



TURCK AIH401-N Analog Input Module User Guide

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TURCK AIH401-N Analog Input Module



Product Information

The AIH401-N is a 4-channel analog input module designed for the connection of passive 2-wire transducers or active 4-wire transducers. It is also compatible with HART-compatible sensors that can communicate with the integrated HART controller. The module is 100% functionally compatible with the AIH40-N and AIH41-N input modules.

Product Features:

- Designed for connection of passive 2-wire transducers or active 4-wire transducers
- Compatible with HART-compatible sensors
- Integrated HART controller
- 100% functionally compatible with AIH40-N and AIH41-N input modules

Intended Use:

The AIH401-N is a piece of equipment from the explosion protection category increased safety. It should be used according to the instructions provided to ensure safety and proper functionality. Any other use is not in accordance with the intended use, and Turck accepts no liability for any resulting damage.

Other documents

Besides this document, the following material can be found on the Internet at www.turck.com:

- Data sheet
- Notes on use in zone 2
- excom manual — I/O system for non-intrinsically safe circuits
- Declarations of conformity (current version)
- Approvals

For your safety

Intended use

The device is a piece of equipment from explosion protection category “increased safety” (IEC/EN 60079-7) and may only be used as part of the excom I/O system with the approved module carriers MT... (TÜV 21 ATEX 8643 X or IECEx TUR 21.0012X) in zone 2.

DANGER These instructions do not provide any information on use in zone 2.
Danger to life due to misuse!

- When used in zone 2: Observe the information on use in zone 2 without fail.

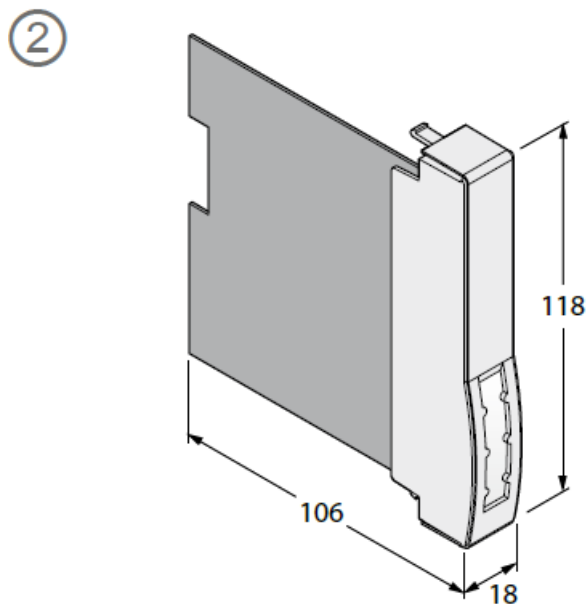
The AIH401-N 4-channel analog input module is designed for connection of passive 2-wire transducers or active 4-wire transducers. HART-compatible sensors can be connected to the module and communicate with the integrated HART controller. The module is 100 % functionally compatible with the AIH40-N and AIH41-N input modules. Any other use is not in accordance with the intended use. Turck accepts no liability for any resulting damage.

General safety instructions

- The device may only be mounted, installed, operated, configured and maintained by professionally trained personnel.
- The device meets the EMC requirements for industrial areas. When used in residential areas, take measures to prevent radio interference.
- Only combine devices that are suitable for joint use based on their technical data.
- Check the device for damage before mounting.

Product description

Device overview



Functions and operating modes

The module converts an analog input signal of 0...21 mA into a digital value of 0...21,000 digits. This corresponds to a resolution of 1 μ A per digit. Up to eight HART variables (maximum four per channel) can be read via the cyclical user data traffic of the fieldbus. The acyclical data exchange offers enhanced communication options such

as the diagnostics and parameter setting of HART field devices.

Installing

Multiple devices can be mounted directly next to each other. The devices can also be changed during operation.

- Protect the mounting location from radiated heat, sudden temperature fluctuations, dust, dirt, humidity and other ambient influences.
- Insert the device into the designated position on the module rack so that it noticeably snaps into place.

