32. COPx-ADIO (Digital IO/PWM/PT100/Analogue Input/LVDT)

COPx-ADIO   611653800

The COPx is a COP card in a larger format. Its dimensions are 150mmx80mm.
The COPx-ADIO module provides the user with eight digital inputs and sixteen digital outputs. In addition, it is possible to supply 24VDC to external peripherals.
The eight analogue inputs are processed as single-ended with a resolution of 16bit.
Two inputs for PT100 sensors are available for temperature measurements.
At the PWM outputs, LEDs can, among other things, also be controlled via PWM modulation. This can be used for flashlight generation. The high-resolution pulsators are used, for example, for actuating dispensers.
The control and analysis of LVDT sensors are also supported.
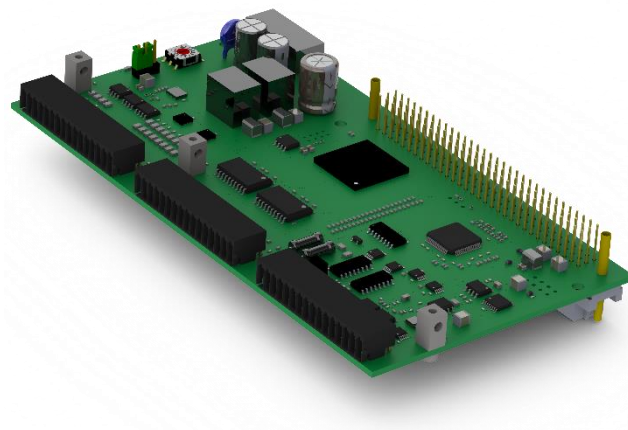
32.1. Technical Specifications

Digital Inputs		
Number of inputs	8	
Rated voltage	24+30%	V_{DC}
Switching threshold	$V_{IL} < 4.4$; $V_{IH} > 11.5$	V_{DC}
Input low-pass filter cut-off frequency	1.6	kHz
Input impedance	12	kΩ
Digital Outputs		
Number of outputs	16	
Maximum current per output	1	A
Maximum current per output when every second output is loaded	2	A
Protection	Short-circuit proof	

Analogue Inputs		
Number of slow inputs	4	
Number of fast inputs	4	
Technology	Single-ended	
Sampling rate of slow inputs	2	kHz
Sampling rate of fast inputs	16	kHz
Voltage range	± 0.1, ± 1, ± 10, ± 5 (relative to analogue GND)	V
Resolution	16	Bit
Input impedance	1	MΩ
Hardware Filter (TP)	1.6	kHz
Full scale drift	20	ppm/K
Common mode	± 10	V
Pulsators		
Number of outputs	2	
Pulsator specifications	See section 18.3	
Maximum output current of 24V outputs [1] [2]	500	mA
Rout output resistance	6.875	Ω
PWM		
Number of outputs	3	
IMAX output current per output	2.5	A
PWM frequency	20	kHz
Resolution	10	Bit
Protection	Internal current limitation, excessive temperature	
Type	Open drain output	
LVDT Sensors		
Number	1	
Supported LVDT types	Mahr	
PT-100 Temperature Measurement		
Number PT-100 inputs	2	
Measuring range	-80 … 500	°C
Sampling rate	200	Hz
Resolution	0.02	K
Relative accuracy	0.5	K
Full Scale drift	10	ppm/K
Connection technology	Two-wire	

Module		
Warm-up time	15	Min
Maximum power consumption at 24V node power supply (connected COP-MAS2 and digital outputs without load!)	250	mA

1) Vcc of the pulsators can be changed from 24V to 5V using jumpers.
2) The pulse outputs are not short-circuit safe.

