

# Gas Analyser AT 505

software version 1.11 onwards

## USER'S MANUAL



Last updated: April 26. 2023  
The right is reserved to change the Manual

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### 1. INTRODUCTION

- The gas analyser is a PC based four (plus optional NOx) gas analyser.
- The gas analyser is intended for the maintenance and inspection of spark ignition engines.
- Gas data is transmitted from the gas analyser to the PC (or Laptop) for processing and printing.
- The gas analyser is part of the modular Multi-Diag system.

### 2. SAFETY PRECAUTIONS

- a) The apparatus meets requirements for operation according to the EN 61010-1.
- b) The device shall be powered using only the power supply provided.
- c) Removing covers from the apparatus is not allowed, as this would cause an electric shock risk.
- d) **The device must be operated higher than the withdrawal probe inlet** due to the risk of the analyser becoming filled with a large quantity of water, coming from condensate in the exhaust system.
- e) **The device is intended for operation in the vertical position only. It should in no case be tilted even when switched off.** The reason is the danger that moisture condensed within the rough filter F1 can flood the sensitive elements within the analyser.
- f) For emission control working sites and for service working sites, relevant safety regulations should be applied. The operator must organise appropriate safety training courses for service staff of the measuring apparatus. This can include training for working on vehicles while the engine is running.

Therefore, safety precautions must be observed according to the manufacturers of the car and of the engine, that are valid for testing the engine while it is running. Sufficient ventilation must be provided for exhaust fumes and outlet gases from the analyser.

- g) **The device should be protected against ambient water in any form** (rain, sprayed water, etc.)

### 3. WASTE DISPOSAL

#### A NOTE ABOUT RECYCLING:

This product's packaging materials are recyclable and can be reused. Please dispose of any materials in accordance with the local recycling regulations.

When discarding the unit, comply with local rules or regulations.

Batteries should never be thrown away or incinerated, but disposed of in accordance with the local regulations concerning chemical waste.

This product and the accessories packed together constitute the applicable product according to the WEEE directive, except batteries.



### 4. DESCRIPTION OF APPARATUS

The exhaust gas analyser is intended for the testing of exhaust gas emissions from spark ignition engines

The AT505 gas analyser is approved for Car and Light Commercial Vehicle Testing. This includes vehicles in the following classes:

- Class III - 3 wheeled vehicles not more than 450 kg unladen weight (excluding motor bicycles with side cars).
- Class IV - Cars, including 3 wheeled vehicles more than 450 kg unladen weight, Taxis, Minibuses and Ambulances up to 12 passenger seats, Goods Vehicles not exceeding to 3000 kg Design Gross Weight (DGW), Motor Caravans and Dual Purpose Vehicles.
- Class VII - Goods Vehicles over 3000 kg up to and including 3500 kg DGW. If a vehicle is presented with a manufacturer's plate and a 'Ministry plate' the weights to be used are those on the 'Ministry plate'.
- More detailed definitions are given in the MoT Testing Guide provided by the Vehicle & Operator Services Agency (VOSA).

The gas analyser is a four-part (optional five-part) analyser of exhaust gases, to be used for measurement and adjustment of petrol, LPG, and CNG engines, and for controlling emissions of those engines according to relevant national regulations. It can measure HC, CO, CO<sub>2</sub>, O<sub>2</sub>, and NO<sub>x</sub> concentrations, and calculate CO<sub>cor</sub> and the coefficient of air redundancy  $\lambda$  from those values. Furthermore, it measures engine speed and oil temperature for use during statutory MoT test procedures. The measured data can be printed by the printer as partial measurements or as an MoT test certificate.

Mechanical construction is described in Chap. I - 5.

### 4.1 FRONT PANEL

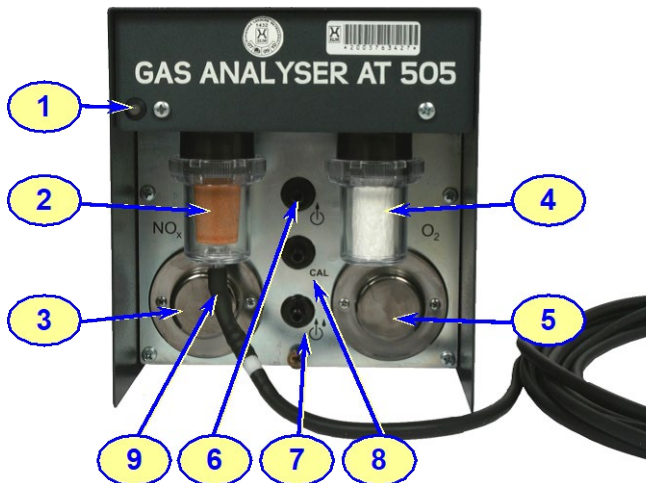
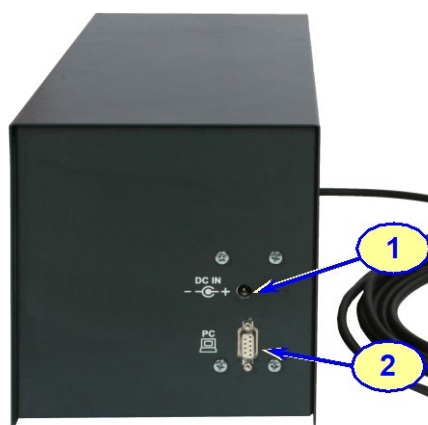


Fig. 1 – View of the front panel of the Gas Analyser

- 1 - Status LED:
  - OFF = the power supply is not connected, or the Gas Analyser AT505 software on the PC is not running and communicating with the Analyser.
  - Red = the power supply is connected, but the communication cable is not connected to the PC or the PC is not switched on
  - Orange = the analyser is ON, but inactive, heating up may be in process or it may be indicating a fault
  - Green = the analyser is ready to use
- 2 - Coarse filter (F1)
- 3 - Nitrogen sensor (NO<sub>x</sub>) (optional)
- 4 - Fine filter (F2)
- 5 - Oxygen sensor (O<sub>2</sub>)
- 6 - Exhaust gas outlet
- 7 - Condensate outlet
- 8 - Calibration gas inlet
- 9 - Exhaust gas intake



### 4.2 BACK PANEL



- 1 - Connector (Jack) for the power supply plug
- 2 - Connector for the computer serial cable

Fig. 2 – View of the back panel of the Gas Analyser

## 5. CONSTRUCTION OF APPARATUS

### 5.1 MECHANICAL PART

The device frame is fabricated from steel with a zinc finish, and is coated with a two-compound acrylic paint. The device case is also fabricated from steel with a zinc protective finish, and sprayed with a wear resistant powder coated paint. The exhaust probe is made of stainless-steel flexible hose.

### 5.2 ELECTRONIC PART

The internal electronic system and all clamps, connectors and sensors accessible from the outside are galvanically isolated, any voltages on them do not exceeding safe levels. The electronics consist of a printed circuit board, the electronic system of the optical testing bench, and the fan. In the case of the extended version including engine speed and engine temperature measurement, an additional circuit board is included for these sensors.

### 5.3 PNEUMATIC PART

This consists of a double membrane pump with two pumping channels. The **P1** channel pumps the exhaust gas to be measured from the exhaust probe to the optical bench and oxygen sensor (or nitrogen sensor NOx), and the **P2** channel continually empties condensate from the rough filter **F1**.

The solenoid enables zeroing of the measuring apparatus by switching from the exhaust probe to the zero setting inlet (which draws in surrounding air). The zero setting inlet includes an active carbon filter **F4**, which decreases hydrocarbons which may be present in the surrounding air.

The gas sample measured is subject to double filtration before entry to the optical bench. The first filtration stage is through a rough filter **F1**, which is made from sintered bronze grain. The second filtration stage is the fine filter **F2**, which is made from paper. Inside the apparatus there is safety filter **F3** that protects the solenoid, optics of the measuring bench, and the oxygen sensor (or nitrogen sensor NOx) in case of incorrect fitting or failure of the external filters.

The apparatus is also equipped with a calibration inlet **CAL**, which is used for the connection of the calibration gas. The pneumatics include a vacuum switch, which is used for indication of decreased flow through the exhaust probe from taking in water or blockage, this is also used for the probe leakage test.

The device is equipped with automatic compensation for ambient air pressure.

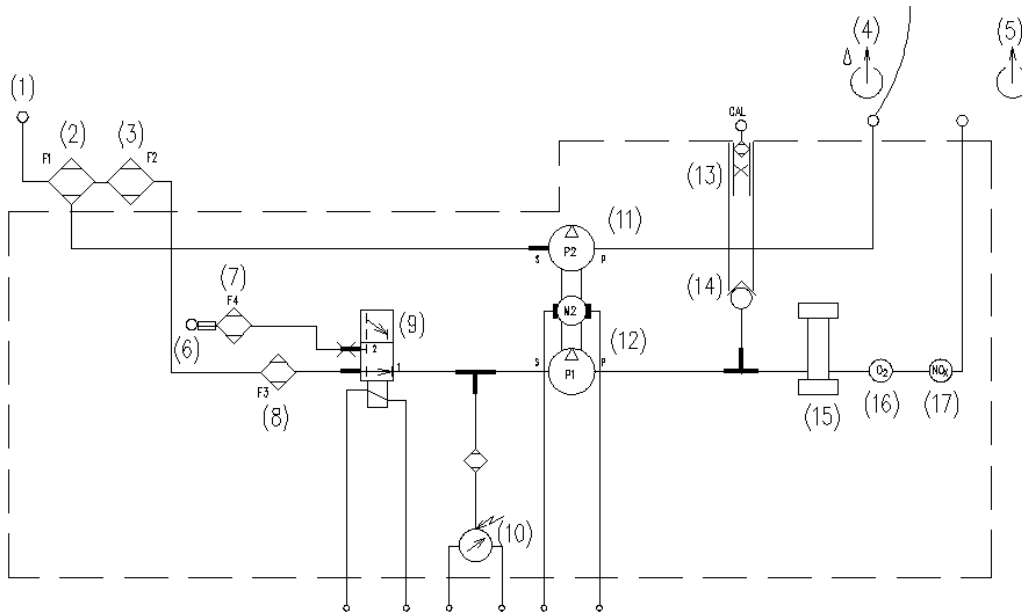


Fig. 3 – Scheme of pneumatic part

- |                                 |   |
|---------------------------------|---|
| 1- Exhaust gas intake           | 10- Vacuum switch   |
| 2- Coarse filter (F1)           | 11- Condensate pump (P2)  |
| 3- Fine filter (F2)             | 12- Main pump (P1) – measured gas   |
| 4- Condensate drain outlet      | 13- Pressure reduction – inlet of calibration gas with pressure reduction |
| 5- Exhaust gas outlet           | 14- Check valve   |
| 6- Air intake (for zeroing)     | 15- Optical bench   |
| 7- Activated carbon filter (F4) | 16- Oxygen sensor (O <sub>2</sub> )                                       |
| 8- Fine safety filter (F3)      | 17- Nitrogen sensor NO <sub>x</sub> (optional)                            |
| 9- Solenoid                     | cal- Calibration inlet  |

## 6. MEASURING PRINCIPLE

The measuring principle for CO, HC, CO<sub>2</sub>, O<sub>2</sub>, and NO<sub>x</sub> complies to the requirements **OIML R 99 class 0**. In the case of CO, HC, and CO<sub>2</sub>, it is through non-disperse light attenuation measuring in an infra-red area (NDIR). Concentration of the three gases is measured in separate measuring cells. Signals obtained from the detectors are then compared with a reference signal. Results are compensated for temperature and barometric pressure changes.

O<sub>2</sub> and NO<sub>x</sub> concentration measurement is done with electro-chemical sensors. The service life of these sensors is limited, and depends on the duration and level of concentrations, particularly of HC and Pb (from lead petrol detergents), which they are exposed to. Normally the service life should be at least six months. The Gas Analyser automatically monitors the sensors and reports when have require renewal.

A diagram of lambda dependency of individual gas compounds in exhaust gases is shown in Fig. 4. The richness of the fuel mixture is expressed by air redundancy coefficient  $\lambda$ . This diagram illustrates model emission behaviour of a non-catalyst engine.

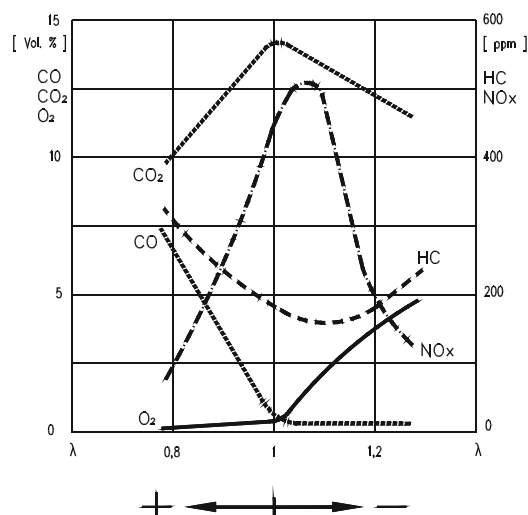


Fig. 4 – Diagram of dependency of concentrations of individual gas compounds in exhaust gases (+ rich mixture, - weak mixture)

## 7. SOFTWARE INSTALLATION

### 7.1 DESCRIPTION OF INSTALLATION CD

The included CD contains all the necessary software for the use of **Gas Analyser** system.

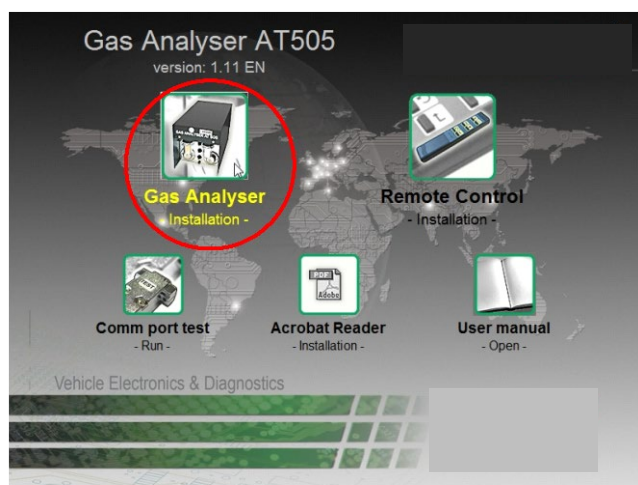
Insert the CD in your CD-ROM drive. If the CD does not run automatically, run the *autorun.exe* program which you will find on the CD.

### 7.2 INSTALLATION AND UNINSTALLATION (REMOVAL) OF THE GAS ANALYSER PROGRAM

#### 7.2.1 FIRST INSTALLATION

**If you install the program on a computer with Windows 2000 / XP / Vista operation system, log in as system administrator.**

Click on the menu item **Gas Analyser – Installation –** (see Fig. 5).



#### Note 1:

If the CD does not run automatically, run the **autorun.exe** program which you will find in the root directory on the CD.

The **Gas Analyser** program installation is intuitive – you should follow the Installation Wizard displayed on the PC screen.

#### Note 2:

The default language of the Wizard is English but it can correspond to your language version of Windows.

Fig. 5 – Menu for Gas Analyser installation (the picture of version 1.11 is for illustration, your version may be different.)

The following set of images comes from the installation wizard for the Windows XP operation system. The Windows Vista wizard is similar:

