ASSEMBLIES


The indicator of Detector HM is designed to rapidly detect irregularities of the structure of the metal in its surface layer caused by different kinds of defects.

The device can be used in a laboratory and by the units of traffic police to detect signs of unauthorized changes to labeling of motor vehicles, according to the following factors:

- The weld;
- Inclusions of non-ferrous metals;
- Plastic deformation;
- Changes in the thickness of paint.

## Functions:

- Identifies the structural irregularities of the metal in its surface layer.
- Detects changes the thickness of the paint.

## Benefits:

- Wide operating temperature range — from -10 to +40 ° C.
- Easy to handle because it is self-powered.
- Time of continuous operation with a charged battery is at least 8 hours.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Display type | visual (graphic, acoustic, digital) |
| Unmonitored area from the product's edge, mm | 10 |
| Thickness of monitored product, mm | 0,7 |
| Device's power supply accumulator battery 8.4 V with output of | 170 mAh |
| Time of device's continuous operation with a power supply from a fully charged accumulator battery, h | 8 (with disconnection of display light and acoustic display) |
| Dimensional specifications, mm | 175x85x30 |
| Mass, g | 270 |

# IZZ-M INDICATOR OF FLUID CONTAMINATION


Indicator of fluid contamination WHI-M is designed for rapid control of impurities in fuel and oils (gasoline, diesel fuel, engine, hydraulic, and transmission oils) of vehicles, as well as in the process of testing engines and filters.

## Functions:

- Allows you to control contamination in the range of 0.00 to 2.00%.
- Makes it possible to obtain information on the percentage of impurities in accordance with GOST 17216 standard values or according to other applicable standards.

## Benefits:

- The indicator is easy to use, requires no special laboratory conditions, additional equipment nor highly skilled personnel.
- Built-in temperature sensor.
- Convenient digital display.


| TECHNICAL SPECIFICATIONS | | |
|---|---|---|
| Temperature of controlled liquid | °C | 20-65 |
| Range of contaminants display | % | 0.00-2,00 |
| Display of measurement results: | digital | |
| Warm-up time of contaminant display | s | 10 |
| Power supply from built-in accumulator Li-Ion | - | 3.6 V 2 A *hour |
| Dimensional specifications and mass of electronics module | mm, kg | 200x75x40, 0.3 |
| Dimensional specifications and mass of feeler-sensor | mm, kg | W =8.5 L = 560; 0.1 |


RUS
RUS


# Weight-measuring equipment

# PPVK MOBILE WEIGHT CONTROL UNIT

The mobile weight control unit is designed to control the weights within parameters accepted for transport of heavy loads on public roads, and to facilitate the collection of fees and compensation for damage caused to roads, as well as impose penalties for violations of the existing restrictions on axial loads on roadways.

The unit is equipped with portable motor vehicle scales of the VA-15C-2 or VA-15C-2M model or VA-20D-2 weights for weighing motor vehicles in motion. These are based on the GAZ 2705 or Ford Transit chassis. The units are equipped with:

- A desktop with two places for a safe-box to store valuable documents, with drawers and outlets for a computer and fluorescent light.
- Two swivel chairs.
- A storage box to accommodate the weighing platforms.
- A locker to place and secure the equipment during transportation.
- An interior heater, a fire extinguisher and a first aid kit.
- An extension cable to connect the equipment to external power supply at 220V.
- An auxiliary high-capacity battery (12V).
- A battery charger to ensure uninterruptible power supply (12/220V).
- VA-15C-2, V-15C-2M or VA-20D-2 scales with a remote control.
- A "Weight Control" software package

## Benefits:

- A mobile and self-sufficient unit
- A wide range of operating temperatures.
- Easy to install, does not require major construction work.
- Easy maintenance and metrology.
- Remote transmission of the results of measurements to the control panel.
- Able to print out a measurement protocol.

# TRUCK SCALES (PORTABLE)

META weighing equipment measures axle loads of any motor vehicle with a maximum weight of 24 tons.
META Engineering & Production Co. has 20 years of experience in manufacturing high-precision load-measuring equipment, which has been used successfully by federal traffic police departments in different regions of Russia and a broad.
Since 1988, the company has put into operation more than 2,000 sets of scales used in fixed and mobile traffic police stations of weight control on the territory of Russia and other CIS countries.
The scales are being used by the Federal Highway and Traffic Police departments in overseeing compliance with weight regulations on public roads.
In recent development, Meta achieved a record of accuracy of VA-15C scales to ±5 kg in measuring loads of up to 24,000 kg. The first model of the VA-15C-1 scales had an accuracy of ±50 kg, so the precision of the scales has increased tenfold!
Currently, META produces a wide range of portable VA-15C truck scales which will fulfill the needs of virtually any application.
During the production of VA-15C, modernization of the scales was carried out through the use of high-strength materials, thus reducing the height of the platform to expand the range of objects weighed. The transfer of data from the weighing platform is carried out over a radio channel.

## Functions:

- Automatic registration of axle loads of motor vehicles in a static mode.
- Printing out the weight control report on a built-in thermal printer control panel: the date, time and the axle load.
- The data transmission is in digital form and is transmitted from the platform to the terminal.
- Maintenance of a database of measured information by using dedicated "Weight Control" software.
- Information about the axle load, including the axial weight limit excess data, stored in the database.
- Creation of weighting station shift reports.
- Automatic calculation of the amount of fine for the excess cargoe according to the current legislation.
- Print of weighting fee receipts without interruption of the monitoring.

VA-15C-2
VA-15C-2M

VA-15C-3
VA-15C-3M

# Benefits:

- A wide range of operating temperatures.
- Easy installation and maintenance.
- The ability to transfer data on passing or failing weight standards from the terminal platform over a wireless communication channel.
- Dedicated "Weight Control" software which allows creation of a database of measurements, automatic calculation of the amount of fines, and reporting on the work of the post of weight control. This software also prints a control protocol on the built-in thermal printer of the control panel.
- The device is built by using only chemically resistant materials: stainless steel, seals, gaskets, load cells and strain gauges which are produced internally, which eliminates the dependence on external manufacturers.

"These are really good scales!" Said Mr. Sergey Ten, the State Duma deputy, and the Deputy Chairman of the Committee on Transport, when testing the VA-15C-2 scales at the conference of the Association of Russian Regional Administrations of Roads (RADOR)

| TECHNICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| | VA-15C-2, | VA-15C-2M | VA-15C-3 | VA-15C-3M |
| Maximum load (Max), kg | 24000 | | 24000 | |
| Minimum load (Min), kg | 400 | | 200 | |
| Testing interval, (e) actual value of dial interval, (d), e=d, kg | 20 | | 10 | |
| Number of testing intervals | 1200 | | 2400 | |
| Limits of allowable absolute error for initial calibration, ±kg<br>in a range from Min to 500e inc.<br>in a range higher than 500e to 2000e inc.<br>in a range higher than 2000e | <br>10<br>20<br>30 | | <br>5<br>10<br>15 | |
| Limits of allowable absolute error for operation, ±kg<br>in a range from Min to 500e inc.<br>in a range higher than 500e to 2000e inc.<br>in a range higher than 2000e | <br>20<br>40<br>60 | | <br>10<br>20<br>30 | |
| Range of empty weight sample, kg | 500 | | 500 | |
| Range of operating temperatures, °C<br>for load carrier<br>for terminal | <br>from minus 40 to plus 50<br>from minus 10 to plus 50 | | | |
| Parameters of power supply:<br>current, V<br>DC source power supply unit, V | <br>$220^{+12,5\%}/_{-15\%}$<br>$12^{+4}/_{-2\%}$ | | | |
| Dimensional specifications, mm*2 | 700x400x40 | 900x500x40 | 700x400x105 | 900x500x105 |
| Mass, kg*2 | 36 | 42,5 | 42 | 67,5 |

Note*2 — Characteristics given for one load carrier

# MOTOR VEHICLE SCALES FOR WEIGHING IN MOTION

At the foundation of the modern scales produced by META, there are many years of development and production of strain gauge load cells and maintenance of other weighing equipment. The scales at the weight control posts are built based on the VA-D dynamic vehicle scale design and determine the axle load and total weight of motor vehicles and trucks in motion.

These scales are used in various industries, in agriculture, and especially at the weight control checkpoints of traffic police, and at mobile weight control stations (with a modified version of VA-20D-2).

The principle of operation of the scales is based on the transformation of the elastic deformation of strain gauge sensors arising under the gravity of the motor vehicle being weighed, which is converted into analog electrical signals. Such analog electrical signals from the sensors are added up and fed into a microprocessor control unit in which the total sum of the signals is further converted into a digital code. The value of the mass of the weighed motor vehicle is then stored on a hard drive.