Connecting

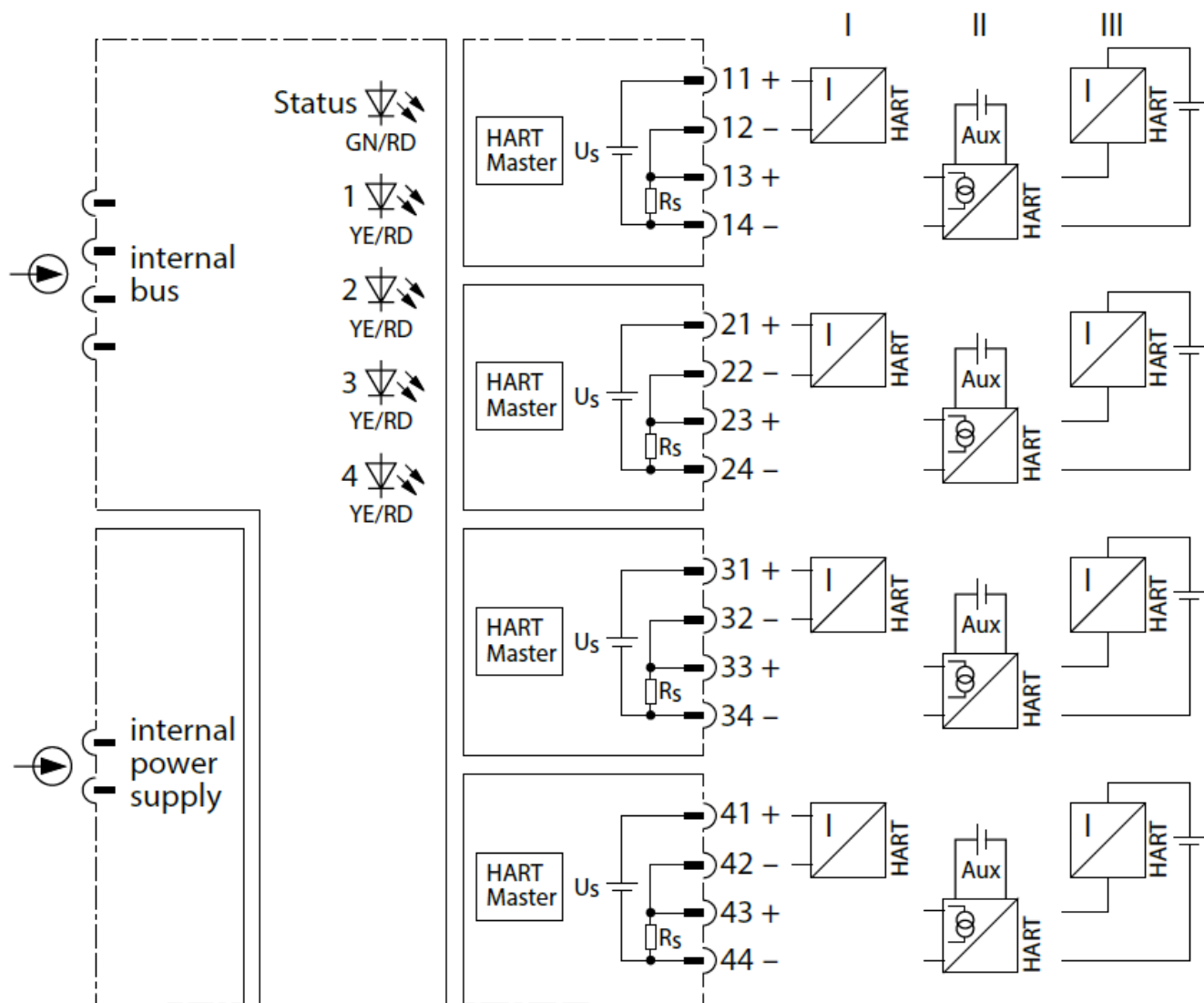
When plugged into the module rack, the device is connected to the module rack's internal power supply and data communication. Screw connection terminal blocks or terminal blocks with spring technology can be used to connect the field devices.