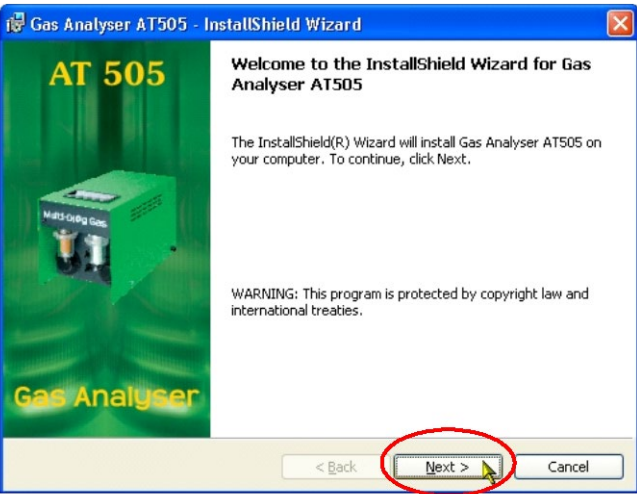
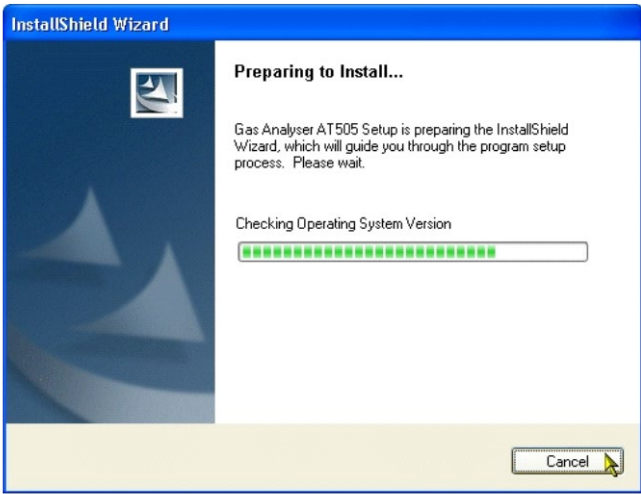
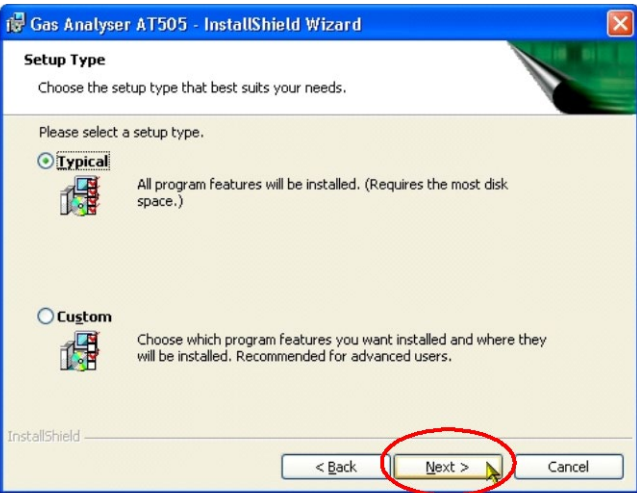
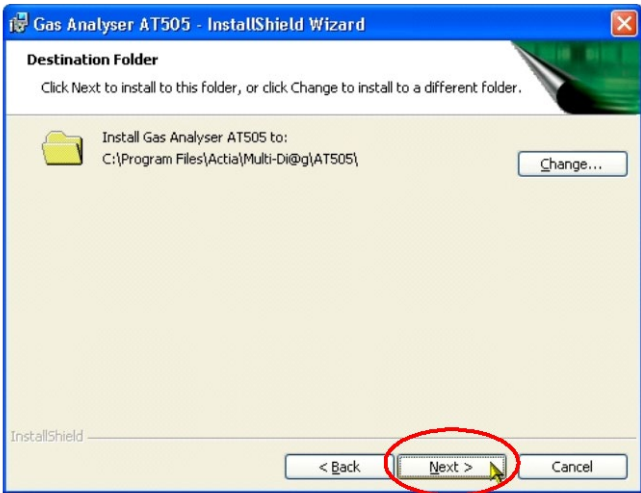
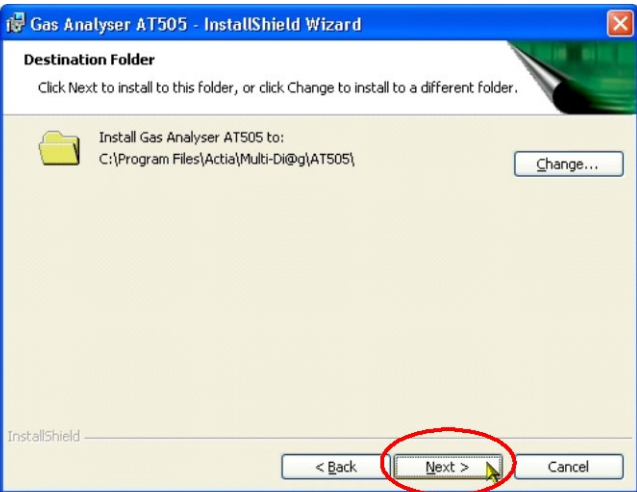
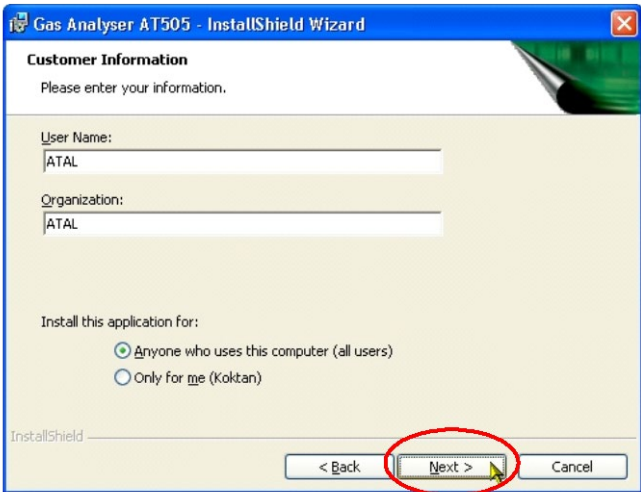
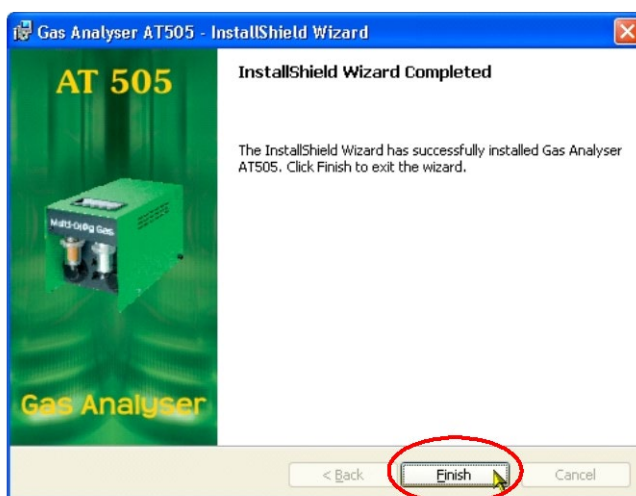
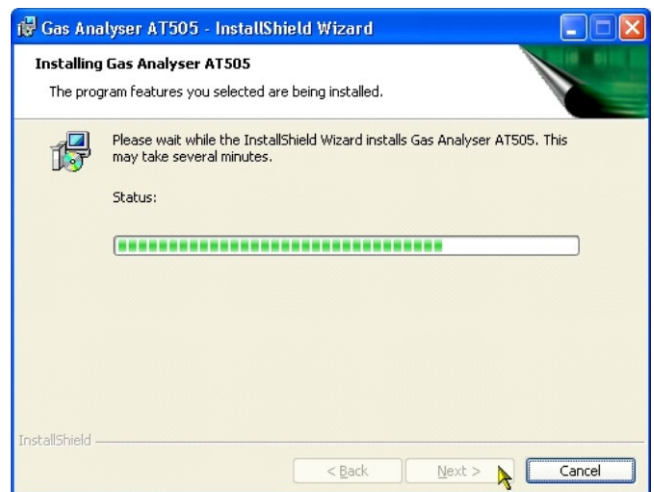
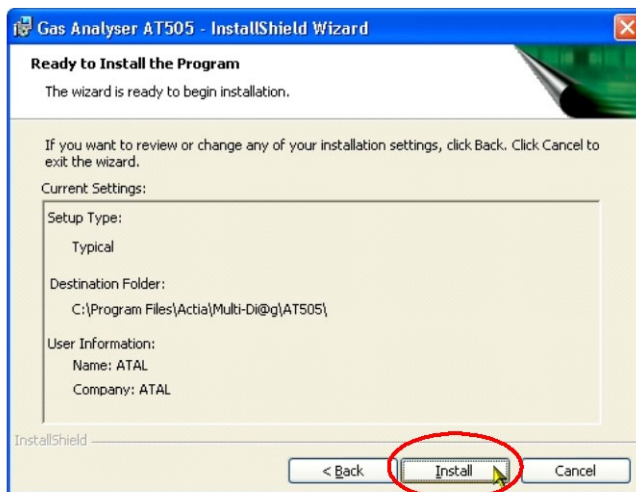


Fig. 6 – The installation can be interrupted at any time during the setup Fig. 7 – Click “Next” to proceed with the installation by clicking on “Cancel”





The installation may take several seconds. Click on "Finish" to complete the installation.

The installation of drivers for the RS232-USB converter starts after its completion (see Chap. I - 2)

Fig. 8 – Click on "Finish" to complete the installation

### 7.2.2 UNINSTALLATION (REMOVAL) OF THE GAS ANALYSER PROGRAM

#### Note:

The default language of the Wizard is English but it can correspond to your language version of Windows.

To uninstall the program open the installation dialog box. There are two ways of doing this:

- Click on Add or Remove Programs in the Control Panel. Then click on **"Remove"** (Fig. 9). Confirm this choice in the displayed dialog box (see Fig. 10) and the program will be removed promptly and without further warning.

#### Note:

Open the Add or Remove Programs by clicking **Start, Control Panel** and double-clicking **Add or Remove Programs**.



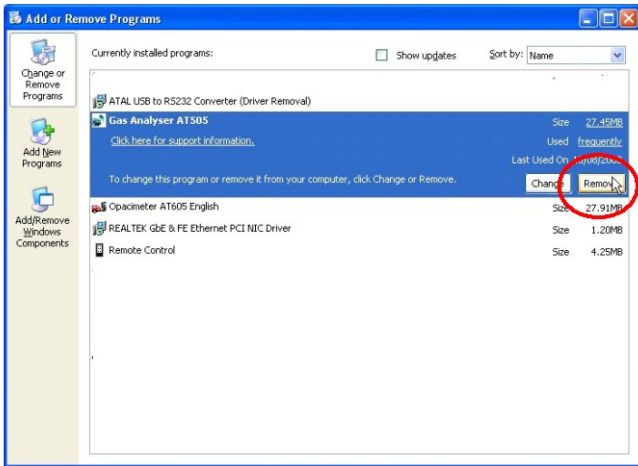


Fig. 9 – Removing Gas Analyser program by selecting the Add or Remove Programs in Control Panel

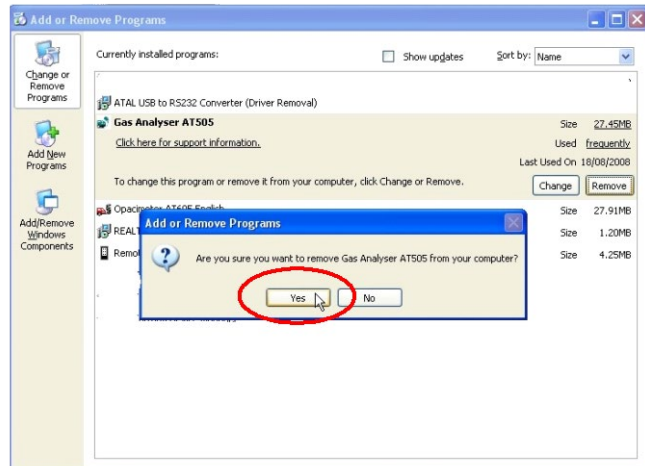


Fig. 10 – Confirm that you really want to remove the program

b) Click on the menu item **Gas Analyser – Installation –** see Fig. 5 (Autorun.exe on the installation CD must be launched). Then select **"Remove"** (Fig. 11). Confirm your choice in the displayed dialog box (Fig. 12) and the Installation Wizard (Fig. 13) will **immediately remove the program**.

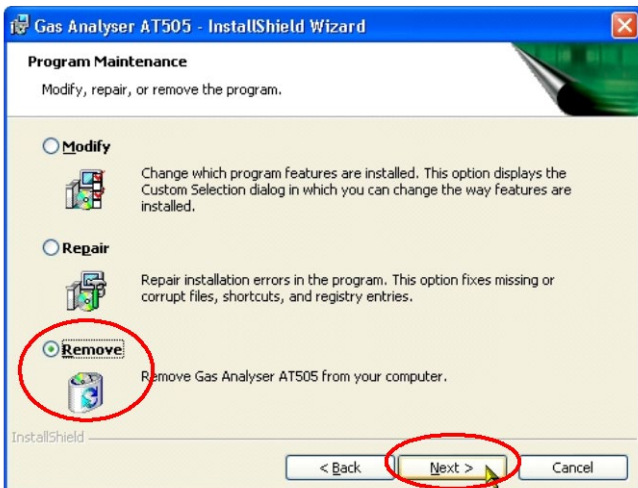


Fig. 11 – After you have clicked on "Remove" and confirmed your choice, the removal of the program will start

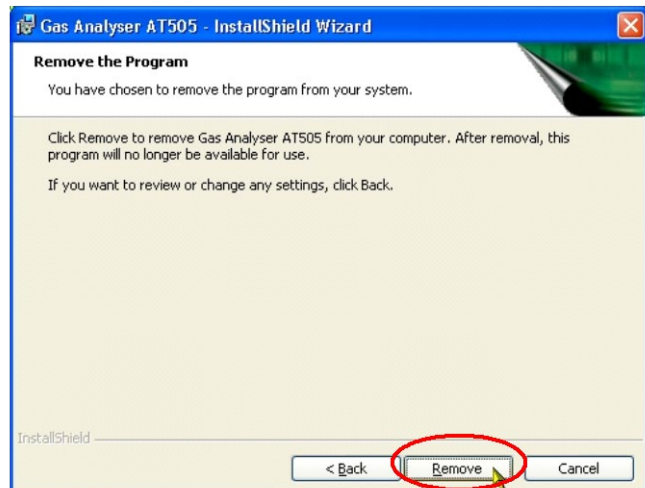


Fig. 12 – To proceed with the removal confirm that you really wish to remove the program

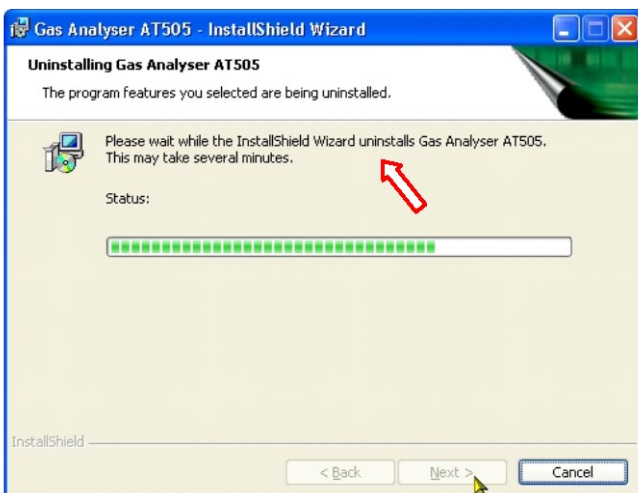
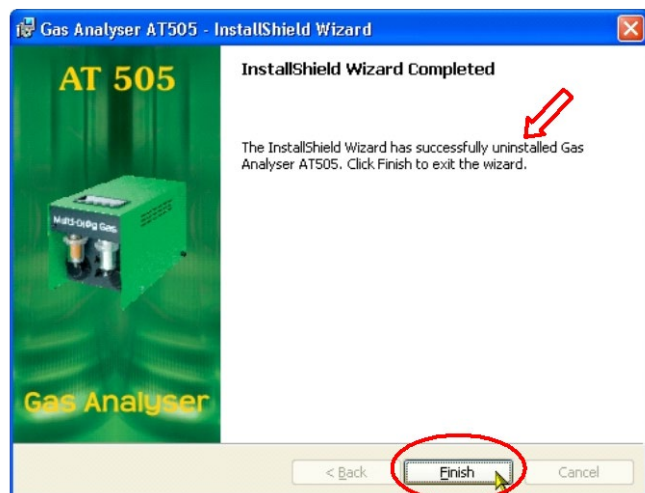


Fig. 13 – Removal may take several seconds. Click on "Finish" to complete the removal



### 8. PROGRAM CONFIGURATION

**In order to be able to perform the program configuration under Windows 2000/XP/Vista you need to have the administrator access rights.**

Before running the configuration program you should:

- exit the Gas Analyser program
- install the USB to RS 232 converter
- connect correctly the communication cable and power supply of the analyser.

The configuration utility is started by clicking on the **Gas Analyser configuration** (see Fig. 14)

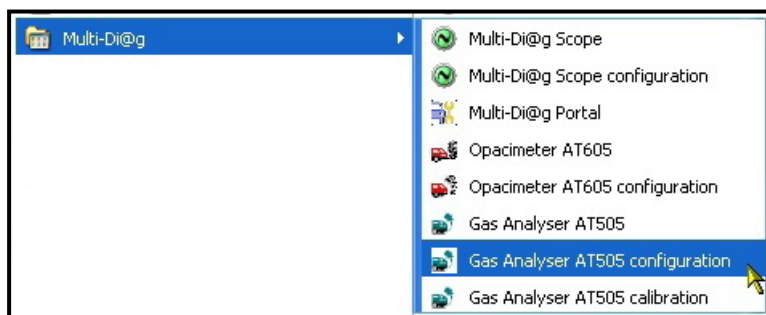


Fig. 14 – Starting the configuration utility for analyser setup

#### 8.1 SCREENS OF CONFIGURATION

##### 8.1.1 CONFIGURATION SCREEN – STATION

See Fig. 15 - Information about the emission control test station

##### 8.1.2 CONFIGURATION SCREEN – GAS ANALYSER

See Fig. 16 - Entering the data necessary for measuring the emission test

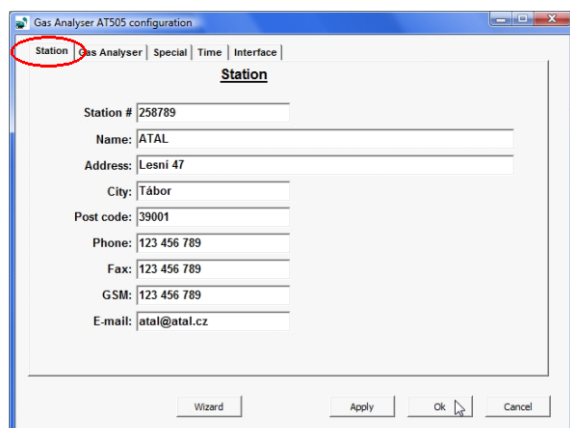


Fig. 15 – The configuration screen (Station) - Information about the emission control test station

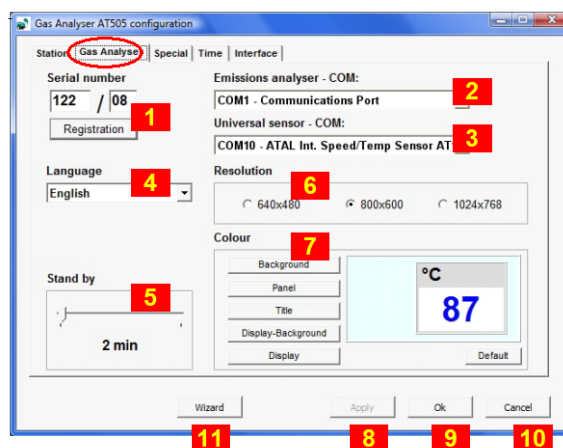


Fig. 16 – The configuration screen (Gas Analyser) where you can change the necessary values

Note to Fig. 16:

- Registration button - By pressing this button you register the entered serial number with the PC počítače - see Fig. 17. (Analyser serial number which can be found on the underside of the analyser)
- Gas Analyser communication port setting
- Speed / Temperature Sensor communication port setting
- Language selection

- 5 - Time in minutes for the device to enter standby mode (5 to 120 minutes)
- 6 - Screen resolution settings
- 7 - Colour and text settings
- 8 - Apply button - To save the set values in the configuration program, press this button
- 9 - OK button - To save the set values and exit the configuration program, press this button
- 10 - Cancel button - To exit the configuration program without saving the set values, press this button
- 11 - Wizard button - Starts the Configuration Wizard – for details see Chap. I - 8.1.6

### Note for points 2 and 3:

If the automatic scan fails the user can enter port numbers manually – for details see Chap. I - 8.1.7

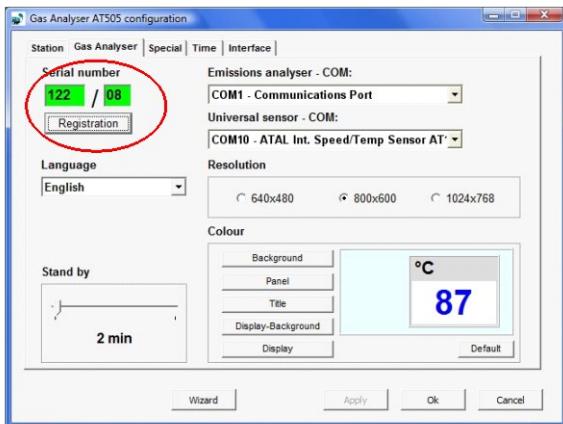


Fig. 17 – Registered serial number on a computer

### 8.1.3 CONFIGURATION SCREEN – SPECIAL

See Fig. 18 – For authorised technician only (for service and calibration)

### 8.1.4 CONFIGURATION SCREEN – TIME

See Fig. 19 – For adjusting time of day

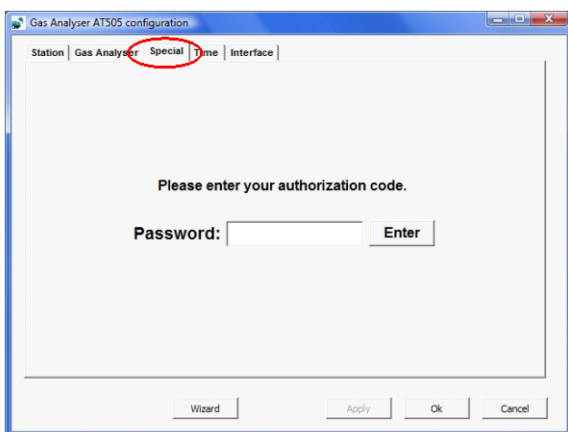


Fig. 18 – For authorized person only

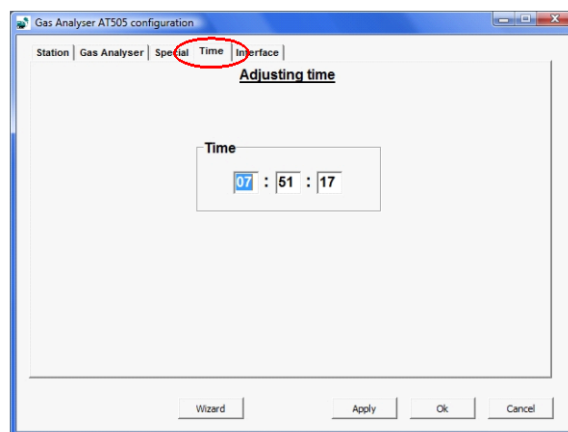


Fig. 19 – The configuration screen (Time) where you can change the setting of the current time

### 8.1.5 CONFIGURATION SCREEN – INTERFACE

See Fig. 20 – For enabling or disabling the usage of peripheral equipment.

