

Battery Tester & Printer

TBT0900

Instruction Manual



INSTRUCTIONS FOR USE

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OPERATION MANUAL AND INSTRUCTIONS FOR DIGITAL BATTERY TESTER, 12V, AND STARTING/CHARGING SYSTEM ANALYZER, 12-24V, MANUFACTURED BY:

 CAUTION	
	IMPORTANT! READ THIS MANUAL CAREFULLY BEFORE USING THE BATTERY TESTER. FAILURE TO COMPLY WITH THE SAFETY STANDARDS AND OPERATING INSTRUCTIONS MAY RESULT IN SERIOUS INJURY.

Store the safety instructions with care and hand them over to the users.

PURPOSE OF USE

The digital battery tester can be used for the following purposes:

- analyzing motor vehicle batteries and electrical systems;
- use on 12V lead batteries, for 12V or 24V systems on motor vehicles;
- performing battery, grounding, starter and alternator tests.

The digital battery tester must not be used for the following operations:

- use on any batteries other than 12V/24V batteries;
- use outside the technical specifications contained in the TECHNICAL DATA table;
- use in humid or wet environments, or in bad weather;
- use for any applications other than stated ones.

WORK AREA SAFETY

 Do not operate the battery tester in environments containing potentially explosive atmospheres or inflammable materials, because sparks may be generated, which can ignite the dust or fumes.

 Keep children and bystanders away from your workplace while operating the battery tester. Distractions from other people can cause you to lose control over the battery tester during use.

 Do not inhale any harmful gases that may be released by the motor vehicle battery while working on the engine.

 During connection operations, keep your face away from the motor vehicle battery. The battery contains corrosive liquid; in the event of accidental contact with your skin or eyes, rinse immediately with water and seek medical advice.

 Do not drop any metal tools on the motor vehicle battery: it may short-circuit.

 Use the battery tester in a dry area, avoiding humidity.

BATTERY TESTER SAFETY

- Before use, check that the battery tester has not been damaged, and that there are no uncovered cables or worn parts.
- Do not use the battery tester when damaged, to avoid the risk of electric shocks; do not try to open or modify it.
- Periodically check the battery tester, the power supply cable and the clamps.

- Do not cover the battery tester when using it. Allow adequate space for ventilation.
- Do not use the battery tester in humid or wet environments; do not expose it to rain. Wet and contaminated environments increase the risk of electric shocks.

PERSONNEL SAFETY

Stay alert; watch what you are doing. Do not use the battery tester while tired or under the influence of drugs, alcohol, or medications.

Always use the following personal protective equipment:

- safety shoes;
- eye protection;
- protective gloves against physical agents.
- Use the battery tester in well-aired, dry rooms.
- Check that the cables of the battery tester are kept away from fans, moving parts and the fuel pipe.
- Do not wear loose clothing, jewellery or metal objects when working on the motor vehicle.
- Clean the battery terminals, preventing corrosive agents from coming into contact with your skin or eyes.

BATTERY TESTER USE AND CARE

- Do not put any objects into any slots or openings on the surface of the battery tester.
- Do not use the battery tester if the case, the clamps, the cables or the power supply cable have been damaged, if it gives off unusual smells or too much heat.
- Do not modify the battery tester. This can reduce the effectiveness of safety measures and increase operator risk.
- Have the battery tester repaired only through a trained repair person and only using original replacement parts.
- Do not operate the battery tester with any voltages other than those stated in the TECHNICAL DATA table.
- If the battery is not a maintenance-free sealed battery, add distilled water into each cell, until the acid battery reaches such level as stated by the manufacturer. Do not exceed the recommended level.
- Remove the battery – if need be – from the motor vehicle, to perform the tests; always remove the earth terminal of the motor vehicle first. Before carrying out each operation, check that all the accessories of the motor vehicle are off, to prevent electric arcs.
- To clean the battery tester, use a dry cloth. Always disconnect the battery tester from the power supply mains. Never use damp or wet cloths.

PERSONAL PROTECTIVE EQUIPMENT TO WEAR WHILE OPERATING BATTERY TESTER



Failure to observe the following warnings may result in physical injury and/or disease.

