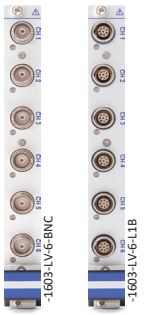
TY-1603-LV

- Isolated input module
- Sampling: 250 kS/s per channel at 16-bit;
- ADC: Low noise, SAR
- Voltage range: ±5 mV to ±100 V



Module specifications

TY-1603-LV specifi ca i ons										
Input channels		TY-1603-LV-6-BNC	6 channels BNC; voltage input							
		TY-1603-LV-6-L1B	6 channels LEMO; voltage or current input; TEDS							
Sampling rate / resolution		100 S/s to 250 kS/s 16-bit								
Data transfer		16-bit								
ADC type		SAR (Successive Approximation Register)								
Data rate DMA transfer		6 analog channels: max. 3 MB/s								
Input ranges – Voltage – Current[1)]		 ±5 mV, ±10 mV, ±20 mV, ±50 mV, ±100 mV, ±200 mV, ±500 mV, ±1 V, ±2 V, ±5 V, ±10 V, ±20 V, ±50 V, ±100 V ±10 mA, ±20 mA, ±50 mA, ±100 mA								
Accuracy[2)]	Voltage	DC to 1kHz ±0.02 % of reading ± 0.02 % of range ±20 µV >1 kHz to 5 kHz ±0.2 % of reading ± 0.02 % of range ±20 µV >5 kHz to 10 kHz ±1 % of reading ± 0.02 % of range ±20 µV								
	Current[1)]	DC to 1kHz ±0.1 % of reading ± 0.02 % of range ±10 µA >1 kHz to 5 kHz ±0.2 % of reading ± 0.02 % of range ±10 µA >5 kHz to 10 kHz ±0.5 % of reading ± 0.02 % of range ±10 µA								
MTBF[3)]		TY-1603-LV-6-BNC: 292,916 h								
Input noise (5 mV range) – 0 to 10 Hz – Noise density		 1.5 μV_{PP} 6.4 nV/$\sqrt{Hz}$								
Input impedance		1 MΩ shunted by 18 pF								
Input bias current		<1 nA								
Input coupling		DC								
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		Typical 0.01 %								
Current input		Internal 10 Ω shunt; max. 100 mA protected with resettable fuse								
Typical signal-to-noise ratio, spu-rious		**20 mV range**			**2 V range**			**100 V range**		
Free SNR, effective number of Bits[4)]		SNR	SFDR[5)]	ENOB[6)]	SNR	SFDR[5)]	ENOB[6)]	SNR	SFDR[5)]	ENOB[6)]
Sample rate		[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]	[dB]	[dB]	[Bit]

Tab. 16: Module specifications

TY-1603-LV specifi ca i ons									
1 kS/s	93	120	15.2	93	120	15.2	93	120	15.2
10 kS/s	90	120	14.7	93	120	15.2	93	120	15.2
100 kS/s	80	116	13.0	93	120	15.2	93	120	15.2
250 kS/s	74	100	12.0	93	120	15.2	93	120	15.2
Typical THD	-97 dB								
Typical CMR – ≤2 V range – >2 V range	 140 dB @ 50 Hz 120 dB @ 1 kHz 90 dB @ 50 Hz 60 dB @ 1 kHz								
Low pass filter (-3 dB, digital) – Characteristic – Filter order	10 Hz, 30 Hz, 100 Hz, 300 Hz, 1 kHz, 3 kHz, 10 kHz, 30 kHz, 100 kHz Bessel or Butterworth 2^{nd} , 4^{th}, 6^{th}, 8^{th}								
Analog antialiasing filter	2^{nd} order Bessel, automatically selected								
Bandwidth (-3 dB, deactivated digital filter)	100 kHz 2^{nd} order Bessel filter								
Crosstalk fin 1 kHz [10 kHz]	≤2 V range: 120 dB [105 dB]								
Channel-to-channel phase mismatch	Typically <10 ns when using the same range; <60 ns for using different ranges								
Board-to-board phase mismatch	<30 ns								
Rated input voltage to earth according to EN 61010-2-30	33 V_{RMS}, 46.7 V_{PEAK}, 70 V_{DC}								
Input configuration – Isolation impedance – Isolation voltage (channel-to-channel and channel-to-chassis)	Isolated Isolation resistance >1 GΩ; Isolation capacitance typically 15 pF 1500 V_{PEAK} with TRION-1603-LV-6-BNC 800 V_{PEAK} with TRION-1603-LV-6-L1B								
Overvoltage protection	±300 V_{DC}								
Voltage excitation[1)]	1 to 28 V @ 1 % ±1 mV accuracy freely programmable (max. 100 mA, max. 1 W) per channel								
ESD protection	IEC61000-4-2: ±8 kV air discharge, ±4 kV contact discharge								
Supported TEDS chips (LEMO only)	All common TEDS chips are supported.								
Power consumption	6 W w/o sensor supply[1)]; absolute maximum with sensor supply[1)]: 13 W								

Tab. 16: Module specifications

1) TY-1603-LV-6-L1B only

2) 1 year accuracy 23 °C ±5 °C

3) Mean time between failure

4) LP Filter in auto mode

5) SFDR excluding harmonics

6) ENOB calculated from SNR