- Connect the field devices as shown in "Wiring diagram."

Commissioning

Switching on the power supply on the module rack immediately switches on the fitted device. As part of the commissioning process, the input and output behaviors must be parameterized once via the fieldbus master and the module slot must be configured.

Wiring diagram



Operating

The device can be fitted in or removed from the module rack during operation if a potentially explosive atmosphere is not present.

LEDs

LED	State	Function
Status	Off	Power off
	Green	Power supply and communication error free
	Red	No communication possible: Module errors are present.
	Red flashing	Module not configured for current slot
	Green flashing (slow: 0.5 Hz)	Module in FailSafe mode
	Green flashing (1.0 Hz asym.)	Module not yet configured by the gateway, awaiting configuration data
1...4 (channel)	Off	HART status request off and, in the case of error-free acyclic HART communication, in ON status for approximately 300 ms
	Yellow	HART status request on and HART communication error free
	Yellow flashing (on/off: 700/300 ms)	HART status request on and HART communication faulty
	Yellow flashing (on: 300 ms per telegram)	HART status polling deactivated and acyclical HART communication error free
	Red	Channel error (wire break, short circuit): Channel diagnostics

Setting

The behavior of the inputs is parameterized via an associated configuration tool, FDT frame or web server, depending on the higher-level fieldbus system. The following parameters can be set for each channel:

- Short-circuit monitoring
- Wire-break monitoring
- Substitute value strategy
- HART status/measuring range
- HART variable
- Channel of the HART variable
- Activate or deactivate secondary variable
- Filter for mean value generation

Repair

The device must not be repaired by the user. The device must be decommissioned if it is faulty. Observe our return acceptance conditions when returning the device to Turck.

Disposal

The device must be disposed of properly and does not belong in the domestic waste.

Technical data

- **Type designation** AIH401-N
 - ID 6884269
- **Supply voltage** Via module-rack, central power supply
 - **Power consumption** 3 W
 - **Galvanic isolation** Complete galvanic isolation acc. to EN 60079-11

- **Number of channels** 4-channel
- **Input circuits** 0/4...20 mA
 - **Supply voltage** 17.5 VDC at 21 mA
 - **HART Impedance** > 240 Ω
 - **Overload capability** > 21 mA
 - **Low level control** < 3.6 mA
 - **Short-circuit** > 25 mA
 - **Wire-break** < 2 mA (only in live zero mode)
- **Resolution** 1 μ A
 - **Rel. measuring inaccuracy (including linearity, hysteresis and repeatability)** ≤ 0.06 % of 20 mA at 25 °C
 - **Abs. measuring inaccuracy (including linearity, hysteresis and repeatability)** $\leq \pm 12$ μ A at 25 °C
 - **Linearity deviation** ≤ 0.025 % of 20 mA at 25 °C
 - **Temperature drift** ≤ 0.0025 % of 20 mA/K
 - **Max. measurement tolerance under EMC influence**
 - **Shielded signal cable:** 0.06 % of 20 mA at 25 °C
 - **Unshielded signal cable:** 1 % of 20 mA at 25 °C
 - **Rise time/fall time** ≤ 40 ms (10...90 %)
- **Connection mode** Module, plugged on rack
- **Protection** class IP20
 - **Relative humidity** ≤ 93 % at 40 °C acc. to EN 60068-2-78
 - **EMC**
 - Acc. EN 61326-1
 - Acc. to Namur NE21

Ambient temperature Tamb: -20...+70 °C

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Documents / Resources

	<p>TURCK AIH401-N Analog Input Module [pdf] User Guide AIH401-N, AIH401-N Analog Input Module, Analog Input Module, Input Module, Module</p>
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References

-  Turck.com
-  Turck.com

