OPERATING INSTRUCTIONS

PDS1

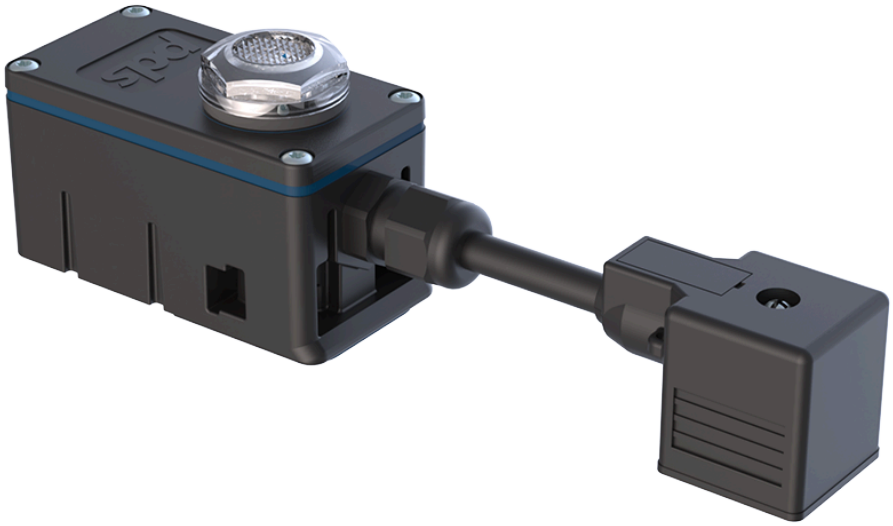


Table of contents

1 General Information

These operating instructions are intended to ensure the correct, effective, and safe use of the PDS1 electronics from Wandfluh. The operating instructions include behavioral guidelines provided by Wandfluh, either as the manufacturer or through its resale organizations (Wandfluh sister companies or Wandfluh representatives), as part of their instructional duty.

For this purpose, the operating instructions mainly include:

- Information about the proper use, installation, and commissioning of the PDS1 electronics
- Information on safety in handling the control system

1.1 Application Area

Thanks to its compact design, protection class IP65, and a robust plastic housing, the application area of the PDS1 electronics is both in mobile and industrial sectors.

1.2 Product Identification

Nameplate on the underside of the product:

- Type code
- Article number
- Length of solenoid cable (only for 2 solenoid variant)

Digital nameplate, accessible with the parameterization software PASO2 (see PASO2 25).

- Type code
- Article number
- Serial number
- Software version

1.3 Conformity

The PDS1 electronics have been developed and tested in accordance with the latest technical standards. In particular, the EMC directives EN 61000-6-2 (immunity) and EN 61000-6-4 (emission of interference) have been applied.

1.4 Manufacturer

Wandfluh AG
Postfach
CH-3714 Frutigen

sales@wandfluh.com
www.wandfluh.com

2 Safety Regulations

Attention

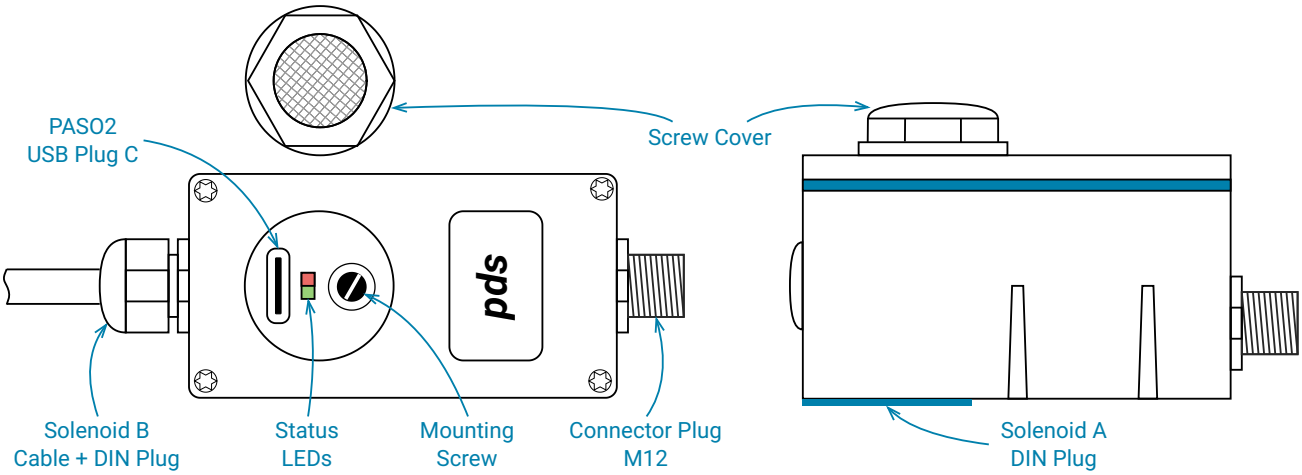
The PDS1 electronics monitor control-internal and system-side operating states, but uncontrolled movements or force changes due to an unforeseeable error in the PDS1 electronics cannot always be prevented.

Therefore, personal hazard must be prevented by interrupting the operating voltage through the **emergency stop chain** on the system side.

2.1 Installation / Commissioning / Parameterization

- These operating instructions must be carefully studied beforehand, and their instructions must be followed.
- All supply voltages and other energy sources must be disconnected before installation.
- Installation/assembly must only be carried out by personnel with electrical knowledge.
- Precautions regarding electrostatic discharge-sensitive components on the control card must be observed.
- Incorrect operation by personnel cannot be prevented by the PDS1 electronics.
- Before switching on the supply voltage, the fuse protection, correct wiring, and compliance of the supply voltage with the permissible supply voltage range must be checked.

