

TECHNICAL REFERENCE MANUAL

OBSIDIAN® V23-3



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2. About this document

This is the Technical Reference Manual for OBSIDIAN® Systems.

OBSIDIAN® embedded data acquisition system based on a low-power ARM processor with Linux-based open architecture. OBSIDIAN® can act like a standalone data logger, real-time control system, and signal conditioning frontend, all at the same time. Currently, it comes in standard and rugged form which can be equipped with a wide range of different amplifiers so you can use it for virtually any measurement task. Each system also includes a professional license for our award-winning DewesoftX® data acquisition software.

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

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

2.1. Legend

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



Important

It gives you important information about the subject.
Please read carefully!



Hint

It gives you a hint or provides additional information about a subject.



Example

It gives you an example of 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.

2.2. Online versions

2.2.1. OBSIDIAN® Technical Reference Manual

The most recent version of this manual can be downloaded from our homepage:

<https://dewesoft.com/download/manuals>

In the *Hardware Manuals* section click the download link for the *OBSIDIAN® technical reference manual*.

2.2.2. IOLITE® Technical Reference Manual

The most recent version of this manual can be downloaded from our homepage:

<https://dewesoft.com/download/manuals>

In the *Hardware Manuals* section click the download link for the *IOLITE® technical reference manual*.

2.2.3. DewesoftX® User Manual

The DewesoftX® User Manual document provides basics and additional information and examples for working with DewesoftX® and certain parts of the program.

The latest version of the DewesoftX® tutorials can be found here:

<https://dewesoft.com/download/manuals>

In the Software Manuals section click the download link of the DewesoftX's User Manual entry.



Important

Read safety instructions first in chapter [9. Safety instructions](#).

3. Getting started

This chapter will help you to install the software, connect your OBSIDIAN® system to the PC via GLAN or EtherCAT®, and show you how to configure the device inside DewesoftX® software.

To follow these steps, you need the following items:

- your brand new OBSIDIAN® system (included in the shipment)
- your network cable (included in the shipment)
- your PC with Windows 10

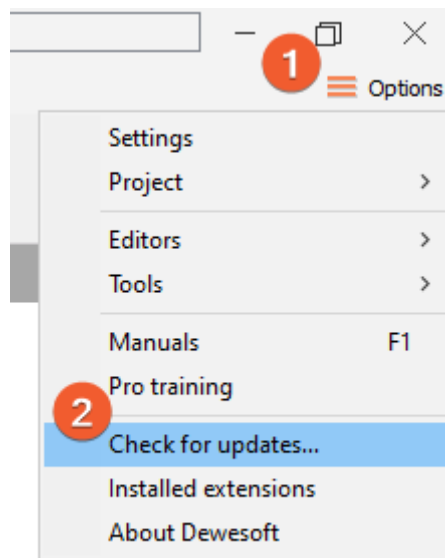
Hint



As OBSIDIAN® is a new platform device and its software functionalities are still improving therefore we recommend using the latest Release, Release Candidate or Development versions of DewesoftX® with the newest compatible FW version. For more information please contact our support team.

3.1. Software installation

For optimal working, we recommend that you install the latest version of DewesoftX®. If you already have DewesoftX® installed, please check if a newer version is already available. You can either check for this on the [Dewesoft website](#) under the “Support -> Dewesoft Downloads” section or directly in the software under the “Options -> Check for updates”. In both cases, the full changelog is included.



Check for updates

3.2. OBSIDIAN® device connection options

OBSIDIAN® is a multifunctional device that can be utilized either as a standalone data logging device or as a EtherCAT device (behaves same as an IOLITE device). These two modes exhibit significant differences in terms of hardware connection, software configuration, supported software options, and more. The two possible configuration modes are:

- **Standalone mode** - when used as a standalone device, the software on the embedded Linux system is controlling the OBSIDIAN device therefore the device can acquire/store data without DeweosofX software. DeweosofX software is only required for device configuration. To start the configuration, the device needs to be connected to the PC over a GLAN connector.

When connected over GLAN, also the other device modules are enabled, for signal conditioning:

- CAN output RT
 - XCP output RT
 - Analog output RT
- **Disable standalone mode (Switches to standard EtherCAT mode)** - when used as a standard EtherCAT device, first you need to connect the device over GLAN connector and disable standalone mode. When still connected over GLAN you will only see CAN and GPS module. Connect the device over 8-pin Lemo EtherCAT connector to the PC, for proper usage. In this mode the OBSIDIAN® device behaves the same way as our IOLITE device. For additional information please refer to the IOLITE manual.

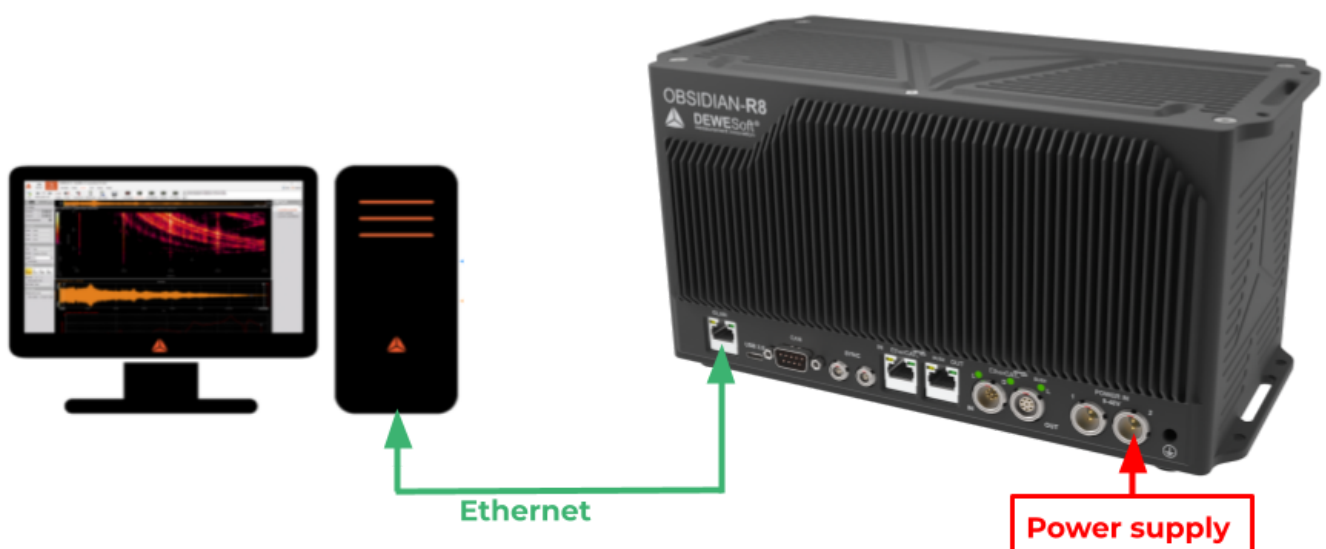
Important



This manual will mostly focus on the **Standalone mode**. Only configuration and features related to the standalone mode will be described. For more information regarding the behavior, functionality and features of IOLITE device please refer to the IOLITE manual.

3.3. Connecting OBSIDIAN® device in standalone mode

First connect the power supply cable (PS-120-L1B2f) to the PWR IN 2-pin LEMO male connector. Then connect the Ethernet Cable with the RJ-45 connector to the appropriate GLAN connector on the back of the OBSIDIAN® device. Finally, connect the other side of the ethernet cable to the LAN port of the PC.



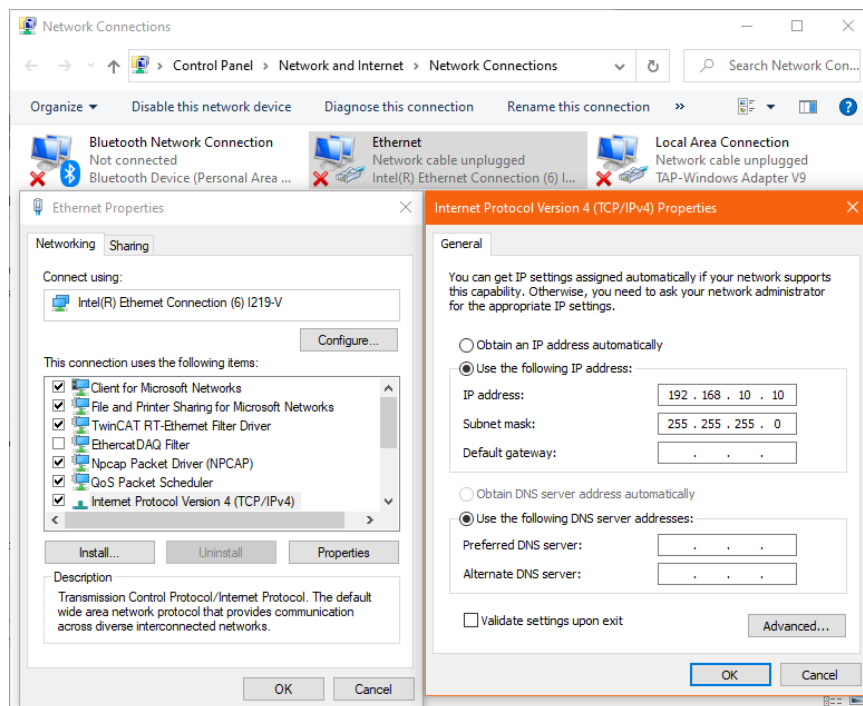
Connection of the OBSIDIAN® to a PC

3.3.1. Ethernet configuration on the PC

In order to access the OBSIDIAN® over as a GLAN, you have to set a static address on your Network Card. The static address should be part of the same subnet as the address of the device.

Lets say that the *device IP address* is 192.168.10.1, then you need to set up the following settings on your *PC's network card*:

- define the IP address (e.g. 192.168.10.10)
- define the Subnet mask (e.g. 255.255.255.0)



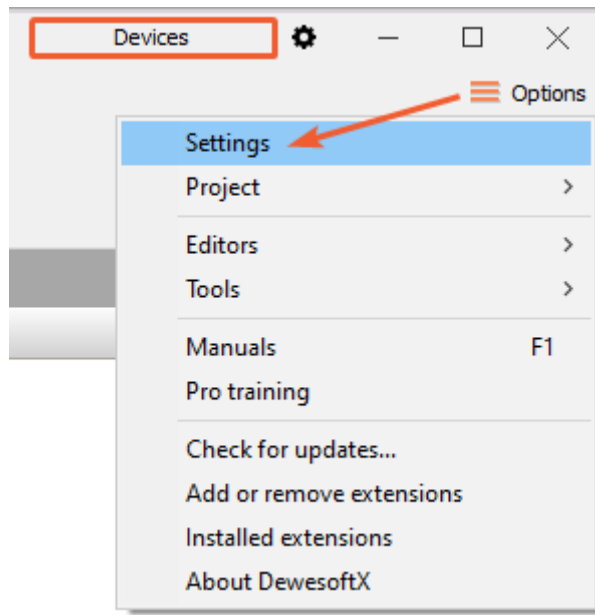
Setting up IP address of network card

3.3.2. DewesoftX settings OBSIDIAN®

In this chapter we will describe how to add the OBSIDIAN® device to DewesoftX, how to reach all the Device properties in HW settings and how to adjust the synchronization of the connected system.

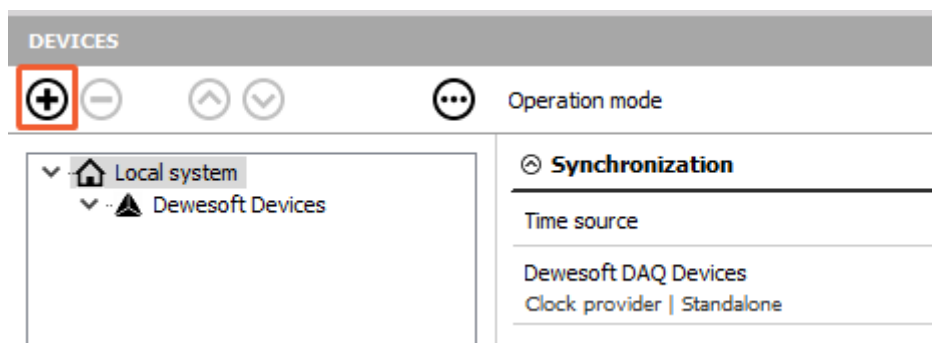
3.3.2.1. Add OBSIDIAN® device to DewesoftX®

The properly connected devices will be listed under detected network devices in the HW settings, even if the device have incorrect network settings. To reach HW settings click on the Options button at the top right corner, and then on the Settings item in the pop-up or simply click on the Devices status button on top of the DewesoftX screen.



DewesoftX® settings

Press the (+) button under the Devices menu to reach the configuration window, where you can select which device or device plugin you want to add to your system. By enabling “Add multiple” option you can add multiple devices or device plugins at once.



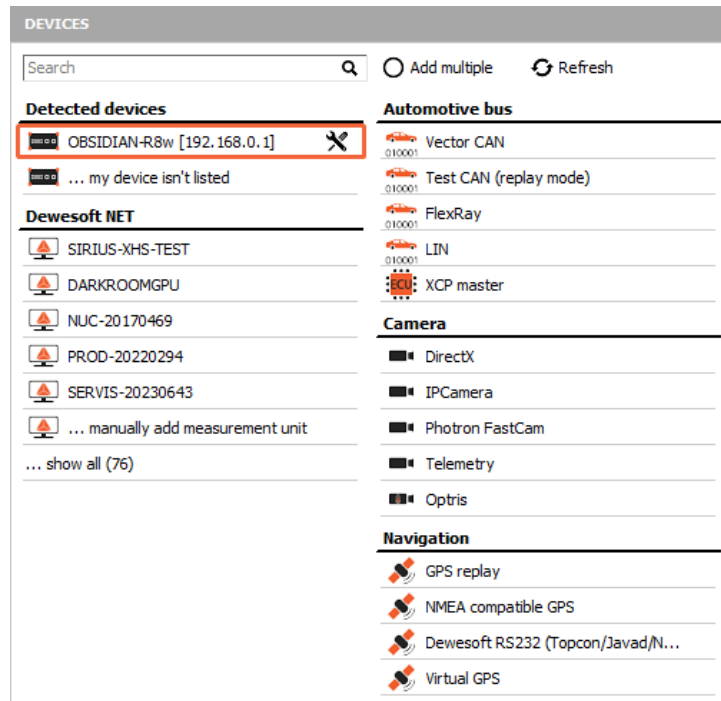
Adding new network devices in HW settings

All the network devices will be listed under the “Detected devices” section. All devices will be detected, even the ones that can not be added to your system because of network incompatibilities. The reason that you can not add the device to your system can be:

- The device is in use by another Client (DewesoftX or DewesoftM)
- The device is in a different subnet

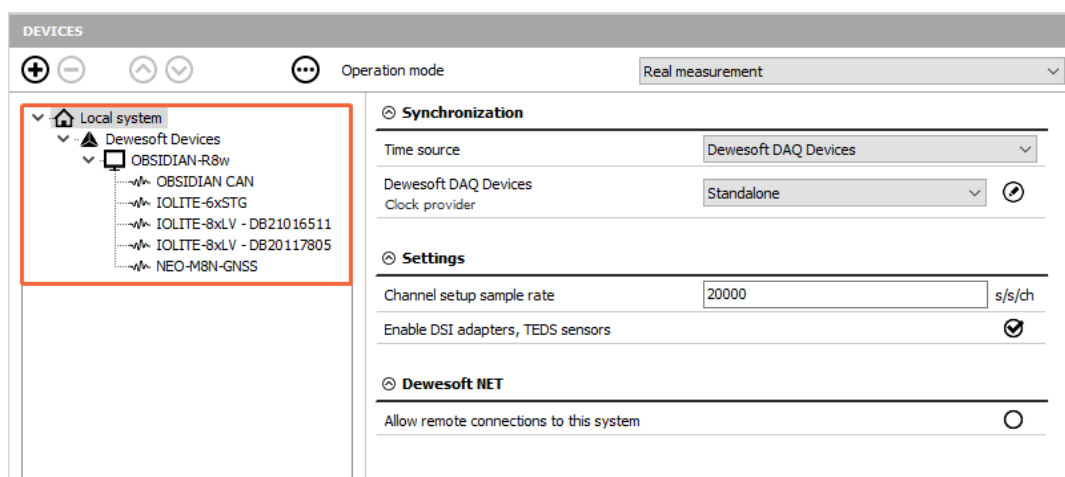
All the information regarding the device will be listed at the bottom of the window that appears after you press the plus button. To change the configuration of the device (such as IP address), simply click on the configuration button right next to the device name and IP address. Additional window will appear, where you can change device properties.

To add the device simply click on the wanted device in Detected devices list. If you want to add multiple devices at once enable the “Add multiple” option first.



Adding OBSIDIAN® device in HW-setup

Once the OBSIDIAN® device is properly added it will be listed under the HW devices. Each connected IOLITE module/card will be presented separately in the list in sequential order. The first module OBSIDIAN CAN represents the two already integrated CAN ports on the OBSIDIAN® device. If a GPS module is connected or integrated it will also appear as the last module.