32.2. Pin Assignment

X1   X2   X3

X11
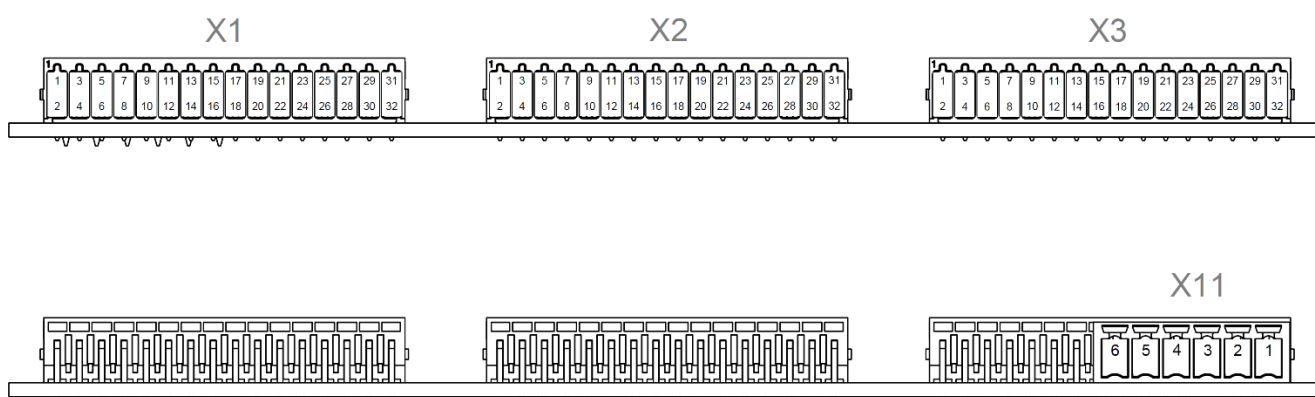
X1					
No.	Dir	Id.	Id.	Dir	No.
2		GND	PULS 0[3]	Out	1
4		GND	PULS 1	Out	3
6		GND	Shield		5
8		GND	GND		7
10		GND	Shield		9
12	Out	+24V	PWM 0	Out	11
14	Out	+24V	PWM 1	Out	13
16	Out	+24V	PWM 2	Out	15
18	Out	+24V	D 00	In	17
20	Out	+24V	D 01	In	19
22	Out	+24V	D 02	In	21
24	Out	+24V	D 03	In	23
26	Out	+24V	D 04	In	25
28	Out	+24V	D 05	In	27
30	Out	+24V	D 06	In	29
32	Out	+24V	D 07	In	31

X2					
No.	Dir	Id.	Id.	Dir	No.
2		GND	D 00	Out	1
4		GND	D 01	Out	3
6		GND	D 02	Out	5
8		GND	D 03	Out	7
10		GND	D 04	Out	9
12		GND	D 05	Out	11
14		GND	D 06	Out	13
16		GND	D 07	Out	15
18		GND	D 08	Out	17
20		GND	D 09	Out	19
22		GND	D 10	Out	21
24		GND	D 11	Out	23
26		GND	D 12	Out	25
28		GND	D 13	Out	27
30		GND	D 14	Out	29
32		GND	D 15	Out	31

P3) PULS: Pulse outpu

3) PULS: Pulse output

X3					
No.	Dir	Id.	Id.	Dir	No.
2	I/O	PT100 1	PT100 0	I/O	1
4		AGND[4]	AGND		3
6		Shield	Shield		5
8	Out	A 24V	A 24V	Out	7
10	Out	A 24V	A 24V	Out	9
12	In	A 01	A 00	In	11
14	In	A 03	A 02	In	13
16		AGND	AGND		15
18		AGND	AGND		17
20	In	A 05	A 04	In	19
22	In	A 07	A 06	In	21
24		AGND	AGND		23
26	Out	A 24V	A 24V	Out	25
28		Shield	Shield		27
30	In	- LVDT	-VCC_LVDT	Out	29
32	In	+ LVDT	+VCC_LVDT	Out	31