3 Product Description



3.1 Type Code

P DS1 5 0 ☐ D8 0 - A A / ☐

Plug		
Digital Smart		
Adjustable with PASO2 via USB		
Basic amplifier		
1 solenoid execution 2 solenoid execution	1 2	
Supply voltage	8...32V	
Analogue input voltage / current		
12 bit resolution		
Analogue setpoint		
Solenoid cable	not specified: 095: 110: 135: Option:	only 1 solenoid / without solenoid cable solenoid cable 95 mm for WDPFA04 with VDE37 solenoid cable 110 mm for WDPFA06 with WDE45 solenoid cable 135 mm for WDPFA10 with WDE64 other lengths available on request

3.2 Technical Data

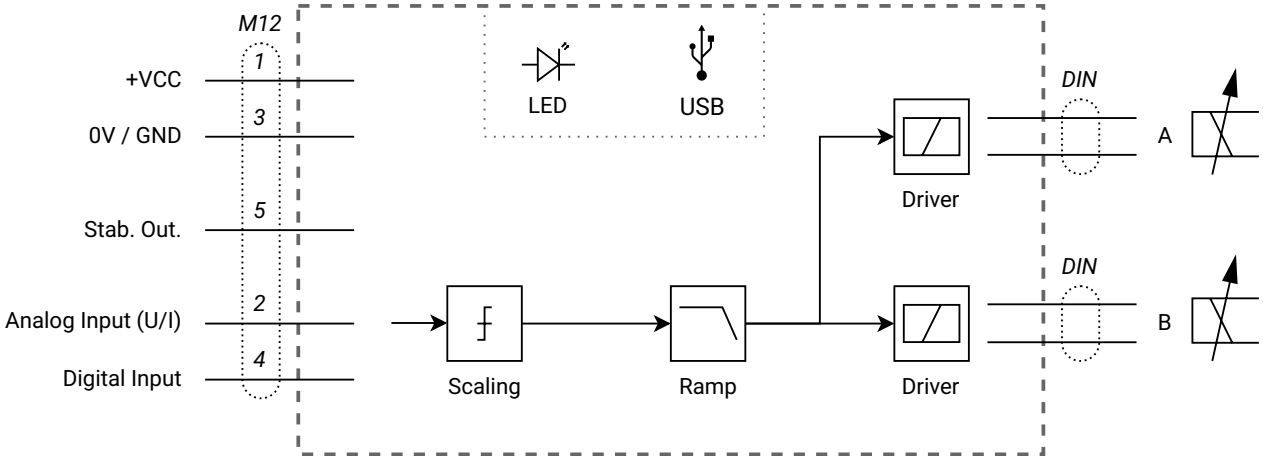
3.2.1 General Specifications

Description		Value
Design	Pluggable	on solenoid with DIN plug DIN EN 175301-803 type A (ISO 4400)
Connections	Connection plug	M12 plug (male) 5-pole
	Solenoid plug	only for 2 solenoid variant PUR, 2 x 0.75 mm2, DIN plug
	Parametrisation	USB (Plug C)
Dimensions		see drawing 11
Ambient Temperature	-40...+85 °C	Derating see Temperaturüberwachung 13
Installation	1 centre bolt	captive screw M3x10 tightening torque 0.4 Nm
Protection Class		IP65 acc. to EN 60 529[1]

3.2.2 Electrical Specifications

Description		Value
Supply Voltage +VCC		8 ... 32 VDC
Fuse		The PDS1 electronics must be secured by the user with a slow-blow fuse
Temperature Drift		< 1% at ΔT = 40° C
No-load Current		approx. 20 mA
Maximum Current Consumption		no-load- + 1x max. solenoid current
Analog Input		1 input Voltage/Current (switchable via parameter)
	Voltage	0 ... ± 10 V
	Current	0/4 ... 20 mA
	Resolution	12 Bit
	Input Resistance Voltage Input	> 100 kΩ
	Load for Current Input	124 Ω
Digital Input		1 input, high-active
	Switching Level High	> 4 VDC
	Switching Level Low	< 1 VDC
Parameter Interface		USB (Plug C)
Stabilized Output Voltage		has to be enabled in PASO2[2]
	Voltage	5 VDC
	max. Load	20 mA
Solenoid Current		0 ... 2300 mA Min. and max. current adjustable
Dither		individually per solenoid
	Frequency Adjustable	4 ... 500 Hz
	Level Adjustable	0 ... 400 mA
EMC	Immunity	EN 61000-6-2
	Emission	EN 61000-6-4

3.3 Block Diagram

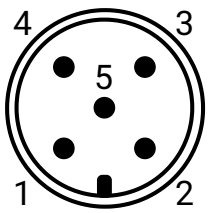


3.4 Indicators

The PDS1 electronics features a status LED:

- **Lights green**
  Electronics are started and ready for use.
- **Lights green + flashes yellow**
  A device warning is being signaled. The indicated warning codes are described in the chapter Troubleshooting 30.
- **Flashes red**
  A device error is signaled. The signaled error codes are described in the chapter Troubleshooting 29.
- **Flashes red/green/yellow**
  The device startup is signaled with a short blinking sequence *yellow-green-red* (2x).
- **Lights red**
  The device is in DFU (Device Firmware Update) mode.

