GEFRAN

COPS-1

(Calibrator for electrical stroke ONPP-A)

*S*OFTWARE INSTALLATION AND
OPERATION MANUAL

CODE **85195A**_ *E*DITION *05-2014*

GEFRAN

COPS-1
Software Installation and Use Manual

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1. Introduction

The GEFRAN COPS-1 software allows user to adjust the value of the output signal of Gefran ONPP transducers, regarding its zero and full scale positions.

2. Hardware installation

The Gefran COPS-1 software communicates via RS232 serial interface with Gefran COPS-1 device.

The transducer must be properly powered and connected to Gefran COPS-1.

Requirements:

1 Gefran COPS-1 device
1 RS232 serial interface
1 multimeter
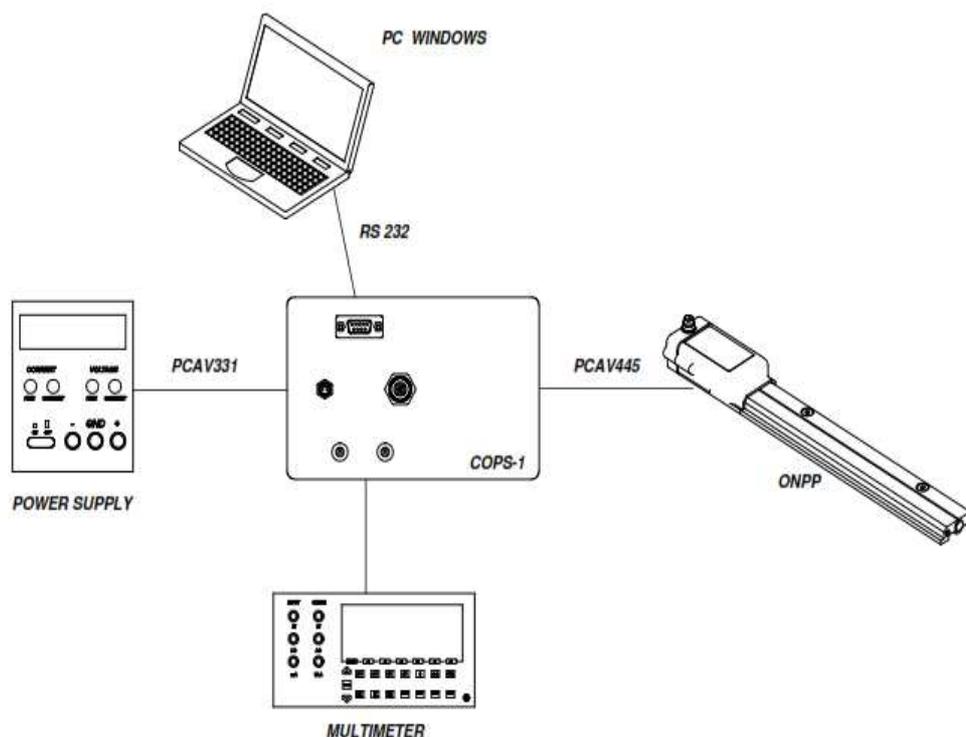
3. Installation of "Gefran COPS-1" software

The installation package of the software consists of 2 files:

1) Gefran COPS-1.msi
2) setup.exe

To start the installation process, double-click the file "setup.exe". This opens the following window:
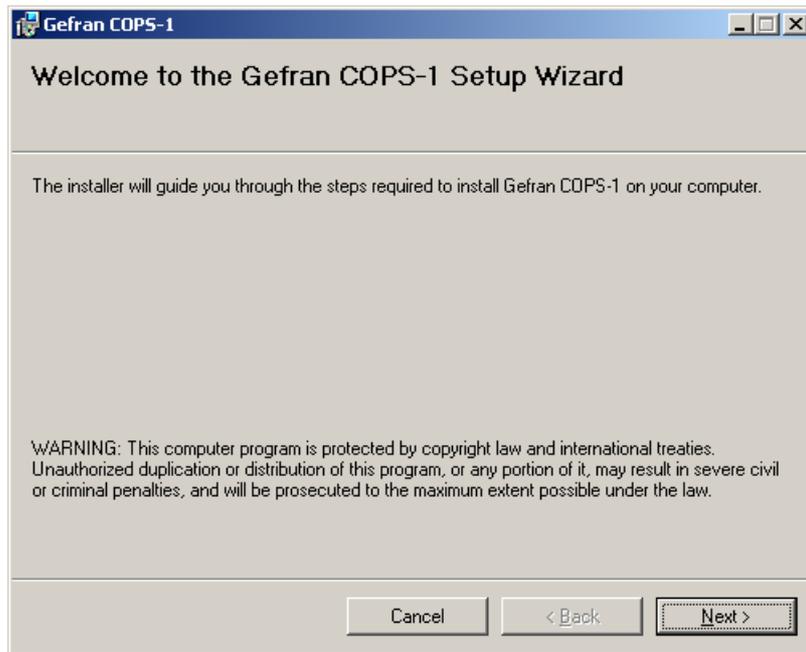
Figure 1. Installation (1)

Press Next to continue.

Note: If your computer has not installed the Microsoft. NET Framework 2.0, a message will be prompted asking for its installation. The component will be downloaded from Microsoft website. Follow the instructions on the screen to complete the process.
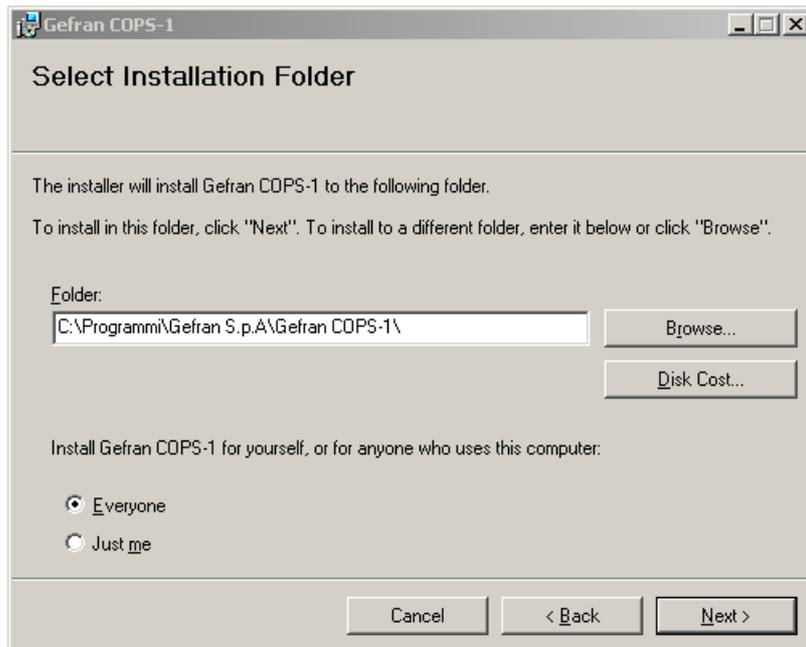
Figure 2. Installation (2)

Select installation folder through "Browse" button. Specify if you want to install the program for everyone (default setting) or only for the current user.
Press Next to continue.
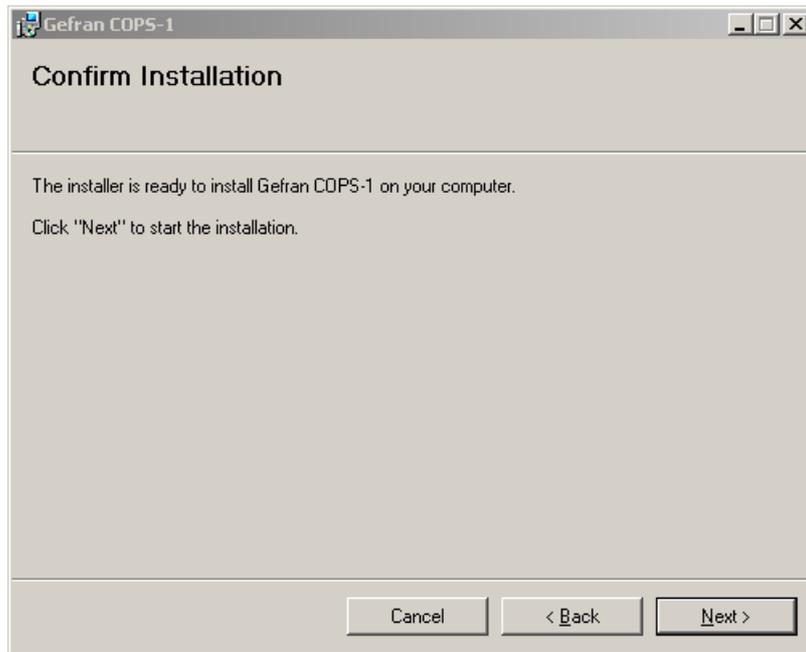
Figure 3. Installation (3)

Press Next to start installation process.
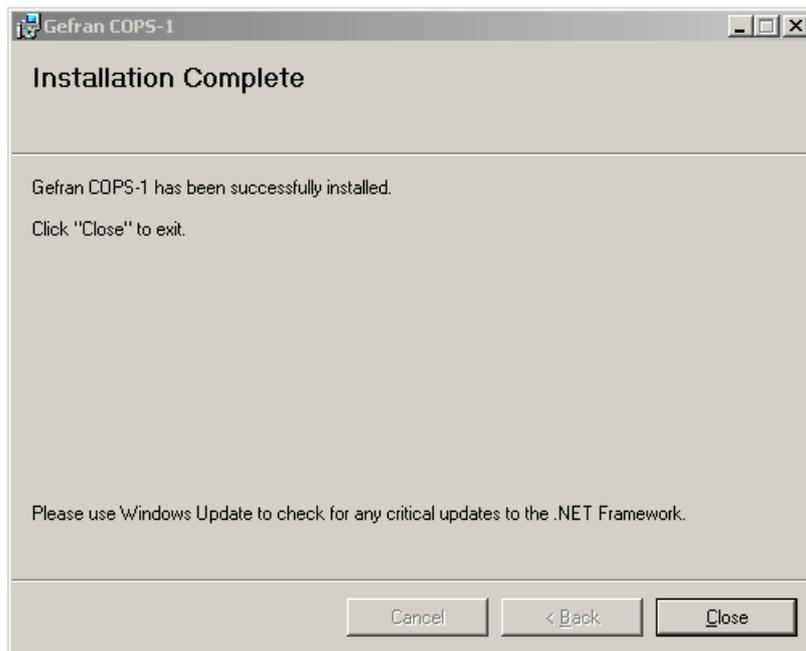
Figure 4. Installation (4)

Installation is completed. The installer creates application shortcuts on the desktop and inside the Start menu.

