

TECHNICAL REFERENCE MANUAL

KRYPTON V26-1



4.2. General specifications

Interface	
Data interface	EtherCAT®
Data Rate	100 Mbps Full Duplex bus speed
Max. Throughput per Chain	From 6 MB/s to 10 MB/s (see 1)
Sync Accuracy	below 1 sample to Sirius®
EtherCAT®	Max. Cable Length 100 m
Max. Number of Units	64 or more (power injectors may be required)
Data Interface Connection	LEMO 1T EtherCAT® hybrid cable Single cable for data, power and sync, daisy chainable
Additional Specifications	
Power supply ground to mechanical ground (housing) resistance	> 100 kΩ
Power	
Power Supply	9 - 48 V DC
Environmental	
Operating Temperature	-40 to 85°C
Storage Temperature	-40 to 85°C
Humidity	5 to 100 % RH
IP rating	IP65 / IP67
Shock	Shock: SIST EN 60068-2-27:2009 100 g, 6 ms, half-sine 100x pos./neg in each axis 600x total
Vibration	Random vibration: MIL-STD-202G Method 214A, test condition II-D Profile break points: 50 Hz @ 0.025 g ² /Hz 100 Hz @ 0.1 g ² /Hz 2000 Hz @ 0.1 g ² /Hz Profile RMS / Peak = 13.9 g / 41.7 g 8 hrs in each axis, 24 hrs total
1) It depends on the devices connected, numbers of channels, configuration, length of cables and other parameters.	

5.2. VOLTAGE MEASUREMENT

KRYPTON product family includes three types of low voltage (LV) modules and one type of high voltage (HV) modules. KRYPTON LV modules are rugged isolated DAQ devices for low voltage measurements.

Below is the list of the products:

- KRYPTONi-8xLV,
- KRYPTONi-4xLV,
- KRYPTONi-1xLV,
- KRYPTONi-1xHV.

5.2.1. KRYPTONi-4xLV, KRYPTONi-8xLV

KRYPTONi-4xLV has 4 BNC input connectors for voltage measurement.



KRYPTONi-4xLV

KRYPTONi-8xLV has 8 input connectors for voltage measurement.



