

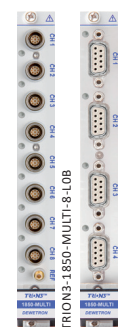


DEWETRON

TRION(3)-18xx-MULTI

UNIVERSAL INPUT MODULE

- > Sampling: up to 5 MS/s per channel
- > Input types: Voltage, bridge, resistance, RTD, IEPE® current and counter
- > Isolation: 350 V_{DC}
- > CAN: High-speed CAN2.0 port
- > Bandwidth: 2 MHz



SPECIFICATIONS

General specifications			
Input channels	TRION-1820-MULTI-4-D	4 channels DSUB connector	<div style="display: flex; justify-content: space-around;"> <div>CH1 Analog/CAN</div> <div>CH2 Analog</div> <div>CH3 Analog/CNT</div> <div>CH4 Analog/CNT</div> </div>
	TRION3 -1820-MULTI-8-L0B	8 channels 0B LEMO connector	<div style="display: flex; justify-content: space-around;"> <div>CH1 Analog CAN</div> <div>CH2 Analog</div> <div>CH3 Analog</div> <div>CH4 Analog</div> <div>CH5 Analog</div> <div>CH6 Analog</div> <div>CH7 Analog CNT</div> <div>CH8 Analog CNT</div> </div>
	TRION3 -1820-MULTI-4-D	4 channels DSUB connector	<div style="display: flex; justify-content: space-around;"> <div>CH1 Analog/CAN</div> <div>CH2 Analog</div> <div>CH3 Analog/CNT</div> <div>CH4 Analog/CNT</div> </div>
	TRION3 -1850-MULTI-8-L0B	8 channels 0B LEMO connector	<div style="display: flex; justify-content: space-around;"> <div>CH1 Analog CAN</div> <div>CH2 Analog</div> <div>CH3 Analog</div> <div>CH4 Analog</div> <div>CH5 Analog</div> <div>CH6 Analog</div> <div>CH7 Analog CNT</div> <div>CH8 Analog CNT</div> </div>
	TRION3 -1850-MULTI-4-D	4 channels DSUB connector	<div style="display: flex; justify-content: space-around;"> <div>CH1 Analog/CAN</div> <div>CH2 Analog</div> <div>CH3 Analog/CNT</div> <div>CH4 Analog/CNT</div> </div>
Sampling rate / Resolution	TRION-1820-MULTI TRION3-1820-MULTI	100 S/s to 2 MS/s	24-bit
	TRION3-1850-MULTI	100 S/s to 2 MS/s >2 MS/s to 5 MS/s	24-bit 18-bit
Onboard data buffer	512 MB		
Isolation	Channel to channel 350 V _{DC} ¹⁾ Channel to chassis 350 V _{DC} ¹⁾		
Input types	<div style="display: flex; flex-direction: column; align-items: center;"> <div>Voltage </div> <div>IEPE[†] </div> <div>Bridge </div> <div>Resistance </div> <div>Current </div> <div>MSI </div> </div>	Ranges	Supported sensors
		±0.1 mV to ±100 V ¹⁾ freely programmable	-
		±100 mV to ±10 V freely programmable	IEPE® sensors
		1 to 1000 mV/V	4-, 5-, 6-wire full bridge; 3-, 4-, 5-wire ½ bridge; 2-, 3-, 4-wire ¼ bridge; 120/350/1000 Ω internal ¼ bridge completion
		10 Ω to 30 kΩ	Potentiometer, Resistance temperature detection: Pt100, Pt200, Pt300, Pt500, Pt2000 (2-, 3-, 4-wire)
		±30 mA	4 to 20 mA sensors; loop powered sensors
		MSI-BR-CH-x: 500 to 50000 pC MSI-BR-TH-x: various TC ranges MSI-BR-LVDT	LVDT, RVDT, Charge output and thermocouple sensors
REF connector	SMB connector to apply external calibration signal (LEMO version only)		
Input connector	9-pin LEMO EPG.0B.309 (TRION3-18xx-MULTI-8-L0B) 9-pin SUB-D connector (TRION(3)-18xx-MULTI-4-D)		
Environmental specifications	Operating temperature	32 to 113 °F (0 to +45 °C)	
	Storage temperature	-4 to 158 °F (-20 to +70 °C)	
	Humidity	10 to 80 % non cond., 5 to 95 % rel. humidity	