Uninstall: from Control Panel -> Add or Remove Programs (or equivalent depending on Windows version), locate the "Gefran COPS-1" entry to uninstall the application.

Note: before installing a new software version, or before reinstalling the same software version, the current version must be uninstalled.

4. Using the Software

The software can be launched:
1) from the Desktop (Gefran COPS-1 icon)
2) from the Start menu (Gefran S.p.A. -> Gefran COPS-1)
At the first start you need to configure some settings. The software looks like the image below.

Figure 5. Main screen, first use

4.1. Application Settings

Click on Options-> Settings
This opens the following window.
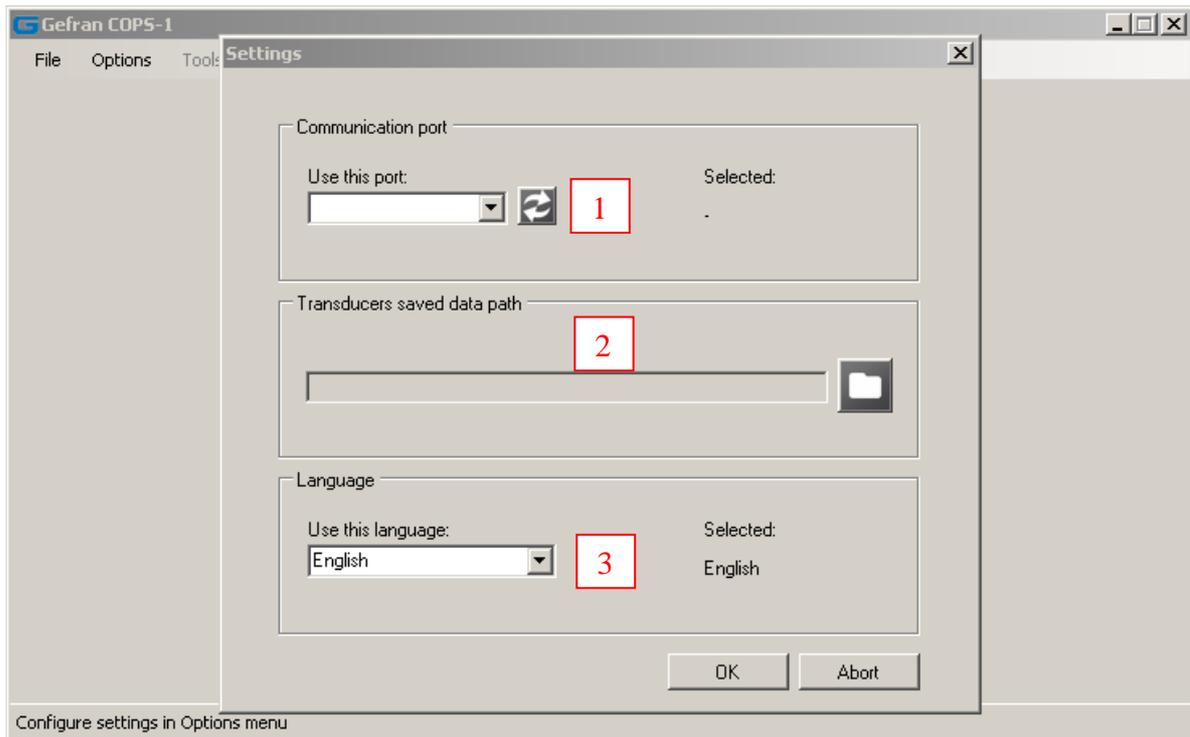
Figure 6. Options (1)

Specify the following settings:
- COM port [1]: the available ports appear in the combo box, select the one you want to use. If a COM port is connected or disconnected while the software is open, you can update the list by pressing the "Update" button.
- Transducers saved data [2]: Specifies where to save the file containing the original parameters of the used transducers. Creating and using the same folder for all users who will be using the software is recommended. Use a shared folder for authorized users.
- Language [3]: You can choose the language for the user interface. English, Italian, German, French, Portuguese and Spanish are available. If you select a language other than the one currently in use, you are prompted to restart the application.
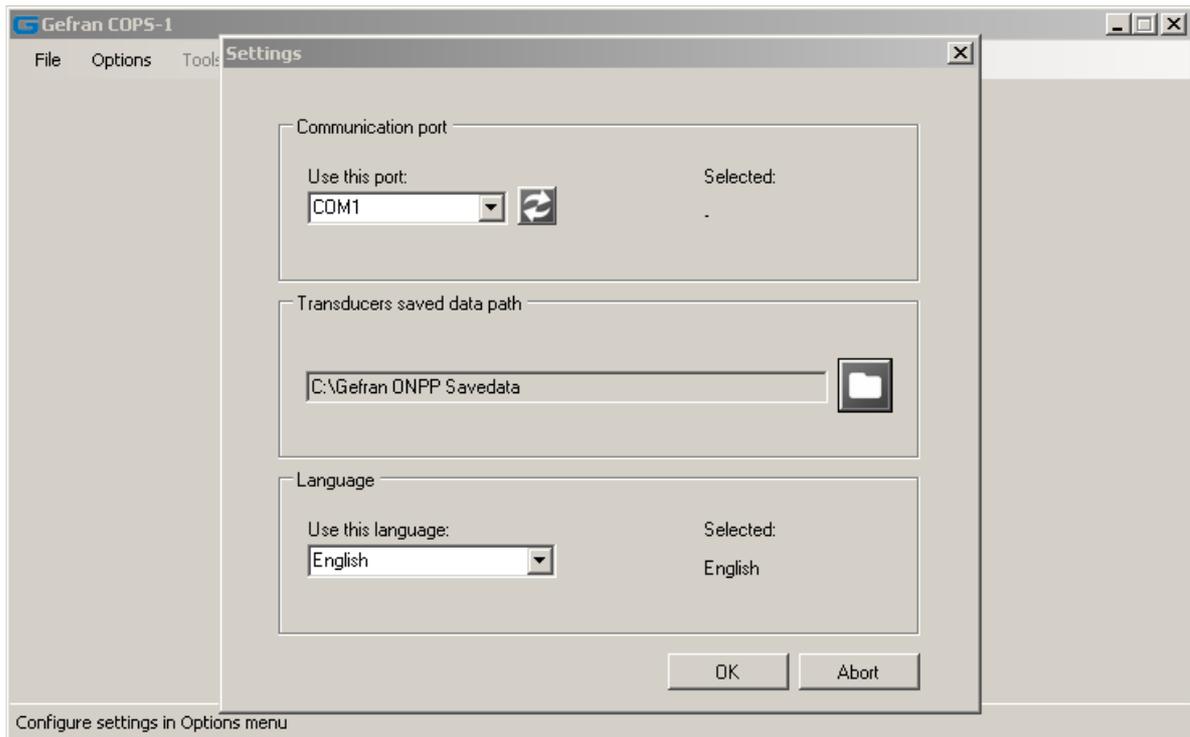
Figure 7. Options (2)

When finished, press OK to store your settings. If you select a different language you will be prompted to close and reopen the application in order to apply language changes.

4.2. Transducer Adjustment Procedure

After configuring all settings, the main screen looks like the image below.
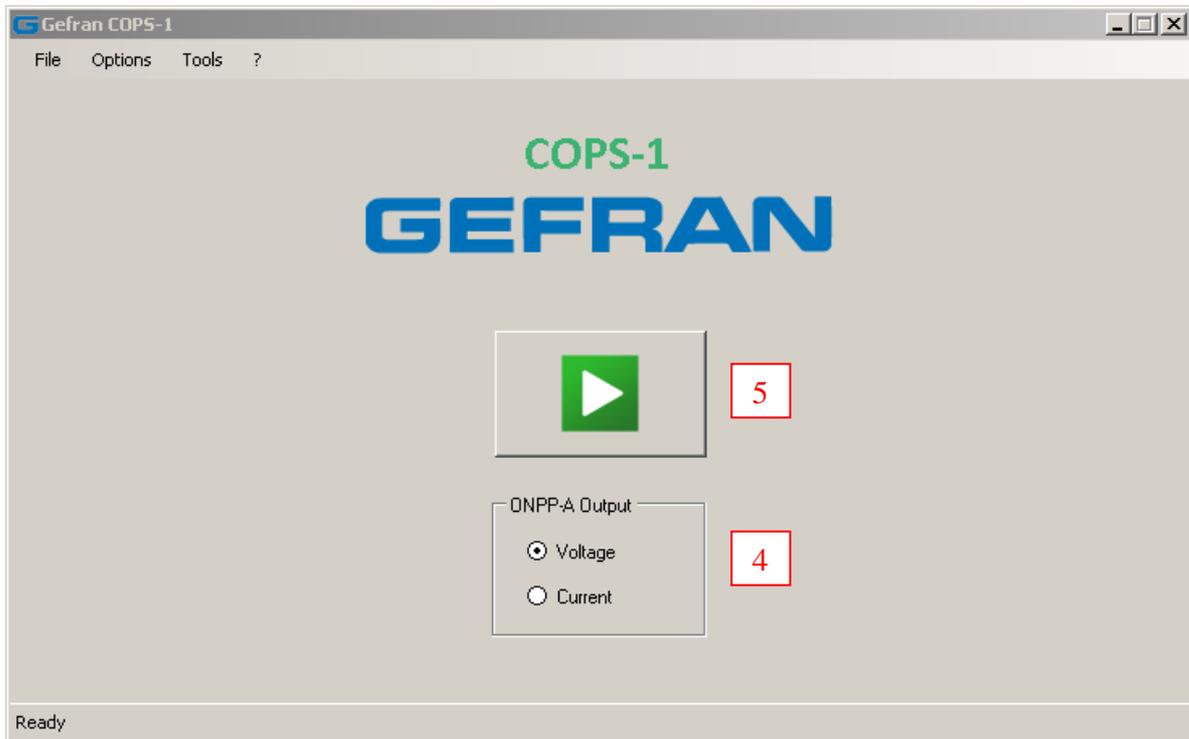
Figure 8. Software is configured and ready

Connect and power on the hardware. Select the transducer type [4] connected to the COPS-1 (ONPP-A with voltage output or ONPP-A with current output), then press the central button [5] to start the communication with the transducer.

