

TECHNICAL REFERENCE MANUAL

IOLITE® V26-1



6.4.3. IOLITEicw-1xSTG

IOLITEicw-1xSTG is a single channel strain gauge amplifier with internal quarter, half and full-bridge configurations. Low noise voltage and current source excitation are available with freely settable levels. Input ranges span from 50V to 100mV. Data transferred over the EtherCAT to a PC running powerful and easy to use. 1xSTG is available with two types of connectors at the front end: DSUB9 and internal screw terminal with cable gland (-TB option).



IOLITEicw 1xSTG



IOLITEicw 1xSTG-TB

6.4.3.1. IOLITEicw 1xSTG: Specifications

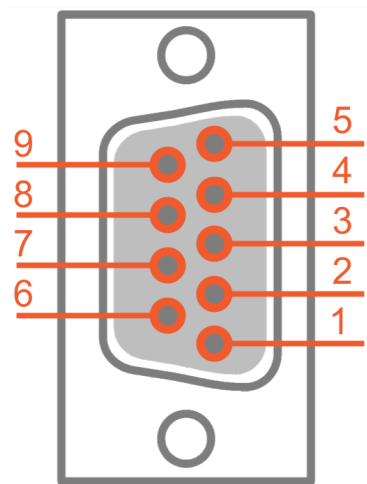
Analog input - Voltage				
Input types	Voltage, current, full bridge strain, half bridge strain, quarter bridge strain			
Number of channels	1			
Input connector	DB9			
ADC Type	24-bit SAR with anti-aliasing filter			
Sampling Rate	40 kS/s			
Voltage Mode				
Ranges	±50 V	±10 V	±1 V	±100 mV
Typ. Input Accuracy	±0.03 % of reading ±0.02 % of range ±0.1 mV			
Typ. SNR (10 kS/sec, -1 dBFS sine wave @ 1 kHz)	89 dB	88 dB	88 dB	87 dB
Type. SFDR (10 kS/sec, -1 dBFS sine wave @ 1 kHz)	100 dB	110 dB	130 dB	145 dB
Typ. Noise floor @ 10 kS/sec	-103 dB	-99 dB	-103 dB	-96 dB
Typical CMR @ 400 Hz / 1 kHz	71 dB / 66 dB	72 dB / 66 dB	96 dB / 88 dB	96 dB / 87 dB
Gain Drift	typ. 10 ppm/K (max. 40 ppm/K)			
Offset Drift	typ. 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	Range ≥ 10 V: 1 M Ω between IN+ and IN- Range < 10 V: 20 M Ω
Overvoltage Protection	Range ≥ 10 V: 200 V Range < 10 V: 50 V
Isolation	125 Vrms channel to ground isolation
TEDS support	Standard + DSI adapters
Current mode	
Current ranges	2 mA, 20 mA
Input Accuracy	± 0.03 % of reading, ± 0.02 % of range, ± 2.1 μ A
Internal Shunt resistor	50 Ω
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
Excitation voltage	
Excitation voltage	Free programmable (16-bit DAC)
Predefined Levels	Unipolar 0 - 24 V, Bipolar 0 - 12 V
Accuracy	± 0.05 % ± 2 mV
Drift	± 50 ppm/K ± 100 μ V/K
Stability 10 % to 90 % Load	< 0.01 %
Current Limit	42 mA (400 mW max. Power)
Protection	Continuous short to ground
Bridge mode	
Bridge Connection Types	full bridge strain, $\frac{1}{2}$ bridge strain, $\frac{1}{4}$ bridge strain (3 wire)
Bridge ranges	2...1000 mV/V free programmable
Internal Bridge Completion	$\frac{1}{2}$ bridge and $\frac{1}{4}$ bridge 120 and 350 Ω
Bridge Completion Accuracy	0.05 %; TCR: 2 ppm/K (others on request)
Internal Shunt Resistor	100 k Ω (others on request)
Shunt Resistor Accuracy	0.1 %; TCR: 10 ppm/K (others on request)
Input Short, Sensor Offset Adjust	Software-selectable
Power	
Power consumption	2.5 W
Environmental	
IP rating	IP67 when front DSUB9 connector is mated by a sealed plug
Physical	
Dimensions	100 x 83 x 45 mm
Weight	400 g

6.4.3.2. IOLITEicw-1xSTG: D-SUB9 Connector

IOLITEicw-1xSTG module has a standard D-SUB9 female connectors for voltage or strain measurement.

