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Remote Terminal Units - Data sheet

Analog output 530AOD01

RTU530 product line

Analog output, 4 channels

- DA converter resolution: 16 bit
- Output ranges: +/-2.5 mA; +/-5 mA; +/-10 mA; +/-20 mA (4... 20 mA)

Application

Analog control outputs for sequential or closed-loop control, display instruments, measurement recorders etc. can be connected by the analog output module 530AOD01. The module 530AOD01 has 4 output channels, which can be configured to different output current ranges.

The module 530AOD01 is able to process the following types of signals:

- Analog setpoint commands (ASO)
- Floating point setpoint commands (FSO)

The following output current ranges can be set individually per channel with RTUtil500:

- 0... 2.5 mA, ± 2.5 mA
- 0... 5 mA, ± 5 mA
- 0... 10 mA, ± 10 mA
- 0... 20 mA, 4... 20 mA, ± 20 mA

The unit is available in two versions:

- 530AOD01 R0001
- 530AOD01 R1001 conformal coated

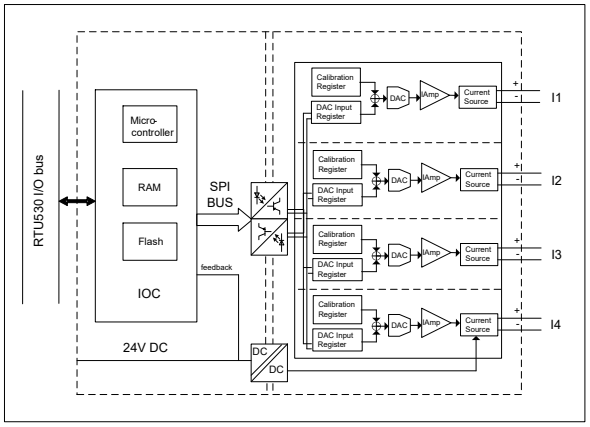

Figure 1: Block diagram 530AOD01

Characteristics

Analog outputs

Each output has a digital to analog converter (DAC), which converts the digital value into an analog signal. The DAC has a resolution of 16 bit.

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A received output value keeps stored until a new value is received. The output channels are set to 0 % after power on or restart of the communication module.

The output channels are potential isolated from the power supply, but not between the output channels.

Power supply input

The required power for the module is supplied via the RTU530 I/O bus connector.

I/O controller (IOC)

The micro-controller (MPU) on the module processes all time critical I/O tasks of the parameterized processing functions. Moreover it carries out the interactive communication with the RTU530 I/O bus. All configuration data and processing parameters are loaded by the communication unit via the RTU530 I/O bus.

In connection with an I/O adapter (e. g. 530ADD01) or the RTU530 communication unit the module is interfaced to the RTU530 I/O bus.

During initialization and operation the module carries out a number of tests. If a fault occurs it is reported to the communication unit. A failure of the connected module(s) is detected and signalized by the communication unit.

Technical data

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

General standards	
Safety tested according to	• IEC 61010-1 • IEC 61010-2-201
Environmental conditions tested according to	• IEC 60255-21-1 class 1 • IEC 60255-21-2 class 1 • IEC 60870-2-2 class Bm and C1
Electromagnetic compatibility (EMC) tested according to	• IEC 61000-6-2 • IEC 61000-6-4 • IEC 61000-6-5
Insulation classification according to	IEC 60664-1 • Pollution degree 2 • Overvoltage category II • Altitude: ≤ 3,000 m

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)

Environmental conditions - mechanical	
Vibration sinusoidal, Test Fc , IEC 60068-2-6	3.5 mm (3 ... 9 Hz) 10 m/s² (9 ... 35 Hz) 1 octave/min, 1 cycle per axis IEC 60255-21-3 class 1 3 mm (3 ... 9 Hz) 10 m/s² (9 ... 200 Hz) 15 m/s² (200 ... 500 Hz) 1 octave/min, 10 cycles per axis IEC 60870-2-2 class Bm 0.035 mm (10 ... 60 Hz) 5 m/s² (60 ... 150 Hz) 1 octave/min, 1 cycle per axis IEC 60255-21-1 class 1
Shock and Bump, Test Ea, IEC 60068-2-27	250 m/s², 10 ms 4 shocks per direction IEC 60721-3-3 class 3M5 150 m/s², 11 ms 3 shocks per direction IEC 60255-21-2 class 1 IEC 60870-2-2 class Bm 100 m/s², 16 ms 1000 shocks per direction IEC 60255-21-2 class 1