	ALWAYS WEAR SAFETY SHOES
	ALWAYS WEAR EYE PROTECTION
	ALWAYS WEAR PROTECTIVE GLOVES AGAINST PHYSICAL AGENTS WHILE OPERATING BATTERY TESTER

 **Additional personal protective equipment to wear according to the values found in the environmental hygiene/risk analysis survey if the values exceed the limits under current regulations.**

TECHNICAL DATA

FOR USE WITH BATTERIES	12V
OPERATING VOLTAGE	9V ~ 36V DC (max)
CAR OPERATING RANGE (CCA)	100A ÷ 2000A
MOTORCYCLE OPERATING RANGE (CCA)	40A ÷ 600A
BATTERY TESTING TIME	<8 seconds
INTERNAL BATTERY CAPACITY	Stores up to 70 test results
OPERATING TEMPERATURE	0 °C ÷ + 50 °C
DIMENSIONS	180x135x45 mm
CLAMP CABLE LENGTH	1.6 m
WEIGHT	0.74 kg

SECURING PRINTER (OPTIONAL)

The unit can accommodate the printer (optional accessory), so that the results can be printed immediately after each test. To secure the mobile printer in position, first remove the cover from the tester back. Then fit in the printer, making it slide as far as its fixing point. Open the ticket compartment, and secure the printer by means of the supplied screw. Fit in the roll with the end part turned upwards. Make sure that the paper sticks out by at least 2 cm before closing the compartment.

SETTING UP TESTER

To set up the tester, move onto the item "Setup Menu", where you can select the following: "Language", "LCD Brightness", "Set date & time", "Company name" and "Erase Memory" (the last mentioned setting allows all the stored tests to be erased). Use the ▼ ▲ keys to select the item to set, and press "Enter" to get into the individual sections. Use the ▼ ▲ ◀ ▶ keys to input the data, and press "Enter" to confirm selection.

NEW TEST – CONTINUE TEST – INTERNAL MEMORY

Whenever a new test needs to be started, press ▼ ▲ to move onto the item "New Test", and press "Enter". A new set of tests can then be started on the motor vehicle (battery, grounding, starter or alternator). Once a test (e.g. a battery test) has been completed, you can perform the other tests, or return to the initial menu; if you return to the initial menu, but want to continue the previously started test, use the ▼ ▲ keys to select the item "Continue Test...", and press "Enter". The tester will automatically bring you back to the screen that allows the type of test to be selected, and you will be able to continue with a different test on the motor vehicle, without losing the previously saved data. The tester is fitted with the internal memory, "Stored Results", which can record test data, so that they can be later input into the computer or checked without the test being performed again.

PRINTING TEST

Once the test has been completed, if the tester is equipped with a printer, test results can be printed by pressing the printer button after the test has been completed. If the tester is not equipped with a printer, follow the instructions contained in the last section.

12V BATTERY OPERATING AND USE INSTRUCTIONS

1. Before testing a battery in a motor vehicle, switch off the motor vehicle as well as all the accessories and loads. Close all the motor vehicle doors and the boot.

CAUTION: After switching off the motor vehicle engine, switch on the headlights, and leave them on for approximately 30 seconds, so that the battery surface charge can be removed.

CAUTION: On 24V systems, test 12V batteries individually.

NB: The screen will not show anything if the tester is not connected to the motor vehicle battery.

2. Make sure that the battery terminals are clean. Clean with a metal brush, if necessary. Clamp the red lead to the negative terminal on the motor vehicle battery. Clamp the red lead to the positive terminal on the motor vehicle battery.

Make sure that the tester clamps and the battery posts make good contact with each other, so that a correct test can be performed.

