DEWESoft®
measurement innovation

IOLITE®

TECHNICAL REFERENCE MANUAL

V1.0

Table of contents

1. About this document

This is the Technical Reference Manual for IOLITE® Version **1.0.0**.

IOLITE® is an industrial real time data acquisition hardware line which comes in many different form factors and can be equipped with a wide range of different amplifiers, so that you can use it for virtually any measurement task. Each system also includes a professional license for our award-winning DEWESoft® data acquisition software.

The manual is divided into several chapters. You will find:

- A detailed description of the IOLITE® hardware and the main combination and expansion options
- A description of the connection variants and the pin assignments on the inputs and outputs
- A comprehensive introduction to the configuration of the modules using DEWESoft®
- Detailed technical data: Specifications, etc.

1.1. Legend

The following symbols and formats will be used throughout the document.

Important
Gives you an important information about a subject.
Please read carefully!

Hint
Gives you a hint or provides additional information about a subject.

Example
Gives you an example to a specific subject.

Safety symbols in the manual:

Warning
Calls attention to a procedure, practice, or condition that could cause the body injury or death

Caution
Calls attention to a procedure, practice, or condition that could possibly cause damage to equipment or permanent loss of data.

1.2. Online versions

1.2.1. IOLITE® technical reference manual

The most recent version of this manual can be downloaded from our homepage:
https://download.dewesoft.com/list/manuals-brochures/hardware-manuals
In the *Hardware Manuals* section click the download link for the *IOLITE® technical reference manual*.

1.2.2. DEWESoft® tutorials

The DEWESoft® tutorials document, provides basics and additional information and examples for working with DEWESoft® and certain parts of the program.
The latest version of the DEWESoft® tutorials can be found here:
https://download.dewesoft.com/list/manuals-brochures/software-manuals
In the *Software Manuals* section click the download link of the DEWESoft X3 tutorials entry.

Important
Read safety instructions first in chapter 6. Safety instructions.

2. Getting started

This chapter will help you to install the software, connect your IOLITE® system to the PC via EtherCAT® and will show you how to configure DEWESoft®.
To follow these steps, you need the following items:

- your brand new IOLITE® system (included in the shipment)
- your IOLITE® EtherCAT® cable (included in the shipment)
- your PC with Windows 10 (older versions like Windows® 7 may also work)

2.1. Software installation

For optimal working, we recommend that you install the latest version of Dewesoft®. If you already have installed older version Dewesoft® it is recommended that you find the newest version on the website. The details of software installation can be found on https://download.dewesoft.com.

2.2. Connecting IOLITE®

In this chapter, you can see the basic instructions for connecting IOLITE® devices. Advanced connections are described in the following chapters.

IOLITEr

First connect the power supply cable (PS-120-L1B2f) to the PWR IN LEMO 1B 2-pin connector. Then connect standard ethernet cable to IN connector of BUS 1 on IOLITE-GATE. Finally connect the other side of the ethernet cable to the LAN port of PC. You can find advanced connections in chapter 3.3.1.4. Connection of IOLITEr.

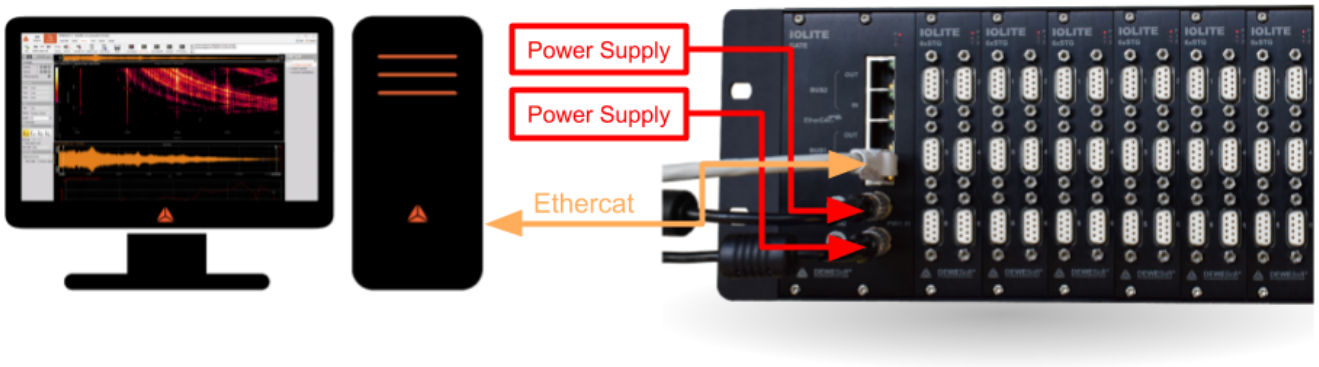


Illustration 1: *Connection of IOLITEr standalone device to PC*

IOLITEs

First connect the power supply cable (PS-120-L1B2f) to the PWR IN LEMO 1B 2-pin connector. Then connect L1T8f-RJ45-1M cable (LEMO side) to IN connector of BUS 1 on IOLITEs back panel. Finally connect the other side of the L1T8f-RJ45-1M cable (RJ45 side) to the LAN port of PC. You can find advanced connections in chapter 3.3.2.4. Connection of IOLITEs.

Illustration 2: *Connection of IOLITEs standalone device to PC*

2.2.1. DEWESoft® Settings IOLITE®

The connected device will show up in the DEWESoft® settings. Click on the Options button at the top right, and then on the Settings item in the pop-up to open the DEWESoft® settings dialogue.

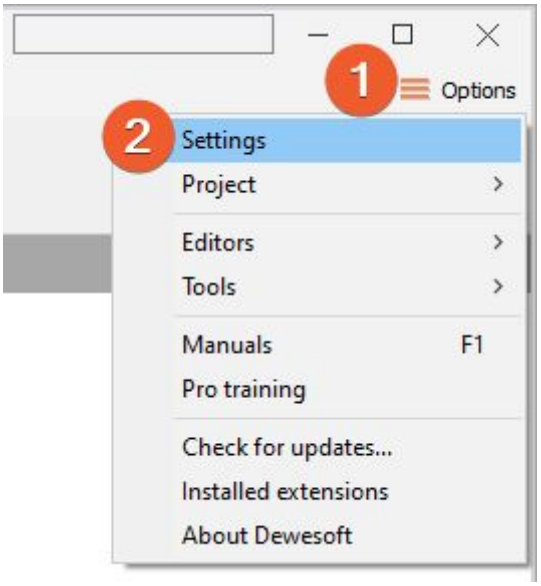


Illustration 3: *DEWESoft® settings*

In the Devices section, you can see the connected IOLITE® slices. When you select one of them, the properties pane at the right will show the related data e.g. Serial number, Firmware version, etc.

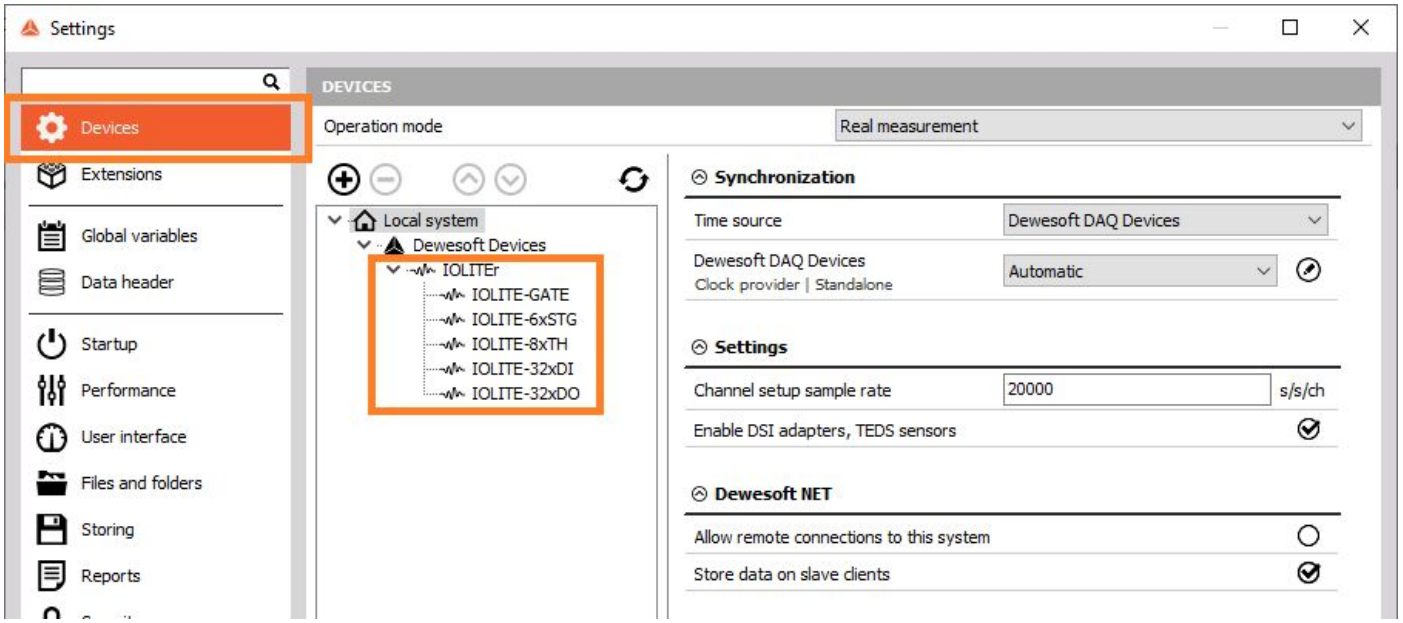


Illustration 4: *DEWESoft® settings: Devices*

2.2.2. Channel Setup IOLITE®

In the channel setup you can see a preview of the connected devices on the left side.

When you click on a connector in the image the corresponding channel in the Channel setup grid will automatically be selected. This also works the other way around: when you select a channel (or multiple channels) in the setup grid, the corresponding connectors in the image will be highlighted.

The sampling rate will be set for all connected IOLITE® slices: of course only up to the max. sampling rate of the individual slices.

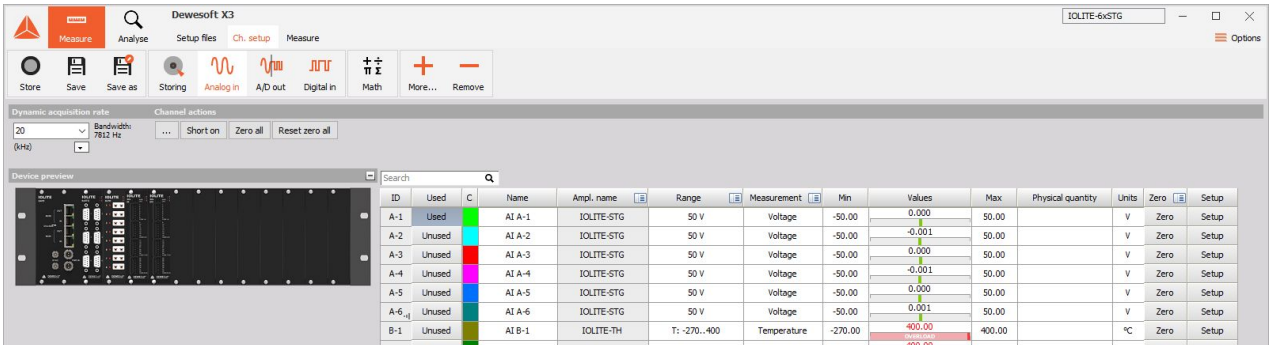


Illustration 5: *Channel setup IOLITEr*

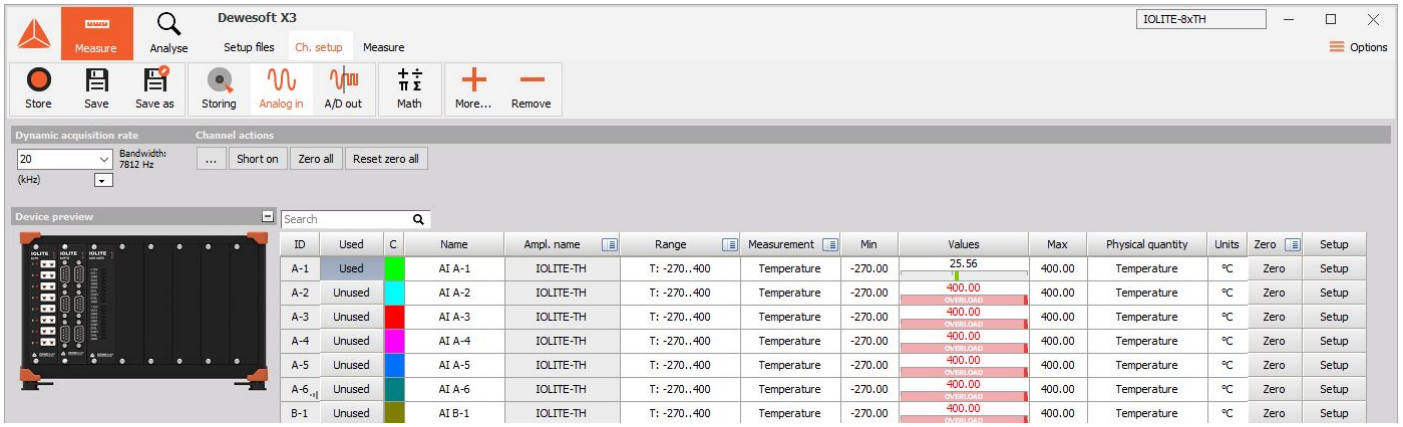


Illustration 6: *Channel setup IOLITEs*

2.3. Simple Measurement

This chapter describes measurement basics, how to configure IOLITE® and gives some details on the measurement setup.

2.3.1. Help - Manual

Note that this document is just a quick start guide. For detailed information about DEWESoft® consult the Manual. To open the manual press the F1 button or click on the Options button and then select Manual from the pop-up menu.

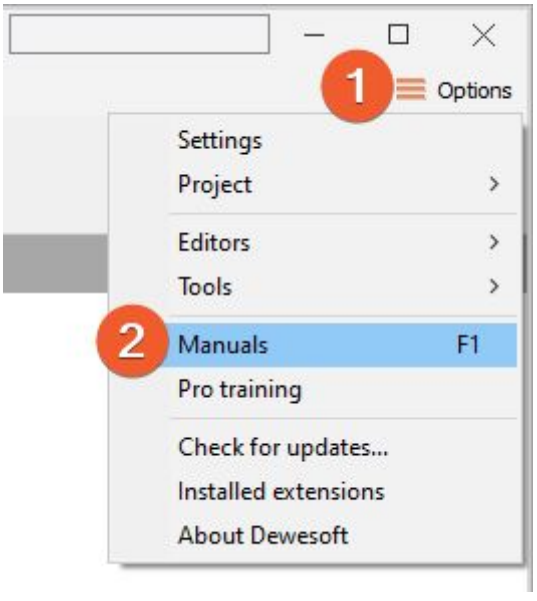


Illustration 7: *Help - Manual*

When DEWESoft® has started up, you will be in the Measure mode and see the Setup files list. Click on Ch. setup (on the right of Setup files) to switch to the Channel setup mode.

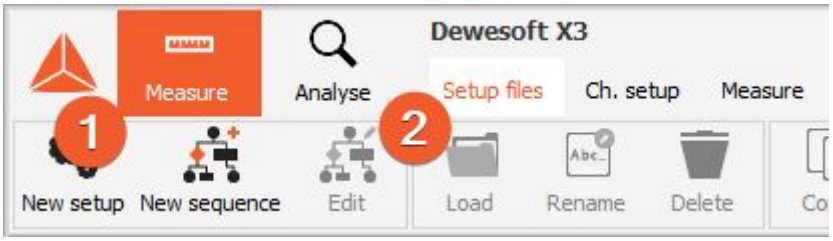


Illustration 8: *Setup files*

2.3.2. Analogue channel setup

In the analogue channel setup screen you can see all channels of your connected IOLITE® systems. Per default only the first channel will be set to Used. Unused channels will not show up in measure mode and can thus not be used for display, calculations or storing: thus, we will also set the other channels to the used. You can left-click on the Used column of channel 2 (1), hold the mouse button and move the mouse down to channel 8 (2): then release the mouse button and all channels will be selected – this is shown by the black rectangle around the buttons. Then you can click into the selected region to toggle Used/Unused for all channels at once. The selected channels will also be highlighted in the small preview image of the device (3).
When you press the Setup button of a channel (the column at the right edge of the channel table – not shown in this screen-shot), you can change all the settings of the channel amplifier.
You can also change the sample rate of the IOLITE® (4).

