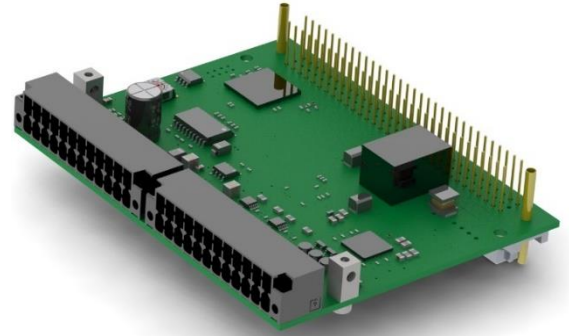


18. COP-ADA-PULS (Analogue IO/Digital IO/Pulsator)

COP-ADA-PULS 611042900

The COP-ADA-PULS module has four fast push-pull outputs, four analogue inputs and outputs as well as four digital 24V outputs and eight digital 24V inputs. The digital high side outputs are supplied from an external power source. It is possible to use an analogue input to conduct a PT100 measurement and an analogue output as a measuring current output.



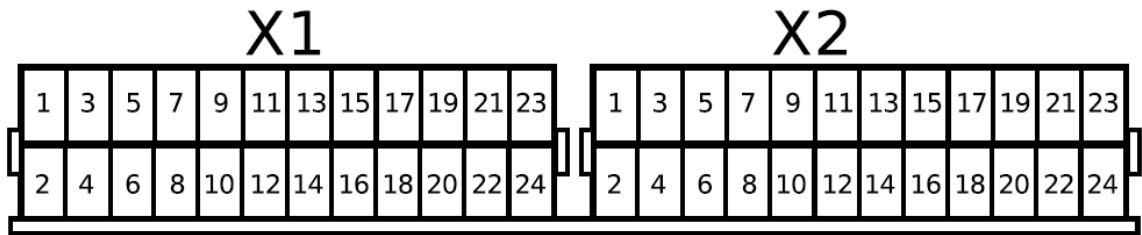
18.1. Technical Specifications

Pulsators		
Number of outputs	4	
Pulsator specifications	See section 18.3	
Maximum output current of 24V outputs ^{1) 2)}	50	mA
ROUT output resistance	50	Ω
Digital 24V Outputs		
Number of outputs	4	
Maximum output current per output	1	A
Maximum output current per output when every second output is loaded	2	A
Protection	Short-circuit proof	
Digital 24V Inputs		
Number of inputs	8	
Rated voltage	24 ± 30%	V _{DC}
Switching threshold	11.5	V _{DC}
Input low-pass filter cut-off frequency	1.6	kHz
Input impedance	12	kΩ

PT-100 Temperature Measurement		
Number of possible PT-100 measurements ³⁾	4	
Measuring range	-40 ... 250	°C
Sampling rate	4	kHz
Resolution	0.01	K
Relative accuracy ⁴⁾	0.5	K
Connection technology	Four-wire	
Analogue Inputs		
Number of inputs	4	
Technology	Differential	
ADC sampling rate	200	kHz
Voltage ranges	$\pm 0.1, \pm 1, \pm 10$	V
Resolution	16	Bit
Input impedance	10	M Ω
Hardware filter ⁵⁾	Mean value filter: 4, 32, 64 values	
Full scale drift	20	ppm/K
Common mode	± 12 relative to GND	V
Analogue Outputs		
Number of outputs	4	
Technology	Single-ended	
Sampling rate for all channels	16	kHz
Voltage range ⁶⁾	$0 \dots 5, \pm 10$	V
Maximum output current in the voltage mode	12	mA
Current range ⁶⁾	$0 \dots 20$	mA
Resolution	16	Bit
Full scale drift	50	ppm/K
Module		
Warm-up time	15	min
Maximum power consumption at 24V node power supply	150	mA

- 1) If no external Vcc_PULS supply unit is connected, the PULS outputs are supplied with internal 5V power.
- 2) The PULS outputs are not short-circuit safe.
- 3) Each PT-100 measurement requires a DAC channel to be used as a power source and an ADC channel for measuring the voltage.
- 4) The value does not take into account the PT100 resistor's accuracy.
- 5) The hardware filter applies for all four channels.
- 6) Switching between different ranges during 120 μ s returns false values on all channels.