X11		
No.	Dir	Id.
1		Earth
2		GND
3		GND
4	In	VCC IO 1[5]
5	In	VCC IO 0[5]
6	In	VCC_24V

4) AGND: analogue ground

5) The digital outputs are supplied from two separate power sources. VCC IO 0 for D 00 to D 07; VCC IO 1 for D 08 to D 15.
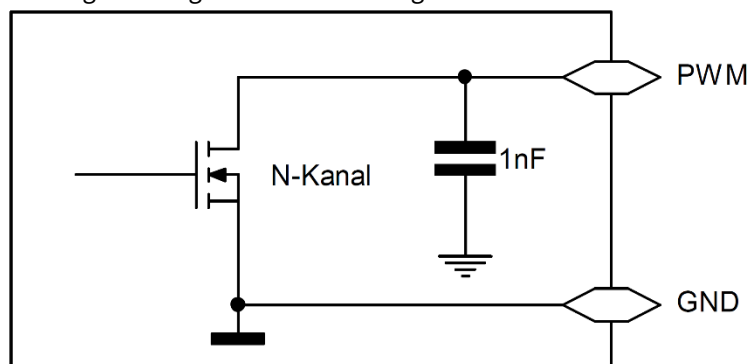
32.3. Hardware Description

Pulsator (DPWM)

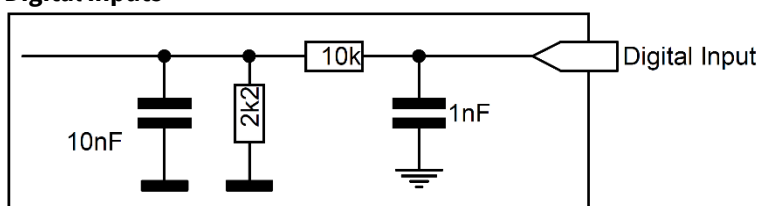The pulse outputs can be set at 5V or 24V using jumpers. This cannot be changed during operation however.
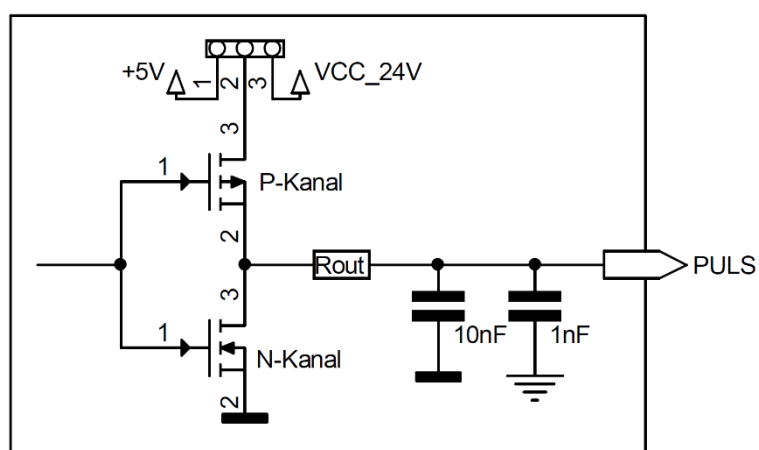
PWM

PWM signals are generated and changed via software.
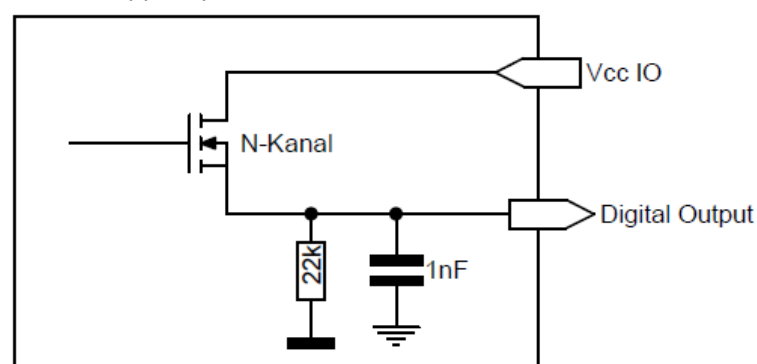