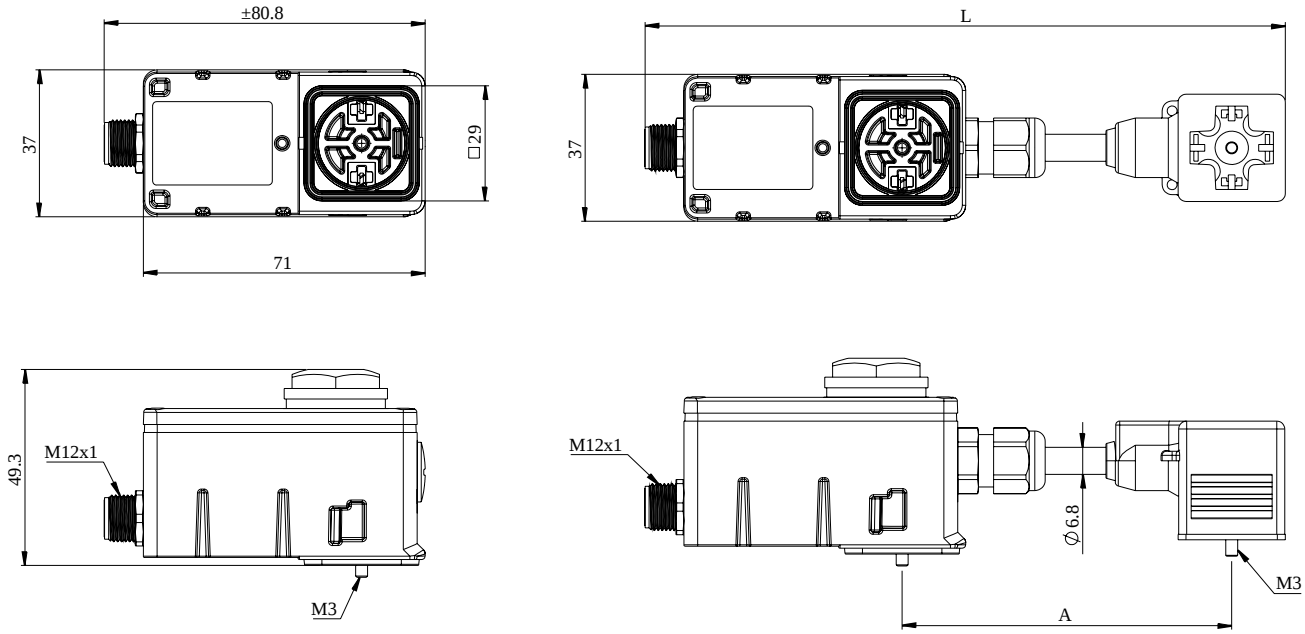
3.5 Pin Assignment



Pin	Signal
1	Supply Voltage +VCC
2	Setpoint Signal
3	Supply Voltage 0V / GND
4	Digital Input
5	Stabilized Output Voltage[2]

3.6 Dimensions

1 solenoid variant / **2 solenoid** variant



Length specifications of the 2 solenoid variant

Type	Dimension A	Dimension L	Suitable valve type
PDS1502D80-AA/095mm	95 mm	173.31 mm	WDPFA04 with VDE37
PDS1502D80-AA/110mm	110 mm	188.31 mm	WDPFA06 with WDE45
PDS1502D80-AA/135mm	135 mm	213.31 mm	WDPFA10 with WDE64
other lenghts on request			

3.7 Inputs and Outputs

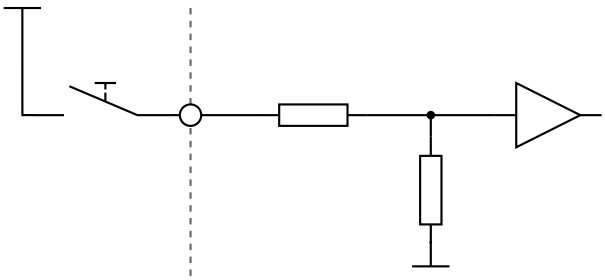
3.7.1 Supply Voltage

The PDS1 electronics are operated via the M12 connector with a supply voltage of 8 VDC to 32 VDC. If this voltage is undershot, the electronics go into error state.
If a brief drop in supply voltage is expected in the system (e.g., when starting a motor in a mobile machine), this error can also be automatically reset. To do this, the Supply Error Auto Reset 21 function must be activated in PASO2.

Parameter changes can also be made without connecting the M12 connector, by only attaching the USB cable. In this case, without supply voltage, the solenoid outputs cannot be activated, and a supply error will be displayed (see Power Supply Error 29).

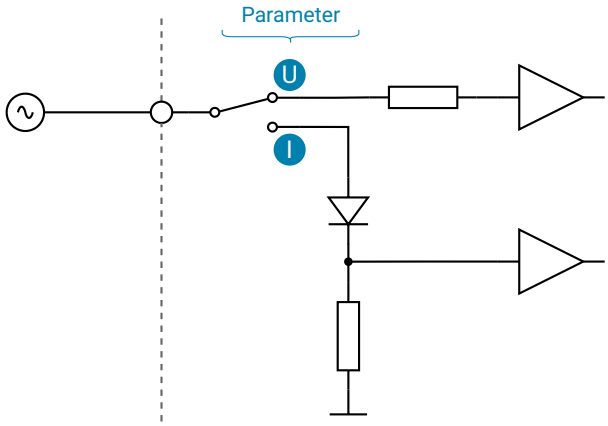
3.7.2 Digital Input

- The digital input is high-active and not galvanically isolated.
- To activate it, a voltage of at least 4 VDC must be connected, e.g., the supply voltage +VCC (see Electrical Specifications 9).



3.7.3 Analog Input

- The analog input can read voltage and current signals.
- The signal type can be switched by a parameter (adjustable via PASO2 25).
- The analog input is not galvanically isolated.



3.7.4 Solenoid Output

The solenoid output measures the effective solenoid current. This enables the electronics to regulate the solenoid current, compensating for temperature effects such as self-heating.
All relevant settings are adjustable via parameters (available settings see Function Description 19). This allows the behavior to be adapted to the valve.