¹⁾ for safety reasons it is not allowed to apply more than 47.2 V_{PEAK} or 70 V_{DC}



Input amplifier																	
Voltage input accuracy ^{1) 2)}	<= 10 V	DC		±0.02 % of reading ± 0.02 % of range ±20 µV													
		0.1 Hz to 10 kHz		±0.02 % of reading ± 0.02 % of range ±20 µV													
		10 kHz to 50 kHz		±0.1 % of reading ± 0.02 % of range ±20 µV													
		50 kHz to 100 kHz		±0.5 % of reading ± 0.02 % of range ±20 µV													
Input divider on	>10 V	DC		±0.02 % of reading ± 0.02 %													
		0.1 Hz to 5 kHz		±0.02 % of reading ± 0.02 %													
		5 kHz to 50 kHz		±0.5 % of reading ± 0.02 %													
		50 kHz to 100 kHz		±1.5 % of reading ± 0.02 %													
Amplifier drift		Gain drift		typical 10 ppm/°C max. 20 ppm/°C													
		Offset drift		typical 0.3 µV/°C+ 10 ppm of range, max 2 µV/°C + 20 ppm of range/°C													
Linearity		typical <25 ppm															
Current input accuracy ^{1) 2)}		0.1 % of reading ± 10 µA															
Current input impedance		Direct input (IN- to GNDi): 75 Ω±25 Ω Loop powered sensor: 120 Ω ±1 Ω															
Input impedance		Differential										Input (Single ended)					
0 to 10 V range		100 MΩ or 1 MΩ (programmable) // 15 pF										50 MΩ // 28 pF					
10 to 100 V range		2 MΩ // 35 pF										1 MΩ //65 pF					
Input bias current		<100 nA 100 mV range															
Input configuration		Single ended or differential (programmable)															
Input coupling		DC / AC (highpass filter 0.16 Hz to 100 Hz freely programmable)															
Common mode voltage		350V _{DC} ³⁾															
Overvoltage protection (IN+ to IN-)		0 to 10 V range		50 V continuous, 100 V for 60 seconds (maximum input current limited to 7 mA)													
		10 to 100 V range		250 V													
Low pass filter (-3 dB, digital)		1 Hz to 1.5 MHz freely programmable or OFF															
		Characteristic		Bessel or Butterworth													
		Filter order		2 nd , 4 th , 6 th , 8 th													
		Filter setting AUTO		30 % of samplerate with 8 th order Bessel													
Analog anti-aliasing filter		2nd order Bessel, automatically selected															
		100 kHz, 500 kHz, 2 MHz; <=1 V range bandwidth is limited to 1.8 MHz															
Channel to channel phase mismatch		<10 nsec between channels using the same range															
CMRR		135 dB @ 50 Hz; 110 dB @ 1 kHz; 90 dB @ 10 kHz; 90 dB @ 100 kHz;															
Typical crosstalk		-134 dB (10 V range; 0 to 100 kHz)															
Input noise (100 mV range)		0 to 10 Hz		0.3 µV _{pp}													
		Noise density		6.9 nV/SQRT(Hz)													
typical THD		10V range: -108 dB; 1V range: -102 dB for 1 kHz fundamental frequency															
Signal to noise ratio; Spurious free SNR;		100 mV range				1 V range				10 V range				100 V range			
Effective number of Bits ⁴⁾ ; Noise V _{pp}		SNR	SFDR ⁵⁾	ENOB ⁶⁾	Noise	SNR	SFDR ⁵⁾	ENOB ⁶⁾	Noise	SNR	SFDR ⁵⁾	ENOB ⁶⁾	Noise	SNR	SFDR ⁵⁾	ENOB ⁶⁾	Noise
Sample rate		[dB]	[dB]	[dB]	[mV _{pp}]	[dB]	[dB]	[dB]	[mV _{pp}]	[dB]	[dB]	[dB]	[mV _{pp}]	[dB]	[dB]	[dB]	[mV _{pp}]
1 kS/s		113.5	130	18.6	0.001	112.4	135	18.4	0.010	127.2	140	20.8	0.018	120.1	140	19.7	0.400
10 kS/s		103.0	130	16.8	0.003	109.0	135	17.8	0.017	119.5	140	19.6	0.055	114.7	140	18.8	0.950
100 kS/s		94.7	130	15.4	0.011	103.9	130	17.0	0.038	109.8	140	17.9	0.190	106.6	140	17.4	2.700
200 kS/s		91.4	130	14.9	0.016	101.4	130	16.6	0.051	107.4	140	17.6	0.260	104.1	140	17.0	3.800
1000 kS/s		84.7	125	13.8	0.038	95.0	130	15.5	0.116	99.8	139	16.3	0.650	97.7	135	15.9	8.300
2000 kS/s		81.4	120	13.2	0.058	91.0	128	14.8	0.170	95.4	132	15.6	1.100	94.1	132	15.3	14.000
5000 kS/s		78.7	110	12.8	0.080	88.7	125	14.4	0.270	93.1	130	15.2	1.600	91.4	130	14.9	19.000
Filter = OFF		76.2	105	12.4	0.110	86.5	120	14.1	0.330	90.5	130	14.7	2.000	89.0	130	14.5	23.000
¹⁾ 1 year accuracy 23 °C ±5 °C ²⁾ add 0.02 % of reading with filter settings OFF ³⁾ for safety reasons it is not allowed to apply more than 47.2 V _{PEAK} or 70 V _{DC} ⁴⁾ LP Filter in auto mode ⁵⁾ SFDR excluding harmonics ⁶⁾ ENOB calculated from SNR																	



