

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.	

5.1. Technical specifications

5.1.1. KRYPTON Multichannel

	STG	TH	TH-HS	RTD	RTD-HS	ACC	LV	LA	DIO	CNT
Connectors	DB9, L2B10f	Thermocouple	Thermocouple	LOB6f	LOB6f	BNC	BNC	BNC	DB25	LIT7f
#ch per module	3x, 6x	8x, 16x	8x, 16x	8x	8x	4x, 8x	4x, 8x	8x	16xDI, 16xDO 8xDI, 8xDO	4xCNT
Data rate / channel	20 kS/s	100 S/s	100 S/s, upgradeable to 10 kS/s	100 S/s	100 S/s, upgradeable to 10 kS/s	20 kS/s	20 kS/s	20 kS/s	40 kS/s	20 kS/s
Resolution	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	digital	100 MHz timebase 5 ppm, 20 ppm max
Bandwidth	0.49*fs	✗	0.49*fs (max. 1 kHz)	✗	✗	0.49*fs	0.49*fs	0.49*fs	✗	10 MHz
Voltage ranges	±10 V, ±1 V, ±100 mV, ±10 mV	±1 V, ±100 mV	±1 V, ±100 mV	±1 V, ±100 mV	±1 V, ±100 mV	±10 V, ±5 V, ±1 V, ±200 mV	±50 V	±20 mA	CMOS compatible	TTL (Low: <0.8 V, High > 2 V)
Input coupling	DC	DC	DC	DC	DC	DC, AC 0.1 Hz, 1 Hz	DC	DC	DC	
Sensor excitation	0...15 V max. 0.4 W/ch (45 mA limit)	✗	✗	✗	✗	IEPE 4 mA, 8 mA	-	-	5 V / 300 mA 12 V / 120 mA Vsupply / 200 mA	5 V / 100 mA / ch 12 V / 50 mA / ch
Bridge connection	Full, ½, ¼ 350 Ω, ¼ 120 Ω 3 wire	✗	✗	✗	✗	✗	✗	✗	✗	✗
Programmable shunt	100 kΩ	✗	✗	✗	✗	✗	✗	✗	✗	✗
IEPE input	DSI-ACC	✗	✗	✗	✗	✓	✗	✗	✗	✗
Resistance	✗	✗	✗	10 kΩ	10 kΩ	✗	✗	✗	✗	✗
Temperature (PTx)	DSI-RTD	✗	✗	PT100, 200, 500, 1000, 2000	PT100, 200, 500, 1000, 2000	✗	✗	✗	✗	✗

Thermocouple	DSI-TH	K, J, T, R, S, N, E, C, B	K, J, T, R, S, N, E, C, B	X	X	X	X	X	X	X
Current	ext. shunt DSI	X	X	X	X	ext. shunt	X	✓	X	X
Potentiometer	✓	X	X	X	X	X	X	X	X	X
LVDT	DSI-LVDT	X	X	X	X	X	X	X	X	X
Charge	DSI-CHG	X	X	X	X	X	X	X	X	X
TEDS	✓	X	X	X	X	✓	X	X	X	X
Isolation voltage	Differenti al	1000 V	1000 V	1000 V	1000 V	Differenti al	1000 V	1000 V	250 V	X
Isolation arrangement	None	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	None	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Isolated common GND	Isolated common GND
Power consumption per module	2.4 W (4 W 120 Ω @ 5 V load) 3xSTG; 5.9 W (8.9 W 120 Ω @ 5 V load) 6xSTG	2.5 W (8xTH) 4 W (16xTH)	2.6 W (8xTH-HS) 4.3 W (16xTH-H S)	2.5 W	2.5 W	4.6 W	3.5 W (4xLV) 6.7 W (8xLV)	6.8 W	2 W	2.3W
Advanced functions	Supports all strain types, TEDS support	High isolation, support of main TC types	High isolation, support of main TC types	X	X	TEDS support	High isolation, high input range	High isolation	X	SuperCount er®
OBSIDIAN compatibility	Yes* up to 5kHz	Yes	Yes up to 5kHz	X	X	Yes* up to 5kHz	Yes* up to 5kHz	X	X	Yes
Rev: 1784267400										
*Some features might not be supported.										

