

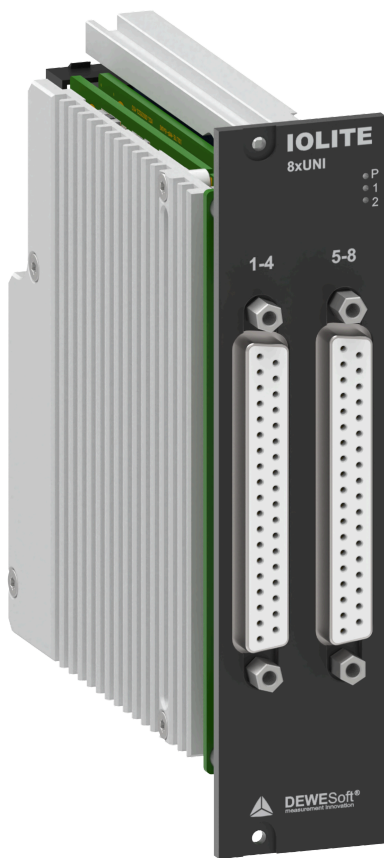
TECHNICAL REFERENCE MANUAL

IOLITE® V26-1



6.1.3. IOLITE 8xUNI

The IOLITE-8xUNI (available in rack and modular versions) doubles the density to 8 channels per module, making it the ultimate tool for high-channel-count universal measurements. It utilizes a D-SUB37 connector for high-density connectivity while maintaining the same 24-bit resolution and 40 kS/s performance.



IOLITEr-8xUNI-D37



IOLITE-8xUNI-D37

6.1.3.1. IOLITE 8xUNI: Specifications

Inputs				
Input types	Voltage Full/Half/Quarter bridge strain (120 Ω and 350 Ω) IEPE Potentiometer, RTD, Resistance Current (ext. and internal Shunt)			
ADC Type	24-bit delta-sigma with anti-aliasing filter			
Sampling Rate	Simultaneous 40 kS/s			
Bandwith	SR ≤ 2 kS/s 0.49*SR / SR > 2kS/s 0.433*SR			
Voltage Mode				
Voltage Ranges	±100 V	±10 V	±1 V	±100 mV
Gain accuracy	±0.03 % of reading			
Offset accuracy	±0.02 % of range			
Typ. Dynamic Range @ 10 kS/s	-150 dB	-150 dB	-150 dB	-137 dB
Typ. Noise floor @ 10 kS/s	115 dB	115 dB	114 dB	99 dB
Typ. CMR @ DC...50 Hz / 400 Hz / 1 kHz	85 dB / 69 dB / 60 dB	85 dB / 85 dB / 85 dB	105 dB / 105 dB / 102 dB	113 dB / 110 dB / 104 dB
Typ. THD 1kHz @ 10kS/s	-91 dB	-101 dB	-100 dB	-107 dB
Gain Drift	Typical 10 PPM/K, max. 40 PPM/K			
Offset Drift	Typical 0.3 μV/K + 2 ppm of range/K, max 0.8 μV/K + 10 ppm of range/K			
Gain Linearity	<0.02 %			
Channel Crosstalk @ 1kHz/10 kHz	-102 dB / -86 dB	-141 dB / -123 dB	-141 dB / -120 dB	-123 dB / -109 dB
Input Coupling	DC			
	AC 0.15 Hz for all ranges;			
Input Impedance	2 MΩ between IN+ and IN- for 100 V Range; all other Ranges > 1 GΩ			
Max. Common Mode Voltage	100 V Range: ±120 V; all other Ranges: ±12 V			
Overvoltage Protection	100 V Range: 200 V continuously ; all other Ranges: 100 V continuously or 200 V peak for 10 ms			
Analog input performance				
Sample rate	SR ≤ 2 kS/s		SR > 2 kS/s	
Bandwidth (-3 dB)	0.489*fs		0.433*fs	
Alias-free Bandwidth	DC to 0.489*fs		DC to 0.433*fs	
Alias Rejection	-105 dB (all sample rates)			
Delay Through ADC	34 / fs			
Oversampling	128			
Current mode (internal shunt)				
Ranges	20 mA		2 mA	
Input Accuracy	±0.03 % of reading, ±0.02 % of range, ±2.1 μA			