Depending on the selected transducer, the software changes the multimeter output. With a current-output transducer, the output signal is switched on a 500 Ω resistance.

NOTE:

1) At power-on (power-off) of the COPS-1, the multimeter output is set by default for ONPP-A with voltage output

2) The regulation range of the ONPP-A transducer with voltage output, read through the COPS-1 multimeter output, is 0,5…9,5 V

3) The regulation range of the ONPP-A transducer with current output (2..20 mA), read through the COPS-1 multimeter output, is 2,4…9,6 V (R = 500 Ω)

FIRST USE OF A TRANSDUCER

When you first use this software on a given transducer, a file called "Parameters File", containing the initial configuration of the operating parameters of the transducer, is saved to disk.

The Parameter File is saved in the folder specified by the user (see the Options window). If everything is configured and connected properly, the transducer will be recognized by the software and the following screen will be showed.
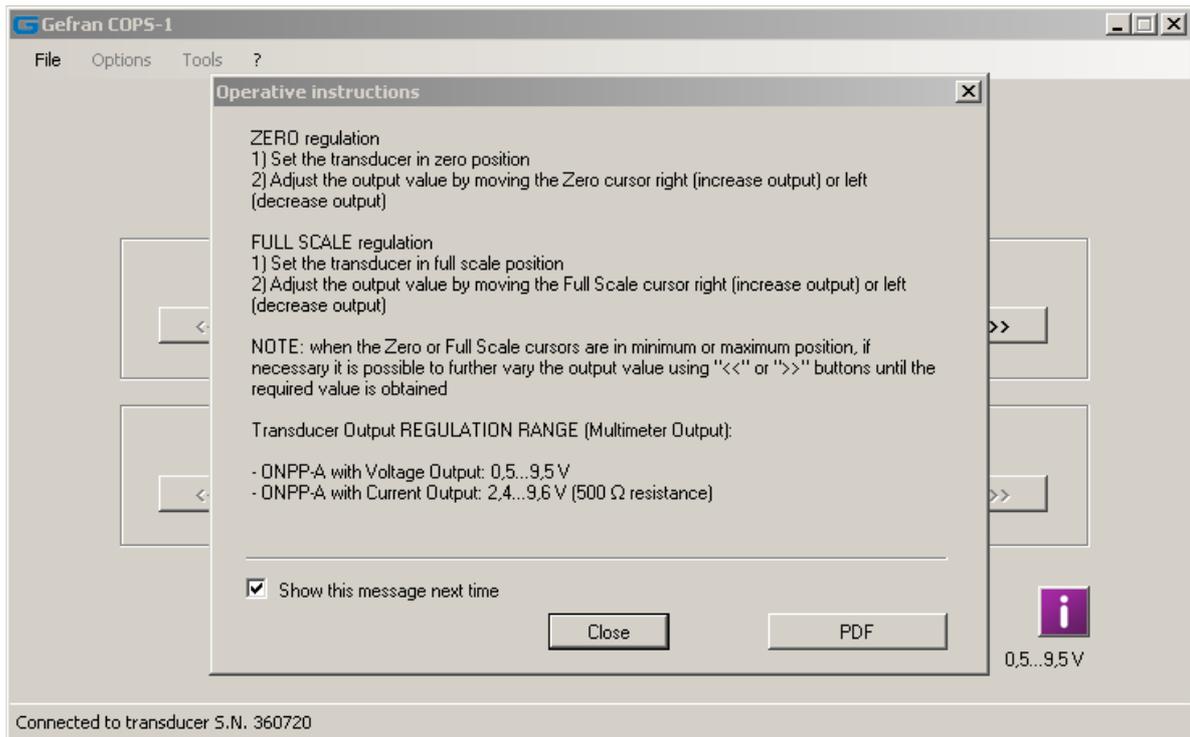
Figure 9. Transducer correctly recognized

The File Parameters of the sensor used will appear Inside the saving data folder. The file is a text file (*. Txt) named with the Serial Number of the transducer, in this way:
"GEFRAN_ONPP__SN_XXXXXX"
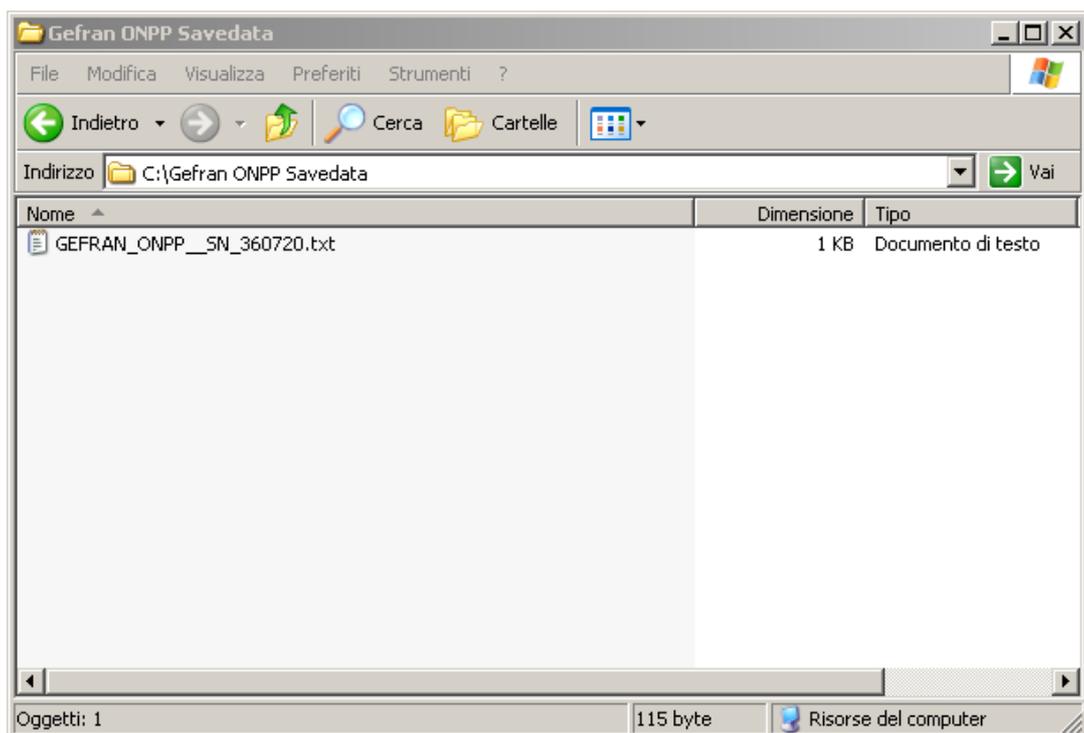
Figure 10. Parameters File folder

NOTE: If this is the first time you program a transducer, it is advisable to make a backup copy of the file and keep it in a safe place.

NOTE: If the file is deleted, the software will detect the transducer as if it were the first time, creating and saving a new parameter file. It is therefore advisable not to clear the Parameter Files created. Always use the same folder for saving data.

NEXT USES OF THE TRANSDUCER

If the software "Gefran COPS-1" is used again on the same transducer, it will be asked whether to overwrite the existing parameter file, saved on disk, with a new one containing the parameter values read from the sensor currently connected. This will display a message like the following:

Figure 11. Confirm Parameters File overwrite

If there is not a particular reason, for example after updating the firmware of the transducer, or after a repair of the transducer by Gefran, you should not overwrite the file.
In any case it is recommended to periodically create a backup copy of the parameter file. They will be used for example for a recovery of the transducer (see below).

REGULATING THE TRANSDUCER

After the correct detection of the sensor, a new screen will appear. It contains the controls for interactively adjusting the output level of the zero and full scale positions of the transducer.