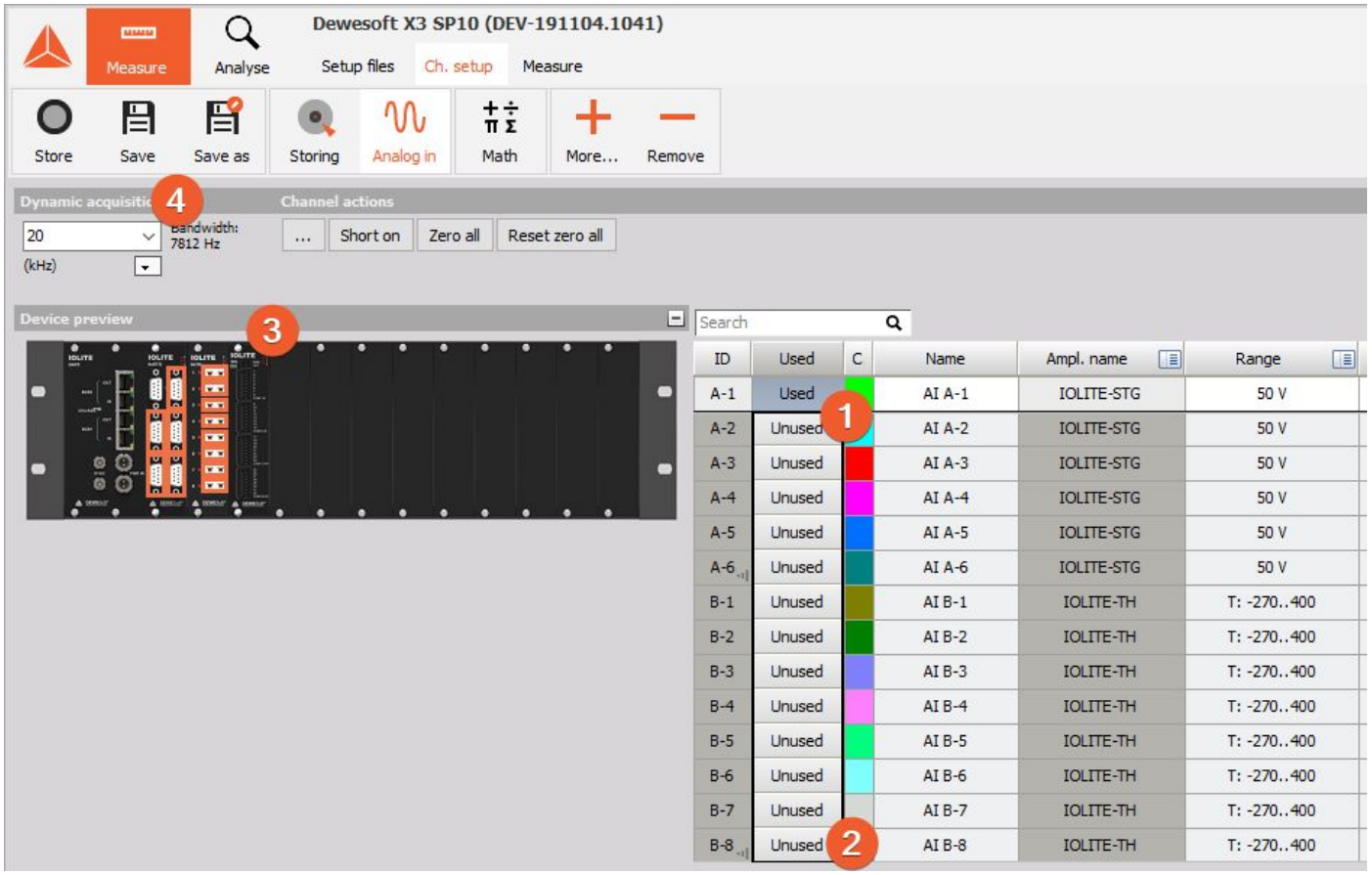


Illustration 9: *Channel setup screen*

2.3.3. Sample rate

One of the most important settings is the sample rate. The sample rate defines how many data points, IOLITE® will transfer to DEWESoft®. Higher sample rate also means that more data needs to be transferred via EtherCAT® to your computer.

The sampling speed mainly depends on your application. To display your signal in time domain with a good time resolution, you should sample 10 to 20 times faster than the frequency of the signal that you want to measure, e.g. 1 kS/s for a 50 Hz sine-wave. If you have a lot of high frequency components, it may be necessary to sample 100 times faster, e.g. 5 kS/s for the 50 Hz sine-wave, or even more. If you display only the frequency domain (FFT analysis), a 2.5 times faster sampling would be sufficient (125 S/s for the 50 Hz sine-wave). The higher the sampling rate, the better the time resolution. But also the file size will increase.

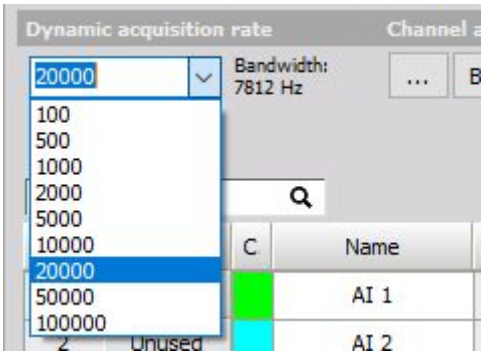


Illustration 10: *Sample rate*

2.3.4. Measurement Mode

A click on Measure (at the right side of Ch. setup in Illustration 11) will take you to the Recorder screen measure mode where you can already see live data.

Hint
When switching to Measure mode the data will not be stored automatically.

Illustration 11: *Measure mode*

In measure mode you can have several measurement screens (5). DEWESoft® will create 2 default screens: Recorder and Custom but you can also create new screens or change the visual displays of the existing screens as you like.
The most important sections of the Measure mode are highlighted in screen-shot Illustration 10:
(1) shows the live measurement data in different measurement instruments which are depending on the selected measurement screen. In this case we see a recorder instrument which displays all your

measurement channels. You can use the channel-selector list (2) to assign measurement channels to the instruments. Each instrument has different settings. (3) shows the settings of the currently selected recorder instrument.
To start storing the data to a file, press the Store button (4). When you are done, press the Stop button to stop recording.
Now DEWESoft® has created a datafile with all the data that you have seen during the recording session. You can now click the Analysis button (on the left-top of the screen to the right of the Measure button) to go to Analysis mode.

2.3.5. Analyse Mode

When you have just stopped a measurement, DEWESoft® will automatically open the last recorded data file in Review mode, so that you can start the analysis right away.

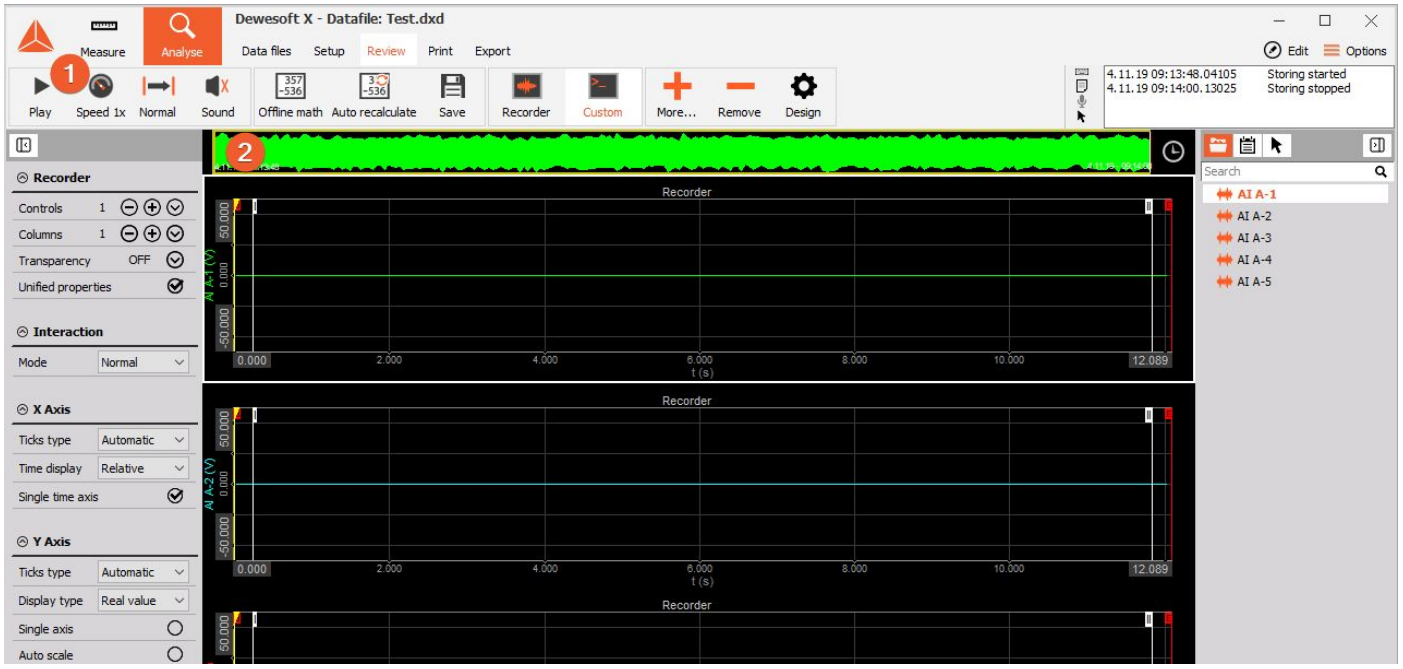


Illustration 12: *Analyse mode*

The Review mode is much like the measurement mode. You will see the same measurement screens, the channel-selector list and the properties of the currently selected instrument.
Differences are:
(1) you have additional tool-buttons
(2) there is a Signal overview window which will show you the whole data of one selected channel of the data file

Now you can use the cursors to analyse your data, zoom in and out of the data, click Offline math to add computations based on your data, etc. You can also change the design of your measurement screens, print reports based on your data and export the data to other file formats for further analysis.

2.4. Advanced configuration

Note, that the DEWESoft® launcher has already done the hardware setup for you – you can check this in the Settings dialogue. Click the Settings button (1) – and then click the Settings Menu item (2).

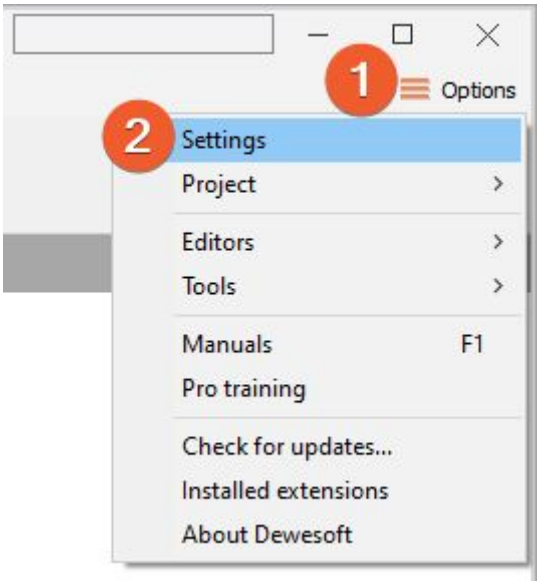


Illustration 13: *Open settings dialogue*

In the Analog tab sheet, DEWESoft USB must be selected in order to user you IOLITE® device (see (1) in the image). All IOLITE® devices will be shown in the device list (2).

If you add a device while this screen is open (or if your device is not shown yet), you can press the Refresh button (3) to scan for devices. When you select a device from the list you will see all the device details and settings in the right area (4).

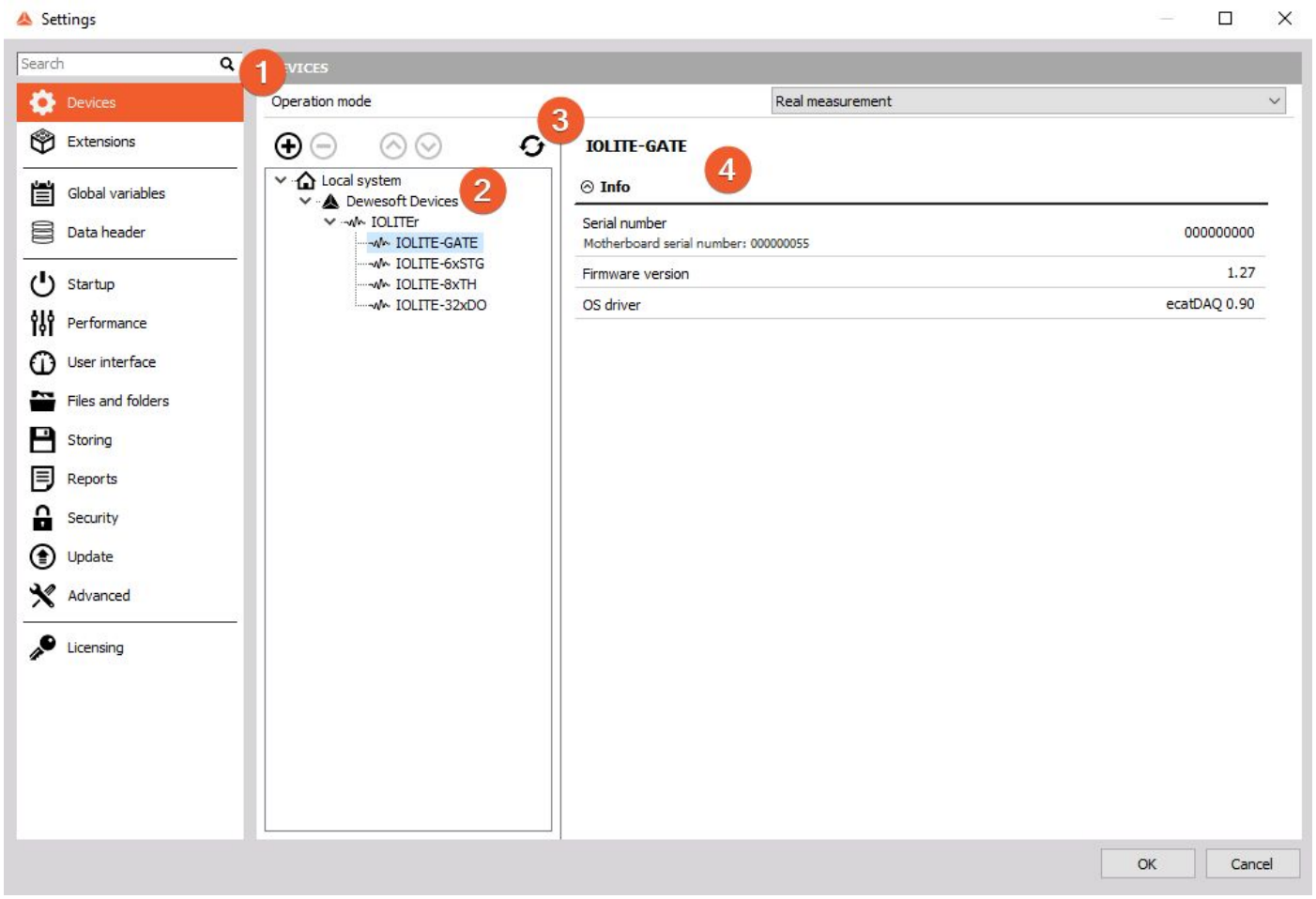


Illustration 14: *Real measurement mode*

2.5. Licensing

As soon as you activate your IOLITE® system in the hardware setup, DEWESoft® will be licensed and you are ready to go (the license information is stored in the IOLITE® device). No need for any online or offline licensing!
Note, that all licenses regarding IOLITE® will only work when the IOLITE® system is connected to your PC and the device has been activated in the hardware setup.

2.6. Troubleshooting

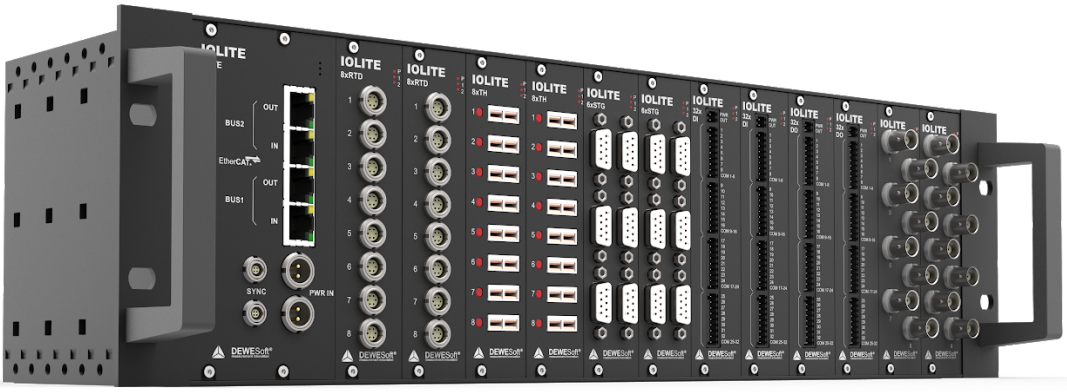
If your IOLITE® device is not found by DEWESoft®:

- If you did not restart Windows after the software installation, restart now
- Make sure that you have started DEWESoft® version X3 SP8 or higher
- Make sure that the external power supply is connected and okay
- Disconnect the EtherCAT® cable and reconnect it. If this does not work, try to connect the EtherCAT® cable to another Ethernet port of your PC
- Try to restart DEWESoft®
- Try to restart the PC

3. System Overview

IOLITE

Data acquisition and real-time control front-end system for industrial applications. All-in-one solution for real-time control and feedback monitoring



Voltage
Strain / Stress
Quarter Bridge
Half Bridge
Full Bridge
Thermocouple

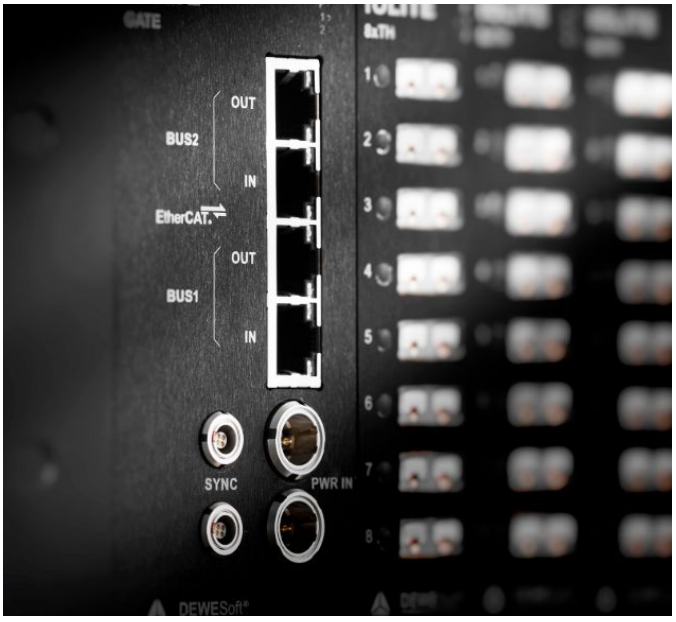
Digital IO
IEPE
Charge
Current
LVDT
RTD

Resistance
DSI Compatible
TEDS Compatible
EtherCAT
IP40
-10 °C to +50 °C

3.1. Main features

- **DUAL ETHERCAT:** IOLITE uses two EtherCAT buses in parallel. EtherCAT primary bus is used for full speed buffered data acquisition to a computer. EtherCAT secondary bus is mainly used for real-time data to any 3rd party control system.
- **GREAT SIGNAL CONDITIONING**: IOLITE features high-quality amplifiers which offer great signal quality and up to 20 kHz sampling rate.
- **REDUNDANT POWER SUPPLY**: Together with dual EtherCAT interface provides maximum system reliability.
- **MULTIPLE CHASSIS OPTION**: IOLITE can be configured in the 19-inch cabinet compatible chassis (IOLITEr) or in more rugged SIRIUS-like compatible chassis (IOLITEs).
- **GREAT PRICE/PERFORMANCE**: IOLITE offers great price/performance ratio and is suitable for test-bed and industrial applications.
- **SOFTWARE INCLUDED WITH FREE LIFETIME UPGRADES**: Easy to use, yet very robust in functionality, award-winning DEWESoft X3 software is included. The software comes with lifetime free upgrades and no hidden costs, bringing you intuitive configuration, smart sensors, advanced storage and analysis capabilities.