Internal Shunt Resistor	47 Ω		
Protection	TYP Trip Im>31mA - auto retry 800ms / MAX volt 33V		
Excitation Voltage			
Excitation Voltage	Free programmable (16-bit DAC)		
Predefined levels	0, 1, 2.5, 5, 10, 12, 15, 24 V DC		
Accuracy	±0.05 % ±2 mV		
Drift	±10 ppm/K ±100 μV/K (offset could be 10uV/k)		
Load stability	0 % to 100 % load <0.01 %		
Noise @ 10 V / 350 Ω	<150 μVrms @ 10 kS/s		
Line regulation over 20 Ω of change	<0.005 % @ 120 Ω load		
Sense Impedance to Exc / to GND	100 kΩ / >100 MΩ		
Current limit	100 mA (max standalone 800 mW / max Rack 600mW)		
Protection	Continuous short to ground		
Excitation Current			
Excitation Current	Free programmable (16-bit DAC)		
Predefined levels	0.1, 1, 2, 5, 10, 20,60 and 100 mA DC		
Ranges	0.1 mA - 1 mA	>1 mA - 20mA	>20-100mA
Accuracy	±0.2 % ±0.5 μA	±0.15 % ±2 μA	±0.01 % ±40 μA
Drift Typical	5 ppm/K	10 ppm/K	25 ppm/K
Compliance voltage	24 Volt, max. 600 mW		
Output Impedance	>100 MΩ		
Bridge Connection Types			
Bridge types	Full / Half / Quarter bridge (3-wire or 4-wire) / Quarter Constant Current (2-wire or 4-wire)		
Ranges	2 mV/V...1000 mV/V free programmable		
Internal Bridge Completion	Half and Quarter bridge 120 Ω and 350 Ω		
Typ. Bridge Completion Accuracy	0.05 %; TCR: 2 ppm/K (others on request)		
Internal Shunt Resistor	100 kΩ, software selectable (others on request 175k / 59.88k)		
Typ. Shunt Resistor Accuracy	0.05 %; TCR: 10 ppm/K (others on request)		
Input Short, Sensor Offset Adjust	Software selectable		
IEPE mode			
IEPE Current	Free programmable (16-bit DAC)		
Predefined levels	2, 4, 8, 12, 16 or 20 mA		
Compliance voltage	25 Volt		
Output Impedance	>100 kΩ		
Sensor detection	Shortcut: <4 Volt; Open: >19 Volt		

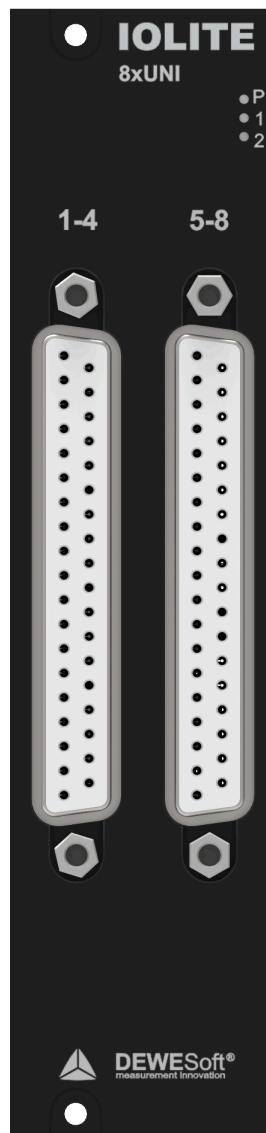
Additional Specifications	
Rack module type	IOLITEr-8xUNI (Water proof option available)
Power supply	9 - 48 Vdc
Power consumption Typ. 24 V / MAX. 48 V	Typ: 6.9 W MAX: 8.15 W (40 kS/s -only Ain EXC 0 V)
	Typ: 18.95 W MAX: 20.7 W (40 kS/s EXC: 0.6 W per channel)
	Typ: 12.6 W MAX: 14 W (40 kS/s - EXC: 5 V / 120 ohms per channel)
Weight	420 g (WP: 435 g)
Device Dimensions	128.4 x 115.4 x 30.1 mm
Shake	7.7 G 10-2 kHz 1 h each axis (MIL-STD-810F, Category 24)
Shock	50 G - 6 ms 25 times on each axis, 150 total
Input connector	D-SUB37
Standalone	IOLITE 8xUNI
Power supply	9 - 48 Vdc
Power consumption Typ. 24 V / MAX. 48 V	Typ: 7.25 W MAX: 8.9 W (40 kS/s -only Ain EXC 0 V)
	Typ: 21.7 W MAX: 23.5 W (40 kS/s EXC: 0.8 W per channel)
	Typ: 12.9 W MAX:15.7 W (40 kS/s - EXC: 5 V / 120 ohms per channel)
Weight	780 g
Device Dimensions	82 x 62 x 52 mm
Shake	1.5 G 5-100 Hz 30 min each axis
Shock	10 G - 6 ms 25 times on each axis, 150 total
Input connector	D-SUB37
Additional Specifications	
TEDS support	Standard + DSI® adapters

6.1.3.2. IOLITE 8xUNI: Connectors

IOLITE 8xUNI and IOLITEr 8xUNI are available with D-SUB37 connectors.