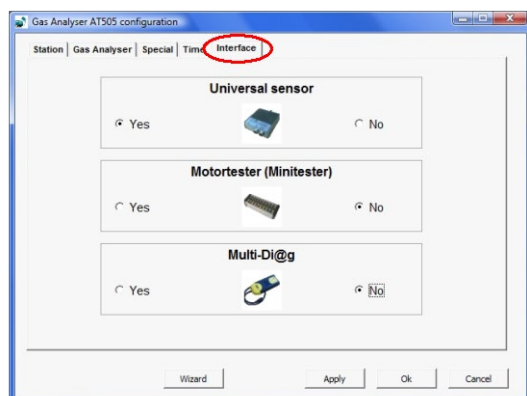


Fig. 20 – The configuration screen (Interface) - for enabling or disabling the usage of peripheral equipment

### 8.1.6 PROGRAM CONFIGURATION WIZARD

The Wizard (see Fig. 16, pos. 11) starts automatically when the configuration utility is ran for the first time.

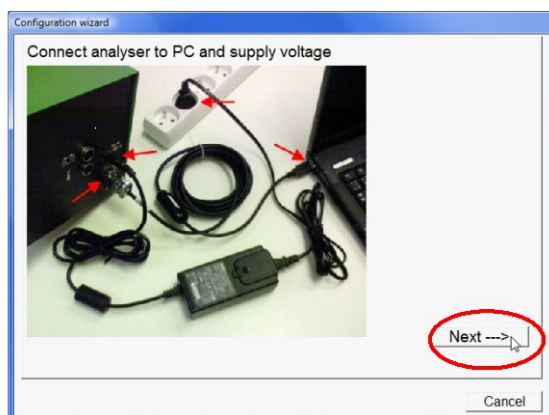


Fig. 21 – Connection of the Gas Analyser to the PC and to the power supply

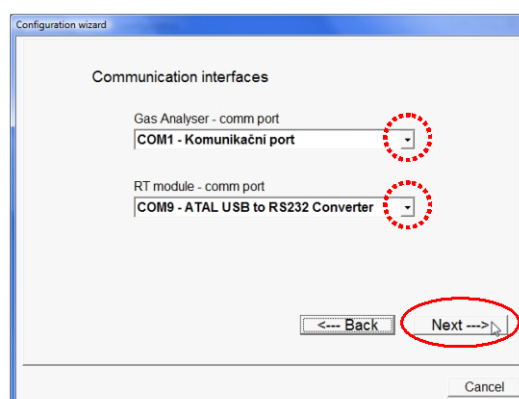


Fig. 22 – Communication ports setup for the Gas Analyser and the Speed / Temperature Sensor module (performed by the user)

Note to Fig. 22:

When you click the arrow in "comm port", a list of available communication ports (see Fig. 23)

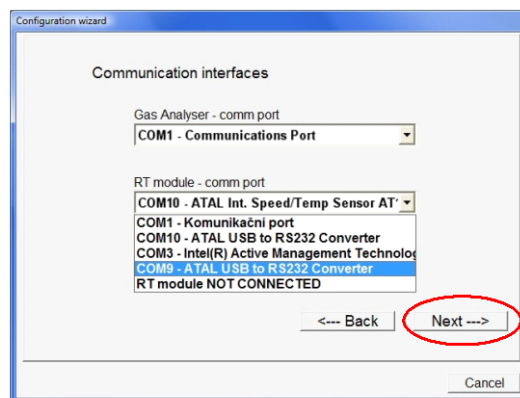
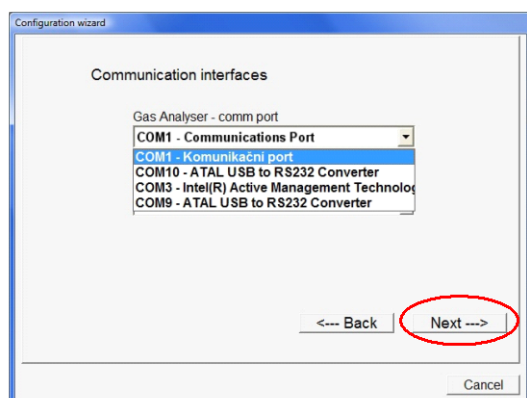


Fig. 23 – The list of available communication ports

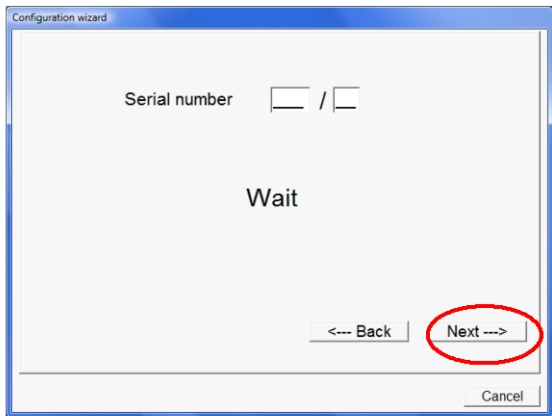


Fig. 24 – Detection of the Gas Analyser serial number (performed by the device)

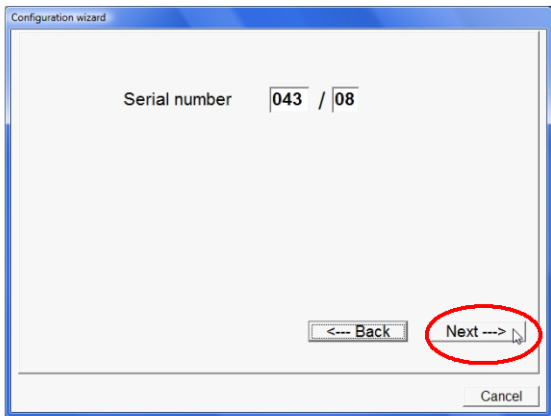


Fig. 25 – The detected serial number is displayed (the user can change it according to the label attached at the underside of the analysed)

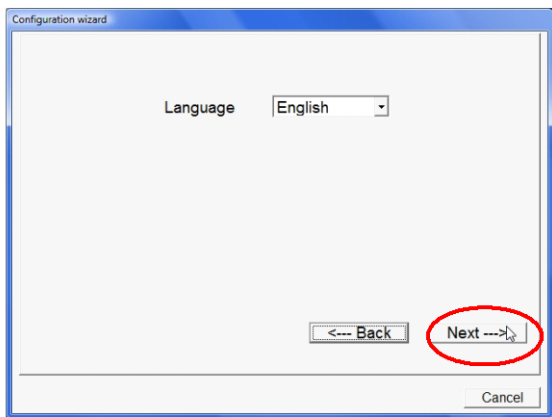


Fig. 26 – Selecting the language

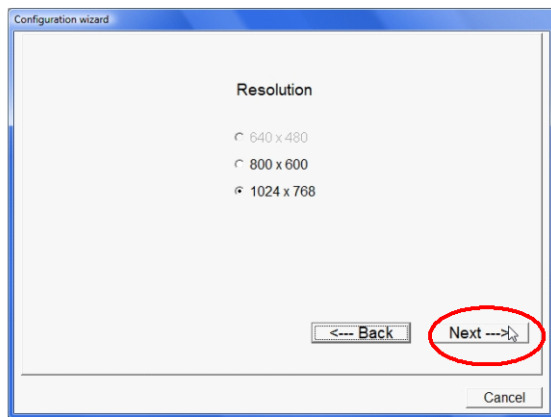


Fig. 27 – Setting the monitor resolution

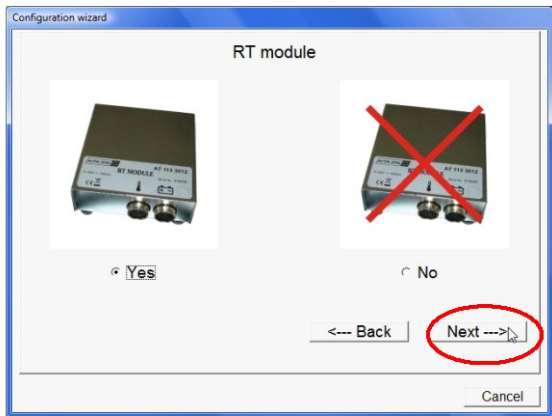


Fig. 28 – Option enabling or disabling the usage of Universal Speed / Temperature Sensor (Yes/No)

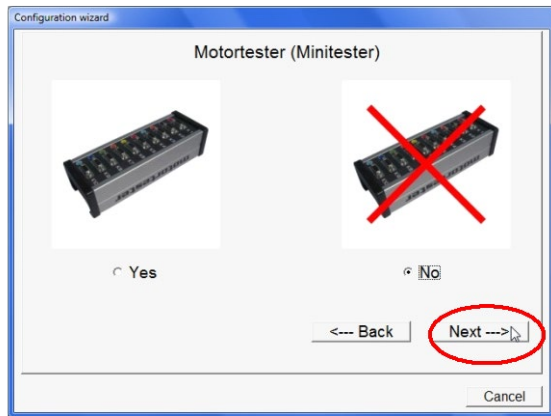


Fig. 29 – Option enabling or disabling the usage of Multi-Diag Motortester or Minitester (Yes/No)





Fig. 30 – Option of enabling or disabling the usage of Multi-Diag (Yes/No)

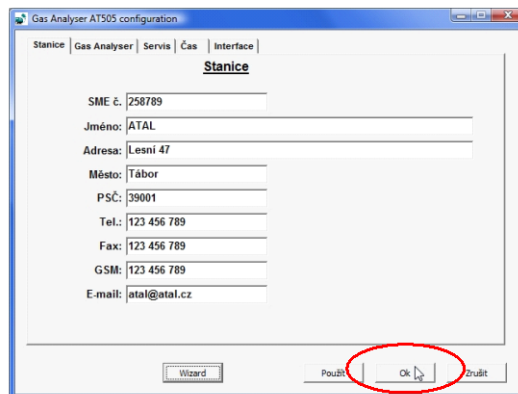
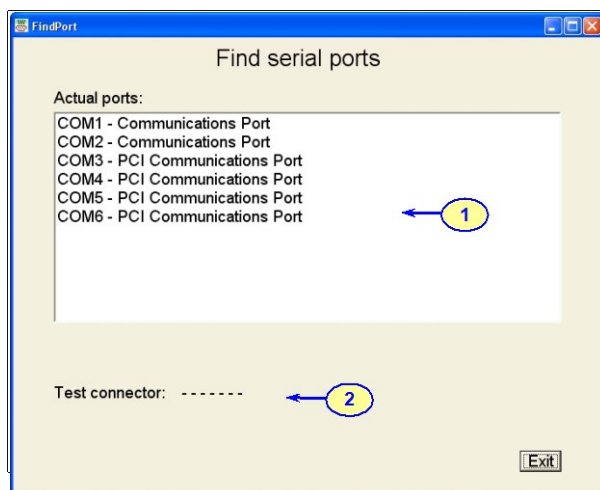


Fig. 31 – To save the file parameters and wizard the end, click the OK button

### 8.1.7 DETECTION OF COMMUNICATION PORTS

Launch the “**FindPort.exe**” program which can be found on the installation CD or which can be downloaded from the website [www.atal.cz/download/FindPort.exe](http://www.atal.cz/download/FindPort.exe)

The program displays all available serial ports (see Fig. 32). Once the testing device is connected to a serial port, its description and status are displayed on the screen (see Fig. 33).



- 1 - List of available ports
- 2 - Port with the testing device

Fig. 32 – Display of the free serial ports

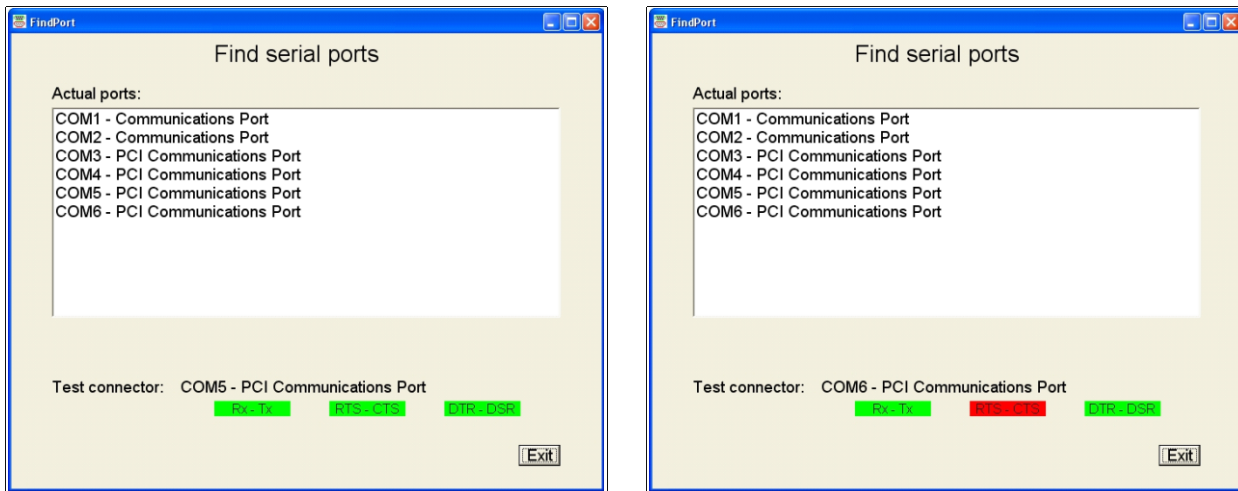


Fig. 33 – The status of the communication ports after connection of the testing device to a computer serial port connector

The status of the communication cables is as follows: green = OK  
red = no connection

Note: Some devices are functional with only the Rx-Tx connections made (e.g. Opacimeter AT605).

Remove the testing device and plug in the analyser. **It is important to set the detected port number** for the analyser in the **Configuration Program** (for starting the program see Chap. I - 8.1.1 and Fig. 16 - note 2) or in the **Program Configuration Wizard** (see Chap. I - 8.1.6, Fig. 22).

## 8.2 PROGRAM CONTROL

After successful program installation, a new **Multi-Diag** program group is created (see Fig. 34), or updated if it already exists. A **Gas analyser AT505** icon (see Fig. 35) is placed on the desktop.

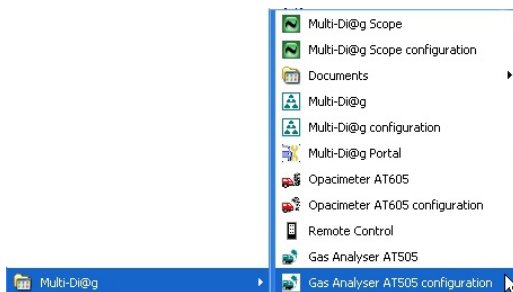


Fig. 34 – Multi-Diag program group (Start \ Programs \ ...)

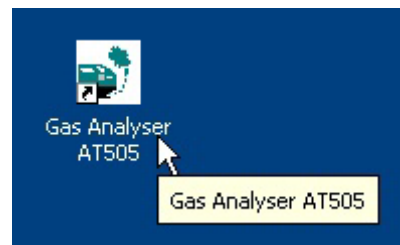


Fig. 35 – Gas Analyser program icon is placed on the desktop

## 9. DEVICE SWITCH-ON AND SOFTWARE START-UP

Before you start the software, the Gas Analyser should be connected to the power supply and computer and it should be correctly configured. The Speed Sensor should also be connected to the computer and configured. If there is a problem with communication to either of the devices, the software will notify the operator with a fault message and it will not be able to carry out any test.