| NAME OF CHARACTERISTIC | WEIGHT VARIANT | | | | |
|---|---|---|---|---|---|
| | VA-20D-1 | VA-40D | VA-60D | VA-20D-2 | VA-20D-4 |
| **WEIGHING IN MOTION** | | | | | |
| Lowest weight limit (LWL), kg | 500 | | | | |
| Highest weight limit (HWL), kg | 200000 | | | | |
| Readability (d), kg | 10 | | | | |
| Limits of allowable error at the moment of weighing during movement with a speed of no more than 10 km/h:<br>uncoupled vehicle, trailer unit or semitrailer vehicle, trailer, semitrailer in a road train without detaching in the initial verification or calibration (for operation):<br>from LWL up to 35% of HWL inclusively, % from 35% of HWL;<br>higher than 35% HWL % of measured mass | ±1,0% (±2,0%)<br>±1,0% (±2,0%) | | | | |
| Maximum speed of traffic through scales | Unlimited | | | | |
| Dimensional specifications of load carrier platform, mm | 3500×1100 | 3500×4000 | 8000×3500<br>6000×3500 | 1000×600<br>(2 in a set) | 1000×600<br>(4 in a set) |
| Mass of load carrier platform, kg | 1500 | 3000 | 5000<br>4000 | 2×200<br>(2 in a set) | 4×200<br>(4 in a set) |
| **STATIC WEIGHING** | | | | | |
| Lowest weight limit (LWL), kg | 200 | | 400 | | 200 |
| Highest weight limit (HWL), kg | 20000 | 40000 | 60000 | 20000 | 20000 |
| Value of testing interval (e), increment (d) | 10 | | 20 | | 10 |
| Limit of allowable error for initial calibration (operation and after repair), kg:<br>from LWL up to 500e;<br>from 500e up to 2000e;<br>higher than 2000e | ± 5;<br>± 10;<br>- | ± 5;<br>± 10;<br>± 15 | ± 10;<br>± 20;<br>± 30 | ± 5;<br>± 10;<br>- | ± 5;<br>± 10;<br>- |
| **DETERMINATION OF AXLE LOAD ON THE ROADWAY IN MOTION** | | | | | |
| Highest measurement limit (HML), kg | 20000 | 40000 | 60000 | 20000 | 20000 |
| Lowest measurement limit of axle load on roadway, kg | 500 | | | | |
| Increment, kg | 10 | | | | |
| Limits of allowable measurement error for axle load at a speed up to 10 km/h in % of HML<br>upon initial calibration<br>in operation | ± 1<br>± 2 | | | | |
| Limits of allowable error at a speed between 10 and 20 km/h, % of HML<br>upon inspection<br>in operation | ±3,0%<br>±3,0% | | | | |
| Limits of allowable error at a speed between 20 and 40 km/h, % of HML<br>upon inspection<br>in operation | ±8,0%<br>±8,0% | | | | |
| Limits of allowable error at a speed between 40 and 60 km/h, % of HML<br>upon inspection<br>in operation | ±13,0%<br>±13,0% | | | | |
| Range of speed measurement, km/h | From 1 to 60 | | | | |
| Limits of allowable error, % of measured speed | ± 10 | | | | |
| Range of axle bases, m | 1,2 – 12 | | | | |
| Limits of allowable error of distance between axles, % of measured distance | ±10 | | | | |

## Functions:

- Measurement of axial loads applied on the road surface and the motor vehicle weight while static and in motion.
- Detection of the type, speed and axial distances of motor vehicle, for weighing in motion.
- Video monitoring and storage of photographic images of the weighed motor vehicle in the computer.
- Control over the movement of the weighed motor vehicle.
- Management of the database of motor vehicles with the ability to create and print final documents.

## Features:

- High accuracy at speeds of up to 60 km /h
- Stability and ease of operation. Thanks to its robust and well thought out design, the scales work perfectly even in the harshest of environments.
- The ease and convenience of weighing thanks to advanced technology. There is no need to use lifting equipment due to the minimal dimensions of the weighing plate made of aluminum alloy.
- Versatility: the scales are suitable for weighing all types of vehicles, irrespective of their size.
- A wide operating temperature range of -40 to +60 C.
- The scale is designed for high intensity work of up to 20,000 vehicles a day.

## Benefits:

- Simplicity and ease of maintenance;
- The thickness of the platform is only 28 mm, and it is made of an aluminum alloy;
- Increased protection from the environment with a special function of covering the platform to shelter it from the elements.

Рабочее окно распознования гос. номера транспортного средства

## VA-20D-2

Portable motor vehicle scales to measure the axle load and total weight of motor vehicles and trucks in motion at speeds of up to 60km/h

Two compact load plates sized 600x1000 mm, with a minimal roadbed footprint, with construction of the foundation requiring only minimal outlays.

This modification of the weights is included in the "Weight control" hardware-software complex. A more detailed description of system capabilities of the "Weight control" hardware-software complex and its function in the application of VA-20D-2 scales is given in a separate publication titled "Weighing Equipment and Automobile Weight Control Checkpoints" as well as on the website of the manufacturer at: http://www.meta-moscow.ru /

## VA-20D-1

A load plate with the size of 1100X3500 mm.

- Covers 3,500 mm. of the traffic lane;
- Accurate measurement acorss the entire width of the scale.

## VA-40D

A single load plate with a length from 900 to 3500 mm. and width of 4000 mm.

- The reinforced platform of VA-40D scales alows weighting of motor vehicles with axial loads of up to 40 tons;
- The VA-40D scales cover the entire width of the traffic lane and eliminate the possibility of bypassing the weigh station.

## VA-60D

A single load plate sized 6000x3500 mm or 8000x3500 mm.

- Covers the entire width of the traffic lane and eliminates the possibility of bypassing the weigh station;
- Accurate measurement acorss the entire width of the scale.

# VPA PLATFORM MOTOR VEHICLE SCALES

VPA motor vehicle scales are designed for static commercial weighing of motor vehicles. The weighing result is displayed on a digital display of the remote control unit and on an external repeater display. VPA motor vehicle scales are equipped with automatic zero setting at start-up, automatic tracking of zero at changes of the weight of the load plate due to precipitation or pollution, as well as an overload signal.

The VPA scales can be connected to a PC via the RS 232 interface for automatic registration of weight and recording of products.

VPAs are delivered as prefabricated metal platforms with a remote control and back-up external display. The scales are installed in a pit or above-ground on a reinforced concrete foundation.

The special modular design allows for the joining of two VPA weighing platforms for weighing extended motor vehicles (of up to 16 meters in length).

# Functions:

- Automatic registration or axial and per-wheel loads of motor vehicles.
- Printing out of weight control reports on the built-in thermal printer of the control panel: date, time, per-wheel and axial load, and gross motor vehicle weight.
- Transfer of data from the platform to the control unit over a communication link.
- Maintenance of a database of measurements in dedicated "Weight Control" software suite.
- Preparation of the weight control checkpoint shift reports.
- Automatic calculation of the fine for transportation of excessively heavy loads.

# Benefits:

- The weighing result is displayed on the digital display of a remote control unit and on an external repeater display.
- Automatic setting of the zero on the scales.
- Automatic tracking of the zero when the weight load on plate changes due to precipitation and/or pollution.
- Overload signaling mechanism.
- Ability to report the output of the scales via RS 232 interface for automatic registration of weighing results and cargo control.

| TECHNICAL SPECIFICATIONS | | | | | | |
|---|---|---|---|---|---|---|
| NAME | WEIGHT, KG | | ACTUAL VALUE OF INTERVAL (D) AND TEST INTERVAL (E) (D=E), KG | WEIGHING INTERVALS, KG | LIMITS OF ALLOWABLE ABSOLUTE ERROR FOR INITIAL CALIBRATION, MPE*, ±KG | LIMITS OF ALLOWABLE ERROR IN OPERATION AND AFTER REPAIR AT AN OPERATING BUSINESS, MPE*, ±KG |
| | MINI-MUM | MAXI-MUM | | | | |
| ACCURACY CLASS III (AVERAGE) PER GOST R 53288-2008 | | | | | | |
| VP-30A | 200 | 30000 | 10 | From 200 to 5000<br>From 5000 to 20000<br>Higher than 20000 | 5<br>10<br>15 | 10<br>20<br>30 |
| VP-40A | 200 | 40000 | 10 | From 200 to 5000<br>From 5000 to 20000<br>Higher than 20000 | 5<br>10<br>15 | 10<br>20<br>30 |
| VP-50A | 400 | 50000 | 20 | From 400 to 10000<br>From 10000 to 40000<br>Higher than 40000 | 10<br>20<br>30 | 20<br>40<br>60 |
| VP-60A | 400 | 60000 | 20 | From 400 to 10000<br>From 10000 to 40000<br>Higher than 40000 | 10<br>20<br>30 | 20<br>40<br>60 |
| VP-80A | 400 | 80000 | 20 | From 400 to 10000<br>From 10000 to 40000<br>Higher than 40000 | 10<br>20<br>30 | 20<br>40<br>60 |

| NAME PERFORMANCE | DIMENSIONAL SPECIFICATIONS OF LOAD CARRIER PLATFORM, MM | MASS OF LOAD CARRIER PLATFORM, KG |
|---|---|---|
| Performance 1 | 6000x3500x700 | 3600 |
| Performance 2 | 8000x3500x700 | 4600 |


К 187 УМ 63


8771 УКК

# Integrated safety systems

# BARRIER AUTOMATED ACCESS CONTROL SYSTEM

The stationary electromechanical barricade, the BARRIER-200, designed to protect high-profile facilities of the Ministry of the Interior and the Russian Ministry of Defense from unauthorized entry or passage by motor vehicles, was developed and put into operation in 2004 for the RF Ministry of Defense. The barricade design was patented.

After the design of the BARRIER-200 was improved, the barricade product line was expanded for equipping garage complexes and parking lots, railway crossings, high risk areas, and strategically important facilities.

The main design is a strong steel panel sheathed with rope wires blocking passage, forming a solid system with fortification blocks weighing 12 tons. When a motor vehicle is stopped, the kinetic energy transfers into the work of moving the block and the flexible strain of the barrier panel. The barricades are produced in versions with a passage width of 3.50 and 4.50 m.

In 2009 a new patented design was developed for a two-sided all-purpose barricade to block vehicular traffic in both directions.

The BARRIER-200 barricades were installed at strategically important and socially significant facilities of Russia and protect against unauthorized entry to the facilities:

— Volzhsky Hydropower Plant lock canal;

— territory of the Ryazansky Military Motor Vehicle Institute;

— main motor vehicle storage bases for vehicular and armored property of the Moscow, Penza and Samara districts;

— territory of the "Volzhsky State Basin Authority of Waterways and Shipping" university in Nizhny Novgorod.

## Benefits:

- Effective protection of the guarded facility from unauthorized entry by motor vehicles.
- Unpassable obstacles for all categories of motor vehicles.
- Intelligent identification system for motor vehicles with "friend-or-foe" sign.
- Fast ascent/descent of barrier panel.
- Patented design and technology of energy absorption by a moving motor vehicle up to 61 mJ at a speed of 50 km/h, which significantly exceeds the performance of other designs.
- 10 years of experience in protecting particularly important facilities of the RF Ministry of Defense and facilities of Russia's Ministries of the Interior and Transportation.
- Licensed welding technology and anti-corrosion protection with Customer acceptance by the RF Ministry of Defense.
- Simple and fast assembly at any active facilities without using complex technology and disrupting the protection scheme.
- Efficient complete recovery of the barricade panel after a motor vehicle is detained within 20 minutes from the set of spare parts.
- Barricade panel width from 3.5 to 4.5 meters.