5.8. DIGITAL AND COUNTER MEASUREMENT

KRYPTON counter modules utilize a patented technology called SUPERCOUNTER® in every of its counter/encoder inputs and in the smallest possible form. It supports counting, waveform timing, encoder, tacho, gear-tooth sensor.

KRYPTON digital input/output modules are perfect choices for control applications:

- KRYPTON-4xCNT, KRYPTON-1xCNT,
- KRYPTONi-16xDI, KRYPTONi-16xDO,
- KRYPTONi-8xDI-8xDO,
- KRYPTONi-4xDI, KRYPTONi-4xDO.

5.8.1. KRYPTON-4xCNT

KRYPTON-4xCNT has four LEMO 7-pin LIT7f connectors.



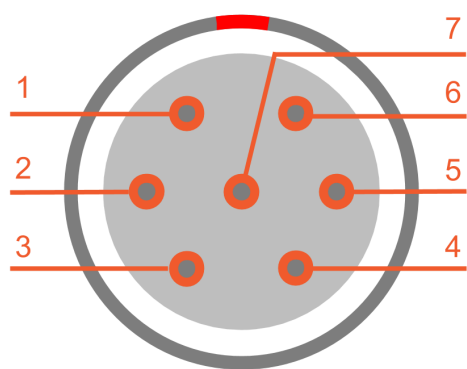
KRYPTON-4xCNT

5.8.1.1. KRYPTON-4xCNT: Specifications

Digital inputs	
Input type	Digital
Number of channels	4
Input connector	LEMO 1T series 7-pin
Timebase	100 MHz
Time base accuracy	Typical: 5 ppm, Max: 20 ppm
Max. bandwidth	10 MHz
Input Filter	500 ns, 1 µs, 2 µs, 4 µs, 5 µs and 7.5 µs
Input Level Compatibility	TTL (Low: < 0.8 V, High > 2 V)
Input impedance	100 kΩ pull-up to +3.3 V
Input Protection	±25 V continuous
Isolation	Ch to GND isolation
Isolated Sensor Power Supply	
Output Voltage +5 V	5 V +/- 10 % 100 mA max. (400 mA to supply 4 channels)
Output Voltage +12 V	12 V +/-10 % 50 mA max. (100 mA to supply 4 channels)
Isolation	Ch to GND isolation

Power	
Power Supply	9 - 48 V DC
Power consumption	Typ 2.3 W (Max 2.7 W)
Physical	
Dimensions	213 x 39 x 56 mm
Weight	700 g

5.8.1.2. KRYPTON-4xCNT: LEMO L1T7f Connector: Pinout



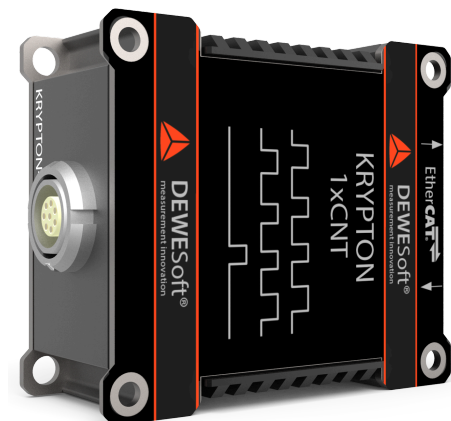
CNT connector: pinout (7-pin LEMO female)

Connector type: EEG.IT.307.CLN
Mating connector: FGG.IT.307.CLAC45

Pin	Name	Description
1	IN0/A	Input A
2	IN1/B	Input B
3	IN2/Z	Input Z
4	GND	Ground
5	+5 V	5 V supply max. current: 400 mA (Shared between 4 ports)
6	+12 V	12 V supply max. current: 200 mA (Shared between 4 ports)
7	GND	Ground

5.8.2. KRYPTON-1xCNT

KRYPTON-1xCNT has a LEMO 7-pin LIT7f connector.