3. Press ▼ ▲ to select "New Test" or "Continue Test...". Press "Enter" to proceed.	New Test Continue Test...
4. Selecting "New Test" will allow the battery "Bar code" (through the reader*, optional accessory) and "Particulars" (e.g. customer's name) to be entered. * A "beep" will confirm that the code has been read. Press "Enter" to proceed.	Bar code: Particulars:
5. Select motor vehicle type: "Car" or "Motorcycle" Press "Enter" to proceed. Selecting "Motorcycle" will only allow the Battery Test to be performed.	Car Motorcycle
6. Press ▼ ▲ to select "Battery Test". Press "Enter" to confirm selection. CAUTION: If any battery surface charge is detected, the tester will remove it. If the battery surface charge is too high to be removed, the tester will prompt you to switch on the headlights to remove it.	Select Test ▲ ▼ Battery Test Grounding Test Starter Test Alternator Test
7. Press ▼ ▲ to select battery type: a. SLI [WET type] b. AGM-Flat plate c. AGM-Spiral wound d. Gel Cell e. EFB (Start/Stop) Press "Enter" to confirm selection.	Select Battery: SLI (Wet Type) AGM-Flat plate AGM-Spiral wound Gel Cell EFB [Start/Stop]
8. Press ▼ ▲ to select battery test ratings CCA/SAE,DIN,JIS,IEC,EN1,EN2, CA/MCA, Unknown Press "Enter" to confirm selection.	Select Rating ▼ ▲ CCA – SAE – DIN JIS – IEC – EN1 – EN2 – CA/MCA – Unknown
9. Press ◀ ▶ (step of 100) ▼ ▲ (step of 5), to enter battery surge current. Press "Enter" to start the test.	Input Battery Rating Increase/decrease: ▲ Single digit ▼ ◀ By hundredth ▶ xxx EN1
10. The test will take a few seconds.	Analysing... Please wait!

11. When the test is completed, the display will show the set surge current, measured surge current, voltage, internal resistance and the “life” of the battery. One of the following results will also be displayed:

<u>Battery: Good:</u> The battery is good and can hold the charge.	Battery: Good Rating: xxxA EN1 Measured: xxxA EN1 Volts: Int. R: x.xx mΩ Life: xx%
<u>Battery: Recharge</u> The battery is flat; the battery conditions cannot be determined correctly until the battery has been fully charged. Charge & retest battery.	Battery: Recharge Rating: xxxA EN1 Measured: xxxA EN1 Volts: xx.xx V Int. R: xx.xx mΩ Life: xx%
<u>Battery: To replace:</u> The battery will not hold the charge. It should be replaced immediately.	Battery: To replace Rating: xxxA EN1 Measured: xxxA EN1 Volts: xx.xx V Int. R: xx.xx mΩ Life: xx%

12. Press “EXIT” to return to step 3, or remove the test clamps from the battery posts to end the test.

GROUNDING SYSTEM TEST - “GROUNDING TEST”

1. Press ▼▲ to select the grounding system test, “Grounding Test”. Press “Enter” to confirm selection.	Select Test ▲▼ Battery Test Grounding Test Starter Test Alternator Test
2. The display will appear as follows. Clip the black clamp to the engine body or the car chassis and the red clamp to the battery [+] post Then press “Enter”.	Clip black clamp to engine body or car chassis and red clamp to positive battery post
3. The test will take a few seconds.	Analysing... Please wait!
4. When the test has been completed, transfer the black clamp from either the engine or the chassis of the motor vehicle to the battery negative post [-]. Take less than 15 seconds to complete this procedure, not to lose the recorded data (otherwise, repeat the test).	Now transfer black clamp to negative battery post
5. After the black clamp has been connected to the negative battery post [-], the display will appear as follows. Press “Enter” to proceed.	[Enter] to proceed
6. The test will take a few seconds.	Analysing... Please wait!
7. If the measured Ohms are within limits, the display will appear as follows.	Result: OK Xx,xx mOhm
8. If the measured Ohms are above limits, the display will appear as follows.	Result: High Ohms Xx,xx mOhm
9. If a wrong procedure was performed during the test, the display will appear as follows.	Result: Not detected Wrong procedures. Try again and follow given instructions step by step.

10. Premete "EXIT" per tornare al passo 3 o rimuovere le pinze di test dai poli della batteria per terminare il test.

START SYSTEM TEST - "STARTER TEST"

1. Clamp the black lead to the negative terminal of the motor vehicle battery. Clamp the red lead to the positive terminal of the motor vehicle battery.

2. Press ▼ ▲ to select "Starter Test". Press "Enter" to confirm selection.	Select Test ▲ ▼ Battery Test Grounding Test Starter Test Alternator Test
3. The following screen will appear: Battery: xxxV Crank the engine until it starts. Press "Enter" to proceed.	Battery: xx.xxV Crank engine until it starts

4. When the engine is started, one of the three results will be shown along with the reading of the measured voltage.

Result: OK The system shows normal Starting Voltage. Press "EXIT" and "Alternator Test" to test the charging system.	Result: OK Min. Volts: xx.xxV Volt Drop: Normal
Result: Abrupt Voltage Drop The starting voltage is below normal limits; find the starter motor fault following the manufacturer's recommended instructions.	Result: High Voltage Drop Min. Volts: xx.xxV Volt Drop: High Check starter relay, battery terminals or battery age.
Result: Not Detected The starting voltage was not detected.	Result: Not detected No change in volt drop. Check clamping at battery and test again.