3.1.1. Redundant Bus Systems



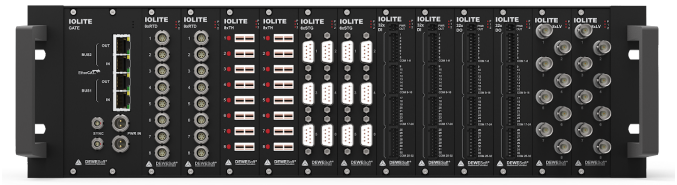
Each IOLITE system has two fully independent Ethercat bus systems that work in parallel.

Primary Bus
Primary bus is used for perfectly timed and synchronized data acquisition via DEWESoft X software.

Secondary Bus
The secondary bus can be used in two ways:

- low latency front-end interface for real-time controllers
- redundant data acquisition bus system for critical applications

3.1.2. Input Slots and Amplifiers



IOLITE chassis can be configured with up to 12 slots, each featuring high-quality input amplifiers. Currently, the following amplifiers are available:

- **6xSTG**: universal analogue and strain gage amplifiers. Compatible with Dewesoft smart interface DSI adapters
- **8xTH**: isolated thermocouple amplifier
- **32xDI**: 32 channel digital input
- **32xDO**: 32 channel digital output with watchdog
- **8xRTD:** isolated amplifiers for measurements with resistance temperature detector

Full technical specifications in 4. Module Overview

3.1.3. Redundant Power Supply

Each IOLITE system is equipped with a redundant power supply completing the feature set for the ideal and reliable front-end system.

If the primary power supply fails, the system will be powered by a secondary power supply without any interruption or system shutdown/restart.

3.1.4. Feedback Monitoring

What is really amazing is that IOLITE offers the operator to acquire and monitor the data in daily operation as well as while tuning the control systems.

Apart from monitoring the input channels on the data acquisition bus, the system can also monitor the outputs from the controller. Let's say we regulate the switch-off valve by monitoring the pressure. DEWESoft can show the pressure signal as well as digital output signal coming from the controller, all fully synchronized.

This allows the operator to prove that the control system is operating correctly every time.

3.2. System specifications

System	IOLITEr	IOLITEs
Number of slots	12	8
Synchronization	2x SIRIUS® SYNC on L00B4f	2x SIRIUS® SYNC on L00B4f
Sync Accuracy	below 1 sample to Sirius®	below 1 sample to Sirius®
Dual EtherCAT® interface		
Number of buses	Two (both with buffered DAQ or real time)	Two (both with buffered DAQ or real time)
Data Rate	Dual 100 Mbit bus speed	Dual 100 Mbit bus speed
Max. Throughput per bus	600 kS/s	600 kS/s
Bus 1 connectors	2x Ethernet RJ45	2x Lemo 1T
Bus 2 connectors	2x Ethernet RJ45	2x Ethernet RJ45
Minimum delay (analog input to EtherCAT® bus)	70 µs	70 µs
Minimum EtherCAT® cycle time	100 µs	100 µs
Power		
Power supply	Dual redundant 12 - 48 V DC	Dual redundant 12 - 48 V DC
Power consumption	9 W to 11 W (incl. IOLITE-GATE) IOLITE-GATE: Max. 1.9 W	8 W (Max: 9 W)
Environmental		
Operating Temperature	-10 to 50 °C	-10 to 50 °C
Storage Temperature	-40 to 85 °C	-40 to 85 °C
Humidity	5 to 95 % RH non-condensing at 50 °C	5 to 95 % RH non-condensing at 50 °C
IP rating	IP30	IP40
Physical		
Dimensions	483 x 148 x 133 mm	266 x 169 x 139 mm
Weight	3.1 kg (incl. IOLITE-GATE) 230 g (IOLITE-GATE)	2.6 kg

3.3. Enclosure Overview

IOLITE can be configured in the 19-inch cabinet compatible chassis or in more rugged SIRIUS-like compatible chassis.

3.3.1. IOLITEr: Cabinet Mount Chassis

Standard IOLITE chassis is compatible and can be mounted in any 19-inch rack cabinet. This is perfect for the test-bed installations.

IOLITE height is 4U and can host up to 12 IOLITE modules. It includes cooling system with four fans on the back panel.

3.3.1.1. IOLITEr: Cabinet Mount Chassis: Renders/Front panel/Back panel

Illustration 15: *Mounting of IOLITEr in the 19" cabinet*

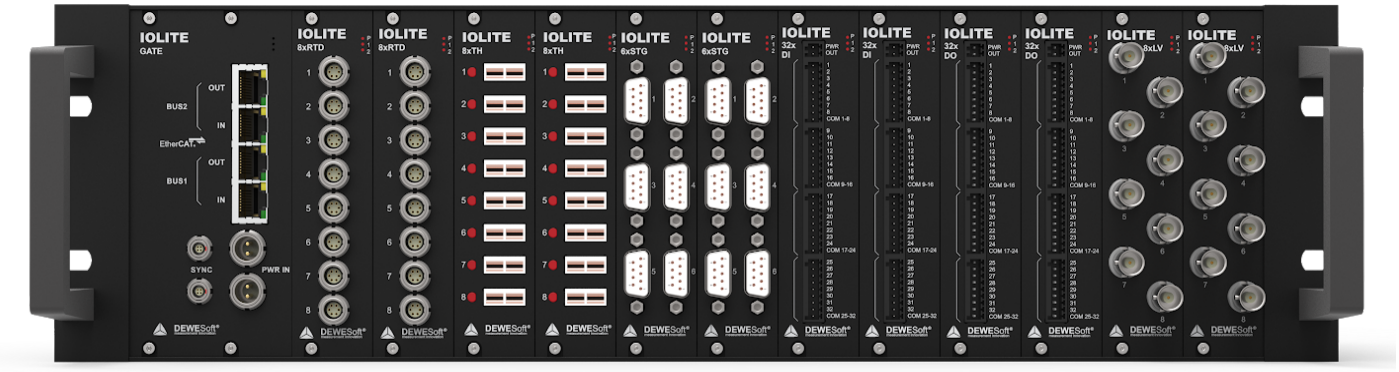


Illustration 16: *IOLITEr (Cabinet Mount Chassis) Front panel*

Illustration 17: *Cooling system on the Back panel of IOLITEr*

3.3.1.2. IOLITEr: Cabinet Mount Chassis: Dimensions

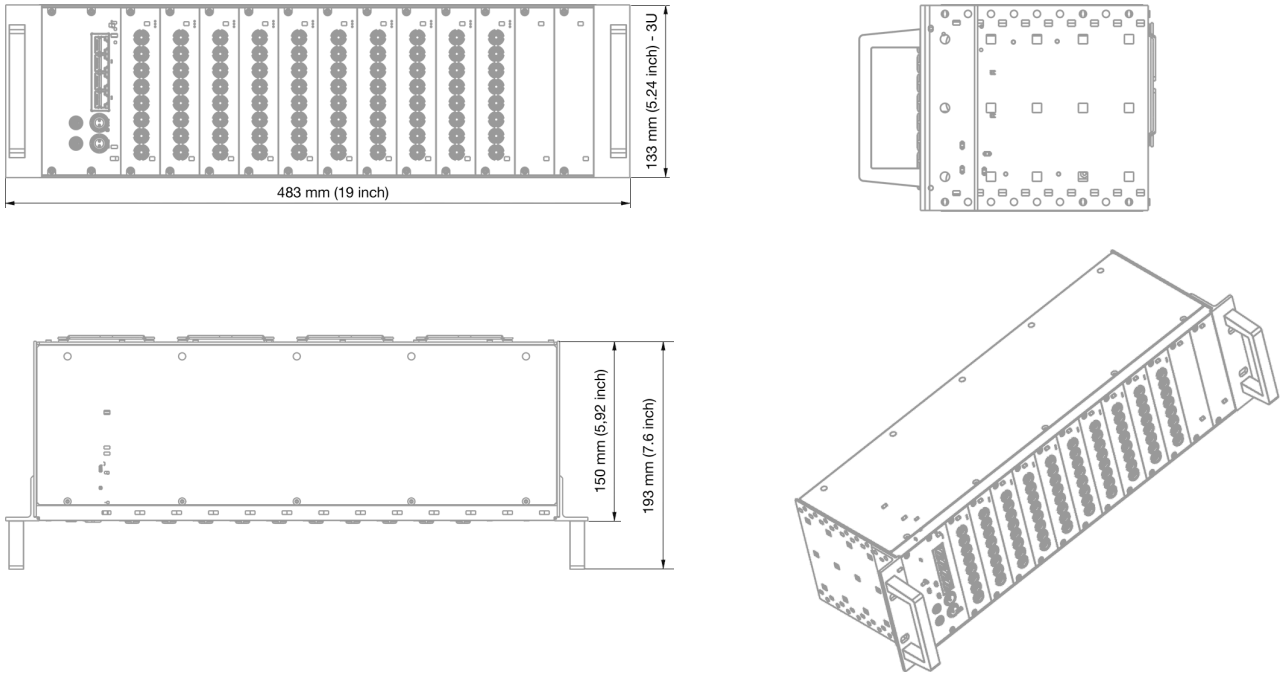


Illustration 18: *Technical Drawings of IOLITEr*

3.3.1.3. IOLITE-GATE

IOLITE-GATE module serves as gateway between IOLITE measurement modules and either PC, other DEWESoft EtherCAT devices or 3rd party control master.
IOLITE-GATE includes dual EtherCAT bus, redundant power supply inputs and provides synchronization with DEWESoft USB devices.
IOLITE-GATE is mounted in first slot from left inside the IOLITEr 19-inch rack cabinet chassis.

Illustration 19: *IOLITE-GATE module*

3.3.1.3.1. IOLITE-GATE: Connectors

IOLITE-GATE module includes 4x RJ45 connectors for dual EtherCAT bus. Primary bus (BUS 1) for buffered data and Secondary bus (BUS 2) for unbuffered data have IN and OUT connector.

Two LEMO 1B 2-pin connectors are used for redundant power supply (PWR IN).

Synchronization with DEWESoft USB data acquisition devices or connection to clock master is on IOLITE-GATE enabled by connecting a synchronization cables to two SYNC inputs (LEMO 00 4-pin).

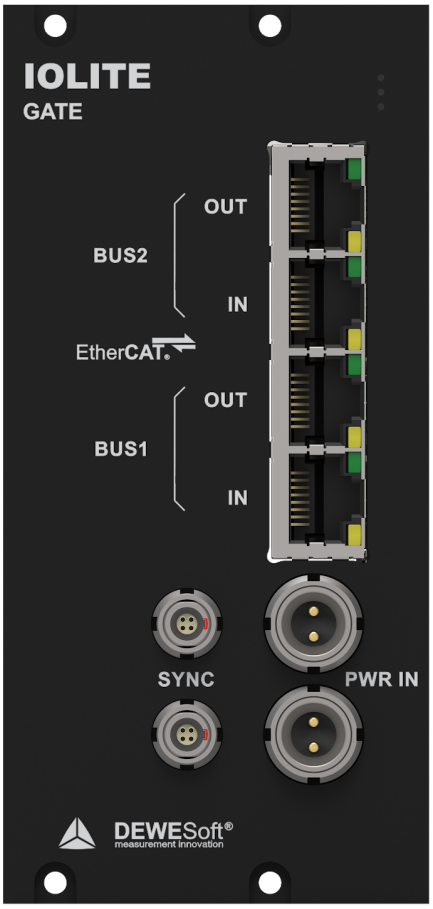
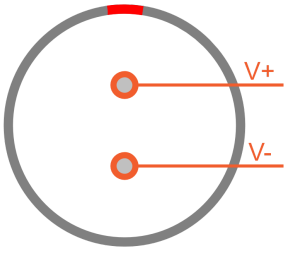


Illustration 20: *IOLITE-GATE front*

3.3.1.3.1.1. IOLITE-GATE: Power in: Pinout



For the power supply an unregulated DC voltage between 12 and 48 Volts is required, which is connected to LEMO 1B connector on the IOLITE-GATE front.

PWR IN connector (on the device): EXJ.1B.302.HLD
Mating connector (for the cable): FGG.1B.302.CLAD52Z

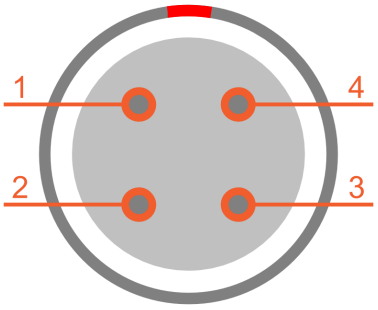
3.3.1.3.1.2. IOLITE-GATE: Sync: Pinout

The sync connectors are required when you want to synchronize the data from IOLITE with DEWESoft USB devices for the same measurement. The signal that is transferred over sync cable makes sure that the measurement data of IOLITE and DEWESoft USB devices are perfectly synchronized to each other.

The other use of sync connector is to connect directly to IOLITE a signal from the clock master.

Note that there is no distinction between the IN and OUT – it does not matter which connector you use.

When IRIG-synchronisation is used, the IRIG signal is on pins 1, 2.



Pin	Name	Description
1	CLK	Clock
2	TRIG	Trigger
3	RES	PPS
4	GND	Ground

SYNC connector (on the device): EEG.00.304.CLL
Mating connector (for the cable): FGG.00.304.CLAD27Z

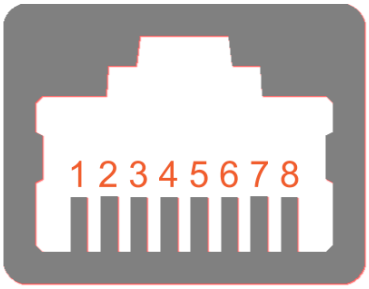
3.3.1.3.1.3. IOLITE-GATE: RJ45: Pinout

IOLITE-GATE module includes four RJ45 connectors that enable data transfer and synchronization via dual EtherCAT bus.

The same connectors are used on Primary bus (BUS 1)for buffered data and on Secondary bus (BUS 2) for unbuffered data.

Each RJ45 connector has two LEDs:
- **GREEN** LED indicates that IOLITE is connected to another device (DEWESoft EtherCAT device, PC or 3rd party control master).
- **YELLOW** LED is active only when the data transfer is active.

Connector used on the device is standard ethernet connector (RJ45).
Standard ethernet cable with standard connector can be used to connect IOLITE-GATE with PC.



Pin	Name	Description
1	-	
2	-	
3	RX_N	Reception -
4	-	
5	-	
6	RX_P	Reception +
7	TX_N	Transmission -
8	TX_P	Transmission +

3.3.1.4. IOLITE-GATE: Connection of IOLITEr standalone device to PC

First connect the power supply cable (PS-120-L1B2f) to the PWR IN LEMO 1B 2-pin connector. To increase system reliability connect redundant power supply to other PWR IN connector.

Important
To improve the redundancy of the system, it is recommended that the device is powered with two power supplies connected to different electrical fuses!

Then connect standard ethernet cable to IN connector of BUS 1 on IOLITE-GATE. Finally connect the other side of the ethernet cable to the LAN port of PC.