9.1 CONNECTION OF AT 505 TO THE PERSONAL COMPUTER (MFS LIGHT)

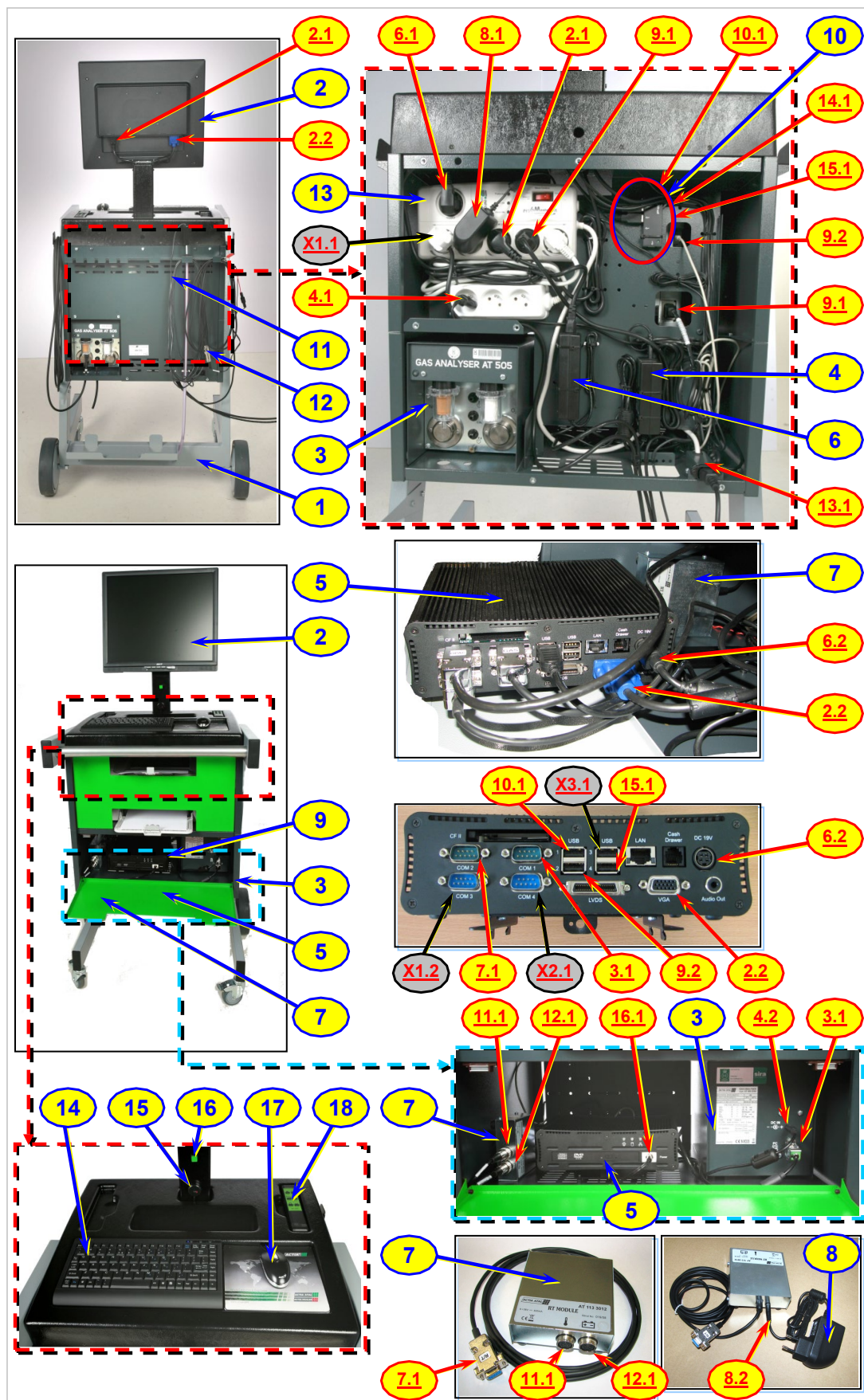


Fig. 36 – Connection of AT505 and accessories

Note to Fig. 36

- 1 - MFS Light Stand (MFS=Multi Function Station)
- 2 - LCD Monitor 19"
  - 2.1 LCD power supply cable (230V-AC)
  - 2.2 VGA cable (analog signal D-sub)
- 3 - Gas Analyser Module AT505
  - 3.1 AT505 communication cable ..... connect to **COM1**
- 4 - AT505 Power supply adapter
  - 4.1 Power supply cable (230V-AC)
  - 4.2 Power supply cable (16V-DC)
- 5 - Box PC
- 6 - Box PC Power supply adapter
  - 6.1 Power supply cable (230V-AC)
  - 6.2 Power supply cable (19V-DC)
- 7 - Universal RPM & Temperature sensor (AT113)
  - 7.1 AT113 communication cable ..... connect to **COM2**
- 8 - AT113 Power supply adapter
  - 8.1 Power supply cable (230V-AC)
  - 8.2 Power supply cable (12V-DC)
- 9 - HP Printer (Ink or Laser)
  - 9.1 Power supply cable (230V-AC)
  - 9.2 Print USB communication cable ..... connect to **USB2**
- 10 - USB HUB (connection to USB Keyboard and USB mouse)
  - 10.1 Cable USB 2.0 ..... connect to **USB1**
- 11 - Oil temperature sensor
  - 11.1 Oil temperature sensor connector
- 12 - RPM measuring cable
  - 12.1 RPM measuring cable connector
- 13 - Master TFR infosec
  - 13.1 Power supply cable (230V-AC)
- 14 - USB Keyboard
  - 14.2 Keyboard USB communication cable ..... connect to **pos.10 (USB1)**
- 15 - Infrared remote control AT 157 - receiver
  - 15.1 Remote control USB communication cable ..... connect to **USB4**
- 16 - Button ON/OFF
  - 16.1 Button ON/OFF communication cable
- 17 - USB Mouse
  - 17.2 Mouse USB communication cable ..... connect to **pos.10 (USB1)**
- 18 - Remote control - sender

### ----- OPTION -----

- X1 - Opacimeter AT605
  - X1.1..... AT605 Power supply cable (230V-AC)
  - X1.2..... AT605 communication cable ..... connect to **COM3**
- X2 - Multi-Diag Scope
  - X2.1..... Multi-Diag Scope..... connect to **COM4**
- X3 - Multi-Diag
  - X3.1..... VCI (Vehicle Interface Communication) ..... connect to **USB3**

**Warning: All connectors should be connected and disconnected with care and without force!**

### 9.2 PROGRAM START-UP

If everything is connected and configured properly, you can start the program. The program can be started by clicking on the **Gas Analyser AT505** icon on the desktop of the screen (see Fig. 35) or on the **Gas Analyser AT505** item from the **"Start\Programs"** program group (see Fig. 34).

### 9.3 DEVICE ACTIVITIES AFTER PROGRAM START-UP

#### 9.3.1 DEVICE INITIALISATION AND OPTICAL BENCH HEAT-UP

After start-up, the initialisation of measuring devices and optical bench heat-up will take place (see Fig. 37). Until the bench is heated-up to its operating temperature, a warming up message will flash in the info box (see pos.1 - Fig. 38).

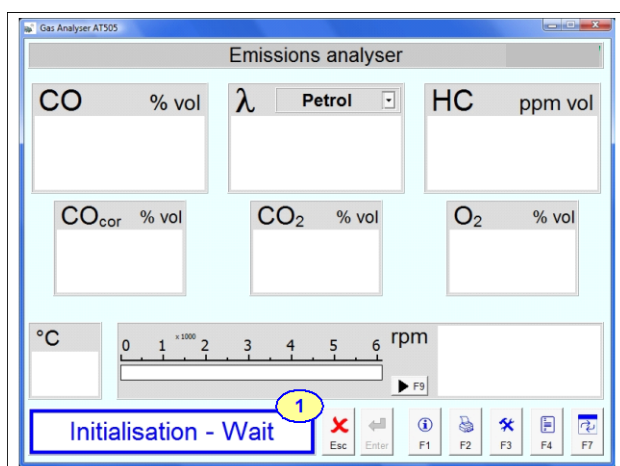


Fig. 37 – Initialisation of measuring devices

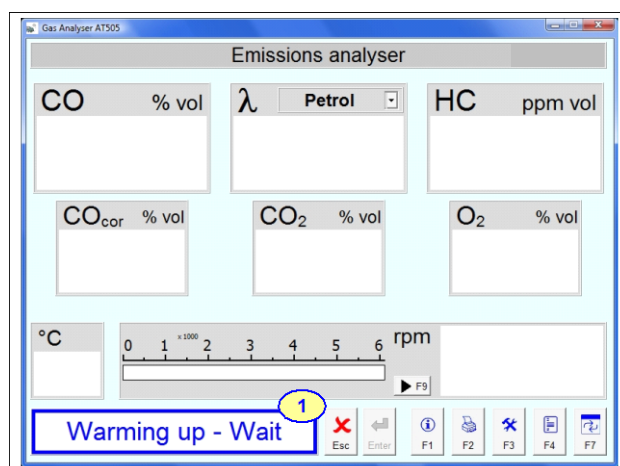


Fig. 38 – Test bench heat-up

#### 9.3.2 LEAKAGE TEST

As soon as the optical bench is warmed up to the required temperature, the leakage test will be carried out. **Before the test is started, the probe should be removed from the exhaust** and the red seal should be fitted.

Request for performing tightness test is displayed automatically once a day after turning on the programme. For the first 14 days after the last tightness test, the user is given the option to skip the test (it is recommended to run it). After more than 14 days, the user no longer has the option and must perform the test.

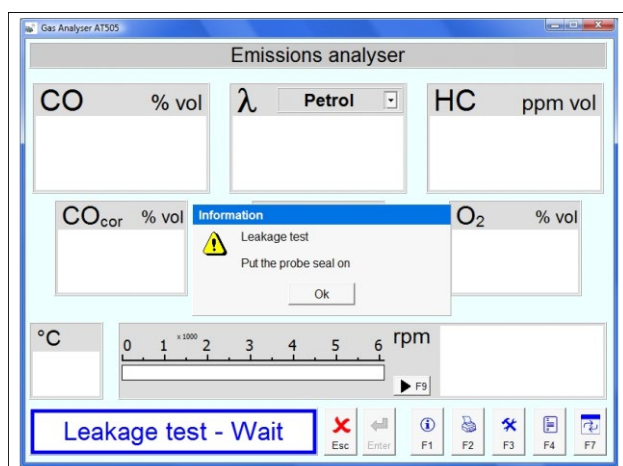


Fig. 39 – Leakage test – First step

Fit the seal on the end of the exhaust probe and click the **OK** button.



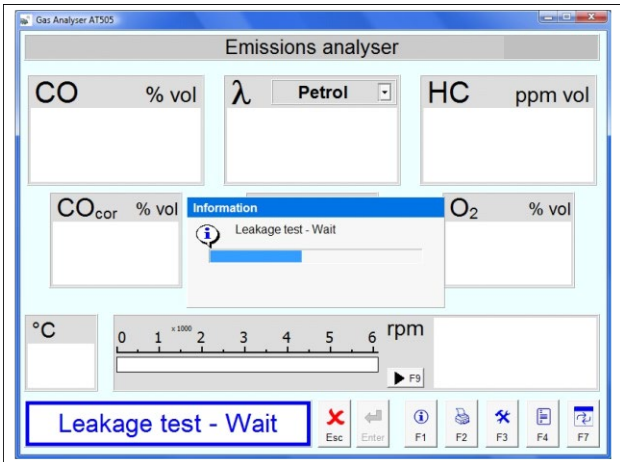


Fig. 40 – Running Leakage test – Self measurement

The device will automatically create vacuum in the withdrawal system and monitor for pressure drop caused by any leaks. If the test is successful, a notification is displayed prompting the removal of the exhaust probe seal.

**The test takes several minutes.**

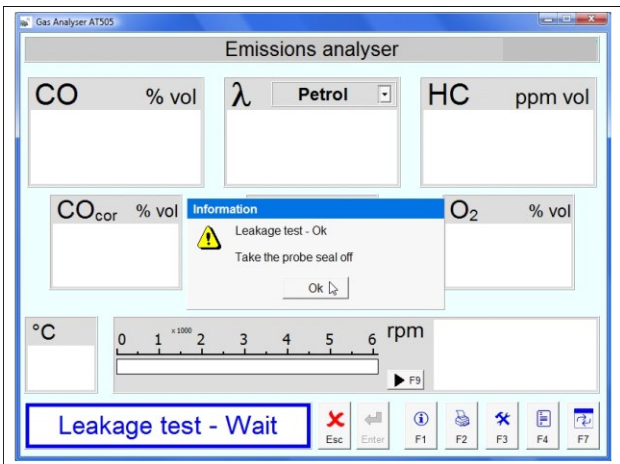


Fig. 41 – Leakage test – positive test

Remove the seal from the exhaust probe and click the **OK** button.

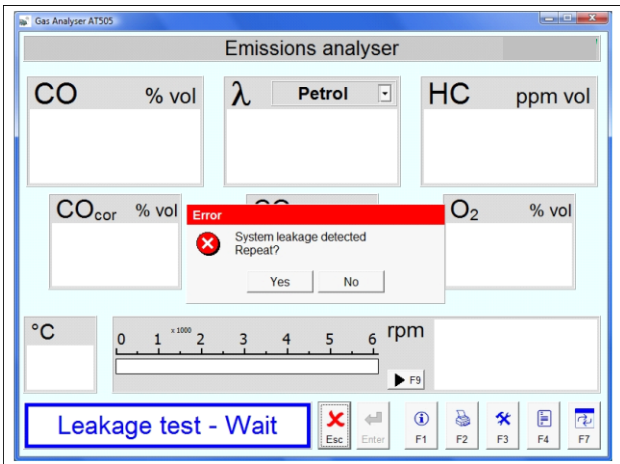


Fig. 42 – Leakage test – negative test

If the leakage test is not successful for any reason (e.g. filter leakage), it is signalled as a fault and gas testing will be disabled. The fault should be corrected (e.g. you may replace a damaged filter).

After the leak has been fixed, you will have to repeat the leakage test.

### 9.3.3 OPTICAL BENCH RESET

This is executed automatically when the program starts. When the analyser is on it carries out a reset at intervals of 15 to 30 minutes, so that the required measurement accuracy is maintained. Resetting is not carried out in the course of a measurement.

During resetting air is drawn through a carbon filter to eliminate any hydrocarbons which may be present.

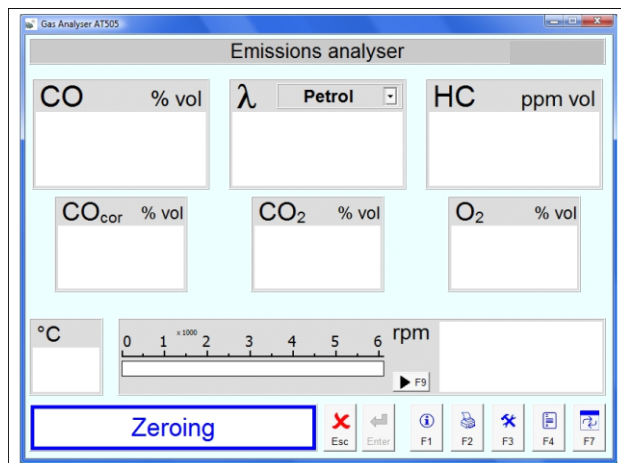


Fig. 43 – Optical bench reset

### Note:

The reset can be carried out anytime by switching to setup mode by pressing **F3** (Pos.5 - Fig. 45) and then by pressing the button in Pos.1 - Fig. 46.

## 10. MAIN SCREEN DESCRIPTION

### 10.1 GAS ANALYSER ONLY AVAILABLE WITH MULTI-DIAG SCOPE

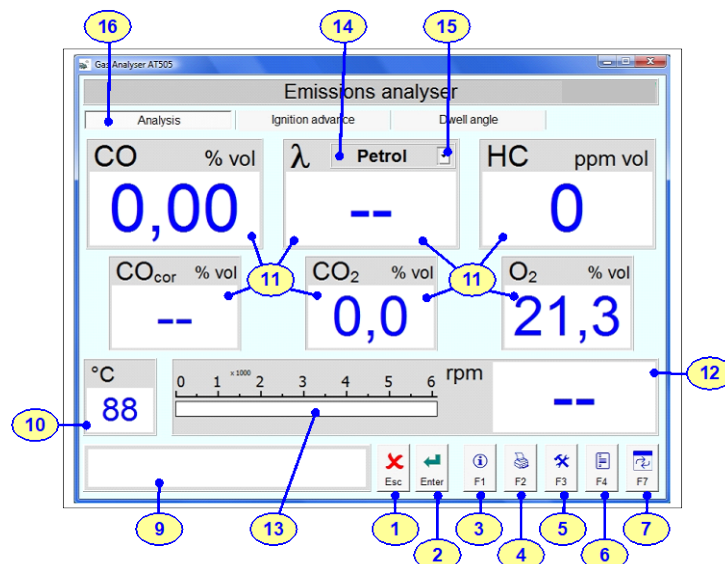


Fig. 44 – Initial Gas Analyser Software screen description (Gas measuring tab position 16 is only available with Multi-Diag Scope)

### 10.2 GAS ANALYSER - IS NOT AVAILABLE MULTI-DIAG SCOPE

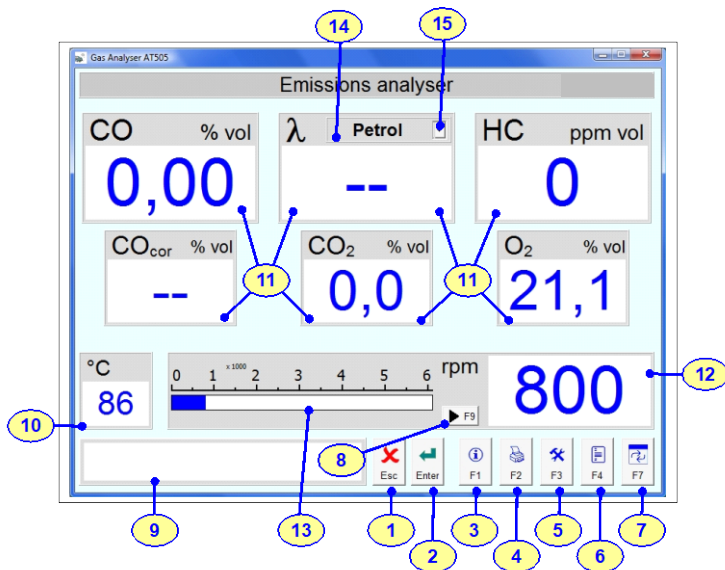


Fig. 45 – Initial Gas Analyser Software screen description (Multi-Diag Scope is not available)

Description of the Fig. 43 and Fig. 44:

- 1 - **Button:** Used to exit from the program
- 2 - **Button:** Green = measurement enabled  
Red = standby, fault or initialisation - **see the Note below**  
by pressing this button you will switch between standby and measuring mode
- 3 - **Button:** Display information about the program and connection (see Fig. 51)
- 4 - **Button:** Prints the currently displayed data
- 5 - **Button:** Configures several program parameters (see Fig. 46)
- 6 - **Button:** Used to start the emission test
- 7 - **Button:** Switches over to another application
- 8 - **Button:** Calibrate the Universal Speed Sensor. For information on how to read data using the vehicle ECU
- 9 - **Screen:** Displays information about program operation
- 10 - **Screen:** Displays the engine temperature
- 11 - **Screen:** Displays gas components
- 12 - **Screen:** Displays the engine speed
- 13 - **Screen:** Displays the engine speed graphically
- 14 - **Screen:** Selected fuel
- 15 - **Quick option:** fuel selection for lambda calculation (petrol, LPG, or CNG)
- 16 - **Tab:** Gas measuring (applies to Fig. 44)

#### Note to Button 2 - Fig. 45 (ENTER Button):

The **ENTER** button is used for switching to emergency mode, where the pump is turned off. The apparatus can also move to emergency state also automatically. After transferring to the emergency state the apparatus always carries out zeroing.