IMPORTANT NOTE: If you are using a ONPP-A transducer with current output, DO NOT turn off the COPS-1 until the transducer is in "connected state". Otherwise, at the next power-on of the COPS-1, the multimeter output is automatically set as "ONPP-A voltage output type", so the reading is not correct. Only after pushing the "Connect" button [5] the multimeter output is switched depending on the selection of the multimeter output type.
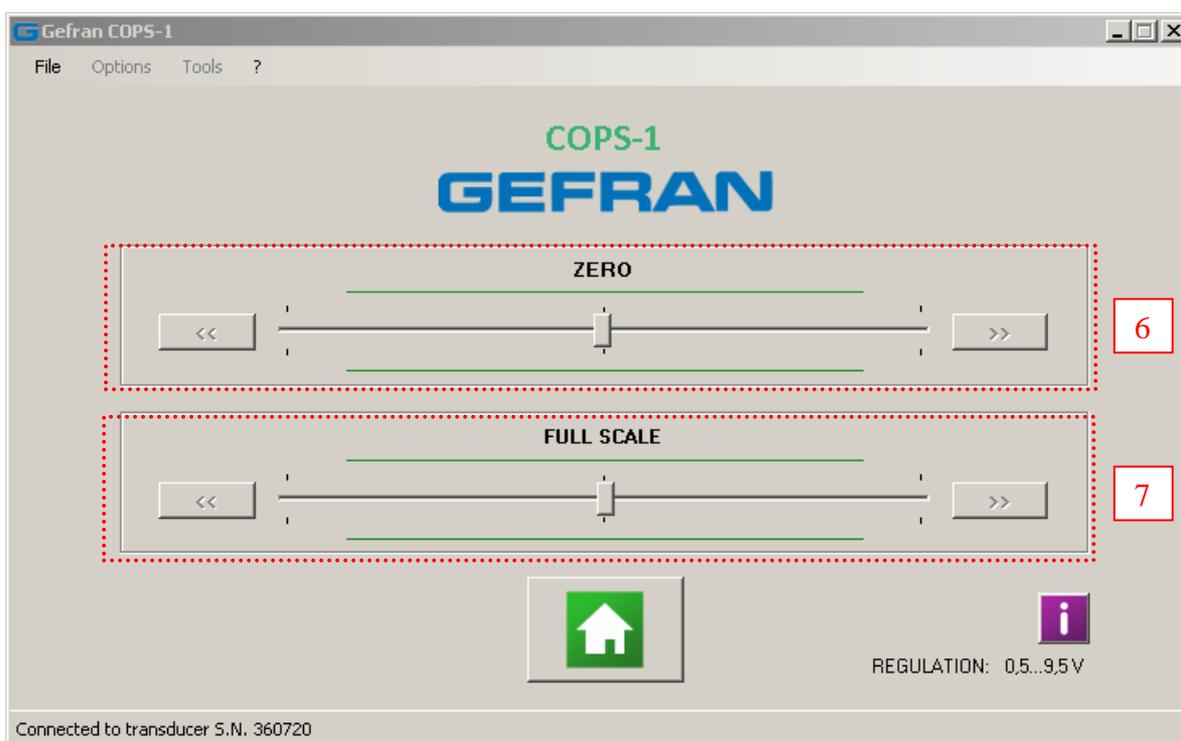
Figure 12. Zero and Full Scale output level regulation (1)

The controls available to the user are divided into two groups:
- Controls for adjusting the output of the transducer relative to the zero position [6]
- Controls for adjusting the output of the transducer relative to the full scale position [7]

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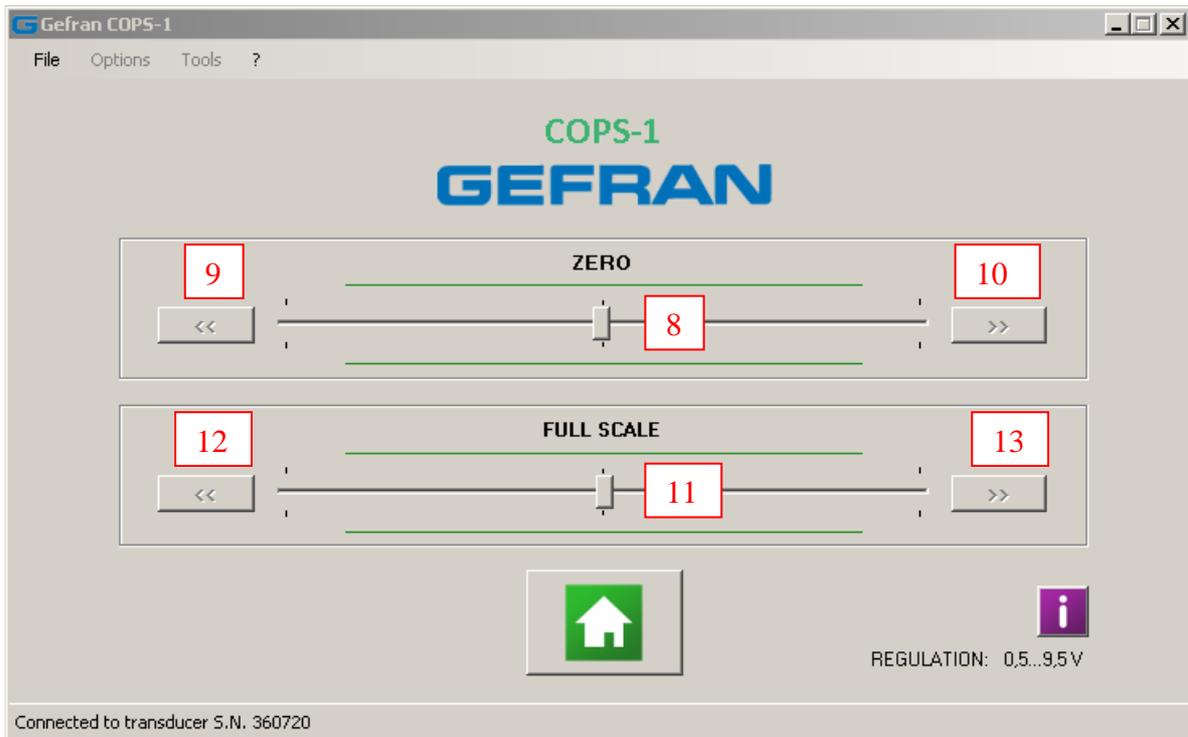
Figura 13. Zero and Full Scale adjustment controls

Inside each group, there are three controls. Controls [8], [9] and [10] are used for zero adjustment, controls [11], [12] and [13] are used for full scale adjustment.

The adjustment is done by moving the slider on the trackbar ([8] for the zero and [11] for the full scale) to the left to decrease the output signal of the transducer, or to right to increase it. To obtain a fine adjustment of the output signal, you can click with the mouse to the left or right of the cursor on the trackbar, or use the mouse wheel, or using keyboard arrows. When the cursor is completely moved to the left, the command [9] or [12] (for zero and full scale respectively) becomes active. If moving the cursor is not sufficient to obtain the desired output, this control allows to further lower the value of the output signal. Similarly, when the cursor is moved completely to the right, the command [10] or [13] (for zero and full scale respectively) becomes active. If moving the cursor is not sufficient to obtain the desired output, this control allows to further increase the value of the output signal.

When the mouse cursor is over the trackbar, the keyboard can be used to adjust the output value (see following table)

KEY	EFFECT
Right Arrow	Small increase of the output
Left Arrow	Small decrease of the output
Up Arrow	Small decrease of the output
Down Arrow	Small increase of the output
Page Up	Small decrease of the output
Page Down	Small increase of the output
Home	Move the cursor all the way left
End	Move the cursor all the way right

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Note: When the mouse cursor is over the zero trackbar, keyboard keys adjust the zero output. When the mouse cursor is over the full scale trackbar, keyboard keys adjust the full scale output

The output signal must be regulated considering the output type of the transducer (Voltage or Current):

OUTPUT	Multimeter reading at ZERO (V)	Multimeter reading at FULL SCALE (V)
Voltage	0,5	9,5
Current (R=500Ω)	2,4	9,6

Zero adjustment
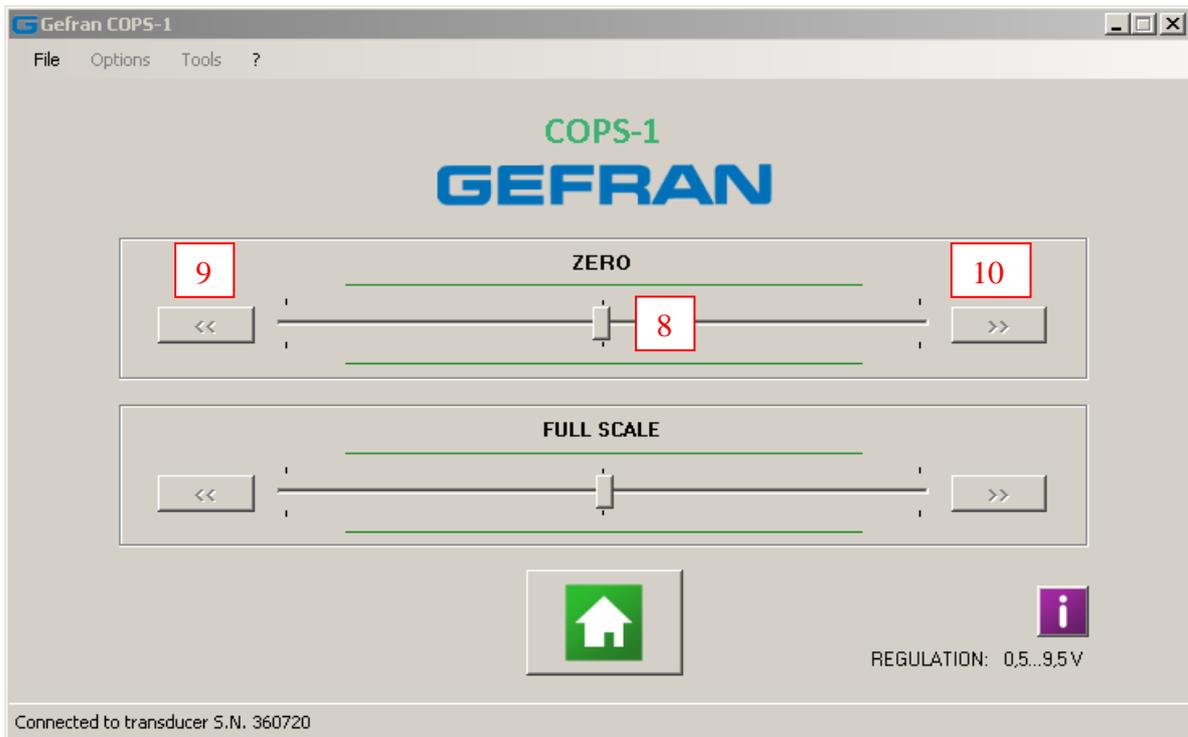
Figure 14. Zero adjustment controls

In order to adjust the output of the transducer in zero position proceed as follows:
1) Set the transducer in "zero position"
2) Move the zero cursor [8] to the left to lower the output signal of the transducer, to the right to increase the output signal of the transducer
3) Check the output signal from the transducer using the multimeter and move the zero cursor [8] until the required value is reached.