18.2. Pin Assignment

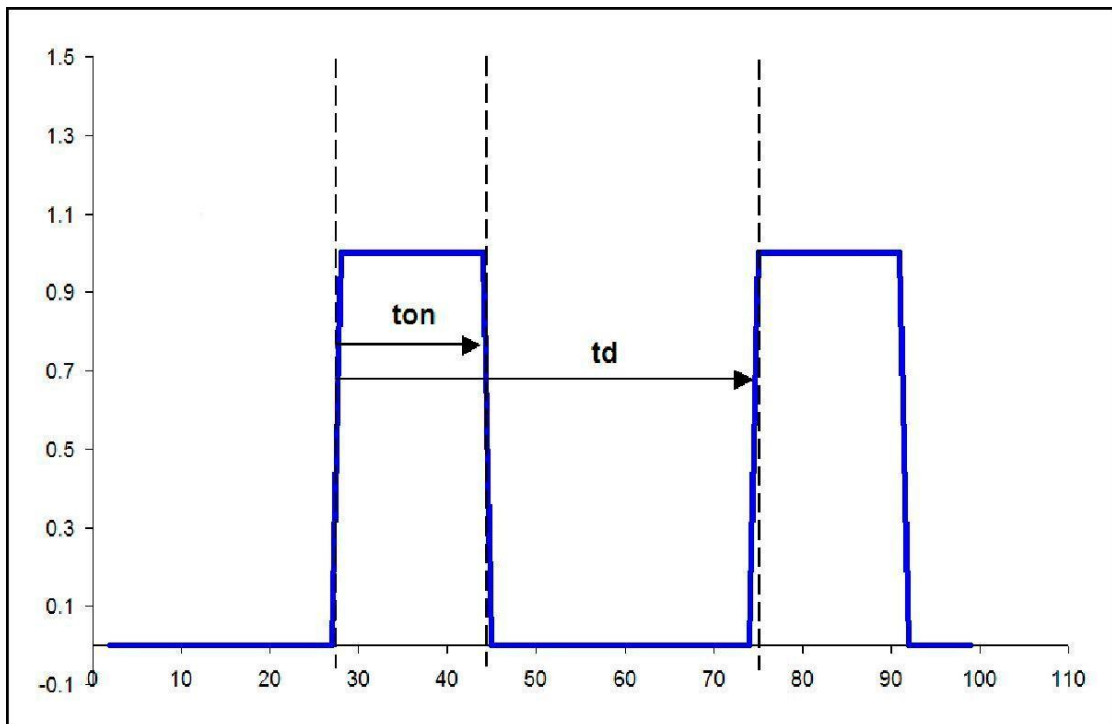


X1					
No.	Dir	Id.	Id.	Dir	No.
2	In	D 04	D 00	In	1
4	In	D 05	D 01	In	3
6	In	D 06	D 02	In	5
8	In	D 07	D 03	In	7
10		GND	GND		9
12		GND	Vcc IO		11
14	Out	D 02	D 00	Out	13
16	Out	D 03	D 01	Out	15
18		GND	GND		17
20	In	Vcc PULS23	Vcc PULS01	In	19
22	Out	PULS 2	PULS 0	Out	21
24	Out	PULS 3	PULS 1	Out	23

X2					
No.	Dir	Id.	Id.	Dir	No.
2	In	+A 01	+A 00	In	1
4	In	-A 01	-A 00	In	3
6		Shield	Shield		5
8	In	+ A 03	+A 02	In	7
10	In	-A 03	-A 02	In	9
12		Shield	Shield		11
14	Out	A 01	A 00	Out	13
16		GND	GND		15
18		Shield	Shield		17
20	Out	A 03	A 02	Out	19
22		GND	GND		21
24		Shield	Shield		23