Excitation	
Excitation voltage	0 to 24 V _{DC} ; freely programmable separately for each channel; 1mV resolution; balanced around GNDi; remote sense support;
1 year accuracy drift	±0.03 % ±1.5 mV
Drift	±10 ppm/°C ±50 µV/°C
Current limit	0.1 to 5 V: 100 mA >5 V to 24 V: limited to 0.5 W
Protection	Continuous short
Load and line regulation error	±0.002 % with sense line connected
Excitation current	0.1 to 60 mA _{DC} (programmable, 16 bit DAC) 1 µA; balanced around GNDi
1 year accuracy ¹⁾	0.1 to 5 mA: 0.05 % ±2 µA >5 to 60 mA: 0.5% ±5 µA
Drift	15 ppm/°C
Compliance voltage	0.1 to 20 mA: 24 V >20 mA: 10 V
Output impedance	>10 MΩ
Load regulation bandwidth	100 kHz
IEPE® excitation	2 to 20 mA; 10%; >21 V compliance voltage
¹⁾ 1 year accuracy 23 °C ±5 °C	

Bridge functions	
Supported bridge types	<p>Full bridge 4-, 5- or 6-wire full bridge 4-wire full bridge with constant current excitation (piezoresistive bridge sensors), Potentiometer</p> <p>Half bridge 3-, 4- or 5-wire ½ bridge with internal completion (software programmable)</p> <p>Quarter bridge 2-, 3- or 4-wire ¼ bridge with internal completion resistor for 120 Ω, 350 Ω and 1000 Ω (software programmable) 2-wire ¼ with constant current excitation for dynamic measurement (AC coupled)</p>
Internal quarter bridge completion	120 Ω; 350 Ω; 1000 Ω; ±0.05%
Bridge resistance	80 Ω to 10 kΩ @ ≤ 5 V _{DC} excitation; the lower limit is caused by the maximum power supply.
Shunt calibration	4000 steps programmable shunt; shunt target can be programmed in mV/V;
Completion resistor accuracy	0.05 % ±15 ppm/K
Automatic bridge balance	±400% of range
Bridge features	Bridge Balance; line-resistance compensation

CAN functions	
CAN specification	CAN 2.0
CAN physical layer	High speed
CAN termination	Programmable: high impedance or 120 Ω
CAN bus protection	±36 V

Counter functions	
Counter	2 x counter channels linked to the last two analog channels; trigger level is 70% of range
Counter modes	Event counting, frequency
Timebase / resolution	5 MHz (200 nsec)