Wiring diagram is shown in Illustration 21.

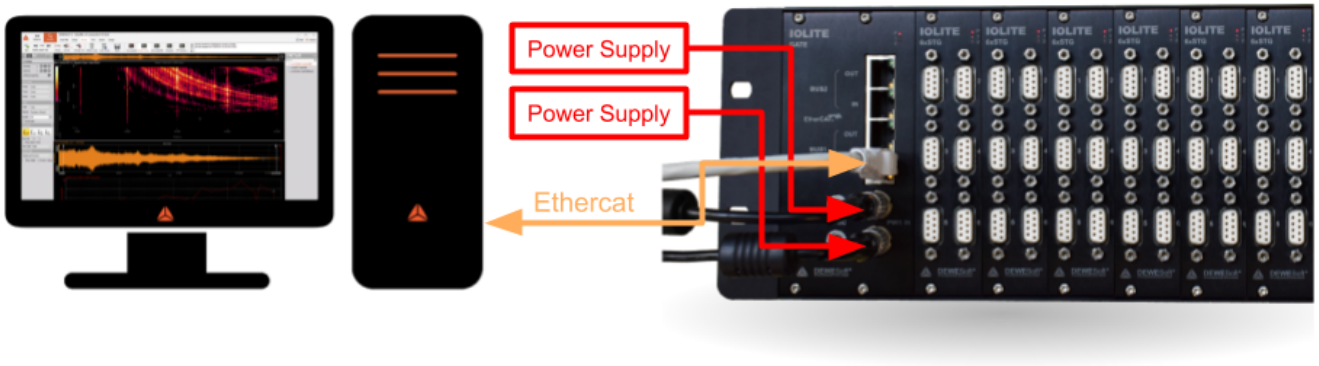


Illustration 21: *Connection of IOLITEr standalone device to PC*

List of required cables:

Function	DEWESoft ORDER CODE
Power supply	PS-120-L1B2f (default)
Ethercat	CABLE-UTP-CAT.6-3m (default), CABLE-UTP-CAT.6-1m

3.3.1.5. IOLITE-GATE: Connection of IOLITEr and DEWE-43A device

The connection of IOLITE device to PC is the same as in 2.3.1.4.
Connect power supply cable to DEWE-43A (PS-60W-12V-5A-L1B2f). Then connect the USB cable (CABLE-USBAmini-USBBS-1.8m) to the USB port on connector side of DEWE-43A. Finally connect the other side of USB cable to the USB port on PC.

In order to have synchronized data between IOLITE and DEWE-43A, connect SYNC cable (e.g. L00B4m-L00B4m-0.2m) to the SYNC connector on IOLITE-GATE and the other side of cable to the SYNC connector on DEWE-43A.

Wiring diagram is shown in Illustration 22.

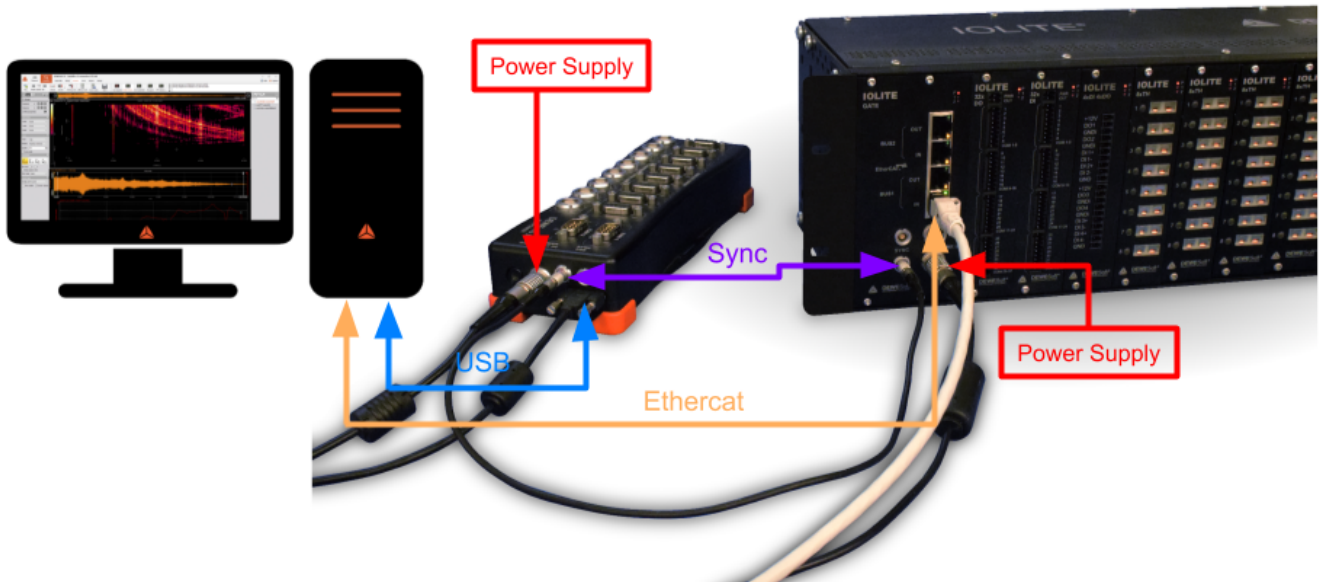


Illustration 22: *Connection of IOLITEr and DEWE-43A device*

List of required cables:

Function	DEWESoft ORDER CODE
Power supply	IOLITEr: PS-120-L1B2f (default) DEWE-43A: PS-60W-12V-5A-L1B2f (default)
Ethercat	CABLE-UTP-CAT.6-3m (default), CABLE-UTP-CAT.6-1m
USB	CABLE-USBAmini-USBBS-1.8m (default), CABLE-USBAmini-USBBS-1m
Synchronization	L00B4m-L00B4m-0.2m (default), L00B4m-L00B4m-0.5m, L00B4m-L00B4m-3m

3.3.2. IOLITEs: Boxed Chassis

In addition to 19-inch rack cabinet compatible chassis, IOLITE is also available in standalone aluminium chassis compatible with SIRIUS data acquisition instruments.

The chassis provides 8 slots for IOLITE input and output slices to be installed.

IOLITEs includes EtherCAT gateway and cooling system.

3.3.2.1. IOLITEs: Boxed Chassis: Renders/Front panel/Back panel

Illustration 23: *IOLITEs Front panel*

Illustration 24: *IOLITEs Back panel*

3.3.2.2. IOLITEs: Boxed Chassis: Dimensions

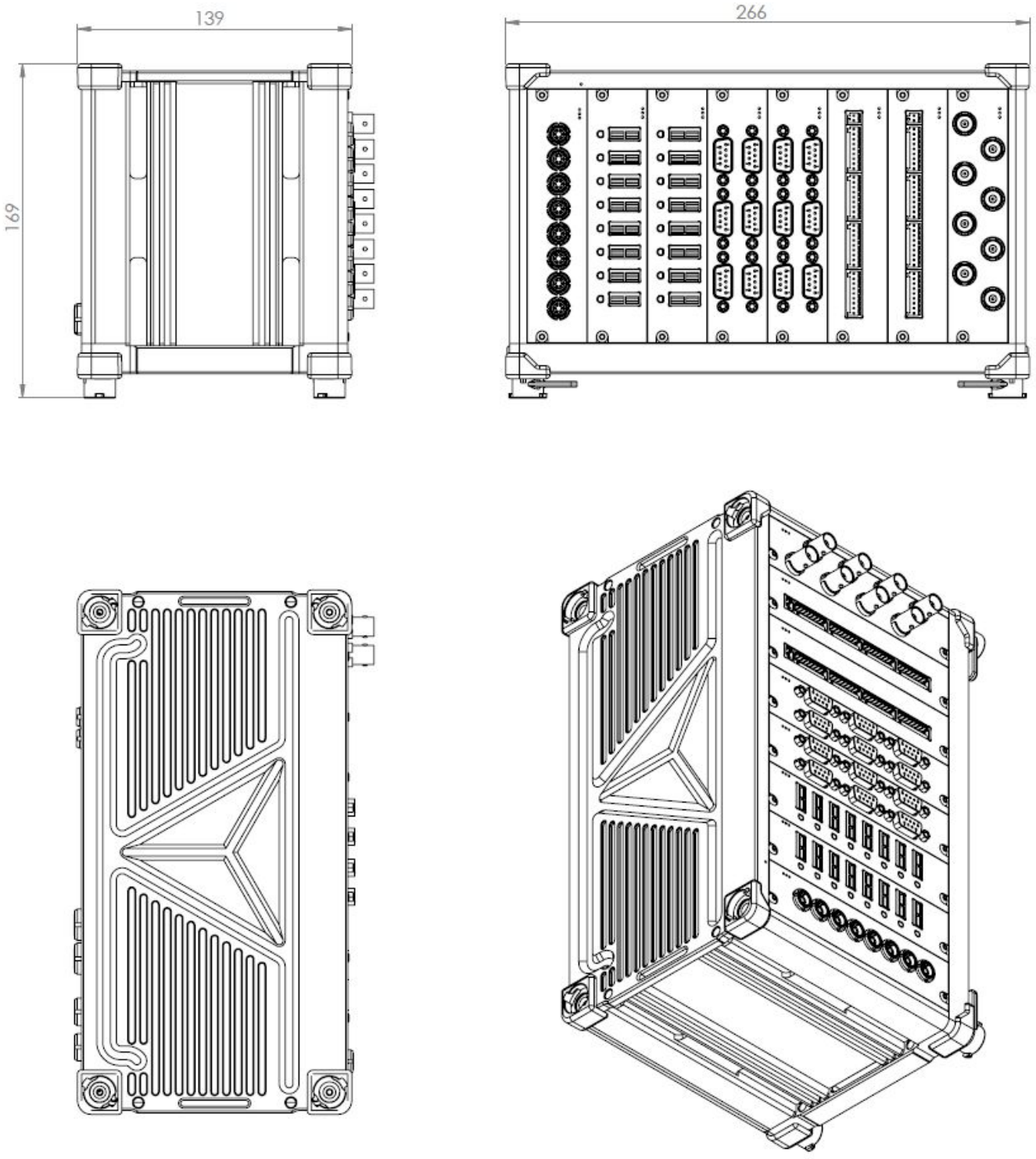


Illustration 25: *Technical Drawings of IOLITEs*

3.3.2.3. IOLITEs: Boxed Chassis: Connectors

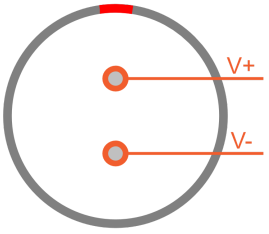
IOLITEs chassis also enables dual EtherCAT bus. There are two LEMO 1B 8-pin connectors on the back panel (Illustration 10) of IOLITEs used for data transfer and synchronisation on the primary bus (BUS 1) for buffered data. OUT connector on BUS 1 also enables power supply for external DEWESoft EtherCAT devices.
Secondary bus (BUS 2) for unbuffered data has two RJ45 connectors (IN and OUT) for data transfer and synchronization to 3rd party control master.

Two LEMO 1B 2-pin connectors are used for redundant power supply (PWR IN).

Above the PWR IN connector is GND socket for grounding the IOLITEs.

Synchronization with DEWESoft USB data acquisition devices or connection to clock master is on IOLITEs enabled by connecting a synchronization cables to two SYNC inputs (LEMO 00 4-pin).

3.3.2.3.1. IOLITEs: Boxed Chassis: Power in: Pinout



For the power supply an unregulated DC voltage between 12 and 48 Volts is required, which is connected to LEMO 1B connector on the rear side of the chassis.

PWR IN connector (on the device): EXJ.1B.302.HLD
Mating connector (for the cable): FGG.1B.302.CLAD52Z

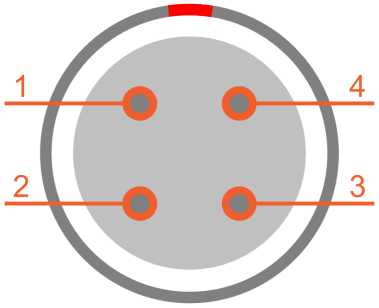
3.3.2.3.2. IOLITEs: Boxed Chassis: Sync: Pinout

The sync connectors are required when you want to synchronize the data from IOLITE with DEWESoft USB devices for the same measurement. The signal that is transferred over sync cable makes sure that the measurement data of IOLITE and DEWESoft USB devices are perfectly synchronized to each other.

The other use of sync connector is to connect directly to IOLITE a signal from the clock master.

Note that there is no distinction between IN and OUT – it does not matter which connector you use.

When IRIG-synchronisation is used, the IRIG signal is on pins 1, 2.

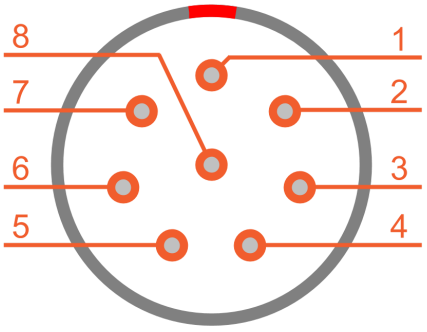


Pin	Name	Description
1	CLK	Clock
2	TRIG	Trigger
3	RES	PPS
4	GND	Ground

SYNC connector (on the device): EEG.00.304.CLL
Mating connector (for the cable): FGG.00.304.CLAD27Z

3.3.2.3.3. IOLITEs: Boxed Chassis: BUS 1: IN: Pinout

IN connector of primary EtherCAT bus (BUS 1) is LEMO 1B 8-pin male connector.

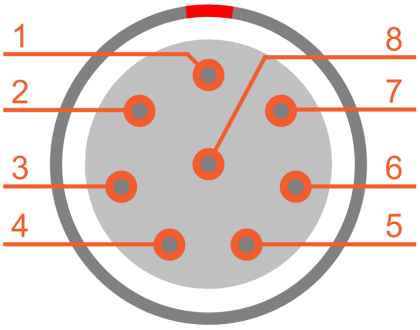


Pin	Name	Description
1	TX_P	Transmission +
2	TX_N	Transmission -
3	RX_P	Reception +
4	RX_N	Reception -
5	-	
6	-	
7	GND	Ground
8	GND	Ground

BUS 1 IN connector (on the device): EEJ.1B.308.CLD
Mating connector (for the cable): FGJ.1T.308.CLL.1433

3.3.2.3.4. IOLITEs: Boxed Chassis: BUS 1: OUT: Pinout

OUT connector of primary EtherCAT bus (BUS 1) is LEMO 1B 8-pin female connector.
OUT connector enables power supply for external DEWESoft EtherCAT devices.



Pin	Name	Description
1	TX_P	Transmission +
2	TX_N	Transmission -
3	RX_P	Reception +
4	RX_N	Reception -
5	VCC	PWR OUT
6	VCC	PWR OUT
7	GND	Ground
8	GND	Ground

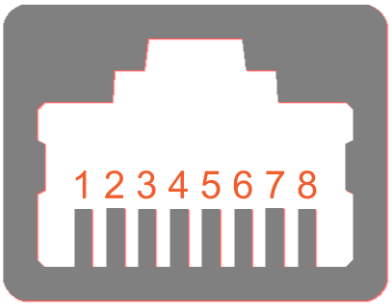
BUS 1 OUT connector (on the device): EEG.1B.308.CLN
Mating connector (for the cable): FGG.1T.308.CLA.1433

3.3.2.3.5. IOLITEs: Boxed Chassis: BUS 2: RJ45: Pinout

IOLITEs includes two RJ45 connectors on Secondary bus (BUS 2) for unbuffered data.

Each RJ45 connector has two LEDs:
- **GREEN** LED indicates that IOLITE is connected to another device.
- **YELLOW** LED is active only when the data transfer is active.

Connector used on the device is standard ethernet connector (RJ45).
Standard ethernet cable with standard connector can be used to connect IOLITE-GATE with PC.



Pin	Name	Description
1		
2		
3	RX_N	Reception -
4		
5		
6	RX_P	Reception +
7	TX_N	Transmission -
8	TX_P	Transmission +

3.3.2.4. IOLITEs: Boxed Chassis: Connection of IOLITEs standalone device to PC

First connect the power supply cable (PS-120-L1B2f) to the PWR IN LEMO 1B 2-pin connector. To increase system reliability connect redundant power supply to other PWR IN connector.

Important
To improve the redundancy of the system, it is recommended that the device is powered with two power supplies connected to different electrical fuses!

Then connect L1T8f-RJ45-1M cable (LEMO side) to IN connector of BUS 1 on IOLITEs back panel. Finally connect the other side of the L1T8f-RJ45-1M cable (RJ45 side) to the LAN port of PC.

Wiring diagram is shown in Illustration 26.

Illustration 26: *Connection of IOLITEs standalone device to PC*

List of required cables:

Function	DEWESoft ORDER CODE
Power supply	PS-120-L1B2f (default)
Ethercat	L1T8f-RJ45-1M (default), L1T8f-RJ45-3M, L1T8f-RJ45-5M

3.3.2.5. IOLITEs: Boxed Chassis: Connection of IOLITEs and KRYPTON® device

The connection of IOLITE device to PC is the same as in 2.3.2.4.

Use EtherCAT to EtherCAT expansion cable (e.g. L1T8m-L1T8f-1M) and connect it to OUT connector on BUS 1 of IOLITEs on one side and to IN connector of KRYPTON device on the other side.

