Analogue signals converter APP03

❑ isolated (1,5 kV / 1 minute) ❑ user configuration over PC ❑ active and passive output

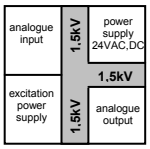
INPUT SIGNALS	
Preset signals – DIP switch	
CURRENT	**0 – 20 mA DC**
	4 – 20 mA DC
VOLTAGE	**0 – 10 V DC**
POTENCIOMETER	**0 – 100 %**
User configuration – over PC	
CURRENT	**+/- 0 – 21 mA DC**
VOLTAGE	**+/- 0 – 10,5 V DC**
	+/- 0 – 500 mV DC
POTENCIOMETER	**10Ω – 500kΩ**

OUTPUT SIGNALS	
Preset signals – DIP switch	
CURRENT due to wirring	**0 – 20 mA DC**
	4 – 20 mA DC
	active / passive
VOLTAGE	**0 – 10 V DC**
User configuration – over PC	
CURRENT due to wirring	**0 – 21 mA DC**
	active / passive
VOLTAGE	**0 – 10,5 V DC**

APP03 series analogue signals converters for above specified industry signals are used as input interface for control systems, monitoring systems, data collection, controllers and everywhere else, where is signal conversion and galvanic isolation needed.

FUNCTION

- **❑ SIGNAL CONVERSION**
  - standart mode (180 s response)
  - fast mode (33 ms response)
- **❑ SMALL SIZE 17,5 x 90 x 60 mm**
- **❑ DIP SWITCH** is used for easy signals conversion type selection
- **❑ INPUT and OUTPUT SIGNAL SELECTION** by user
  - By DIP switch from manufacturer preseted signals
  - By PC (using comm.cable and SW MERCOS®) fully user adustable (eg. input 2 – 12 mA / output 1 – 5 V DC)
  - Due terminal strip wirring – active or passive current output
- **❑ EXCITATION POWER SUPPLY**
- **❑ GALVANIC ISOLATION**
  - Input signal from output signal
  - Input signal & output signal from power supply
  - Output signal & power supply from exc.supply



DESCRIPTION

APP03 signals converter works with all input and output signals in their full range. Converter configuration is performed by DIP switch on front panel or by communication software NP01_A over PC. For PC configuration is communication cable PU 01 (USB) needed
, which galvanically isolate PC from APP 03 converter.

DIP switch allows to set these signals conversion combinations:

- 0-20 mA / 0-20 mA 0-20 mA / 4-20 mA 0-20 mA / 0-10 VDC
- 4-20 mA / 0-20 mA 4-20 mA / 4-20 mA 4-20 mA / 0-10 VDC
- 0-10 VDC / 0-20 mA 0-10 VDC / 4-20 mA 0-10 VDC / 0-10 VDC
- Ω * / 0-20 mA Ω * / 4-20 mA Ω * / 0-10 VDC
- User defined conversion (by comm.software and PU 01 cable)

** end positions of potenciometer are 0% a 100% .*

PC communication software allows to set:

- Non-standart signals conversion
- Potenciometer end positions in full input range (0% a 100%)
- Advanced mathematical filters for signals conversion

APP 03 converter is based on:

- Three-level isolation – pwr.supply X input , pwr.supply X output , input X output , pwr.supply & output X excitation power supply
- Measuring input signal by 20-bits AD converter, signal processing by Intel MCU and if selected than mathematical filters are applied (polynomial filter, moving average), galvanic isolation and digital signal conversion by 14-bits DA converter back to analogue output signal.