## 11. INITIAL ANALYSER SETUP

The analyser settings can be changed to configure it as required.

Here you can change the setting of the Speed and Temperature Sensor, fuel type and several other features of the program. You can get to the setup mode by clicking on the button **F3** (Pos.5 - Fig. 45).

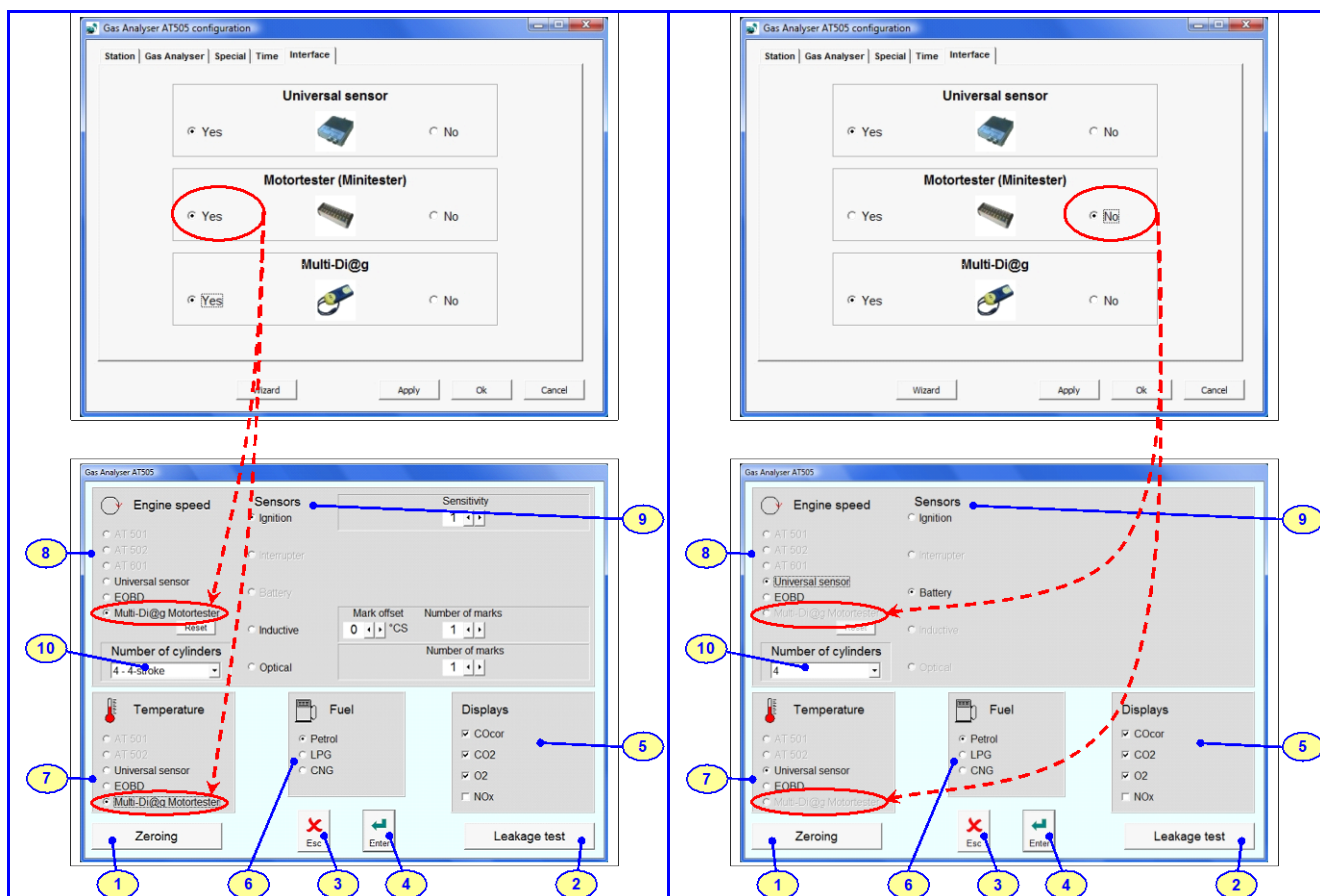


Fig. 46 – Setting some parameters of the program depending on the switching peripheral equipment on or off (see Configuration in Chap. I - 8.1.5 / Fig. 20). In this case, Motortester is used.

Fig. 47 – Setting some parameters of the program depending on the switching peripheral equipment on or off (see Configuration in Chap. I - 8.1.5 / Fig. 20). In this case, Motortester is not used.

- 1 - **Button:** Start optical bench reset
- 2 - **Button:** Start leakage test
- 3 - **Button:** Exit setup without saving changes
- 4 - **Button:** Exit setup and save changes
- 5 - Selection of gases to be displayed
- 6 - Selection of fuel for which the lambda coefficient will be calculated
- 7 - Selection of sensor from which the engine temperature will be read
- 8 - Selection of sensor from which the engine speed will be read
- 9 - Setup of individual probes
- 10 - Setup of number of cylinders or of engine type (2 stroke, 4 stroke)

## 12. ENGINE SPEED MEASURING

The measurement can be done by one of the following devices:

### 12.1 UNIVERSAL SPEED SENSOR

The measuring is carried out by connecting a suitable cable to the battery of the vehicle. There are two options to select from:

- Connect it to the auxiliary power outlet (cigarette lighter socket)
- Connect it to the vehicle's battery terminals: Red terminal is + pole; Black terminal is – pole
- Ignition sensor

### 12.1.1 MEASUREMENT PRINCIPLE

The universal speed sensor performs frequency analysis of the battery voltage. The ripple waveforms added to the DC battery voltage by the alternator allow engine speed to be computed.

### 12.1.2 RECOMMENDATIONS

- It is advantageous not to have fully charged battery - switch the headlights on for a while before measurement.
- While the measurement is in progress try to increase the current consumption (e.g. switch headlights and/or other electrical instruments on).
- Direct connection to the battery terminals usually gives more reliable results than other points.
- In case of implausible speed readings try to resynchronise the sensor by pressing the **F9** key (position 8 in Fig. 45).

### 12.2 MULTI-DIAG MOTORTESTER

Measurements shall be made connecting the appropriate sensor. The choice of three options

- Ignition sensor
- Induction sensor
- Piezo Semiconductor (optical) sensor

### 12.3 MULTI-DIAG MINITESTER

Measurements shall be made connecting the appropriate sensor. The choice of three options

- Ignition sensor
- Induction sensor
- Piezo Semiconductor (optical) sensor

### 12.4 MULTI-DIAG

The measurement is performed by reading the values from the electronic control unit (ECU) of the vehicle. The communication with the vehicle can be started or ended by pressing the **F9 button** (pos.8 - Fig. 45).

If the **F9 button** is:

- **Green** – communication with the vehicle electronic control unit is under way
- **Red** – communication is stopped

#### **Warning:**

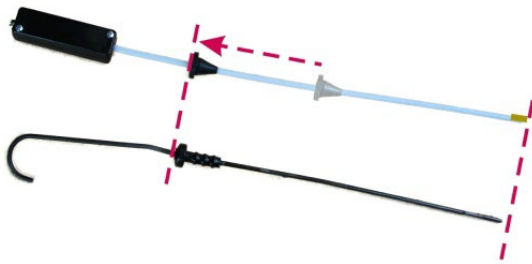
You should disconnect the EOBD cable when no communication with the control unit (the F9 button is red) is present, only. Therefore, if you want to disconnect the cable from the EOBD connector quit the communication by pressing F9 first.

## 13. OIL TEMPERATURE MEASURING

The measurement can be performed by one of the following devices:



### 13.1 OIL TEMPERATURE SENSOR



The proper oil temperature sensor type (with correct length set) should be used. After removing oil dip stick, set the thermometer's rubber stop (with help of the dip stick) so that the thermometer is about 20 mm deep (30 mm max.) in the oil.

### 13.2 UNIVERSAL SPEED SENSOR

The measurement is performed by means of a thermometer probe (see oil temperature sensor).

### 13.3 MULTI-DIAG MOTORTESTER

The measurement is performed by means of a thermometer probe (see oil temperature sensor).

### 13.4 MULTI-DIAG MINITESTER

The measurement is performed by means of a thermometer probe (see oil temperature sensor).

### 13.5 MULTI-DIAG

The measurement is performed by reading the values from the electronic control unit (ECU) of the vehicle.

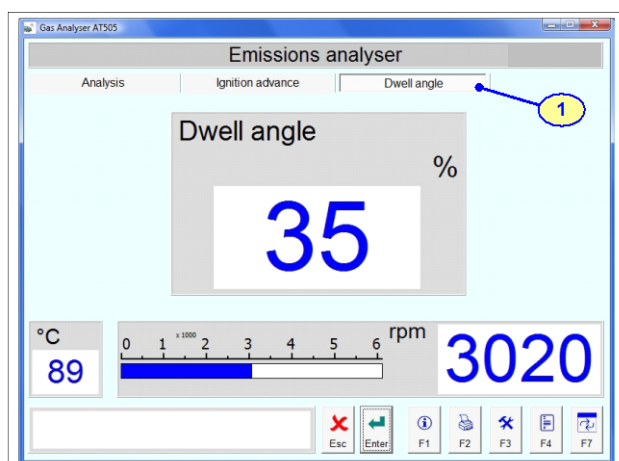
## 14. DWELL ANGLE MEASURING

This function is only available with another device – Multi-Diag Scope, Motortester or Minitester (optional extension). Otherwise no choices for switching into the measuring of ignition advance or dwell angle will be displayed (Fig. 44).

Measuring is carried out through the connection of voltage probe which makes part of Multi-Diag Scope. It shall be connected to the primary coil winding. Dwell angle and engine speed are determined from its course.

Note 1:

When measuring engine parameters (ignition advance, dwell angle) in the "Gas Analyser AT505" program, you shall not use "Multi-Diag Scope" program.



1 - Tab: for ignition advance selection

Note:

Tab is only available with Multi-Diag Scope

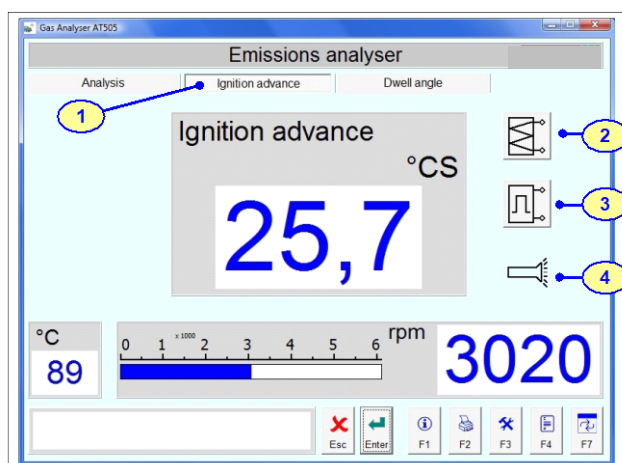
Fig. 48 – Initial Gas Analyser Software screen description Analyser – after switching into the dwell angle tab

## 15. IGNITION ADVANCE MEASURING

This function is only available in connection with another device – i.e. with Multi-Diag Scope, Motortester or Minitester (optional extension). Otherwise no choices for switching into the measuring of ignition advance or dwell angle will be displayed (Fig. 44).

Measuring is carried out through two sensors which make part of Multi-Diag Scope. One probe is the ignition sensor and the other probe can be selected from the following:

- Induction sensor
- Semiconductor (optical) sensor
- Stroboscope



1 - **Tab**: for ignition advance measuring selection

Selection of ignition advance sensors:

2 - Induction sensor

3 - Semiconductor (optical) sensor

4 - Stroboscope

Note:

Tab is available only with Multi-Diag Scope

Fig. 49 – Initial Gas Analyser Software screen description Analyser – after switching into the ignition advance measuring tab

Note:

In measuring the advance is measured spark-ignition engine speed sensor

## 16. PRINTING VALUES

The print queue behaves like a storage folder for collecting individual records of the measurement results to be printed later. The contents of the print queue are printed when the user desires.

Press the **F2** button to add the screen data to the print queue (pos.4-Fig. 45). An information window will be displayed, see Fig. 50.



Fig. 50 – The printer options are displayed

**ESC** button to continue measuring – the existing saved data is preserved  
**F2** button prints all data from the print queue to the printer  
**F5** button deletes all data in the print queue (without printing)

**Note:**  
The print queue is automatically deleted on exiting the program.

## 17. EMISSION TEST

This mode is used to perform an MoT emission test and is launched by pressing the **F4** key - Fig. 45 pos 6. The test can only be carried out once the Speed Sensor and Engine Temperature Sensor are correctly connected, set and synchronized. Gas measurement must be also underway.

**Note:**

The emission test is automatically terminated if a pause between program steps exceeds 10 minutes.

**The Emission Test meets the requirements set out by current legislature**

## 18. CHANGE OF THE COMPANY LOGO IN THE PROTOCOL

The user can change the company logo which is printed on the final emission test protocol. The change can be performed as follows:

- Find the “**company\_logo.bmp**” file in the folder with the installed Gas Analyser AT505 (usually C:\Program Files\Actia\Multi-Di@g\AT505\pics)
- Replace this file with your logo which complies with the prescribed parameters
- The name of the file must be the same and the logo size should not exceed 360x85 dpi
- We recommend that the logo is produced by a computer graphics expert

### 19. INFORMATION WITH F1

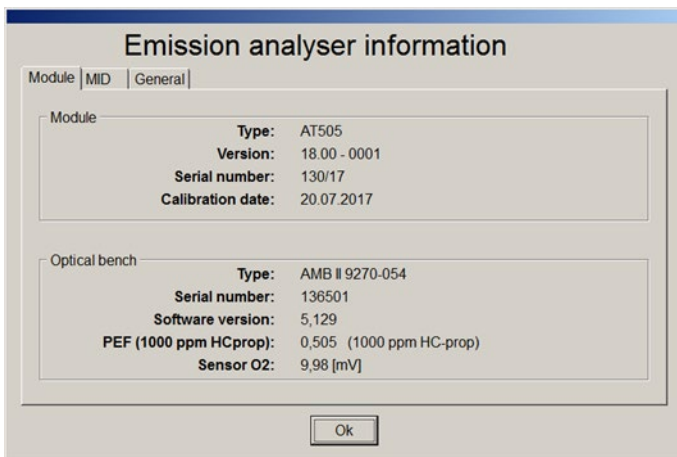


Fig. 51 – Displaying information in the emission programme

After the initialisation of the emission programme, pressing "F1" or "I" (information) displays information about the device – analyser module, .dll communication library etc. Information is split into logical blocks and displayed on multiple screens for clarity.

Displaying information about analyser module and optical bench.

#### Module Block – Information about Analyser Module

- Type – type of analyser module.
- Version – hardware configuration of the module, information for servicing. The format is AA.BB – CCCC, where:
  - AA is the year of MID approval (current 18, previous 08)
  - BB is sub-version (in case of potential changes and revisions)
  - CCCC is bit information of the given configuration. E.g. the zero bit of the last Byte indicates whether the pneumatic valve is in original connection (0) or whether the functionality is reversed (1).
- Serial number – module serial number
- Calibration date – date of last calibration of the module

#### Bench Block – Basic Information about the Measuring Optical Bench

- Type – bench type.
- Serial number – bench serial number
- Software version – version of bench's internal programme
- PEF – PEF value
- Sensor O2 – voltage value on the oxygen sensor

Displaying application (exe programme) information, communication library and hw key check status for relevant legal inspection.

#### Application Block – Information about the Running Application (exe Programme)

- File name – name of the running application
- Software version – programme version of the running application
- Digital signature – information from tests of application's digital signature
  - Verification – result of digital signature test (Valid / Invalid)
  - Signer name – name of certificate signer that is being checked

#### Measuring DLL Block – Information about DLL Measuring and Communication Library

- File name – name of library
- Software version – version of library programme
- Digital signature – information from tests of library's digital signature
  - Verification – result of digital signature test (Valid / Invalid)
  - Signer name – name of certificate signer that is being checked
  - Digest – report summary (print) that is being checked

#### HW Key Block – Information about the Status of Hardware Key Located in Analyser Module

- Connected – whether key is installed. Not installed for older versions, obligatory for newer versions since 2018.

- Verification – test result (Valid / Invalid)

General supporting information for users – can change.

## 20. RECORD OF MEASURED DATA FOR POTENTIAL CHECK

Each measurement print is provided a unique identifier (set of numbers and letters) for potential check of measured data. The identifier is marked on the report as "muid". Measured data is stored in the computer for 2 years.

You can check measured data using programme "GasMIDViewer.exe". Entering the muid identifier into this programme shows the measured data.

Figure: GasMIDViewer.exe programme for checking measured data.

## 21. SWITCHOVER TO ANOTHER APPLICATION

The program allows the user to switch over to another application, e.g. to **Multi-Diag** (or to other applications that will be available in time) by clicking on the **F7** button (see Fig. 52).



Fig. 52 – Tab for switching to another application

## 22. STAND BY MODE

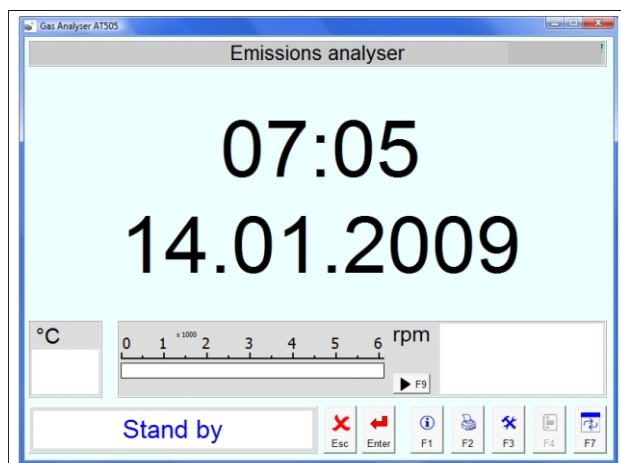


Fig. 53 – Standby Mode

The software will switch to standby mode automatically if the user does not carry out any operation for the specified time. This time can be changed in the configuration program, for further details see Chap. I - 8.1.2.