KRYPTONi-8xLV



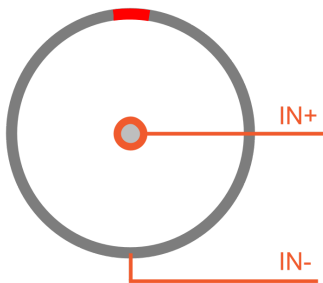
5.2.1.1. KRYPTONi-8xLV-100V-LIT2m

5.2.1.2. KRYPTONi-4xLV, KRYPTONi-8xLV: Specifications

Analog input		KRYPTONi-4xLV	KRYPTONi-8xLV
Input type		Isolated voltage	Isolated voltage
Number of channels		4	8
ADC Type		24-bit oversampled SAR with 41 kHz anti-aliasing filter	24-bit oversampled SAR with 41 kHz anti-aliasing filter
Sampling Rates		Simultaneous 20k, 10k, 5k, 2k, 1k, 500, 200, 100 S/s (software-selectable)	Simultaneous 20k, 10k, 5k, 2k, 1k, 500, 200, 100 S/s (software-selectable)
Voltage Mode			
Range		±50 V	±50 V, ±100 V (See 2)
Accuracy		±0.03 % of reading ±5 mV	±0.03 % of reading ±5 mV
Typ. SNR (10 kS/s, -1 dBFS sine wave @ 1 kHz)		104 dB	104 dB
Typical noise floor @ 10 kS/s		-106 dB	-106 dB
Type. THD (10 kS/s, -1 dBFS sine wave @ 1 kHz)		-104 dB	-104 dB
Type. SFDR (10 kS/s, -1 dBFS sine wave @ 1 kHz)		105 dB	105 dB
Typical CMR @ 400 Hz / 1 kHz		105 dB / 94 dB	105 dB / 94 dB
Gain Drift		Typical 10 ppm/K, max. 20 ppm/K	Typical 10 ppm/K, max. 20 ppm/K
Offset Drift		Typical 5 µV/K, max. 10 µV/K	Typical 5 µV/K, max. 10 µV/K
Gain Linearity		< 0.01 %	< 0.01 %
Input Coupling		DC	DC
Input Impedance		1 MΩ	1 MΩ
Noise		0.7 mVRMS	0.7 mVRMS
Overvoltage Protection		In+ to In-: 200 V continuous, 350 Vpeak (100 msec)	In+ to In-: 200 V continuous, 350 Vpeak (100 msec)
Analog input performance			
Bandwidth (-3dB)		0.49 fs	0.49 fs
Alias-free Bandwidth		DC to 0.453 fs	DC to 0.453 fs
Alias Rejection		-100 dB (all sample rates)	-100 dB (all sample rates)
Delay Through ADC		37 / fs	37 / fs
Oversampling		32	32
Additional Specifications			
Input Connector		BNC	BNC, LEMO 2pin (See 2)
Isolation Voltage		1000 Vpeak channel/ground & channel/channel	1000 Vpeak channel/ground & channel/channel
Power			
Power Supply		9 - 48 V DC	9 - 48 V DC
Power Consumption		3.8 W	6.8 W

Environmental		
IP Rating (see 1)	IP67	IP67
Physical		
Weight	700 g	1000 g
Slice Dimensions	213 x 39 x 56 mm	213 x 54 x 56 mm
Dimensions with Connectors	213 x 39 x 66.8 mm	213 x 54 x 66.8 mm
1) Depending on the mating connector types 2) Upon request		

5.2.1.3. KRYPTONi-4xLV, KRYPTONi-8xLV: BNC connector: Pinout



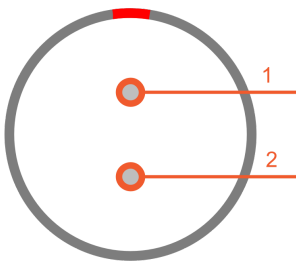
BNC connector: pinout (BNC)

Pin	Name	Description
1	IN+	Analog Input +
2	IN-	Analog input -



Note
KRYPTONi-4xLV and KRYPTONi-8xLV have a single-ended input where IN- (Analog input -) represents isolated ground.