# DOZOR-ANTITERROR
# ACCESS CONTROL SYSTEM

"Friend-or-foe" identification by the vehicle's license plate or by a radio frequency ID set in the vehicle.

- Rapid blocking of the entrance to a protected territory in case of the appearance in the observation zone of:
  — a vehicle not identified as friend or foe;
  — a vehicle moving in excess of the established speed;
  — other suspicios movement of objects or people.
- Creation of a base of motor vehicles traveling through the facility with a photographic image record.
- Automatic management of the barricade and verification of motor vehicles traveling to the territory, with databases of authorized motor vehicles.
- Preparation of reports for the indicated intervals and observation periods for the division officer or facilities manager.

Simultaneous operation of the control system on 16 communication channels ensures the rapidity of data transfer without decreasing the capacity. The protected information exchange protocol with more than one trillion (1019) combination codes prevents the forgery of a radio frequency ID set for a motor vehicle. The data encryption capability makes the communication channel interference-proof and protected from unauthorized access. The radio modules have communication range of up to 4.5 km.

## BARRIER-200

The stationary electromechanical barricade is designed to protect high-profile facilities of the Ministry of the Interior and the Russian Ministry of Defense from unauthorized entry or passage by vehicles.
The automated checkpoint based on a movement barricade, Barrier-200, was developed in accordance with a Technical Specification of the Russian Ministry of the Interior.
The main design is a strong steel panel sheathed with rope wires blocking passage, forming a solid system with fortification blocks weighing 12 tons. When an automobile is stopped, the kinetic energy transfers into the work of moving the block and the flexible strain of the barrier panel. The barricades are issued in versions with a passage width of 3.50 and 4.50 m.

## BARRIER-200.01

The mobile assembly version is put together at the site of special events in 30 minutes from individual parts weighing no more than 50 kg, it has an independent power supply, and it does not damage the road surface.
The system design is protected by patent No. 48219 of the Federal Service for Intellectual Property.
The barricades went through acceptance testing by an inter-agency commission made up of representatives of the RF Ministry of Defense, Russia's Ministry of the Interior and the Ministry of Transport, as well as an operational test in Special Police Force work for the city of Togliatti and in the Chechen republic.
The barricade designs were developed in accordance with technical assignments of the RF Ministry of the Interior from 2004.
The BARRIER systems were installed at strategic and socially significant venues of Russia:
— for protection of the Volzhsky Hydropower Plant lock canal;;
— in the territory of the Ryazansky Military Automobile Institute;
— at the main automobile storage bases for vehicular and armored property of the Moscow, Penza and Samara districts;
— in the territory of the "Volzhsky State Basin Authority of Waterways and Shipping" university in Nizhny Novgorod.

## BARRIER-200.02

The checkpoint based on a movement barricade, BARRIER-200.02, is designed to close off passage and control the passage area of motor vehicles with a prohibiting signal light and is used as an obstacle to stop unauthorized passage of a motor vehicle through the checkpoint of military bases and posts, field parks, in passage zones in the territory of socially significant and high-risk venues, as well as in territories of railroad crossings as additional obstacles to stop unauthorized entry by motor vehicles through a closed railway crossing.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Energy-absorbing capability, kJ | 22540 |
| Passage width, mm | 3300 |
| Platform ascent time from open position to closed, s | 8 |
| Power intake of electric motor, kW | 0,12 |
| Dimensional specifications of barricade, mm<br>in "Open" position<br>in "Closed" position» | <br>4350x1500x60<br>4350x1500x700 |
| Mass of barricade, kg | 520 |

# ALCOLOCK
# IGNITION INTERLOCK

Driver intoxication monitoring device


## Area of use:

— for social transport, on school buses, railway transportation, on metro trains, for special cargo transportation.

## Functions:

— Reliable detection of alcohol in exhaled air.
— Audio and visual feedback of the measurement procedure.
— Disabling of the motor vehicle's ignition system in case of alcohol detection in the exhaled air.

Ignition interlock device driver's personal data entry

## Benefits:

— High degree of accuracy in the measurements.
— Absolute discrimination relative to elements in the vehicle's interior: gasoline, fuel acids, aromatizers, scents.
— No calibration or maintenance required.
— Prevents falsification of exhalation.
— Fiscal record without an editing capability.
— Remote transmission of positive test data to the dispatcher station via GPRS.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Trigger threshold, mg/l | 0,150 |
| Time for express analysis, s | 3 |
| Number of fiscal records in the format "Date-time-number breath-result" | 2700 |
| Electric supply: from the vehicle's in-vehicle network, V | 12,6±20% (24±20%) |
| Maximum power consumption, V | 10 |
| Dimensional specifications of the measurement unit, mm | 195x80x58 |
| Mass of measurement unit, kg | 0,4 |
| Range of operating temperatures, °C | -10 — +40 |


# Police equipment

# AUTOSCAN
# RADAR SPEEDOMETERS WITH VIDEO RECORDING


"AUTOSCAN", radar speedometers with video recording, are designed for automatic detection of moving motor vehicles in the monitored zone, measurement of a motor vehicle's speed, video recordings of a violation of the speed limit and other traffic rules, observation of events on a monitor, and processing, storage and playback of video recordings on the monitor screen. The speedometers are approved for use by Federal Traffic Safety Administration employees in highway patrol service.

## Functions:

- Remote selective maximum speed measurement of motor vehicles moving in the flow of a selected direction.
- Automatic video recording of speed violators if the established speed threshold (20-250km/h) is exceeded and video recording in the one-time manual speed measurement mode with a marking on the still shot of the date, time, and speed.
- Capability of data transfer from the flash memory card to the master PC with a subsequent printout.
- Adjustment of the number of still shots in the videoclip and the time interval between shots, depending on the traffic situation.
- Review of the recorded information on a built-in monitor, digital zoom of selected shots.
- Vehicle speed measurement in manual and automatic modes both for individual and for vehicles moving in a group exceeding the speed of traffic flow.
- Speed measurement both in a stationary and in a moving patrol vehicle mode.
- Vehicle selection according to direction of their movement (speed measurement of only on-coming or only passing vehicles).
- Visual image on the photo-still display of traffic conditions with information about the date, time, and speed of moving vehicles, with the capability of video recording at the operator's command.
- Record of single shots; capability of reproducing the recorded violation of driving regulations both with still shots and with video clips.

## AUTOSCAN-M

**Benefits:**

- Automatic selective maximum speed measurement of motor vehicles, including group of vehicles, moving in the flow in a selected direction.
- Capability to select monitored vehicular traffic direction — (incoming and passing).
- Automatic video recording and audible warning if a motor vehicle exceeds the established speed threshold.
- Visual image on the display of still shots of traffic conditions.
- Photo mode.
- Capability of reproducing the recorded violation of driving regulations both with still shots and with video clips.
- Capability of connecting a modem for the transferring of data about a violation.
- Capability of identifying vehicle registration plates.


## AUTOSCAN-MV

**Benefits:**

- Capability of storing up to 1360 colour shots in memory.
- Capability of transferring information from the flash memory to a PC with a subsequent printout.
- Motor vehicle selection for direction of their movement: speed measurement of only on-coming or only passing motor vehicles.
- Capability of recording single shots (photo mode).
- Capability of reproducing the recorded violation of driving regulations both with still shots and with video clips.
- Prevention of unauthorized removal of a recorded driving violation by an operator and authorisation of access to software.

| TECHNICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| | AUTOSCAN M(V) | AUTOSCAN M | AUTOSCAN P | AUTOSCAN S |
| Power supply, V | from 10 to 16 | from 10 to 16 | 12 | 220 |
| Power intake, W | 100 | 100 | 100 | 1000 |
| Range of speed measurement, km/h | from 20 to 250 | | | |
| Allowable error limit for speed measurement in a stationary mode, km/h | +1 | +1 | +2 | +2 |
| Allowable error limit for speed measurement in a motion mode, km/h | +2 | ±2 | ±2 | ±2 |
| Operational frequency of emission, GHz | 24,150±0,1 | | | |
| Alignment of record, s | From 0.1 to 5 (step 0.1) | from 5 to 60 (step 5) | от 5 до 60 (шаг 5) | от 5 до 60 (шаг 5) |
| Speed of record, shots/s | 6 | | | |
| Range of operating temperatures, °C | from 0 to +60 | from 0 to +60 | from -20 to +50 | from -40 to +50 |

# AKPE BREATH ALCOHOL ANALYSERS

AKPE-01 devices are a medical measurement resource for the quantitative measurement of alcohol content in exhaled breath. The AKPE-01 device is approved for use for the purposes of establishing levels of intoxication and entered in the stage registry "Technical Medical Devices" FSR 2011/09984.

Approved for usage by Roszdravnadzor Order No. 380-Pr/11 from 2/2/2011.
Recommended for usage by the Federal Traffic Safety Administration of the Russian Ministry of the Interior

The device's operating principle is based on the spectrophotometric method of detecting ethanol vapours. The AKPE-01 has absolute selectivity in relation to substances interfering with the detection of ethanol in exhaled breath. The AKPE-01 has been produced commercially since 1994 and is the first and so far the only, Russian device for measuring the ethanol content in exhaled breath. The device's alcohol determination process is fully automated and eliminates the possibility of error or evidence-tampering. The initial conditions are established before each measurement with neutral air cleared of ethanol with a special filter.

During the production of the device, the product line was significantly expanded; modifications of the AKPE were introduced with the video recording of the measuring process, and portable devices were introduced in a compact housing with a built-in printer.

In order to improve the accuracy of the readings, the hardware was updated to prevent error from non-measured elements. An improved version of the software was developed, as well as operational indicators as part of the expansion of the operation temperature range.

GSVS-META-02 devices are used Ffor metrological calibration of the breath alcohol analysers.

Also, the META company developed and introduced ALCOLOCK ignition interlock device designed to monitor driver intoxication.

## Functions:

- Automatic calibration of the measuring channel before each measurement.
- Monitoring of the duration of the exhale.
- Monitoring and recording of an interruption in the exhalation and an incomplete exhalation with a description of the irregularities on the display.
- Measurement of the concentration of ethanol vapours in exhaled breath with a representation of the results on an alphanumeric 128x32 pixels LCD.
- Involuntary sample selection for express analysis.
- Storage of up to 4,000 measurement results with a date and time reference in the fiscal memory.
- Printing of the measurement results report on the built-in printer. The report contains the device's serial number, date and time of the measurements, date of the metrological verification, and the value of the measured concentration of ethanol vapours in exhaled air.
- Transfer of a block of measurement results to the computer.