6.4.3.2.1. IOLITEi-1xSTG: D-SUB9 Connector: Pinout



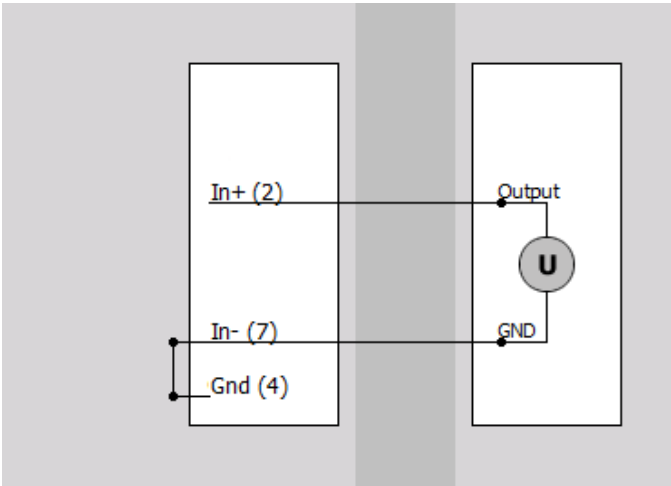
IOLITEi-1xSTG connector: pin-out (DSUB-9 female)

Pin	Name	Description
1	Exc+	Excitation+
2	In+	Input+
3	Sns-	Sense-
4	GND	Ground
5	R+	¼ Bridge / Shunt
6	Sns+	Sense+
7	In-	Input-
8	Exc-	Excitation-
9	TEDS	TEDS

6.4.3.2.2. IOLITEi-1xSTG: D-SUB9 Connector: Wiring diagram

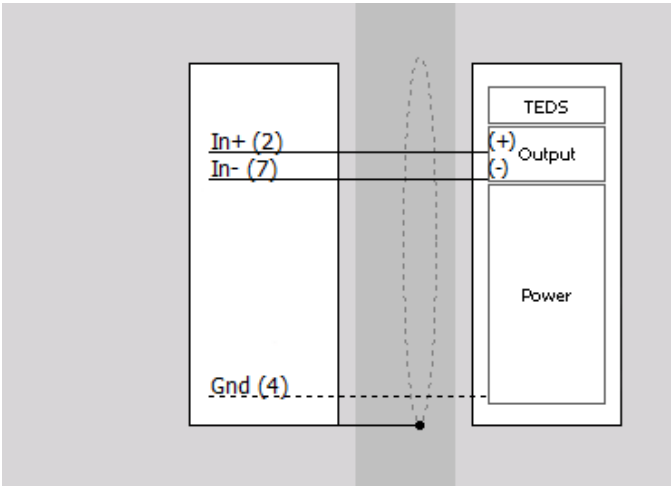
Voltage

Single ended



Differential

Use only when sensor Output (+) and Output (-) are referenced to Gnd. Gnd must be connected.



Potentiometer

6.6.2. IOLITEicw 1xACC

IOLITEicw 1xACC is a single channel signal conditioner for IEPE sensors with high-precision isolated front end and EtherCAT bus on the back side.