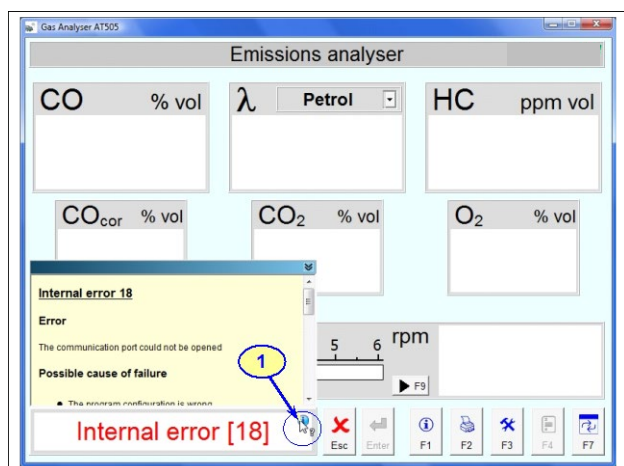
When in this mode the current date and time is displayed and measurement is stopped.

This does not apply during an emission test.



## 23. ERROR ALERTS BY THE ANALYSER

All errors and other information are displayed on the PC screen. Test data can be printed out with the printer. On the gas analyser there is a status LED.



If an icon (see pos. 1) is displayed in the information box, click it to display a panel with further information.

Clicking again removes it.

Fig. 54 – Example of an error message

Internal fault number	Fault description	Measures to be taken
10	Communication fault	See the repair instructions below
11	Communication fault	See the repair instructions below
12	Communication fault	See the repair instructions below
13	Communication fault	See the repair instructions below
14	Communication could not be opened	Check the communications configuration and connection of the analyser communication and power supply cables
15	Communication fault	See the repair instructions below
16	Communication fault	See the repair instructions below
17	Communication fault	See the repair instructions below
18	Communication fault	Check the communications configuration and connection of the analyser communication and power supply cables
19	Communication fault	See the repair instructions below
20	Communication fault	See the repair instructions below
21	Communication fault	See the repair instructions below
22	Communication fault	See the repair instructions below
23	Communication fault	See the repair instructions below
24	Communication fault	See the repair instructions below
25	Communication fault	See the repair instructions below
26	Communication fault	See the repair instructions below
27	Communication fault	See the repair instructions below
28	Communication fault	See the repair instructions below
29	Communication fault	See the repair instructions below
30	Communication fault	See the repair instructions below
31	Communication fault	See the repair instructions below
32	Low pressure	Check for blockages at the gas inlet
33	High pressure	Check for blockages at the gas outlet
34	Printer fault	Check the installation, connection and settings of the printer
35	Communication fault	See the repair instructions below
36	Failed leakage test	Check leaks in the filters, pipes, pump, etc.
37	Faulty O2 sensor	Check the sensor and replace if faulty
38	Car battery not connected	Check the speed sensor is connected correctly
39	Temperature sensor not connected	Check the temperature sensor connection

40	Fault listing from the analyser	Wait approximately 30 seconds or see the repair instructions if fault does not clear
41	Gas analyser power supply over-	Check for short circuits, jammed pump, etc.
42	A safe connection between the analyser and the computer could not be verified	See the repair instructions below
43	Multi-Diag Scope communication failure	See the repair instructions below
44	Multi-Diag Scope program already running	Exit the Multi-Diag Scope program
45	Motortester not connected (Oscilloscope without Motortester)	Connect the Oscilloscope to the Motortester
46	Faulty parameter settings for Multi-Diag Scope	See the repair instructions below
47	Multi-Diag communication failure	Check the connection of the Multi-Diag to the computer
48	Multi-Diag communication failure	Check the connection of the Multi-Diag to the vehicle
49	EOBD function not supported	Use an alternative method of measuring engine speed

Repair instructions:

Start with point 1, and if necessary continue through to point 3

- 1) Enter button - active Press the Enter button to initialise the analyser (in some cases this procedure may have to be tried twice).  
- not active Exit and restart the Gas Analyser AT505 program.
- 2) Exit the Gas Analyser AT505 program, disconnect the communication cable from the computer, disconnect the analyser power supply, wait 30 seconds, connect the analyser power supply, connect the communication cable and restart the Gas Analyser AT505 program.
- 3) Contact the service center.

## 24. MAINTENANCE

The apparatus is designed to be as maintenance free as possible. Special attention should be given to protecting the analyser inlet from undue contamination. The exhaust probe should not be left on the floor or any other contaminated area, where it can suck in dust, contaminants, or water. The probe should only be inserted into the exhaust when required during emission measuring, and removed when not required.

Calibration of the gas analyser should be carried out every 6 months by a UKAS approved calibration service (see chap 27).

### 24.1 MEASURES TO AVOID WATER CONDENSATION IN OPTICAL BENCH

In case of drop in intake probe pressure the device reports an error condition (see Fig. 55).

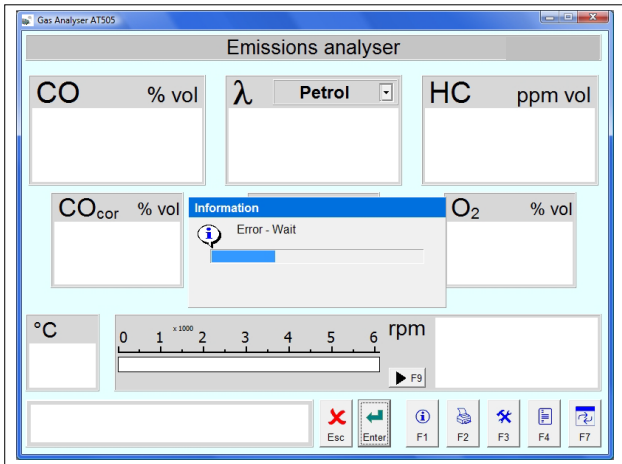


Fig. 55 – Blocked probe warning

The condition is a result of a choked or blocked intake probe (hose) or sucking water.

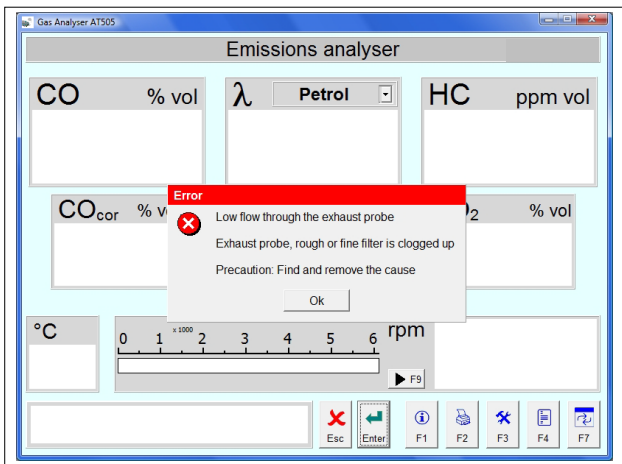


Fig. 56 – Error message with request for a fix

The device operates the valve several times in order to reduce underpressure (clicking sound may be heard from inside).

The user is informed with the error message and asked for fixing the problem.

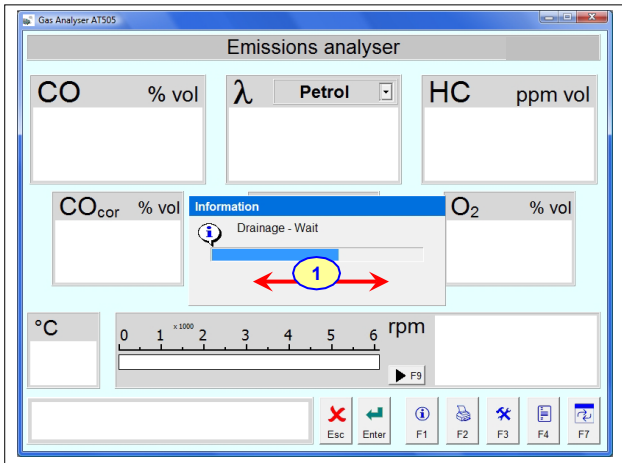


Fig. 57 – The display during the probe cleaning phase

The following action of the analyzer tries to avoid water penetration into a sensitive optical bench. The device actuates the valve and the pump in several cycles (with corresponding sound effects) and in the meantime it is testing if conditions returned back into a normal state (see pos 1 in Fig. 3), i. e. the probe is clean again. In case of success the measurement can continue.

## 24.2 COARSE FILTER INSPECTION AND CLEANING

The sintered bronze grain coarse filter may be cleaned by washing in spirit. After cleaning the filter it must be rinsed out thoroughly in clean water and blown through with pressurised air.

Filter contamination can prolong the residual hydrocarbon check and so increase the overall time of the emission test.

### 24.3 FINE FILTER INSPECTION AND RENEWAL

If the paper filter is contaminated it must be replaced with a new one. Its lifetime depends on the emission levels of the vehicles tested. Where the engine is equipped with a catalyst, the life service of the filter is minimally 50 emission tests. With engines that are in a poor condition, and in the case of two-stroke engines, the life service of the filter may only be 5 emission tests.

Filter contamination can prolong the residual hydrocarbon check and so increase the overall time of the emission test.

### 24.4 OXYGEN SENSOR CHECK

Oxygen concentration measurement is done by an electro-chemical sensor with a limited service life. Service life is affected by the composition and number of measured vehicles. The measuring optical bench checks the functioning of the sensor automatically. If it finds the sensor is no longer in order, a warning message will be displayed and it is not possible to continue measuring. The analyser programme displays a warning about the possible end of the sensor's service life so that the user can contact a service technician.

The voltage status of the oxygen sensor can be displayed in the programme information (see chapter 17). A new sensor has at least 12 mV; values below 5 mV mean the sensor is already in a poor condition and measuring is locked.

Oxygen sensor can only be replaced by an authorised service technician.

## 25. TECHNICAL SPECIFICATION

Quantities with accuracy figures provided are guaranteed. Other values are for information only.

### 25.1 FUNCTION PROPERTIES

Measurement	Range	Resolution	Accuracy	Note
CO	0 - 10 % vol	0.01 % vol	0.03 % vol or 5 % RV	
CO <sub>2</sub>	0 - 20 % vol	0.1 % vol	0.5 % vol or 5 % RV	
HC <sub>(hex)</sub>	0 - 2000 ppm vol	1 ppm vol	10 ppm vol or 5 % RV	
	2001 - 9000 ppm vol	10 ppm vol	or 5 % RV	
O <sub>2</sub>	0 - 4 % vol	0.01 % vol	0.1 % vol or 5 % RV	
	4 - 21 % vol	0.1 % vol	5 % RV	
CO <sub>cor</sub>	0 - 10 % vol	0.01 % vol		1
NO <sub>x</sub>	0 - 5000 ppm vol	1 ppm vol		
Lambda	0.500 - 2.000	0.001	ISO 3929	2
RPM	400 - 2000 min-1	10 min-1	20 min-1	3
	2001 - 9999 min-1		2 % RV	
Temperature	0 - 150 °C	1 °C	2°C	3

RV = of reading value

Note no.:

1 - Calculation: at  $CO + CO_2 \leq 15\% \text{ vol}$   $CO_{cor} = \frac{15 \cdot CO}{CO + CO_2}$   
 at  $CO + CO_2 > 15\% \text{ vol}$   $CO_{cor} = CO$

2 - Calculation: Brettschneider's equation \*\*)

3 - Only for the version of analyser with built in engine speed and temperature measurement facility.





### 25.5 STORAGE AND TRANSPORT

Storage temperature .....-10 to 45 °C

The gas analyser must not be transported or stored outdoors where it may be exposed to rain or other inclement conditions. Areas where it may be exposed to acids, chloride, mercury vapours, etc should be avoided.

## 26. ASSEMBLY

### 26.1 GAS ANALYSER

1 pc	Gas Analyser	AT 505 200X
1 pc	AT505 Exhaust sample probe with hose	AT 104 3032
2 pc	Fine filter	6FP 00067
1 pc	Power supply	0AZ 00915
1 pc	Cable of communication AT505/ 1xRS232	AT 505 4033
1 pc	Software CD and User Guide	AT 505 4022 *)
2 pc	O - rings for filter housings	6TG 00158
4 pc	Exhaust probe seal	6HP 00058
1 pc	Condensate drain hose 0.5 m length	

\*) – Part number may change with new revisions of manual

### 26.2 GAS ANALYSER ACCESSORIES

1 pc	RPM - Temperature module / A	AT 113 3012
1 pc	Oil temperature sensor 0,65 m / G	AT 103 3014
1 pc	NOx sensor	AT 124 9010
1 pc	IR Remote Control	AT 157 4001
1 pc	Ignition sensor G	AT 102 3030
1 pc	USB to RS232 Converter / GAS	AT 505 4034
1 pc	USB to RS232 Converter / RT	AT 113 4011

Opacimeter .....	AT 605 2000
Multi-Diag Motortester .....	AT 550 5000
Multi-Diag Scope .....	AT 540 5001
Multi-Diag Handy .....	AT 560 5004

## 27. CALIBRATION AND SERVICE

The analyser should be calibrated at the required interval by a UKAS approved calibration service.

### 1. INSTALLATION OF ATAL DEVICES – GENERAL

After you have successfully installed **any program from the Multi-Diag family** and you then connect **any USB device from the ATAL company** to your computer, information about new hardware (HW) will appear in the form of a Windows “Info tip” (see Fig. 58).

**Note:**

The language of the Wizard will correspond to your language version of Windows.

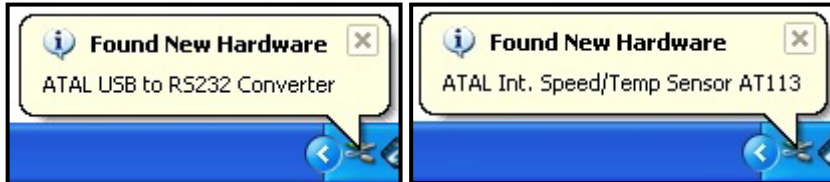


Fig. 58 – Examples of info tips about the detection of a new device (Windows XP)

If any problems occur with the installation of a new device (e.g. missing drivers), another info tip appears.



Fig. 59 – Info tip informing about a problem with the installation of the new device (Windows XP)

After the new device has been installed successfully, a final Info Tip appears about successful installation (see Fig. 60)



Fig. 60 – Info tip about the successful installation of the device (Windows XP)

### 2. INSTALLATION OF THE USB-RS232 CONVERTER

The USB-RS 232 converter (see Fig. 61) allows communication between the device with serial port and a PC (or Laptop) without serial ports.



Fig. 61 – RS232-USB converter (currently not available)

#### 2.1 INSTALLATION OF DRIVERS FOR THE USB-RS 232 CONVERTER

After you have clicked on the “Finish” button to complete the Gas Analyser installation (see Fig. 8) , it is also necessary to install the drivers for the RS232-USB converter.

At the start of installation (see Fig. 62) a search for older (invalid) drivers takes place (see Fig. 63).

The following series of figures was taken from the installation wizard for the Windows XP operating system. The wizard for Windows Vista is similar:

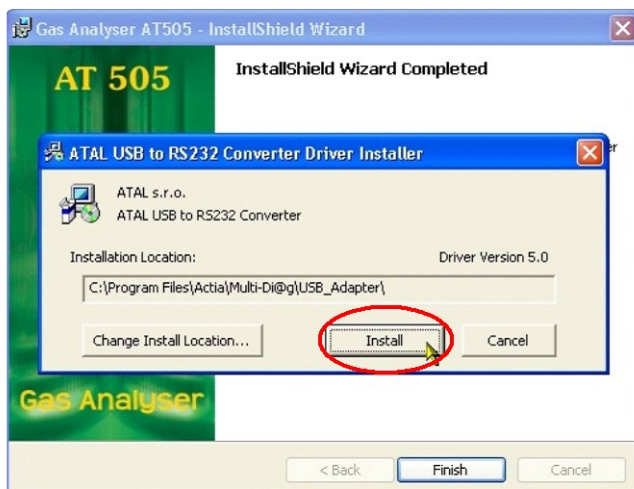


Fig. 62 – Start of the installation of RS 232-USB converter drivers

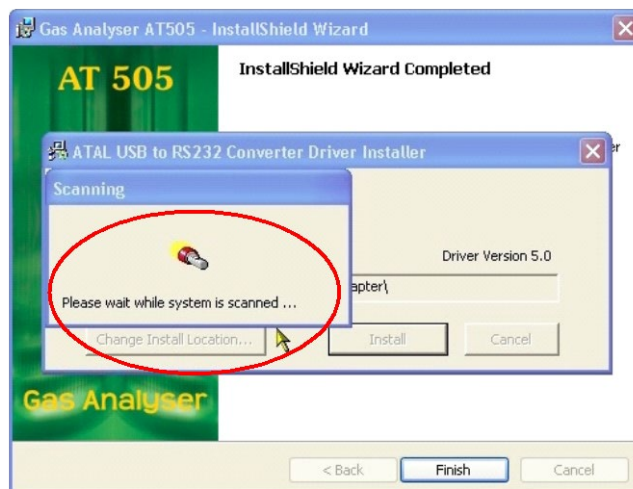


Fig. 63 – Search for older (invalid) drivers

- a) **If old drivers are detected**, the information about their presence will be displayed (see Fig. 64) together with a suggestion for their removal. It is recommended that you remove the old drivers.



Fig. 64 – The result of a search for old drivers – it is recommended to uninstall them (Yes)



Fig. 65 – A warning from Windows XP is displayed (for further details see the Note below)

The driver installation here ensures the RS232-USB converter will be detected correctly when it is connected to the PC for the first time. This process ensures that the installation CD will not be required again.

### Warning:

If the old drivers are not removed, the new drivers will not be installed and the correct operation of the RS232-USB converter cannot be guaranteed.

Note to Fig. 65:

A warning from Windows XP informs that the installed driver is not certified by Microsoft. This **notification can be displayed** in the process of installation several times and it is possible to **ignore it without any concerns!**

When installation of the new drivers is complete, a notification is displayed about restarting the system (see Fig. 67). It is recommended to perform this restart.

- b) **If up-to-date drivers are detected**, the information about their presence will be displayed (see Fig. 66) and the Gas Analyser installation will be complete.