ALTERNATOR TEST" WITH ELECTRIC LOADS OFF

1. If the starting voltage is normal, press "EXIT" and "Alternator Test" to perform the charge system test. Select alternator type: "Normal" or "Smart". Switch off all the accessories of the motor vehicle being tested, including lights, air conditioner and radio, before starting the engine.	Select Test ▲ ▼ Battery Test Grounding Test Starter Test Alternator Test
2. Press "Enter" to view the following screen: Start the engine and keep it running. Press "Enter" to proceed.	Start engine and keep it running. [Enter] to proceed
3. The following screen will appear: Press "Enter" to proceed. Rev the engine up to 3,000 rpm for 10 seconds; then press "Enter" again to view the results.	Make sure all electrical loads are turned off. Rev engine up to 3,000 rpm Press [Enter]. Hold on to 3,000 rpm for 10 seconds, then release pedal.
4. The following screen will appear:	At 3,000 rpm: Average Volts: xx,xV Max. < xx,xV: xx,xV Min. > xx,xV: xx,xV

5. Press “Enter” again; one of the three results will be displayed along with the current measured reading.

Result: <u>Good</u> No problems have been detected; the system is working correctly. Press “Enter” to continue the test on load:	Results: Good At 3,000 rpm, Loadless Test: Average Charging Volts Volts: xx,xV
Result: <u>State of charge is high!</u> The output voltage from the alternator to the battery exceeds normal operating limits. Make sure that there are no loose connections and that the grounding conditions are good. If all the connections are flawless, replace the regulator. As alternators usually have built-in regulators, replace the alternator. The normal voltage limit of a typical car regulator is 14.6 volts +/- 0.05. Check the correct operating limit in the manufacturer’s specifications.	Result: Volts is high At 3,000 rpm, Loadless Test: Max. < xx,xV: xx,xV Check alternator and regulator.
Result: <u>State of charge is low!</u> The alternator is not supplying enough voltage to the battery. Check the belts and make sure that the alternator is rotating with the engine running. If the belts slip or are broken, replace them and repeat the test. Check the connections from the alternator to the battery. If connection is loose or corroded, clean or replace the cable, and test again. If the belts and connections are in good condition, replace the alternator.	Result: Volts is low at 3,000 rpm, Loadless Test: Min > xx,xV : xx,xV Check for loose belt; check alternator.

“ALTERNATOR TEST” WITH ELECTRIC LOADS ON

1. Press “Enter” to perform the alternator TEST on load: switch on the heating, main-beam headlamps, rear demister. Do not use cyclic loads, such as air conditioning or windscreen wipers.

2. The following screen will appear: Press “Enter” to proceed. Rev the engine up to 2,000 rpm for 10 seconds; then press “Enter” again to view the results.	Switch on all electric loads. Rev engine up to 2,000 rpm. Press [Enter]. Hold on to 2,000 rpm for 10 seconds, then release pedal
3. The following screen will appear:	At 2,000 rpm: Average Volts: xx,xV Max. < xx,xV: xx,xV Min. > xx,xV: xx,xV

4. Press “Enter” to continue testing the system with the accessories on load. One of the following three results will be displayed, along with the current measured reading.

Result: Good No problems have been detected; the system is working correctly.	Results: Good At 2,000 rpm: Test on Load: Average charge Volts: xx,xV
Result: High Charge The voltage output from the alternator to the battery exceeds normal operating limits. Make sure that there are no loose connections and that the grounding conditions are good. If all the connections are flawless, replace the regulator. As alternators usually have built-in regulators, replace the alternator. Check the correct operating limit in the manufacturer’s specifications.	Result: High Charge At 2,000 rpm, Test on Load: Max. < xx,xV: xx,xV Check for loose belt and alternator.
Result: Low Charge The alternator is not supplying enough voltage to the electric system and the battery. Check the belts and make sure that the alternator is rotating with the engine running. If the belts slip or are broken, replace them and repeat the test. Check the connections from the alternator to the battery. If the connection is loose or heavily corroded, clean or replace the cable and test again. If the belts and the connections are in good condition, replace the alternator.	Result: Low Charge At 2,000 rpm, Test on Load: Min > xx,xV : xx,xV Check for loose belt; check alternator.