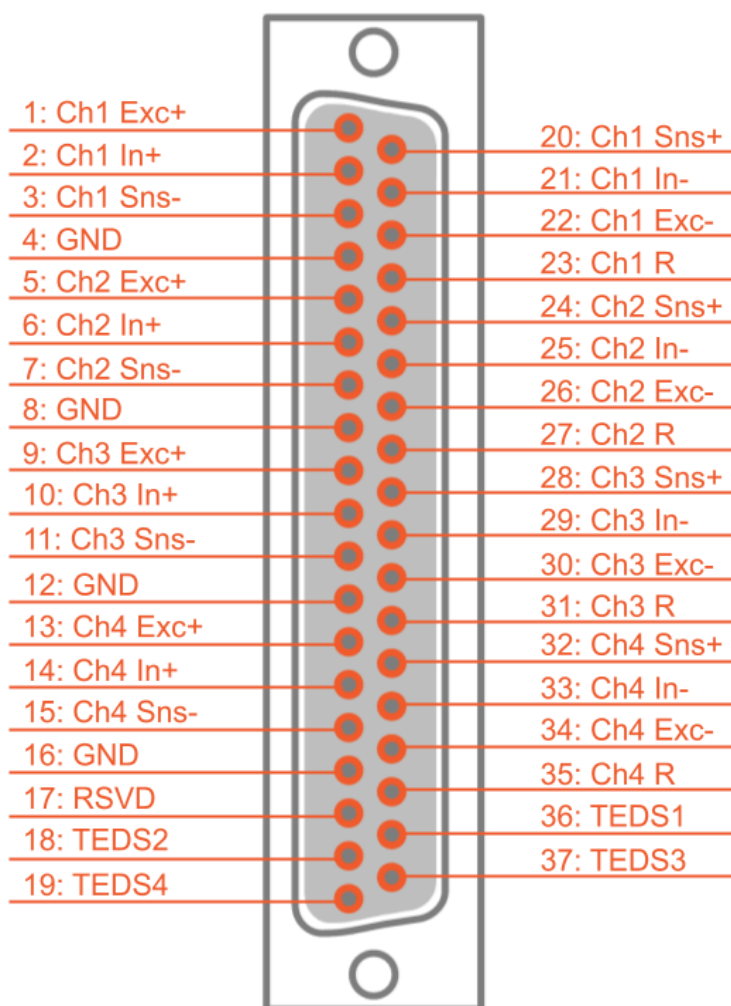
6.1.3.2.1. IOLITE 8xUNI: D-SUB37 Connector

The IOLITE 8xUNI and IOLITEr 8xUNI have 8 D-SUB37 connectors for analog input.



IOLITEr-8xUNI front

6.1.3.2.1.1. IOLITE 8xUNI: D-SUB37 Connector: Pinout



IOLITE-8xUNI-D37f connector: Pinout

6.1.3.2.1.2. Waterproof version: IOLITE_{rw} 8xUNI

Connector on the module: DSUB37 IP67 version (Wurth 61803729321 - IP ver.)

Mating connector: compatible with DSUB37m IP67 and standard non-waterproof connectors.

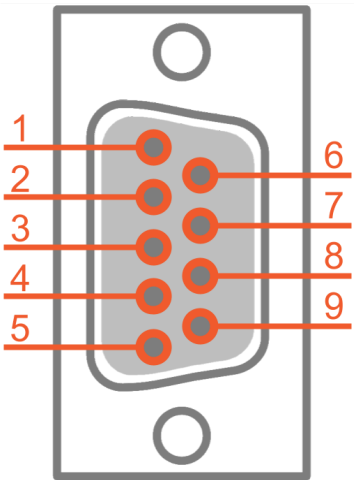
6.1.3.2.1.3. IOLITE 8xUNI: 2xD37m-4xD9f-UNI adapters: Pinout

There is a 2xD37m to 4xD9f adapter available (D37m-4xD9f-UNI) that is compatible only with the IOLITE X 8xUNI modules. The D37m-4xD9f-UNI adapter simplifies the calibration of the IOLITE 8xUNI module and allows full functionality with DSI® adapters.