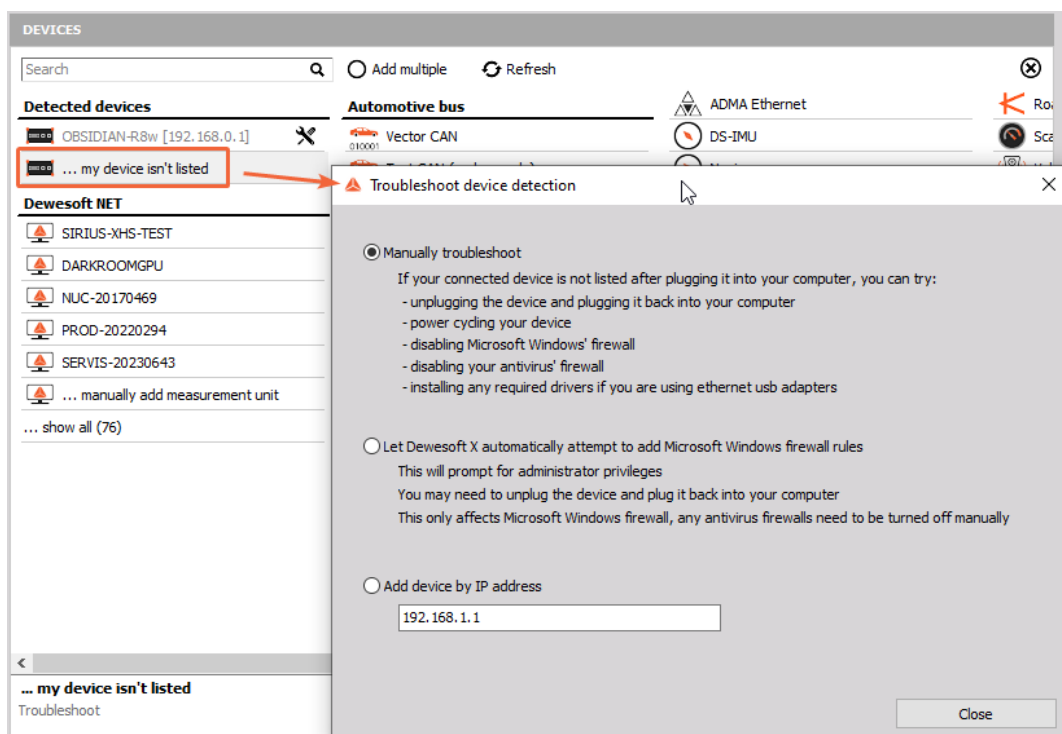
OBSIDIAN device in HW settings

3.3.2.2. OBSIDIAN device is not detected

If the OBSIDIAN® device is still not detected, please check Windows firewall settings. If your firewall is turned on and you didn't add DewesoftX to exceptions during its installation, create a new "Inbound Rule" for connections with TCP (port 30002) or UDP (port 30004) protocol, either one works. The full instructions can be found on the Freshdesk solution portal.

This can also be done automatically over DewesoftX software. By clicking the "... my device isn't listed" option Troubleshoot device detection menu will appear. You can select the second option for automatic attempt to add Microsoft Windows firewall rules.

If the device is not recognized also after performing this steps, please check your PC for any other Anti-Virus or Firewall softwares that can block your device.



Troubleshoot device detection menu

3.3.2.3. Synchronization of the connected system

When the device is already added in DewesoftX software you need to go to the Local system settings, under Synchronization you can adjust the synchronization configuration for the connected system. When running as a standalone device, no additional synchronization is needed and the settings can be left on "Automatic". In combination with other DewesoftX devices you can use IRIG synchronization.

Curenlty supported synchronization option:

- IRIG (slave & master)
- External GPS-PPS

3.3.2.4. Device properties

By clicking on OBSIDIAN device inside the device list, you will see the device information such as device serial number, IP address, HW version, FW version, current operation mode and other information. Under Network settings you can again reach the device network settings and change the IP address of the currently connected device.

Under the EtherCAT settings we have two options:


- **Disable standalone mode** - the options configure the device to work in standard EtherCAT mode. Please go to Chapter [3.5. Connecting OBSIDIAN® device in standard EtherCAT mode](#) for more information.
- **Enable control over scan cycle frequency** - this option offers quicker response times [1 ms loop time for AO RT module] when signal conditioning is used. When this mode is enabled, storing of the data on the device is not recommended.

OBSIDIAN-R8

Device name	OBSIDIAN-R8w
Device location	Testing device
IP address	192.168.10.1
Serial number	00000000
Hardware version	0.0.0.0
Firmware version	2.8.0.08120100
Connection type	Ethernet
Real-time mode	Not running

⊙ Network settings

Configure network settings



⊙ EtherCAT settings

Disable standalone mode
Switches to standard EtherCAT mode

☒

Enable control over scan cycle frequency
Reduces AI to AO delay

☐

Scan cycle frequency

10

Hz

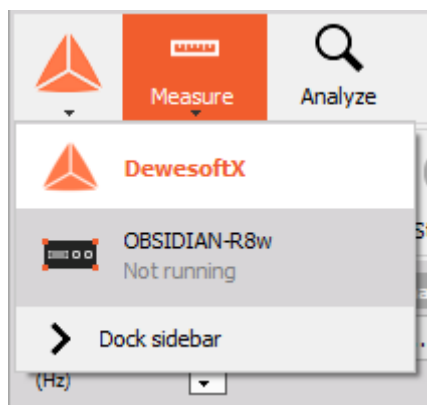
OBSIDIAN-R8 informations

Additionally you have settings for:

- **Cross triggers** - when you have multiple devices connected over Network and you want one start or stop trigger to affect all the devices. This setting is the same as for DewesoftNET Cross trigger functionality. All the connected devices need to be in the same Multicast group.
- **Advanced** - the advanced options are mostly used for debugging purpose.

3.3.3. Channel Setup OBSIDIAN®

Once you switch to channel setup there are two different views, that are shown in the collapsable sidebar on the left side of DewesoftX software. To access the sidebar you need to press the Logo button on the left side of software. By enabling the Dock sidebar option, you will always have a preview of connected devices.



View Sidebar

- **DewesoftX view** (normal mode) - reflects the setup which is related to DewesoftX software on the PC. Option to add all the calculations that are performed via software.
- **Device view** (Dark mode) - reflects the setup which is related to the device. Only reflects properties and modules (GPS, System Monitor, CAN, CNT, etc) which are only related to the device. Additional Math modules, which are only calculated via software can not be added in this view. On the top of the window you will see the IP address of the device you are currently configuring.

The screenshot displays the DewesoftX software interface for channel setup. The top bar shows 'OBSIDIAN-R8w 192.168.0.11' and a 'Devices' button. The sidebar on the left contains 'DewesoftX' and 'OBSIDIAN-R8w Not running'. The main window features a control bar with buttons like Start, Stop, Storing, Sys. mon., Analog in, CAN, GPS, More..., and Remove. Below this is the 'Acquisition rate' section with a value of 20000 [Hz]. A search bar is present above a table of channels. The table has columns: ID, Used, Stored, Sample rate, Name, Ampl. name, Range, and Measurement. The table lists 24 channels (A-1 to C-6) with various sample rates and measurement types. A red arrow points to the 'OBSIDIAN-R8w Not running' status in the sidebar. A 'Collapse sidebar' button is located at the bottom left of the sidebar.

ID	Used	Stored	Sample rate	Name	Ampl. name	Range	Measurement
A-1	Used	Store	20000	AI A-1	IOLITE-8xACC	5 V	Voltage
A-2	Used	Store	20000	AI A-2	IOLITE-8xACC	5 V	Voltage
A-3	Used	Store	20000	AI A-3	IOLITE-8xACC	5 V	Voltage
A-4	Used	Store	20000	AI A-4	IOLITE-8xACC	5 V	Voltage
A-5	Used	Store	20000	AI A-5	IOLITE-8xACC	5 V	Voltage
A-6	Used	Store	20000	AI A-6	IOLITE-8xACC	5 V	Voltage
A-7	Used	Store	20000	AI A-7	IOLITE-8xACC	5 V	Voltage
A-8	Used	Store	20000	AI A-8	IOLITE-8xACC	5 V	Voltage
B-1	Used	Store	20000	AI B-1	IOLITE-STG	10 V	Voltage
B-2	Used	Store	20000	AI B-2	IOLITE-STG	10 V	Voltage
B-3	Used	Store	20000	AI B-3	IOLITE-STG	10 V	Voltage
B-4	Used	Store	20000	AI B-4	IOLITE-STG	10 V	Voltage
B-5	Used	Store	20000	AI B-5	IOLITE-STG	10 V	Voltage
B-6	Used	Store	20000	AI B-6	IOLITE-STG	10 V	Voltage
C-1	Used	Store	20000	AI C-1	IOLITE-STGS	2 mV/V	Bridge
C-2	Used	Store	20000	AI C-2	IOLITE-STGS	2 mV/V	Bridge
C-3	Used	Store	20000	AI C-3	IOLITE-STGS	2 mV/V	Bridge
C-4	Used	Store	20000	AI C-4	IOLITE-STGS	2 mV/V	Bridge
C-5	Used	Store	20000	AI C-5	IOLITE-STGS	2 mV/V	Bridge
C-6	Used	Store	20000	AI C-6	IOLITE-STGS	2 mV/V	Bridge

Channel setup - DewesoftX and Device view

On both views you have the Analog In modules, where you see all the channels of the connected devices. On the Device view you see less channel properties as on the DewesoftX view, but all same properties are linked, meaning that changing one parameter on one view changes the same parameter on the other view. For more detailed information and a signal preview, you can enter the channel setup by clicking on the Setup button in the DS-Grid.

Dynamic acquisition rate can only be set on the DewesoftX view. The sampling rate will be set according to the Dynamic acquisition rate for all connected IOLITE® slices inside the OBSIDIAN® device, only up to the max of each module. The maximum sampling rate for an OBSIDIAN® device is 20kHz but differs for different IOLITE DAQ modules. The maximum sample rates of IOLITE DAQ modules are written in the data sheets in chapter [5.Module overview](#).

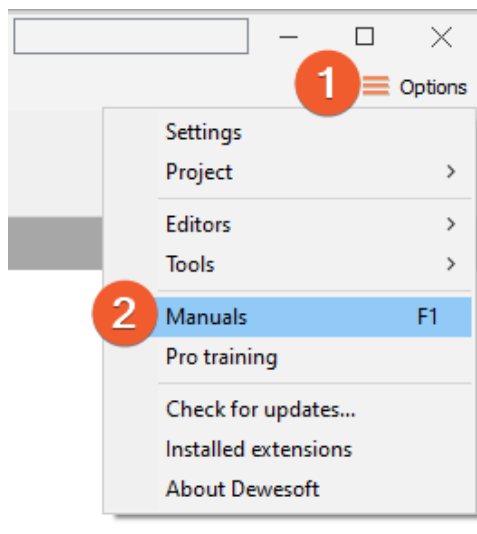
3.4. Simple measurement

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

3.4.1. Help - Manual

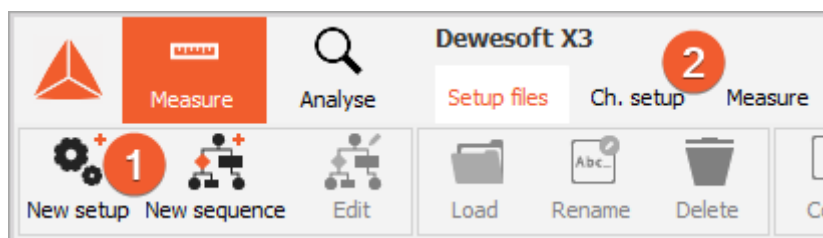
Note that this document is just a quick start guide. For detailed information about DewesoftX® consult the Online Manual or contact our support team. To open the manual press the F1 button or click on the

Options button ❶ and then select Manual from the pop-up menu ❷.



Help - Manual

When DewesoftX® has started up, you will be in Measure mode and see the Setup files list or you can create a New setup ❶. Click on Ch. setup (on the right of Setup files) to switch to the Channel setup mode ❷. In the channel setup, you can see a preview of the connected devices on the upper left side.



Setup files

3.4.2. Analog-in channel setup

Inside the Analog-in module in channel setup all the available channels from the connected device will be listed. This is where you can adjust amplifier properties such as range, measurement type, etc. For more detailed information and a signal preview, you can enter the channel setup by clicking on the Setup button in the DS-Grid.

Currently only linear sensors can be used with the OBSIDIAN® devices, including sensors with TEDS chips. Non-linear sensors are not yet supported and if such sensor is connected to the amplifier the "Not-supported" warning will appear in DS-Grid on the corresponding channel. In this case only the raw sensor value will be stored.

ID	Used	C	Name	Ampl. name	Range	Measurement	Min	Values	Max
A-1	Used		AI A-1	IOLITE-STG	1 V	Voltage	-1.00	AVG 0.13718 Not supported: Non-linear scaling	1.00

Warning when the DSI-RTD sensor is connected



Important

Only Linear sensors are currently supported with OBSIDIAN device. When non-linear sensor is connected only raw-data is stored on the device. The sensor scaling can be applied in offline mode via Mathematical modules.



Important

OBSIDIAN® device doesn't support binary sample rates (such as 512, 1024), due to EtherCAT limitation.

3.4.3. Storing module on device

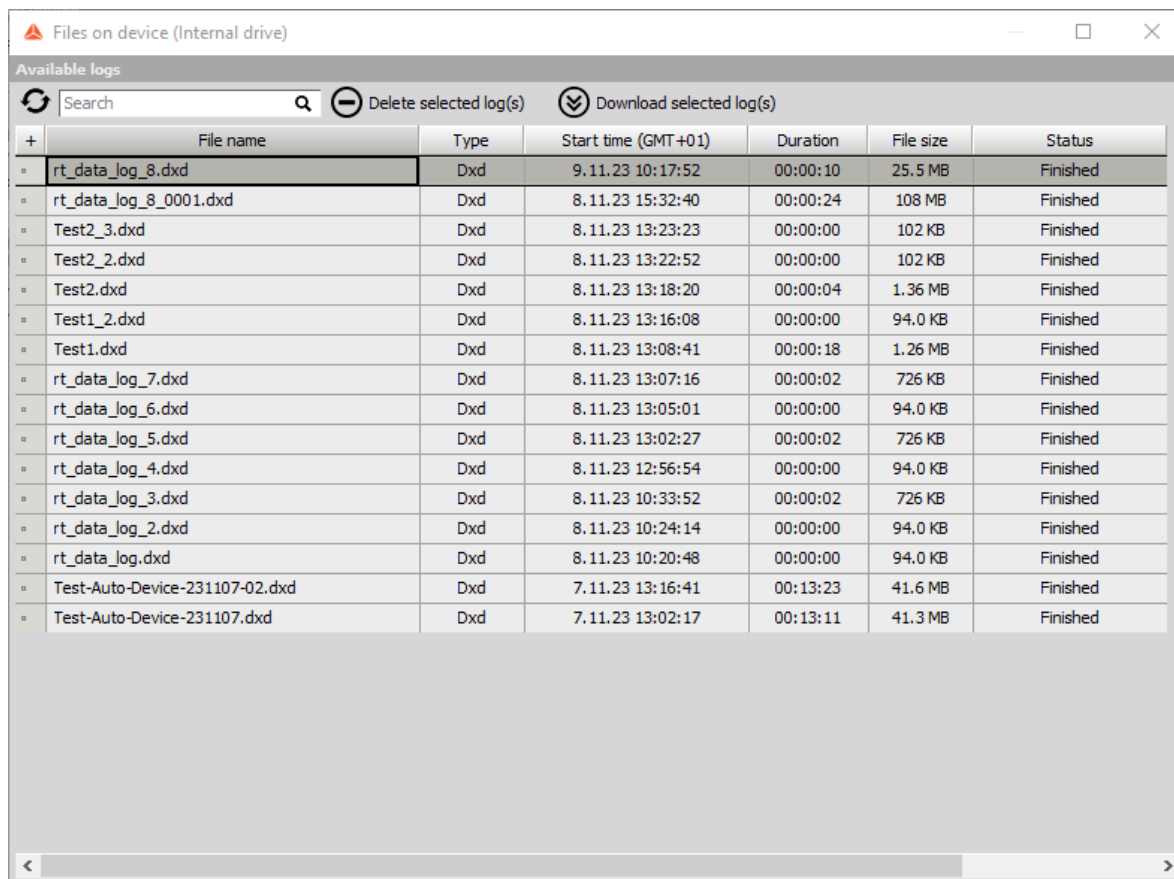
If you want to store data directly on the device or on any external drives connected to the device, first you need to enable the logging mode and properly define storing settings. These settings can be configured in the **Storing module**, when you are on the **Device preview**.

The screenshot displays the 'Storing' module configuration window for the OBSIDIAN-R8w device at IP 192.168.0.1. The window title bar includes 'Devices' and 'RT not running'. The main menu has tabs for 'Measure', 'Analyze', 'Setup files', 'Ch. setup', and 'Measure'. Below the menu is a toolbar with icons for 'Start', 'Stop', 'Storing', 'Sys. mon.', 'Analog in', 'CAN', 'GPS', 'More...', and 'Remove'. The 'Storing' section shows the number of stored channels: AI: 22, CAN: 1, GPS: 7, System Monitor: 10. It lists two storage locations: 'Internal drive' (461 / 3265 MB, 14.1%) and 'SD Card' (442 / 28991 MB, 1.5%), each with 'Eject' and 'Browse' buttons. The 'Storing options' section includes 'Storing type' (Fast on trigger), 'Storing location' (Internal drive), 'File name' (rt_data_log), 'No storing limit' (1 MB), and 'Stop when disk 90% full'. The 'Trigger setup' section has checkboxes for 'Pre time', 'Post time', 'Holdoff time', 'Cross trigger', and 'Send and receive stop trigger'. The 'Start trigger setup' and 'Stop trigger setup' sections allow for defining 'Start storing conditions' and 'Stop storing conditions' using a visual editor with '+' and '-' buttons. A 'Don't store' conditions section is also present at the bottom.