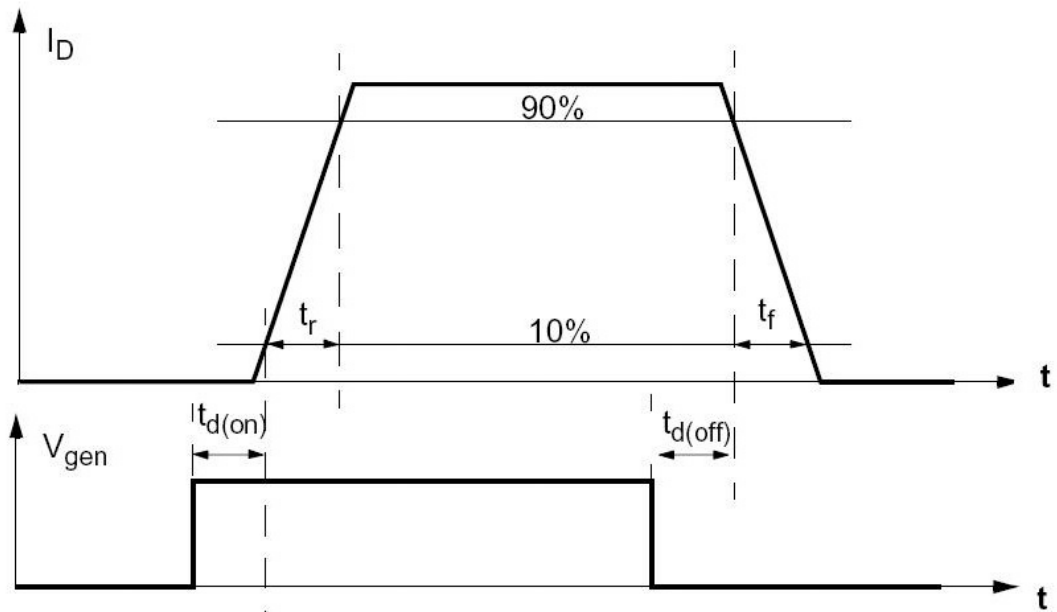
18.3. Pulse Output Specifications

Resolution		
tON min	1	μs
tON max	1	s
td min	2	μs
td max	1	s
Number of pulses	1 ... endless	



18.3.1. Delay Times

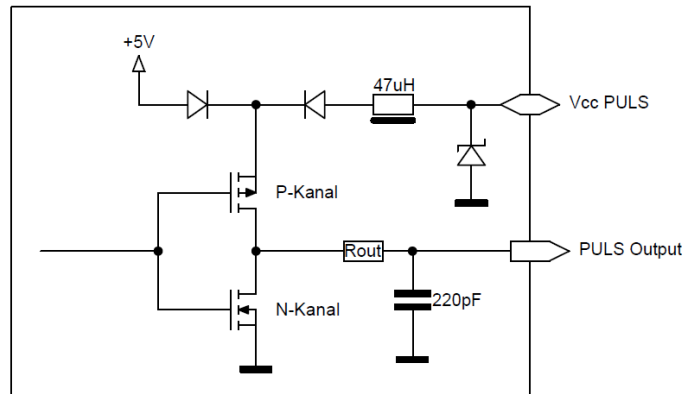
Time		
$t_{d(on)}$ turn on delay	65	ns
t_r rise time	16	ns
$t_{d(off)}$ turn off delay	65	ns
t_f fall time	14	ns



18.4. **Hardware Description**

Pulse outputs

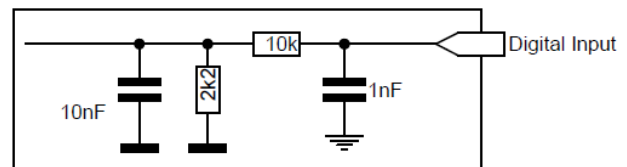
The four pulse outputs can be powered with 5...24V. The Vcc PULS01 supply unit provides power to outputs PULS 0 and 1, and the Vcc PULS23 supply unit outputs PULS 2 and PULS 3. If no power is applied to Vcc PULS01 and Vcc PULS23, the outputs are supplied with internal 5V power. The wires of the pulse outputs must be shielded. The shield should be applied to the mounting plate before the COP module using a fully contacting strap. Make sure that there is a good connection between the module's GND terminals and the earthing conductor of the 24V or Vcc PULS power supply.



PT-100

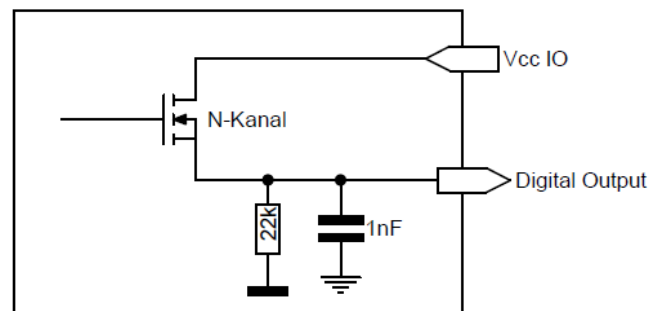
The analogue inputs can also be used as PT-100 inputs. The PT-100 sensors are connected directly to the module via four-wire lines. To prevent errors due to self-heating, the measuring current flows only during the measurement. Each PT-100 measurement requires an analogue output for the power source.

Digital inputs



Digital outputs

The digital high side outputs are supplied from an external power source. Vcc IO supplies power to D 00 to D 03



18.5. **Available Options**

Item Number	Label	Option	Description
611042900	COP-ADA-PULS		4 ADC/PT-100 inputs, 4 DAC current and voltage outputs, 4 PULS outputs, 8 digital inputs, 4 digital outputs