DIODE “RIPPLE” TEST

1. Press “Enter” to perform the diode ripple test on load: idle the engine and switch on loads. (This test determines ripple amplitude from the charging system to the battery).

2. The following screen will appear: Idle the engine; switch on all the electric loads. Press [Enter].	Idle engine. Switch on all electric loads. Press [Enter]
3. The following screen will appear:	Diode Ripple Test with idling engine Analysing... Please wait!

4. One of the following results will be displayed, along with the current measured reading.

Result: Ripple OK. Diodes are working correctly.	Result: OK AC Ripple Test Idling engine: Max. <x.xV: x,xxV Ripple OK [Exit] to menu and alternator.
Result: High Ripple One or more diodes in the alternator are not working, or the stator has been damaged. Check that the installed alternator is firm and that the belts are in good condition and are working correctly.	Result: High Ripple AC Ripple Test Idling engine: Max. <x.xV: x,xxV High Ripple Check diodes

DRIVER INSTALLATION

IMPORTANT!!

Before the drivers are installed, the tester should not be connected to the computer through the USB port; otherwise, installation will fail, and no results will be shown when the tester is connected.

• Le chargeur de batterie est destiné à la recharge de batteries au plomb acide et pour la technologie des (12V) batteries Lithium-ion LiFePO4. Ne pas l'utiliser pour d'autres destinations. Ne pas charger de batteries de type non rechargeables. Ne pas charger les batteries congelées.

connected through the USB port.

The drivers are installed through the CD supplied with the tester case.

Follow the various installation steps; when these are completed, you will be able to launch the programme.

Before launching the software, connect the tester to the USB port of your PC.

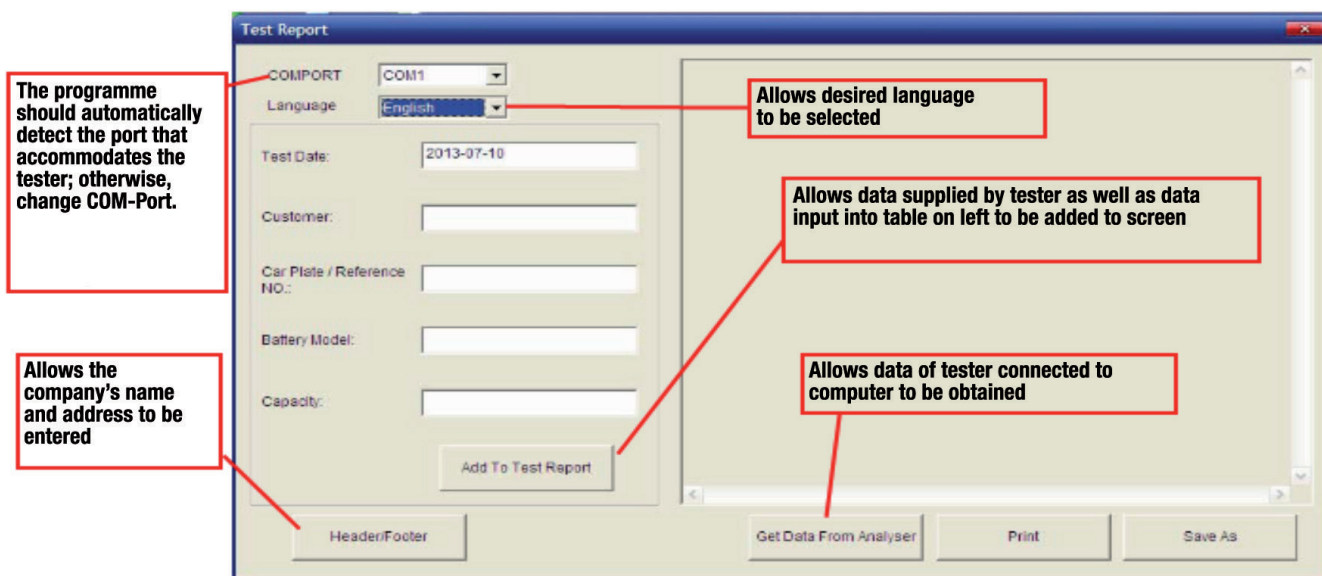
When the tester has been connected, double click the icon of the programme and open it.

