

# TRION3-AOUT-8

## TRION3-AOUT-8

- ▶ 8 isolated output channels
- ▶ Programmable voltage or current output
  - $\pm 5$  V
  - $\pm 10$  V
  - $\pm 30$  mA
- ▶ FPGA based arbitrary signal generator
- ▶ Data replay



## Module specifications

TRION3-AOUT-8 specifications		
Input channels / connectors	<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; text-align: center;">CH1 Analog OUT</div> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; text-align: center;">CH2 Analog OUT</div> <div style="border: 1px solid gray; border-radius: 50%; padding: 5px; text-align: center;">CH3 Analog OUT</div> <div style="border: 1px solid gray; padding: 5px; text-align: center;">Analog out CH1 to CH8 DI1 to 8 DO1 to 4</div> </div>	
Onboard data buffer	512 MB	
Isolation voltage (channel-to-channel and channel-to-chassis)	$\pm 350$ V <sub>DC</sub>	
Environmental specifications	Operating temperature	0 to +45 °C (32 to 113 °F)
	Storage temperature	-20 to +70 °C (-4 to 158 °F)
	Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity
Power consumption	Typ. 15 W, max. 24 W	
Analog outputs	8 isolated channels, independently programmable	
Output range	$\pm 5$ V, 0 to 5 V, $\pm 10$ V, 0 to 10 V, $\pm 30$ mA; 0 to 30 mA	
Load current	$\pm 30$ mA max.	
Temperature drift	$\pm 25$ ppm/K	
Linearity	<100 ppm	
Output impedance	<1 $\Omega$ at D- SUB connector, 50 $\Omega$ at BNC	
Output protection	Continuous short to ground	
Analog output accuracy	See <i>Tab. 60 below</i> .	

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TRION3-AOUT-8 specifications			
Modes <sup>1)</sup>	Constant output	-10 to +10 V or -30 to +30 mA	
	Function generator	Waveform	Sine, square, triangle, custom
		Frequency	0.001 Hz to 1 MHz
		Amplitude	0–10 V <sub>PEAK</sub> or 0–30 mA <sub>PEAK</sub>
		Offset	-10 to 10 V or -30 to 30 mA
		Phase	-180 to 180°
		Symmetry (triangle)/duty cycle (square)	0.01 to 100 %
		Custom waveforms	Up to 4 custom waveforms Max. 16384 samples per waveform
	Stream output	Output signal	-10 to +10 V or -30 to +30 mA
		Optional factor and offset	
Math output <sup>2)</sup>	A*B; A+B; A-B		
Monitor output <sup>2)</sup>	Direct conditioned signal output: -10 to +10 V or -30 to +30 mA		
DAC mode	<b>Highspeed mode</b>	<b>High-resolution mode</b>	
Update rate	2.5 MS/s	500 kS/s	
DAC resolution	16-bit	32 bit	
Bandwidth	600 kHz, 4 <sup>th</sup> ord. Bessel characteristic	70 kHz, 6 <sup>th</sup> ord. Bessel characteristic	
Latency	<5µs	<100 µs	
LSB	305 µV	1 µV	
Linearity	50 ppm	10 ppm	
THD	90 dB	100 dB	
Rise/fall time	400 ns	4 µs	
Latency (filter=off)	4 µs	15 µs	
Input to output Jitter	400 ns	3.5 µs	
Auxiliary power supply	+5 V, 20 mA		
Isolated digital input			
– Compatibility (input)	CMOS	Low: <1.5 V      High: >3.2 V	
– Overvoltage protection	±35 V <sub>DC</sub> , 65 V <sub>PEAK</sub> (100 ms)		
– Bandwidth	50 kHz		
– Pulse width distortion	2.3 µs		
– Input high current @ 5V UIN	<3 mA		
– Input high current @ 35V UIN	<5 mA		
Isolated digital output			
– Compatibility (output)	Open collector		
– Max. collector voltage	+30 V <sub>DC</sub>		
– Max. collector current	5 mA		

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TRION3-AOUT-8 specifications	
Non isolated digital I/O	
– Compatibility (input)	CMOS/TTL, 100 kΩ pullup
– Compatibility (output)	TTL, 20 mA
– Overvoltage protection	$\pm 30 V_{DC}$ , $50 V_{PEAK}$ (100 ms)
Number of DIO	6 DI + 3 DI (isolated) + 4 DO + 1 DO (isolated) + 2 (reserved internally)
Connector	D-SUB-37 socket for all 8 channels, additionally 3x BNC sockets for CH1 to CH3
BNC connector	Analog out AO1, AO2, AO3
D-SUB-37 connector	Analog out AO1 to AO8
	Digital in DI3 to DI8
	Digital in (isolated) DI1, DI2, DI11
	Digital out DO1 to DO4
	Digital out (isolated) DO5

Tab. 59: Module specifications

1) Analog output channels can be assigned variably (e.g. AO1 = CH4; AO2 = CH2 + CH7).

2) Only supported by TRION3-18xx-MULTI-AOUT-8, not by TRION3-AOUT-8.

Output accuracy					
Voltage output (+10 V; 0 to 10 V; ±5 V; 0 to 5 V)		Highspeed mode		High-resolution mode	
		DC	±0.02 % of reading	±1 mV	±0.02 % of reading
	0.1 to 1 kHz	±0.02 % of reading	±1 mV	±0.02 % of reading	±1 mV
	0.1 to 10 kHz	±0.02 % of reading	±1 mV	-	-
	10 to 100 kHz	$\pm(0.015 \% * f)$ of reading	±1 mV	-	-
Current output (±30 mA; 0 to 30 mA)	DC	±0.03 % of reading	±3 μA	±0.02 % of reading	±3 μA
	0.1 to 1 kHz	±0.03 % of reading	±3 μA	±0.05 % of reading	±3 μA
	0.1 to 10 kHz	±0.07 % of reading	±3 μA	-	-
	10 to 100 kHz	$\pm(0.015 \% * f)$ of reading	±3 μA	-	-

Tab. 60: Output accuracy