Logger RT module setup

On the top of the setup screen number of stored channels separated in different channel groups are presented.

Next all the currently available drives (internal and external) are shown. When the three dotted button (Browse) next to the drive is clicked, additional window is opened with the list of already stored files on the device. The files on the device can be deleted or downloaded from this view.



The screenshot shows a window titled "Files on device (Internal drive)". Inside, there's a section "Available logs" with a search bar and two buttons: "Delete selected log(s)" and "Download selected log(s)". Below this is a table with the following columns: File name, Type, Start time (GMT+01), Duration, File size, and Status. The table contains 17 rows of log files, all with a status of "Finished".

File name	Type	Start time (GMT+01)	Duration	File size	Status
rt_data_log_8.dxd	Dxd	9.11.23 10:17:52	00:00:10	25.5 MB	Finished
rt_data_log_8_0001.dxd	Dxd	8.11.23 15:32:40	00:00:24	108 MB	Finished
Test2_3.dxd	Dxd	8.11.23 13:23:23	00:00:00	102 KB	Finished
Test2_2.dxd	Dxd	8.11.23 13:22:52	00:00:00	102 KB	Finished
Test2.dxd	Dxd	8.11.23 13:18:20	00:00:04	1.36 MB	Finished
Test1_2.dxd	Dxd	8.11.23 13:16:08	00:00:00	94.0 KB	Finished
Test1.dxd	Dxd	8.11.23 13:08:41	00:00:18	1.26 MB	Finished
rt_data_log_7.dxd	Dxd	8.11.23 13:07:16	00:00:02	726 KB	Finished
rt_data_log_6.dxd	Dxd	8.11.23 13:05:01	00:00:00	94.0 KB	Finished
rt_data_log_5.dxd	Dxd	8.11.23 13:02:27	00:00:02	726 KB	Finished
rt_data_log_4.dxd	Dxd	8.11.23 12:56:54	00:00:00	94.0 KB	Finished
rt_data_log_3.dxd	Dxd	8.11.23 10:33:52	00:00:02	726 KB	Finished
rt_data_log_2.dxd	Dxd	8.11.23 10:24:14	00:00:00	94.0 KB	Finished
rt_data_log.dxd	Dxd	8.11.23 10:20:48	00:00:00	94.0 KB	Finished
Test-Auto-Device-231107-02.dxd	Dxd	7.11.23 13:16:41	00:13:23	41.6 MB	Finished
Test-Auto-Device-231107.dxd	Dxd	7.11.23 13:02:17	00:13:11	41.3 MB	Finished

Files on device preview

To start preparing the device setup first, you need to select storing type between:

- **Off** - if the storing module is not enabled, the data will not be stored on the device.
- **Always fast** - all the data is stored on the device.
- **Always slow** - only reduced/statistic data is stored on the device (min, max, avg, rms).
- **Fast on trigger** - all the data is stored on the device, based on a trigger condition. If multiple triggers occur this will end as one file with gaps between trigger conditions.
- **Fast on trigger, slow otherwise** - all the data will be stored on a trigger condition. When the trigger is not active only reduced data will be stored.



Hint

Once the storing is actually enabled, the drive where the data should be stored can be selected.

In the Storing settings you can also define:

- **Name** of the data file with the option of adding a suffix
- **Stop storing after** - You can define the amount of data either in MB, the format of time or number of trigger events.

- **Make a new file after** - You can define the amount of data either in MB the format of time or number of trigger events.
- **Stop when disk is 90% full** - storing will automatically stop when the disk will be 90% full.
- **Keep only the last # of files** - when the number of files exceeds the entered custom value, the older file will be deleted.
- **Delete the oldest file when the disk is #% full** - when the disk is at the entered custom %, the oldest file will be deleted.

If the trigger option is enabled following setting will appear

- **Pre-time** - Pre trigger time, defined in milliseconds. This value defines the storage duration before the trigger event occurs.
- **Post time**- Post trigger time, defined in milliseconds. This value defines the storage duration after the trigger event has been finished.
- **Holdoff time** - Gives you the possibility to suppress trigger events for a certain time after the last event had happened
- **Start storing condition** - Define a start storing event on a condition.
- **Stop storing condition** - Define stop storing event on a condition.
- **Don't store condition** - Define condition, when the acquisition will not start storing even if start-trigger appears.

There is also a possibility of enabling Cross triggers (start and stop), when multiple devices are connected. This means that one defined start trigger can affect all the connected devices in the same network.

3.4.3.1. Storing Counter, and CAN data on the device

When CNT module is connected, you can only store the following channels directly on the device:

- **Raw_edge**
- **Raw_EdgeSep** (in sensor mode)
- **Event CNT channel** in Basic Count mode.

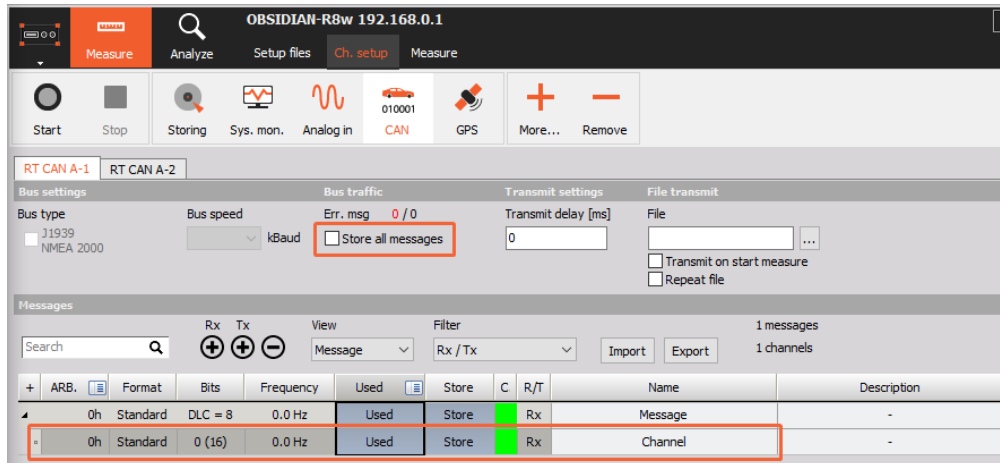
The recalculation of Angle and Speed channels can be done in post-analysis with Counter Math.



Important

Currently the digital input (IN0, IN1, IN2) are not stored on the device.

With CAN data you can either store the whole CAN stream or you can store a separate decoded message. The raw CAN stream can be later decoded in the post-analysis inside the Port Channel decoder.



Storing CAN data on the device

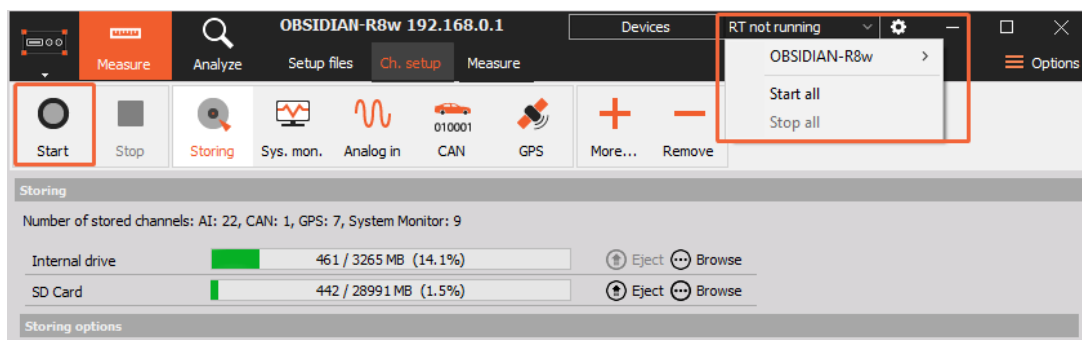


Important

Currently you can only store up to 100 decoded CAN channels per device.

3.4.4. Measurement mode

For starting the measurement - starting recording on the device or starting the signal conditioning over CAN, AO, XCP protocol you need to start the acquisition on the device. This can be done either by pressing Start button on the Device view or by pressing "Start all" on the down menu of the functional button.



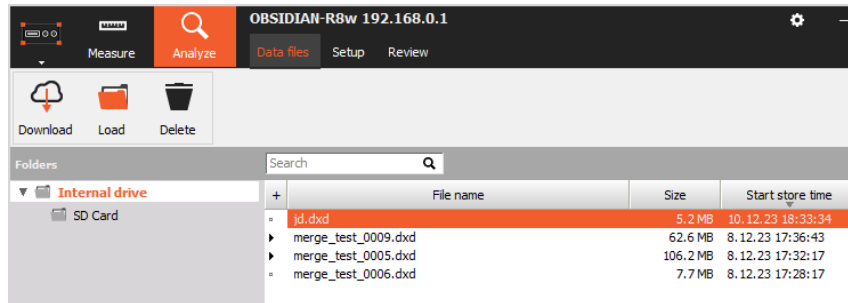
Start button and RT status button

Once the acquisition on the device is started the configuration of the device is locked, meaning that device parameters can not be changed. Also the RT status will turn green as a notification that the device is in running mode.

3.4.5. Analyze mode

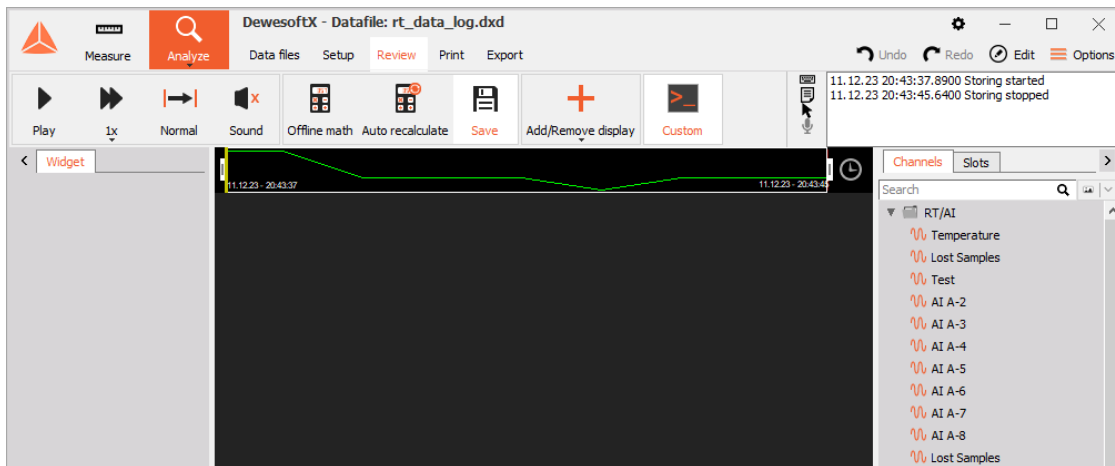
Once you ended your storing you can observe the data in the Analyze mode. When the OBSIDIAN device is connected, you will also see the Software view and the Device view as described in the chapter [3.3.3 Channel Setup OBSIDIAN](#).

If you go to the Device view, you will see the data that are stored on the internal drive or any external drive (SD card or external drive connected over USB-C port) currently connected to the device. You can either Load or Download the stored data from the device to the PC.



Analyze mode in Device view

Once you open the *.dxd file you are automatically redirected to the Review window, where you can start to perform the analysis on your recorded data.



The *.dxd data doesn't contain any Display or offline math settings

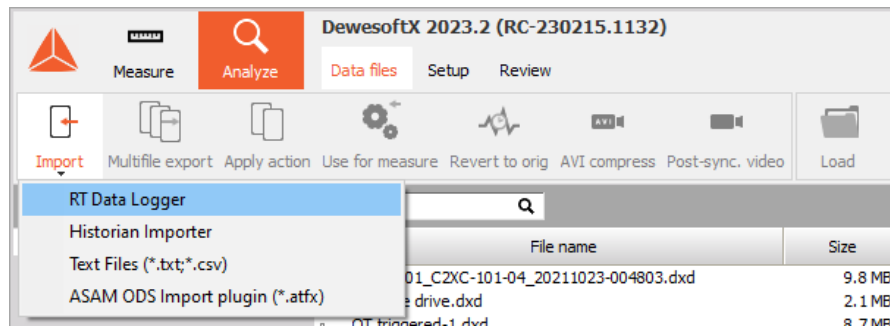


Important

Currently no Display settings or offline math are stored to the *.dxd file stored on the device, meaning that once you open a file you will need to adjust your Displays and offline math for post-analysis.

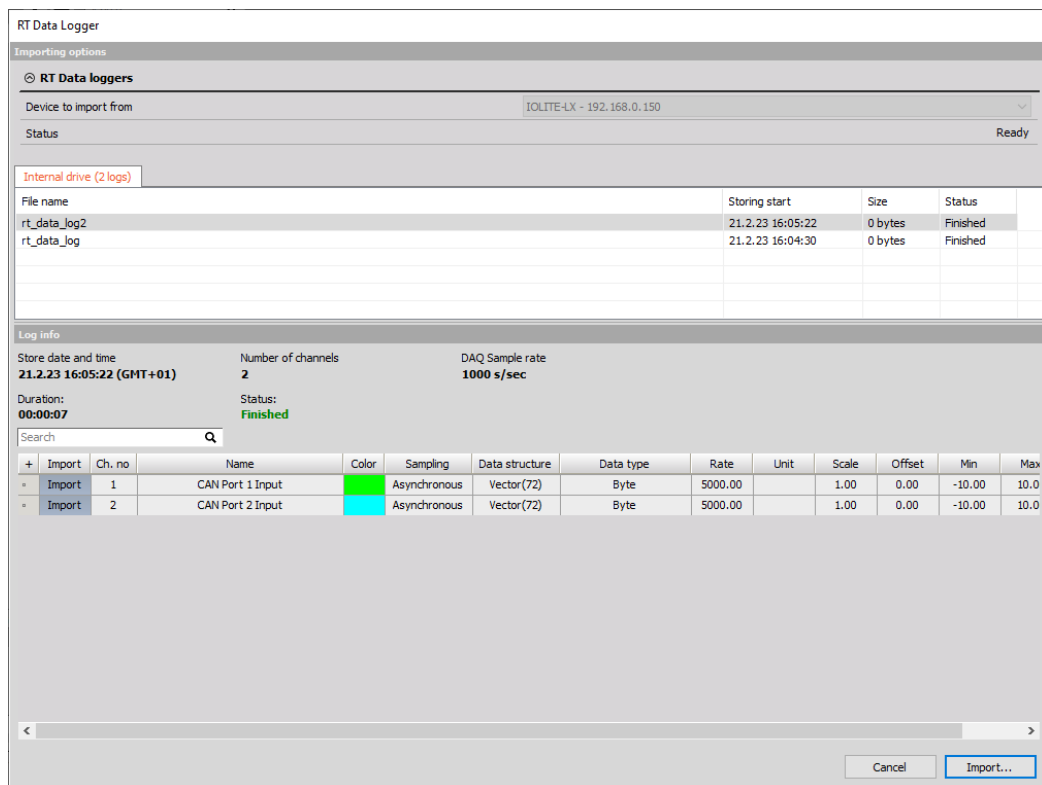
3.4.5.1. RT Data Logger Importer (obsolete option)

In previous versions of OBSIDIAN device it was possible to store the data in the binary file. Binary files are not natively supported inside DewesoftX, therefore such data needs to be imported to the software. This can be done over the RT-importer. The RT-Importer can be reached in Analyze mode, under Import options.



Accessing RT Data Logger importer

Once you open the importer the configuration window will appear. If the device is already connected to the PC you can import the data directly from the device. You can also import the data only from the SD Card or External disc in this way you need to select the PC as the device to import from.



RT Data Logger importer menu

In the settings you will see a list of channels with some additional properties. You can also select which channel you want to import in DewesoftX. The newly created *.dxd file will have the same name as the binary file that you are importing.

3.4.6. Output RT modules

OBSIDIAN® device offers additional options on how to output the measurement data through different protocols. You can either use EtherCAT, CAN, AO and XCP protocols to output the data when the device is in standalone mode. For setting the output over EtherCAT please refer to the Third Party EtherCAT Masters Technical Reference Manual, that can be found on our website.

3.4.6.1. Output data over CAN channel

The “CAN Output RT” module allows us to output the measured values through the CAN port on the rear of the device. The interface allows us to add or automatically generate the list of channels which should be outputted. It is also possible to define the frequency of the messages being sent out through CAN. For easier definition of CAN channel setup on other devices, a DBC file can be exported with definition of CAN messages.