3.7.4.1 Temperature Monitoring

The PDS1 electronics have a factory-set internal temperature monitoring system that can limit the solenoid current to prevent overheating of the electronics.
This means that at high ambient temperatures and high solenoid temperatures, the full solenoid current may not be reached.

Above 85 °C of the internal electronics temperature, the set maximum solenoid current (I_{max}) is reduced depending on the temperature.
The temperature of the PDS1 electronics is visible in the parameterization software PASO2.

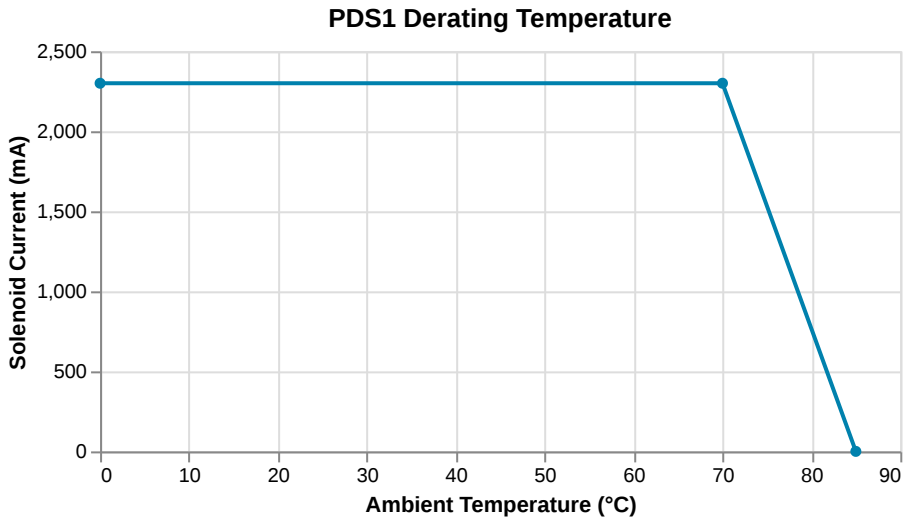
Since the self-heating of the solenoid significantly impacts the electronics temperature, this current limitation can reduce the electronics temperature, allowing the electronics to operate with limited current even at higher ambient temperatures.
When this limitation, known as **derating**, is active, the solenoid current of the valve, and consequently the operating range of the valve, is restricted — the effect is similar to that of a restricted setpoint signal range (see valve data sheet).

Attention

If the monitored electronics temperature exceeds 90 °C, the PDS1 electronics switch to error mode.
The solenoid outputs are then locked to prevent permanent damage to the electronics.
After cooling down and resetting the error (see chapter Troubleshooting 28), the PDS1 electronics can be activated again.

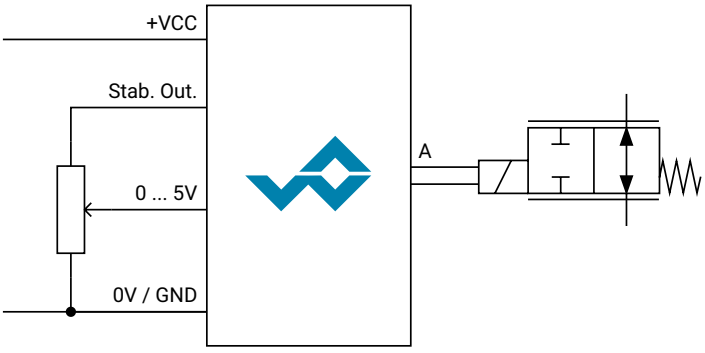
The derating/reduction of current depends on:

- Ambient temperature (lower temperature is better)
- Supply voltage (higher voltage is generally better)
- Solenoid type (smaller solenoid with lower power is generally better)
- Solenoid current (lower current is generally better)



3.7.5 Stabilized Output Voltage

The stabilized output voltage allows for very simple wiring and generation of a setpoint signal. A potentiometer is simply connected between this output and 0V. This way, a local voltage signal is generated, which serves as the setpoint for the PDS1 electronics.
The stabilized output voltage is disabled by default[2].



1. When mounted on round Wandfluh slip-in coils
2. Can be activated with PASO2 (some M12 distributor boxes have ground at pin 5 → risk of short circuit!)

4 Function Description

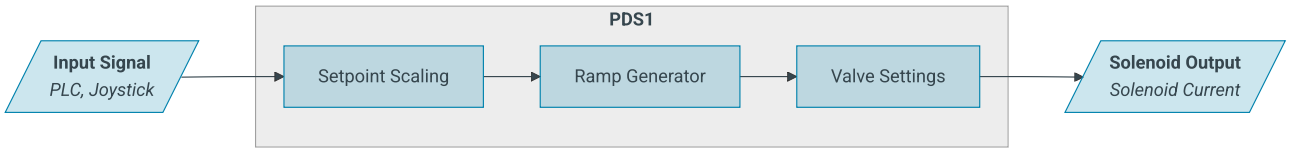
The PDS1 electronics is a compact amplifier for one or two solenoids, which can be directly attached to a solenoid.

The electronics can either read a voltage or a current signal. This selection can be switched using parameters. The scaling can be freely adjusted and tailored to the specific application.

Thanks to the built-in ramp function, various monitoring functions, and other adjustable options, the functionality of the electronics can be individually customized.

The parameterizable solenoid drivers allow various types of valves to be controlled.

Simplified overview of the signal flow



The **function blocks** and their **parameters** are described below.

Info

The documentation is valid for the entire product family. Individual functions may not be available in all product variants.

This documentation is also available in the parameterization software PASO2 25.

4.1 Setpoint Scaling

This function block is used for settings related to setpoint signal scaling.
You can configure the source of the setpoint as well as the processing (scaling).

4.1.1 Signal Type

The desired signal type of the setpoint is selected here.
This setting influences the available input sources (see Source 15).

