

Analog input 560AIR01 RTU560 product line



Analog input, 8 channels

- AD converter resolution: 16 bit
- Measuring ranges: +/-2 mA; +/-5 mA; +/-10 mA; +/-20 mA; +/-40 mA; +/-2 V DC; +/-20 V DC

Application

The 560AIR01 is a module of the RTU560 product line and records up to 8 analog measured values.

The module 560AIR01 is able to process the following types of signals:

- Analog measured values (AMI)
- Measured floating point information (MFI)

Following measurement ranges can be configured:

- ± 2 mA
- ± 5 mA
- ± 10 mA
- ± 20 mA
- ± 40 mA
- ± 2 V DC
- ± 20 V DC

Other input ranges and live zero values are generated from these values by conversion on the communication unit (CMU).

Characteristics

Analog inputs

Basic signal checks and cyclic processing functions are already be done locally in order to unburden the

communication unit. The module transmits relevant changes as event via the RTU I/O bus.

The 8 differential inputs are not galvanic isolated against the power supply.

The differential inputs are protected against static and dynamic over-voltages by a protection circuit. A low-pass filter suppresses unwanted frequency components.

The internal high resolution of the AD converter allows to scan all measuring ranges with the same resolution. An additional measurement channel is used for automatic zero calibration. This compensates the longterm drift of the components.

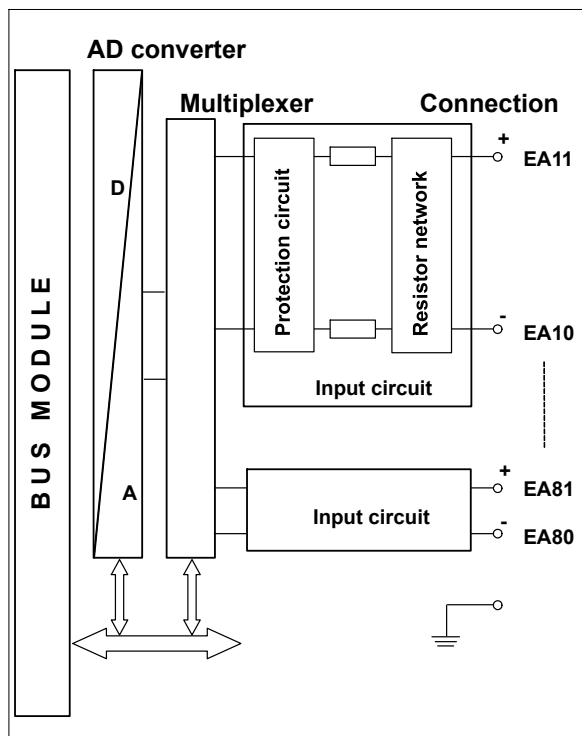


Figure 1: Block diagram Analog input board 560AIR01

For elimination of tolerances a calibration is done during production.

The synchronization of the scan cycle with the line frequency is used to increase the line frequency interference suppression of the DC input signal.

| Frequency | Conversion time per channel | Scan cycle time (same for all channels) |
|-----------|-----------------------------|---|
| 60 Hz | 54 ms | 486 ms |
| 50 Hz | 54 ms | 486 ms |
| 16.7 Hz | 155 ms | 1395 ms |

Power supply input

The required power for the module is supplied via the RTU560 backplane.

I/O controller (IOC)

The micro-controller on the module processes all time critical tasks of the parameterized processing functions. Moreover it carries out the interactive communication with the RTU I/O bus. All configuration data and processing parameters are loaded by the communication unit via the RTU I/O bus.

The module is equipped with a serial interface to the RTU560 I/O bus on the backplane.

The analog input unit can execute the following processing functions on the measured values:

- Scan cycle and line frequency interference suppression
- Zero value supervision and switching detection
- Smoothing
- Threshold value monitoring on absolute value or with accumulation
- Periodic transmission and background cycles

During initialization and operation the module carries out a number of tests. If a fault occurs it is reported to the communication unit. All fault conditions impairing the function of the module are displayed as common fault signal by a red LED. A failure of the module is detected by the communication unit.

Technical data

In addition to the RTU500 series general technical data, the following applies:

| Analog input channels 560AIR01 | |
|---|---|
| Inputs | 8 differential inputs |
| Configurable measuring range | <ul style="list-style-type: none">• ± 2 mA• ± 5 mA• ± 10 mA• ± 20 mA• ± 40 mA• ± 2 V DC• ± 20 V DC |
| Input impedance | 150 Ω @ ± 2 mA and 5 mA 50 Ω @ ± 10 to ± 40 mA 110 k Ω @ ± 2 and ± 20 V DC |
| Max. load | 80 mA continuous @ ± 10 to ± 40 mA 40 mA continuous @ ± 2 and ± 5 mA 38 V / 0.5 mA @ ± 2 and ± 20 V DC |
| Resolution | 12 bit + sign 11 bit + sign @ ± 2 V DC |
| AD converter resolution | 16 bit |
| Accuracy at 25 °C | ≤ 0.1 % ≤ 0.2 % @ ± 2 V DC |
| Linearity error at 25 °C | ≤ 0.1 % |
| Temperature drift | ≤ 100 ppm/K (0... 70 °C) |
| Max. common mode input voltage | ± 150 V DC (electrical limit) ± 8 V DC (functional limit) |
| Max. differential input voltage | ± 4 V DC (current input) ± 38 V DC (voltage input) |
| Common mode rejection | > 70 dB @ 25 °C > 60 dB @ 0... 25 °C |
| Configurable line frequency f_N | <ul style="list-style-type: none">• 16.7 Hz• 50 Hz• 60 Hz |
| Line frequency interference suppression | > 100 dB @ $f_N \pm 2$ % > 45 dB @ $f_N \pm 10$ % |

Current consumption for power supplied via RTU560 backplane

| | |
|---------|-------|
| 5 V DC | 75 mA |
| 24 V DC | -- |

Signaling by LEDs

| | |
|-----------|---|
| ERR (red) | Common fault information for the module |
|-----------|---|

Mechanical layout

| | |
|--------------|---|
| Dimensions | 160 mm x 100 mm, 3HE euro card format 4R (20 mm) front panel |
| Housing type | Printed circuit board |
| Mounting | for mounting in RTU560 racks |
| Weight | 0.3 kg |

Connection type

| | |
|----------------------------|--------------------------|
| RTU560 backplane connector | 48 pole type F DIN 41612 |
|----------------------------|--------------------------|

Immunity test

| | |
|---|---|
| Electrostatic discharge IEC 61000-4-2 | 8 kV air / 6 kV contact (level 3) Performance criteria A |
| Radiated Radio-Frequency Electromagnetic Field IEC 61000-4-3 | 10 V/m (level 3) Performance criteria A |
| Electrical Fast Transient / Burst IEC 61000-4-4 | 2 kV (level 3) Performance criteria A |
| Surge IEC 61000-4-5 | 2 kV (level 3) Performance criteria A |
| Conducted Disturbances, induced by Radio-Frequency Fields IEC 61000-4-6 | 10 V (level 3) Performance criteria A |

Environmental conditions - climatic

| | |
|---|-----------------------------|
| Operating temperature EN 60068-2-14 | -25 °C ... 70 °C |
| Start up EN 60068-2-1 | -40 °C |
| Max. operating temperature, max. 96h EN 60068-2-2 | +85 °C |
| Relative humidity EN 60068-2-30 | 5 ... 95 % (non condensing) |

Ordering information

| | |
|----------------|-----------------|
| 560AIR01 R0001 | 1KGT036500R0001 |
|----------------|-----------------|

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