+	Device	CAN Port	Output Frequency	Transmit delay	Arb. ID [hex]	Channel	Min	Value	Max	Unit	DBC file	DBC export
+	OBSIDIAN-R8	CAN A-1	10 Hz	0 ms	0	AI A-1	-10.00	AVG 0.0000	10.00	V	OBSIDIAN-R8.dbc	Export
+					1	AI A-2	-10.00	AVG 0.0000	10.00	V		
+					2	AI A-3	-10.00	AVG 0.0000	10.00	V		
+					3	AI A-4	-10.00	AVG 0.0000	10.00	V		
+					4	AI A-5	-10.00	AVG 0.0000	10.00	V		
+					5	AI A-6	-10.00	AVG 0.0000	10.00	V		
+					6	AI A-7	-10.00	AVG 0.0000	10.00	V		
+					7	AI A-8	-10.00	AVG 0.0000	10.00	V		

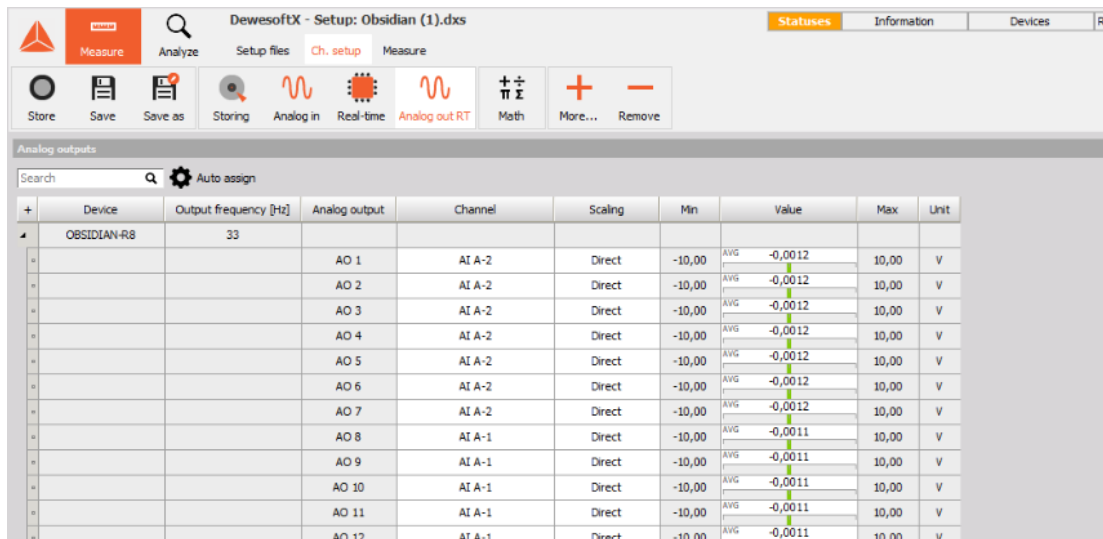
CAN RT output module settings

3.4.6.2. Output data over the AO channel

The “Analog output” module is designed for outputting the measured values through the optional analog outputs if the OBSIDIAN is configured with the needed hardware.

Here you can enable the output functionality and define which input channel should be output on which analog output channel. You can also define the scaling, where “Direct” means 1:1 output, so if input is 5 V then also the output will be 5 V. The other option, “From range”, means that the output range will be matched to the range, so if the input module range is ± 100 V and the measured value is 50 V, it will match the input range to the output range of ± 10 V and will therefore output 5 V.

The output frequency can be either set to 33 Hz or 1000 Hz, depending on the chosen setting of the device. For a faster loop time a special option needs to be enabled. Please check [3.3.2.3. Device properties](#).

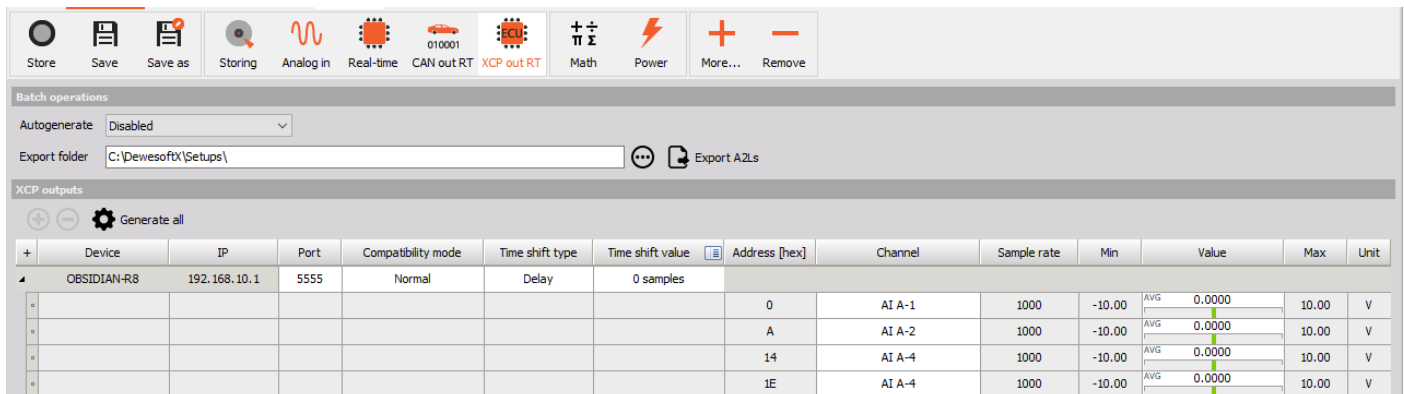


AO RT output module settings

3.4.6.3. Output data over XCP protocol

With the OBSIDIAN® device you can output any Analog or Digital signals over the XCP protocol. Please press the “Generate all” button to populate the settings with all the channels that are turned to “Used” in the Analog-in module.

The maximum sample rate is related to the Dynamic acquisition rate set in DewesoftX software. Once you properly configure the XCP settings, the configuration *.a2l file is generated automatically. The output frequency is related to the dynamic acquisition rate.

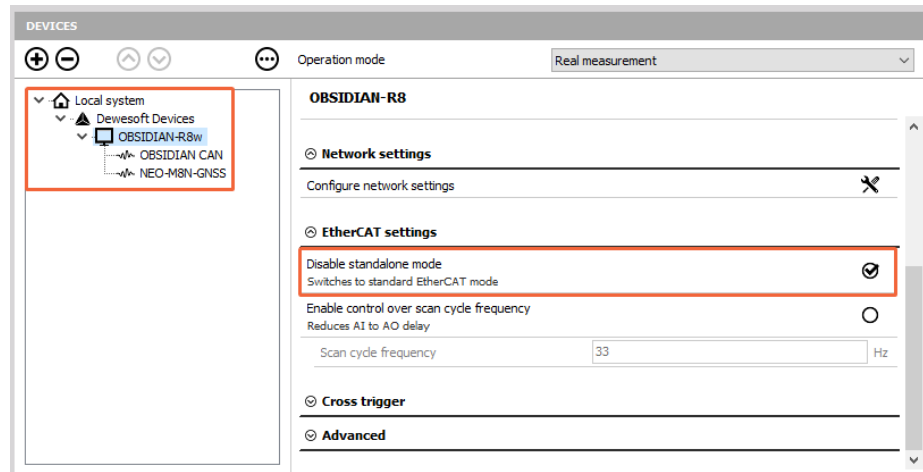


XCP output RT module settings

3.5. Connecting OBSIDIAN® in standard EtherCAT mode

The primary EtherCAT® bus can be switched to external mode, allowing OBSIDIAN® to be used like a regular IOLITE system for full-speed buffered data acquisition to a computer running DewesoftX DAQ software.

To use the OBSIDIAN® device in standard EtherCAT mode (as IOLITE device), you need to first properly set the device. First, you need to connect the device over the GLAN connector and select **Disable standalone mode** option. The device will be rebooted automatically.



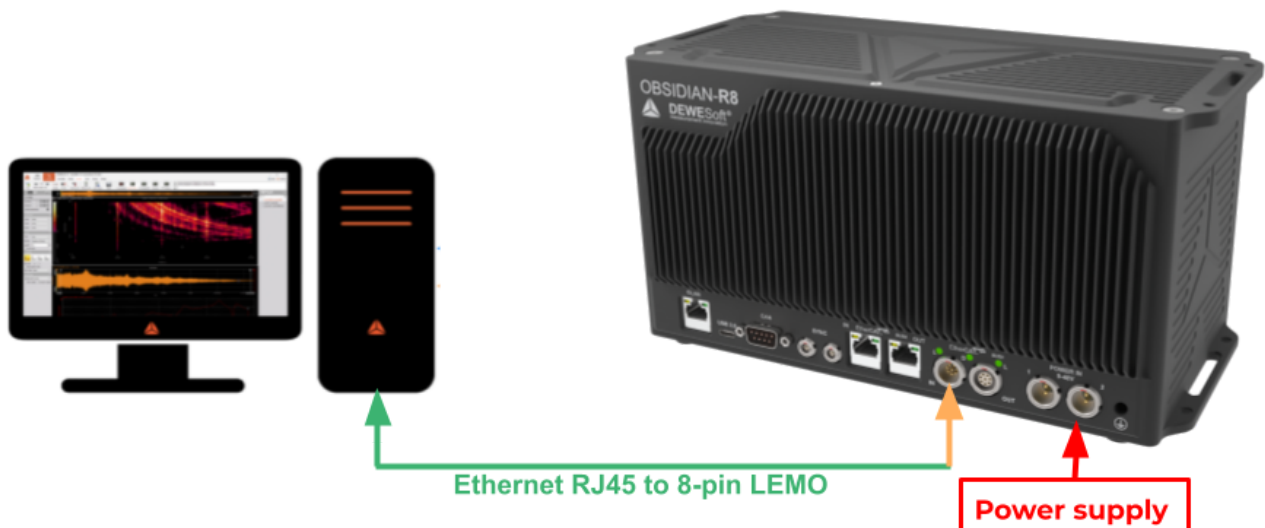
Switching between internal and external availability of modules

Once the device is set properly you can connect your OBSIDIAN® device with a 8-pin LEMO connector to the PC. The device will be recognized automatically and will be listed under the Dewesoft Devices in HW settings.

3.5.1. How to connect OBSIDIAN® device over EtherCAT

To connect your OBSIDIAN® device to a PC in external master mode, connect:

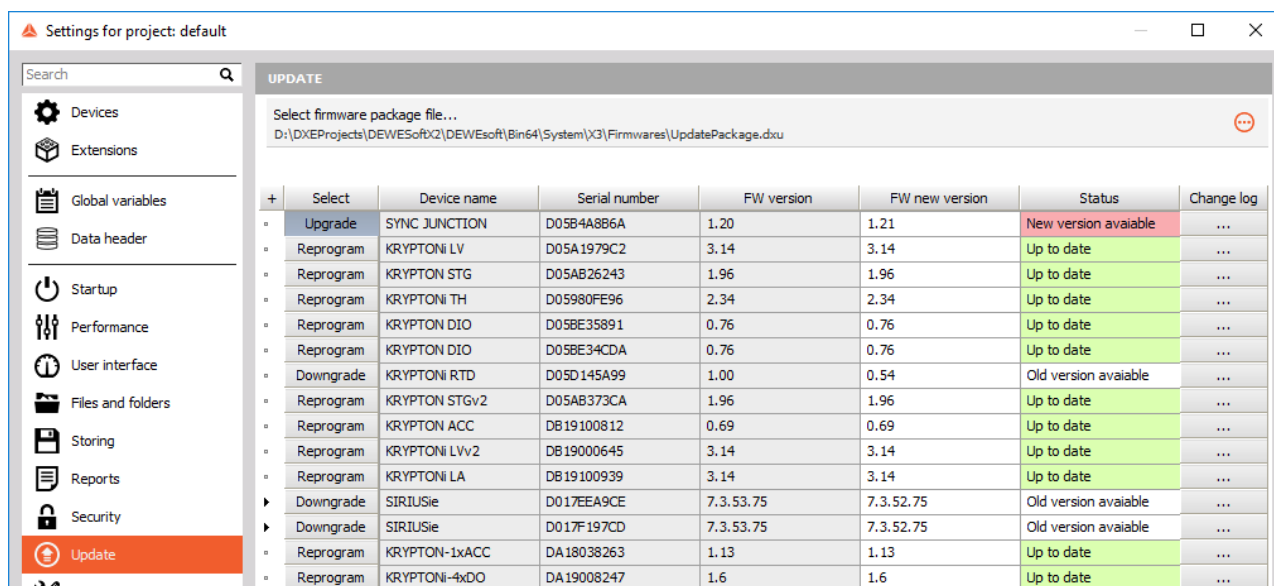
- power cable to the Power-in port,
- L1T8m-RJ45 cable from primary EtherCat bus "IN" port to the PC's Ethernet port.



Connection of the OBSIDIAN® to a PC over EtherCAT

3.6. Firmware upgrade

- Download the [Dewesoft upgrade package](#) (.dxu file) from the Dewesoft downloads page under the section Drivers.
- Copy the file into the Firmwares folder of your DewesoftX® installation (e.g. D:\DewesoftX\System\Firmwares).
- Connect the Dewesoft instrument to the PC and run DewesoftX®.
- Go to settings under the Update tab:



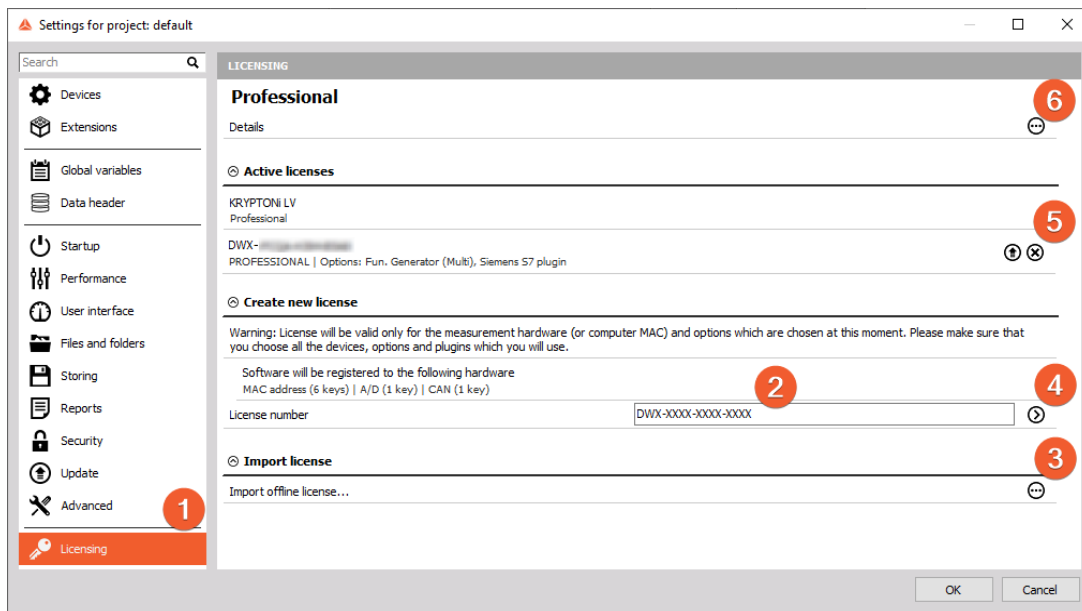
Firmware update settings

- If the firmware package isn't selected, select it by pressing the button and find the folder with the firmware file in it.
- Select the device you want to upgrade and start the firmware upgrade by pressing the "Upgrade" button.

3.7. Licensing

IOLITE or any other Dewesoft device already comes with an embedded DewesoftX® license. You can check the license details with all the available options in the Licensing tab **1** by pressing the three-dotted buttons **6**. However, if the user decides to upgrade the license with an additional extension, DewesoftX® will require a new license registration. The registration can be made online **2** or offline by importing an offline license **5** in case the system doesn't have an internet connection. Offline license can be registered on a different PC with an internet connection. If needed, the license can also be written on the actual device **5**.

Active and embedded licenses are seen under the Active Licenses tab **5**. If the license is recognized as none active, it usually means that the wrong license was entered.



Active licenses tab



Hint

All licenses regarding OBSIDIAN® will only work when the OBSIDIAN® system is connected to your PC and the device has been activated in the hardware setup.



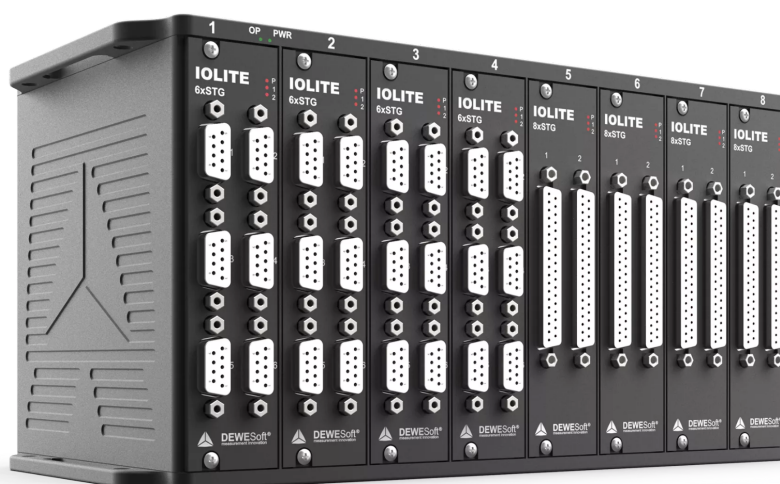
Important

Writing the license on the OBSIDIAN® device, when connected over EtherCAT (External master mode) is currently not supported.