5.2.1.4. KRYPTONi-8xLV-100V-LIT2m: LEMO connector: Pinout

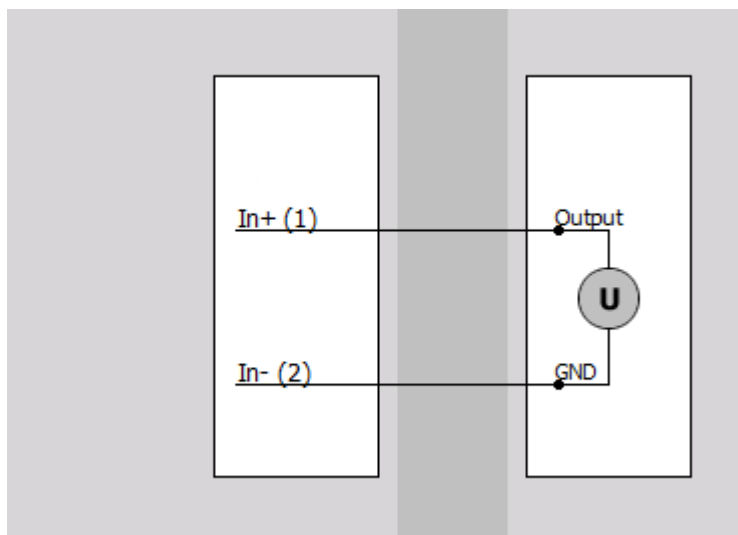


Pin	Name	Description
1	IN+	Analog Input +
2	IN-	Analog input -

LEMO connector: EGJ.1T.302.CLD
Mating connector: FGJ.1T.302.CLLK80Z

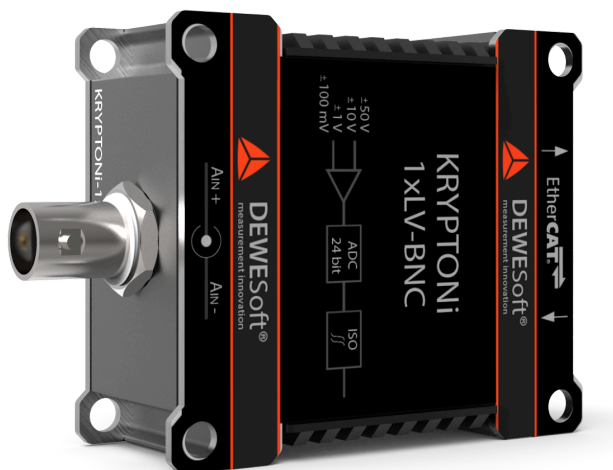
5.2.1.5. KRYPTONi-4xLV, KRYPTONi-8xLV: Wiring diagrams

Voltage



5.2.2. KRYPTONi-1xLV

KRYPTONi-1xLV is a single channel low voltage module with BNC connector.



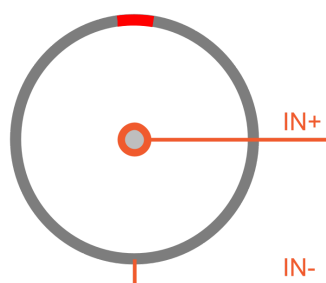
KRYPTONi-1xLV

5.2.2.1. KRYPTONi-1xLV: Specifications

Analog input				
Input types	Voltage			
Number of channels	1			
ADC Type	24-bit SAR with anti-aliasing filter			
Sampling Rate	Simultaneous 40 kS/s per channel (software-selectable)			
Voltage Ranges	±50 V	±10 V	±1 V	±100 mV
Input Accuracy	±0.03 % of reading, ±0.02 % of range, ±0.1 mV			
Typical SNR @ 10 kS/s	96 dB	96 dB	94 dB	88 dB
Typical Dynamic Range @ 10 kS	-130 dB	-132 dB	-137 dB	-138 dB
Typical Noise floor @ 10 kS	-108 dB	-102 dB	-107 dB	-100 dB
Gain Drift	Typical 10 ppm/K (max. 40 ppm/K)			
Offset Drift	Typical 0.3 μV/K + 5 ppm of range/K, max 2 μV/K + 10 ppm of range/K			
Gain Linearity	< 0.02 %			
Input Coupling	DC, AC 1 Hz			
Input Impedance	1 MΩ		20 MΩ	
Overvoltage Protection	200 V		50 V	
Analog input performance				
Bandwidth (-3 dB)	0.49 fs			
Alias-free Bandwidth	DC to 0.453 fs			
Alias Rejection	-100 dB (all sample rates)			
Delay Through ADC	37 / fs			
Oversampling	32			
Additional specifications				
Input connector	BNC			

Isolation	125 Vrms channel to ground isolation
Power	
Power Supply	9 - 48 V DC
Power consumption	1.5 W (typ.)
Physical	
Dimensions	62 x 56 x 29 mm
Weight	250 g

5.2.2.2. KRYPTONi-1xLV: BNC connector: Pinout



BNC connector: pinout (BNC)

Pin	Name	Description
1	IN+	Analog Input +
2	IN-	Analog input -

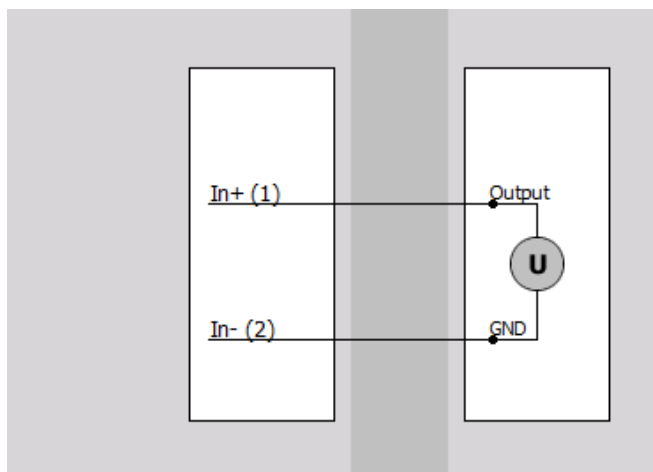


Note

KRYPTONi-1xLV has a single-ended input where IN- (Analog input -) represents isolated ground.

