

Documentation – Pressure Switch 5

Revision: 2016-09-13

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List of Changes

Revision	Date	Remarks	Edited by
A	2016-09-13	First edition, initial release	R. Voelckner

1 All features at one glance

The Pressure Switch 5 has a rich feature set, including:

- Switching two channels' loads depending on applied pressure (PNP // high side),
- The desired switching behaviour can be set flexible by the customer,
- Automatic pressure unit conversion within the configuration software (Windows/Linux) for easiest system integration,
- Available switching behaviour: Normally Open/Closed and Windows Modes,
- Maximum load current of 1 Ampere,
- Moderate supply current of 50 Milliampere,
- Fully integrated reverse polarity protection.

2 Configuration procedure

The configuration procedure is easy; the user only needs the following two tools:

The hardware connection to the *Pressure Switch 5* is made up by the *ServiceBox*. Its general purpose is to unify many sorts of ADZ's digital transducers and to offer a USB-connection to the customer's PC. Both *ServiceBox* and attached *Pressure Switch 5* are powered via USB, so there is no need for external power supplies.

For the configuration of the *Pressure Switch 5*, the necessary *ServiceBox* hardware-revision is at least v2.

The delivered *configuration program* was especially written for use with the *Pressure Switch 5*. When starting the tool, most of the user controls are disabled.

At first, the program needs to connect to the *ServiceBox*. This is done by clicking the "Connect" button. Afterwards the program waits for transducers to be attached.

As soon as a *Pressure Switch 5* is recognized, all relevant data is being downloaded and made visible – now the transducer is ready for configuration.

2.1.1 Switching behaviour and switching state

The main part of the program is used for graphical feedback containing switching behaviour of the chosen output and pressure measurements. The currently chosen switching output (*Output 1/2*) may be switched-over using the tabbed control located in the upper area of the program.

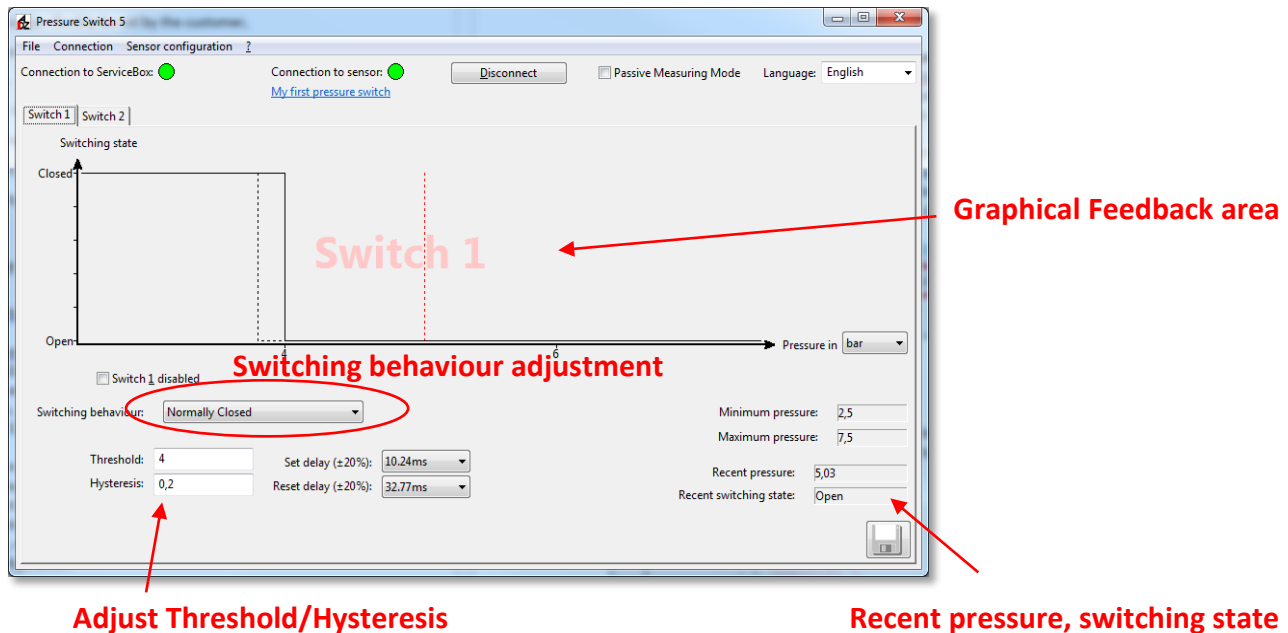
Underneath the graphical feedback, the user finds the currently chosen output's switching data in a textual manner:

- Output enabled/disabled,

- Switching behaviour,
- Switching threshold/hysteresis
- ...

... as well as the live-captured output's switching state (currently opened/closed).

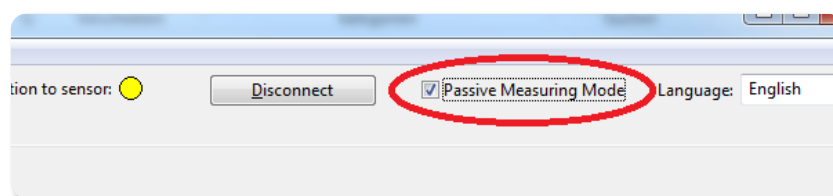
The picture below depicts the relevant parts of the main window:



Technical limitations regarding switching (during connected to ServiceBox):

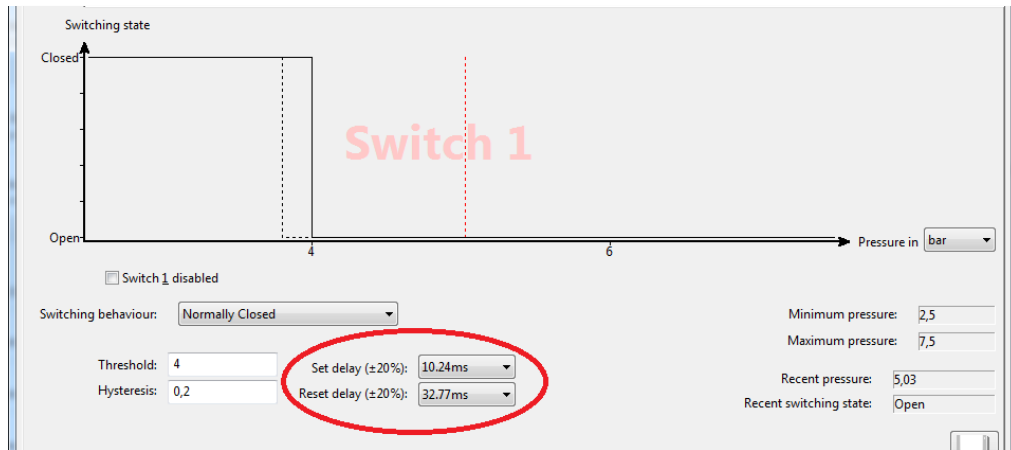
As long as the *Pressure Switch 5* stays connected to the *ServiceBox*, the switching behaviour may differ from what the user sets. This is a result of technical limits; after disconnecting the *Pressure Switch 5* from the programming tool, it works as intended. Thus, e.g. switching hystereses do not seem to work.

For simulating the "unconnected" state while still capturing the correct switching states, you might want to use the *Passive Measuring Mode*. You enable this mode by checking the CheckBox in the top-right corner of the main window. Once the *Passive Measuring Mode* is enabled, all eventual sensor connections get lost and the LED "Connection to Sensor" flashes yellow/red.



2.1.2 Switching delays

Both switching outputs have the ability for delayed switching. These delays split up into *Set Delay* and *Reset Delay* – both for each switching output. You can find the delay options underneath the graphical feedback. See picture below.



