

# TRION3-1802/1600-dLV-32



- ▶ Multi-function module with voltage inputs, digital I/Os, counter and CAN
- ▶ Channels: 32 single-ended or 16 differential, synchronous channels
- ▶ Sampling
  - TRION3-1802-dLV-32: 18-bit; 200 kS/s per channel
  - TRION3-1600-dLV-32: 16-bit; 20 kS/s per channel
- ▶ Input type: 5 V/10 V
- ▶ Features: 2x counter; CAN bus; RS-485; 8x DI; 4x DO



## Module specifications

TRION3-1802/1600-dLV-32 specifications		
Input channels	TRION3-1802-dLV-32	32 channels single-ended or 16 channels fully differential
	TRION3-1802-dLV-32-CAN	32 channels single-ended or 16 channels fully differential + CAN
	TRION3-1600-dLV-32	32 channels single-ended or 16 channels fully differential
	TRION3-1600-dLV-32-CAN	32 channels single-ended or 16 channels fully differential + CAN
Sampling rate / resolution	TRION3-1802-dLV-32	High-speed mode: >50 to 200 kS/s, 18-bit Over-sampling mode: 100 S/s to 20 kS/s, 24-bit
	TRION3-1600-dLV-32	100 S/s to 20 kS/s 16-bit
Data transfer	TRION3-1802-dLV-32: 16-bit / 24-bit / 32-bit TRION3-1600-dLV-32: 16-bit	
Onboard data buffer	512 MB	
ADC type	18-bit SAR <sup>2)</sup> (Successive Approximation Register)	
Data rate DMA transfer	32 analog channels: max 28 MB/s; 2x counter: max. 6 MB/s	
Input ranges		
– Voltage	±5 V, ±10 V	
Input noise (5 mV range)		
– 0 to 10 Hz	10 μV <sub>pp</sub>	
– Full bandwidth	1.35 mV <sub>pp</sub>	
Input impedance	1 MΩ single-ended, 2 MΩ differential	
Input bias current	<25 pA	
Input coupling	DC	
Accuracy <sup>1)</sup>	Voltage	DC to 1 kHz ±0.02 % of reading ± 0.01 % of range ±20 μV
		>1 kHz to 5 kHz ±0.5 % of reading ± 0.01 % of range ±20 μV
		>5 kHz to 10 kHz <sup>2)</sup> ±1 % of reading ± 0.01 % of range ±20 μV
Gain drift	Typical 10 ppm/°C max. 20 ppm/°C	
Offset drift	Typical 0.3 μV/°C + 10 ppm of range/°C, max 15 μV/°C + 20 ppm of range/°C	
Linearity	<20 ppm	
Input configuration	Differential or single-ended with GND sense	
Typical THD	-95 dB	
Typical CMRR in differential mode	100 dB @ 50 Hz; >70 dB @ 1 kHz	

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TRION3-1802/1600-dLV-32 specifications				
Typical signal-to-noise ratio, spurious	<b>10 V range</b>			
Free SNR, effective number of Bits, $V_{pp}^{(2)}$	SNR	SFDR <sup>3)</sup>	ENOB <sup>4)</sup>	Noise peak to peak
Sample rate	[dB]	[dB]	[Bit]	[mV <sub>pp</sub> ]
0.1 kS/s	127	130	20.8	0.015
1 kS/s	118	130	19.3	0.055
10 kS/s	109	130	17.8	0.22
20 kS/s	106	130	17.3	0.33
50 kS/s <sup>2)</sup>	102 <sup>2)</sup>	130 <sup>2)</sup>	16.7	0.52 <sup>5)</sup>
100 kS/s <sup>2)</sup>	99 <sup>2)</sup>	130 <sup>2)</sup>	16.2	0.66 <sup>5)</sup>
200 kS/s <sup>2)</sup>	96 <sup>2)</sup>	125 <sup>2)</sup>	15.7	1.00 <sup>5)</sup>
Low pass filter (-3 dB, dig.)	1 Hz to 40 % of sample rate freely programmable or OFF			
– Characteristic	Bessel or Butterworth			
– Filter order	2 <sup>nd</sup> , 4 <sup>th</sup> , 6 <sup>th</sup> , 8 <sup>th</sup>			
Analog antialiasing filter	2 <sup>rd</sup> order Butterworth			
Bandwidth (-3 dB, deactivated digital filter)	70 kHz 3 <sup>rd</sup> order Butterworth filter			
Crosstalk fin 1 kHz [10 kHz]	>108 dB			
Channel-to-channel phase mismatch	Typically <30 ns when using the same input range			
Board-to-board phase mismatch	<30 ns			
Common mode voltage	$\pm 12.5 V_{DC}$			
Overvoltage protection	$\pm 50 V_{DC}$			
Digital IN specification	Digital Input	8 CMOS/TTL compatible digital inputs; weak pullup via 100 k $\Omega$		
	Overvoltage protection	$\pm 30 V_{DC}$ , 50 V <sub>PEAK</sub> (for 100 ms)		
	Counter	2 counter channels; TTL input; shared with digital inputs		
	– Counter resolution	32-bit		
	– Counter time base	80 MHz		
– Max. input freq.	10 MHz			
Counter modes	– Waveform timing	Period, frequency, pulse width duty cycle and edge separation		
	– Sensor modes	Encoder (angle and linear)		
	– Event counting	Basic event counting, gated counting, up/down counting and encoder mode (X1, X2 and X4)		
Digital OUT specification	Digital output	4 DO; TTL		
	Output indication	LED (green = high; off = low)		
	Maximum current	25 mA continuously		
	Power-on default	Low		
General specification	Sensor power supply (per module)	5 V (600 mA) and 12 V (600 mA)		
	ESD protection	IEC61000-4-2: $\pm 8$ kV air discharge, $\pm 4$ kV contact discharge		
	Power consumption	Voltage mode: 6 W		

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TRION3-1802/1600-dLV-32 specifications		
Interfaces	CAN bus – CAN specification – CAN physical layer – Bus pin fault protection – Termination – RS485	1 CAN Bus; not isolated; routed to D-SUB-25 CAN 2.0B High-speed $\pm 36 V_{DC}$ Programmable: High impedance or 120 $\Omega$ 1 RS485 interface dedicated to DAQP series modules

Tab. 34: Module specifications

- 1) 1 year accuracy 23 °C  $\pm$ 5 °C
- 2) LP Filter in auto mode
- 3) SFDR excluding harmonics
- 4) ENOB calculated from SNR
- 5) TRION3-1802-dLV-32 only