At this point there may be several cases:
- The output signal value has been reached and the zero cursor [8] is inside the green marked area → the procedure is terminated.
- The output signal value has been reached, but the zero cursor [8] is outside the green marked area. Proceed in this way:
    a. If the zero cursor [8] in on the left:
        i. Move the zero cursor [8] all the way left
        ii. Use the command [9] (if possible) to further lower the output value
        iii. Move right the zero cursor [8] and verify whether at the desired output value the cursor falls within the green marked area. If so, the procedure is terminated, otherwise restart from point a.i.
    b. If the zero cursor [8] in on the right:
        i. Move the zero cursor [8] all the way right
        ii. Use the command [10] (if possible) to further increase the output value
        iii. Move left the zero cursor [8] and verify whether, at the desired output value, the cursor falls within the green marked area. If so, the procedure is terminated, otherwise restart from point b.i

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- The zero cursor [8] has been completely moved left, but the desired output signal level has not yet been reached (should be further lowered). Proceed in this way:
    a. use the control [9] (if possible), to further decrease the output, until the signal level read on the multimeter is below the required signal value
    b. move the zero cursor [8] right to obtain the required output signal level from the transducer. Now, if the cursor falls within the green marked area in correspondence with the required output signal level, the procedure is terminated. Otherwise, move the zero cursor [8] all the way left and restart from point a.
- The zero cursor [8] has been completely moved right, but the desired output signal level has not yet been reached (should be further increased). Proceed in this way:
    a. use the control [10] (if possible), to further increase the output, until the signal level read on the multimeter is higher than the required signal value.
    b. move the zero cursor [8] left to obtain the required output signal level from the transducer. Now, if the cursor falls within the green marked area in correspondence with the required output signal level, the procedure is terminated. Otherwise, move the zero cursor [8] all the way right and restart from point a.

Full Scale adjustment
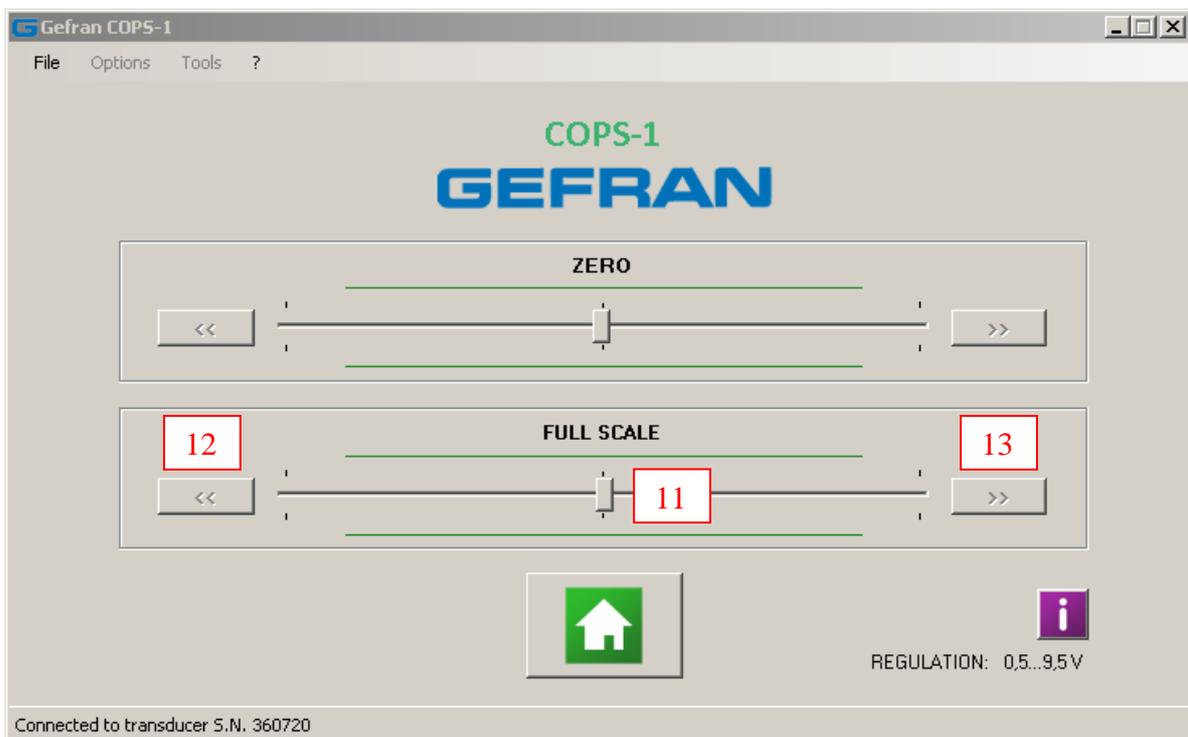
Figure 15. Full Scale adjustment controls

In order to adjust the output of the transducer in zero position proceed as follows:
1) Set the transducer in "zero position"
2) Move the full scale cursor [11] to the left to lower the output signal of the transducer, to the right to increase the output signal of the transducer
3) Check the output signal from the transducer using the multimeter and move the full scale cursor [11] until the required value is reached.

At this point there may be several cases:
- The output signal value has been reached and the full scale cursor [11] is inside the green marked area → the procedure is terminated.
- The output signal value has been reached, but the full scale cursor [11] is outside the green marked area. Proceed in this way:
  - a. If the full scale cursor [11] in on the left:
    - i. Move the full scale cursor [11] all the way left
    - ii. Use the command [12] (if possible) to further lower the output value
    - iii. Move right the full scale cursor [11] and verify whether at the desired output value the cursor falls within the green marked area. If so, the procedure is terminated, otherwise restart from point a.i.
  - b. If the full scale cursor [11] in on the right:
    - i. Move the full scale cursor [11] all the way right
    - ii. Use the command [13] (if possible) to further increase the output value
    - iii. Move left the full scale cursor [11] and verify whether, at the desired output value, the cursor falls within the green marked area. If so, the procedure is terminated, otherwise restart from point b.i
- The full scale cursor [11] has been completely moved left, but the desired output signal level has not yet been reached (should be further lowered). Proceed in this way:
  - a. use the control [12] (if possible), to further decrease the output, until the signal level read on the multimeter is below the required signal value
  - b. move the full scale cursor [11] right to obtain the required output signal level from the transducer. Now, if the cursor falls within the green marked area in correspondence with the required output signal level, the procedure is terminated. Otherwise, move the full scale cursor [11] all the way left and restart from point a.
- The full scale cursor [11] has been completely moved right, but the desired output signal level has not yet been reached (should be further increased). Proceed in this way:
  - a. use the control [13] (if possible), to further increase the output, until the signal level read on the multimeter is higher than the required signal value.
  - b. move the full scale cursor [11] left to obtain the required output signal level from the transducer. Now, if the cursor falls within the green marked area in correspondence with the required output signal level, the procedure is terminated. Otherwise, move the full scale cursor [11] all the way right and restart from point a.

Undo changes
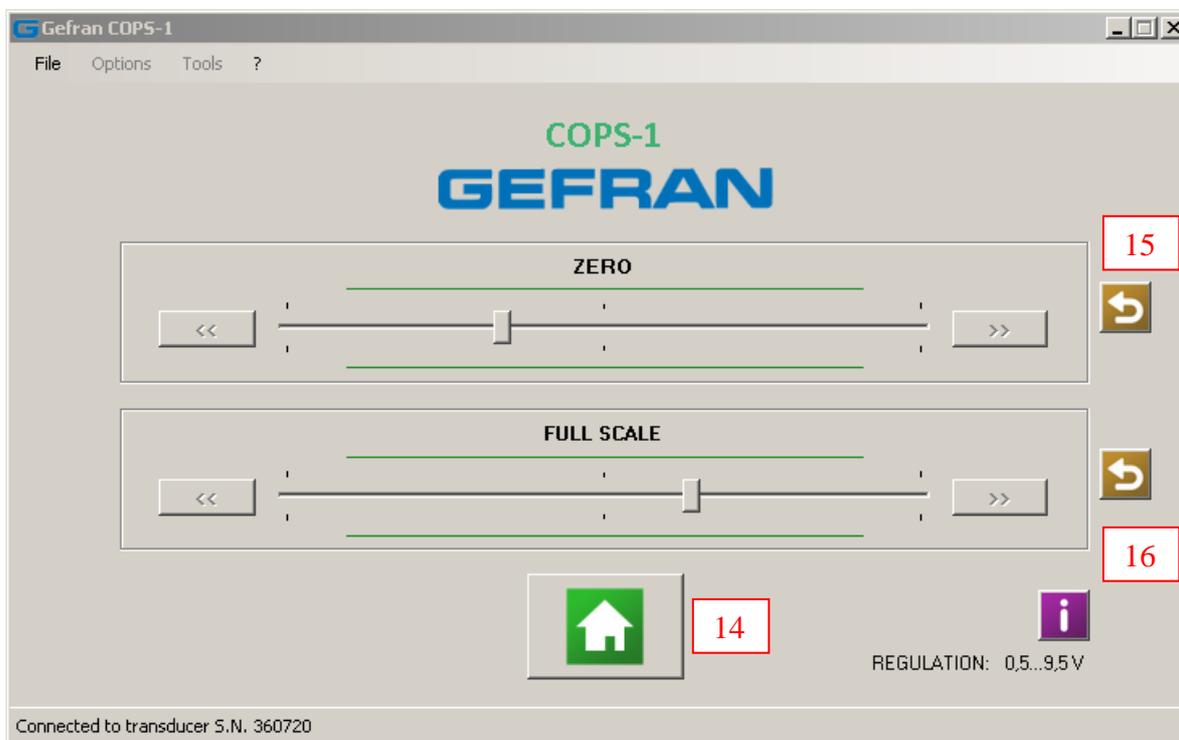
Figure 16. Undo changes and exit controls

It's possible to cancel zero and full scale changes before exiting from the current session. The zero undo button [15] discards the changes made to the zero, while the full scale undo button [16] discards the changes made to the full scale parameters.