## Benefits:

- Objectivity of evaluation: prevents an inaccurate result in cases of recorded alcohol in the mouth cavity, reports an interruption in exhale or insufficient exhale force.
- Monitoring of ambient air: automatically monitors the alcohol contents in the ambient air and in the sample delivery system.
- Record printout: the record contains measurement results, date, time, device number, and record number. There is a protected memory of the results.
- Productivity: allows for up to 80 examinations per hour.
- Accuracy: does not require calibration throughout it service life, and maintains stable metrological characteristics without the use of calibration gas mixtures.
- Possibility to accept video input for recording of the medical examination and video file storage in the device memory.

**Portable breath alcohol analyser**

## AKPE-01.01

## AKPE-01.01-01

**Compact breath alcohol analyser with on-board 12V power supply for use at mobile traffic police stations**

## AKPE-01.01M

## AKPE-01.01M-01

with built-in keyboard

**Portable brath alcohol analyser with independent and on-board power supply. Allows for express analysis with involuntary selection of an air sample through a funnel for a no-contact express analysis. Produced in three versions: with keyboard, without keyboard, and with keyboard and built-in printer.**

## AKPE-01M

with keyboard and external printer

## AKPE-01M-01

with printer

## AKPE-01M-03

with keyboard and built-in printer

## ALCOTESTER 02 SPECTROPHOTOMETRIC BREATH ALCOHOL ANALYSER

NEW

### Benefits:

- Increased accuracy.
- No calibration required for 12 months.
- Competitive price

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Display | Alphanumeric liquid crystal display |
| Range of calibrated readings, mg/l | 0-1,500 |
| Electric supply | Built-in battery 3.6 V 2.2 A* hour |
| Mass, kg | 0,4 |
| Overall dimensions, mm | 200x80x50 |
| Conditions of operation: ambient temperature | From -10 to +40 |

| TECHNICAL SPECIFICATIONS | | | | |
|---|---|---|---|---|
| | AKPE-01.01, AKPE-01.01-01 | AKPE-01.01M AKPE-01.01M-01 | AKPE-01M, AKPE-01M-01, AKPE-01M-02 | AKPE-01M-03 |
| Range of measurements of large ethanol vapor concentration in exhaled air, mg/l | from 0 to 1.500 | | | |
| Range of readings, mg/l from | 0 to 5.000 | | | |
| Limits of allowable absolute error in the range of 0-0.200 mg/l | ± 0.020 mg/l | | | |
| Limits of allowable relative error in a range higher than 0.200–1.500 | ± 10 % | | | |
| Time of measurement after sample selection, s | no more than 5 | | | |
| Time of preparation for operation after turning on at the ambient temperature (20 ± 5) °C, min | no more than 10 | | no more than 3.5 | |
| Time of preparation for operation after measurement at the surrounding air temperature (20 ± 5) °C | no more than 60 s | | no more than 20 s | |
| Time interval of analyzer operation without adjustments to readings | 12 months | | | |
| Electric supply | —AC network with voltage (220±22) V, frequency (50±1) hz<br>—DC power supply with voltage (12±2) V | —DC power supply with voltage (12.6±2) V;<br>—in-vehicle network (12.6±2) V | —in-vehicle network (12.6±2) V;<br>—built-in accumulator battery;<br>—network supply and charge (5±0,25) V; | |
| Number of measurements in analyzers without recharging the accumulator | - | | no less than 250 | |
| Range of surrounding air temperature, °C | from 0 to 40 | | from minus 10 to plus 40 | |
| Relative humidity of surrounding air at a temperature of 25 °C, % | no more than 98 | | | |
| Range of atmospheric pressure, kPa | from 66.6 to 106.6 | | | |
| Dimensional specifications, mm | 440x135x270 | 275x215x95 | 195x80x50 | 223x78x68 |
| Mass, kg | 5,5 | 3 | 0,4 | 0,5 |
| Power intake, VA:<br>in warming-up mode<br>in operating mode | <br>60<br>10 | <br>60<br>10 | <br>5<br>0,5 | <br>10<br>2,5 |

## LICENSES AND CERTIFICATES OF THE AKEP 01.01 BREATH ALCOHOL ANALYSER

Entered into the State Registry of Medical Technology Products, Registration Certificate No. FSR 2011/09984

Winner of the contest of Russia's Ministry of the Interior Traffic Safety Department, «Safe Road» in the category: «Best Device» for examining the alcoholic intoxication condition and the competition winner of the program «100 Best Products of Russia».

Awarded the gold medal of the international quality mark «For High Quality. New Millenium».

# INDICATORS OF ETHANOL IN EXHALED AIR ALCOTESTER

The ALCOTESTER alcohol indicators have been commercially produced since 2000, and they are designed to detect alcohol vapors in exhaled air in the monitoring of drivers' sobriety and in other necessary situations for revealing persons suspected of consuming alcoholic drinks.
During the release of the device, META developers created a new frame for the device and introduced an independent power supply. Also, errors in inserting a sample into the detector are prevented through the introduction of a blowing chamber with a mouthpiece.
In 2012, the ALCOTESTER spectrophotometric breath alcohol analyser was introduced, with significantly increased accuracy of measurement and decreased device maintenance cost.

## ALCOTESTER 01

### Benefits:

- Increased breath alcohol measurement accuracy.
- Reliability and ease of use.
- Warning of an interruption in exhale and insufficiently strong exhale air flow.
- Visual and audible alarm during sampling.
- Monitoring and alarm for alcohol vapors in ambient indoor air.
- On-board power supply 36 hours of continuous operation on single charge.
- Power-saving mode and indication of the remaining battery charge.
- Electronic calibration of sensitivity using calibrating gas mix.

## ALCOTESTER 01.01

with accumulator battery

## ALCOTESTER 01.01B

with standard battery

### Benefits:

- Compact and capable.
- Competitive price
- Reliability and ease of use.
- Warning of an interruption in exhale and insufficiently strong exhale.
- Visual and audible alarm during sampling.


ALCOTESTER 01

ALCOTESTER 01.01


| TECHNICAL SPECIFICATIONS | | | |
|---|---|---|---|
| | ALCOTESTER 01 | ALCOTESTER 01.01 | ALCOTESTER 01.01B |
| Display | Alphanumeric liquid crystal display | Digital LED indicator | Threshold LED indicator |
| Range of calibrated readings, mg/l | 0-1,500 | 0-1,500 | 0-1,500 |
| Power supply: | Rechargeable battery 3.6 V 1.4 A *hour | Rechargeable battery 3.6 V 0.3 A *hour | Standard battery 1.5 V, 2 pieces |
| Mass, kg | 0,5 | 0,1 | 0,1 |
| Overall dimensions, mm | 200Ч80Ч50 | 120Ч46Ч22 | 120Ч46Ч22 |
| Conditions of operation: ambient temperature, °C | from +1 to +40 | | |

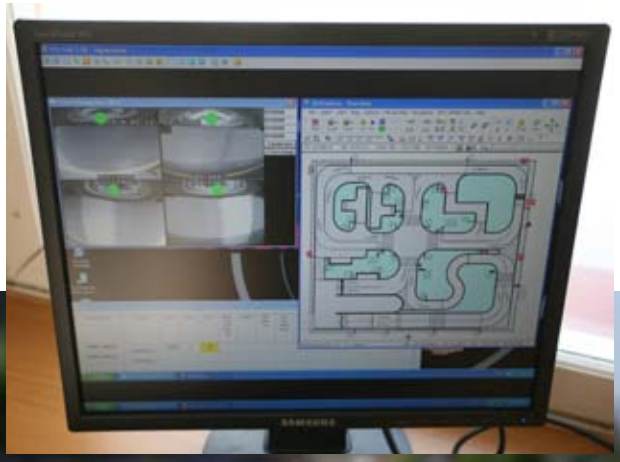
# SOFTWARE PACKAGE FOR AUDIO AND VIDEO OBSERVATION

## FOR DRIVER TRAINING AND PRACTICAL DRIVING QUALIFICATION EXAMS

# EXPERT-M.4

The EXPERT-M.4 hardware and software package is designed for audio and video observation for the roadway, monitoring/measuring devices, main and supplementary apparatuses for driving a motor vehicle, and activities of the examinee and examiner, and also for the registering and storing of obtained information during a practical driving exam.

An image from all video transmitters is continuously delivered in real time to the video camera, displayed on the monitor, and automatically recorded on the camera's memory card. Audio information from the exam is captured in the video camera through a built-in microphone, which is also automatically recorded on the memory card. Power supply of the entire set comes from the motor vehicle's cigarette lighter.



## Functions:

- Record of images in real time.
- Combination of several images in one picture received from the video cameras.
- Audio record of exam.
- Automatic recording of mistakes and penalty points on the monitor screen.

## Benefits:

- Synchronous record on one information medium from the video cameras.
- Storage of settings and video material in non-volatile memory in power-down mode.
- Password protection against removal and adjustment of information.
- Storage of information on a hard disk drive up to 1,000 GB or CF and SD cards.
- Visual monitoring of the performance of the equipment when a monitor is available.
- Volume of recorded information from 2 to 192 hours, depending on the memory capacity.
- Equipment has a water-proof and vibration-proof frame.

## The software enables:

- Record search by date and time.
- Review of a recorded clip at various playback speeds.
- Advanced search for information according to marks on the video record.
- Stop-frame function.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Power supply of the recording device, V | from 12 to 30 |
| Current consumption Max, mA | 400 (version from CF or SD)<br>600 (version from HDD 2.5') |
| Input video signal, V | 0,8 – 1,5 |
| Input audio signal, V | 0,7 – 1,4 |
| Input resistance, Ohms | 75 |
| Output signal, V | 1,2 |
| Output audio signal, V | 1,4 |
| Output resistance, Ohms | 75 |
| Capacity, GB | Up to 1000 |
| Permission for video record, points | 720x576 and 360x576 (25k/s)<br>720x288 and 360x288 (<25 k/s) |
| Speed of audio stream, Kb/s | 64 |
| Speed of frame recording/s | From 1 to 25 |
| Operating temperature, °C | -40…+70 |
| Dimensional specifications, mm no more | 140x190x60 |
| Mass, kg | 0,15 |

# TRAFFIC MONITORING SYSTEM EXPERT-M.2

Expert-M.2, a hardware and software package for audio and video observation of a traffic situation, is designed for round-the-clock observation and recording of video information and telemetry for a traffic situation and the actions of the traffic violator and inspector in the patrol motor vehicle cabin. The video camera for observation of the road situation is installed on the rearview mirror, and the observation video camera for the actions of the traffic police officer is installed on the dashboard.