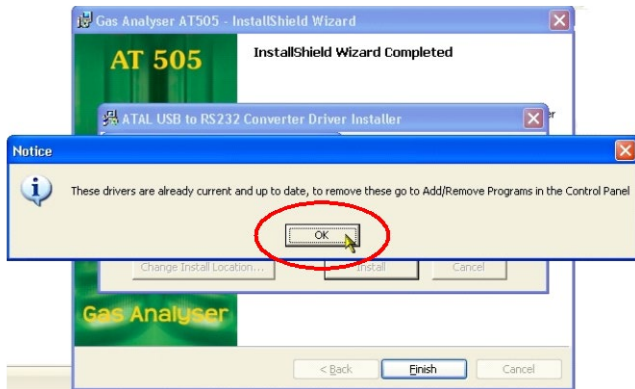


Fig. 66 – The result of a search for old drivers (in this case the drivers are up-to-date)

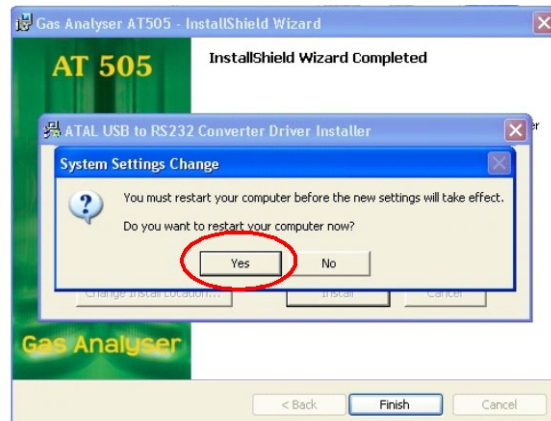


Fig. 67 – A system request for restarting the system – it is recommended to perform the restart (Yes)

## 2.2 ADAPTER USB-RS232 FINAL INSTALLATION

1. Initiation of the converter installation is dependent on successful Gas Analyser installation.
2. Connect the converter to the PC (insert it into a free USB port)
3. The device should be detected, see Fig. 58.
4. The hardware installation is straightforward and is guided by the installation wizard on the PC screen.

### Note:

The language of the Wizard will correspond to your language version of Windows.

The following series of figures was taken from the installation wizard for the Windows XP operating system. The wizard for Windows Vista is similar:

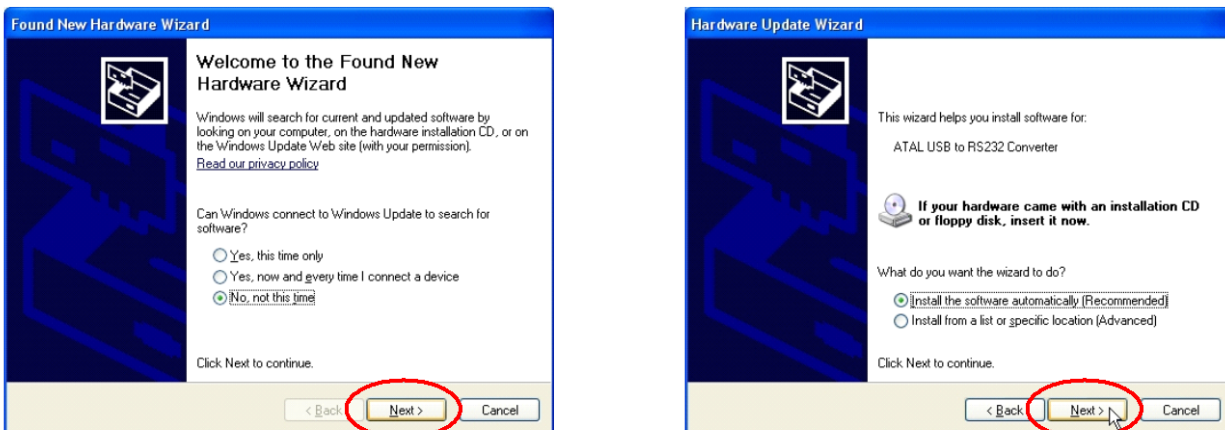


Fig. 68 – New Hardware Found Wizard (Windows XP). Proceed with the installation by clicking "Next"

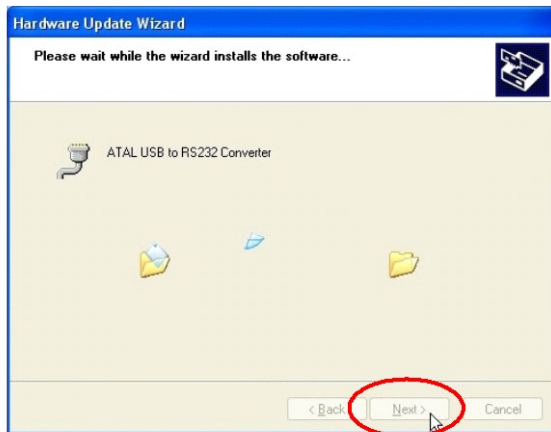


Fig. 69 – A warning from Windows XP is displayed (for further details see the Note below)

Note to Fig. 69:

A warning by Windows XP informs that the driver is not certified by Microsoft. This **notification can be displayed** in the process of installation several times and it can be **ignored without any concerns!**



Fig. 70 – Click on "Finish" to complete the installation



Fig. 71 – Info tip about the successful installation of the device (Windows XP)



### 1. INTRODUCTION



Fig. 72 – Infrared remote control AT 157 and RC receiver

The infrared remote control AT157 (hereinafter referred to as RC) is supplied as standard with the analyser. It allows the operator to carry out an emission test from the drivers seat of the vehicle.

The remote control receiver module is connected to a free USB port.

The use of the **RC** is very intuitive as the symbols on its keys correspond to the symbols used in the emission programs during tests.

### 2. INSTALLATION AND UNINSTALLATION (REMOVAL) OF REMOTE CONTROL PROGRAM

#### 2.1 INSTALLATION OF REMOTE CONTROL

If you install the program on a computer with Windows 2000 / XP / Vista operation systems, you must have administrator rights.

**Warning:**

- 1) The receiver should not be connected to a USB port before program installation.
- 2) If you install a newer version, first exit the RC program if it is running. This will help avoid potential problems after the update.

If the latest RC version is already installed on your system, then you will not have to install it again.

Click the option **Remote Control – Installation –** in the menu (see Fig. 73).



**Note 1:**

If the CD does not run automatically, run the **autorun.exe** program which you will find in the root directory on the CD.

The installation of the **RC** program is intuitive, using the Installation Wizard displayed on the PC display.

**Note 2:**

The default language of the Wizard is English but it can correspond to your language version of Windows.

Fig. 73 – Selection for remote control installation (your version may be different)

The following series of figures comes from the Installation Wizard for Windows XP operation system. The wizard for Windows Vista is similar:

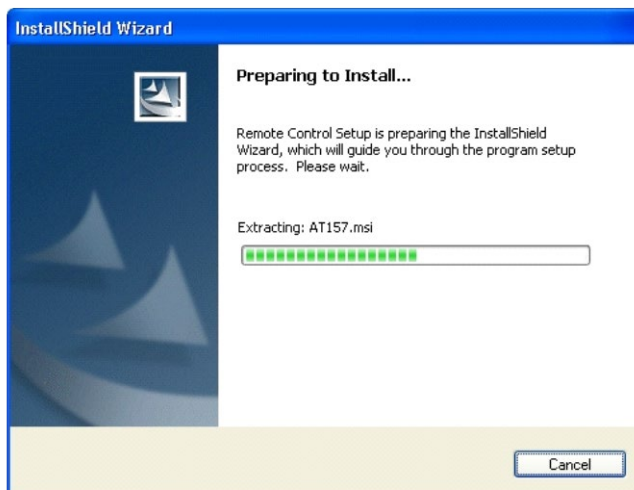


Fig. 74 – Installation can be interrupted at any time by clicking on "Cancel"

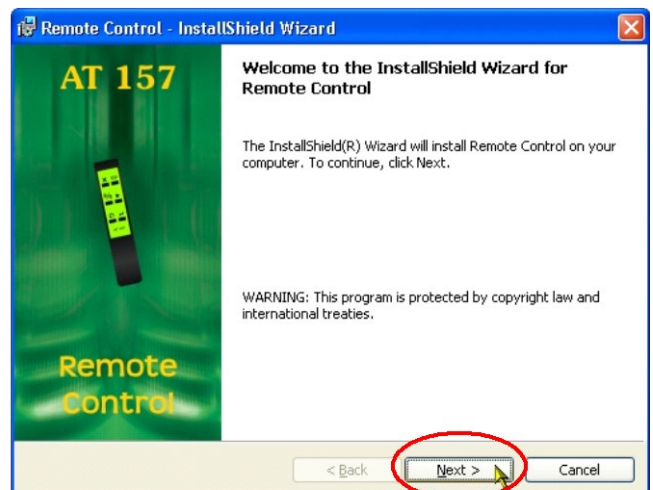
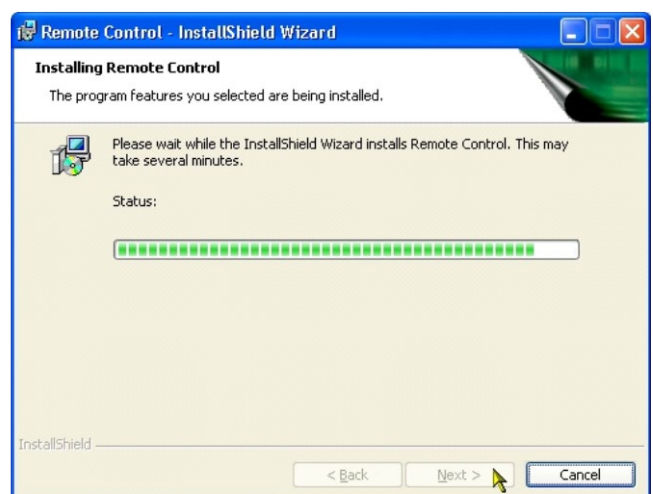
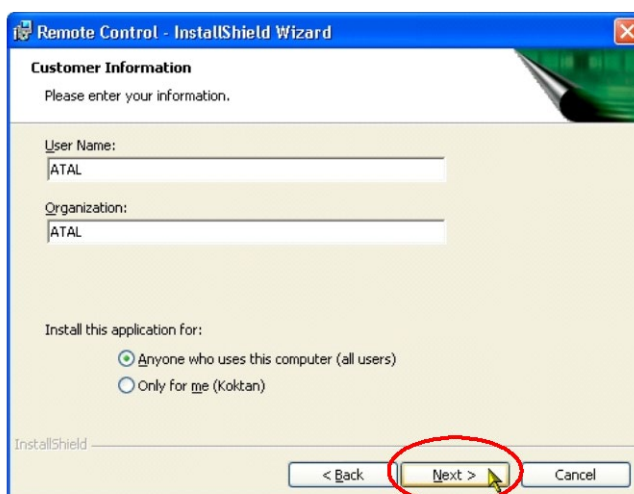


Fig. 75 – Proceed with the installation by clicking "Next"



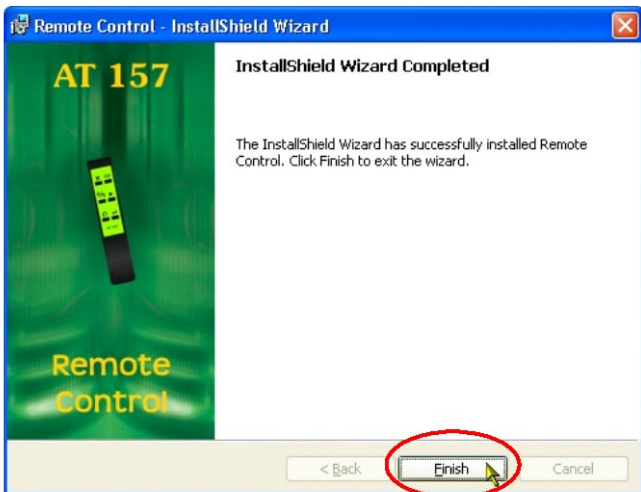


Fig. 76 – Click on "Finish" to complete the installation

Installation may take several seconds. Click on "Finish" to complete the installation.  
The installation of drivers for the RC receiver follows (see chap. Chap. I - 2.3.1)

## 2.2 UNINSTALLATION (REMOVAL) OF THE REMOTE CONTROL PROGRAM

### Note:

The default language of the Wizard is English but it can correspond to your language version of Windows.

To uninstall the program open the installation dialogue. There are two ways of achieving this:

a) Click on **Add or Remove Programs** in the Control Panel. Then click on "Remove" (Fig. 77). Confirm this choice in the dialogue box (see Fig. 78) and the **program will be removed promptly and without further warning**

### Note:

Open the Add or Remove Programs by clicking **Start, Control Panel** and double-clicking **Add or Remove Programs**.

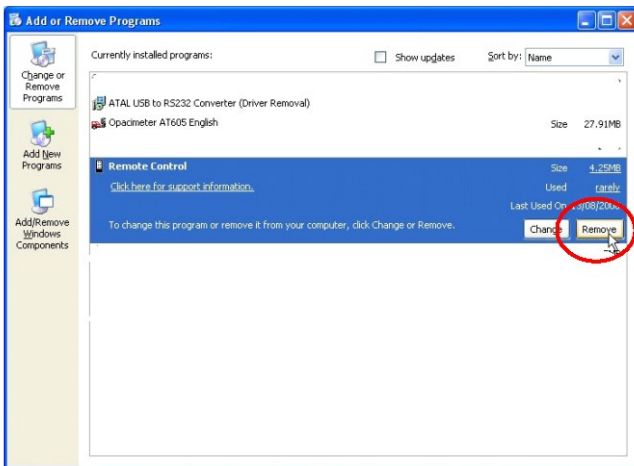


Fig. 77 – Removing the Remote Control program by selecting the Add or Remove Programs in the Control Panel

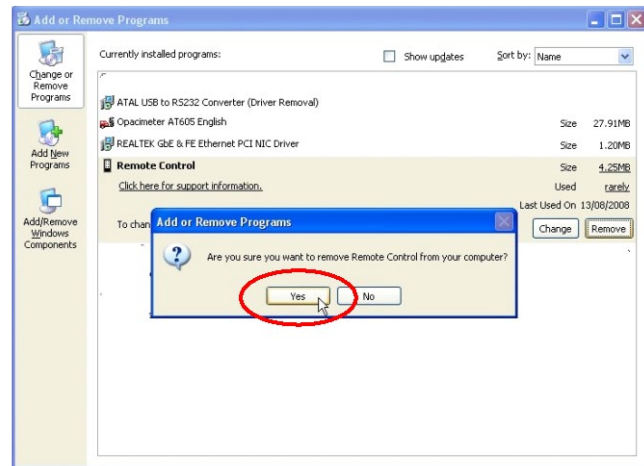


Fig. 78 – Confirm that you really want to remove the program

b) Click on the menu item **Remote Control – Installation –** see Fig. 73 (Autorun.exe on the installation CD must be launched). Then click on "Remove" (Fig. 79). Confirm your choice in the dialogue box (Fig. 80) and the Installation Wizard (Fig. 81) will **immediately remove the program**.

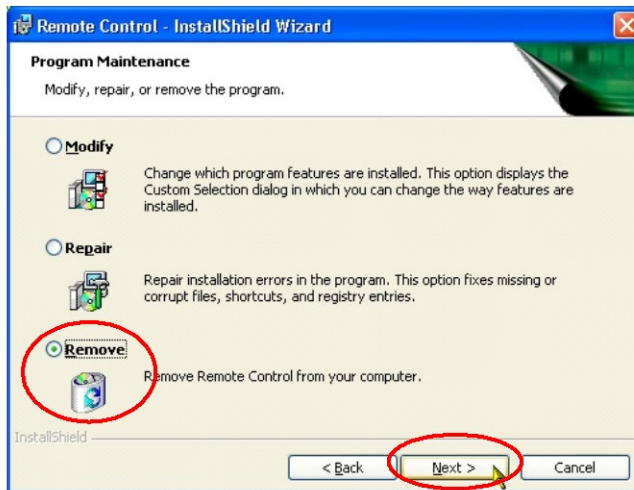


Fig. 79 – After you have clicked on “Remove” and confirmed your choice, the removal of the program will start

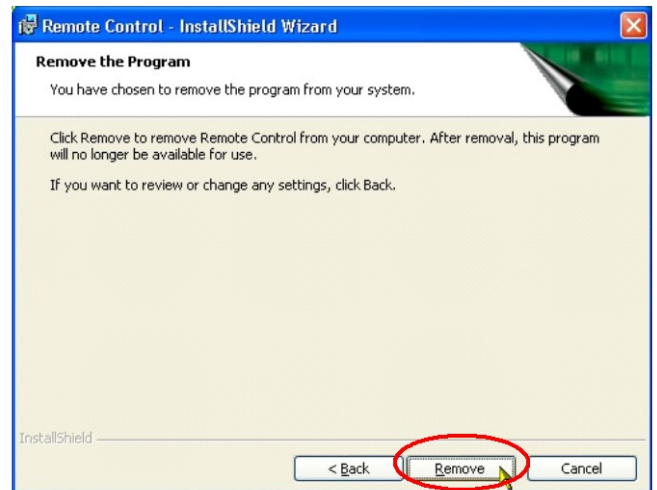


Fig. 80 – To proceed with removal confirm that you really wish to remove the program

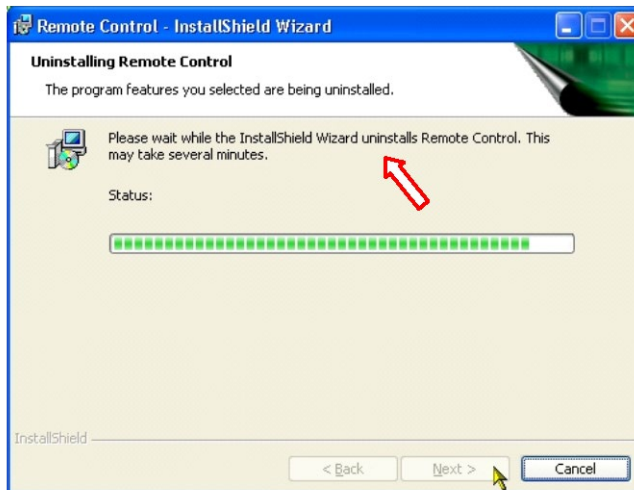


Fig. 81 – Removal may take several seconds. Click on “Finish” to complete removal



### 2.3 INSTALLATION OF THE REMOTE CONTROL RECEIVER



Fig. 82 – Remote control receiver

The RC receiver enables communication between the analyser station PC and the RC.