Wiring diagram is shown in Illustration 27.

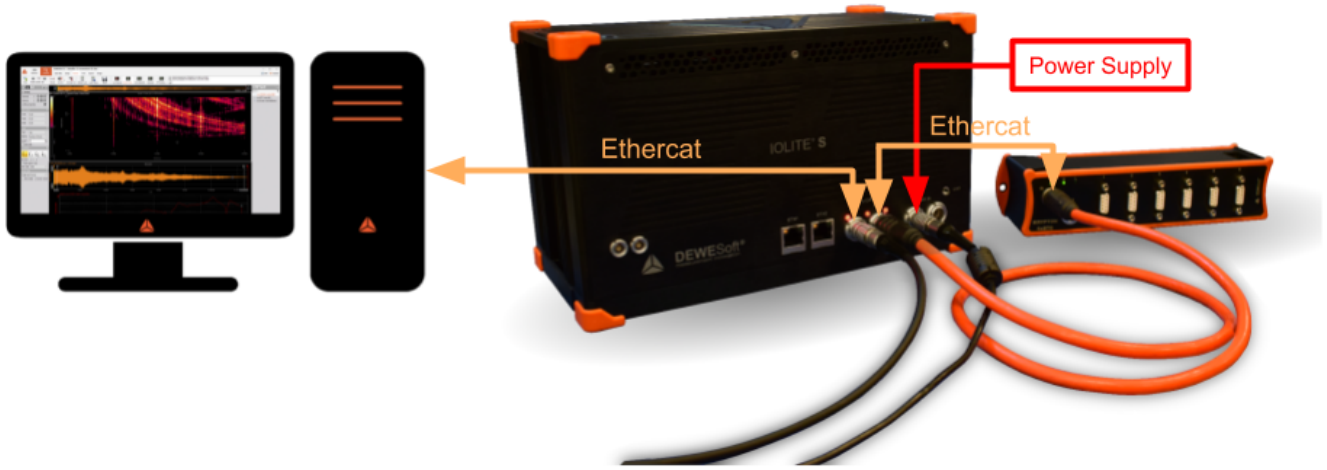


Illustration 27: *Connection of IOLITEs and KRYPTON® device*

List of required cables:

Function	DEWESoft ORDER CODE
Power supply	PS-120-L1B2f (default)
Ethercat	IOLITE to PC: L1T8f-RJ45-1M (default), L1T8f-RJ45-3M, L1T8f-RJ45-5M IOLITE to KRYPTON: L1T8m-L1T8f-02M, L1T8m-L1T8f-0.4M, L1T8m-L1T8f-1M, L1T8m-L1T8f-2.5M

3.3.2.6. IOLITEs: Boxed Chassis: Connection of IOLITEs and SIRIUS® device

Connect power supply cable to SIRIUS (PS-120W-L1B2f). Then connect the USB cable (CABLE-USBAmini-USBBS-1.8m) to the USB port on the back panel of SIRIUS device. Finally connect the other side of USB cable to the USB port on PC.

Use power supply daisy chain cable (e.g. L1B2m-L1B2f-0.4m) to enable power supply for IOLITEs.
Then connect L1T8f-RJ45-1M cable (LEMO side) to IN connector of BUS 1 on IOLITEs back panel. Finally connect the other side of the L1T8f-RJ45-1M cable (RJ45 side) to the LAN port of PC.

In order to have synchronized data between IOLITE and SIRIUS, connect SYNC cable (e.g. L00B4m-L00B4m-0.2m) to the SYNC connector on IOLITE-GATE and the other side of cable to the SYNC connector on SIRIUS.

Wiring diagram is shown in Illustration 28.

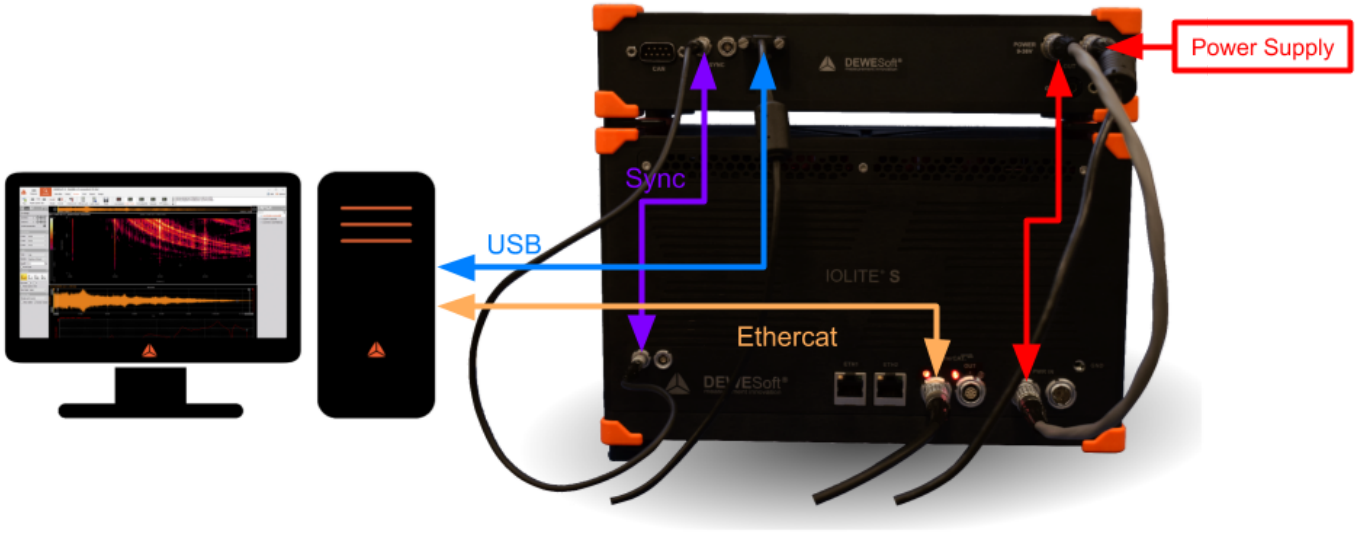


Illustration 28: *Connection of IOLITEs and SIRIUS® device*

List of required cables:

Function	DEWESoft ORDER CODE
Power supply	SIRIUS: PS-120-L1B2f (default) SIRIUS to IOLITE: L1B2m-L1B2f-0.2m, L1B2m-L1B2f-0.4m, L1B2M-L1B2F-3m
Ethercat	IOLITE to PC: L1T8f-RJ45-1M (default), L1T8f-RJ45-3M, L1T8f-RJ45-5M
USB	CABLE-USBAmini-USBBS-1.8m (default), CABLE-USBAmini-USBBS-1m
Synchronization	L00B4m-L00B4m-0.2m (default), L00B4m-L00B4m-0.5m, L00B4m-L00B4m-3m

4. Module Overview

	6xSTG	8xTH	32xDI	32xDO	8xRTD
Connectors	DB9	Thermocouple	screw terminal	screw terminal	L0B6f
#ch per module	6x	8x	32x	32x	8x
Data rate / channel	20 kHz	100 Hz	40 kHz		100 Hz
Resolution	24-bit	24-bit	digital	digital	24-bit
Bandwidth	0.49*fs				
Voltage ranges	±50 V, ±10 V, ±1 V, ±100 mV	1 V, 100 mV		open collector	1 V, 100 mV
Input coupling	DC, AC 1 Hz	DC			DC
Sensor excitation	0..12 V (bipolar), 0..24 V (unipolar) max. 0.4 W/ch				
Bridge connection	Full, ½, ¼ 350 Ω, ¼ 120 Ω 3-wire				
Programmable shunt	100 kΩ				
IEPE input	DSI-ACC				
Current	20 mA (internal shunt), DSI-5A				
Temperature (PTx)	DSI-RTD				PT100, 200, 500, 1000, 2000
Thermocouple	DSI-TH	K, J, T, R, S, N, E, C, U, B			
Resistance					1 kΩ, 10 kΩ
Potentiometer	✓				
LVDT	DSI-LVDT				
Charge	DSI-CHG				
TEDS	✓				
Isolation voltage	Differential	1000 V	1000 V	1000 V	1000 V
Power consumption per module	Typ. 5.4 W, Max. 11.1 W	3.2 W	Typ. 1.2 W, Max. 1.9 W	Typ. 1.2 W, Max. 2.0 W	Typ. 2.1 W, Max. 2.7 W
Advanced functions	Supports all strain types and high input range	High voltage, high isolation		watchdog	High voltage, high isolation

4.1. DI: Digital Input Module

IOLITEi-32xDI module has 32 digital inputs. This is a perfect choice for control applications.

IOLITE digital input module includes power out option, where unregulated power supply voltage is brought to 2-pin PWR OUT connector.

Illustration 29: *IOLITE 32xDI module*

4.1.1. DI: Specifications

Digital Input	
Isolated Input Channels	32
Input low level	-1 V ~ +1 V
Input high level	-48 V ~ -3 V, +3 V ~ +48 V
Input high current @5 V	UIN < 1 mA
Input high current @30 V	UIN < 1 mA
Sampling rate	Simultaneous 40 kS/sec
Overvoltage protection	100 V continuous (250 Vpeak)
Isolation voltage peak	1000 V channel to ground & channel to channel
Additional Specifications	
Input connectors	Terminal block, 2 pole, 4 x 9 pole OMNIMATE SL 2.50 / BLF 2.50/180
Power supply	12 - 48 V DC
Power consumption	Typ. 1.2 W, Max. 1.9 W
Weight	220 g
Slice Dimensions	128.4 x 115.4 x 30.1 mm

4.1.2. DI: Connector version

IOLITEi-32xDI module has four 9-pin terminal block connectors with 2.50mm pitch for digital input. 8 pins on a 9-pin connector bank are used for digital inputs and pin 9 for common GND.

Additionally, there is a 2-pin terminal block connector with 2.50mm pitch for PWR OUT function.

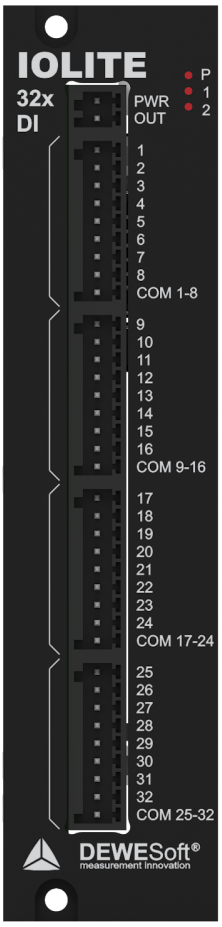
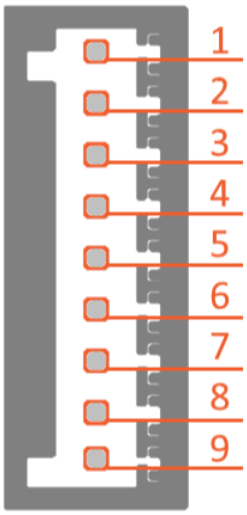


Illustration 30: *IOLITE 32xDI front*

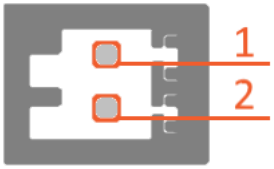
4.1.2.1. DI: Digital Input: Pinout



Pin	Name	Description
1	DI 1	Digital input 1
2	DI 2	Digital input 2
3	DI 3	Digital input 3
4	DI 4	Digital input 4
5	DI 5	Digital input 5
6	DI 6	Digital input 6
7	DI 7	Digital input 7
8	DI 8	Digital input 8
9	COM	Common ground

DI connector (on the device): OMNIMATE Signal SL 2.50/09/90G
Mating connector (for the cable): OMNIMATE Signal BLF 2.50/09/180

4.1.2.2. DI: Power Out: Pinout



Pin	Name	Description
1	VOUT	Output voltage
2	GND	Ground

PWR OUT connector (on the device): OMNIMATE Signal SL 2.50/02/90G
Mating connector (for the cable): OMNIMATE Signal BLF 2.50/02/180

4.2. DO: Digital Output Module

IOLITE-32xDO module has 32 digital outputs. This is a perfect choice for control applications.

IOLITE digital output module includes power out option, where unregulated power supply voltage is brought to 2-pin PWR OUT connector.

IOLITE digital output modules also offer watchdog functionality.

Hint
Find out more about Watchdog feature in Watchdog User Manual:
https://download.dewesoft.com/list/manuals-brochures/software-manuals
In the *Software Manuals* section click the download link of the Watchdog User Manual entry.

Illustration 31: *IOLITE 32xDO module*

4.2.1. DO: Specifications

Digital Output	
Isolated Output Channels	32
Compatibility	Solid state relay
Maximum sink current	0.5 A
Maximum switching voltage	50 V
Maximum update rate	depending on EtherCAT master
Isolation voltage peak	1000 V channel to ground, no channel to channel isolation
Additional Specifications	
Input connectors	Terminal block, 2 pole, 4 x 9 pole OMNIMATE SL 2.50 / BLF 2.50/180
Power supply	12 - 48 V DC
Power consumption	Typ. 1.2 W, Max. 2.0 W
Weight	230 g
Slice Dimensions	128.4 x 115.4 x 30.1 mm

4.2.2. DO: Connector version

IOLITE-32xDI module has four 9-pin terminal block connectors with 2.50mm pitch for digital input. 8 pins on a 9-pin connector bank are used for digital inputs and pin 9 for common GND.

Additionally, there is a 2-pin terminal block connector with 2.50mm pitch for PWR OUT function.

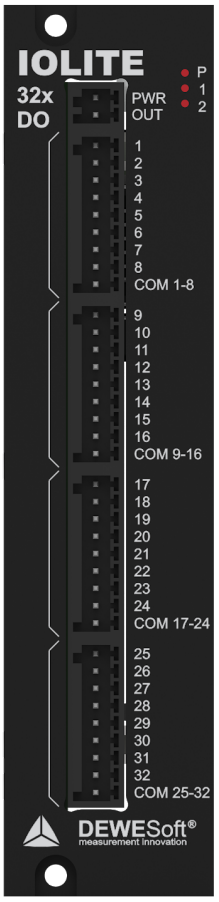
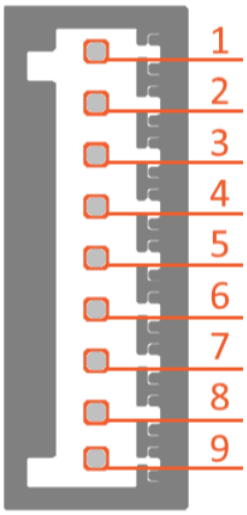


Illustration 32: *IOLITE 32xDO front*

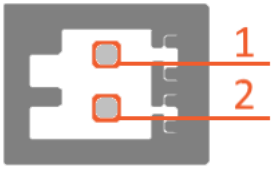
4.2.2.1. DO: Digital Output: Pinout



Pin	Name	Description
1	DO 1	Digital output 1
2	DO 2	Digital output 2
3	DO 3	Digital output 3
4	DO 4	Digital output 4
5	DO 5	Digital output 5
6	DO 6	Digital output 6
7	DO 7	Digital output 7
8	DO 8	Digital output 8
9	COM	Common ground

DO connector (on the device): OMNIMATE Signal SL 2.50/09/90G
Mating connector (for the cable): OMNIMATE Signal BLF 2.50/09/180

4.2.2.2. DO: Power Out: Pinout



Pin	Name	Description
1	VOUT	Output voltage
2	GND	Ground

PWR OUT connector (on the device): OMNIMATE Signal SL 2.50/02/90G
Mating connector (for the cable): OMNIMATE Signal BLF 2.50/02/180

4.3. RTD: Resistance Temperature Detector Module

IOLITE RTD module with 6-pin Lemo 0B input connectors is used for measurements with universal platinum thermometer probes, thermistors, as well as for resistance and voltage measurements.

IOLITEi-8xRTD module has 8 isolated measurement channels.

Illustration 33: *IOLITE 8xRTD module*

4.3.1. RTD: Specifications

Analog inputs		
Input types	voltage, resistor or universal PTxxx inputs	
Number of channels	8	
ADC Type	24-bit delta-sigma	
Sampling Rate	Simultaneous 100 S/sec	
Voltage Ranges	**±1 V**	**±100 mV**
Input Accuracy	±0.02 % of reading ±0.01 % of range ±10 µV	±0.02 % of reading ±0.01 % of range ±10 µV
Typical Noise floor @10/100 s/sec	117 dB / 107 dB	111 dB / 101 dB
Gain Drift	Typical 4 ppm/K (max. 10 ppm/K)	
Offset Drift	Typical 0.05 µV/K (max. 0.2 µV/K)	
Gain Linearity	< 0.01 %	
Input Coupling	DC	
Input Impedance	1 MΩ	
Temperature	**PT500, PT1000, PT2000**	**PT100, PT200**
Measurement range	-200 °C to +850 °C	
Accuracy	±0.05 % of reading ±0.2 °C	
Temperature Drift	typ. ±5 ppm/K (max. ±12 ppm/K ±0.003 °C/K)	
Input Connection	3-wire or 4-wire	
Resolution	< 0.001 °C	
Resistance	**0...10 kΩ**	**0...1 kΩ**
Accuracy	±0.02 % of reading ±0.01 % of range	
Input Connection	3-wire or 4-wire	
Additional Specifications		
Input connectors	Lemo 0B 6pin EEA.0B.306.CLN	
Isolation voltage	1000 Vpeak channel to ground & channel to channel	
Power supply	12 - 48 V DC	
Power consumption	Typ. 2.1 W, Max. 2.7 W	
Weight	260 g	
Dimensions	128.4 x 115.4 x 30.1 mm	

4.3.2. RTD: LEMO L0B6f Connector

IOLITEi-8xRTD module has 8 LEMO 0B 6-pin female connectors.