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Warning

The IOLITE X 8xUNI universal module is only compatible with the 2xD37m-4xD9f-UNI adapter!
Use of any other module/adapter configuration could cause permanent damage to the module!



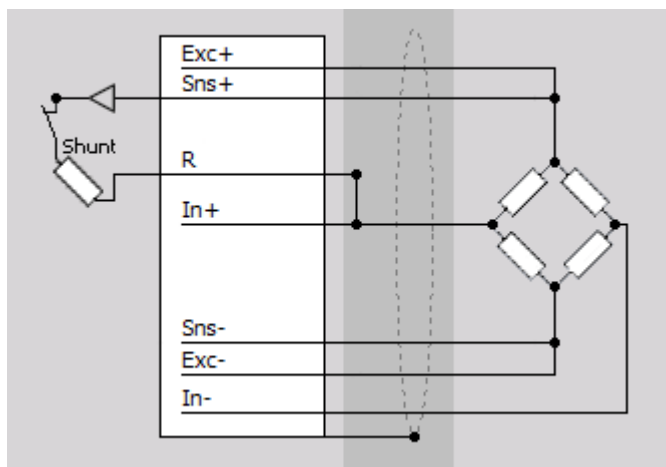
D37m-4xD9f-UNI: pin-out (DSUB-9 female)

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

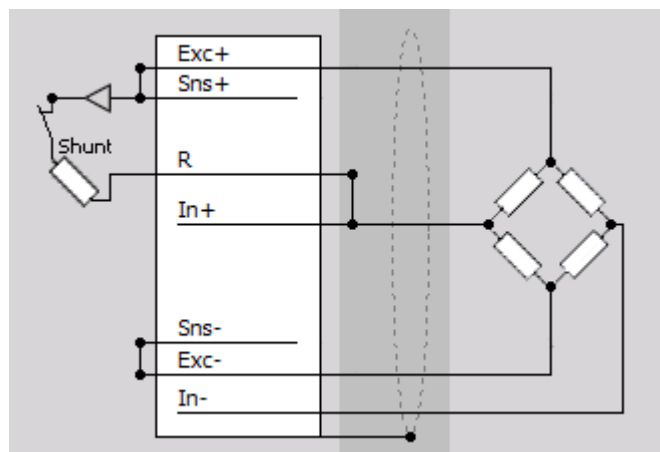
6.1.3.2.1.4. IOLITE 8xUNI: D-SUB37 Connector: Wiring diagram

Bridge

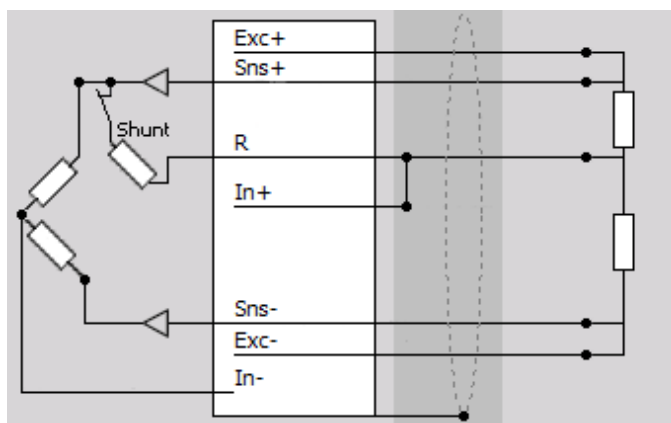
Full bridge (6-wire)



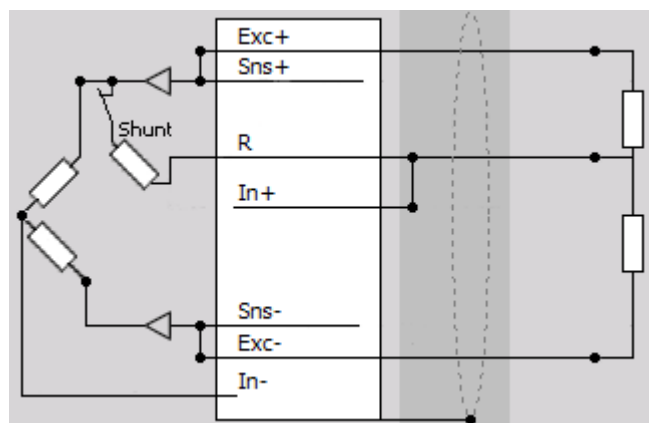
Full bridge (4-wire)



Half bridge (5-wire)



Half bridge (3-wire)