Digital inputs

Digital outputs

The digital high side outputs are supplied via X11 connector. There are two different power sources.
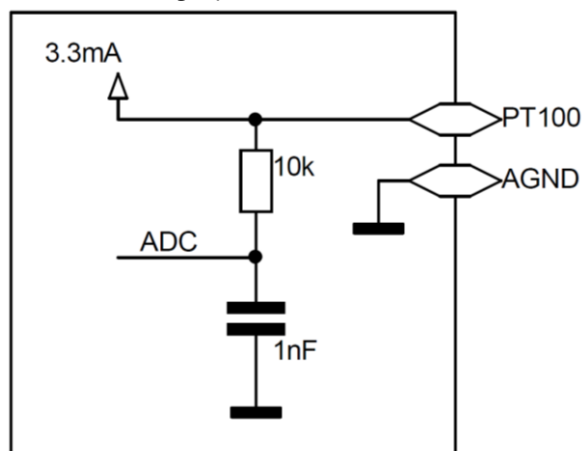VCC IO 0 supplies power to D 00 to D 07
VCC IO 1 supplies power to D 08 to D 15

PT100

The PT100 sensors are connected via two-wire lines. To prevent errors due to self-heating, the measuring current flows only during the PT100 measurement. The PT100 terminal serves both as a power output and a measuring input. The PT100 is measured directly against analogue earth.
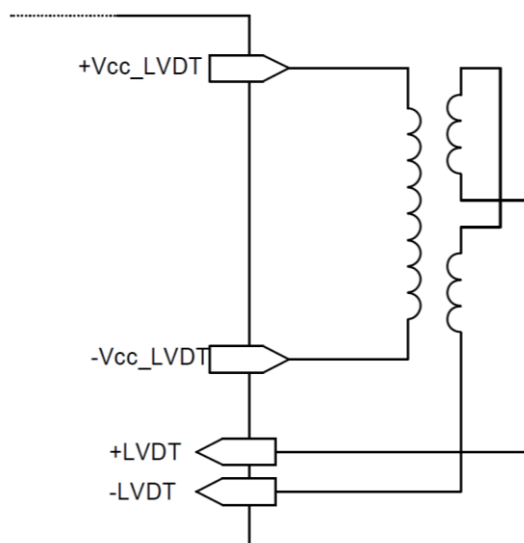

Analogue inputs

The analogue inputs are not differential. Thus, measurements are always carried out against analogue earth. The input range can be set from ± 5V to ± 10V.
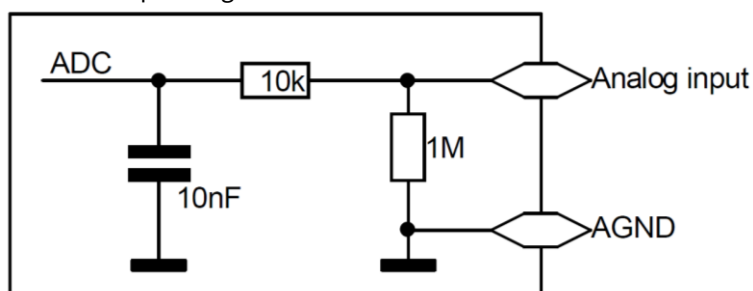
LVDT

The ± VCC LVDT is used to supply the reference signal. The measurement signal is recorded and analysed at the ± LVDT inputs.

32.4. Available Options

Item Number	Label	Option	Description
611653800	COPx-ADIO		· 2 x pulse outputs with 1us resolution · 3 x PWM (LED) · 8 x digital inputs · 16 x digital outputs · 2 x PT100 · 8 x analogue inputs · 1 x LVDT