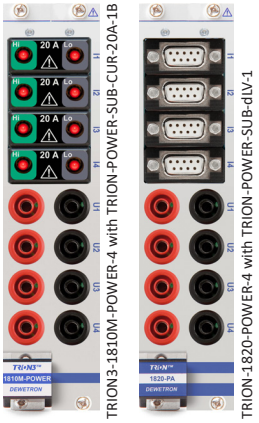
TRION(3)-18xx-POWER-4

DEWETRON

TRION(3)-18xx-POWER-4

- TRION(3) module for 4-phase power analysis
- Sampling
  - TRION3-1810M-POWER: up to 10 MS/s
  - TRION3-1820-POWER: up to 2 MS/s
  - TRION-1820-POWER: up to 2 MS/s
- Voltage input: 1000 V_{RMS} / 2000 V_{DC}
- Modular current input



Basic module with fixed high-voltage inputs

The following section provides detailed information on the fixed high-voltage inputs. The values given below were determined in a standardized test setting[1].

General specifications

Fixed high-voltage inputs			
Input channels			
Sampling rate / resolution	TRION3-1820-POWER	100 S/s to 2 MS/s	24-bit
	TRION-1820-POWER		
	TRION3-1810M-POWER	100 S/s to 2 MS/s	24-bit
		>2 MS/s to 10 MS/s	18-bit
Input range		1000 V_{RMS} (±2000 V_{PEAK}) CF = 2	
Accuracy[1) 2) 3)] – DC – 0.5 Hz to 1 kHz – 1 kHz to 5 kHz – 5 kHz to 10 kHz – 10 kHz to 50 kHz – 50 kHz to 300 kHz		 ±0.02 % of reading ±0.02 % of range ±0.03 % of reading ±0.15 % of reading ±0.35 % of reading ±0.6 % of reading ±(0.02 % * f) of reading f: frequency in kHz	
Gain drift		20 ppm/°C	
Offset drift		5 mV/°C	
Typical THD		-95 dB	
CMRR		>85 dB @ 50 Hz; >60 dB @ 1 kHz; >40 dB @ 100 kHz	
Bandwidth		5 MHz	
Rated input voltage to earth according to EN 61010-2-30		600 V CAT IV / 1000 V CAT III	
Differential input (floating circuits)		600 V CAT IV / 1000 V CAT III / 2000 V_{DC} (see *Fig. 134*)	
Common mode voltage		1000 V_{RMS}	
Isolation voltage		3750 V_{RMS} (1 min), 35 kV/µs transient immunity	

Tab. 47: Fixed high-voltage inputs

Fixed high-voltage inputs				
Overvoltage protection	4250 V_{PEAK} or 3000 V_{RMS} (1 min)			
Input resistance	5 MΩ; 2 pF			
Isolation (earth) resistance	100 GΩ; 2.5 pF			
Connector	Safety banana sockets			
	SNR	SFDR[4]	ENOB[5]	$Noise_{PP}$
Sample rate	[dB]	[dB]	[Bit]	[mV]
0.1 kS/s	126	144	20.6	2.6
1 kS/s	123	140	20.1	4.5
10 kS/s	118	137	19.3	9.5
100 kS/s	110	134	18.0	27.2
1000 kS/s	100	134	16.3	92.5
2000 kS/s	82	132	13.3	134.0

Tab. 47: Fixed high-voltage inputs

1) The following accuracy conditions were applied: Temperature: 23 ±5 °C; humidity: 40 to 60 % rel. humidity; input waveform: sine wave; common mode voltage: 0 V; line filter: Auto (8th or Butterworth); sample rate: 2 MS/s (1 MS/s TRION-1810-HV); resolution: 24-bit; power factor: 1; after warm-up; after zero level, accuracy:

2) Add 0.02 % of reading with filter settings OFF

3) Below 1 % of range, add 10 ppm of range.

4) SFDR excluding harmonics

Power specifications

Power specifications		
Active power accuracy with PF=1[1] (f: frequency in kHz)	DC	±0.03 % of reading ±0.03% of range[2]
	0.5 Hz–1 kHz	±0.04 % of reading
	1 kHz–5 kHz	±0.2 % of reading
	5 kHz–10 kHz	±0.5 % of reading
	10 kHz–50 kHz	±(0.5 % + 0.05 % * f) of reading
Influence of power factor	Add 0.01 % * f/50 * √(1/PF²-1)	f: frequency in Hz
Typ. channel-to-channel phase mismatch (Voltage-Voltage, Current-Current, Voltage-Current)	<250 ns (0.1° @ 1 kHz, 0.005° @ 50 Hz)	
Typical board-to-board phase mismatch		
– Same board type	<250 ns (0.1° @ 1 kHz, 0.005° @ 50 Hz)	
– Different board type	±1 sample or 0.2° @ 1 kHz (whichever is higher)	
Fundamental frequency		
– Range	0.1 Hz–200 kHz (>500 kS/s: >0.2 Hz; >1 MS/s: >0.5Hz; >2MS/s: >1 Hz)	
– Accuracy DEWE2	±0.01% of reading ± 1 mHz	
– Accuracy DEWE3	±0.005% of reading ± 1 mHz	
Low pass filter (-3 dB, digital and analog combined)		
– TRION3-1810M-POWER	100 Hz to 3 MHz freely programmable or OFF	
– TRION(3)-1820-POWER	100 Hz to 600 kHz freely programmable or OFF	
– Filter order and characteristics	2nd, 4th, 6th, 8th Bessel or Butterworth	

Filter delay compensation	Up to 15 µs the group delay of the selected filter will be automatically compensated. This works for: – 2nd order filter 15 kHz to 1 MHz – 4th order filter 30 kHz to 1 MHz – 6th order filter 60 kHz to 1 MHz
Onboard data buffer	512 MB
Power consumption	Typ. 13 W, max. 15 W
– With sensor supply	Max. 21 W

Tab. 48: Power specifications

1) Voltage and current channel have a minimum input of 1 % range, otherwise individual uncertainty has to be calculated.

2) Add 0.03 % of range with no zero level.