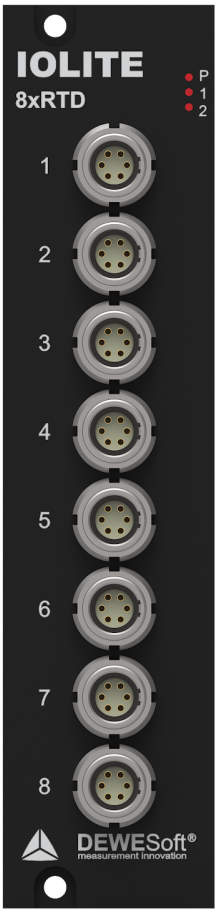
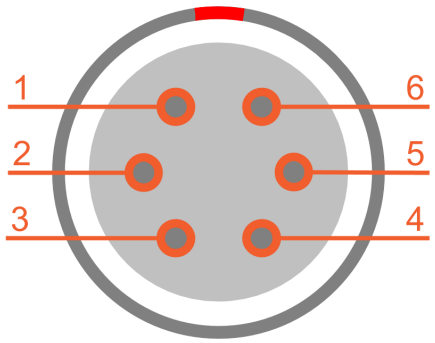


Illustration 34: *IOLITE 8xRTD front*

4.3.2.1. RTD: LEMO L0B6f Connector: Pinout

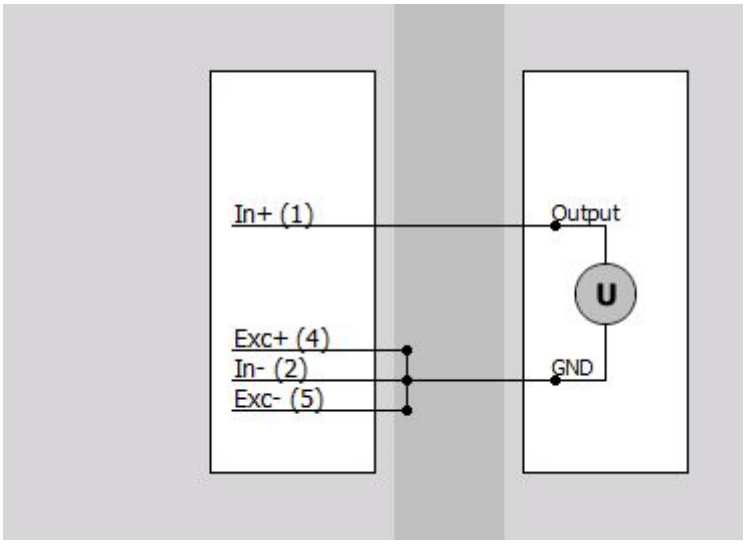


Pin	Name	Description
1	In+	Input+
2	In-	Input-
3	NC	Do not connect
4	EXC+	Excitation+
5	EXC-	Excitation-
6	NC	Do not connect

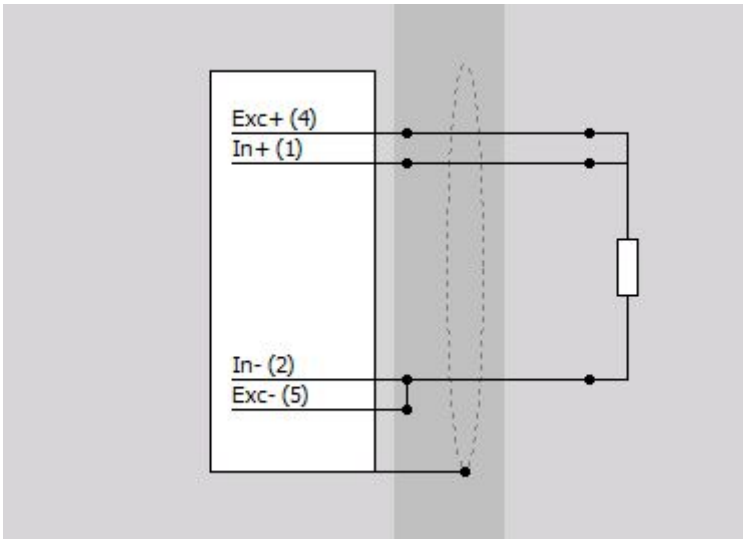
RTD connector (on the device): EEA.0B.306.CLN
Mating connector (for the cable): FGA.0B.306.CLAD21Z

4.3.2.2. RTD: LEMO L0B6f Connector: Wiring diagram

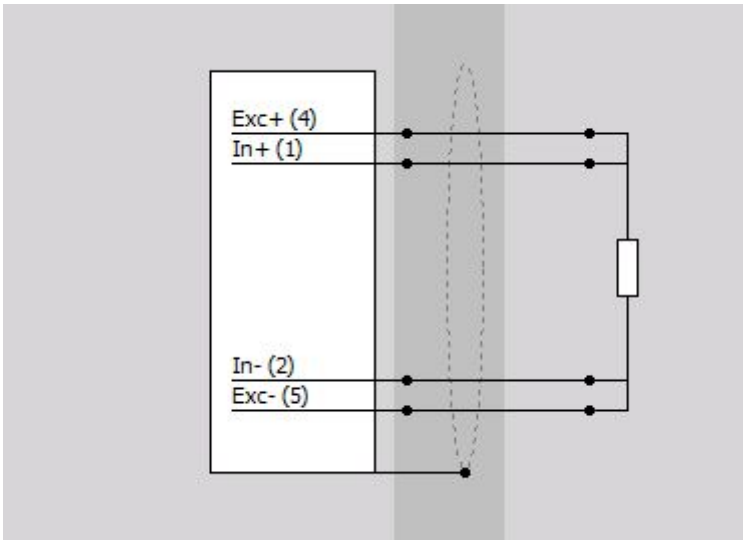
4.3.2.2.1. RTD: Voltage



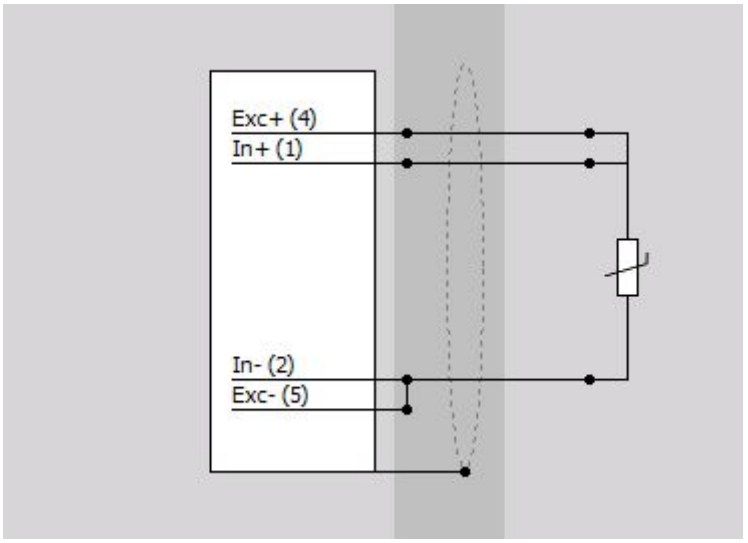
4.3.2.2.2. RTD: Resistance (3-wire)



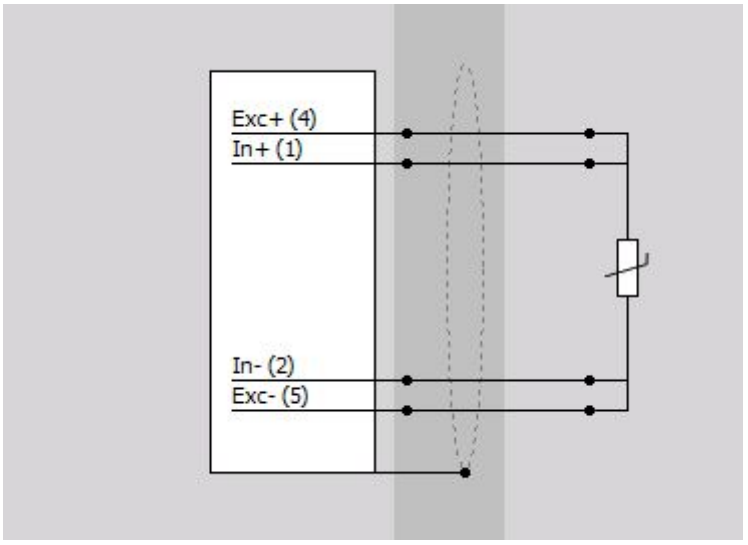
4.3.2.2.3. RTD: Resistance (4-wire)



4.3.2.2.4. RTD: Temperature (3-wire)



4.3.2.2.5. RTD: Temperature (4-wire)



4.4. STG: Strain Gauge Module

IOLITE STG modules have universal 6 channel differential voltage, current and Full/Half/Quarter bridge input with DSUB9 connector. Compatible with DSI adapters for IEPE, CHG, 200V, RTD, TH measurements.

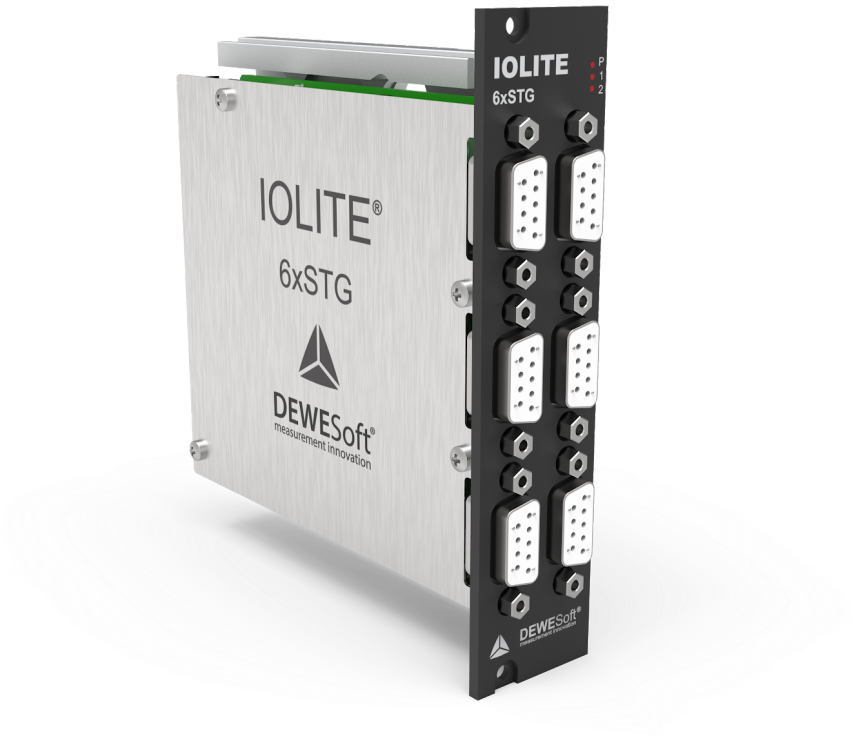


Illustration 35: *IOLITE 6xSTG module*

4.4.1. STG: Specifications

Analog inputs - Voltage				
Input type	Voltage Full/half/quarter bridge strain Current Potentiometer			
Number of channels	6			
ADC Type	24-bit SAR with anti-aliasing filter			
Sampling Rate	Simultaneous 20 kS/sec 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 Dynamic Range @10 kS	100 dB	110 dB	130 dB	145 dB
Typical Noise floor @10 kS	103 dB	97 dB	103 dB	94 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	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 1Hz			
Input Impedance	1 MΩ	1 MΩ	20 MΩ	20 MΩ
Overvoltage Protection	In+ to In-: 50 V continuous, 200 V peak (10 msec)			
Analog inputs - Current				
Current ranges	20 mA		2 mA	
Input Accuracy	±0.03 % of reading, ±0.02 % of range, ±2.1 µA			
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	Bipolar: 0, 1, 2, 5, 10 and 12 VDC Unipolar: 0, 2, 5, 10, 15, 24 VDC			
Accuracy	±0.05 % ±2 mV			
Drift	±50 ppm/K ±100 µV/K			
Stability 10 % to 90 % Load	< 0.01 %			
Current Limit	42 mA (550 mW max. power)			
Protection	Continuous short to ground			

Excitation Current	
Excitation Voltage	Free programmable (16-bit DAC)
Predefined Levels	0, 2, 4, 8, 16, 44 mA
Accuracy	±0.1 % ±2 µA (<10 mA), ±0.5 % ±5 µA (>10 mA)
Bridge measurement	
Bridge Connection Types	full bridge strain, ½ bridge strain, ¼ bridge strain (3-wire)
Ranges	2...1000 mV/V free programmable
Internal Bridge Completion	½ bridge and ¼ bridge 120 and 350 Ω
Bridge Completion Accuracy	0.05 %; TCR: 5 ppm/K (others on request)
Internal Shunt Resistor	100 kΩ (others on request)
Shunt Resistor Accuracy	0.05 %; TCR: 10 ppm/K (others on request)
Input Short, Sensor Offset Adjust	Software-selectable
Additional Specifications	
Input connectors	DB9
TEDS support	Standard + DSI adapters
Power supply	12 - 48 V DC
Power Consumption	5.4 W, Max. 11.1 W (7.9 W 120 Ω @ 5 V load, 8.8 W 350 Ω @ 10 V load)
Weight	340 g
Slice Dimensions	128.4 x 115.4 x 30.1 mm

4.4.2. STG: DSUB-9 Connector

IOLITE-6xSTG module has 6 standard DSUB-9 female connectors for voltage or strain measurement.

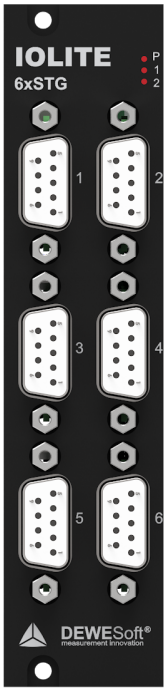
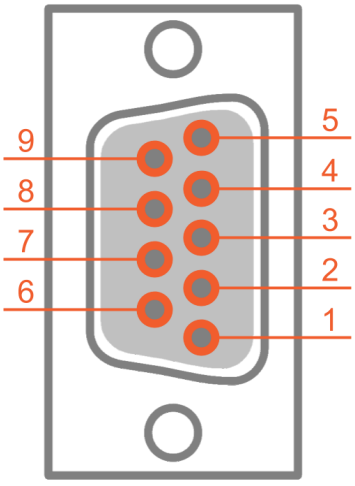


Illustration 36: *IOLITE 6xSTG front*

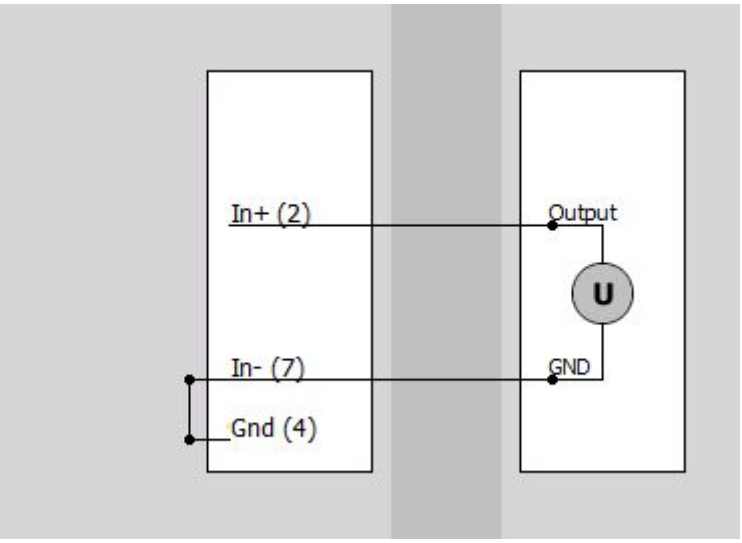
4.4.2.1. STG: DSUB-9 Connector: Pinout



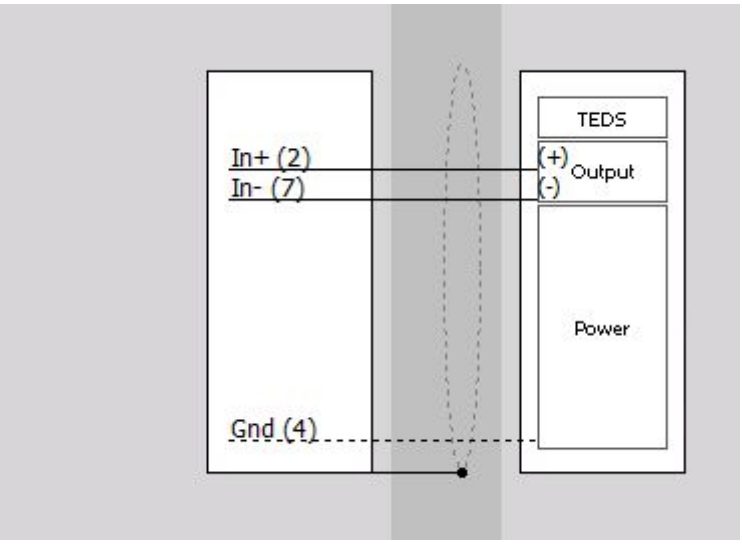
Pin	Name	Description
1	Exc+	Excitation+
2	In+	Input+
3	Sns-	Sense-
4	GND	Ground
5	R+	¼ Bridge / Shunt
6	Sns+	Sense+
7	In-	Input-
8	Exc-	Excitation-
9	TEDS	TEDS