4.1.2 Source

Selection of the desired source to be used as the setpoint.

4.1.3 Cable Break Monitoring

Activation of the cable break detection of the input signal.
The thresholds at which a cable break is detected are defined by the parameters Lower Cable Break Threshold 16 and Upper Cable Break Threshold 16.

4.1.4 Lower Cable Break Threshold

An input value lower than the Lower Cable Break Threshold 16 triggers the cable break error.

4.1.5 Upper Cable Break Threshold

An input value greater than the Upper Cable Break Threshold 16 triggers the cable break error.

4.1.6 Lower Raw Value

The lower input value at which the scaled setpoint corresponds to the Lower Scaling Value 16.

4.1.7 Upper Raw Value

The upper input value at which the scaled setpoint corresponds to the Upper Scaling Value 16.

4.1.8 Lower Scaling Value

The Lower Raw Value 16 is scaled to this value.

If the raw input value falls below the value defined in the parameter Lower Raw Value 16, the setpoint is linearly extrapolated so that the scaled setpoint can also fall below the value set here. If this is not desired, the setpoint can be limited to the value set here using the parameter Limit Scaling 16.

4.1.9 Upper Scaling Value

The Upper Raw Value 16 is scaled to this value.

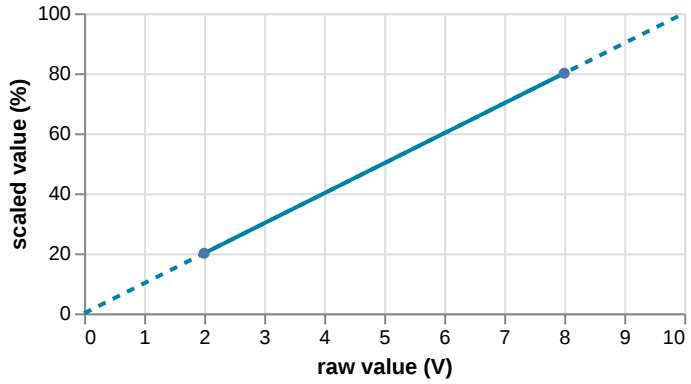
If the raw input value rises above the value defined in the parameter Lower Raw Value 16, the setpoint is linearly extrapolated so that the scaled setpoint can also rise above the value set here. If this is not desired, the setpoint can be limited to the value set here using the parameter Limit Scaling 16.

4.1.10 Limit Scaling

When this parameter is activated, no extrapolation occurs during the scaling of the setpoint value. Instead, the two scaling values are used as absolute limits.

Info

This graph illustrates the relationship between raw parameters (Lower Raw Value 16 at 2V and Upper Raw Value 16 at 8V) and their corresponding scaled outputs (Lower Scaling Value 16 at 20% and Upper Scaling Value 16 at 80%).
It also demonstrates the impact of the Limit Scaling 16 parameter on extrapolation beyond the defined range.



4.1.11 Deadband

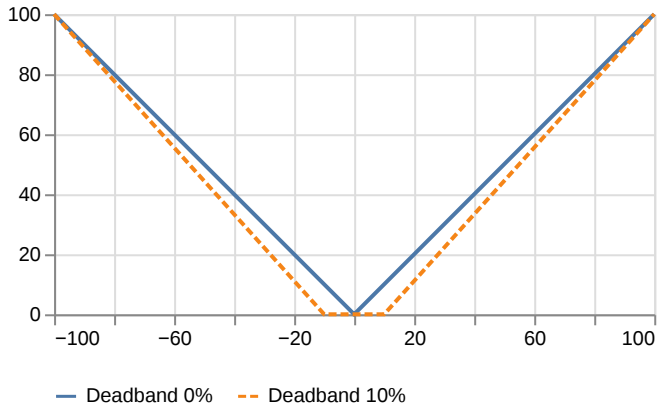
The deadband can be used to ensure that the solenoid current remains at zero for a defined small setpoint value, preventing the activation of the valve. This function is commonly used with joysticks as setpoint controllers, so that the valve remains stationary when the joystick is in its neutral position.

The set percentage value is applied to the scaled setpoint. If the scaled value is smaller (in absolute terms) than the threshold value, 0% is output.

If the value 0% is set, the deadband function is deactivated.

Attention

The scaling of the output value changes!
The output is scaled linearly from 0...+/-100% from the deadband value to 100% (see graphic).



4.2 Setpoint Functions

In this function block, the setpoint can be further processed.

4.2.1 Inversion

With this parameter, the output of this function block can be inverted (sign is changed) using a digital signal (e.g., a digital input).

If the value is set to `Not used`, the function is disabled.

Info

This function can be used to select/switch the solenoid using a digital input.

4.3 Ramp Generator

This function block is used to configure the settings for setpoint value changes (ramp-up and ramp-down speeds of the setpoint value).

In the event of a sudden change in the setpoint value, the internal setpoint value is gradually increased using the ramp. This can help prevent abrupt movements or pressure surges, for instance.

Info

When the enable signal changes from *inactive* to *active*, the ramp generator is restarted.

4.3.1 Ramp Up (positive)

The set ramp time refers to a setpoint jump from 0% to +100% for solenoid driver **1** (positive setpoint).

A value of 0 means the ramp is turned off at this point.

4.3.2 Ramp Down (positive)

The set ramp time refers to a setpoint jump from +100% to 0% for solenoid driver **1** (positive setpoint).

A value of 0 means the ramp is turned off at this point.

4.3.3 Ramp Up (negative)

The set ramp time refers to a setpoint jump from 0% to -100% for solenoid driver **2** (negative setpoint).

A value of 0 means the ramp is turned off at this point.