6.4.2.2. IOLITE 8xSTGSv2: Specifications

Analog inputs		IOLITE STGSv2			
Input type		Full / half / quarter bridge strain (3-wire, 4-wire), Potentiometer			
Number of channels		8			
ADC Type		24-bit oversampled sigma-delta with anti-aliasing filter			
Sampling Rate		Simultaneous 20 kS/s per channel (software-selectable)			
Voltage Mode					
Ranges		±1 V	±100 mV	±20 mV	
Gain accuracy		0.02 % of reading	0.02 % of reading	0.02 % of reading	
Offset accuracy		210 uV	30 uV	14 uV	
Typical Noise floor @ 10 kS/s / 1 kS/s / 100 S/s		-107 / -114 / -122 dB	-99 / -107 / -117 dB	-87 / -96 / -108 dB	
Typical Dynamic Range @ 10 kS/s / 1 kS/s / 100 S/s		-131/ -139/ -144 dB	-123/ -133/ -141 dB	-111 / -123 / -131 dB	
Typ. Crosstalk @ 1 kHz		-137dB	-131dB	-121dB	
Typ. CMR @ 50 Hz / 400 Hz / 1 kHz		81 / 80 / 77 dB	100 / 92 / 84 dB	110 / 91 / 84 dB	
Gain Drift		Typical 10 ppm/K (max. 20 ppm/K)			
Offset Drift		Typical 0.03 µV/K + 2.5 ppm of range/K, max 0.1 µV/K + 9 ppm of range/K			
Gain Linearity		< 0.01 %			
Input Coupling		DC			
Overvoltage Protection		In+ to In-: 6 V continuous			
Analog input performance					
Bandwidth (-3 dB)		0.433*fs (0.49*fs < 5 kS/s)			
Alias-free Bandwidth		DC to 0.499*fs (DC to 0.44*fs @ < 5 kS/s)			
Alias Rejection		-105 dB (all sample rates)			
Delay Through ADC		34 / fs			
Oversampling		128			
Excitation Voltage					
Excitation Voltage		Unipolar: 1 V, 2 V, 5 V (see 1)			
Excitation Accuracy		±3 % of set ±50 mV			
Sense Accuracy		±0.02 % of reading ±0.25 mV			
Sense Drift		Typical 10 µV/K + 10 ppm of reading/K, max 20 µV/K + 20 ppm of reading/K			
Current Limit		42 mA			
Protection		Continuous short to ground			
Bridge measurement					
Bridge Connection Types		full bridge strain, ½ bridge strain, ¼ bridge strain (4-wire), ¼ bridge strain (3-wire)			
Ranges		2 mV/V ... 1000 mV/V free programmable (software ranges)			
	Range \ Excitation	1 V	2 V	5 V	
	Accuracy	200 mV/V	±0.035 % of	±0.028 % of	±0.025 % of reading ±42 µV/V

		reading ±210 µV/V	reading ±105 µV/V	
	20 mV/V	±0.027 % of reading ±14 µV/V	±0.027 % of reading ±15 µV/V	±0.024 % of reading ±6 µV/V
	2 mV/V	±0.027 % of reading ±14 µV/V	±0.024 % of reading ±7 µV/V	±0.022 % of reading ±2.8 µV/V
Internal Bridge Completion	¼ bridge 120 Ω and 350 Ω			
Bridge Completion Accuracy	±125 µV/V, TCR: 5 ppm/K (others on request)			
Internal Shunt Resistor	100 kΩ software selectable to SNS+ or SNS- and In+ or In-			
Shunt Resistor Accuracy	0.05 %; TCR: 10 ppm/K (others on request)			
Input Short, Sensor Offset Adjust	Software-selectable			
Internal switch configurations	Bridge type	Selectable connections	Internal SW on:	Additional compensation
	Full	6 or 4 Wires	4 wires SNS + and EXC + & SNS- and EXC -	
	Half	5 or 3 Wires	3 wires SNS + and EXC + & SNS- and EXC -	
	QB 3W	SNS + and EXC + & SNS- and EXC -	SNS + and EXC + & SNS- and EXC -	Lead wire compensation available
	QB 4W	SNS + and EXC +	SNS + and EXC +	
Sensor current measurement				
Bridge configuration	Full / Half		QB	
Current measuring line	EXC+ line		R Line	
Current limit	50 mAdc			
Resolution	0.1 mAdc			
Additional math calculus	Resistance, Power			
Sample rate	1 Hz			
Additional Specifications				
Rack	IOLITEr-8xSTGSv2			
Input connectors	Terminal block, DSUB-37			
TEDS support	Available for Terminal block			
Power supply	9 - 48 V DC			
Power Consumption	Typ. 3.1 W Max. 6 W (120 Ω @ 5 V load)			
Weight	340 g			
Slice Dimensions	128.4 x 118.4 x 30.14 mm			
Additional Specifications				
Modular	IOLITE-8xSTGSv2			
Input connectors	Terminal block, DSUB-37			
TEDS support	Available for Terminal block			
Power supply	9 - 48 V DC			

