

# Analog input 520AID01 Data sheet



Other effective ranges and live zero signals become generated out of these ranges through conversion of the communication unit (CMU).

The module is available in two versions (rubrics):

- R0001: Current measurement version
- R0002: Voltage measurement version

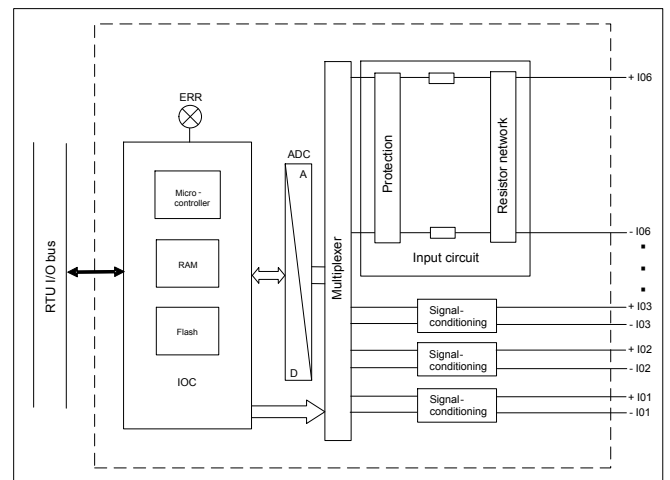


Figure 1: Block diagram 520AID01

## Application

The 520AID01 module records up to 6 analog measured values.

The module 520AID01 is able to process the following types of signals:

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

Following measurement ranges can be configured for 520AID01 R0001:

- $\pm 2.5$  mA
- $\pm 5$  mA
- $\pm 10$  mA
- $\pm 20$  mA

Following measurement ranges can be configured for 520AID01 R0002:

- $\pm 1$  V DC
- $\pm 10$  V DC

## 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 6 differential inputs are not galvanic isolated against the power supply.

Single-ended or differential input values are resolved by up to 2048 steps (11 bit plus sign) for 100 % measurement amplitude.

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. 2 additional measurement channels are used for automatic zero calibration. This compensates the longterm drift of the components.

For elimination of tolerances a calibration is done during production.

Measuring range and line frequency are easily to configure by the RTUutil500 configuration tool. 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	50 ms	400 ms
50 Hz	60 ms	480 ms
16.7 Hz	200 ms	1600 ms

### Power supply input

The required power for the module is supplied via the RTU520 I/O bus connector.

### 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.

In connection with an I/O adapter (e. g. 520ADD01) or the RTU520 communication unit the module is interfaced to the RTU520 I/O bus.

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:

Input channels 520AID01	
Inputs	6 differential inputs
Configurable measuring range	R0001: – ± 2.5 mA – ± 5 mA – ± 10 mA – ± 20 mA  R0002: – ± 1 V DC – ± 10 V DC
Input impedance	50 Ω (R0001) 82 kΩ (R0002)
Max. load	50 mA for 1 min
Resolution	11 bit + sign 10 bit + sign @ ±2,5 mA
AD converter resolution	13 bit
Accuracy at 25 °C	< 0.25 % < 0.5 % @ ±2.5, ±5, ±10 mA and ±1 V DC < 1% @ ±10 V DC
Linearity error at 25 °C	< 0.15 % (positive range) < 0.25% (negative range)
Temperature drift (0... 70 °C)	< 150 ppm/K
Max. common mode input voltage	±150 V DC (electrical limit) ±10 V DC (functional limit)
Max. differential input voltage	1 V DC (current inputs) 10 V DC (voltage inputs)
Common mode rejection	> 85 dB @ 25 °C
Configurable line frequency $f_N$	– 16.7 Hz – 50 Hz – 60 Hz
line frequency interference suppression	> 75 dB @ $f_N \pm 5$ %
Current consumption for power supplied via WRB bus	
5 V DC	25 mA
15 V DC	10 mA
18 V DC	--
24 V DC	--
Signaling by LEDs	
ERR (red)	Common fault information for the module

Mechanical layout	
Dimensions	35 mm x 98 mm x 117 mm (Width x Height x Depth)
Housing type	Plastic housing (V-0), IP20, RAL 7035 light gray
Mounting	DIN rail mounting EN 50022 TS35: 35 mm x 15 mm or 35 mm x 7.5 mm
Weight	0.14 kg

Connection type	
Process connector	1 x 13 pole 5.08 mm pluggable screw terminals (included in delivery) 0.2... 2.5 mm <sup>2</sup> / AWG 24 - AWG 12

Insulation tests	
AC test voltage IEC 61000-4-16 IEC 60870-2-1 (class VW3)	2.5 kV, 50 Hz Test duration: 1 min
Impulse voltage withstand test IEC 60255-5 IEC 60870-2-1 (class VW 3)	5 kV (1.2 / 50 μs)
Insulation resistance IEC 60255-5	> 100 MΩ at 500 V DC

Immunity test	
Electrostatic discharge IEC 61000-4-2	8 kV air (level 3) / 4 kV contact (level 2) Performance criteria A
Radiated Radio-Frequency Electro-magnetic Field IEC 61000-4-3	10 V/m (level 3) Performance criteria A
Electrical Fast Transient / Burst IEC 61000-4-4	4 kV (level X) 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
Damped oscillatory wave IEC 61000-4-18	2.5 / 1 kV (level 3) Performance criteria A

Environmental conditions	
Nominal operating temperature range:	-25 ... +70 °C
Start up:	-40 °C
Max. operating temperature, max. 96h:	+85 °C
EN 60068-2-1, -2-2, -2-14	

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**Environmental conditions**

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Relative humidity	5 ... 95 %
EN 60068-2-30	(non condensing)

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**Ordering information**

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520AID01 R0001	1KGT033100R0001
520AID01 R0002	1KGT033100R0002

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