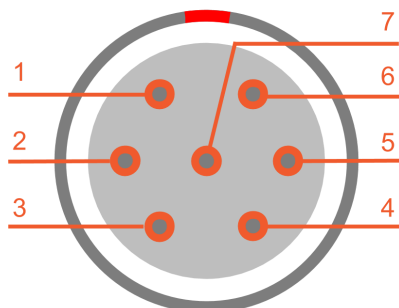


KRYPTON-1xCNT

5.8.2.1. KRYPTON-1xCNT: Specifications

Counter	
Input type	Digital
Number of channels	1
Timebase	100 MHz
Time base accuracy	Typical: 5 ppm, Max: 20 ppm
Max. bandwidth	10 MHz
Input Filter	500 ns, 1 μ s, 2 μ s, 4 μ s, 5 μ s and 7.5 μ s
Input Level Compatibility	TTL (Low: < 0.8 V, High > 2 V)
Input impedance	100 k Ω pull-up to +3.3 V
Input Protection	$\pm$ 25 V continuous
Isolated Sensor Power Supply	
Output Voltage +5 V	5 V $\pm$ 10 % 100 mA max.
Output Voltage +12 V	12 V $\pm$ 10 % 90 mA max.
Additional specifications	
Input connector	LEMO 1T series 7-pin
Isolation	-
Power	
Power Supply	9 - 48 V DC
Power consumption	1.2 W (typ.)
Physical	
Dimensions	62 x 56 x 29 mm
Weight	250 g

5.8.2.2. KRYPTON-1xCNT: LEMO L1T7f Connector: Pinout



CNT connector: pinout (7-pin LEMO female)

Connector type: EEG.1T.307.CLN
Mating connector: FGG.1T.307.CLAC45

Pin	Name	Description
1	IN0/A	Input A
2	IN1/B	Input B
3	IN2/Z	Input Z
4	GND	Ground
5	+5 V	5 V supply max. current: 100 mA
6	+12 V	12 V supply max. current: 90 mA
7	GND	Ground

5.8.4. KRYPTONi-4xDI

KRYPTON ONE isolated module with 4 digital inputs and power supply on the front 15-pin DSUB male connector.



KRYPTONi-4xDI

5.8.4.1. KRYPTONi-4xDI: Specifications

Digital Inputs	
Input type	Digital
Number of channels	4
Compatibility	TTL / CMOS Voltage Levels
Input low level	UIN < 1 V
Input high level	UIN > 2 V
Input high current @ 5 V UIN	3 mA typ.
Input high current @ 30 V UIN	6 mA typ.
Propagation delay	< 1 µs
Max. sampling rate	40 kS/s
Non-Isolated Sensor Power Supply	
Output Voltage +5 V	5 V +/- 10 % 300 mA max. (see 1)
Output Voltage +12 V	12 V +/-10 % 100 mA max. (see 1)
Output Voltage +Vecat	EtherCAT Bus Supply Voltage 200 mA max. (see 1)
Additional specifications	
Connector	DSUB15HD Male
Overvoltage protection	30 V Continuous, 65 V peak
Isolation	Galvanic isolation CH, GND

Power	
Power supply	9 - 48 V DC
Power consumption	1.5 W (typ.)
Physical	
Dimensions	62 x 56 x 29 mm
Weight	250 g
1) Max. combined load on +5 V and +12 V pins: 1.5 W reduced by the load already present on +Vin pin	

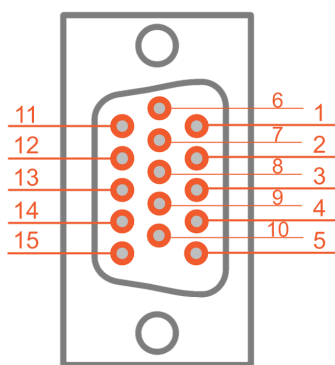
5.8.4.2. KRYPTONi-4xDI: DSUB Connector: Pinout



Note

When using the supply from the KRYPTON module (pin 11, 12 or 15 on DSUB-15) please keep in mind to connect the GND iso with GND.