TECHNICAL DATA	
POWER SUPPLY	24 V AC/DC : -15% / +20%
CONSUPTION	max. 2 W – device is protected by reversible fuse
Exc.power supply	22V @ 0mA , 19V @ 23mA
INPUT RESISTANCE	current input : 50 Ω (input resistor) + 25 Ω (protection posistor PTC)
	voltage input : 100 kΩ
CONVERSION	linear
MAXIMAL INPUT OVERLOAD	current : 100 mA continous , 160 mA @ 1minute
	voltage : 48 VDC continous
	48 VDC on terminal strip 3
DIGITAL RESOLUTION	analogue input : 20 bits
	analogue output : 14 bits
SIGNAL RESPONSE 10% to 90%	180 msec in standart mode
	33 ms in fast mode
ACCURACY	+/- 0,1 % from full range
TEMP.COEFFIC.	0,005 % from full range / °C
ISOLATION STRENGTH	testing volatge : 1500 V DC / 1 min *input vs. output ; power supply vs.input, output*
	working voltage : 120 V DC *input vs. output ; power supply vs.input, output*
ANALO.OUTPUT	max. 21mA or 10,5 VDC
OUTPUT IMPEDANCE	current output : max. 600 Ω
	voltage output : min. 5 kΩ
MAX. OUTPUT OVERLOAD	current : unlimited *(short-circuit resistant)*
	voltage : unlimited *(short-circuit resistant)*
CALIBRATION	valid for one year
MOUNTING	Plastic DIN rail box – 17,5 mm module
DIMMENSIONS	17.5 x 90 x 60 mm (W x H x D)
ENCLOSURE	IP20
WIRRING CONNECTION	terminal strip *max. conductor cross-section is 2,5mm*
WEIGHT	69 grams
STABILISATION	5 minutes
OPERATING TEMPERATURE	- 10 °C / +50 °C
OPERATION	continuos
SITE ALTITUDE	max. 2000 metres above the sea level
EMC radiation	ČSN EN 61326-1 article 7 (2006)
	ČSN EN 55011/A1/A2, article 5.2, table 3, article 16 (bellow limit for group 1, class. B)
EMC immunity influence	max. +/- 0,1% from full signal with unshielded wires

NOTICE

- **❑ Attention**
  - Excitation power supply for sensors is galvanically connected with input signal.

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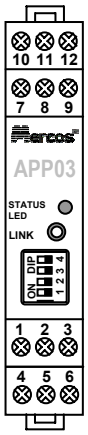
ORDER CODE

APP 03	Analogue signals converter with excitation power supply

APP03 converter TERMINAL STRIP



LEGEND
- ❑ **strips 1 – 5** ..... analogue inputs
  - current
  - voltage
  - potenciometer
- ❑ **strip 6** ..... excitation power supply
  - 19V @ 23 mA
- ❑ **strips 7 – 9, 12** ..... analogue outputs
  - current active
  - voltage passive
  - voltage
- ❑ **strips 10 – 11** ..... APP03 power supply
  - 24 VAC or 24 VDC (polarity is not important)

LEGEND
- ❑ **LINK** ..... communication socket for PC connection
- ❑ **DIP** ..... signals conversion combinations switch

INPUT SIGNALS WIRRINGS for APP03

CURRENT INPUT

ACTIVE SENS.