Final check

At the end of zero and full scale adjustments, verify that the output signal level of the transducer in zero and full scale positions results in agreement with that expected, moving the transducer cursor at the start and at the end. If not so, repeat the adjustments as previously done.
For an optimal regulation, the zero [8] and full scale [11] cursors should be inside the green marked area.

NOTE: The zero adjustment can change the current setting of the full scale signal, and vice versa. This is even more true as the adjustment is "high". It may therefore be necessary to repeat alternately the two types of adjustment, until the desired output signal values are obtained.

Ending transducer regulation

Click on the button [14] to stop communication with the transducer and return to the main screen. If changes to the zero or full scale values were made, the software will ask confirmation for exiting. If you want to exit discarding the applied changes, use the controls [15] and [16] (see "Undo Changes"). If no changes were made, the communication ends without further notice.

When you go to the main screen, it is possible to disconnect the transducer. If required, connect a new transducer and begin a new programming.

NOTE: always return to the main screen before connecting and working with another transducer. Otherwise, for safety reasons, the software reports an error message and requires the user to exit from the current session.

4.3.   "Restore Transducer Parameters" Tool

By using this function you can restore the values of the transducer parameters which are read from the Parameters File previously saved.

You should use this feature only in case of real necessity.

To start the procedure, click on the menu Tools -> Restore Parameters transducer. You will see the following screen.
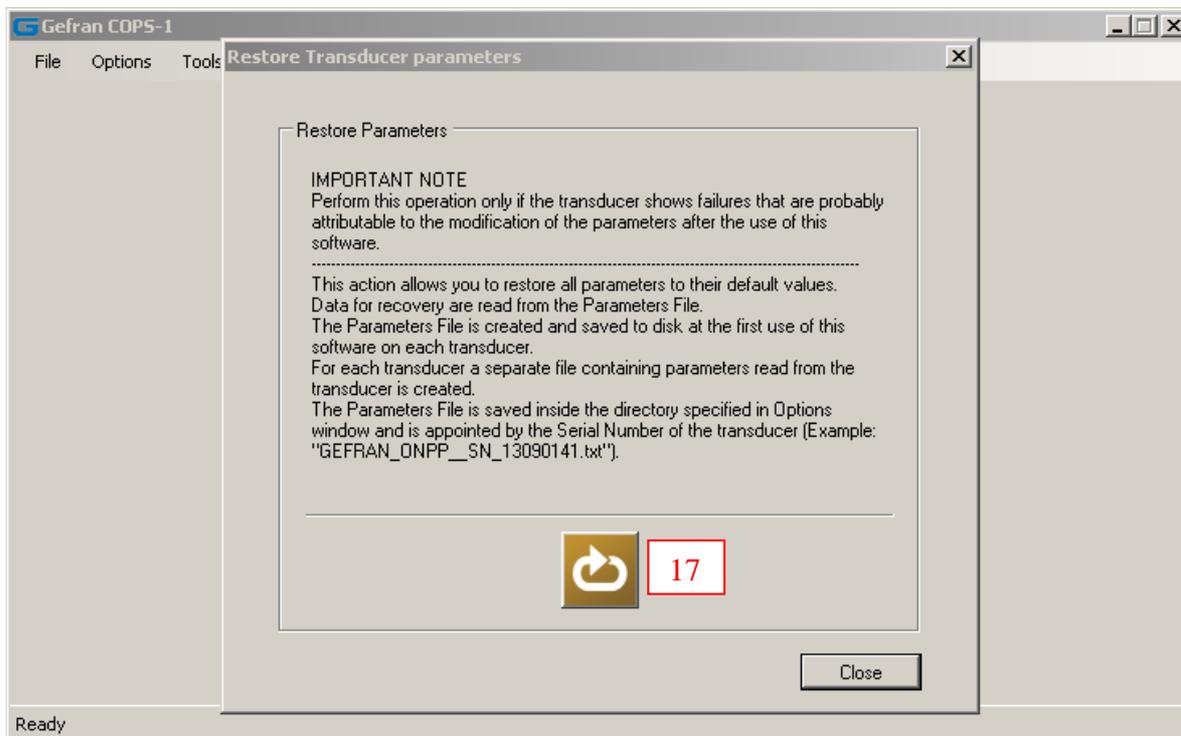
Figure 17. "Restore Transducer Parameters" tool

Connect and power on the hardware. Start the restore process by pressing the button [17].
The software starts communicating with the transducer, reading its Serial Number, and then retrieves the related Parameters File from the disk folder (see options). If the file is found it notifies you and asks you to confirm the operation.
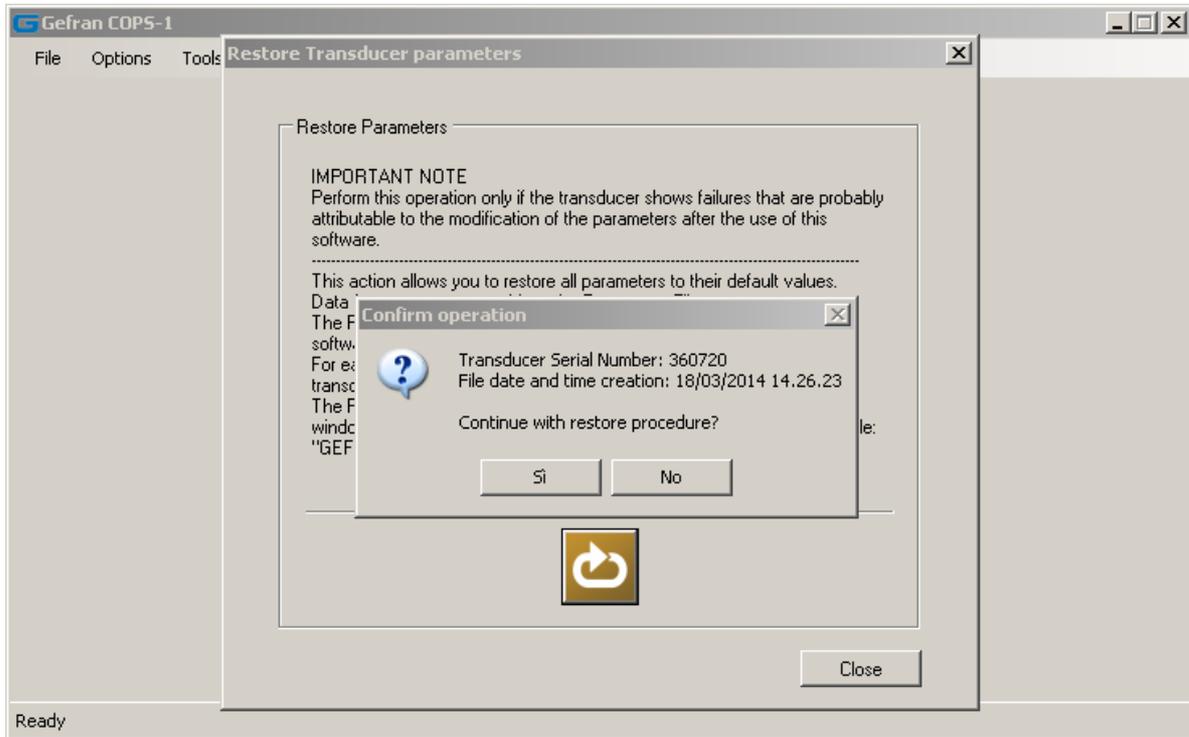
Figure 18. Restore Parameters tool - Confirm Operation