Please be aware that the options you choose are just coarse delay values. The real switching delays may *differ up to ±20%*!

2.1.3 Applying custom switching behaviour to (volatile) RAM memory

The application of user-defined switching behaviour is simple. After entering the desired data, they will instantly be displayed in the graphical feedback area. Additionally, the changes are immediately transferred to the transducer, enabling the user to dynamically track the switching behaviour.

The user must keep in mind that all changes being made here are volatile. When disconnecting the *Pressure Switch 5* from the *ServiceBox*, all changed data will be lost. For permanently saving data, please read the next paragraph.



Important note regarding *Windowed Switching Modes*:

When realizing a windowed switching mode on channel 1, it internally will be connected to channel 2. The second output will then realize the inverted windowed switching mode.

2.1.4 Applying custom switching data to (persistent) EEPROM memory

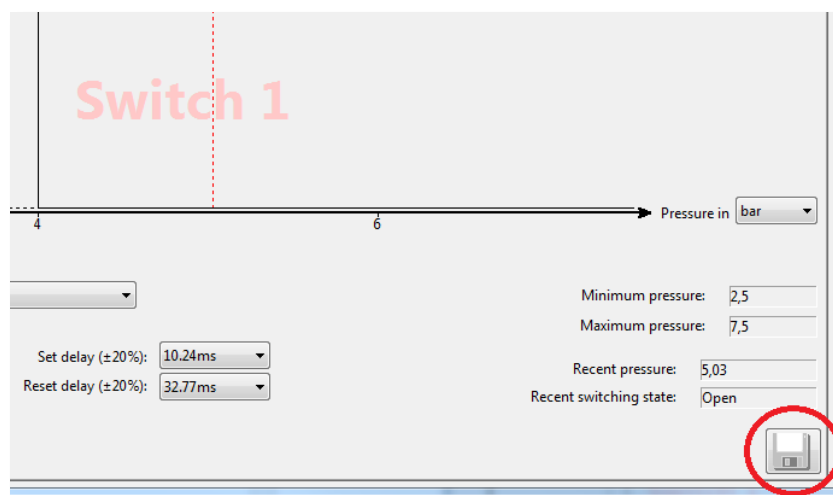
After making/testing all settings, the user may apply the changes into the persistent memory section. This can be done by pressing the button showing a *Floppy disk* in the bottom-right corner.

PRESSURE SWITCH 5

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It is **essential** not to disconnect the transducer from the *ServiceBox* during this process!
Otherwise, it could be destroyed.



2.1.5 Using the configuration data base

Every time the persistent memory section is modified, a copy of the written data (referred to as *Database Entry*) is put into the program-internal database.

The user may access it by navigating to the “*Sensor configuration → Configuration database*” menu. The window shows all database entries that are related to the attached transducer.

The database window enables the user to:

- Add/edit data set specific notes,
- Delete single data sets,
- Load previous data sets into the (volatile) transducer RAM.



The topmost data set always represents the *Factory Settings*. This database entry is made, when a *Pressure Switch 5* is being attached to your PC for the first time. The user cannot delete the *Factory Settings* entry.

In addition to that, resetting a transducer to its factory settings can be performed by choosing the “*Sensor configuration → Load factory settings to sensor-EEPROM*” menu. This “saves” the indirection via loading the data to RAM.

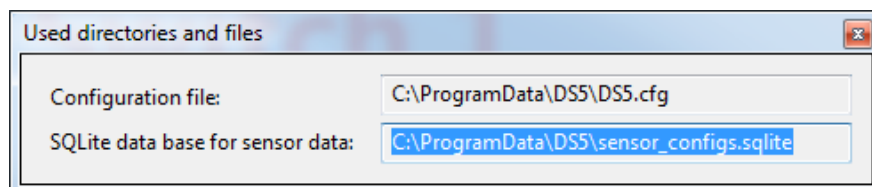
Please be aware that resetting a *Pressure Switch 5* to *Factory Settings* means to load the configuration from the first time the switch was attached to the PC.