4. System Overview

OBSIDIAN®

Data logger and embedded data acquisition system



Voltage



Strain / Stress



Quarter Bridge



Half Bridge



Full Bridge



Thermocouple



RTD



Current



Resistance



Ethernet



EtherCAT



OPC-UA



CAN out



XCP out



CAN bus



Data logger



IP40/IP60



-10 °C to
+50/60 °C

4.1. Main features

- **EMBEDDED PROCESSING:** Built-in dual-core 1.5 GHz ARM processor with Linux OS and DewesoftRT is perfect for embedded applications such as data logging, and real-time control.
- **DATA STORAGE:** 32 GB of internal storage expandable with up to 2 TB SD card or a USB Type-C external HDD or SSD is useful for storing large amounts of data.
- **LOW POWER CONSUMPTION:** Extremely powerful but designed to operate with very low power consumption which makes it a perfect choice for applications where power consumption is of critical importance.
- **HIGH-END SIGNAL CONDITIONING:** OBSIDIAN® offers the same high-end signal conditioning modules as IOLITE DAQ and control system. Amplifiers are available for Voltage, Current, Resistance, Strain gauge, Bridge, Digital Counters, RTDs, and Thermocouples.
- **REDUNDANT POWER SUPPLY:** Redundant power supply is seamlessly switching between available power sources and provides non-stop availability even for the most demanding test applications.
- **WIDE OPERATING TEMPERATURE RANGE:** While OBSIDIAN® DAQ systems are labeled to run from -10°C to 50°C, certain configurations can operate in the range from 40°C to +85°C temperature..
- **EXTERNAL MASTER MODE:** Instead of being used internally by Dewesoft RT, the primary EtherCAT® bus can be switched to external mode, allowing OBSIDIAN® to be used like a regular IOLITE system for full speed buffered data acquisition to a computer running DewesoftX DAQ software.
- **SECONDARY ETHERCAT BUS:** A secondary EtherCAT bus can be used in parallel to serve real-time data to any 3rd party control system like Labview, Beckoff, Clemessy Syclone, MTS FlexTest, Acontis, and similar EtherCAT masters.
- **GREAT CONNECTIVITY:** Standard data interfaces are available to transfer the data to real-time controllers, cloud servers, and Industry 4.0 clients, using a wide variety of standard data interfaces, such as EtherCAT®, OPC UA, XCP, and CAN.
- **DAQ SOFTWARE INCLUDED WITH FREE LIFETIME UPGRADES:** The easy-to-use but rich-in functionality, award-winning DewesoftX data acquisition software is included. All upgrades to the software are free forever with no hidden licensing costs.
- **DEWESOFT QUALITY AND 7-YEAR WARRANTY:** Enjoy our industry-leading 7-year warranty. Our data acquisition systems are made in Europe, utilizing only the highest build quality standards. We offer free and customer-focused technical support. Your investment into the Dewesoft solutions is protected for years ahead.

4.2. System specifications

Specification for OBSIDIAN-R8 and OBSIDIAN-R8w device options.

System	OBSIDIAN-R8	OBSIDIAN-R8w
Number of slots	8	8
Synchronization	2x SIRIUS® SYNC on L00B4f	2x SIRIUS® SYNC on L00B4f
Sync Accuracy	< 200 ns within same EtherCAT chain < 2 µs using sync for multiple EtherCAT chains below 1 sample to Sirius®	< 200 ns within same EtherCAT chain < 2 µs using sync for multiple EtherCAT chains below 1 sample to Sirius®
Ethernet Interface		
Interface type	Gigabit Ethernet	Gigabit Ethernet
Connector	RJ-45	RJ-45
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 Chain	From 6 MB/s to 10 MB/s	From 6 MB/s to 10 MB/s
Bus 1 connectors	2x Lemo 1T	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
CAN bus		
Number of ports	2	2
Interface type	CAN 2.0B, up to 1 MBit/sec	CAN 2.0B, up to 1 MBit/sec
Special applications	CCP, OBDII, J1939, CAN output	CCP, OBDII, J1939, CAN output
Galvanic isolation	Isolated (only on isolated motherboard)	Functional isolation
Bus pin fault protection	±36 V	From -27 V to 40 V
ESD protection	8 kV	±4 kV
Internals		
CPU type	ARM	ARM
Operating system	Linux	Linux
Software	Dewesoft RT	Dewesoft RT
Internal storage	4 GB eMMC	4 GB eMMC
Expandable storage	SD card up to 2 TB, USB-C Type external storage	SD card up to 2 TB, USB-C 3.0 Type external storage
Power		
Power supply	Dual redundant 9 - 48 V DC	Dual redundant 9 - 48 V DC
Power consumption	5.8 W @ 24 V (without modules)	Typ. 7.2 W (Max. 11 W)
EtherCAT Bus 1 maximum output	10 A	10 A
Environmental		
Operating Temperature	-10 to 50 °C (-40 to 85 °C optional) (see 1)	-40 to 60 °C (-40 to 85 °C optional) (see 1)

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	IP40	IP67
Physical		
Dimensions	282 x 145 x 144 mm	322 x 162 x 155 mm
Weight	2.4 kg	3.6 kg

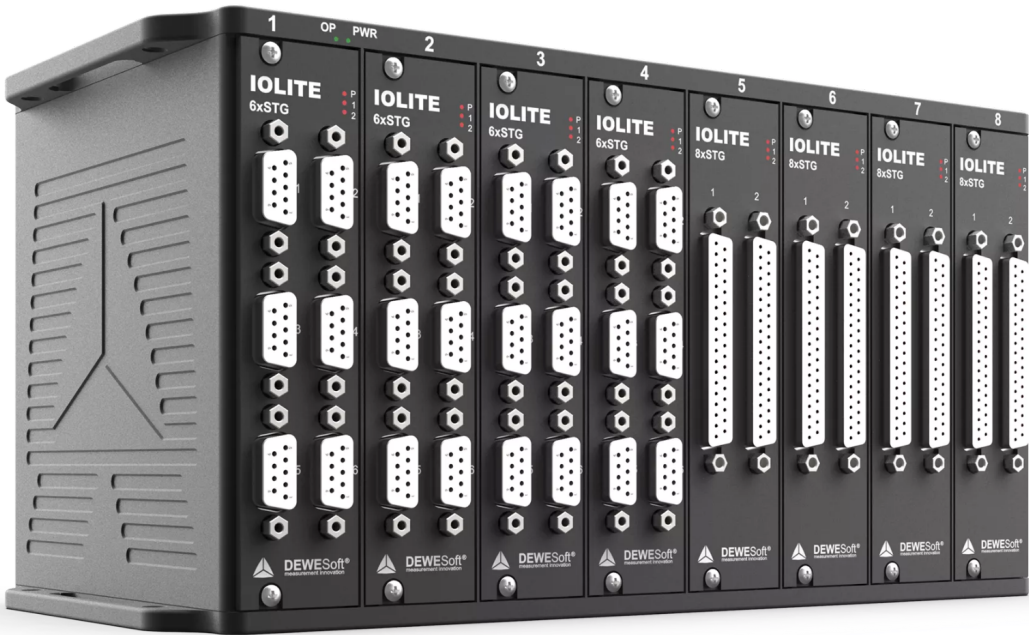
1) Extended operating temperature range depends of module configuration

4.3. Enclosure Overview

OBSIDIAN® is currently available in a standalone aluminum chassis that provides 8 slots for IOLITE input and output slices to be installed. The chassis can either be standard (R8) or rugged/waterproof (R8w).

4.3.1. OBSIDIAN-R8: Boxed Chassis

4.3.1.1. OBSIDIAN-R8: Boxed Chassis: Renders

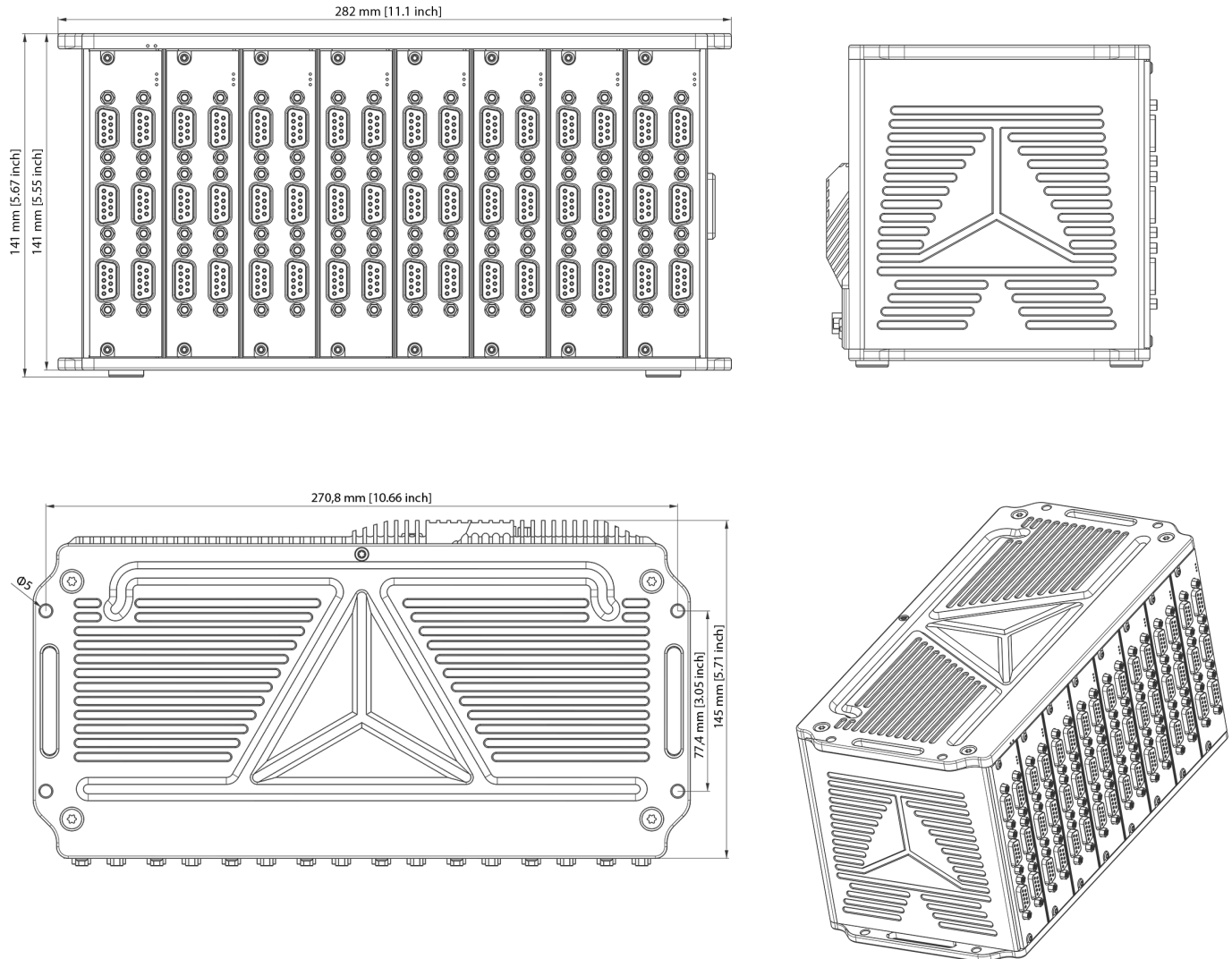


OBSIDIAN-R8 Front panel



OBSIDIAN-R8 Backpanel

4.3.1.2. OBSIDIAN-R8: Boxed Chassis: Dimensions



Dimensions for OBSIDIAN-R8 device

4.3.1.3. OBSIDIAN-R8: Boxed Chassis: Connectors

OBSIDIAN® device has one GLAN connector which enables the connection over OPC-UA (RT-mode).

The OBSIDIAN® chassis also enables dual EtherCAT bus. There are two 8-pin LEMO 1B connectors on the back panel of OBSIDIAN® used for data transfer and synchronization on the primary bus (BUS 1) for buffered data. The 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 2-pin LEMO 1B connectors are used for redundant power supply (PWR IN).

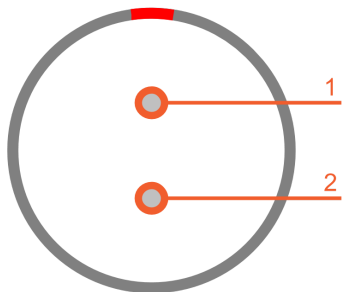
Next to the PWR IN connector is a GND socket for grounding the OBSIDIAN-R8.

Synchronization with Dewesoft USB data acquisition devices or connection to clock master is on OBSIDIAN-R8 enabled by connecting a synchronization cable to two SYNC inputs (4-pin LEMO 00).

For connection of an external disk or GPS device, an additional USB-C connector is placed on the back site of the OBSIDIAN® device.

Additionally we have one DSUB9 connector which provides two CAN ports.

4.3.1.3.1. OBSIDIAN-R8: Boxed Chassis: Power in: Pinout



Power in connector: pin-out (2-pin LEMO male)

Pin	Name	Description
1	V +	Supply
2	V -	Ground

For the power supply an unregulated DC voltage between 9 and 48 Volts is required, which is connected to the 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): FGJ.1B.302.CLLD42Z

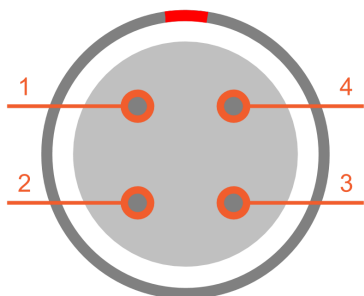
4.3.1.3.2. OBSIDIAN-R8: Boxed Chassis: Sync: Pinout

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



Hint

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.



Sync connector: pin-out (4-pin LEMO female)

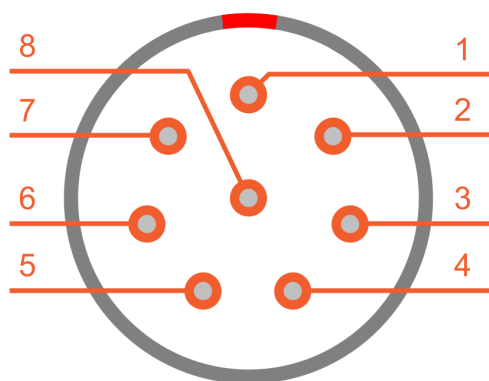
Pin	Name	Description
1	CLK	Clock
2	TRIG	Trigger
3	PPS	PPS
4	GND	Ground

SYNC connector (on the device): XBG.00.304.HLN

Mating connector (for the cable): FGG.00.304.CLADXX

4.3.1.3.3. OBSIDIAN-R8: Boxed Chassis: BUS 1: IN: Pinout

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



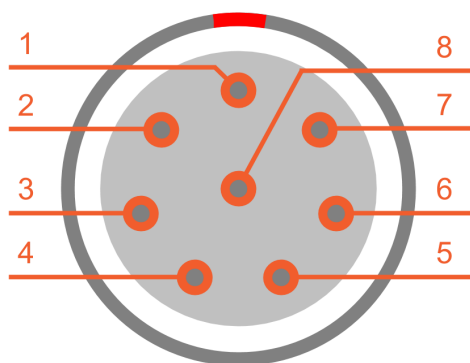
EtherCAT connector: pin-out (8-pin LEMO male)

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

Pin	Name	Description
1	TX_P	Transmission +
2	TX_N	Transmission -
3	RX_P	Reception +
4	RX_N	Reception -
5	NC	Not connected
6	NC	Not connected
7	GND	Ground
8	GND	Ground

4.3.1.3.4. OBSIDIAN-R8: Boxed Chassis: BUS 1: OUT: Pinout

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



EtherCAT connector: pin-out (8-pin LEMO female)

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

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

Important



Pins 5 and 6 of the EtherCAT IN 8-pin LEMO connector are not connected. You can not power multiple R8r systems with the EtherCAT line and should always provide a separate power supply and connect it to the Power in connector of each of the systems. However, you can power other devices with EtherCAT OUT!

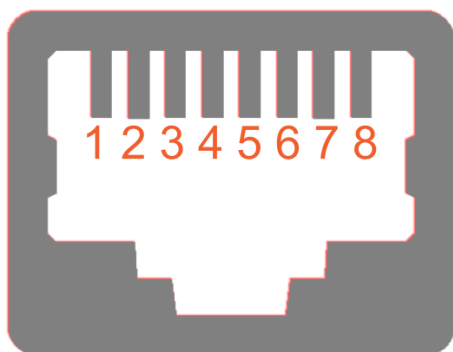
Important



Power distribution boxes are available in case of only one power supply (POWER-SPLITTER-1xL1B2m-5xL1B2f).

4.3.1.3.5. OBSIDIAN-R8: Boxed Chassis: GLAN

Gigabit LAN port for connection to the PC running DewesoftX DAQ software when OBSIDIAN® is used in RTC (real-time controller) mode.



GLAN connector: pin-out (RJ-45 female)

Pin	Name	Description
1	Tx A+	Transmitting pair A+
2	Tx A-	Transmitting pair A-
3	Rx B+	Receiving pair B+
4	Tx C+	Transmitting pair C+
5	Tx C-	Transmitting pair C-
6	Rx B-	Receiving pair B-
7	Rx D+	Receiving pair D+
8	Rx D-	Receiving pair D-

Each RJ45 connector has two LEDs:

- **GREEN** LED indicates that SIRIUS-XHS is connected to another device (PC, SBOX etc).
- **YELLOW** LED is active only when the data transfer is active.

4.3.1.3.6. OBSIDIAN-R8: Boxed Chassis: USB-C 3.0.

USB Type-C port for connecting external drives. Connecting to a PC through USB is not supported.

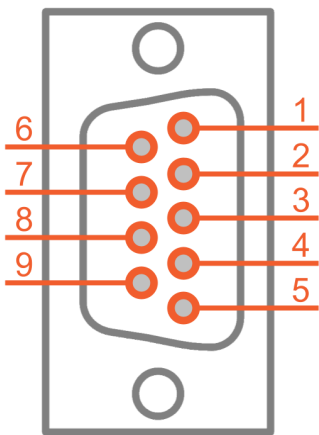
USB 3.0 has a maximum signaling rate of 5 Gbit/s.