If the Parameter File is not found, it may be due to several causes:
- The folder in use (see options) to save Parameters File does not contain the file of the transducer in use (the file has been deleted or moved)
- You have selected a different folder (check options)
- The transducer has never been configured before (Parameter File not yet created for that transducer)
If the file is successfully found and valid, the procedure is correctly completed when displaying the following message.
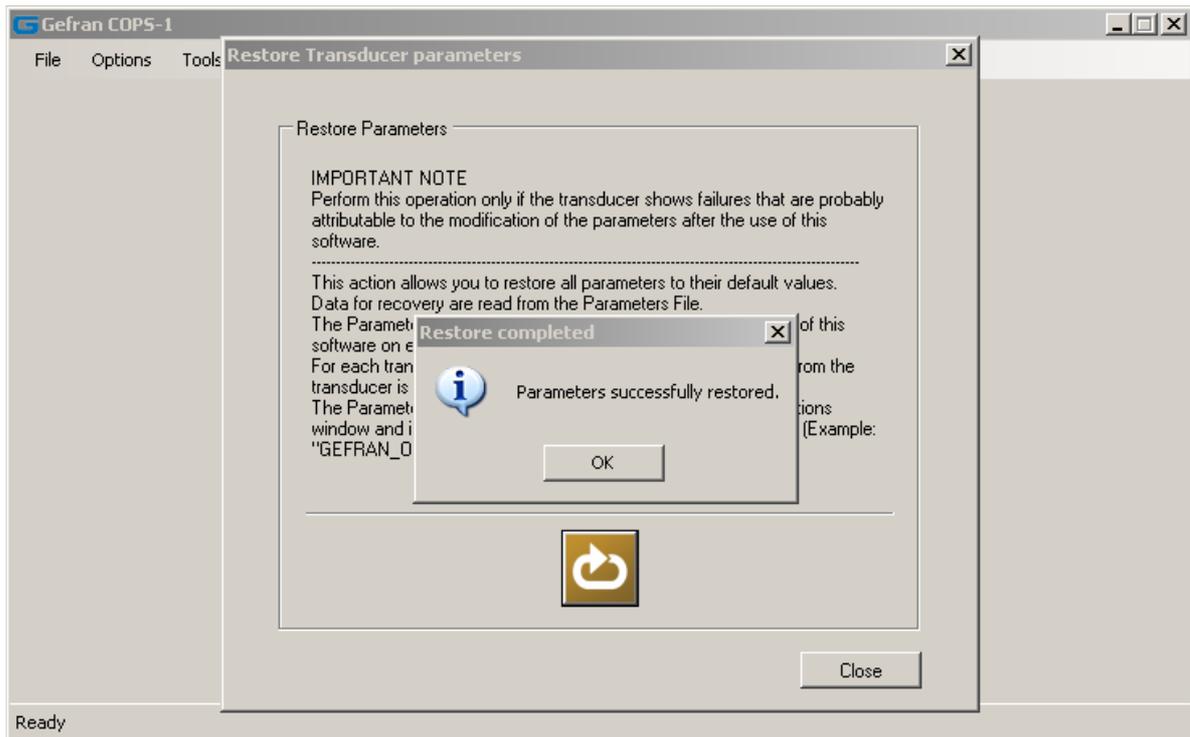
Figure 19. Restore Parameters tool – Restore completed

4.4.   "Import/Export Zero and Full Scale Parameters" Tool

By using this function you can import into the transducer or export from the
transducer the Zero and Full Scale parameters of a particular transducer.
To start the procedure, click on the menu Tools -> Import/Export Zero and Full Scale
Parameters.
You will see the following screen.
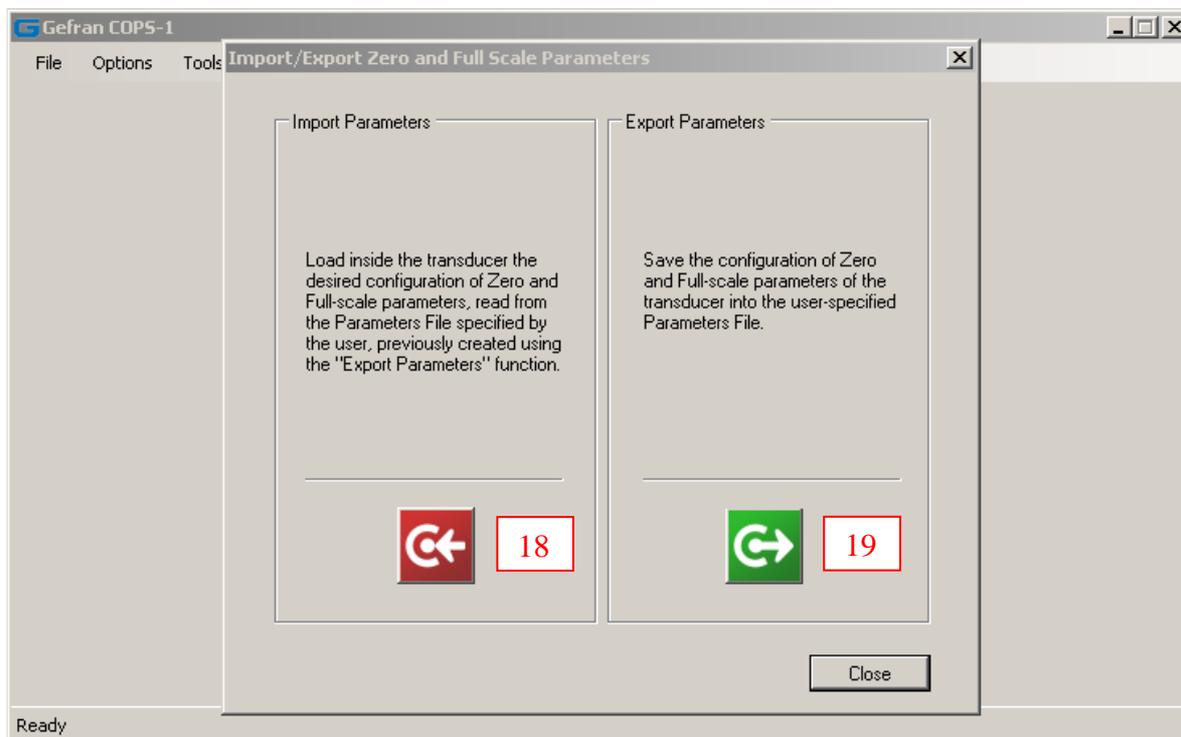
Figure 20. "Import/Export Zero and Full Scale Parameters" tool

By pressing button [18] you can start the procedure for importing (writing) the parameters into the transducer, while pressing button [19] you can start the procedure for exporting (reading) the parameters from the transducer.

Import Parameters

By using the "Import Parameters" tool, you can load inside the transducer the desired configuration of Zero and Full-scale parameters, read from the Parameters File specified by the user, previously created using the "Export Parameters" function (see the related paragraph).
Note that this function only modify Zero and Full Scale parameters; it does not check the Serial Number of the transducer, so it is possible to import a common configuration inside different transducers.
Connect and power on the hardware. Start the restore procedure by pressing the button [18].
The program reads the parameters from the connected transducer to check its serial number, then it checks if the Parameters File (used for a restore operation) exists inside the default saved data folder. If it does not exist, the software automatically creates and saves it.
You can specify the desired Parameters File inside the open dialog window.
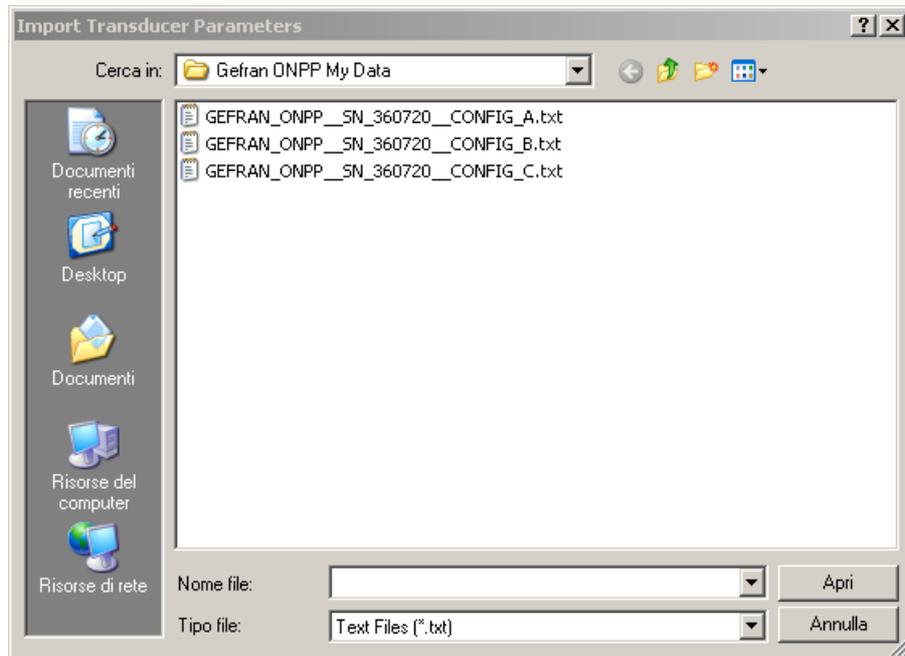
Figure 21. Select the Parameter File for the "Import Parameters" tool

Select the desired file and open it.
If the Parameter File is valid, the program asks for confirmation.
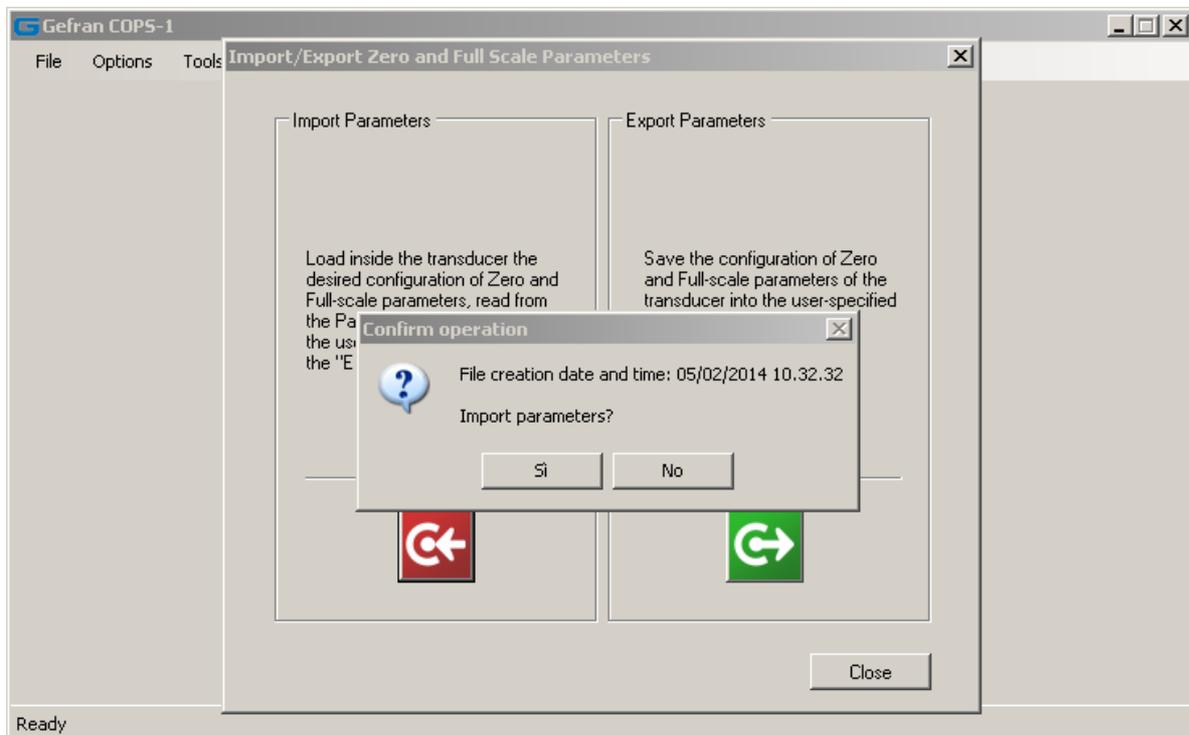
Figure 22. Import Parameter - Confirm operation