Power Consumption	Typ. 3.1 W Max. 6 W (120 Ω @ 5 V load)
Weight	570 g
Slice Dimensions	136.75 x 115.0 x 35.0 mm
Rev: 1671786000	
1) Ratiometric method	



Note

The IOLITE 8xSTGS 4-wire functionality is optional and can be used with DewesoftX versions 2023.6 or higher.



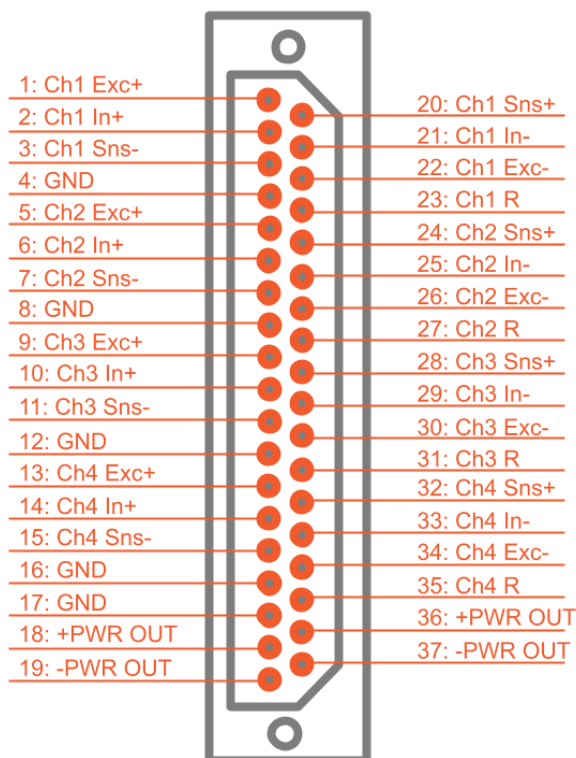
Note

There is a sensor disconnect functionality, which shows an overload on the channels if no sensor is connected to the channel.

6.4.2.2.1. IOLITE 8xSTGS: Bridge Accuracy Specifications

Bridge range	Set excitation	IOLITE-8xSTGS
2 mV/V	1 V	0.022 % of reading + 14 μ V/V
20 mV/V	1 V	0.031 % of reading + 14 μ V/V
200 mV/V	1 V	0.028 % of reading + 210 μ V/V
2 mV/V	2 V	0.022 % of reading + 7.0 μ V/V
20 mV/V	2 V	0.026 % of reading + 15 μ V/V
200 mV/V	2 V	0.027 % of reading + 110 μ V/V
2 mV/V	5 V	0.022 % of reading + 2.8 μ V/V
20 mV/V	5 V	0.026 % of reading + 6.0 μ V/V
200 mV/V	5 V	0.027 % of reading + 42 μ V/V

6.4.2.3.1.1. IOLITE 8xSTGS: D-SUB37 Connector: Pinout



Warning

PWR OUT pins are intended to supply external loads. Do not connect the external power supply to the PWR OUT pins! It can damage the equipment.

There is no protection on the module. Current limit of the IOLITE system is 16 A!

Incorrect connection can damage the equipment or cause data loss. The connection of PWR OUT must be made according to the pinout below:

Pin	Name	Description
18, 36	+PWR OUT	V_{supply} output
19, 37	-PWR OUT	Non-isolated GND

6.4.2.3.1.2. Waterproof version: IOLITErw-8xSTGS-D37f

Connector on the module: DSUB37 IP67 version (61803729321 - IP ver.)

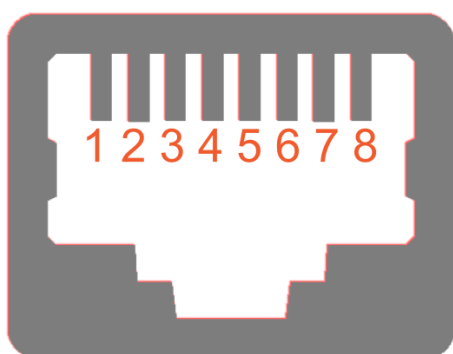
Mating connector: compatible with DSUB37m IP67 and standard non-waterproof connectors

6.4.2.3.1.3. 2xD37m-8xRJ45f adapters: Pinout

The 2xD37m-8xRJ45f breakout adapter allows full functionality with RJ45 connectors. The adapter fits with IOLITE 8xSTGS-D37 or the IOLITE 8xLVe-D37 modules.