3 Troubleshooting

Each error message comes up with an error code. The following sections discuss all possible error messages and try to offer fixes.

Error codes #0 and #1:

Comes up when an internal database error occurs while saving configuration data into EEPROM. You could try to *delete/rename* the internally used *SQLite configuration database*. You find its name by navigating to the following menu: “?” > “Used directories”.



Error code #2:

Opens up directly after starting the program when trying to access the internal database. An approach is to *delete/rename* the internal *SQLite configuration database* (see Error codes #0 and #1).

Error code #3:

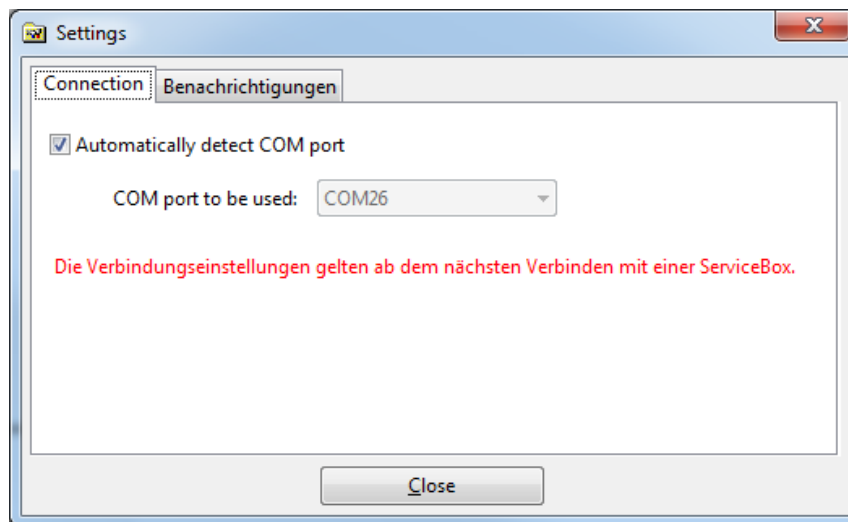
The program could not find a directory to put the internal *SQLite configuration database* to. Please consider using the program with a more privileged user account. The following locations are tested for writing permissions (in exactly this order):

- %PROGRAMDATA%\DS5\
- C:\Users\<username>\AppData\Local\DS5
- The directory where the executable is located at

Error code #100.

The program was not able to find and connect to the *ServiceBox*. Please make sure that all necessary drivers were installed correctly and the *ServiceBox* was attached properly to your PC.

Additionally, you might check the “*Automatically detect COM port*” option within the settings dialog. You find the dialog by navigating to the following menu: “File” > “Settings”.



Error code #101:

The error message comes up if there was a communication failure while connecting to the *ServiceBox*. You might try to use another *ServiceBox*.

Error code #102:

This message is rather of informational type. It informs you about the necessity to update the *ServiceBox* firmware. In order to use the *ServiceBox* in combination with the *Pressure Switch 5*, the update must be gone through.

Once the update process started, do not disconnect the *ServiceBox*. Otherwise, it will remain in an unusable state.

Error code #103:

Comes up, if an incompatible *ServiceBox* version was detected. For configuring a *Pressure Switch 5*, you need to use at least a *ServiceBox v2*.

Error code #201 ... #205:

An error occurred during the *ServiceBox* firmware update process.

Error code #301:

This message comes up if the transducer connects to the *ServiceBox*, but could not be identified as *Pressure Switch 5*. Please consider contacting our technical support.

Error code #302:

The read out switching data are inconsistent. Before considering to contact our technical support, you might try to:

- disconnect and reconnect the *Pressure Switch 5*,
- shorten the wiring between *ServiceBox* and *Pressure Switch 5*.

Error code #303:

After writing data to EEPROM, a checksum error occurred. You might try to shorten the wiring between *ServiceBox* and *Pressure Switch 5*.