Two wires
- 0/4 – 20 mA
- +/- 0 – 20 mA

Three wires
- 0/4 – 20 mA

supply from APP03

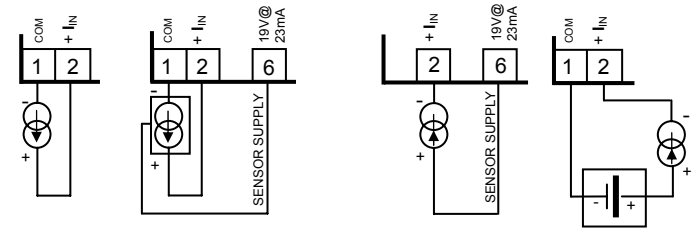
PASSIVE SENS

Two wires
- 4 – 20 mA

supp. form APP03

Two wires
- 4 – 20 mA

external supply



VOLTAGE INPUT

Two wires
- 0 – 10 VDC
- +/- 0 – 10 VDC

Three wires
- 0 – 10 VDC

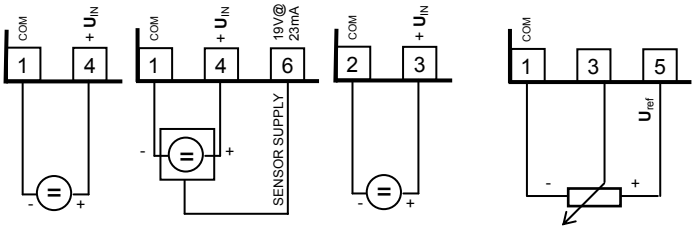
supply form APP03

Two wires
- 0 – 500 mVDC
- +/- 0 – 500 mVDC

POTENCIOMETER

potenciometer (three wires)
- 10 Ω – 500 kΩ

supply form APP03



OUTPUT SIGNALS WIRRINGS for APP03

CURRENT OUTPUT

current active

- 0/4 – 20 mA

APP03 generates current

current passive

- 4 – 20 mA

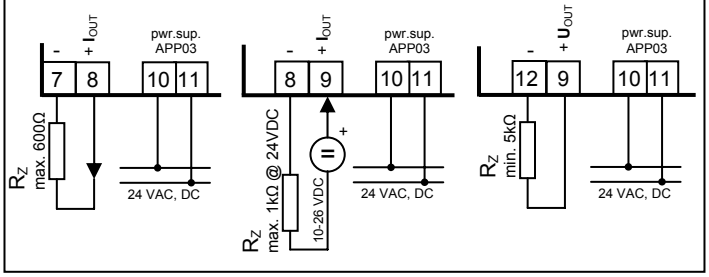
APP03 is current hole

VOLTAGE OUTPUT

voltage active

- 0 – 10 V DC

APP03 generates voltage



HOW TO SET APP03

Introduction

DIP switch on the APP03 signal converter front panel, allows selection of input and output signal type. All possible preset input and ouput signals conversions are shown in table which follows.

DIP SWITCH				
1	2	3	4	
ON	ON	ON	ON	0/4-20 mA .. 0/4-20 mA
ON	ON	ON		0-20 mA .. 4-20 mA
ON	ON		ON	0-20 mA .. 0-10 VDC
ON	ON			4-20 mA .. 0-20 mA
ON		ON	ON	4-20 mA .. 0-10 VDC
ON		ON		0-10 VDC .. 0-20 mA
ON			ON	0-10 VDC .. 4-20 mA
ON				0-10 VDC .. 0-10 VDC
	ON	ON	ON	Potenciom. (0-100%) .. 0-20 mA
	ON	ON		Potenciom. (0-100%) .. 4-20 mA
	ON		ON	Potenciom. (0-100%) ..0-10VDC
	ON			Not used : not allowed
		ON	ON	Not used : not allowed
		ON		Not used : not allowed
			ON	fast response 33 msec*
				User defined conversion (PC)

Signal conversion type change is confirmed by LED diode (1x blink a continous light). In case of not allowed position selected on DIP switch, LED diode blink slowly (two times a second) and analogue signal converter does not convert signal (see bellow – LED diode STATUS)

NOTICE:
When fast response is selected, PC connection is disabled.

***) fast response option is available from 09/2014 (FW: 1.100/140212)**

Settings over PC

- To set non standart signals conversion in their full range or inverse signals
- Current loop 4-20 mA signal failure notification
- To choose mathematical filters for enviroment with high EMC disturbances
- To measure, display graph or record the input signal with measured data export in *.csv format (Excel, OpenOffice Calc, …)

FAST RESPONSE

User has to set type of input and output signal in communication software NP01_A before selecting fast response mode on DIP switch. Fast response mode works only with user defined types of signals.

NOTICE:
- When using user defined conversion option, we will need signal source (generating input signal) and multimeter (to measure output signal).
- To set up APP 03 : communication cable PU 01 (USB) and communication software NP01_A, which is free for download from our webpage : http://www.mercos.cz/ is needed.
- communication socket (LINK) has the potential of input terminal strips. Galvanic isolation of communication is realized by communication cable PU 01.

LED diode STATUS

The status LED diode is situated in the middle of the front panel. It has red color and informs user about actual analogue signals converter status.

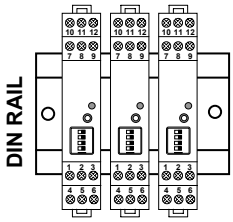
STATUS LED	
Continous light	Measuring mode
1 blink and continouslight	DIP switch position change confirmation
Slow blinking (two times a second)	Not allowed position selected on DIP switch
	Output signal is controled by PC (output setup) and analogue signal converter does not convert signal.
Fast blinking (ten times a second)	Analogue signal converter malfunction, please contact manufacturer.

ORDER EXAMPLE

APP03 input signal / output signal

Standart signals (common signals – set by DIP switch):
eg. APP03 4-20mA / 0-10 V , APP03 0-10V / 4-20mA
Non-satndart signals (inverted, special ranges – set by PC):
eg. APP03 0-1V / 2-5V , APP03 10-2 mA / 2-8 V

MOUNTING EXAMPLE



❑ **RECOMMENDATION:**
- We recommned to mount converter on DIN rail vertically with inputs down.
- In case that operational temperature is expected to be higher than 40°C , we recommned to mount converters on DIN rail with 5mm space.

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