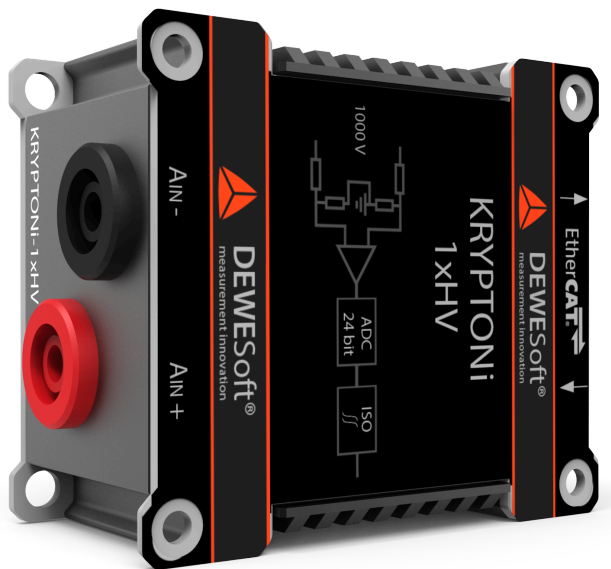
5.2.2.3. KRYPTONi-1xLV: Wiring diagrams

Voltage



5.2.3. KRYPTONi-1xHV

KRYPTONi-1xHV has two banana front connectors for single channel high voltage measurement.



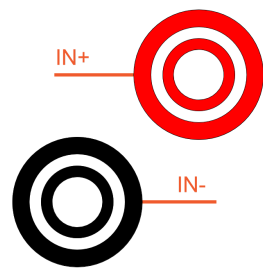
KRYPTONi-1xHV

5.2.3.1. KRYPTONi-1xHV: Specifications

Analog Input	
Input types	Voltage
Number of channels	1
ADC Type	24-bit SAR with anti-aliasing filter
Sampling Rate	40 kS/s (software-selectable)
Input range	±1000 V
Input accuracy	±0.03 % of reading ±0.2 V
Typ. Noise floor @ 10 kS/s	-96 dB
Typ. Noise floor @ 40 kS/s	-90 dB
Typ. CMR @ 400 Hz / 1 kHz	-
Gain Drift	Typ. 50 ppm (Max. 150ppm)
Offset Drift	Typ. 1.5 mV/K (Max. 4 mV/K)
Gain Linearity	-
Input Coupling	DC
Input Impedance	10 MΩ
Protection class	CAT IV 600 V, CAT III 1000 V
Overvoltage Protection	+/-2 kVpeak
Analog input performance	
Bandwidth (-3 dB)	0.49 fs
Alias-free Bandwidth	DC to 0.453 fs

Alias Rejection	-100 dB (all sample rates)
Delay Through ADC	37 / fs
Oversampling	32
Additional specifications	
Input connector	4 mm safety banana jack
Power	
Power Supply	9 - 48 V DC
Power consumption	1 W (typ.)
Environmental	
IP rating	IP65 / IP67 (see 1)
Physical	
Dimensions	62 x 56 x 36 mm
Weight	300 g
1) Depending on the mating connector types	

5.2.3.2. KRYPTONi-1xHV: Banana Connector: Pinout



Pin	Name	Description
1	In+	Input +
2	In-	Input -

HV connector: pinout (Banana plug)

5.2.3.3. KRYPTONi-1xHV: Wiring diagrams

Voltage