The video recorder is installed in the vehicle cabin using support brackets with suction cups that are secured to the windscreen.

the video recorder is powered from a power supply unit which is included in the delivery.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Power supply of the recording device, V | +12V nominal, possibly from 6 to 18 V. |
| Current consumption Max, mA | 400 (version from CF or SD)<br>600 (version from HDD 2.5') |
| Current consumption with video cameras Max, mA | 600-1000 (with the connection of 2 cameras) |
| Input video signal, V | 0,8–1,5 |
| Input audio signal, V | 0,7 – 1,4 |
| Input resistance, Ohms | 75 |
| Output signal, V | 1,2 |
| Output audio signal, V | 1,4 |
| Output resistance, Ohms | 75 |
| Capacity | Depending on the medium capacity |
| Permission for video record, points | 720x576, 720x288, 360x288 |
| Speed of audio stream, Kb/s | 64 |
| Operating temperature, °C | -10…+50 |
| Dimensions SxGxV, mm | 95x150x60 (ver. HDD),<br>95x150x40 (ver. CF or SD) |

## The software enables:

A record search by date and time.
Review of a recorded clip at various playback speeds.
Stop-frame function.

## Functions:

- Record of images in real time.
- Synthesis of images obtained from the video cameras.
- Storage of information on a hard disk or the CF and SD information medium type.

## Benefits:

- Non-volatile memory for storage of set values and video material in case of a sudden power cut.
- Password for removal and adjustment of information.
- Visual monitoring of the performance of the equipment.
- Volume of recorded information from 2 to 192 hours, depending on the memory capacity.
- Capability of connecting the video recorder to the PC for review and processing of recorded video information using software.

# AUTOMATED "AUTODROME-META"

- PREPARATION OF DRIVERS FOR CATEGORIES "B", "C", "D",
- INCREASE OF QUALIFICATION AND ACCEPTANCE OF FIRST STAGE OF PRACTICAL EXAM
- DESIGN OF AUTODROMES
- EQUIPMENT INSTALLATION
- PERSONNEL TRAINING

Automated AUTODROME-META is designed for the training and passing of practical qualification exams to obtain the right to drive.

AUTODROME-META is an intelligent system for training drivers and passing the qualification exams.

AUTODROME-META is stationed in the territory of about two hectares with level, uniform asphalt concrete pavement and equipped with sections for 12 exercises in accordance with the approved method of conducting exams.

The operating principle of the "Autodrome-Meta" is based on the use of dashboard video recorders that identify markers and record instances of the vehicle's wheels straddling the guide lines.

# Functions:

- Recording of the results of test exercises according to a specially developed method in conditions that are very close to real road traffic.
- Processing of the result and delivering the report of the exam without the examiner's participation.
- Recording of the time for executing the exercises and mistakes in performing the control exercises: crossing the guide lines, rolling back of the vehicle on an incline, shifting gears and hand brake, and other actions of the driving candidate.
- Control and monitoring of the movement of motor vehicles around the autodrome to ensure driver safety.
- Recording and transfer of operation information and student mistakes the control centre server via radio channel.
- Automatic control of the correctness of the data transmitter system and metrological ensuring of accuracy of the recording of mistakes permitted during the test exercises.
- Protection of the system from unauthorized access and the falsification of results from test exercises.

# Benefits:

- High reliability and accuracy of the recording of mistakes from exercises by means of video monitoring of an incident of crossing the guide line.
- A significant decrease in the cost of autodrome equipment by means of using video recorders identifying the control mark of the "START" and "STOP" lines and lines for proper parking.
- A reduction of volumes and terms of construction/installation work in comparison with similar autodromes on the basis of mechanical data transmitters.
- A reduction of operational expenses and an increase of reliability of the autodrome equipment operation.
- The Autodrome-Meta does not contain mechanical crossing sensors and permits mechanized clearing of snow from the area.
- The absence of mechanical sensors for crossing the guide lines makes it possible to use the equipment year-round without decreasing the accuracy of recording the mistakes in any climate.
- Capability of customisation of the examination program to reflect changes in technical requirements for the automated autodrome.

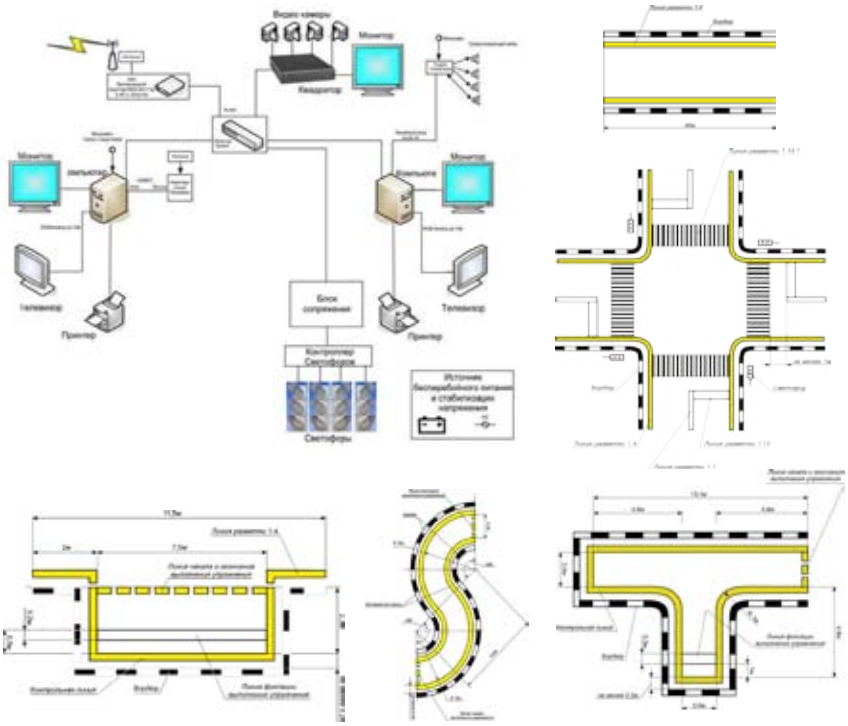
| Автомобили | Состояние | Баллы | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| № 001 (УАЗ-439) | | | | | | | | | | | | | | |
| № 002 (ВАЗ-2107) | | | | | | | | | | | | | | |
| № 003 (КАМАЗ) | | | √ | √ | -6 | | | | | | | | | |
| № 004 (ВАЗ-2107) | | | √ | -5 | -5 | -7 | √ | √ | -2 | | | | | -3 |
| № 005 (ЗИЛ) | Сдал | | √ | √ | √ | √ | √ | √ | -5 | √ | -5 | √ | √ | √ | -2 |
| № 006 (ПАЗ) | Не сдал | | √ | -10 | √ | -3 | X | | | | | | | | |
| № 007 (ГАЗ-24) | | | | | | | | | | | | | | |
| № 008 (ГАЗ-24) | | | | | | | | | | | | | | |

## For simulation of real traffic conditions at the autodrome, it is equipped with:

- “intersection” area;
- “pedestrian crossing” area;
- “railway crossing” area;
- “overpass” area;
- road signs, traffic lights and guide lines..

## AUTODROME-META

- Guarantees the highest level of objectivity in evaluation and accuracy of the recording of mistakes in the complete set of mandatory exercises and specialized tasks.
- Metrologically provided by laser pointers for optical registration of the approach of wheels to guide lines at an allowable distance.
- Initial driving training with comments and prompts of an electronic examiner.
- Skill practice for an experienced driver with the side video camera monitor.



# Model verification instruments

# GSVS-META-02 ALCOHOL-AIR MIXTURE GENERATORS

The GSVS alcohol-air mixture generator was developed and launched in production in 2003. GSVS is designed to prepare ethanol gas mixtures used for conducting the calibration and testing of alcohol breath analysers.

- Full of human exhalation flow simulation.
- Container for the ethanol solution with temperature sensor and electric heating unit.

**GSVS-META-02**

**GSVS-META-02 S**

**GSVS-META-02 M**


# UNIVERSAL CALIBRATION BOARD

The all-purpose calibration board is designed to conduct periodic calibration of the alcohol indicators of the ALCOTESTER-META to various modifications and the small-scale leak detectors TM-META.

- The board is connected to the diagnostic outlet of the ALCOTESTER-META indicators or the leak detectors with cables included in the delivery supply.

Electric supply of the board comes from an external power supply BPN-A included in the delivery supply of the board

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Power supply voltage, V | 14-20 |
| Maximum current consumption, mA | 250 |
| Dimensional specifications, cm | 140x80x40 |
| Weight of board, kg | 0,20 |

# SPL-META 3-RD CATEGORY GONIOMETRIC UNITS

The SPL-META goniometric units are designed for the assignment and simulation of the steering wheel positions when conducting verification and regulation of the devices for measurements of the total play in the steering system of vehicles. In recent years, in connection with the tightening of requirements for the production and certification of calibration equipment, the device's design was changed: the element base was renovated, which made it possible to greatly increase the accuracy of the device and expand its range of measurements. The operation of the measuring system of the SPL-META 3rd category goniometric units lies in the simulation by the units of steering wheel positions of vehicles at the assigned corner units according to the electronic readout. The measurement of the assigned turning angle is conducted by an electric converter of angular rotations.

| TECHNICAL SPECIFICATIONS | |
|---|---|
| Range of turning angle simulation, ...° | ±120 |
| Limits of allowable absolute error of turning angle simulation, ..." | ±5 |
| Resolution of the turning angle image, ...' | 3 |
| Scale graduation value for turning angle, ...° | 5 |
| Electric supply of the device is from the power supply unit | 12 V, 0.5 A |
| Dimensional specifications of the frame, mm | 400x400x550 |
| Dimensional specifications of the terminal, mm | 160x85x50 |
| Mass of the frame, kg | 9 |
| Mass of the terminal, kg | 1 |
| Conditions of operation:<br>Working range of temperatures, □C<br>relative humidity of the air, % | <br>5–35 |

# UVS WEIGHT-MEASURING DEVICE

The UVS is designed for the verification of small-scale hand-held vehicle scales for wheel and axle weighing.