The 2xD37m-8xRJ45f-QB-CAT-m is only suitable for quarter bridges, having a mirrored design suited to rewire the sensor in case the RJ45 connector gets damaged on one side. It fits on the IOLITE 8xSTGS-D37 module.

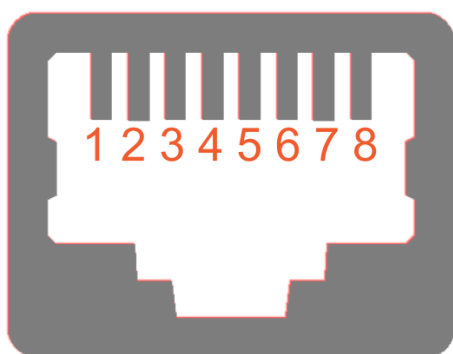
2xD37m-8xRJ45f: RJ-45 Connector pinout



Pin	Name	Description
1	EXC -	Excitation-
2	SNS -	Sense-
3	IN +	Input+
4*	GND	Ground
5**	R (8xSTGS) / TEDS (8xLVe)	¼ Bridge / Shunt TEDS
6	IN -	Input-
7	EXC +	Excitation+
8	SNS +	Sense+

* In the case of IOLITE 8xSTGS modules, there is Ch-GND isolation. In case of IOLITE 8xLVe GND is non-isolated.

** In the case of IOLITE 8xSTGS pin 5 is R-pin for bridge and shunt measurements. In case of IOLITE 8xLVe pin 5 is reserved for TEDS.



2xD37m-8xRJ45f-QB-CAT-m: RJ-45 Connector pinout
(mirrored)

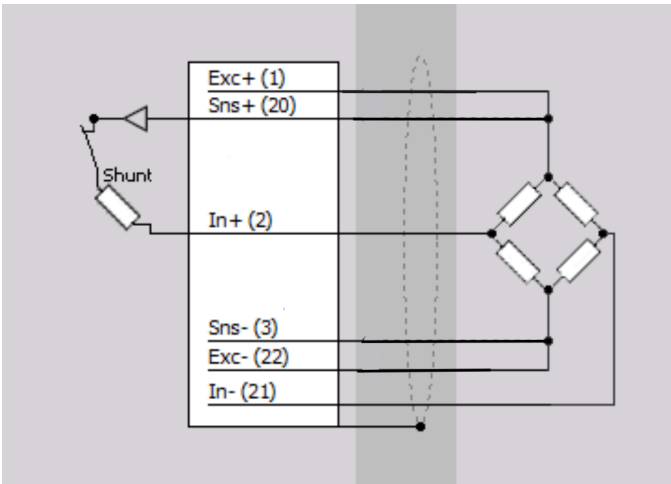
Pin	Name	Description
1	EXC-	Excitation -
2	R	R
3	IN+	Input +
4	GND	Ground
5	GND	Ground
6	IN+	Input +

7	R	R
8	EXC-	Excitation -

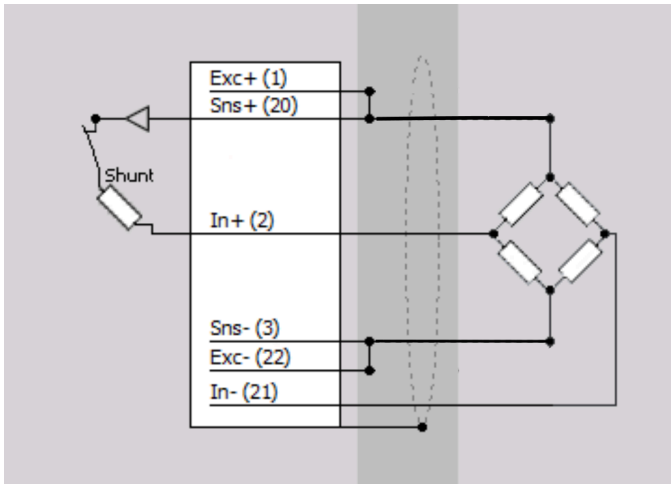
6.4.2.3.1.4. IOLITE 8xSTGS: D-SUB37 Connector: Wiring diagram