4.3.4 Ramp Down (negative)

The set ramp time refers to a setpoint jump from -100% to 0% for solenoid driver **2** (negative setpoint).

A value of 0 means the ramp is turned off at this point.

4.4 Solenoid Driver

This function block is used to configure solenoid (valve)-specific settings.

4.4.1 Output

Selection of which physical solenoid output is controlled by this solenoid driver.

4.4.2 Cable Break Monitoring

Activation of the cable break monitoring of the solenoid output.

4.4.3 Minimal Current (i_{min})

Minimum solenoid current, which flows at a setpoint > 0%.
This parameter corresponds to the opening point of the valve.

4.4.4 Maximal Current (i_{max})

Solenoid current that flows at a setpoint of 100%.
This parameter corresponds to the desired maximum actuation of the valve or the maximum allowable solenoid current for the solenoid being used.

4.4.5 Dither Amplitude

The ± level of the dither signal.

If no dither is desired, the level can be set to 0.

Info

The dither function overlays the solenoid current with a dither current of the desired amplitude 20 and frequency 20, causing the valve spool to oscillate slightly to break the static friction in the spool.

This can minimize the *stick-slip effect* and improve the valve's response.

Based on experience, 70 Hz / 200 mA is a good baseline setting for Wandfluh valves. Depending on the application (fast/slow valve, long hoses/short pipes, with/without accumulators, etc.), the settings can be further adjusted.

4.4.6 Dither Frequency

Selection of the desired dither frequency.

4.5 Channel Enable

The enable function allows the signal processing of the electronics and the solenoid outputs to be intentionally enabled or disabled.

Info

When the enable signal changes from *inactive* to *active*, all **errors** in the current channel **are reset**.

This also resets all device errors.

If the ramp generator is used, it will be restarted.

4.5.1 Enable

Determines whether and how the channel can be locked and enabled.

Possible settings:

Value	Explanation
Off	The channel is locked, i.e., no solenoid current will flow.
On	The channel is enabled, solenoid current can flow.
External	The enable signal is controlled with a digital high signal. The parameter Source 21 determines the source of the signal.
External inverted	The enable signal is controlled with a digital low signal. The parameter Source 21 determines the source of the signal.

4.5.2 Source

If `External` or `External inverted` is selected in the parameter Enable 21, this parameter selects the source of the enable signal.
The selected input activates or deactivates the enable signal accordingly.

4.6 Device Error

4.6.1 Supply Error Auto Reset

Setting whether an error due to the supply voltage will be automatically reset when the error condition is no longer present.

Info

This can be useful for mobile machines where the supply voltage temporarily drops during the startup process. Without the auto-reset function, the electronics would switch to error status and wait for manual reset via the enable input (or via PASO2).

4.6.2 Stab. Voltage Output Error Auto Reset

Setting whether an error related to the stabilized voltage output will be automatically reset when the error condition is no longer present.

Info

If the stabilized output voltage is used and Supply Error Auto Reset 21 has been activated, it is advisable to also enable this Auto-Reset function.
A drop in the input voltage below a critical level will inevitably result in an error in the stabilized output voltage.

4.7 Device Properties

4.7.1 Name

Display name for the device. Shown in the PASO2 device selection.

4.7.2 Stabilized Voltage Output

Enable stabilized voltage output.

4.8 Additional Functions

Additional functions available:

- Display of Errors and Warnings
- Export and import of all settings
- Reset to factory settings
- Retrieve operating statistics data
- Retrieve device information

Info

If a special function is needed that is not available in the electronics, Wandfluh also offers custom developments.

sales@wandfluh.com

5 Commissioning

Attention

Please refer to the section Safety Regulations 6.

For **EMC-compliant connections**, the following points must be strictly observed:

- Solenoid and signal cables must not be routed parallel to high-power cables.

Further notes:

- All inputs and outputs should be connected via the M12 5-pin connection cable.
- Under the screw cap of the housing cover, there is a USB interface through which parameterization and diagnostics can be performed using the parameterization software PASO2.
- The tuning to the used valves must be done by the user.
- Further settings regarding the device's function must be made by the user.

Info

Wandfluh can create application-specific parameter files upon customer request.

5.1 Installation

The PDS1 electronics are directly plugged onto a solenoid (DIN connector) and screwed in place. Access to the screw is under the transparent screw cap of the housing cover, where the USB connector for PASO2 is also located.

Caution

During installation, ensure that no excessive force is applied, as this may impair the seal and damage the electronics.
The mounting screw should be tightened with a maximum torque of 0.4 Nm.

The housing is optimized for round plug coils from Wandfluh. Solenoid coils from other manufacturers have not been tested - particularly for sealing.
Therefore, protection class IP65 can only be guaranteed if the installation is done on those solenoid coils.

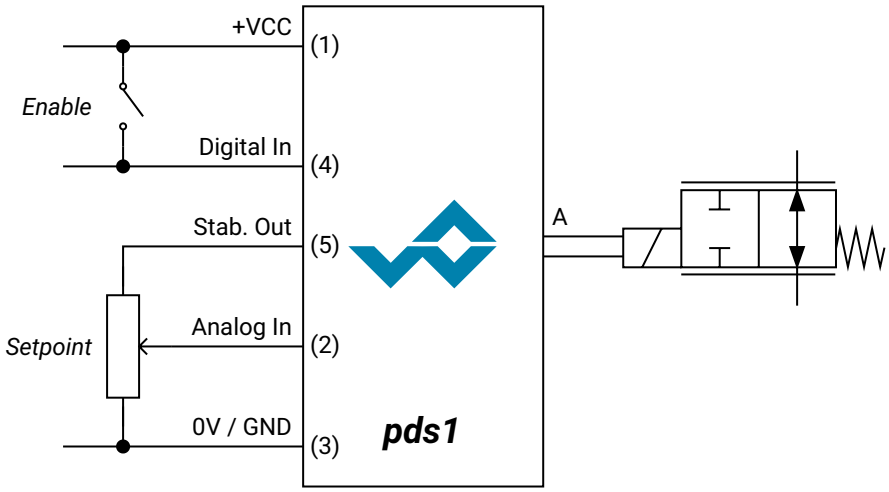
5.1.1 Acessories

For square type solenoid coils from Wandfluh, an additional gasket is required.