More information is available on [our Solutions website](#).



DSUB-15 HD male for KRYPTON 4xDI

Pin	4xDI	
	Name	Description
1	DI1 +	Digital input CH1 +
2	DI2 +	Digital input CH2 +
3	DI3 +	Digital input CH3 +
4	DI4 +	Digital input CH4 +
5	NC	-
6	DI1 -	Digital input CH1 -
7	DI2 -	Digital input CH2 -
8	DI3 -	Digital input CH3 -
9	DI4 -	Digital input CH4 -
10	NC	-
11	+5V/300mA	5 V supply, max. 300 mA
12	+12V/130mA	12 V supply, max.130 mA
13	GND	Ground
14	GND	Ground
15	V _{supply} /200mA	Supply voltage, max. 200 mA

5.8.5. KRYPTONi-4xDO

KRYPTON ONE isolated module with 4 digital outputs and power supply on the front 15-pin DSUB female connector. Output type is an open collector with max 2 A sink current.



KRYPTONi-4xDO



Hint

The PWM option is currently only supported on KRYPTON 4xDO devices. You can see the settings of the PWM signal in the [10.1. PWM output on KRYPTON 4xDO](#) chapter.

5.8.5.1. KRYPTONi-4xDO: Specifications

Digital Outputs	
Output type	Digital
Number of channels	4
Maximum update rate	depends on EtherCAT master cycle time
Output type	open collector with active internal pullup to 5 V
Sink	max 50 V, 2 A (resistive load, unprotected)
Source:	5 V, max. 40 mA (internally limited)
Max. switching frequency for internal PWM	100 kHz
Non-Isolated Sensor Power Supply	
Output Voltage +5 V	5 V +/- 10 % 300 mA max. (see 1)
Output Voltage +12 V	12 V +/-10 % 100 mA max. (see 1)
Output Voltage +Vecat	EtherCAT Bus Supply Voltage 200 mA max. (see 1)
Additional specifications	
Connector	DSUB15HD Female
Isolation	Galvanic isolation CH, GND
Power	
Power supply	9 - 48 V DC
Power consumption	2 W (typ.)

Physical		
	Dimensions	62 x 56 x 29 mm
	Weight	250 g

5.8.5.2. KRYPTONi-4xDO: DSUB Connector: Pinout



Note

When using the supply from the KRYPTON module (pin 11, 12 or 15 on DSUB-15) please keep in mind to connect the GND iso with GND.

More information is available on [our Solutions website](#).



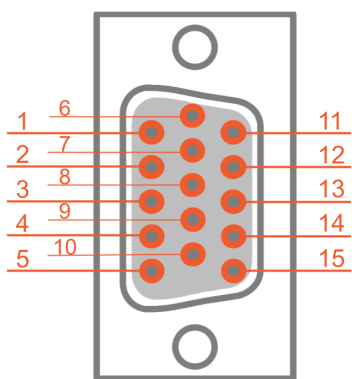
Note

Wiring diagrams for DO connections are available [as a Solution](#)



Caution

Pin 5 (Vext+) on KRYPTONi-4xDO is not recommended to be connected, because it outputs the input voltage of the device. Pin Vext+ is used in case digital outputs are driving large inductive loads. In that case, connecting the power supply of the load to Vext+ takes care of large current spikes when switching the outputs. Apart from that application, this pin should not be used.



DSUB-15 HD female for KRYPTON 4xDO

Pin	4xDI	
	Name	Description
1	DO1	Digital output CH1
2	DO2	Digital output CH2
3	DO3	Digital output CH3
4	DO4	Digital output CH4
5	Vext +	External voltage
6	GNDi	Isolated ground
7	GNDi	Isolated ground
8	GNDi	Isolated ground
9	GNDi	Isolated ground
10	NC	-
11	+5V/300mA	5 V supply, max. 300 mA
12	+12V/130mA	12 V supply, max.130 mA
13	GND	Ground
14	GND	Ground
15	V _{supply} /200mA	Supply voltage, max. 200 mA