## Benefits:

- High degree of accuracy in the measurements.
- Measurement results are displayed on the liquid crystal indicator.
- The device can work in two modes: measurement mode and calibration mode

| TECHNICAL SPECIFICATIONS | | | | | | |
|---|---|---|---|---|---|---|
| NAME OF DEVICES UVS-X-N | LOWER WEIGHT LIMIT, KG | UPPER WEIGHT LIMIT, KG | VALUE OF TESTING DIVISION AND RESOLUTION E=D, KG | LIMITS OF ALLOWABLE ERROR | | |
| | | | | INTERVALS OF WEIGHING | FOR INITIAL CALIBRATION, ±KG | IN OPERATION, ± KG |
| YBC-10-1 | 40 | 10000 | 2 | From Lower Weight Limit to 500e inc.<br>Higher than 500e to 2000e inc.<br>Higher than 2000e | ±2<br>±2<br>±4 | ±2<br>±4<br>±6 |
| YBC-20-1 | 100 | 20000 | 5 | From Lower Weight Limit to 500e inc.<br>Higher than 500e to 2000e inc.<br>Higher than 2000e | ±5<br>±5<br>±10 | ±5<br>1±0<br>±15 |
| YBC-30-1 | 100 | 30000 | 5 | From Lower Weight Limit to 500e inc.<br>Higher than 500e to 2000e inc.<br>Higher than 2000e | ±5<br>±5<br>±10 | ±5<br>±10<br>±15 |

# ETO-2 TELECENTRIC LIGHT

The model telecentric light, designed for calibration and verification of the measuring device for IPF headlight beam performance during its operation, was modernized according to the following indicators:

- Reworked plan for the stabilization of the current for the light bulb for improving performance.
- A crosshair was used for the continuous, more precise measurement at one point of the light circle, which made it possible to increase the measurement accuracy.
- In accordance with standard requirements, a test point for turn signals was introduced.
- Improved software for the device.


| TECHNICAL SPECIFICATIONS | |
|---|---|
| Setting range of calibrated values for the strength of the emitted light, kd | 30-1000; 1000-2000; 5000-10000; 10000-30000 |
| Limits of allowable value of relative error for light strength, % | ± 8 |
| Adjustment range of voltage, V | 12, ±5% |
| Frequency of turn signal flash, hz | 1,0 ; 1,5 ; 2,0 |
| Limits of allowable value of absolute error for turn signal flash, hz | ±0,1 |
| Power supply voltage from the AC current network with a frequency of (50±1) hz, V | 220±22 |
| Power intake, VA | 300 |
| Dimensional specifications, mm:<br>lighting unit<br>turn signal unit<br>stabilized power source | <br>236x107x120<br>85x125x70<br>280x270x140 |
| Mass, kg:<br>lighting unit<br>turn signal unit<br>stabilized power source | <br>2,5<br>0,5<br>5 |

# TALISMAN
# ELECTRONIC MONITORING SYSTEM FOR PERSONNEL AND ACCESS CONTROL

Electronic monitoring system designed for observation of personnel with satellite navigation compatible with GLONASS/GPS

Electronic monitoring of the work and recreation modes of the supervised group of people: employees of a high-risk business, drivers of vehicles for inter-city hauls, corporate clients, businesses with dangerous work conditions and increased risk.

Electronic monitoring of health condition for employees of police departments, the Ministry for Emergency Situations, and the Ministry of Defense.

Electronic monitoring and access control for business personnel.

## The TALISMAN system includes:

- Monitoring server for acceptance of navigation system coordinates and alarm messages from monitored facilities on the GSM communication channel, cable lines, and radio contact.
- Mobile terminal for the transit of messages and special signals between the monitoring server and individual transmitter TALISMAN
- Retransmission unit for the transit of messages and signals from TALISMAN in closed premises without signal access of the satellite navigation GBS/GLONASS and GSM network.
- Personal transmitter TALISMAN (bracelet).

## Functional capabilities of the TALISMAN monitoring system:

- Monitoring of the movement of personnel in an open area and zoning for permitted and forbidden premises for personnel access.
- Overseeing of the health condition and working ability of the personnel in open areas and in closed, including underground facilities and transport means.
- Overseeing of the movement of personnel and compliance with the regulations and guidelines for access to forbidden and permitted zones of the facility.
- Storage of the history of the movement pattern and work and recreation modes of the personnel, including transportation drivers.
- Acceptance of urgent instruction commands from the head (leader) and submission of alarm messages:
  — battery class
  — about the absence of movement of a supervised individual
  — unauthorized approach of persons
  — breach of movement corridor
  — breach of perimeter;
  — exit from monitoring zone;
  — breach of the band's integrity and opening the TALISMAN bracelet;
- Emergency call button.
- Tracking of daily living activity characteristics with a set interval.
- Tracking of movement characteristics and presence in the monitored zone by cell phone.
- Built-in movement sensor.
- Management of tracking system protocols.

## Benefits:

- Miniature size and little mass.
- Low energy consumption.
- Waterproof casing of the transmitter allows for a visit to the sauna and swimming pool with submersion up to 30 m.
- Built-in battery with a life of 3 years.

# ELECTRONIC MONITORING SYSTEM FOR PATIENTS

An electronic monitoring system for people under supervision (children, elderly people, patients, etc.) is designed for continuous, round-the-clock receipt and identification of signals from transmitters and beacons/retransmission units. It is used for the control of the presence and movement in a premises or a set territory, as well as for the reporting of incidents of removal from the hand and/or damage to the transmitters or other breaches.
The personal TALISMAN transmitter is worn on the arm or leg of the supervised person. TALISMAN makes it possible to submit and receive information by means of mobile and stationary retransmission units.

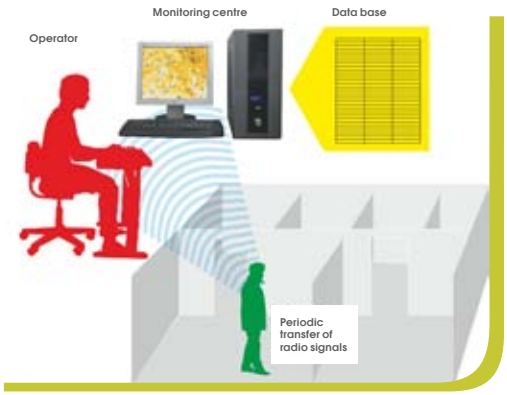
Electronic monitoring bracelet for patients

## The system provides:

- monitoring of the location and movement of supervised persons in the perimeter of a monitored section, and it also receives, stores, and submits alarm messages about a breach of the monitored section and perimeter boundaries of the given configuration;
- monitoring of the presence of a supervised person in the perimeter of a monitored section in real time;
- timely warning of a breach of the boundary perimeter of a monitored section and
- entrance into a forbidden area of the monitored section by a supervised person;
- timely monitoring for a breach of the band's integrity and clasp of the TALISMAN;
- additionally — any information about the health upon connecting the supplementary sensors in the TALISMAN (temperature, pulse, blood pressure, body movement (hand)).

## Functional capabilities:

- Transfer of information on the verification of supervised persons with TALISMAN.
- Monitoring of the movement and integrity of the casing of the beacon/retransmission unit.
- Monitoring of damage to the TALISMAN.
- Transfer of information on the integrity of the TALISMAN band, opening of the clasp and casing of the TALISMAN.
- Monitoring of the TALISMAN within a radius of up to 15 m with the capability of, programmatically or through a special interface, setting various radii of the TALIS-
- MAN's supervision zones.
  For expansion of the monitored zone, the capability of setting
- the beacons/retransmission units is provided.
  Transfer of alarm messages to the server, and then to the terminal of the driver or leader of the supervised facility.




## Benefits:

- High cryptographic integrity.
  Interactive interface.

# GEOTRANS TRANSPORTATION MONITORING SYSTEM

## Purpose:

- Global monitoring of a corporate client's transport in the area of Russia and the CIS.
- Monitoring of the conveyance of special freight and special squads with two-way communication channels of the board and control station.
- Public transport, school buses with registration and submission of signals of health, intoxication, and work and rest periods of the drivers.
- Multi-channel audio and video recording of road conditions, the drivers' actions, and incidents in the vehicle's passenger cabin with the submission of photo images along an alarm signal to the monitoring server on the GSM channel. Storage of information on a hard disk drive of the "black box" in a compact form with protection against forgery and removal.
- Monitoring of the movement and technical condition performance according to security requirements. Recording and storage of information on the mileage, speed, fuel consumption, operation modes, and compliance with the itinerary job, speed limit, and road safety rules.
- Two-way voice communication between the motor vehicle and the dispatcher through the GSM communication channel. Reports on the condition of the special freight, breaches of the perimeter by the motor vehicle, and the condition of the locks. Monitoring of access to protected zones by the motor vehicle.

# METKA GLOBAL MONITORING SYSTEM FOR FREIGHT TRACKING

Monitoring of the movement and temporary storage of freight in warehouses and container sites on the basis of electronic "marks".
Escort of freight and containers "from door to door" by means of METKA electronic monitoring along satellite navigation signals.

## Three registration categories for freight and valuable property in storage and movement:

- passive two-level RFID-mark with tracking coverage of 10 meters;
- active RFID-mark with tracking coverage of 1000 meters;
- active RFID-mark with a GSM communication channel and satellite navigation receiver with an unlimited tracking overage.

## Functional capabilities:

- itinerary recording and registration;
- recording and transmission of relevant information about the condition of freight in the container: temperature, integrity of locks, condition of sensors for the perimeters and enclosure, etc.
- monitoring of the performance of the movement sensors for freight and freight containers: acceleration-deceleration, bearings, pitch.