Now select the stored test you would like to download:

- Select “Stored Results” from the tester menu;
- Chose the required test;
- Press “Enter”. **Caution: do not press “Enter” again. Otherwise, the result of the test will not be shown on the PC; it will only be shown on the tester**

Now you can download the required data by clicking the item “Obtain data from analyser”.

All the data about the selected test will be automatically shown, and you can enter other data, and save or print the test



NB: The Test Report programme runs on computers with Windows XP, Vista, 7, 8, 9.1 or 10. To allow the feature of the programme, "Save as", to operate properly, the PC where the programme has been installed must have the complete version of Microsoft Word 2003 or a later version.

MAINTENANCE

When not in use, the device must be stored in a dry place to avoid exposure to humidity. To clean the outer body, disconnect the device and clean with a soft cloth.

Maintenance and repair jobs must be carried out by trained personnel. For such jobs, you can contact Beta Utensili S.P.A.'s repair centre.

USER INFORMATION

GEL BATTERIES

A gel battery is a lead calcium battery with positive and negative plates immersed in a gelatinous solution. It is hermetically sealed and requires no maintenance. These batteries are usually used in intense conditions. Their strength makes them particularly suited for motorcycles, off-road vehicles, operating machinery and boats.

STANDARD LIQUID/WET BATTERIES

A standard liquid/wet battery is a lead battery with positive and negative plates immersed in a water and sulphuric acid solution. They may be sealed or fitted with caps for maintenance. This is the most commonly used battery in the car industry.

EFB BATTERIES (also known as AFB or ECM batteries)

An enhanced flooded battery (EFB) is an advanced lead battery with positive and negative plates immersed in a water and sulphuric acid solution with special additives (e.g. carbon) and envelope separators. They are usually sealed batteries. This type of battery is the most commonly used in the low-end Start & Stop car industry.

Their benefits compared to conventional flooded batteries include increased deep-cycling performance.

AGM SPIRAL BATTERIES

Gas recombination batteries (AGM) are continuous band batteries in which the same plate, electrolyte solution and silicon and polymeric fibre separators are rolled in a spiral. They are maintenance-free, with a high starting surge designed specifically for extreme and heavy-duty conditions. They can withstand deep charge-discharge cycles.

AGM FLAT PLATE BATTERIES

FLAT PLATE gas recombination batteries (AGM) are sealed batteries using a VRLA pressure-control system. The electrolyte solution is generally held by fibreglass separators placed between the plates. These high-performance, maintenance-free batteries are ideal for deep cycling, high loading and working in partial states of charge. These batteries are suited to latest-generation Start & Stop systems.

DISPOSAL

The crossed-out wheellie bin symbol on the equipment or packaging means that the product should be collected separately from other types of urban waste at the end of its useful life.

Any user who is going to dispose of this tool can:

- deliver it to an appropriate collection facility for electronic or electrotechnical equipment;
- return it to the dealer upon purchase of a new, equivalent item of equipment;
- in case of a product for professional use only, contact the manufacturer which will arrange for the product to be properly disposed of.

Proper disposal of this product allows the raw materials contained in it to be reused and prevents damage to the environment or human health.

Illegal disposal of this product is a violation of the provision concerning the disposal of hazardous waste and will give way to the application of such fines as provided for under current regulations.



WARRANTY

This tool is manufactured and tested in accordance with current EU regulations. It is covered by a 12-month warranty for professional use or a 24-month warranty for nonprofessional use.

We will repair any breakdowns caused by material or manufacturing defects by fixing the defective pieces or replacing them at our discretion.

Should assistance be required once or several times during the warranty period, the expiry date of this warranty will remain unchanged.

This warranty will not cover defects due to wear, misuse or breakdowns caused by blows and/or falls.

In addition, this warranty will no longer be valid if any changes are made, or if the tool is damaged or sent to the customer service in pieces.

This warranty explicitly excludes any damage to people and/or things, whether direct or consequential.

EU DECLARATION OF CONFORMITY

We hereby declare, assuming full responsibility, that the described product complies with all the relevant provisions of the following Directives:

- Electromagnetic Compatibility Directive (EMC) 2014/30/EU;
- Directive concerning the restriction of the use of certain hazardous substances in electric and electronic equipment (RoHS) 2011/65/EU.