PS® AUTOMATION
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# Operating Instructions

## PS-AMS1x with Fieldbus-Interface HART


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*Subject to change!*

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# 1. Description

The optional fieldbus HART modem allows operation of the PS-AMS1x actuator via HART network. This modem communicates to the actuator via ModbusRTU. The actuator does then not use analogue set values.

Adjustment of parameters of the actuator is not possible via fieldbus.

**Note**: The actuator has a single communication port. This is used when the optional fieldbus module is installed. For parameterisation of the actuator with the communication software PSCS for PS-AMS or local control unit PSC.2, the position of a switch on the mainboard of the actuator PS-AMS1x has to be changed, see chapter 2.2. After that, communication with PC is possible via the communication cable. After parameterisation, the switch has to be placed to position “Fieldbus” again, to allow communication of the fieldbus module to the actuator.
-> See also Instruction Manual PSCS for PS-AMS

**Note**: „Digital Set Value” (in the communication software PSCS for PS-AMS under Operate - Configuration - Set Value & Feedback) must be activated to control the actuator via the fieldbus interface!

**Note**: During PC communication there may unreasonable data appear in the (fieldbus-based) process data objects.

**Note:** You can download the appropriate software at the following link:

# 2. Connecting the Fieldbus

**Caution**: When working at or on the actuator’s mainboard, proper earthing of the worker has to be ensured. As a makeshift it will help to firmly touch the actuator housing with bare hands before working on the actuator, to create an equalisation of potential.

## 2.1 Wiring to terminal block

There are two specific metal cable glands for insertion of the fieldbus cables. These allow connection of the PE shielding as shown in Figure 1.

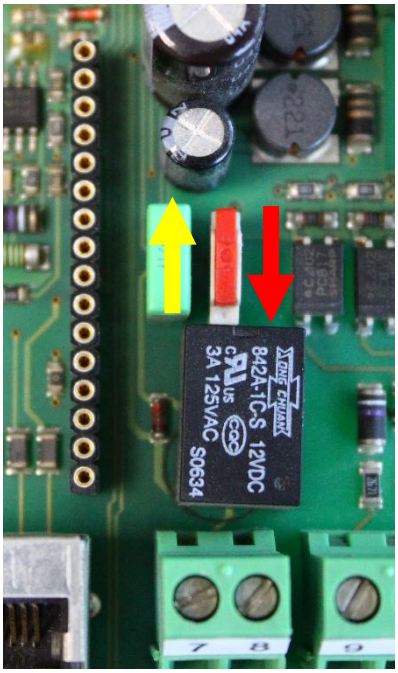
*Figure 1: EMC cable gland with earthing cones*

It is recommended to use the HART communication cable as a two-wire cable with twisted pair and common shielding!

| | |
|---|---|
| 1 | GND |
| 2 | +24 VDC |
| 3 | HART + |
| 4 | HART - |

The HART fieldbus is connected to Terminal 3 HART+ and 4 HART - . Depending on the power supply of the actuator, the power supply for the HART modem Terminal 1 GND and 2 +24VDC may already be wired internally.

## 2.2. Slide switch for selecting the communication interface




On the mainboard inside the actuator there is a slide switch for selecting the interface (see Figure 2).
For normal operation, i.e. if the actuator is controlled via the fieldbus, put the switch to lower position (red arrow).
For adjustment work, parameterisation, etc. with the communication software PSCS for PS-AMS the switch has to be put in upper position to allow PC-communication (yellow arrow).

**Caution**: After finishing adjustment work, make sure that the switch is in "fieldbus communication" position (red arrow). In "PC communication" position (yellow arrow) the interface does communicate to the bus, but not to the actuator's electronics!

yellow: PC-communication
red: fieldbus-communication

*Figure 2: Slide switch for selecting the interface*

# 3. HART Commands

Three dynamic variables are used to transfer the process data.

## 3.1. HART device category "Actuator"

**PV (primary variable) = Setpoint [0-100%**]
To send the setpoint to the actuator, "Desired Position" must be set to 0-100%

**SV (secondary variable) = Actual position value [0-100%]**

**TV (third variable) = Error No. 0-64**

The below table lists the messages that can appear during operation.

| Error No. [dec] | Description of Status |
|---|---|
| Working condition | |
| 0 | Normal operation |
| 1 | Actuator doing auto-commissioning |
| 2 | Actuator not commissioned to the valve |
| 14 | Actuator not in AUTO mode<br>(in conjunction with local control unit PSC.2) |
| Peripheral errors | |
| 3 | Set value error |
| 4 | Torque error |
| 5 | Fail Safe-action is started |
| 6 | Set value error of the process sensor |
| 12 | Position passed over |
| 13 | Position nor reached |
| 11 | Under voltage at supply |
| Errors in actuator | |
| 7 | Mechanical / positioning error |
| 8 | Critical / maximum temperature reached |
| 9 | Electronics error / CRC |
| 10 | Limit of wear reached |
| Communication error | |
| 32 | No communication to actuator possible |

**Note:** Error No. 32 may be displayed twice during commissioning of the actuator to the valve: when either of the end positions is reached and the measured values are stored inside the actuator. During normal operation, this error signals a malfunction if it is displayed longer than 10 s.

# 4. Device Description file (DD)

The description of the HART fieldbus interface "Description Device HART" can be found at the following link:
https://www.ps-automation.com/products/ethernet-and-fieldbus-interfaces/?lang=en

**Alternatively:**
On the PS Automation website, select the "Products" category, then Accessories PS-AMS → Ethernet and fieldbus interfaces. Here, the file "Description Device HART" is highlighted in blue in the text.

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