USB-C connector on the device

4.3.1.3.7. OBSIDIAN-R8: Boxed Chassis: CAN1/CAN2

A CAN bus connector, with two CAN channels



DSUB9 male connector

Pin	Name	Description
1	i5V OUT	Isolated 5V output (max. 150 mA)
2	CAN1 LOW	CAN Low for First Bus
3	IGND	Isolated Digital Ground
4	CAN2 LOW	CAN Low for Second Bus
5	CAN2 HIGH	CAN High for Second Bus
6	IGND	Isolated Digital Ground
7	CAN1 HIGH	CAN High for First Bus
8	NC	Not connected
9	NC	Not connected



Important

The CAN ports are not supported when the OBSIDIAN® device is connected in External Master mode (IOLITE mode).



Important

OBSIDIAN-R8 and OBSIDIAN-R8w have different pinouts of CAN connectors.

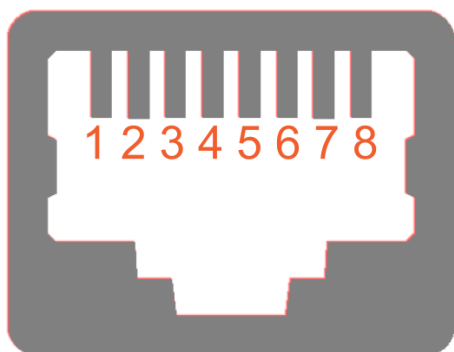
4.3.1.3.8. OBSIDIAN-R8: Boxed Chassis: BUS 2: RJ45: Pinout

OBSIDIAN-R8 includes two RJ45 connectors on the 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.

The connector used on the device is a standard ethernet connector (RJ45).
A standard ethernet cable with a standard connector can be used to connect an OBSIDIAN® device to a PC.

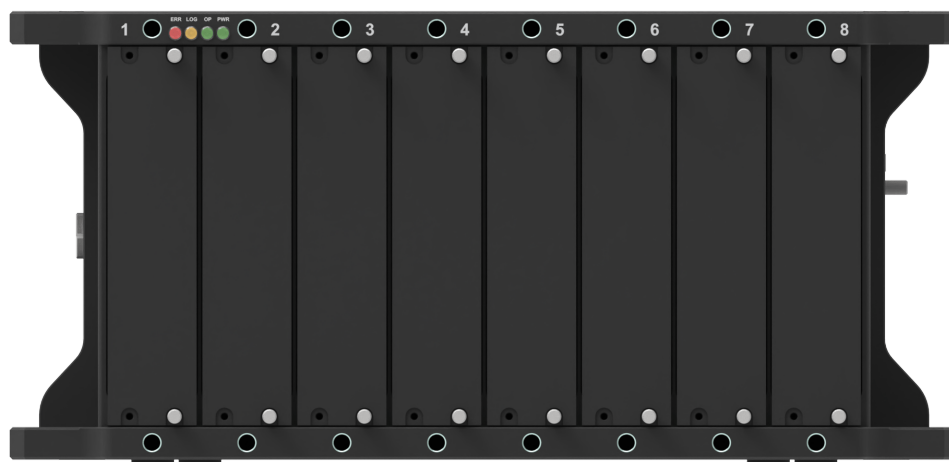


EtherCAT connector: pin-out (RJ-45 female)

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

4.3.2. OBSIDIAN-R8w: Boxed Chassis

4.3.2.1. OBSIDIAN-R8w: Boxed Chassis: Renders



OBSIDIAN-R8w Front panel



OBSIDIAN-R8w Backpanel



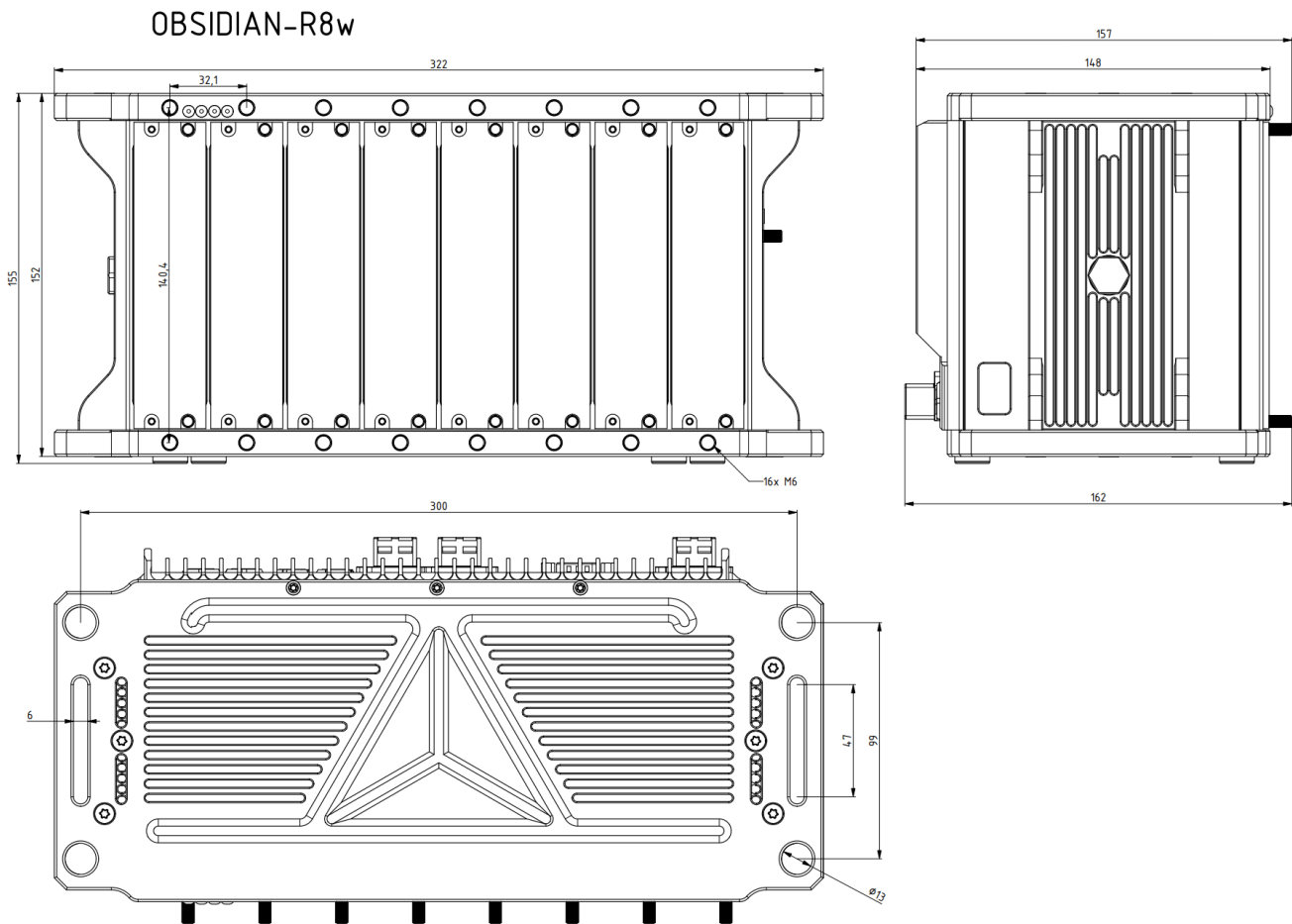
OBSIDIAN-R8w: Front and side render (with pressure relief valve)



Important

OBSIDIAN-R8w has a pressure relief valve engineered to handle the large pressure differentials caused by extreme weather conditions.

4.3.2.2. OBSIDIAN-R8w: Boxed Chassis: Dimensions



Dimensions for OBSIDIAN-R8w device

4.3.2.3. OBSIDIAN-R8w: Boxed Chassis: Connectors

OBSIDIAN-R8w device has one GLAN connector which enables the connection over OPC-UA (RT-mode).

The OBSIDIAN-R8w chassis also enables dual EtherCAT bus. There are two 8-pin LEMO 1T connectors on the back panel of OBSIDIAN-R8w used for data transfer and synchronization on the primary bus (BUS 1) for buffered data. The 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.

It is possible to store directly to the SD card on the device.

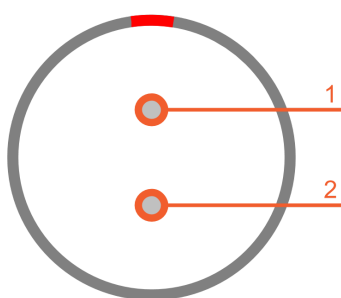
Two 2-pin LEMO 1T connectors are used for redundant power supply (PWR IN).
Next to the PWR IN connector is a GND socket for grounding the OBSIDIAN-R8w.

Synchronization with Dewesoft USB data acquisition devices or connection to clock master is on OBSIDIAN-R8w enabled by connecting a synchronization cable to two SYNC inputs (4-pin LEMO 00).

For connection of an external disk or GPS device, an additional USB-C connector is placed on the back site of the OBSIDIAN® device. There is also a SMA connector for GPS connection and an additional one for WiFi connection, which currently isn't supported in software.

Additionally we have one DSUB9 connector which provides two CAN ports.

4.3.2.3.1. OBSIDIAN-R8w: Boxed Chassis: Power in: Pinout



Power in connector: pin-out (2-pin LEMO male)

Pin	Name	Description
1	V +	Supply
2	V -	Ground

For the power supply an unregulated DC voltage between 9 and 48 Volts is required, which is connected to the LEMO 1B connector on the rear side of the chassis.

PWR IN connector (on the device): EEJ.1T.302.CLD
Mating connector (for the cable): FGJ.1T.302.CLLK80Z

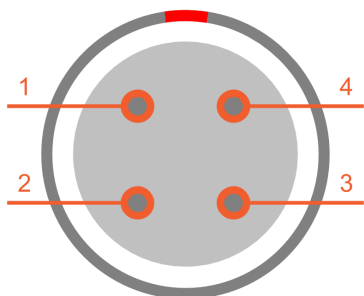
4.3.2.3.2. OBSIDIAN-R8w: Boxed Chassis: Sync: Pinout

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



Hint

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.



Sync connector: pin-out (4-pin LEMO female)

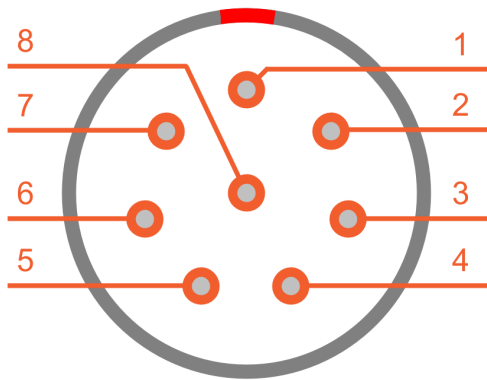
Pin	Name	Description
1	CLK	Clock
2	TRIG	Trigger
3	PPS	PPS
4	GND	Ground

SYNC connector (on the device): HGG.00.304.CLLSV

Mating connector (for the cable): FGG.00.304.CLAD27Z

4.3.2.3.3. OBSIDIAN-R8w: Boxed Chassis: BUS 1: IN: Pinout

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



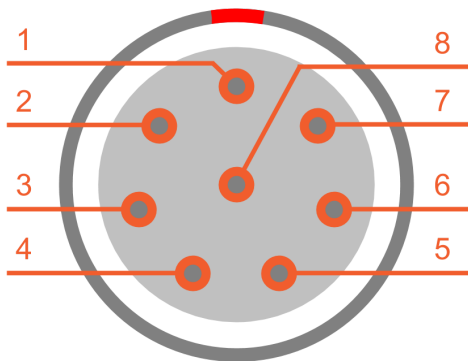
EtherCAT connector: pin-out (8-pin LEMO male)

BUS 1 IN connector (on the device): *EEJ.1T.308.CLDY*
Mating connector (for the cable): *FGJ.1T.308.CLLC65Z*

Pin	Name	Description
1	TX_P	Transmission +
2	TX_N	Transmission -
3	RX_P	Reception +
4	RX_N	Reception -
5	NC	Not connected
6	NC	Not connected
7	GND	Ground
8	GND	Ground

4.3.2.3.4. OBSIDIAN-R8w: Boxed Chassis: BUS 1: OUT: Pinout

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



EtherCAT connector: pin-out (8-pin LEMO female)

BUS 1 OUT connector (on the device): *EEG.1T.308.CLNY*
Mating connector (for the cable): *FGG.1T.308.CLAC65Z*

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

Important



Pins 5 and 6 of the EtherCAT IN 8-pin LEMO connector are not connected. You can not power multiple R8r systems with the EtherCAT line and should always provide a separate power supply and connect it to the Power in connector of each of the systems. However, you can power other devices with EtherCAT OUT!

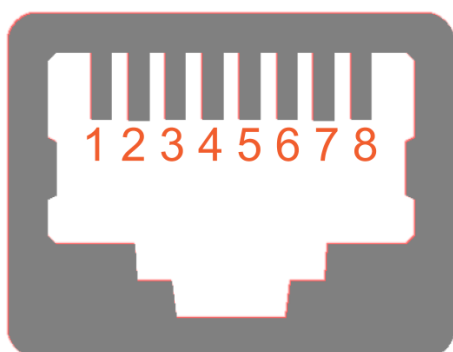
Important



Power distribution boxes are available in case of only one power supply (POWER-SPLITTER-1xLIT2m-5xLIT2f).

4.3.2.3.5. OBSIDIAN-R8w: Boxed Chassis: GLAN

Gigabit LAN port for connection to the PC running DewesoftX DAQ software when OBSIDIAN® is used in RTC (real-time controller) mode.



GLAN connector: pin-out (RJ-45 female)

Pin	Name	Description
1	Tx A+	Transmitting pair A+
2	Tx A-	Transmitting pair A-
3	Rx B+	Receiving pair B+
4	Tx C+	Transmitting pair C+
5	Tx C-	Transmitting pair C-
6	Rx B-	Receiving pair B-
7	Rx D+	Receiving pair D+
8	Rx D-	Receiving pair D-

Each RJ45 connector has two LEDs:

- **GREEN** LED indicates that SIRIUS-XHS is connected to another device (PC, SBOX etc).
- **YELLOW** LED is active only when the data transfer is active.

4.3.2.3.6. OBSIDIAN-R8: Boxed Chassis: USB-C 3.0.

USB Type-C port for connecting external drives. Connecting to a PC through USB is not supported.

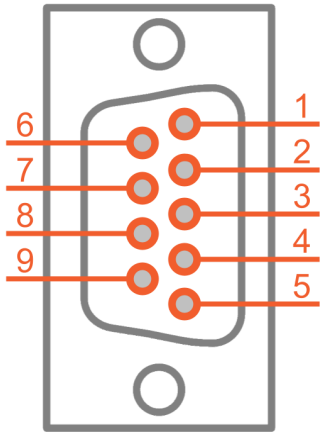
USB 3.0 has a maximum signaling rate of 5 Gbit/s.



USB-C connector on the device

4.3.2.3.7. OBSIDIAN-R8w: Boxed Chassis: CAN1/CAN2

A CAN bus connector, with two CAN channels



DSUB9 male connector

Pin	Name	Description
1	CAN2 LOW	CAN Low for Second Bus
2	CAN1 LOW	CAN Low for First Bus
3	GND	Isolated Digital Ground
4	+5V	Isolated 5V output (max. 220 mA / 1.2 W)
5	NC	Not connected
6	GND	Isolated Digital Ground
7	CAN1 HIGH	CAN High for First Bus
8	CAN2 HIGH	CAN High for Second Bus
9	+12V	Isolated 12V output (max. 85 mA / 1 W)



Important

The CAN ports are not supported when the OBSIDIAN® device is connected in External Master mode (IOLITE mode).



Important

OBSIDIAN-R8 and OBSIDIAN-R8w have different pinouts of CAN connectors.

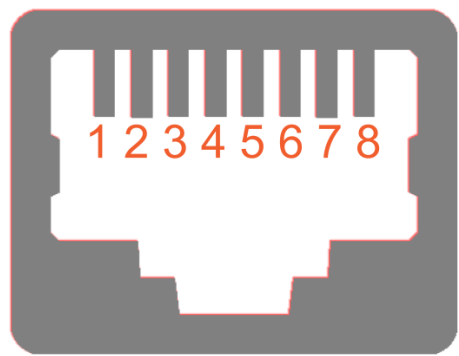
4.3.2.3.8. OBSIDIAN-R8: Boxed Chassis: BUS 2: RJ45: Pinout

OBSIDIAN-R8 includes two RJ45 connectors on the 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.

The connector used on the device is a standard ethernet connector (RJ45).
A standard ethernet cable with a standard connector can be used to connect an OBSIDIAN® device to a PC.



EtherCAT connector: pin-out (RJ-45 female)

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

4.3.2.4. OBSIDIAN-R8w: IOLITEr slices: Mounting/Removing/Replacing from Rack Chassis

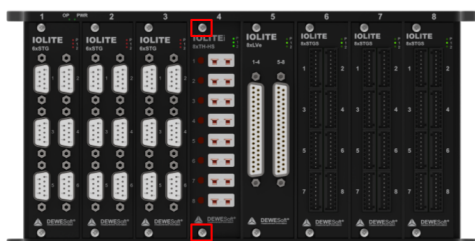


Warning

When mounting or removing IOLITEr slices TURN OFF the equipment! IOLITEr slices ARE NOT hot swappable.

4.3.2.4.1. IOLITEr slices: Replacing the slice - Instructions

1



Turn off the device!

Unscrew two M2.5x5 TRX panhead screws.

2



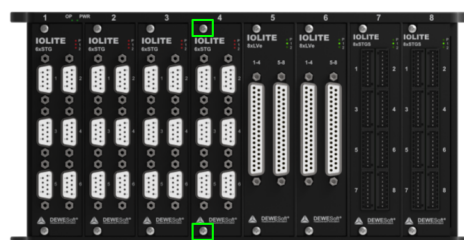
Remove the IOLITEr slice.