### 2.3.1 INSTALLATION OF DRIVERS FOR THE RECEIVER

After you have clicked on the “Finish” button to complete the Remote control installation (see Fig. 76), it is necessary to install the drivers for the Remote control receiver.

At the start of the installation wizard (see Fig. 83) a search for older (invalid) drivers takes place (see Fig. 84).

The following series of figures was taken from the installation wizard for Windows XP. The wizard for Windows Vista is similar:

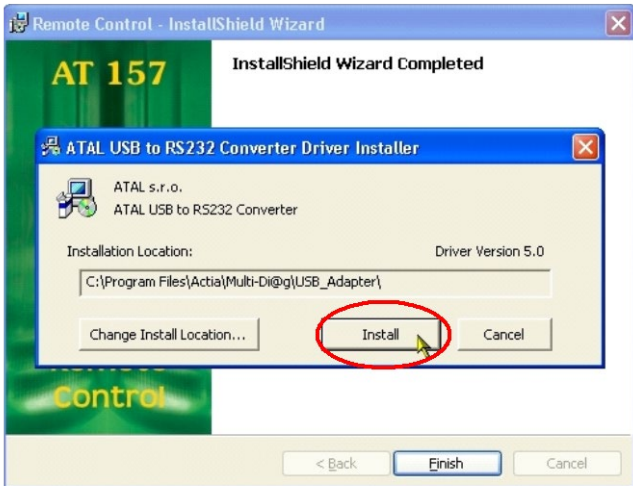


Fig. 83 – Start of the installation of RC receiver drivers

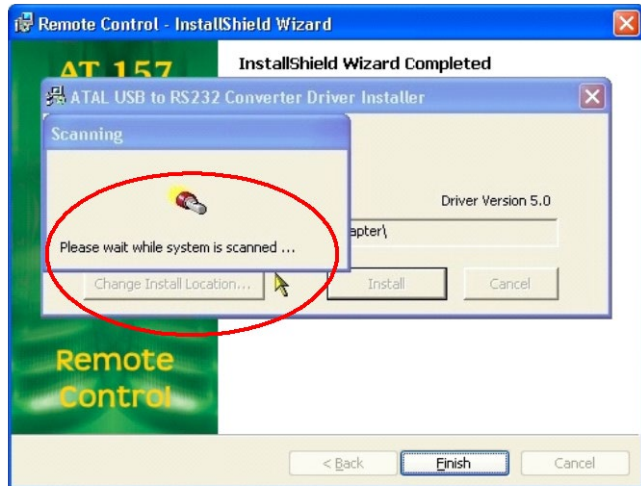


Fig. 84 – Search for older (invalid) drivers

- a) **If old drivers are detected**, information about their presence will be displayed (see Fig. ) together with a suggestion for their removal. It is recommended that you remove the old drivers.



Fig. 85 – The result of a search for old drivers – it is recommended to uninstall them (Yes)



Fig. 86 – A warning from Windows XP is displayed (for further details see the Note below)

The driver installation ensues. These will be used during the new hardware wizard which runs after the connection of the RC receiver to a free USB port. Installation ensures that the installation CD will not be necessary again.

#### Warning:

If the old drivers are not removed, the new drivers will not be installed and correct operation of the RC receiver cannot be guaranteed.

#### Note to Fig. 86:

A warning from Windows XP informs that the new driver is not certified by Microsoft. This **notification can be displayed** in the process of installation several times and it is possible to **ignore it without any concerns!**



When the installation of the new drivers is complete, a notification is displayed recommending that the system is restarted (see Fig. ). It is recommended to perform this restart.

- b) **If up-to-date drivers are detected**, the information about their presence will be displayed (see Fig. 87) and the RC installation will be complete.



Fig. 87 – The result of a search for old drivers (in this case the drivers are up-to-date)



Fig. 88 – A system recommendation for restarting– it is recommended to perform the restart (Yes)

### 2.3.2 RC RECEIVER FINAL INSTALLATION

1. Installation can be initiated after successful RC installation.
2. Connect the RC receiver to the PC (insert it into a free USB port)
3. The device should be detected, see Fig. 89.
4. The hardware installation is straightforward and is guided by the installation wizard on the PC screen.



Fig. 89 – Info tip about the successful installation of the device (Windows XP)

#### Note:

**The language of the Wizard corresponds to your language version of Windows.**

The following series of figures was taken from the installation wizard for the Windows XP operating system. The wizard for Windows Vista is similar:

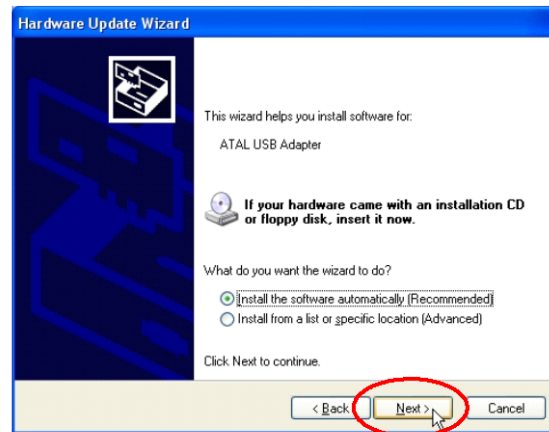


Fig. 90 – New Hardware Found Wizard (Windows XP). Proceed with the installation by clicking on “Next”

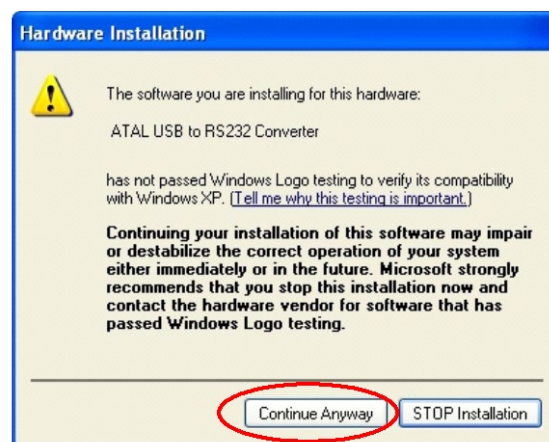
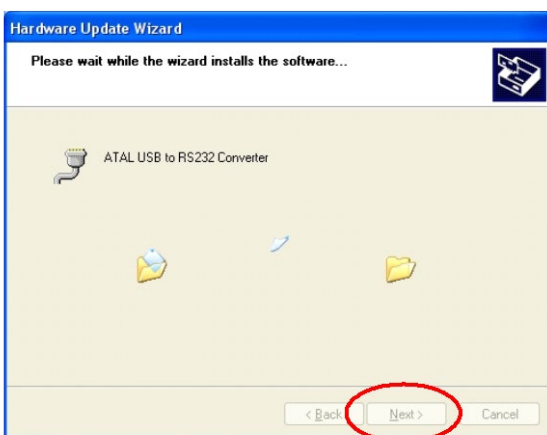


Fig. 91 – A warning from Windows XP is displayed (for further details see the Note below)

Note to Fig. 91:

A warning from Windows XP informs that the new driver is not certified by Microsoft. This **notification can be displayed** in the process of installation several times and it is possible to **ignore it without any concerns!**



Fig. 92 – Click on “Finish” to complete the installation



Fig. 93 – Info tip about the successful installation of the device (Windows XP)

### 3. STARTING REMOTE CONTROL PROGRAM

- a) Following successful installation, the program will run automatically.
- b) It can also be started by clicking on the Remote Control option in the “Start\Programs\Multi-Diag” program group (see Fig. 94).

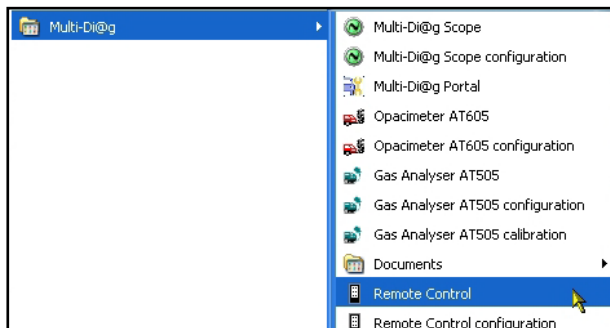


Fig. 94 – Multi-Di@g program group (Start \ Programs \ ...)

After installation the program will be configured to start automatically when Windows starts.

The program runs as a task shown by the remote control icon in the system tray (see Fig. 95).

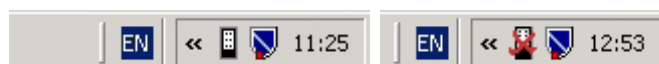


Fig. 95 – Icon in the system tray showing connected and disconnected remote control

#### 3.1 REMOTE CONTROL CONFIGURATION

The RC has its own configuration utility called “Remote Control configuration” which can be opened from the “Start\Programs\Multi-Di@g” program group (see Fig. 96).

##### Warning:

**You must have administrator rights to open the RC configuration program**

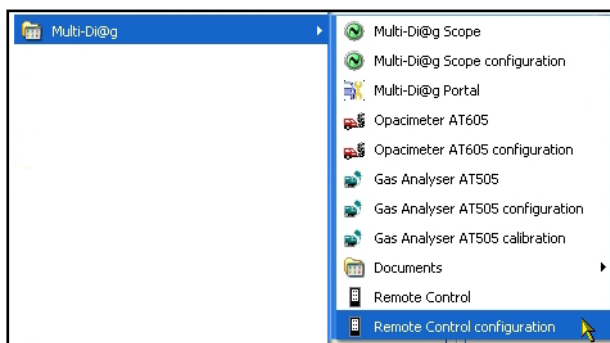


Fig. 96 – Remote control configuration - Multi-Di@g program group (Start \ Programs \ ...)

##### 3.1.1 SETTING THE COMMUNICATION PORT OF THE REMOTE CONTROL RECEIVER

The following dialog displays after launching the configuration utility.

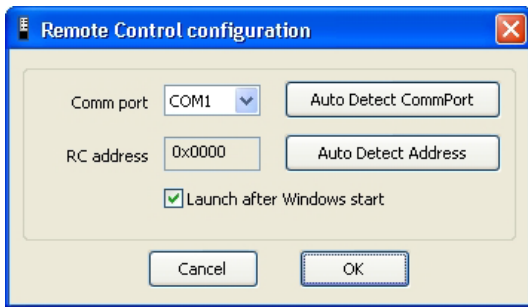


Fig. 97 – Remote control configuration

You can manually enter the port number which the RC is connected to.

### Recommendation:

If you do not know or are not sure which port the **RC** is connected to, use auto detection feature by clicking the **“Auto Detect CommPort”** button (see Fig. 98). You will then be prompted to hold any button of the remote control while auto detection is in progress (see Fig. 99). Thus the **RC** can be detected automatically (see Fig. 100).

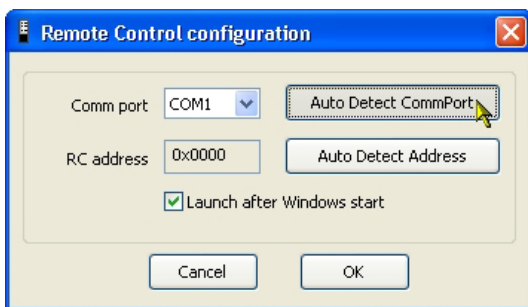


Fig. 98 – Launching auto detection function to determine the remote control communication port

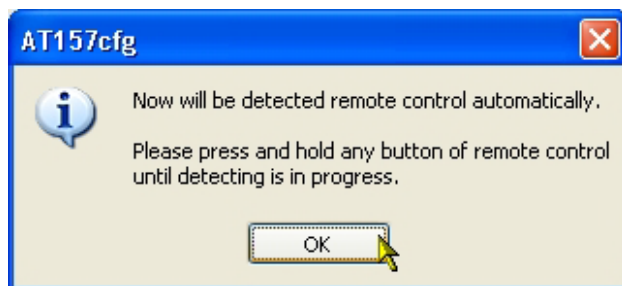


Fig. 99 – Information dialog for auto detection of the remote control port

If auto detection is successful, a message is displayed and the detected port number is automatically filled in. (Fig. 100).

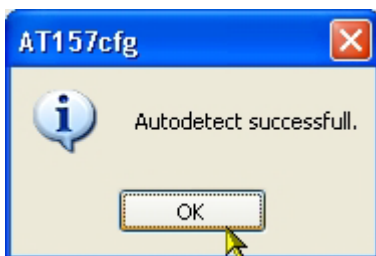
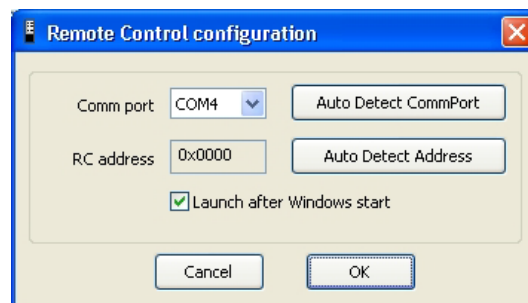


Fig. 100 – Notification of a successful auto detection of the remote control



Otherwise a warning message about unsuccessful automatic detection is displayed (see Fig. 101).

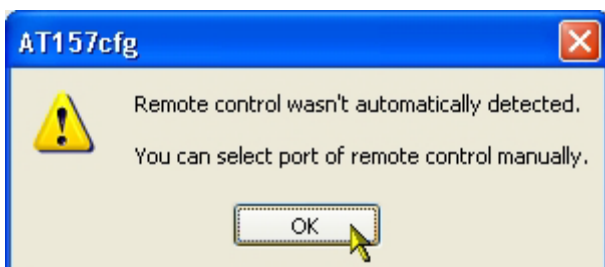


Fig. 101 – Warning message about unsuccessful auto detection of the remote control

In such a case it is necessary to check whether:

- 1) The **RC** receiver is connected to the PC
- 2) Batteries in the **RC** are OK
- 3) Alternatively try to set the port manually

**However auto detection should work in the vast majority of cases..**

### 3.1.2 SETTING THE ADDRESS OF THE REMOTE CONTROL TRANSMITTER

For the correct function of the **RC** it is necessary to set the address of the transmitter (if there are several **RCs** in the workplace, you should assign a unique address to each **RC**).

You should proceed by clicking on the “**Auto Detect Address**” button (see Fig. 102). The user is informed that they should click on any button of the **RC** several times while address detection is in progress (see Fig. 103).

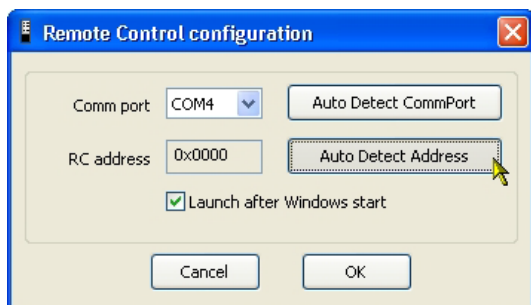


Fig. 102 – Launching auto detection function to determine the remote control address



Fig. 103 – Information dialog for setting the remote control transmitter

The user should confirm the information message and then click on any RC button. If the communication port is set correctly, the address will be detected after pressing any button roughly five times.

The user is informed about address detection by a short message (see Fig. 104).

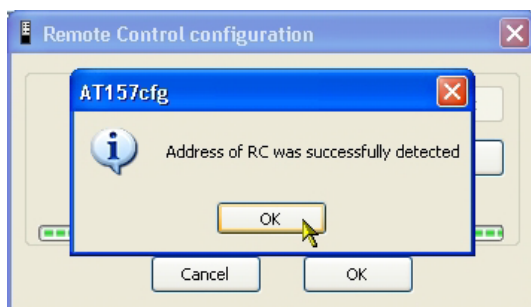


Fig. 104 – Information dialog about successful auto detection of the RC transmitter address

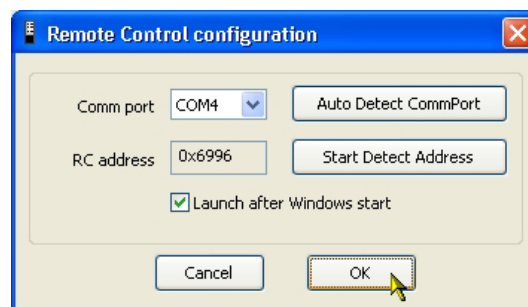


Fig. 105 – Save the changes in the RC configuration and exit

If the address is not detected even after several button presses, then the communication port for the RC is probably incorrectly set or the RC receiver is not connected.

#### Warning:

##### 1) “Launch after Windows start” should remain ticked.

If it is unticked, the program will not start automatically when Windows starts. Then you will always have to run the program manually from the Start menu (see Fig. 94).

##### 2) At the end of configuration, always remember to click on the “OK” button! (see Fig. 105).

Thus any modifications are saved. If you click on the “Cancel” button, no changes to the settings are made.

### 3.2 REMOTE CONTROL TESTING

The RC icon in the system tray changes depending on whether the **RC** is connected and correctly configured:



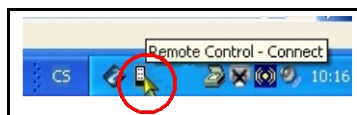
Fig. 106 – Remote control is connected and configured



Fig. 107 – Remote control is disconnected or wrong communication port is set

### Warning!

If you set for instance **COM 2** as the existing port, but the **RC** is physically connected to **COM 1**, then it will not work despite the fact that the icon signals functional state. You can check whether the **RC** is correctly configured and functioning by selecting the option “**Test remote control**” in the menu (available by right-clicking on the RC icon - see Fig. 108).



“**Exit**” – Exit the program. The program automatically ends when Windows is closed down.

“**About ...**” – about the program ...

Fig. 108 – RC context menu

A remote control dialog will then be displayed on the screen (see Fig. 109). Now if you push any **RC** button (see Fig. 110), the relative button on the screen will turn green for a short time (see Fig. 111).

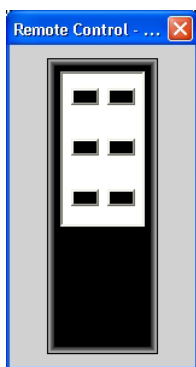


Fig. 109 – Remote control dialog displayed before operating the test



Fig. 110 – Push a button on the remote control

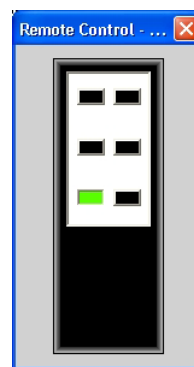


Fig. 111 – Evaluation of the remote control test

## 4. INFORMATION ABOUT SOFTWARE VERSION

If you click “**About ...**” information about software, version number, etc. is shown (see Fig. 112).



Fig. 112 – Information about software version (your version may be different)



Notes: