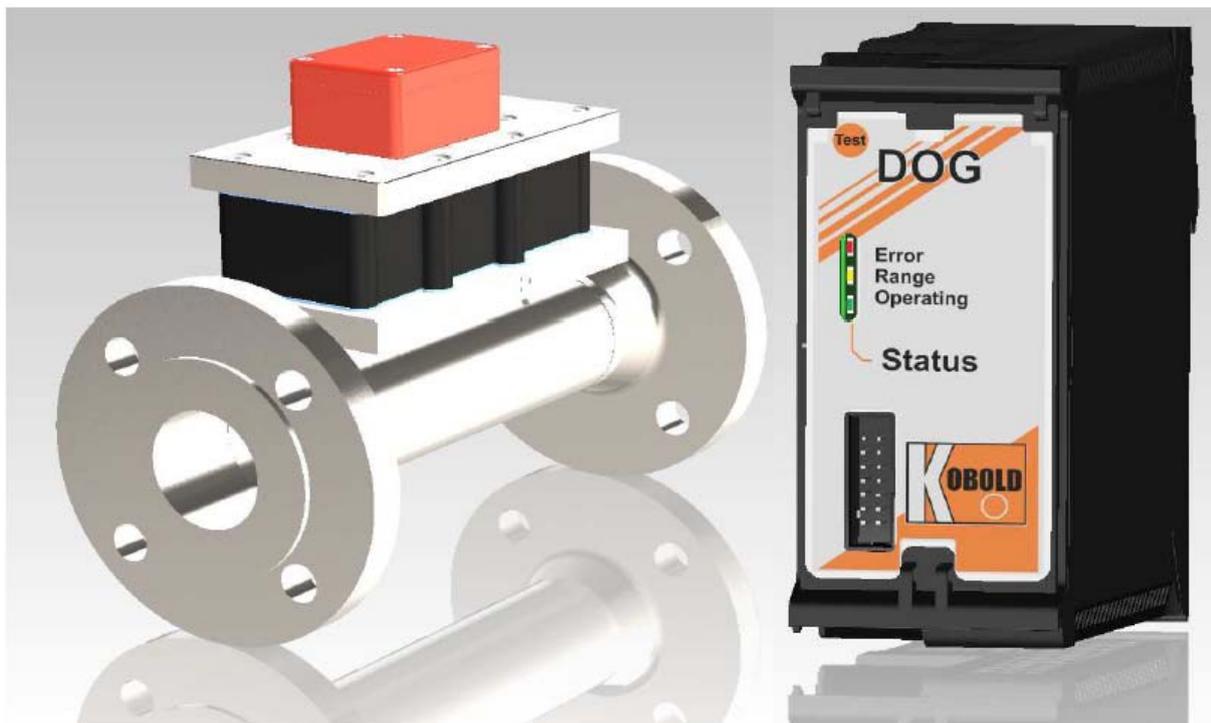


Operating Manual

for DOG-4/-6 Transmitter Recalibration Tool



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The instruction manuals on our website www.kobold.com are always for currently manufactured version of our products. Due to technical changes, the instruction manuals available online may not always correspond to the product version you have purchased. If you need an instruction manual that corresponds to the purchased product version, you can request it from us free of charge by email (info.de@kobold.com) in PDF format, specifying the relevant invoice number and serial number. If you wish, the operating instructions can also be sent to you by post in paper form against an applicable postage fee.

2. Introduction

This manual provides help and advice to customers of Kobold Messring GmbH concerning the recalibration of the DOG-... transmitter.

This manual forms an addition to any documentation already present such as drawings, datasheets and operating manuals for the DOG-...-type oscillation flowmeter.

We reserve the rights to make technical improvements. The present version of this document replaces all previous versions.

Note:

This calibration unit can only be used with transmitters from serial number 220123 and later.

3. General Information

3.1. Safety Information

Before unpacking or using the unit, read this manual carefully and observe its instructions closely.

DOG-... devices may only be calibrated by persons who are familiar with this manual and with the manual of the DOG-...-type oscillation flowmeter and with the applicable regulations concerning workplace safety and accident prevention.

3.2. Inspecting for Transport Damage

Our products are inspected before packing and are shipped in good condition. Should any damage be evident to the packaging, we recommend that you investigate the delivery. If damage has occurred, please notify the parcel service or haulier immediately, since it is the transport company that is liable for transport damage.

Scope of Delivery:

The standard scope of delivery includes:

- Installation CD
- Programming adaptor

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3.3. Intended Use

This recalibration tool is designed solely to enable customers to recalibrate the DOG-... transmitter and is supplied as an accessory to DOG-...-type oscillation flowmeters.

It enables users to disable the factory-preset characteristic curve and to set their own characteristic via the user interface. The factory-preset calibration can however be restored at any time.

The calibration unit may be used for this purpose only. The correct functioning of the unit can be assured only if all instructions given in this manual are observed. We provide no warranty for damage caused by failure to observe this manual.

4. Electrical Supply

For information on connecting the transmitter to a power source, please consult the manual for the DOG-... oscillation flowmeter.

To calibrate the DOG-... flowmeter, connect the calibration adaptor to the PC via the USB interface. The other side of the adaptor has a 14-pin female connector. Connect this to the cable connector on the front of the transmitter. The connector can only be inserted one way, so there is no risk of incorrect insertion.

To enable the transmitter to communicate with the PC via the calibration adapter, the appropriate external supply voltage must be applied to the transmitter.

5. Software Installation

The following software is required to operate the calibration tool:

- USB driver
- Microsoft.NET
- Calibration program

Minimum Hardware Requirements:

500 MB hard disk space and ideally a 1 GHz or faster processor and 256 MB RAM.

System Requirements:

The following operating systems are supported: Windows 2003 Server, Windows XP, Windows Vista, Windows 7, 8, 10 and 11.

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5.1. Drivers for Calibration Adaptor

The calibration adaptor consists of a TTL-232R connecting cable manufactured by FTDI. The adaptor converts the serial interface of the transmitter to a PC-compatible USB interface. For the PC to detect the adaptor, a software driver must first be installed.

The FTDI driver for Windows operating systems is provided on the installation CD in the 'FTDI Driver Setup' folder. You can however also download the most recent version for your specific operating system from the FTDI home page (www.ftdichip.com/Drivers/VCP.htm).

Installation Instructions

Before installing the driver, remove any USB devices (apart from USB keyboard and mouse, if present) from the PC. Having done this, proceed as follows:

- Click the Setup file to begin the installation.
- Next click the 'Run' button to begin the installation process.
- A dialog appears; click Extract to continue.
- Read the licensing conditions and indicate your agreement with them. Click 'Install' to proceed with the installation.
- A further dialog appears; press Continue.
- Once the installation is complete, click Finish.

Should there still be a problem with the USB driver for any reason, uninstall the driver and re-install it.

To uninstall the driver, go to *Control Panel -> Programs (or Programs and Features) -> uninstall programs*, select the two FTDI Windows driver packages and click Uninstall.

You can now connect the calibration adaptor. Use the device manager to check the COM port number on which the device is recognised.

To run the device manager, perform the following steps:

- Right-click the My Computer icon and select Properties from the list that appears.
- Now click on Device Manager at top left. This opens a window that displays all devices connected to the computer in a tree structure.
- Look for the item 'Ports (COM&LPT)' and open it. There should be one USB device linked to a specific COM port number. To verify that this is in fact a calibration adaptor, disconnect this from the PC and check that the device is no longer displayed.
- Make a note of the COM port number used for the calibration adaptor, since you will need to enter this when configuring the user interface in order to establish communication via USB.
- The COM port number is assigned automatically and remains the same each time a particular device is reconnected.

5.2. Microsoft.NET Framework 3.5

Since the user interface applications for the calibration of the transmitter have been developed using Microsoft.NET Framework 3.5, it is essential that this software is also installed on the PC on which it is run. Normally Microsoft supplies the latest version of this with its operating systems.

If you have a version older than 3.5 we recommend that you install Microsoft.NET Framework 3.5 from the installation CD or download a more up-to-date version from www.microsoft.com. The program is free of charge and also available in German.

Installation Instructions

Important notes:

Generally, you should not uninstall any version of the .NET Framework, even older versions, as it is possible that one or more application relies on that version and will no longer run if it is removed. There may be more than one version of .NET Framework installed on a computer at a time. It follows that there is no need to uninstall older versions in order to install a newer one.

Most of the installation files are downloaded from the internet during the installation process. You must therefore ensure that an internet connection is available.

Note:

No download is available for Framework 3.5 for Windows 7, Windows 8 or Windows 8.1. These systems contain more recent versions of the .NET framework as standard. These frameworks include older versions, including Framework 3.5. You must however activate version 3.5 on your computer if it has not already been activated (see section 8, Error Handling).

Installation from the CD:

On the CD, find the 'Setup Microsoft.NET Framework 3.5' folder and click the Setup file.

- Next click the 'Run' button to begin the installation process.
- Read the licensing conditions and indicate your agreement with them. Click 'Install' to proceed with the installation (ensure that the computer is connected to the Internet).
- Once the installation is complete, click Finish.

Installation from the Internet:

Go to the Downloads section in the website mentioned above and select Microsoft.NET Framework 3.5.

- Click the Download button.
- Next click the 'Run' button to begin the installation process.
- Read the licensing conditions and indicate your agreement with them. Click 'Install' to proceed with the installation (ensure that the computer is connected to the Internet).
- Once the installation is complete, click Finish.

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5.3. Calibration Tool

The DOG-calibration tool is a run-time file that contains a graphical user interface and enables communication with the transmitter.

The installation file for this is located in the 'Setup V0.5.0 User Calibration Tool' folder on the CD. To install the program, proceed as follows:

- Click the Setup file.
- A window appears with the message 'Welcome to the DOG-Calibration Tool Setup Assistant'. Click Continue.
- In the next window, select the path for the folder in which you wish to install the program and then click Continue again.
- A further dialog then appears; press Continue again to confirm the installation.
- Once the installation is complete, click Close.

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6. User Interface

Once installation of the 'Calibration Tool' is complete, a shortcut marked 'DOG Calibration Tool' automatically appears. Double-clicking on this shortcut opens the user interface.

Next you must select the COM port number for the calibration adaptor (see section 4.1) and then click the Connect button to establish communication via the USB interface.

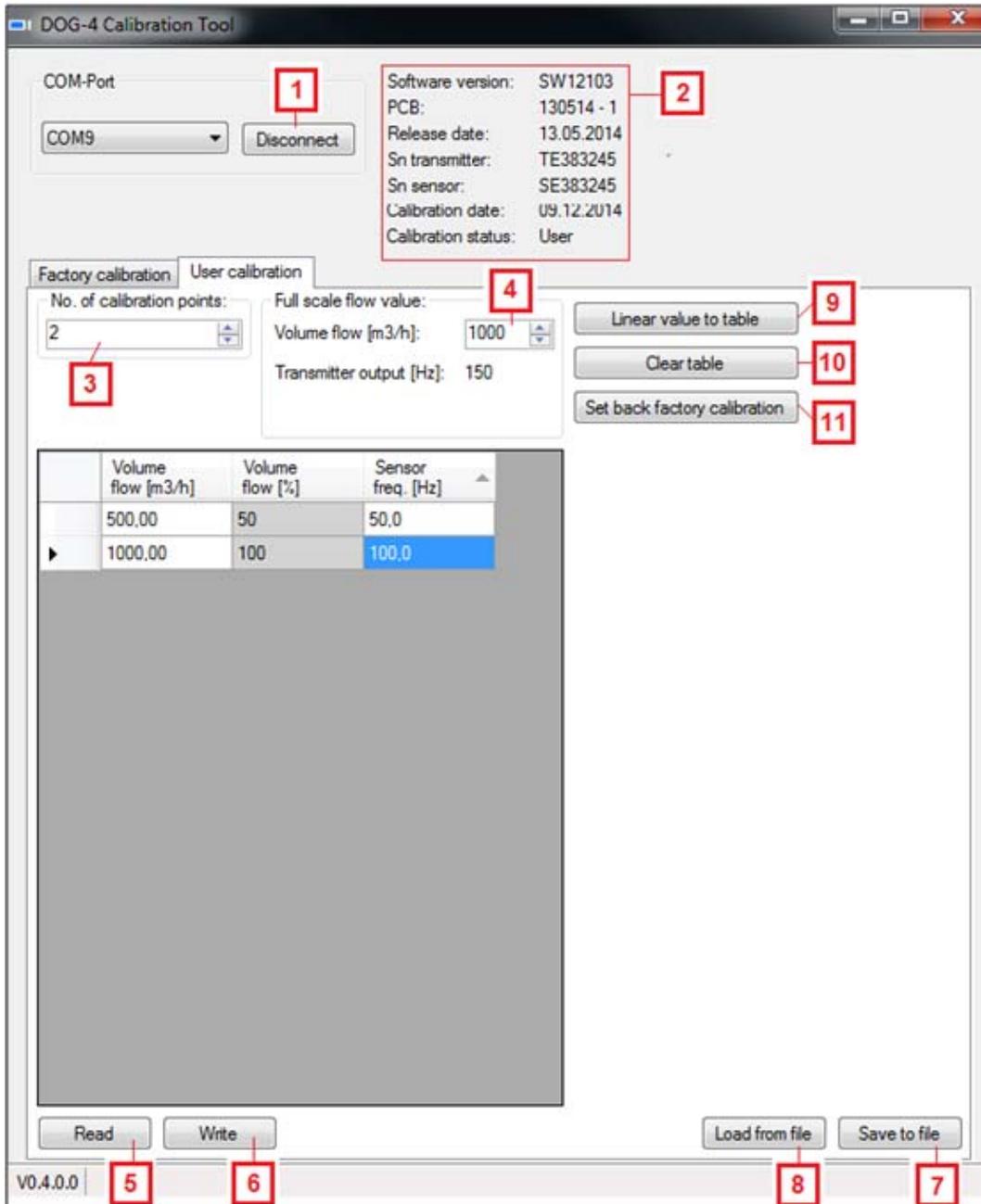


Figure 1: User Interface: 'User Calibration' tab

If the communication connection fails, an error message – 'Error establishing the connection' – is displayed.

If connection is successful, the device parameters [item 2 in Fig. 1] appear at the top, followed by two tab options, Factory Calibration and User Calibration.

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The displayed information, input fields and buttons for the User Calibration option are explained below.

1. Setting up and closing the communication connection between a PC and the DOG-... transmitter
2. Current device parameters in the transmitter
3. Selection list for number of calibration points required
4. Entry field for upper measurement range limit of DOG-... unit to be calibrated
5. Reads the current calibration data from the transmitter and writes it into the calibration table
6. Writes the data from the table into the transmitter memory and then activates User Calibration mode
7. Creates a configuration file with the calibration data entered
8. Reads the calibration data from a configuration file and writes it into the calibration table
9. Fills the calibration table with linear calibration points
10. Deletes all entries in calibration table
11. Activates Factory Calibration mode

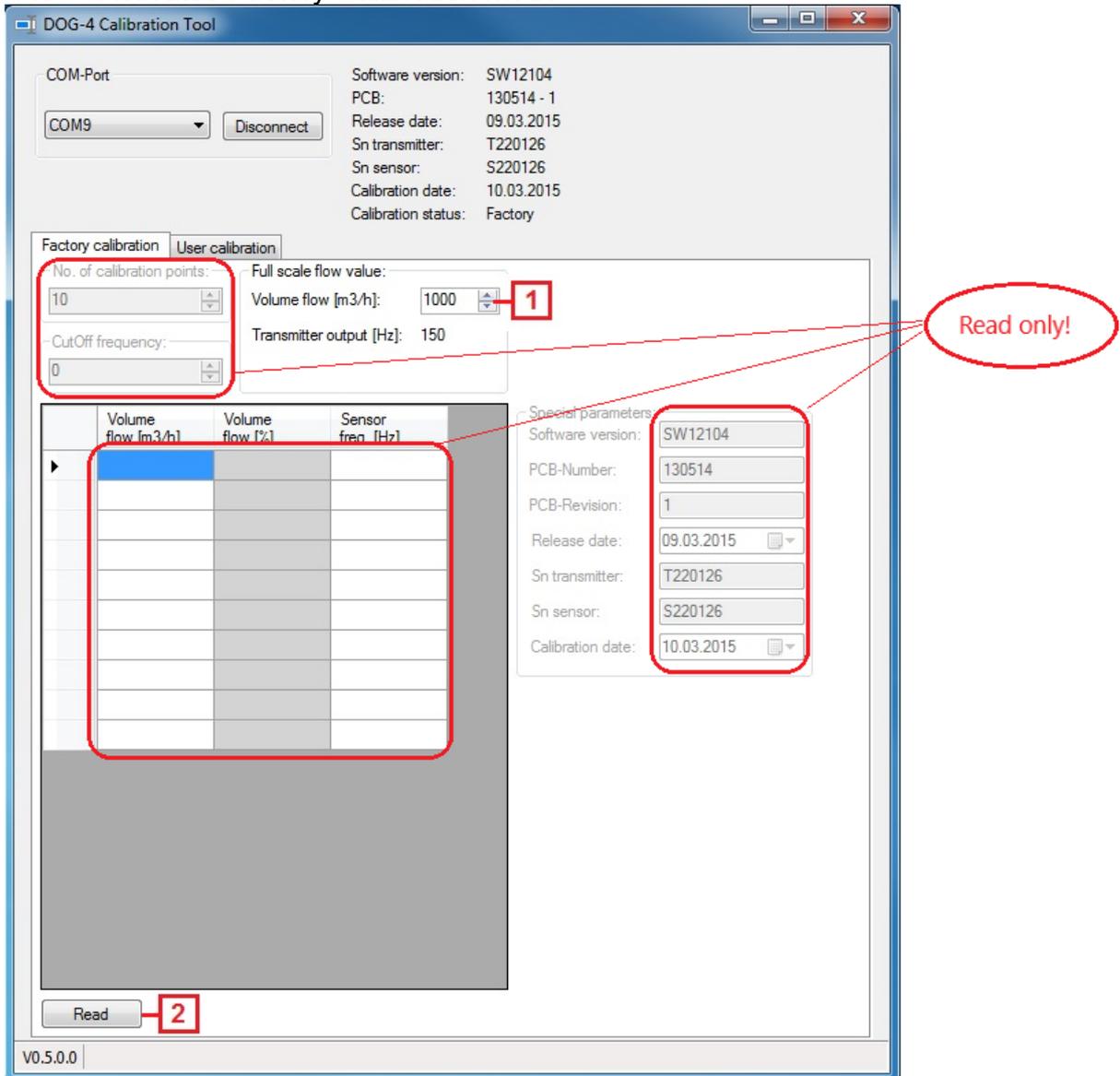


Figure 2: User Interface: 'Factory Calibration' tab

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In the Factory Calibration tab (Fig. 2) all the input fields are greyed out except for Volume Flow [1], since these parameters cannot be modified by the user. The user may nevertheless view the measurement data of the factory calibration by pressing the Read button [2]. Note that the transmitter provides only the sensor frequency values (in Hz) and those of volume flow as percentages of the upper limit value. Volume flow in terms of m³/h is calculated using the PC program only in relation to the measurement range limit value for volume flow. Therefore, click the Read button [2] first; then, when the values are displayed in the table, enter a suitable measurement range limit value for volume flow into the input field [1].

7. Transmitter Re-Calibration

7.1. Capturing the Sensor Data

To recalibrate the DOG-... unit the user must first obtain new calibration data. To do this the transmitter must first be put into a state in which the sensor frequency signal at the output is 1:1.

- In the 'Volume Flow [m³/h]' input field (item 4 in Fig.1), enter the measurement limit value of the DOG-... device being calibrated (see type plate)
- Click 'Create table with linear values' (item 9 in Fig.1)
- Now click the Write button (item 6 in Fig.1) to transfer the data into the transmitter memory.

The transmitter now operates in 1:1, thereby outputting the sensor input signal at the same frequency. The sensor signal can be measured with a frequency meter at the transmitter output.

You can now determine the sensor characteristic curve using a suitable volume flow test rig. To do this, up to 16 volume flow measurement points should be set up on the test rig and the relevant output frequency values recorded, together with the corresponding output frequency of the transmitter, at each of the measurement points. All measurement points must lie within the measurement range specified on the DOG-... type plate.

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7.2. Entering the Sensor Characteristic into the Calibration Tool

To enter the sensor characteristic measured, first select the number of calibration points (item 3 in Fig. 1). This may be a number between 1 and 16. Next, the upper measurement limit value is entered in [m³/h] (item 4 in Fig.1) and all table values then deleted (item 10 in Fig.1).

The sensor characteristic determined can now be arranged in the calibration table in increasing order in the User Interface tab of the calibration program. A total of max. 16 calibration values can be entered in the table; unused cells can be left blank.

Next, click the Write button (item 6 in Fig.1) to carry the data into the transmitter memory.

Once data transmission completes, you must click Disconnect (item 1 in Fig.1) to end the calibration routine. Only then will the transmitter quit the calibration mode and perform an automatic reset to store the data in the transmitter.

You can write the calibration data from the table into a configuration file by clicking the Save Parameters button (item 8 in Fig. 1). You can then reload this data at a later time by clicking Load Parameters (item 7 in Fig.1) in order to analyse the calibration values or to send them to the transmitter again.

You can also read the user calibration data out from memory via the Read button (item 5 in Fig.1).

The factory-preset calibration can also be reactivated. To do this, click 'Restore Factory Settings' (item 11 in Fig. 1). The bottom row of the device parameter display (item 2 in Fig.1) indicates whether the device is currently operating in 'user' or 'factory preset' mode.

Note:

The volume flow is entered into the calibration table in m³/h. The software then converts these values into percentages of the upper limit value. Please note that the conversion will be rounded up or down (to a resolution of 1%). Example: any values between 1.5 and 2.49% will be displayed as 2%. Only whole-number percentages of the volume flow are sent to the transmitter. These then determine the frequency of the output signal.

8. Error Handling

Error messages during input of calibration values

The calibration data must be entered into the table in ascending order. If data is entered in the wrong order, the affected fields are highlighted in orange. These fields remain orange until the order of the data is corrected. Once all the fields have changed back to white, click the Write button to ensure that the transmitter functions correctly.

To prevent these error messages, we recommend that you set the table initially to one calibration point (item 3 in Fig. 1) and enter the data into the first row. Then increase the table to two calibration points and fill in the second row. Continue in this way until all calibration points have been entered. Once there are no orange-highlighted fields in the table, you can begin to transfer the calibration data.

An error message also occurs if the limit values are exceeded. The following limit values must be observed:

- The first input value for volume flow in the calibration table must be greater than 1 m³/h.
- All volume flow values must be lower than the upper limit value (item 4 in Fig. 1).

Problems with the Communication Interface

If an error occurs in the communication between PC and transmitter, check via the Windows Device Manager whether the correct COM port number is set in the calibration program (see section 4.1).

If there is still a fault in the connection, try the following:

- Close the calibration program and restart it.
- Reset the transmitter (disconnect the power supply briefly and reconnect).
- Pull out the calibration adaptor and re-insert it.

Now try to re-establish the connection to the transmitter.

Problems with Microsoft.NET

If the calibration program cannot run, this may be due to incompatibility of the program with the Microsoft.NET version installed.

Since the user interface was created using Microsoft.NET 3.5, this framework is required in order that the applications it contains can be run. Normally the calibration program will also run on more recent versions of Microsoft.NET without problems, since all Microsoft programs are downwardly compatible. Should you nevertheless have a problem when running the calibration software with a more recent version, you should install version 3.5 on your computer.

Running the Calibration Software under Windows 7 / 8 and 8.1

No download is available for Framework 3.5 for Windows 7, Windows 8 or Windows 8.1. The Windows 7 environment includes .NET Framework 4.0, Windows 8 contains Framework 4.5 and Windows 8.1 has Framework 4.5.1 as standard. These frameworks include older versions, including Framework 3.5. You must however activate version 3.5 on your computer if it has not already been activated.

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This can be done in either of two ways: installing the .NET Framework 3.5 on demand or by activating it in the Control Panel. An Internet connection is required in both cases.

Installing .NET Framework 3.5 on Demand

If an application requires .NET Framework 3.5 but this version is not active on the computer, the following dialog box appears either during installation or when the application is executed for the first time.

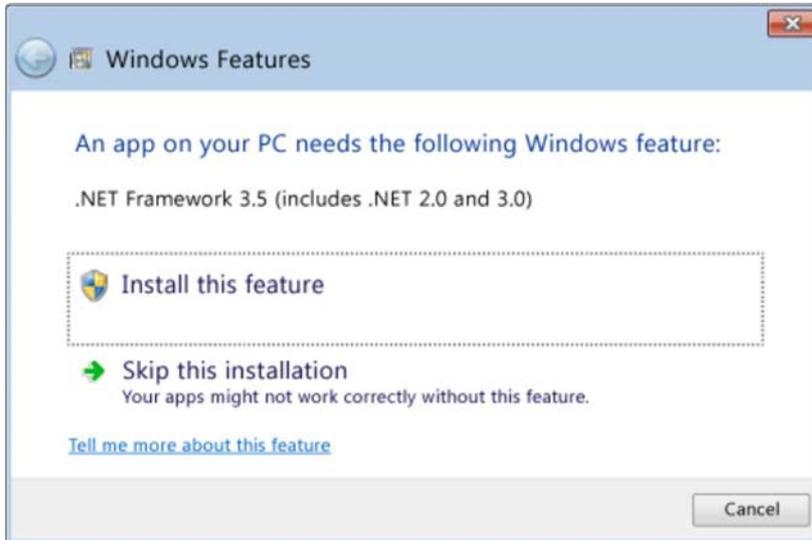


Figure 3: Prompt to install .NET Framework 3.5 on demand

Select 'Install This Function' to activate .NET Framework 3.5.

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Activating .NET Framework 3.5 in the Control Panel

You can also activate .NET Framework 3.5 via the Control Panel.

To do so, perform the following steps:

- Click Start and select Control Panel. (You can initiate the Start menu by pressing the Windows logo button on the keyboard, if present.)
- Now choose Programs and Features and then Turn Windows Features On or Off.
- Tick the .NET Framework 3.5 checkbox (this also contains .NET 2.0 and 3.0). You do not need to select the subordinate elements for HTTP activation of Windows Communication Foundation (WCF).

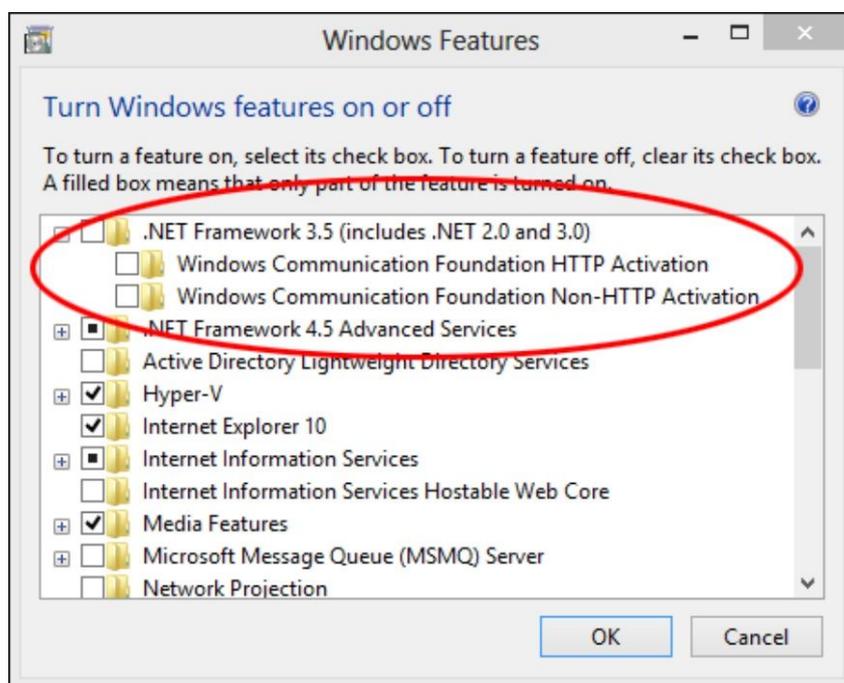


Figure 4: Activating or deactivating Windows functions

Troubleshooting

If an error occurs during installation of .NET Framework 3.5 you may receive one of the following error messages:

0x800f0906: 'Windows could not connect to the Internet to download necessary files. Make sure that you are connected to the Internet, and click Retry to try again.'

0x800F081F: 'The changes could not be completed. Restart your computer and try again.'

DOG-4/-6 Transmitter Recalibration Tool

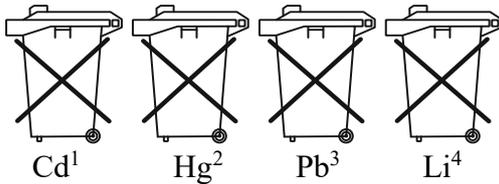
9. Disposal

Note!

- Avoid environmental damage caused by media-contaminated parts
- Dispose of the device and packaging in an environmentally friendly manner
- Comply with applicable national and international disposal regulations and environmental regulations.

Batteries

Batteries containing pollutants are marked with a sign consisting of a crossed-out garbage can and the chemical symbol (Cd, Hg, Li or Pb) of the heavy metal that is decisive for the classification as containing pollutants:



1. „Cd" stands for cadmium
2. „Hg" stands for mercury
3. „Pb" stands for lead
4. „Li" stands for lithium

Electrical and electronic equipment



DOG-4/-6 Transmitter Recalibration Tool

10. EU Declaration of Conformance

We, KOBOLD Messring GmbH, Nordring 22-24, 65719 Hofheim, Germany, declare under our sole responsibility that the product:

DOG-4/-6 Transmitter Recalibration Tool

to which this declaration relates is in conformity with the following EU directives stated below:

2011/65/EU	RoHS (category 9)
2015/863/EU	Delegated Directive (RoHS III)

Also, the following standards are fulfilled:

EN IEC 63000:2018 Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances

Hofheim, 14 Dec. 2023



H. Volz
General Manager



J. Burke
Compliance Manager