# INTEGRATED SECURITY SYSTEMS

Comprehensive protection of the facility, monitoring of life necessities characteristics, supervision of environmental and fire safety of the facilities.
An intelligent protection system for facilities from unauthorized entrance of violators, zoning of facilities by personnel access category, and supervision of movement of marked freight and valuable property within the facility's perimeter.

- Protection of the perimeter by distributed sensors.
- Video observation and recording of violations of the perimeter and passage zones.
- Blocking of unauthorized entry by personnel and vehicles.

## Facility Monitoring:

- supervision and analytical consideration of the consumption of heat and electric resources by the facility;
- monitoring of wastewater disposal and environmental safety of the facility;
- supervision and analytical consideration of the economic security of the facility's business operations.

# GENERAL PURPOSE MOBILE PREFABRICATED BUILDINGS

Pre-fabricated modular buildings, living facilities, work areas and trade studios. Warm, environmentally friendly, safe, comfortable, and affordable — from 6,000 euros.

## Purpose:

— Pre-fabricated modular hotels Capsule of economy class, comfort, luxury.
— Construction camps for shift workers;
— Multi-story pre-fabricated buildings.
— Mobile unit offices of the technical inspection station operator;
— Mobile weight check posts;
— Mobile checkpoints for access control;
— Mobile police posts;
— Mobile headquarters for Emergency response, armed forces, and rapid response units;
— Medical stations;
— Shift workforce modules.

## Benefits:

- Wide variety in usage: modular buildings can be for a residential or commercial purpose.
- Excellent comfort: standard hotel module with a size of 5050x2350x2500 mm, equipped with two comfortable beds and a separate bathroom with a shower.
- Individual design and interior design, original design with a large selection of finishing materials and color layouts, possible construction of one-story and two-story modular building complexes.
- Safe and environmentally clean finishing materials: medium-density fiberboard, wood structures, Finnish roofing.
- Maximum usage of space for necessary, vitally essential habitation conditions.
- Economic LED-based lighting and aesthetic lighting enables a reduction in expenses by 5 times.
- Does not require lengthy construction work; erection in days.
- Economy in transportation:
- Due to modular design, the capsular building can be shipped by light — goods commercial vehicle.
- For shipping of assembled mobile pre-fabricated buildings, no special technology is needed; it can be shipped in a trailer with only a motor vehicle.

## Optionally the Capsule can be equipped with:

- An efficient system for ventilation, air conditioning, and climate control;
- Informational and telecommunication equipment: access to the Internet, IP-tv, etc.
- Economic heating with heat recuperation: only 500 W for heating the building at a temperature of minus 30°C, and power supply from solar panels with Li rechargeable batteries.
- Independent water supply systems and wastewater disposal systems.

# AWARDS AND ACHIEVEMENTS

META — Winner of the All-Russian competition "Safe Road" of Russia's Ministry of the Interior Traffic Safety Department and Stop newspaper in the category "Best Resources of Vehicle Technical Diagnostics", and in the category "Driver Examination for Alcohol Intoxication"


1st degree certificate for the contest Gold medal of the Siberian Trade Fair AUTOSIB-2002 for applicability and potential relevance on the modern market of gas analyzers "Autotest-SO-SN-$SO_2$-" 2002

International certificates and gold medals of the US Chamber of Commerce and Industry "For High Quality. New Millenium".


Gold medal in the international exhibition EXPO-91


2nd degree certificate of the Russian agro-industrial exhibition "Gold Autumn" for the development of a set of devices for monitoring the technical conditions of self-powered machines. 2006.


Winner's certificate in the category "Brand-olymp" of the contest "Company of the Year. Best businesses of the Samara district-2004"


Certificate of the "100 best goods of Russia-2003". Analyzers of ethanol vapor concentration AKPE-01


Certificate of the "100 best goods of Russia-2003". Small-scale general purpose braking exhibits STM-6000


Certificate on the acquisition of a quality mark for the measurement unit for light transmission of glass, "Tonic," at the second international exhibition of measurement and testing equipment resources "Metrology-2007"

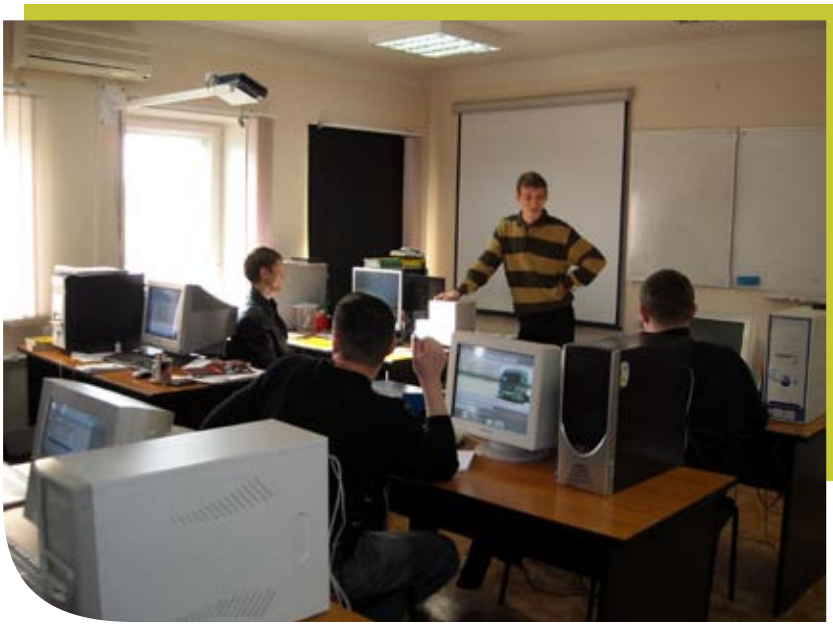

2nd degree certificate of the Russian agro-industrial exhibition "Gold Autumn" for the high-quality development of equipment and devices for fulfilling the supervisory roles by the State Technical Authority agencies. 2002.

# TRAINING CENTRE
# "RUSSIAN TECHNICAL ROAD SAFETY CENTER"

The private educational institution, the Center of Supplementary Vocational Education (increased qualification) for Specialists, the "Russian Technical Road Safety Centre", was founded in 2001 on the base of the scientific production firm "META", thanks to which the Center possesses one of Russia's best training and material technical bases.

The main types of activity of the Russian Technical Road Safety Centre are vocational training, advanced training, improvement of experts' skills, satisfaction of experts' requirements in receiving knowledge on the newest achievements in corresponding branches of science and technology and leading Russian and foreign experience, the organization and conducting of scientific research, scientific/technical and trial/experimental tasks, consulta-

| MAIN EDUCATIONAL PROGRAMS | TRAINING PERIOD |
|---|---|
| *1. VOCATIONAL ADVANCED TRAINING FOR SPECIALISTS IN AUTOTECHNICAL EXPERTISE (EXPERT-AUTOMECHANIC)* | |
| Leaders and specialists with advanced technical education, having qualification in a related profession | 2.5 months |
| 2. ADVANCED TRAINING OF SPECIALISTS IN AUTOTECHNICAL EXPERTISE (EXPERT-AUTOMECHANIC) PROGRAM: "EVALUATION OF AUTO TRANSPORT RESOURCES" | |
| Leaders and specialists with advanced technical education, having the qualification "Specialist in Autotechnical Expertise (Expert-Auto Mechanic) | 2.5 weeks |
| 3. VOCATIONAL TRAINING OF SKILLED LABOR WORKERS "INSPECTOR OF TECHNICAL CONDITION OF AUTO MOTOR TRANSPORT RESOURCES" | |
| People with qualification and work experience: mechanics for the repairing of automobiles or more advanced qualification in a related profession, drivers of transportation in the categories "B" and "C" | 1 month |
| 4. COURSE OF ADVANCED TRAINING FOR INSPECTORS OF TECHNICAL CONDITION OF AUTO MOTOR TRANSPORT RESOURCES PROGRAM: "HEAD OF TECHNICAL INSPECTION STATION | |
| People with the qualification "Inspector of Technical Condition of Auto Motor Transport Resources" | 1 week |
| 5. COURSE OF VOCATIONAL ADVANCED TRAINING OF SKILLED LABOR WORKERS "EXPERT-TECHNICIAN OF TECHNICAL CONDITION OF TRANSPORT RESOURCES" | |
| People, specialists with advanced or technical education, having qualification and work experience: mechanics for the repairing of automobiles, drivers of transportation in the categories "B" and "C" | 2.5 weeks |
| 6. COURSE OF VOCATIONAL ADVANCED TRAINING OF SKILLED LABOR WORKERS "INSPECTOR-OPERATOR OF WEIGHT CHECK OF TRANSPORT RESOURCES" | |
| | 1 week |
| 7. COURSE OF VOCATIONAL ADVANCED TRAINING OF SPECIALISTS "SPECIALIST OF SERVICE DEPARTMENT" | |
| | 1 week |



tion activity, and scientific evaluation of programs, projects, recommendations, and other materials in the area of monitoring the technical condition of vehicles.

In the 11 years of the Center's operation, training has taken place for more than 10,000 specialists for work at government technical inspection stations, experts in vehicle technical condition, and specialists providing solutions for the general issue of road safety.

At the center a qualified and consistent pedagogical team has been assembled, which possesses great potential and an ability to resolve modern issues in the training of specialists. The students have at their disposal progressive training technology, new software packages, and comfortable auditoriums equipped with the newest equipment. The students in the courses have a unique opportunity to gain practical work skills directly on the equipment issued by the scientific production firm "META".

The updating and expansion of the center's educational programs are taking place with consideration for the development of the branch and are directed at meeting the growing needs of the customer. The programs implemented at the center are relevant and in demand on the educational service market.

The base level of education of graduates accepted for training is intermediate or advanced vocational education, depending on the chosen program.

The form of training for the students is on-site or on-site/off-site with the use of modern distance training technology.

At this time the Ministry of Education and Science has licensed more than twenty of the Center's additional vocational education programs.

All educational programs are developed by teachers at the center, taking into account the modern level of development of specific branches of industry and business needs, new achievements in science and technology, and information and communication technologies.