IOLITEicw 1xACC

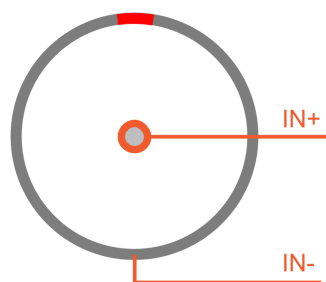
6.6.2.1. IOLITEicw 1xACC: Specifications

Analog inputs				
Input types	Voltage, IEPE			
Number of channels	1			
Input connector	BNC			
ADC Type	24-bit SAR with anti-aliasing filter			
Sampling Rate	40 kS/s (50 kS/s while using it standalone)			
Voltage Mode				
Ranges	±10 V	±5 V	±1 V	±200 mV
Typ. Input Accuracy	±0.03 % of reading ±0.02 % of range ±0.1 mV			
Typ. SNR (10 kS/sec, -1 dBFS sine wave @ 1 kHz)	90 dB	90 dB	89 dB	88 dB
Type. SFDR (10 kS/sec, -1 dBFS sine wave @ 1 kHz)	113 dB	110 dB	109 dB	106 dB
Typ. Noise floor @ 10 kS/sec	-100 dB	-99 dB	-99 dB	-98 dB
Typical CMR @ 400 Hz / 1 kHz	130 dB / 120 dB	122 dB / 119 dB	104 dB / 97 dB	90 dB / 84 dB
Gain Drift	typ. 10 ppm/K (max. 40 ppm/K)			
Offset Drift	typ. 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 0.1 Hz, 1 Hz			
Input Impedance	1 MΩ			
Overvoltage Protection	In+ to In-: 50 V continuous, 200 V peak (10 msec)			
Isolation	125 Vrms channel to ground isolation			

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
IEPE input	
Excitation	4 mA, 8 mA
Compliance voltage	24 V
Sensor detection	Shortcut: <4 V; Open: >19 V
TEDS support	IEPE mode only
Power	
Power consumption	2 W
Environmental	
IP rating	IP67 when mated with an IP67 BNC plug
Physical	
Dimensions	141 x 83 x 45 mm

6.6.2.2. IOLITEicw 1xACC: BNC Connector

6.6.2.2.1. IOLITEicw 1xACC: BNC Connector: Pinout

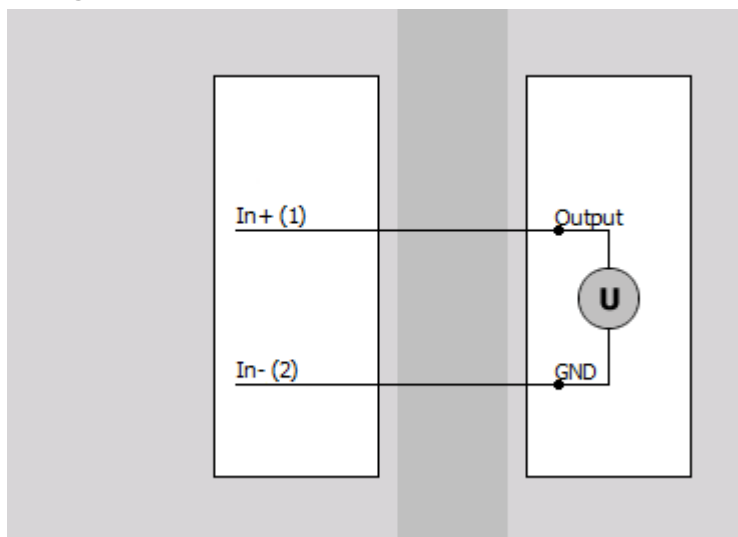


ACC connector: pin-out (BNC)

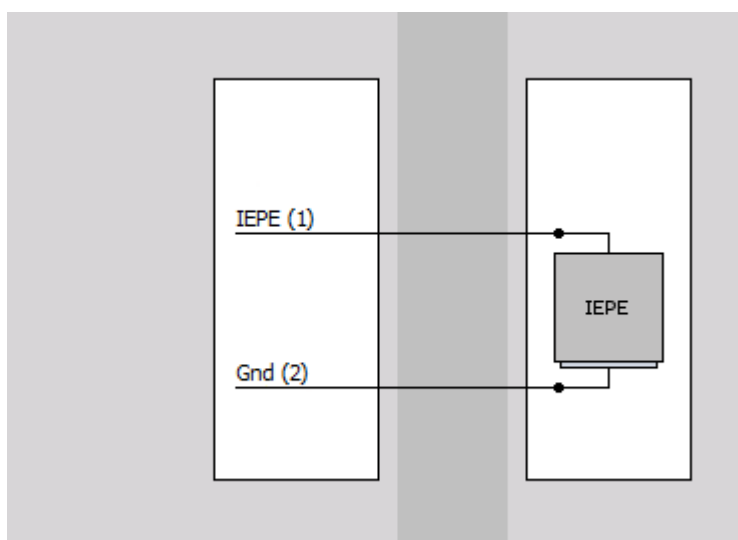
Pin	Name	Description
1	IN+	Input +
2	IN -	Input-