Bridge

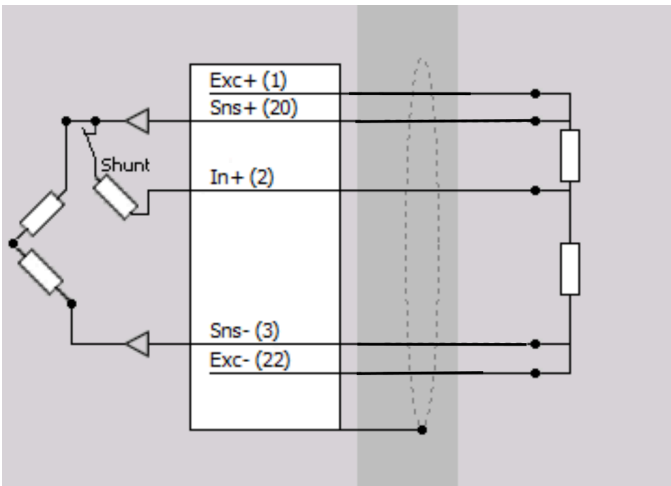
Full bridge (6-wire)



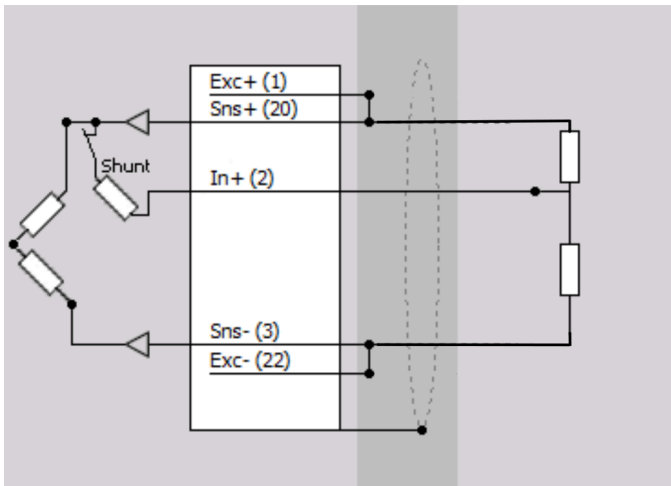
Full bridge (4-wire)



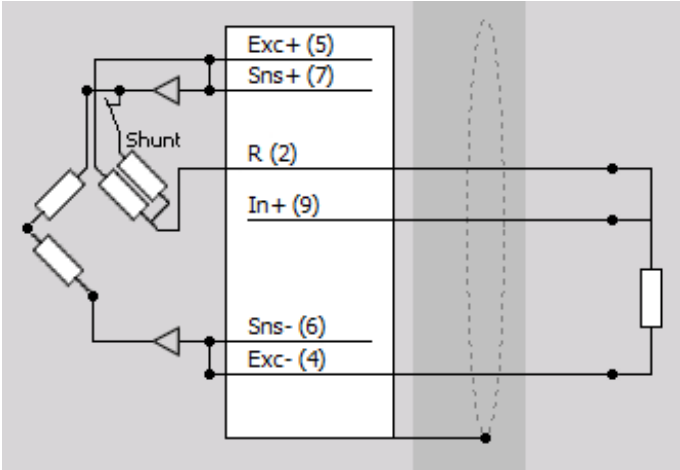
Half bridge (5-wire)



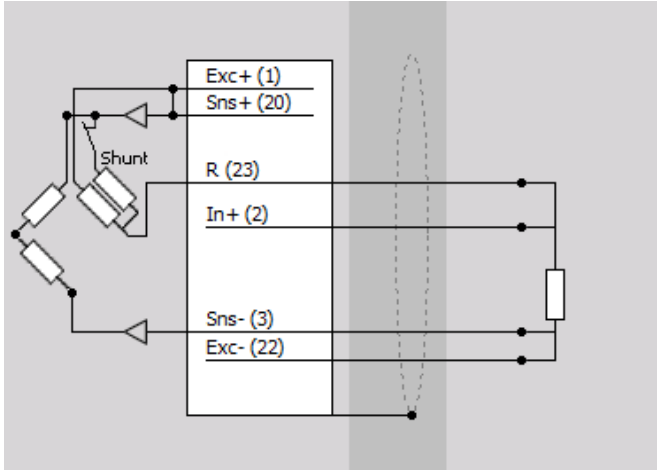
Half bridge (3-wire)



Quarter bridge (3-wire)



Quarter bridge (4-wire)



* available as an upgrade (license) with STGSv2 amplifier

Potentiometer