3



Insert the new slice by sliding it on rails.

4

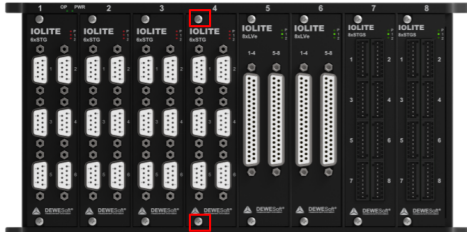


Screw two M2.5x5 TRX panhead screws.

You are ready to measure!

4.3.2.4.2. IOLITEr slices: Removing the slice - Instructions

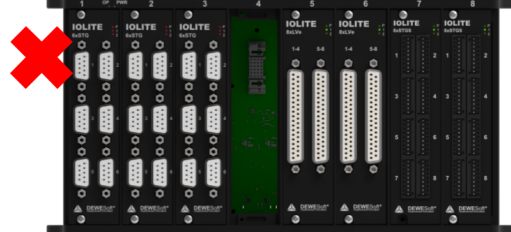
1



Turn off the device!

Unscrew two M2.5x5 TRX panhead screws.

2



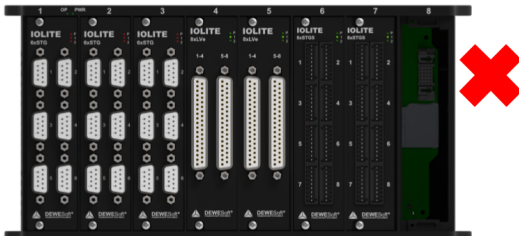
Remove the IOLITEr slice.



Important

By removing the IOLITEr slice the EtherCAT chain gets broken. IOLITEr slices right to the removed IOLITEr slice will not be detected.

3



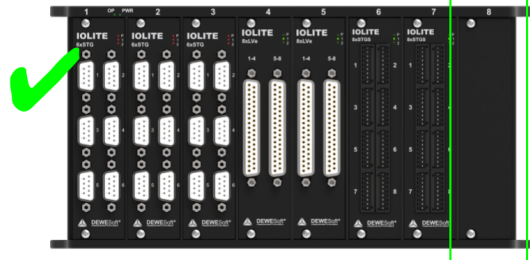
Shift the IOLITEr slices in a way that the EtherCAT chain is not broken.



Caution

By removing the IOLITEr slice the empty slot is exposed. Unwanted parts or larger objects can get into the chassis causing permanent damage to the equipment. Use the front ALU cover to close the empty slot.

4



Cover the empty slot with front ALU cover.
Screw two M2.5x5 TRX panhead screws.

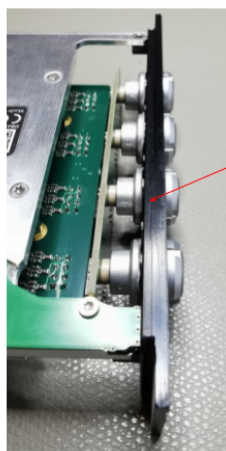
You are ready to measure!

4.3.2.5. OBSIDIAN-R8w: Mounting/Removing/Replacing IOLITErw slices from Rack Chassis

To ensure IP rating with the IOLITErw slices there is an o-ring on the front of the module. When removing and mounting the slice, you need to re-apply the [MOLYKOTE 55 O-Ring Grease](#) on the o-ring.

4.3.2.5.1. OBSIDIAN-R8w: Installing the O-ring on the IOLITErw front

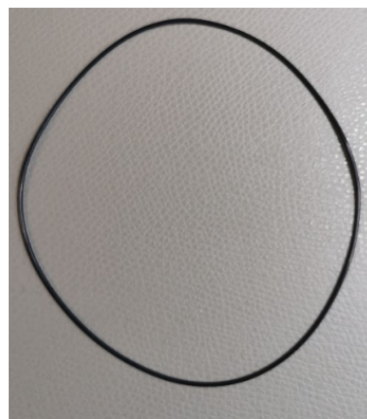
1 INSTALLING O-RING



O-RING-80x1

Make sure the seal groove is clear of dust or any other impurities.

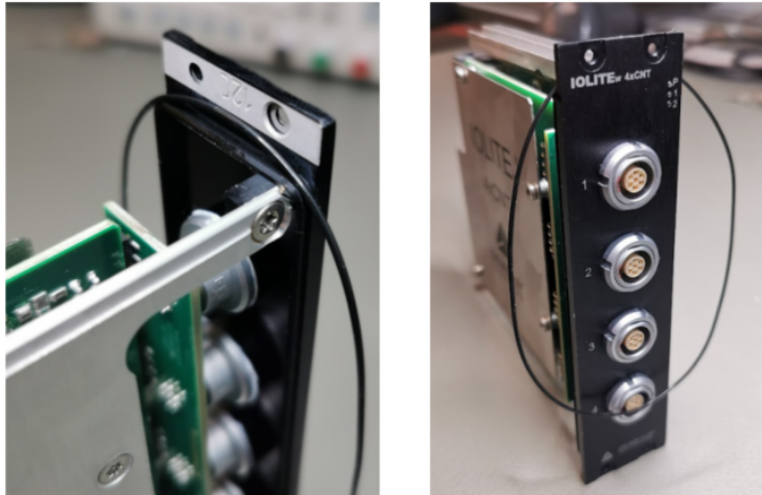
2 APPLY GREASE



Apply MOLYKOTE 55 O-Ring Grease on O-ring. Make sure the O-ring is greased well on the whole surface.

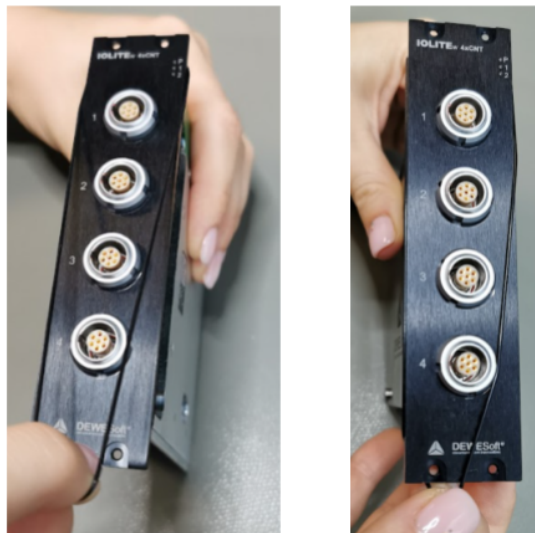
4.3.2.5.2. OBSIDIAN-R8w: Mounting/Removing the O-ring on the IOLITErw front

1 MOUNT O-RING 1/3



Insert O-ring into the groove on one side of the instrument .

1 MOUNT O-RING 2/3



Grab the O-ring with your finger and insert it to groove on one edge.

Try to extend the O-ring as little as possible ! Extending it too much can cause damage.

1 MOUNT O-RING 3/3



Insert into the groove also on the other edge.

Try to extend the O-ring as little as possible ! Extending it too much can cause damage.

2 REMOVING O-RING 1/2



Grab an O-ring with 2 fingers on both sides and extend in direction towards the edge.

2 REMOVING O-RING 2/2



Grab the O-ring with and remove it on one edge first, and then on the other.

5. Module overview

OBSIDIAN® device is compatible with the following IOLITE single slices. For more detailed information regarding the modules please refer to [IOLITE technical manual](#).



Caution

IOLITErw (waterproof of rack versions) currently fit only to OBSIDIAN-R8w and IOLITE-R12 chassis.

5.1. Standard IOLITE modules

	6xSTG	8xSTGS	8xLV	8xLVe	16xLV	4xHV	8xLA	8xACC
Connectors	DSUB-9	Terminal block, DSUB-37	BNC, Terminal block	Terminal block, DSUB-37	Terminal block	Banana plug	BNC, Terminal block	BNC
Channels per module	6x	8x	8x	8x	16x	4x	8x	8x
Data rate per channel IOLITE	20 kS/s	20 kS/s	20 kS/s	20 kS/s	20 kS/s	40 kS/s	20 kS/s	40 kS/s
Data rate per channel OBSIDIAN	20 kS/s	20 kS/s	20 kS/s	20 kS/s	5 kS/s	20 kS/s	20 kS/s	20 kS/s
Resolution	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit	24-bit
Bandwidth	0.49*fs	0.433*fs	0.49*fs	0.433*fs	0.433*fs	0.433*fs	0.49*fs	0.433*fs
Voltage mode ranges	±50 V, ±10 V, ±1 V, ±100 mV	×	±100 V, ±10 V (±10 V, ±1 V on request)	±100 V, ±5 V	±200 V, ±10 V	±2000 V, ±1000 V, ±400 V, ±200 V	×	±10 V, ±5 V, ±1 V, ±200 mV
Input coupling	DC, AC 1 Hz	DC	DC	DC	DC	DC	DC	DC, AC 1 Hz, AC 0.1 Hz
Sensor excitation	0.24 V (unipolar), 0.12 V (bipolar), 0.44 mA (current), max. 0.55 W/ch	1 V, 2 V, 5 V	×	0...24V (unipolar)	×	×	×	2 mA, 4 mA, 6 mA
Bridge connection	Full, ½, ¼ 350 Ω, ¼ 120 Ω 3-wire	Full, ½, ¼ 350 Ω, ¼ 120 Ω 3-wire, 4-wire (optional)	×	×	×	×	×	×
Programmable shunt	100 kΩ	100 kΩ	×	×	×	×	×	×
IEPE input	DSI-ACC	×	×	×	×	×	×	✓
Resistance	✓	×	×	×	×	×	×	×
Temperature (PTx)	DSI-RTD ¹	×	×	×	×	×	×	×
Thermocouple	DSI-TH ¹	×	×	×	×	×	×	×
Current	20 mA (internal shunt), DSI-5A, DSIi-10A, DSIi-20A	×	×	×	×	×	±20 mA, ±2 mA	×
Potentiometer	✓	✓	×	✓	×	×	×	×
LVDT	DSI-LVDT	×	×	×	×	×	×	×
Charge	DSI-CHG	×	×	×	×	×	×	×
TEDS	✓	✓ (except DB37)	×	✓	×	×	×	✓
Isolation voltage	Differential	Differential	450 V	250 V	250 V	CAT II 1000 V	450 V	250V
Isolation arrangement	None	Ch-GND	Ch-Ch & Ch-GND	Ch-GND	Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-GND
Power consumption per module	Typ. 5.4 W, Max. 11.1 W	Typ. 2.7 W, Max. 5.1 W	Typ. 2.4 W, Max. 3.5 W	Typ. 3.3 W, Max. 4.2 W	Typ. 3.4 W, Max. 4.2 W	Typ. 2.6 W, Max. 3 W	Typ. 2.4 W, Max. 3.5 W	Typ. 4.5 W, Max. 6 W
Waterproof version	✓	✓	×	✓	×	×	×	×
PoE functionality	×	✓	×	✓	✓	×	×	✓

Advanced functions	Supports all strain types, high input range	Supports all strain types, low power consumption	High isolation, high input range	High isolation, high input range	High isolation, high input range	High isolation, high input range	High isolation, high input range	IEPE, supports TEDS, high channel density
---------------------------	---	--	----------------------------------	----------------------------------	----------------------------------	----------------------------------	----------------------------------	---

	8xTH	8xTH-HS	8xRTD	8xRTD-HS	8xRTDp ¹	32xDI	32xDO ¹	8xDI-4xDO ¹
Connectors	MINI TC	MINI TC	LOB6f, Terminal block	LOB6f, Terminal block	LOB6f	Terminal block	Terminal block	Terminal block
Channels per module	8x	8x	8x	8x	8x	32x	32x	8x digital in, 4x digital out
Data rate per channel IOLITE	100 S/s	100 S/s, upgradable to 10 kS/s	100 S/s	100 S/s, upgradable to 10 kS/s	100 S/s	20 kS/s	✗	✗
Data rate per channel OBSIDIAN	100 S/s	100 S/s, upgradable to 5 kS/s	100 S/s	100 S/s, upgradable to 5 kS/s	100 S/s	10 kS/s	not supported	not supported
Resolution	24-bit	24-bit	24-bit	24-bit	24-bit	digital	digital	digital
Bandwidth	✗	0.49*fs (max. 1 kHz)	✗	0.49*fs (max. 1 kHz)	✗	✗	✗	✗
Voltage mode ranges	±1 V, ±100 mV	±1 V, ±100 mV	±1 V, ±100 mV	±1 V, ±100 mV	±1 V, ±100 mV	✗	open collector	✗
Input coupling	DC	DC	DC	DC	DC	✗	✗	✗
Sensor excitation	✗	✗	244 uA / 440 uA	150 uA / 400 uA	0.4 mA / 2 mA	✗	✗	✗
Bridge connection	✗	✗	✗	✗	✗	✗	✗	✗
Programmable shunt	✗	✗	✗	✗	✗	✗	✗	✗
IEPE input	✗	✗	✗	✗	✗	✗	✗	✗
Resistance	✗	✗	1 kΩ, 10 kΩ	1 kΩ, 10 kΩ	100 Ω, 1 kΩ, 10 kΩ	✗	✗	✗
Temperature (PTx)	✗	✗	PT100, 200, 500, 1000, 2000	PT100, 200, 500, 1000, 2000	PT100, 200, 500, 1000, 2000	✗	✗	✗
Thermocouple	K, J, T, R, S, N, E, C, B	K, J, T, R, S, N, E, C, B	✗	✗	✗	✗	✗	✗
Current	✗	✗	✗	✗	✗	✗	✗	✗
Potentiometer	✗	✗	✗	✗	✗	✗	✗	✗
LVDT	✗	✗	✗	✗	✗	✗	✗	✗
Charge	✗	✗	✗	✗	✗	✗	✗	✗
TEDS	✗	✗	✗	✗	✗	✗	✗	✗
Isolation voltage	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V	1000 V
Isolation arrangement	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-Ch & Ch-GND	Ch-GND, groups of 8 ch.	Ch-GND, groups of 8 ch.	Ch-GND, group of 4/8 ch
Power consumption per module	3.2 W	Typ. 2.6 W, Max. 3.4 W	Typ. 2.1 W, Max. 2.7 W	Typ. 3.5 W, Max. 4.3 W	Typ. 2.1 W, Max. 2.7 W	Typ. 1.2 W, Max. 1.9 W	Typ. 1.2 W, Max. 2.0 W	Typ. 1.1 W, Max. 1.8 W
Waterproof version	✗	✗	✗	✗	✗	✗	✗	✗

PoE functionality	X	✓	X	✓	X	X	X	X
Advanced functions	High isolation, support of main TC types	High isolation, support of main TC types	High isolation	High isolation	Pulsed excitation, Cryogenic temperature range, High isolation	X	Watchdog	High sink current, watchdog

	4xCNT	16xAO
Connectors	L1B7f	Terminal block
Channels per module	4x	16x
Data rate per channel IOLITE	20 kS/s	20 kS/s
Data rate per channel OBSIDIAN	5 kS/s	1 kS/s
Resolution	100 MHz timebase 5 ppm, 20 ppm max	16-bit
Bandwidth	10 MHz	X
Voltage mode ranges	TTL (Low: <0.8 V, High > 2 V)	±10 V
Input coupling	X	X
Sensor excitation	5 V, 12 V	X
Bridge connection	X	X
Programmable shunt	X	X
IEPE input	X	X
Resistance	X	X
Temperature (PTx)	X	X
Thermocouple	X	X
Current	X	X
Potentiometer	X	X
LVDT	X	X
Charge	X	X
TEDS	X	X
Isolation voltage	X	X

Isolation arrangement	Ch-GND	Ch-GND
Power consumption per module	Typ. 1.9 W	Typ. 4.3 W, Max. 7.2 W
PoE functionality	✓	✗
Waterproof version	✗	✗
Advanced functions	Supercounter technology	✗



Important

Only **linear sensors** are supported on the OBSIDIAN® device (over TEDS or defined in DewesoftX). Non-linear sensors are not supported. This means that DSI-RTD and DSI-TH-UNI are not properly supported. When a non-linear sensor is used with an OBSIDIAN® device only raw data will be stored, either when stored directly on the device or in DewesoftX.

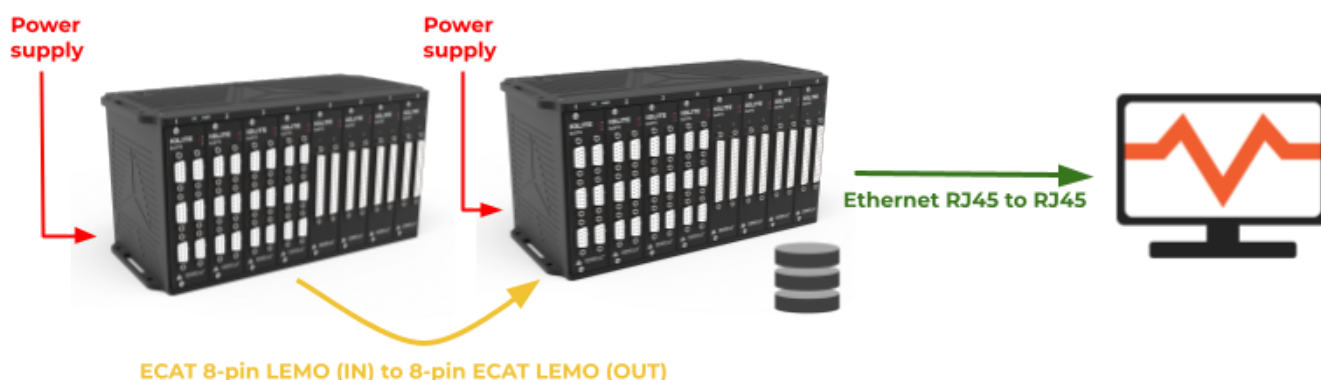
6. Connection examples

In this chapter some connection examples will be explained with schematics

6.1. Two OBSIDIAN® devices connected in a chain

When connecting two OBSIDIAN® devices you can either connect them to the PC separately or in a chain. When the two devices are connected in a chain, meaning that one device is connected to another over 8-pin LEMO EtherCAT connector, all the data is internally stored only on one OBSIDIAN® device.