- Flat gasket - *Art.No. 106513*

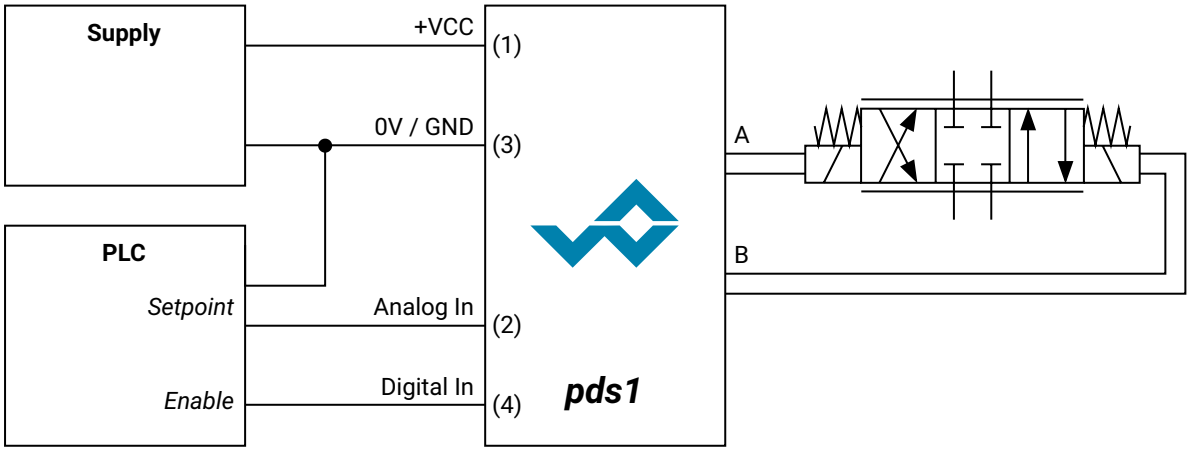
5.2 Connection Examples

5.2.1 Local



Connection example 1 solenoid with stabilized voltage output and potentiometer

5.2.2 PLC



Connection example 2 solenoid with setpoint signal from plc

6 Configuration (PASO2)

The parameterization and diagnostic software **PASO2** enables easy configuration of the PDS1 electronics. All settings can be made via the intuitive user interface.

The software offers the following key features:

- **Flowchart-Based Parameterization**
  Functions are clearly presented as functional blocks in the signal flow. Within each block, the available parameters are visible and can be directly edited.

- **Real-Time Analysis**
  The current values of inputs and outputs as well as the results of the functional blocks are displayed in real time within the signal flow. Changes to parameters are immediately traceable.
  Any device error or warning messages are shown directly and explained.

- **Parameter File Management**
  All device settings can be saved in a parameter file and transferred to other devices as needed.
  These files can be opened and edited even without a connected device. New files can also be created for any desired device.

- **Integrated Help**
  The software features a comprehensive help function that covers both the operation of PASO2 and the explanation of all functional blocks and parameters.

Beyond the listed features, PASO2 also offers additional options for simple and efficient commissioning of the electronics as well as optimal adaptation to the respective hydraulic system.

Download PASO2
https://www.wandfluh.com/en/software/

6.1 Installation

6.1.1 System Requirements

System Requirements	
Operating System	Windows 10 or higher
USB Cable	Plug Type C

Info

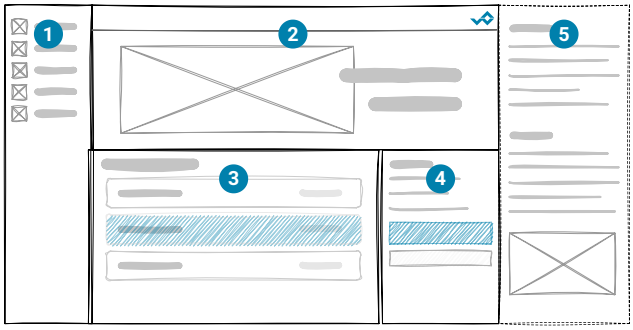
The software can be installed for a single user or globally for all users.
For a global installation, administrative rights are required depending on company policy.

6.2 Layout

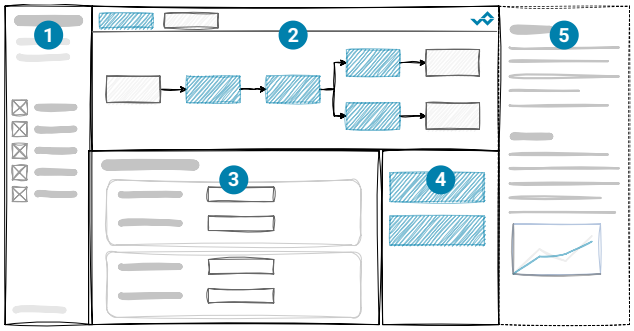
In PASO2, two main views can be distinguished, each of which is divided into five areas.

Various basic actions can be carried out in the *Start view*. The *Editing view* then allows you to edit parameters (of connected devices and parameter files).