4.4.2.2. STG: DSUB-9 Connector: Wiring diagram

4.4.2.2.1. STG: Voltage (single-ended)

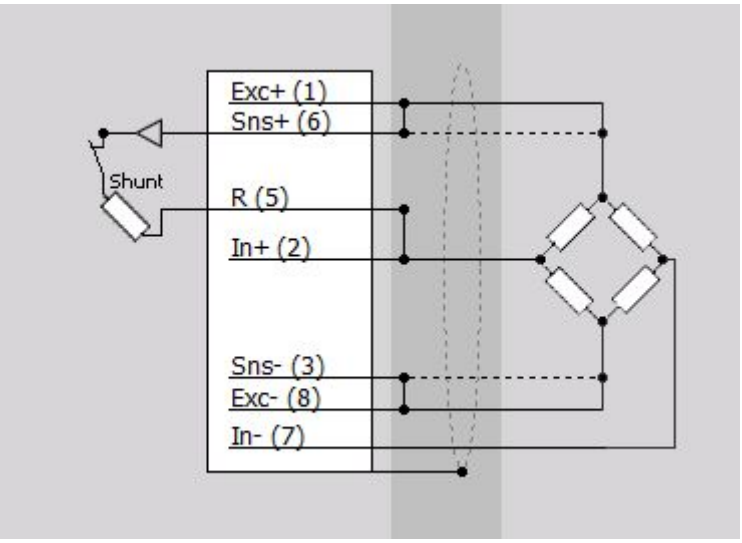


4.4.2.2.2. STG: Voltage (differential)

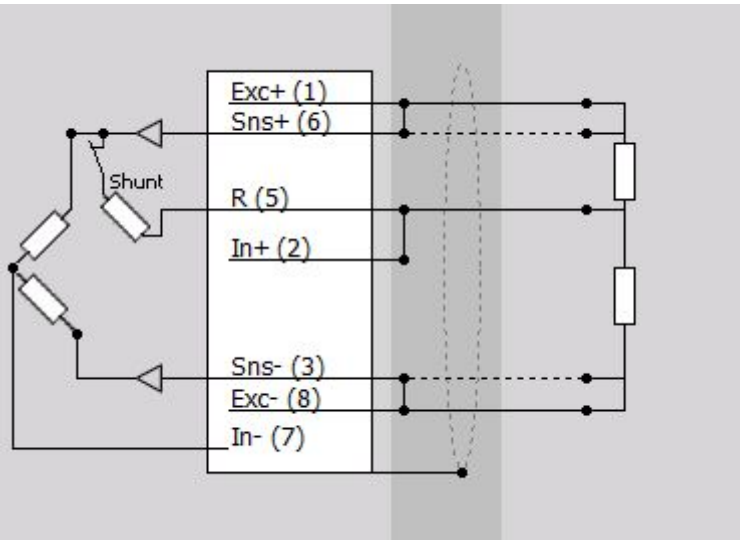


Important
Use only when the sensor is powered by the excitation voltage of the module.

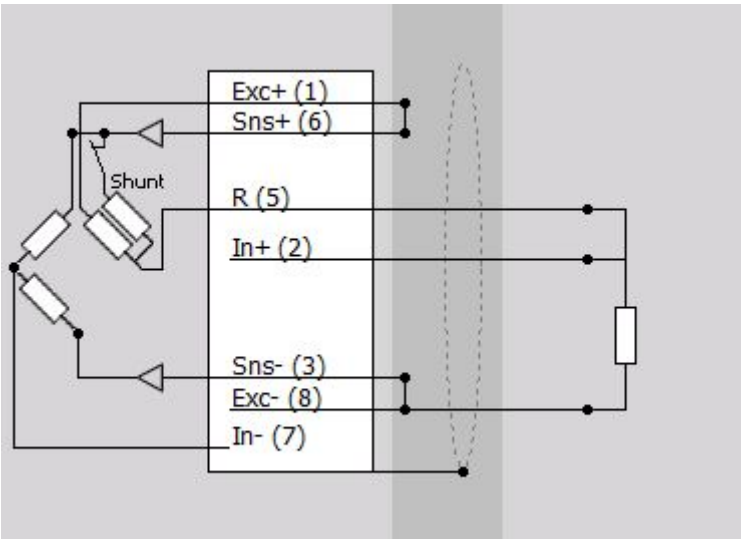
4.4.2.2.3. STG: Full-Bridge



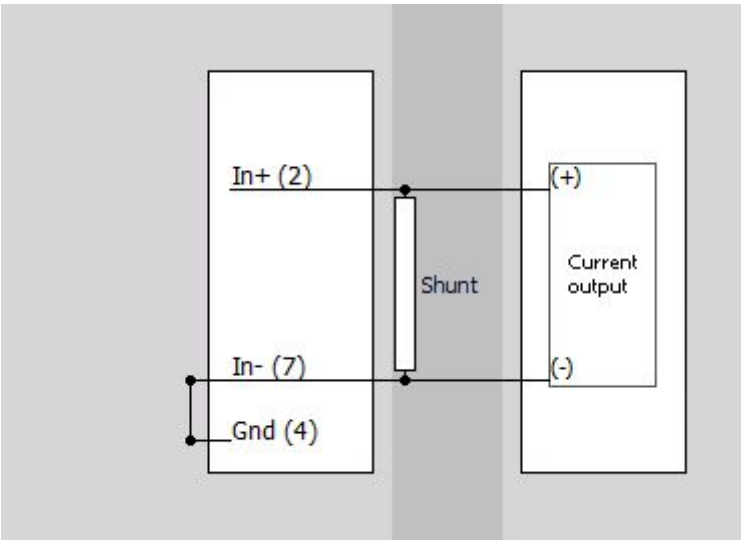
4.4.2.2.4. STG: Half-Bridge



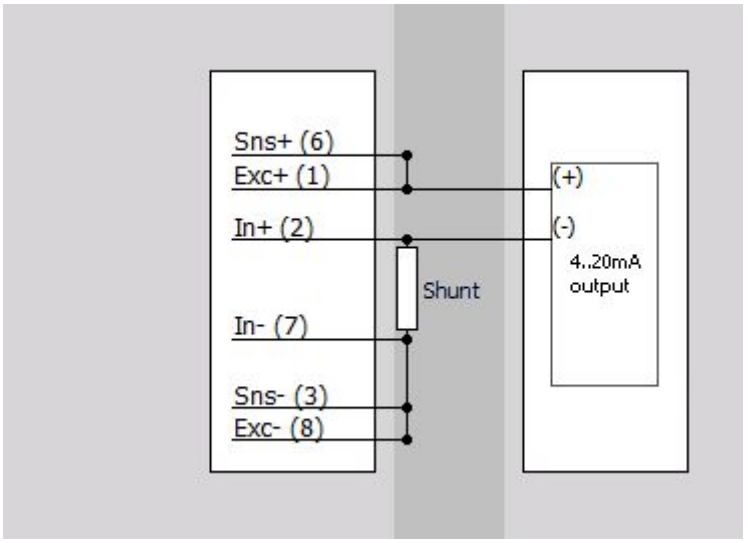
4.4.2.2.5. STG: Quarter-Bridge



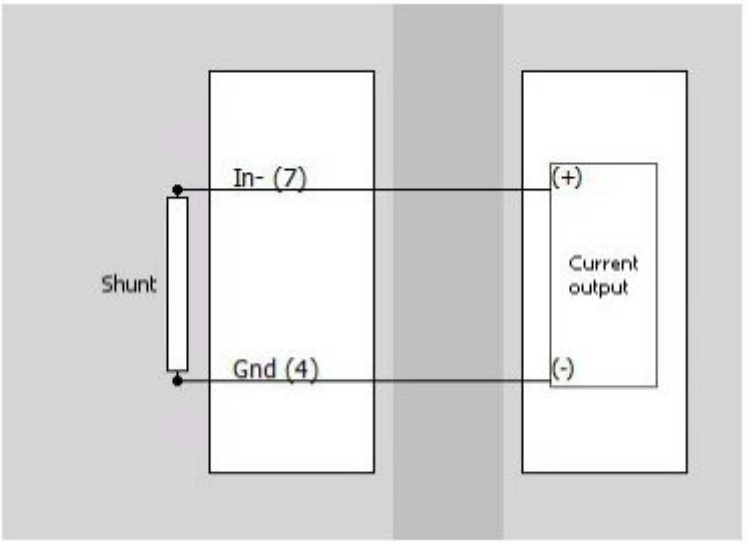
4.4.2.2.6. STG: Current (External direct shunt)



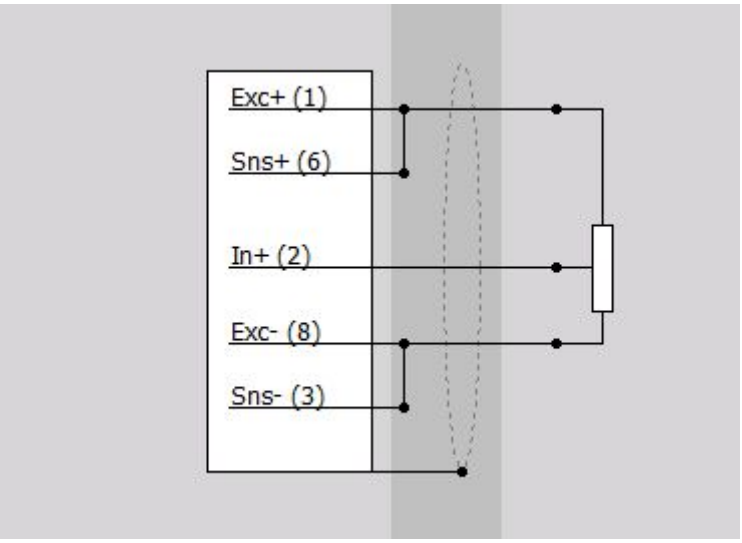
4.4.2.2.7. STG: Current (External loop powered shunt)



4.4.2.2.8. STG: Current (Internal shunt)



4.4.2.2.9. STG: Potentiometer



4.5. TH: Thermocouple Module

IOLITE TH modules are isolated DAQ devices for temperature measurements using thermocouples. Isolated thermocouple module can acquire data from any kind of thermocouple (K, J, T, R, S, N, E, C, B). It offers sensor break detection in software as well as using LED indicator.

Illustration 37: *IOLITE 8xTH module*

4.5.1. TH: Specifications

Inputs		
Input type	Isolated universal thermocouple and voltage	
Number of channels	8	
ADC Type	24-bit delta-sigma	
Sampling Rate	Simultaneous 100 S/sec	
Voltage Ranges	**±1 V**	**±100 mV**
Input Accuracy	±0.02 % of reading ±10 µV	±0.02 % of reading ±10 µV
Typical Noise floor @10/100 s/sec	115 dB / 106 dB	110 dB / 106 dB
Gain Drift	Typical 4 ppm/K (max. 10 ppm/K)	
Offset Drift	Typical 0.05 µV/K (max. 0.2 µV/K)	
Gain Linearity	<0.01%	
Input Coupling	DC	
Input Impedance	100 MΩ	
Thermocouple	TC Types: K, J, T, R, S, N, E, C, B	
Accuracy	±0.02 % of reading ±0.5 °C ±10 µV	
Resolution	< 0.001 °C	
Sampling rates	10, 20, 40, 80, 100 S/sec	
Typical Noise	0.007 °C RMS@Type K @ 10 S/sec 0.02 °C RMS@Type K @ 100 S/sec	
Additional Specifications		
Input connectors	Mini Thermocouple connector (copper)	
Isolation voltage	1000 Vpeak channel to ground & channel to channel	
Power supply	12 - 48 V DC	
Power consumption	3.2 W	
Weight	230 g	
Slice Dimensions	128.4 x 115.4 x 30.1 mm	

4.5.2. TH: Miniature Thermocouple Connector

IOLITEi-8xTH module has 8 miniature thermocouple-connectors for temperature measurement.

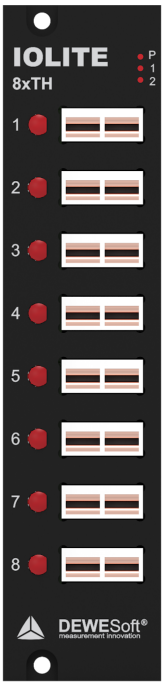
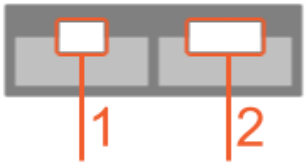


Illustration 38: *IOLITE 8xTH front*

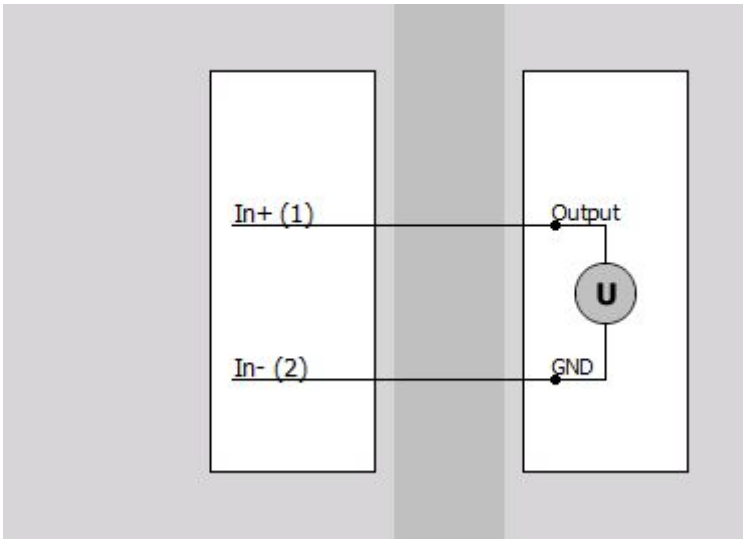
4.5.2.1. TH: Miniature Thermocouple Connector: Pinout



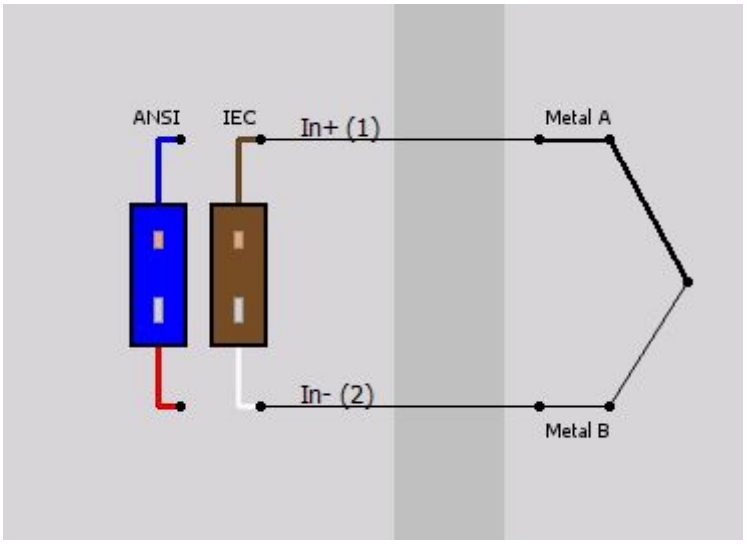
Pin	Name	Description
1	In+	Input+
2	In-	Input-

4.5.2.2. TH: Miniature Thermocouple Connector: Wiring diagram

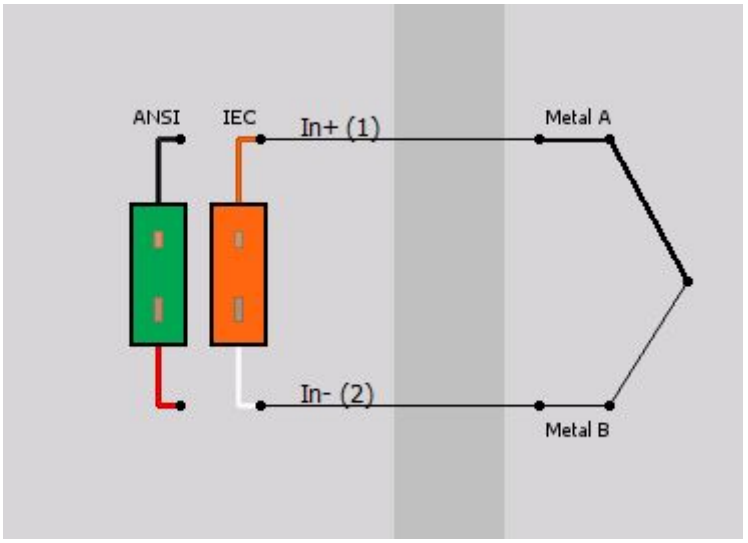
4.5.2.2.1. TH: Voltage



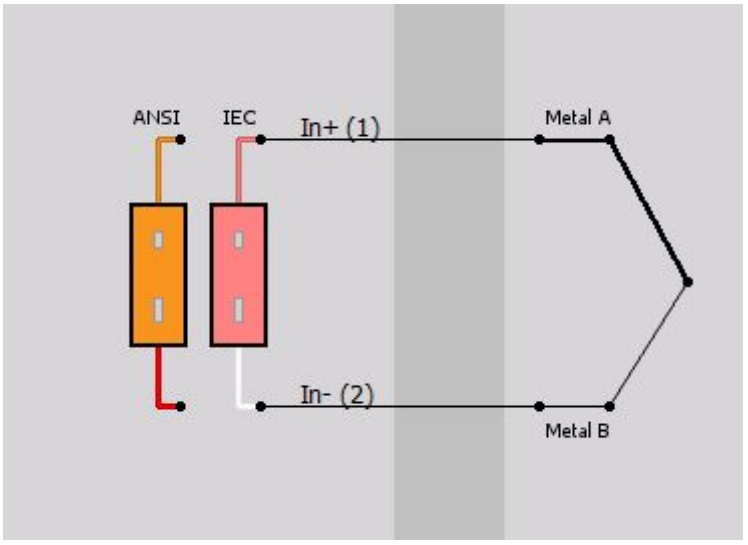
4.5.2.2.2. TH: Temperature (T-type thermocouple)