The second OBSIDIAN device needs to be configured in ECAT mode - see [3.5 Connecting OBSIDIAN in standard EtherCAT mode](#).



Connection example: two OBSIDIAN-R8 devices

6.2. Two OBSIDIAN® devices - separately connected

You can also connect two devices to the PC separately over RJ-45 to the PC. This means that the data of each OBSIDIAN® device will be stored in two separate files on each device. In this way, you can configure

multiple OBSIDIAN® devices and for the configuration, no additional synchronization is needed.



Connection example: two OBSIDIAN-R8 devices

6.3. OBSIDIAN-R8 and ECAT devices

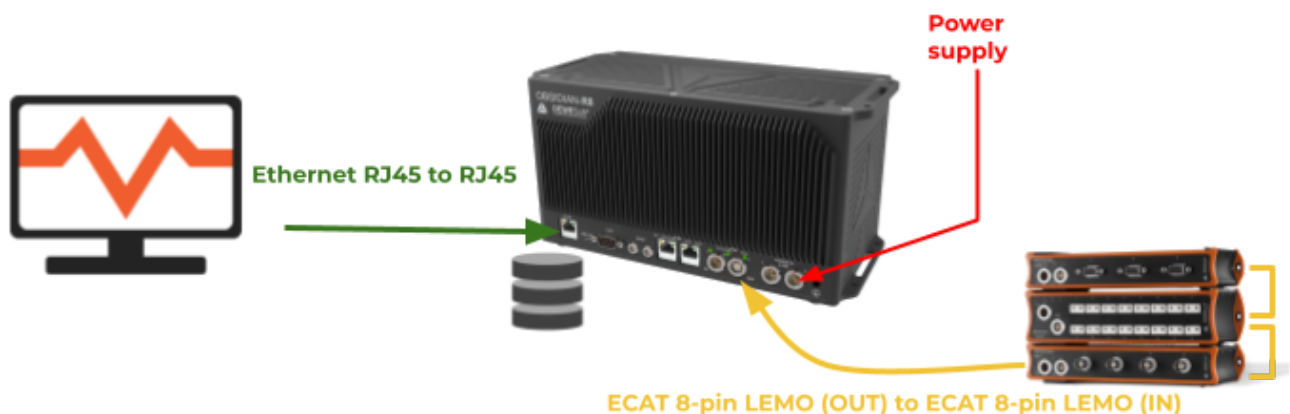
To complete the system with additional channels the user can simply connect KRYPTON or IOLITE devices directly to the EtherCAT OUT port (8-pin LEMO connector) on the back of the OBSIDIAN® device. The communication protocol between the devices is EtherCAT based, so only one cable is required for data, synchronization, and power, making the solution simple for the user. All Krypton modules can be easily stacked together to create a truly convenient design.

The data from KRYPTON/IOLITE devices can be stored on the internal drive on the OBSIDIAN® device (standalone/logger option).

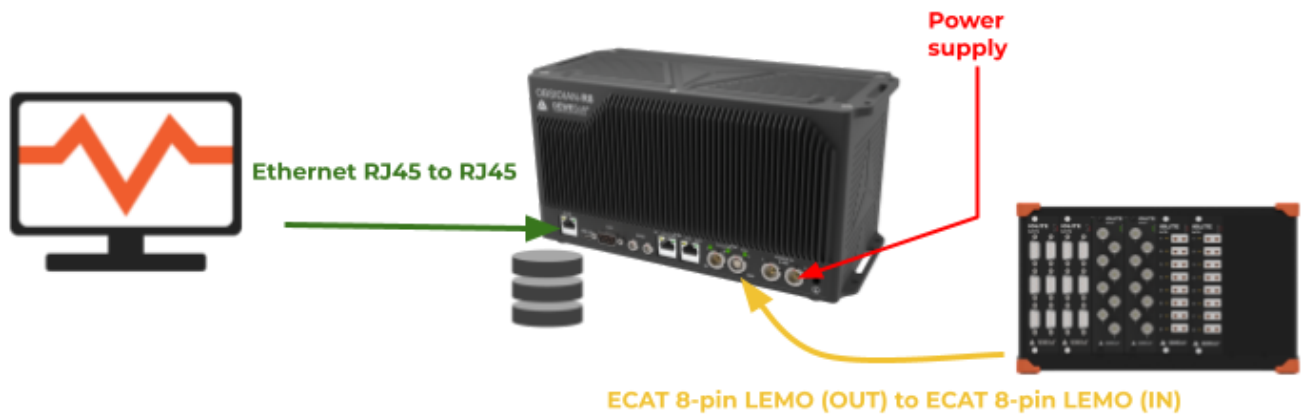


Important

The OBSIDIAN® device offers 10A on PWR OUT



Connection example: OBSIDIAN-R8 and Krypton devices



Connection example: OBSIDIAN-R8 and IOLITE-R8 device



Extending CAN ports: OBSIDIAN-R8 and Krypton1xCAN devices

Currently supported Krypton devices

- KRYPTON-1xCAN
- KRYPTON-1xCAN-FD
- KRYPTON-8xTH, 16xTH, 8xTH-HS, 16xTH-HS
- KRYPTON-3xSTG, 6xSTG
- KRYPTON-4xCNT
- KRYPTON-4xACC, 8xACC

6.4. OBSIDIAN-R8 and GPS module (DS-GPS-SYNC-10Hz)

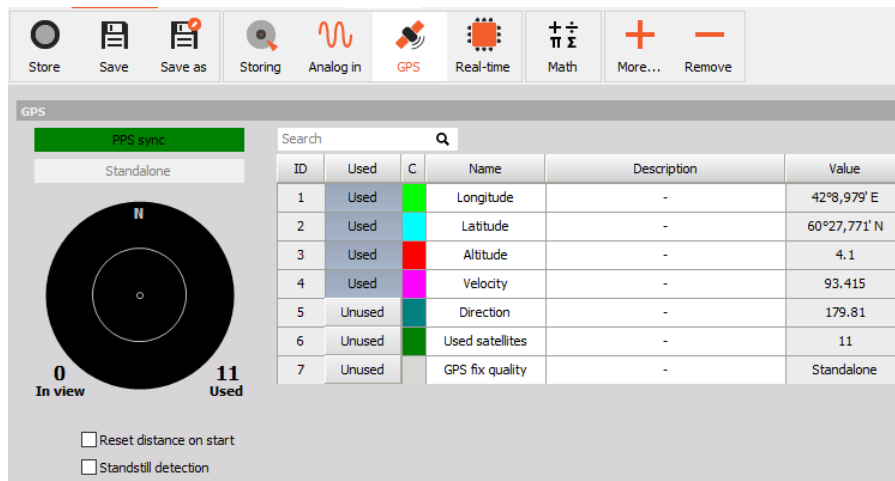
With the OBSIDIAN-R8 unit the GPS module is not integrated inside the device, but the user can connect the external GPS module directly to the USB-C port on the back of the device. To have a

complete Dewesoft solution you can add DS-GPS-SYNC-10Hz which you can find in Dewesoft configurator.



Connection example: OBSIDIAN-R8 and external GPS module

Once the GPS is connected to the device additional GPS channels can be stored internally.



Additional GPS channels inside DewesoftX

If you use third party GPS receiver you need to adjust the following NMEA settings

- RMC (Time, date, position, course and speed data)
- GGA (Time, position and fix type data)
- Baudrate: 115200
- PPS out: signal need to get PPS out to our 4-pin LEMO connector

6.5. OBSIDIAN-R8 and SIRIUS device

When connecting OBSIDIAN® with SIRIUS devices, you need to make sure to establish the synchronization between the devices. One of the options is IRIG synchronization, where you need to plug the 4-pin LEMO connector between the two devices.



Connection example: OBSIDIAN-R8 and Krypton devices

6.6. OBSIDIAN-R8 connected with DS-WIFI4

For remote connection you can also use the mobile outdoor Wi-fi communication set DS-WIFI4



Connection example: OBSIDIAN-R8 connected to the PC over DS-WIFI4

7. Accessories

In this chapter you will find a description of the Scope of supply for the OBSIDIAN-R8 system and some additional accessories that can ease your usage of the device.

7.1. Scope of supply

7.1.1. OBSIDIAN-R8

When an OBSIDIAN-R8 device is ordered you get the following scope of supply with the device:

- Ethernet cable
- Dewesoft Bag
- USB-key with the latest DewesoftX version
- Ground cable

7.1.2. OBSIDIAN-R8w

When an OBSIDIAN-R8w device is ordered you get the following scope of supply with the device:

- Ethernet cable
- Dewesoft Bag
- USB-key with the latest DewesoftX version
- Ground cable
- GPS antenna
- Wi-fi antenna

7.2. Expandable storage: External disk or SD card

You can extend the 4GB internal storage that is already available on the OBSIDIAN® device with either a USB type-C external disk or a standard SD-card.

On the right side of the OBSIDIAN® device, you will find a slot for the external SD Card. A standard SD card of up to 2TB is supported. On the back side of the device, you will find the USB-C connector where you can connect your external USB-C type external SSD or disk.



The SD-Card slot on the left is available on the right side of the device



Important

When using the external SD card or the external disk, you need to use them in FAT32 or NTFS format. Optionally you can also use EX4 format, which is more suitable for Linux but the SD-CARD will not be automatically recognized on a Windows PC.

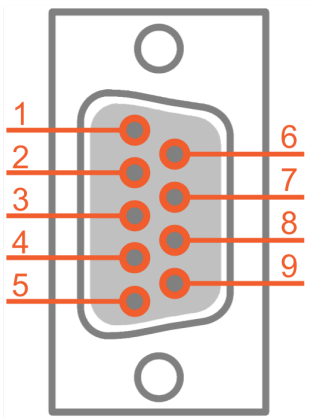
7.3. D9f-2D9m-Xm-CAN-DUAL-D

The Y cable - CAN-DUAL-D is used for splitting the two CAN ports that are available on the DSUB-9 CAN connector on the back of the OBSIDIAN® device.
Pin-out of the female DSUB-9 connector that is connected to the OBSIDIAN® device.



Important

OBSIDIAN-R8 and OBSIDIAN-R8w have different pinouts of CAN connectors, so D9f-2D9m-Xm-CAN-DUALw and D9f-2D9m-Xm-CAN-DUAL-D are not interchangeable.

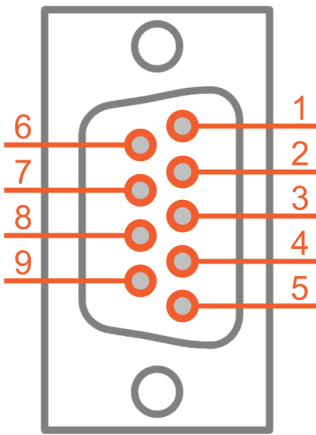


DSUB9 female connector

Connector type: DSUB9

Pin	Name	Description
1	+5V	5V power supply
2	CAN LOW	CAN Low for First Bus
3	DGND	Isolated Digital Ground
4	CAN2 LOW	CAN Low for Second Bus
5	CAN2 HIGH	CAN High for Second Bus
6	DGND	Isolated Digital Ground
7	CAN HIGH	CAN High for First Bus
8	NC	Not connected
9	+12V	12V power supply

On the other side of the Y cable there are two DSUB-9 male connectors with the standard CAN pin-out.



DSUB9 male connector

Connector type: DSUB9

Pin	Name	Description
1	I5V OUT	Isolated 5V output
2	CAN LOW	CAN Low
3	IGND	Isolated Digital Ground
4	NC	Not connected
5	NC	Not connected
6	IGND	Isolated Digital Ground
7	CAN HIGH	CAN High
8	NC	Not connected
9	NC	Not connected

7.4. D9f-2D9m-Xm-CAN-DUALw

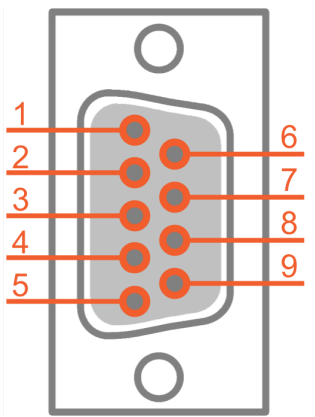
The Y cable - CAN-DUAL-Dw is used for splitting the two CAN ports that are available on the DSUB-9 CAN connector on the back of the OBSIDIAN®-R8w device.



Important

OBSIDIAN-R8 and OBSIDIAN-R8w have different pinouts of CAN connectors, so D9f-2D9m-Xm-CAN-DUALw and D9f-2D9m-Xm-CAN-DUAL-D are not interchangeable.

Pin-out of the female DSUB-9 connector that is connected to the OBSIDIAN®-R8w device.

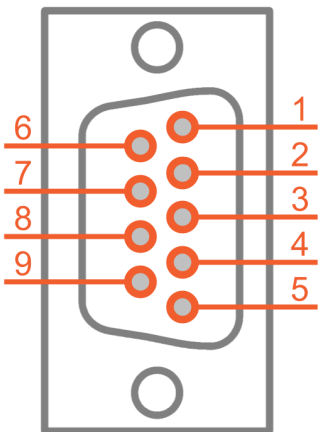


DSUB9 female connector

Connector type: DSUB9

Pin	Name	Description
1	CAN2 LOW	CAN Low for Second Bus
2	CAN1 LOW	CAN Low for First Bus
3	GND	Isolated Digital Ground
4	+5V	Isolated 5V output (max. 150 mA)
5	NC	Not connected
6	GND	Isolated Digital Ground
7	CAN1 HIGH	CAN High for First Bus
8	CAN2 HIGH	CAN High for Second Bus
9	+12V	Isolated 12V output (max.)

On the other side of the Y cable there are two DSUB-9 male connectors with the standard CAN pin-out.



DSUB9 male connector

Connector type: DSUB9

Pin	Name	Description
1	I5V OUT	Isolated 5V output
2	CAN LOW	CAN Low
3	IGND	Isolated Digital Ground
4	NC	Not connected
5	NC	Not connected
6	IGND	Isolated Digital Ground
7	CAN HIGH	CAN High
8	NC	Not connected
9	NC	Not connected

7.5. DewesoftM

You can observe the live-data from the OBSIDIAN® device with the mobile application - DewesoftM. You can connect to the OBSIDIAN® device, when the device and the mobile phone are in the same network.

You can present live-data on different widgets:

- Recorder
- Digital meter
- Analog meter
- Map widget

With the app you can also reach some system monitor channel of the OBSIDIAN® device. The mobile app can act as the remote display to monitor the currently recorded data and current status of your OBSIDIAN® device. Currently you can be connected to the device either with DewesoftX or DewesoftM. Parallel connection is currently not supported.

You can download the DewesoftM mobile app from the [Google play store](https://play.google.com/store/apps/details?id=com.dewesoft.dewesoftm).



Important

The DewesoftM mobile application is in a beta version. Please report all found bugs to support@dewesoft.com



Connection to the OBSIDIAN® device

8. Warranty information

Notice

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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/distributors>.

8.1. Calibration

Every instrument needs to be calibrated at regular intervals. The standard norm across nearly every industry is 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.

8.2. 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.

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

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

8.3. 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>.

8.4. Restricted Rights

Use Slovenian law for duplication or disclosure. Dewesoft d.o.o. Gabrsko 11a, 1420 Trbovlje, Slovenia / Europe.

8.5. Printing History

Version 2.0.0, Revision 217 Released 2015 Last changed: 23. July 2018 at 16:54.

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9. Safety instructions

Your safety is our primary concern! Please be safe!

9.1. 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.

9.2. 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.

9.2.1. Environmental Considerations

Information about the environmental impact of the product.

9.2.2. Product End-of-Life Handling

Observe the following guidelines when recycling a Dewesoft system:

9.2.3. 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 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.

9.2.4. 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 main 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 environments. 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 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 flawlessness 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.

EN 61326-3-1:2008

IEC 61326-1 applies to this part of IEC 61326 but is limited to systems and equipment for industrial applications intended to perform safety functions as defined in IEC 61508 with SIL 1-3.

The electromagnetic environments encompassed by this product family standard are industrial, both indoor and outdoor, as described for industrial locations in IEC 61000-6-2 or defined in 3.7 of IEC 61326-1.

Equipment and systems intended for use in other electromagnetic environments, for example, in the process industry or in environments with potentially explosive atmospheres, are excluded from the scope of this product family standard, IEC 61326-3-1.

Devices and systems according to IEC 61508 or IEC 61511 which are considered as “operationally well-tried”, are excluded from the scope of IEC 61326-3-1.

Fire-alarm and safety-alarm systems, intended for the protection of buildings, are excluded from the scope of IEC 61326-3-1.

10. Documentation version history

Version	Date	Notes
V23-1	27.6.2023	First version
V23-3	28.12.2023	<ul style="list-style-type: none">- Trigger module- GPS module- New synchronization type- New UI redesign- DewesoftM- OBSIDIAN-R8w