Start view



Editing view



1. **Menu**
   The context menu is located here.
   Additional information about the device is displayed in the editing view.
2. **Graphic**
   In this area, the flowchart with function blocks is displayed in the editing view. The function blocks can be clicked to edit them. At the top, you can switch between channels.
3. **Setting**
   The connected devices are displayed here in the *Device Selection*. Under *New*, a Wandfluh device can be selected for which a parameter file is to be created.
   In the editing view, the parameters of a function block can be displayed and edited.
4. **Action**
   In the start view, a selected device can be opened/connected. A parameter file can also be written to connected devices.
   In the editing view, additional information such as the *Allocation List* appears in this area.
5. **Help**
   The optional help is displayed in this area. In the *Settings* area, the help for the current context can be called up by clicking on the help symbol (**?**).

6.3 Edit Parameters

Step-by-step instructions on how to modify a parameter on the device using PASO2.
Ensure that the software is installed and the PDS1 electronics are connected via USB.

1. Open PASO2 and navigate to the *Device Selection* menu ❶ from the start view.
2. Select the desired device from the list ❸ and click *Connect* ❹.
3. In the editing view that appears, click on *Disable Write Protection* ❶ to enable parameter changes.
4. Click the desired function block ❷ and enter the new value for the target parameter ❸.
   Confirm entry with `Enter` / `↵` or leave the field — the new value will be transferred to the device.
5. *(Optional)* Use *Save As ...* ❶ to store all parameters in a file — for reuse or documentation, for example.
6. Use *Disconnect* ❶ to end the connection to the device.

7 Troubleshooting

The device can detect fault conditions and report them as errors and warnings.

7.1 Display

7.1.1 Blink Code

Active Errors and warnings are indicated by blink codes (5 Hz) by the device:

Status LED	Meaning
	OK
	The LED indicates an **Error** (e.g., Blink Code 3x)
	The LED indicates a **Warning** (e.g., Blink Code 2x)

Error

In case of an error, the status LED of the PDS1 electronics blinks red.

Blink Code	Status
1x	Error (see PASO2 for details)
2x	Power Supply Error 29
3x	Setpoint Cable Break 30
4x	Short Circuit 30 or Cable Break 30 at the magnet output
7x	Internal Error 30

Warning

In case of a warning, the status LED lights up greend and blinks yellow.

Blink Code	Status
1x	Warning (see PASO2 for details)
2x	High Temperature 30 (> 85 °C) *The Derating Function 13 is active.*

7.1.2 PASO2

When the device is connected to PASO2, the error/warning icon in the channel is animated.

Under *Channel Error*, all active errors and warnings for the current channel are listed.

If an error is reported by a function block, a warning icon appears in the corresponding function block.

Device errors are additionally listed under *Device Error*.

7.2 Error

7.2.1 Power Supply Error

The supply voltage is below 8 VDC.
The error is also reported if a voltage dip (t > 250 ms) has occurred.

Notes:

- Is the supply power adequate?
- Is the AC component too high (see section Electrical Specifications 9)?
- Using the parameter Supply Error Autoreset 21, this error is reset automatically once the supply voltage returns to the allowed range.

7.2.2 Stabilized Voltage Output

The voltage of the stabilized voltage output has fallen below its setpoint.

Notes:

- The maximum current load of the output (see section Electrical Specifications 9) must not be exceeded.
- An insufficient supply voltage also causes this error.
- Using the parameter Stab. Voltage Output Error Autoreset 22, this error can be automatically reset once the fault condition is no longer active.
- If the stabilized voltage output is not required, the function can be disabled in the device properties using the parameter Stabilized Voltage Output 22.

7.2.3 Temperature

The electronics temperature is too high (above 90 °C).

Notes:

- The solenoid was operated at too high a current, causing the electronics to overheat, and/or the ambient temperature is too high.
- Check the ambient temperature and solenoid current settings, and allow the electronics to cool down.

7.2.4 Setpoint Cable Break

The setpoint value has either fallen below the lower cable break limit or exceeded the upper cable break limit.

Notes:

- Check the connections between the setpoint generator and the electronics.
- If the cable break function is not required, monitoring can be disabled via the parameter Cable Break Monitoring 16.

7.2.5 Solenoid Output Short Circuit

A short circuit has occurred at the solenoid output.

Notes:

- Check the connections between the electronics and the valve (solenoid).

7.2.6 Solenoid Output Cable Break

A cable break has occurred at the solenoid output.

Notes:

- Check the connections between the electronics and the valve (solenoid).
- If the cable break function is not required, monitoring can be disabled via the parameter Cable Break Monitoring 19.

7.2.7 Internal Error

A severe internal error has occurred.

Connect the electronics to PASO2 and update the firmware. If the issue persists, contact support.

7.3 Warning

7.3.1 High Temperature

The electronics temperature has exceeded 85 °C.

Notes:

- The solenoid is being driven with too high a current, causing significant heating of the electronics, and/or the ambient temperature is too high.
- Check the ambient temperature and solenoid current settings.
- Prolonged exposure to high temperatures can reduce the electronics' lifespan.

7.3.2 Derating

The device is in *derating* mode and reduces the maximum solenoid current based on the device temperature (see Temperature Monitoring 13).

Notes:

- The solenoid was operated with too high a current, causing significant heating of the electronics, and/or the ambient temperature is too high.
- Check the ambient temperature and solenoid current settings.
- Prolonged exposure to high temperatures can reduce the electronics' lifespan.

7.4 Resetting Errors

When the fault condition has been resolved, the error must be reset.

In PASO2, errors can be reset per channel or for the entire device at the push of a button.

The error can also be reset directly on the device (without PASO2). To do this, the device can be briefly locked and then unlocked again using the Channel Enable 20 function. When switching to *active*, all errors are reset.

Info

Warnings are always reset automatically.

8 Disposal

- The PDS1 electronics must be disposed of in accordance with the general regulations of the country in which it is used.
- Electronic parts are recycled by specialized companies.