6.6.2.2.2. IOLITEicw 1xACC: BNC Connector: Wiring diagram

Voltage



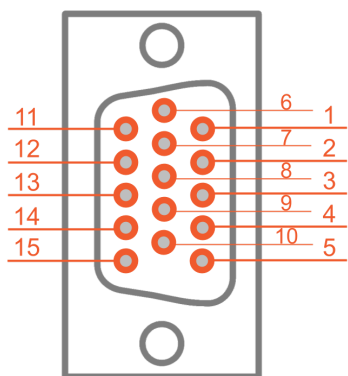
IEPE



6.8.4.1. IOLITEicw 4xDI: Specifications

Digital Input	
Input type	Digital
Number of channels	4
Connector	DSBU15HD Male
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/sec
Overvoltage protection	30 V Continuous, 65 V peak
Isolation	Galvanic isolation CH, GND
Non-Isolated Sensor Power Supply	
Output Voltage +5 V	5 V +/- 10 %, 300 mA max.
Output Voltage +12 V	12 V +/-10 %, 100 mA max.
Output Voltage +Vecat	EtherCAT Bus Supply Voltage, 200 mA max.
Power	
Power consumption	2.5 W
Environmental	
IP rating	IP67 when front DSUB9 connector is mated by a sealed plug
Physical	
Dimensions	141 x 83 x 45 mm
Weight	550 g

6.8.4.2. IOLITEicw 4xDI: DSUB-15 Connector: Pinout



DSUB-15 HD male for IOLITEi-4xDI

Pin	IOLITEicw 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

6.8.5. IOLITEicw 4xDO

Isolated digital outputs with high current capability can drive motors, pumps or valves as well as trigger pure digital signals. Three power supply voltages (5V, 12V and device voltage supply level) available on the front connector. EtherCAT interface, signal and power over the same cable.



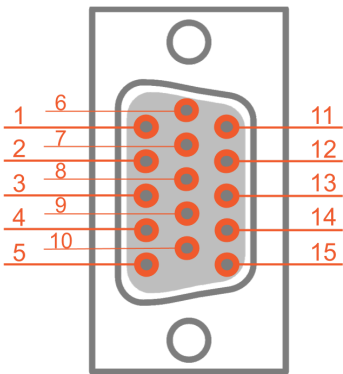
IOLITEicw 4xDO

6.8.5.1. IOLITEicw 4xDO: Specifications

Digital Output	
Output type	Digital
Number of channels	4
Connector	DSUB15HD Female
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
Isolation	Galvanic isolation CH, GND
Non-Isolated Sensor Power Supply	
Output Voltage +5 V	5 V +/- 10 %, 300 mA max. Max. combined load on +5 V and +12 V pins: 1.5 W reduced by the load already present on +Vin pin
Output Voltage +12 V	12 V +/- 10 %, 100 mA max. Max. combined load on +5 V and +12 V pins: 1.5 W reduced by the load already present on +Vin pin
Output Voltage +Vecat	EtherCAT Bus Supply Voltage, 200 mA max. (see 1.)
Power	
Power consumption	2.5 W
Environmental	

	IP rating	IP67 when front DSUB9 connector is mated by a sealed plug
Physical		
	Dimensions	141 x 83 x 45 mm
	Weight	550 g

6.8.5.2. IOLITEicw 4xDO: DSUB-15 Connector: Pinout



DSUB-15 HD female for IOLITEicw 4xDO

Pin	IOLITEicw 4xDO	
	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