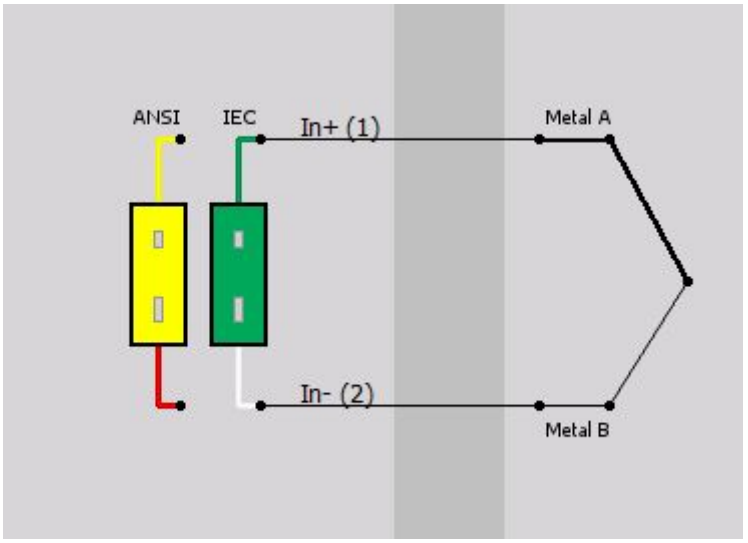
4.5.2.2.3. TH: Temperature (S-type, R-type thermocouple)



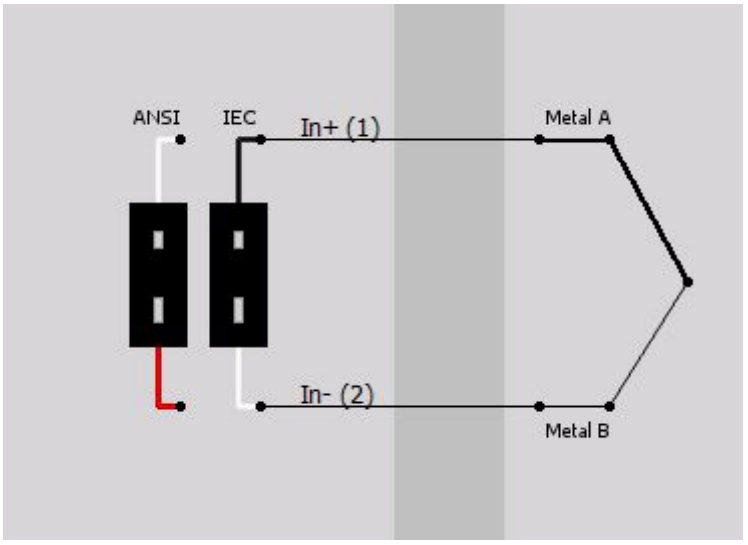
4.5.2.2.4. TH: Temperature (N-type thermocouple)



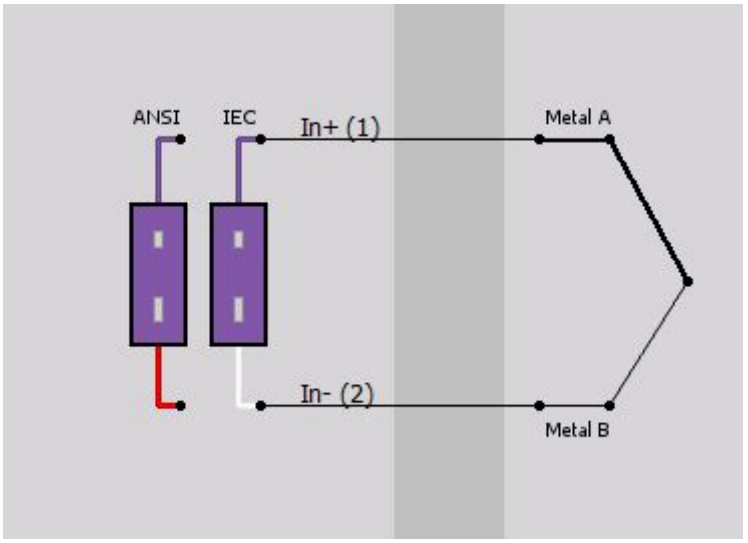
4.5.2.2.5. TH: Temperature (K-type thermocouple)



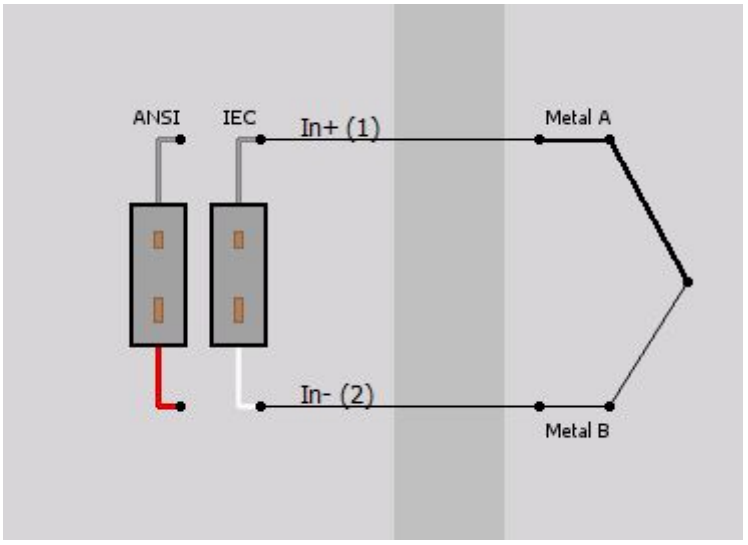
4.5.2.2.6. TH: Temperature (J-type thermocouple)



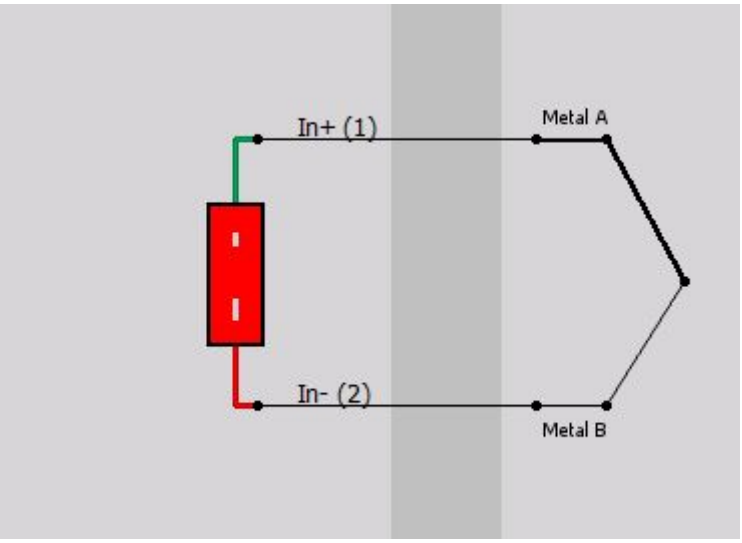
4.5.2.2.7. TH: Temperature (E-type thermocouple)



4.5.2.2.8. TH: Temperature (B-type thermocouple)



4.5.2.2.9. TH: Temperature (C-type thermocouple)



5. Accessories

Optional IOLITE® Accessories and Sensors (e.g. DSI®-adapters, Battery Packs, Current Clamps, etc.) can be found in a separate document, which is available for download from our homepage:
https://download.dewesoft.com/download-file/accessories-and-sensors-technical-reference-manual.pdf

In the *HW Manuals* section click the download link for the *Manual for DEWESoft Accessories and Sensors*.

6. Safety instructions

Your safety is our primary concern! Please be safe!

6.1. General Safety Instructions

Warning

The following general safety precautions must be observed during all phases of operation, service, and repair of this product. Failure to comply with these precautions or with specific warnings elsewhere in this manual violates safety standards of design, manufacture, and intended use of the product. Dewesoft d.o.o. assumes no liability for the customer's failure to comply with these requirements.

All accessories shown in this document are available as an option and will not be shipped as standard parts.

6.1.1. Environmental Considerations

Information about the environmental impact of the product.

6.1.2. Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

System and Components Recycling
Production of these components required the extraction and use of natural resources. The substances contained in the system could be harmful to your health and to the environment if the system is improperly handled at its end of life! Please recycle this product in an appropriate way to avoid an unnecessary pollution of the environment and to keep natural resources.

This symbol indicates that this system complies with the European Union's requirements according to Directive 2002/96/EC on waste electrical and electronic equipment (WEEE). Please find further information about recycling on the Dewesoft web site www.dewesoft.com

Restriction of Hazardous Substances
This product has been classified as Monitoring and Control equipment and is outside the scope of the 2002/95/EC RoHS Directive. However, we take care of our environment and the product is lead-free.

6.1.3. General safety and hazard warnings for all Dewesoft systems

Safety of the operator and the unit depend on following these rules.

- Use this system under the terms of the specifications only to avoid any possible danger.
- Read your manual before operating the system.
- Observe local laws when using the instrument.
- DO NOT touch internal wiring!
- DO NOT use higher supply voltage than specified!
- Use only original plugs and cables for harnessing.
- You may not connect higher voltages than rated to any connectors.
- The power cable and connector serve as Power-Breaker. The cable must not exceed 3 meters, the disconnect function must be possible without tools.
- Maintenance must be executed by qualified staff only.
- During the use of the system, it might be possible to access other parts of a more comprehensive system. Please read and follow the safety instructions provided in the manuals of all other components regarding warning and security advice for using the system.
- With this product, only use the power cable delivered or defined for the host country.
- DO NOT connect or disconnect sensors, probes or test leads, as these parts are connected to a voltage supply unit.
- Ground the equipment: For Safety Class 1 equipment (equipment having a protective earth terminal), a non-interruptible safety earth ground must be provided from the mains power source to the product input wiring terminals.
- Please note the characteristics and indicators on the system to avoid fire or electric shocks. Before connecting the system, please read the corresponding specifications in the product manual carefully.
- The inputs must not unless otherwise noted (CATx identification), be connected to the mains circuit of category II, III and IV.
- The power cord separates the system from the power supply. Do not block the power cord, since it has to be accessible for the users.
- DO NOT use the system if equipment covers or shields are removed.
- If you assume the system is damaged, get it examined by authorized personnel only.
- Adverse environmental conditions are Moisture or high humidity Dust, flammable gases, fumes or dissolver Thunderstorm or thunderstorm conditions (except assembly PNA) Electrostatic fields, etc.
- The measurement category can be adjusted depending on module configuration.
- Any other use than described above may damage your system and is attended with dangers like short-circuiting, fire or electric shocks.
- The whole system must not be changed, rebuilt or opened.
- DO NOT operate damaged equipment: Whenever it is possible that the safety protection features built into this product have been impaired, either through physical damage, excessive moisture, or any other reason, REMOVE POWER and do not use the product until the safe operation can be verified by service-trained personnel. If necessary, return the product to Dewesoft sales and service office for service and repair to ensure that safety features are maintained.
- If you assume a more riskless use is not provided anymore, the system has to be rendered inoperative and should be protected against inadvertent operation. It is assumed that a more riskless operation is not possible anymore if the system is damaged obviously or causes strange

noises. the system does not work anymore. the system has been exposed to long storage in adverse environmental. the system has been exposed to heavy shipment strain.

- Warranty void if damages caused by disregarding this manual. For consequential damages, NO liability will be assumed!
- Warranty void if damage to property or persons caused by improper use or disregarding the safety instructions.
- Unauthorized changing or rebuilding the system is prohibited due to safety and permission reasons (CE).
- Be careful with voltages >25 VAC or >35 VDC! These voltages are already high enough in order to get a perilous electric shock by touching the wiring.
- The product heats during operation. Make sure there is adequate ventilation. Ventilation slots must not be covered!
- Only fuses of the specified type and nominal current may be used. The use of patched fuses is prohibited.
- Prevent using metal bare wires! Risk of short circuit and fire hazard!
- DO NOT use the system before, during or shortly after a thunderstorm (risk of lightning and high energy over-voltage). An advanced range of application under certain conditions is allowed with therefore designed products only. For details, please refer to the specifications.
- Make sure that your hands, shoes, clothes, the floor, the system or measuring leads, integrated circuits and so on, are dry.
- DO NOT use the system in rooms with flammable gases, fumes or dust or in adverse environmental conditions.
- Avoid operation in the immediate vicinity of high magnetic or electromagnetic fields, transmitting antennas or high-frequency generators, for exact values please refer to the enclosed specifications.
- Use measurement leads or measurement accessories aligned with the specification of the system only. Fire hazard in case of overload!
- Do not switch on the system after transporting it from a cold into a warm room and vice versa. The thereby created condensation may damage your system. Acclimatise the system unpowered to room temperature.
- Do not disassemble the system! There is a high risk of getting a perilous electric shock. Capacitors still might be charged, even if the system has been removed from the power supply.
- The electrical installations and equipment in industrial facilities must be observed by the security regulations and insurance institutions.
- The use of the measuring system in schools and other training facilities must be observed by skilled personnel.
- The measuring systems are not designed for use in humans and animals.
- Please contact a professional if you have doubts about the method of operation, safety or the connection of the system.
- Please be careful with the product. Shocks, hits and dropping it from already- lower level may damage your system.
- Please also consider the detailed technical reference manual as well as the security advice of the connected systems.
- This product has left the factory in safety-related flawless and in proper condition. In order to maintain this condition and guarantee safety use, the user has to consider the security advice and warnings in this manual.

7. Notice

The information contained in this document is subject to change without notice.

Note:
Dewesoft d.o.o. shall not be liable for any errors contained in this document. Dewesoft MAKES NO WARRANTIES OF ANY KIND WITH REGARD TO THIS DOCUMENT, WHETHER EXPRESS OR IMPLIED. DEWESOFT SPECIFICALLY DISCLAIMS THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. Dewesoft shall not be liable for any direct, indirect, special, incidental, or consequential damages, whether based on contract, tort, or any other legal theory, in connection with the furnishing of this document or the use of the information in this document.

7.1. Warranty Information

The copy of the specific warranty terms applicable to your Dewesoft product and replacement parts can be obtained from your local sales and service office. To find a local dealer for your country, please visit https://dewesoft.com/support/distributers.

7.2. Calibration

Every instrument needs to be calibrated at regular intervals. We recommend annual calibration. Before your Dewesoft data acquisition system is delivered, it is calibrated. Detailed calibration reports for your Dewesoft system can be requested. We retain them for at least one year, after system delivery.

7.3. Support

Dewesoft has a team of people ready to assist you if you have any questions or any technical difficulties regarding the system. For any support please contact your local distributor first or Dewesoft directly.

E-mail: support@dewesoft.com

Address:
Dewesoft d.o.o.
Gabrsko 11a
1420 Trbovlje Slovenia

Europe Tel.: +386 356 25 300
Web: http://www.dewesoft.com
The telephone hotline is available Monday to Friday from 07:00 to 16:00 CET (GMT +1:00)

7.4. Service/repair

The team of Dewesoft also performs any kinds of repairs to your system to assure a safe and proper operation in the future. For information regarding service and repairs please contact your local distributor first or Dewesoft directly on https://dewesoft.com/support/rma-service.

7.5. Restricted Rights

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7.6. Printing History

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7.7. Copyright

7.8. Trademarks

We take pride in our products and we take care that all key products and technologies are registered as trademarks all over the world.
The Dewesoft name is a registered trademark.
Product families (KRYPTON, SIRIUS, DSI, DS-NET, IOLITE) and technologies (DualCoreADC, SuperCounter, GrandView) are registered trademarks as well.
When used as the logo or as part of any graphic material, the registered trademark sign is used as a part of the logo.
When used in text representing the company, product or technology name, the ® sign is not used. The Dewesoft triangle logo is a registered trademark but the ® sign is not used in the visual representation of the triangle logo.

7.9. Documentation version

Doc-Version	Date [dd.mm.yyyy]	Notes
1.0.0	10.11.2019	Initial version