If the operation is confirmed and terminates correctly, the following message is displayed, indicating that the parameters have been imported.
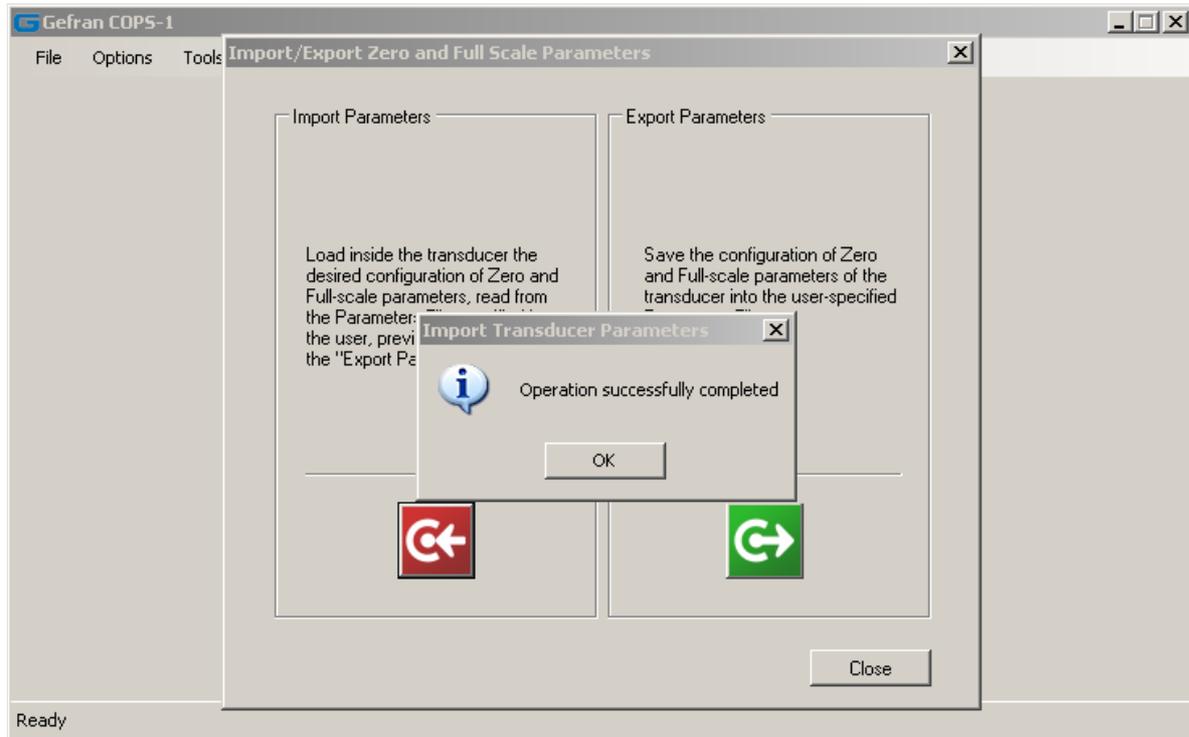
Figure 23. Import Parameters - Operation completed

Export Parameters

By using the "Export Parameters" tool you can save the configuration of Zero and Full-scale parameters of the transducer into the user-specified Parameters File.
The generated file can be used with the "Import Parameters" tool (see related paragraph) to load the Zero and Full Scale configuration into the same transducer, or different transducers.
Connect and power on the hardware. Start the procedure by pressing the button [19]. The program reads the parameters from the transducer, then it displays a save dialog window. Specify a valid name for the Parameter File.
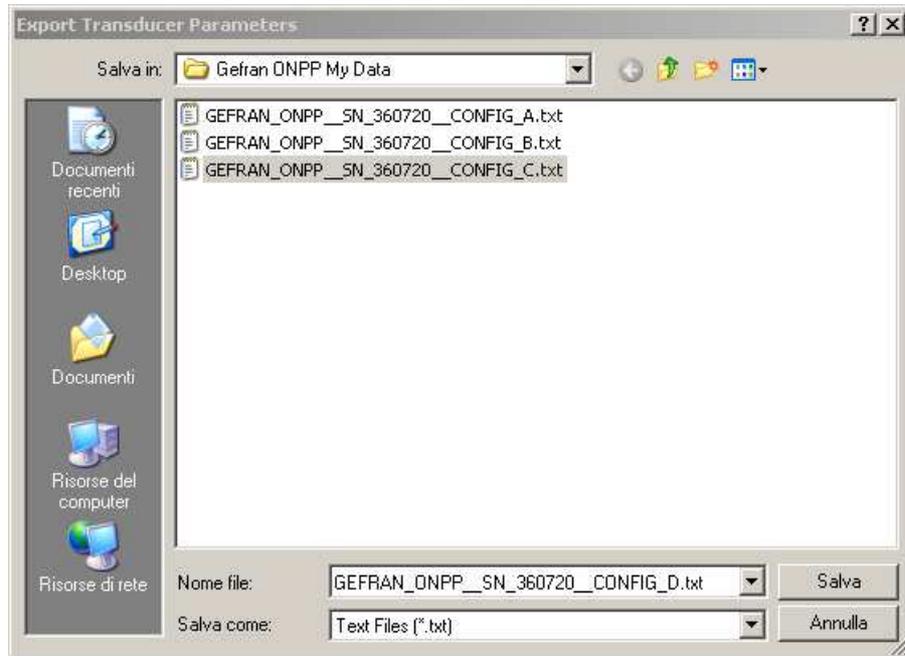
Figure 24. Parameters File name selection for the "Export Parameters" tool

Confirm the operation. If the operation terminates correctly, the following message is displayed, indicating that the parameters have been exported.
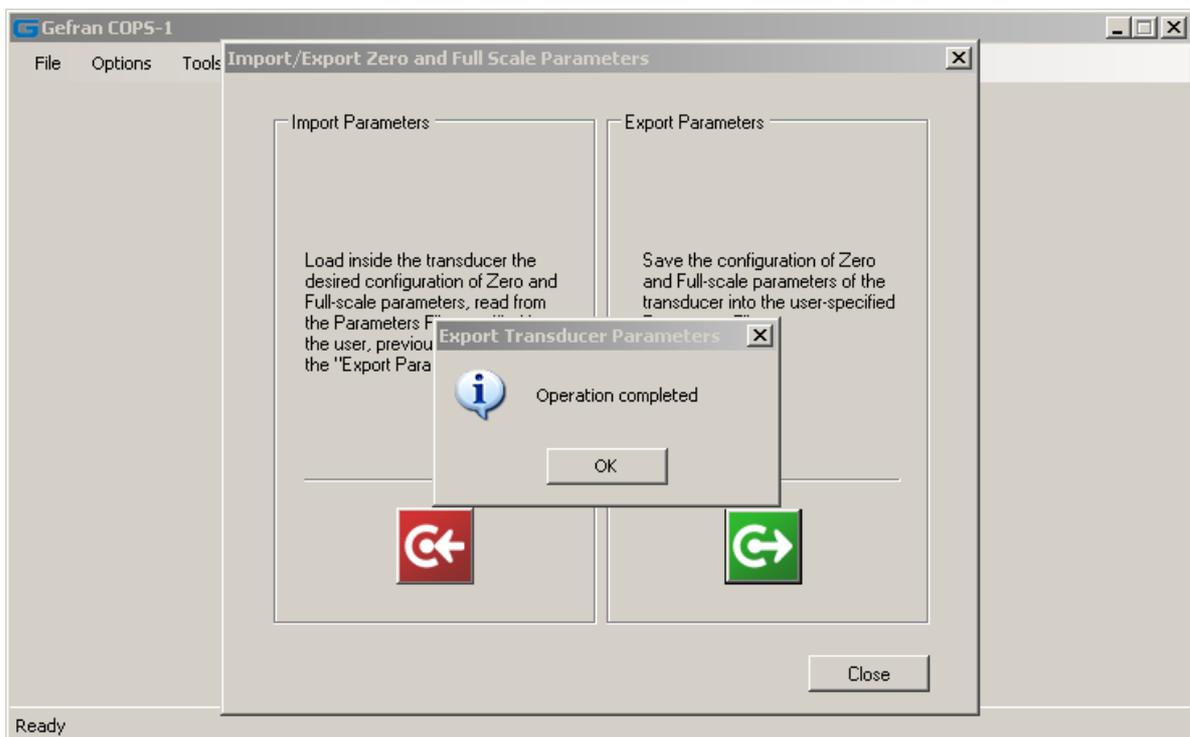
Figure 25. Import Parameters – Operation completed