The contents of the educational programs meet the principle of sequence and system approach in the training of specialists. The customer's proposals and their individual concerns are taken into account, and the combination of theoretical and practical lessons are a mandatory condition.

At the classes, the student receives not only professional knowledge but also

practical experience. He/she has the opportunity to receive a qualified consultation with specialists on issues that arise outside the educational program, exchange experience with his/her colleagues from different regions, and establish business relationships with new partners.

Both an independent specialist (individual or in a group) and an entire team of businesses can receive supplementary vocational education. Today, corporate education is not simply a fashionable trend, but a real investment into the future company, a pledge of stable work for the business.

The center conducts thematic and topical seminars in scientific/technical, technological, socioeconomic and other topics that arise at the level of the branch, region, or organization.

One of the areas of activity of the Russian Technical Road Safety Centre is consultation, conducted according to the following focuses:

- construction of state technical inspection stations and technical inspection points;
- use of diagnostic equipment in the examination of the technical condition of transportation resources;
- technologies and software and hardware packages for monitoring the technical condition of transportation resources for compliance with safety requirements;
- maintenance of diagnostic equipment.

Supplementary vocational education is the road to success.

Private Educational Institution, Centre of Supplementary Vocational Education for Specialists, "Russian Technical Road Safety Centre"
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rtcbdd@rtcbdd.ru
http://www.rtcbdd.ru/

## SERVICE CENTRES

| CITY, NAME OF ORGANIZATION | CONTACT TELEPHONE NUMBERS | SERVICE | DEALER |
|---|---|---|---|
| Moscow, OOO SPC "META" | (499) 784-41-15, 784-41-16 | + | + |
| Arkhangelsk, OOO "GARO-SERVIS" | (8182) 29-3382, 470-420 | | + |
| Almaty, TOO "Kompaniya ECOS" | (3272) 50-71-91, 61-19-58, 61-19-29 | | + |
| Anapa, OOO "Techauto" | (86133) 2-10-83 | | + |
| Barnaul, AKOD "Ekopribor" | (3852) 63-38-01, 63-38-42 | | + |
| Barnaul, OOO "GARO-SERVIS" | (3852) 31-93-77, 69-23-13, 69-50-64 | | + |
| Blagoveshchensk, OOO "Farm-Express" | (3852) 35-68-04, 35-67-65 | | + |
| Bryansk, OOO "Technovek" | (4832) 51-67-67, 29-66-25 | + | + |
| Veliky Novgorod, GARO-TRADE | (8182) 196931, | | + |
| Vologda, OOO "AUTOSERVISKOMPLEKT" | (8172) 74-78-89 | | + |
| Volgograd, Volgograd district department VOA | (8442) 28-96-60, 28-96-58 | + | + |
| Volgograd, IP Kuznetsova E.V. | (8442) 36-84-63, 28-96-58 | | + |
| Vladivostok, OOO "TECHNOTEST" | (4232) 26-12-12, 228-753 | + | + |
| Vladikavkaz, RTS BDD SOO "AIRos+" | (8672) 53-03-94ф, 44-24-17 | + | + |
| Georgievsk, MP "GEOEK" | (87951) 6-00-53, 6-13-30 | | |
| Ekaterinburg, OOO "SERVISNY CENTER Ormet" | (343) 216-96-36,331-99-87,228-37-83 | + | + |
| Ekaterinburg, ZAO "S.AUTO.-Oborudovaniye" | (343) 339-09-41, 370-21-97 | | + |
| Ekaterinburg, MO "Otdel Meditsinsky Tekhniki" | (343) 231-80-00, 231-80-10 | | + |
| Ekaterinburg, GUC SO POP "Medtechnika" | (343)341-02-43, 341-05-90, 341-02-40 | | + |
| Ivanovo, OOO "CHEKA" | (4932)49-17-29, 34-40-20 | + | + |
| Izhevsk, OOO "Techkontrol" | (3412) 50-70-47, 50-66-24, 50-50-84 | | + |
| Irkutsk, OOO "TS DA" | (3952) 44-59-74, 44-59-55, 44-61-35 | + | + |
| Kazan, OOO "TechnorossT" | (843) 570-63-73, 570-63-66 | + | + |
| Kazan, OOO "Technorosst" | (843) 275-83-10, 229-88-72 | | + |
| Kaliningrad, OOO "Profinstrument" | (4012) 65-00-61 | | + |
| Kaliningrad, Meta-Kaliningrad | (4012) 76-45-48 | | + |
| Kemerovo, OOO "Balans-Plus" | (3842) 53-98-95, 36-65-12 | | + |
| Kiev, OOO "SKIF LTD" | +38 (044) 456-38-74, 483-35-31 | + | + |
| Kiev, Signal 2000 | +38 (044)221-02-50, 507-26-00 | | + |
| Kishinev, Firma "BERUF AUTO" | +373 (22) 888-159, 888-158 | | + |
| Krasnodar, OOO "TS BDD" | (8612) 263-02-15 | + | + |
| Krasnoyarsk, OOO "EMAN" | (391) 233-98-66, 233-98-69 | + | + |
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| Kursk, OOO "VVP-Servis" | (47122) 4-15-63 | | + |
| Kursk, FGU "Kursky SCM" | (47122) 53-67-74 | + | + |
| Lipetsk, Automechanic | (4742) 41-39-65, 41-06--85 | | + |
| Lvov, CP "Zapadpribor" | +38-050-370-90-07, +38-032-243-09-31 | | |
| Magnitogorsk, OOO "Podemnik" | (3519) 24-54-08, 24-90-75 | + | + |
| Maloyaroslavets Kaluzhskaya district, MOPAZ | (48431)2-68-90 | | + |
| Minsk, OOO "Evromechanika" | +375(17)235-32-33 | | + |
| Minsk, MOP VTI | +375(17)203-30-09 | | + |
| Minsk, UP "RENITS" | +375(17)232-60-74 | | + |
| Minsk, OOO "Belovol" | +375(17)284-19-59, 284-20-65 | | + |
| Minsk, Ekotechnergoservis | +375(17)262-90-99 | + | + |
| Moscow, GARO | (495)258-81-36/37/38/22 | | |
| Moscow, ZAO Grantek-m | (495) 700-71-02 700-71-04 | | + |
| Moscow, Transtechservis | (495)744-0624, 350-0170 | | + |
| Moscow, Arteg | (495) 287-48-04 | | + |

| | | | |
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| Moscow, Spetsdrevtechnika | (499) 265-56-79, 261-22-78 | | + |
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| Moscow, US Besopasnost | (495) 368-01-80 | | + |
| Moscow, Remgaro | (499) 618-09-1 | | + |
| Moscow, OOO "Trans DK" | (495) 4966688, ф.4969383 | | + |
| Moscow, TechServisSnab | | | |
| Moscow, Fors | (495) 709-88-03, 709-86-67 | | + |
| Naberezhnye Chelny, OOO "EKOSTANDART" | (8552) 58-71-83 | + | + |
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| Nizhny Novgorod, Autodomservis | (831) 432-57-11, 432-57-23 | | + |
| Nizhny Novgorod, Autotechstandart | (831) 438-43-21, 438-45-98 | | + |
| Nizhny Novgorod, OOO "EKARS" | (8312) 77-68-00, 77-98-86 | | + |
| Nizhny Novgorod, OOO "TESA" | (831) 413-55-44, 293-66-07 | | + |
| Nizhny Novgorod, OOO "TFK Medtechnika" | (831) 245-77-08, 240-30-91 | + | + |
| Orel, OOO "Orlovsky TS BDD" | (4862) 76-39-42 | + | + |
| Orenburg, OOO "Orenburgsky TS BDD" | (3532) 77-10-60 | | + |
| Orenburg, GUP OPTF "Medtechnika" (3532) | 52-15-65, 52-06-89 | | + |
| Omsk, OOO PKF "Autoformat B" | (3812)46-78-88, 90-71-57, 90-84-63 | | |
| Omsk, OOO NPO "Kompaniya SIVIK" | (3812) 55-33-37, 58-56-76 | | + |
| Omsk, OOO PKF "OMAS" | (3812) 53-85-52, 57-71-80 | | + |
| Perm, OOO PTI "PermAutoTech" | (3422)60-26-60, 60-25-73 | | + |
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| Pskov, FGU "Pskovsky SCM" | (8112)16-36-51, 16-80-24 | + | + |
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| Samara, OOO "META-SERVIS Plus" | (846) 932-49-78, 932-49-77 | + | + |
| Samara, OOO "Technostil" | (846) 268-10-86, 269-95-00 | | + |
| Saint Petersburg, "STORM-Rempribor" | (812) 552-23-03, 552-84-40 | | + |
| Saint Petersburg, Promkhimservis | (812) 702-19-99 | | + |
| Saint Petersburg, ZAO "Koncertn Promsnabkomplekt" | (812) 3278601, 5161341, 5160956 | | + |
| Saint Petersburg, "Atlet-SPB" | (812) 448-12-26 | | + |
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| Sochi, OOO "Veteran MVD" | (8622) 40-25-60, 45-14-26 | | + |
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| Togliatti, OAO "Lada Spetsoborudovaniye" | (8482) 63-82-28, 63-83-25, 63-83-18 | + | + |
| Togliatti, NTS "META" | (8482) 37-64-65 | | + |
| Tumen, OOO "MB Autoride" | (3452) 34-27-22, 34-27-21, 43-47-81 | | + |
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| Ufa, OOO PKP "Devona" | (3472) 77-78-00, 77-78-63 | | + |
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| Chelyabinsk, IP Kubaytsev I.V. | (351) 791-74-65 | + | + |
| Chelyabinsk, OOO "OMG" | (351) 211-29-34, 211-29-49 | | + |
| Chelyabinsk, OOO "TS BDD" | (3852) 34-63-88, 34-47-05 | | + |
| Cheboksary, OOO "Elektronnyt systemy bezopasnosti" | (3852) 40-40-90, 67-66-17 | | + |
| Cheboksary, OOO "SLUZHBA SERVISNOVO OBSLUZHI-VANIYA" | (8352) 51-41-91 | | + |
| Yaroslavl, ZAO "Magistral-Kontrol" | (4852) 58-01-78, 58-66-36 | + | |
| Yaroslavl, Techauto | (4852) 74-77-11 | | + |

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