Emission test	
Radiated emissions - enclosure ports (1 to 6 GHz), CISPR 16-2-3/ EN 55016-2-3	EN 55011/ CISPR 11 class A

Immunity test	
Electrostatic discharge, IEC 61000-4-2	8 kV air / 6 kV contact (level 3), criterion A
Radiated radio-frequency electromagnetic field, IEC 61000-4-3	80 MHz to 1 GHz: 10 V/m (level 3), criterion A 1 GHz to 2.7 GHz: 10 V/m (level 3), criterion A
Power frequency magnetic field, IEC 61000-4-8	100 A/m (level 5), criterion A
Impulse magnetic field, IEC 61000-4-9	100 A/m (level 3), criterion A

Mean time between failure (MTBF)	
Calculation according to Telcordia III 40°C	5.914.923 h

Mechanical layout	
Dimensions	30 mm x 125 mm x 85 mm (Width x Height x Depth)
Housing type	Plastic housing (V-2), RAL 7035 light gray
Mounting	DIN rail mounting (EN 50022 TS35: 35 mm x 15 mm or 35 mm x 7.5 mm)
Enclosure protection class	IP30
Weight	0.15 kg

Conformal coating	
Material base	Acrylate resins (AR)
Standards	• IPC-CC-830B • MIL-I-46058C • UL 94 • UL 746E
Noxious gas protection (coating material)	Noxious gas test according to DIN EN 60068-2-60 or BMW GS 95003-4
Dielectric strength (coating material)	60 kV/ mm according to IPC-TM-650 or DIN EN 60243-1
Resistance to condensation (coating material)	1.0 x 10^{10} Ohm based on DIN EN ISO 6270-2

Connection type	
Process connector (X4)	1 x 17 pole 5.08 mm pluggable screw terminals (included in delivery), 0.2... 2.5 mm²/ AWG 24 - AWG 12
Connector from CMU/ADD or other I/O module (X2)	2 x 6 pin, male

Connection type	
Connector to the I/O modules (X3)	2 x 6 pin, 2.54mm female header
Connector to next I/O module (X3)	

Current consumption for power supplied via RTU530 I/O bus	
5 V DC	90 mA
24 V DC	110 mA, typ. 80 mA

Analog output channels 530AOD01	
Outputs	4 analog outputs,
Configurable output range	• 0... 2.5 mA, ± 2.5 mA • 0... 5 mA, ± 5 mA • 0... 10 mA, ± 10 mA • 0... 20 mA, 4... 20 mA, ± 20 mA
Galvanic isolation	Potential isolated against power supply
Load impedance	max. 500 Ω
Resolution	16 bit
Accuracy at 25 °C	< 0.15 % @ 20 mA
Linearity error at 25 °C	< 0.05 % @ 20 mA
Temperature drift (0... 70 °C)	≤ 100 ppm/k
Bipolar Zero Error	< 0.05 %
Electrical fast transient / Burst, IEC 61000-4-4	4 kV (level 4), criterion A
Surge 1.2/50 µs, IEC 61000-4-5	4 kV line to earth, 2 kV line to line (level 4), criterion A
Conducted disturbances, induced by radio-frequency fields, IEC 61000-4-6	10 V (level 3), criterion A
Conducted, common mode disturbances in the frequency range 0 Hz to 150 kHz, IEC 61000-4-16	30 V continuous disturbance/ 300 V short duration disturbance (level 4), criterion A
Damped oscillatory wave, IEC 61000-4-18	2 kV line to earth, 1 kV line to line @ 1 MHz (level 3), criterion A
AC dielectric voltage test, IEC 60255-27, IEC 61000-4-16, IEC 60870-2-1 (class VW3)	2.5 kV, 50 Hz, 1 min
Impulse voltage withstand test of insulation, IEC 60255-27, IEC 60870-2-1 (class VW3)	5 kV (1.2 / 50 µs)
Insulation resistance, IEC 60255-27	> 50 MΩ @ 500 V DC

Ordering information	
530AOD01 R0001	1KGT051100R0001
530AOD01 R1001 conformal coated	1KGT051100R1001

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