

**SIRIUSi-XHS®**

 **DEWESoft®**

## TECHNICAL REFERENCE MANUAL

SIRIUSi-XHS® V23-2

**HYBRID ADC**  
**HIGH BANDWIDTH 5MHz @ 15 MS/s**  
**ALIAS-FREE HIGH DYNAMIC UP TO 1MS/s**



# Table of contents

<b>1. About this document</b>	<b>6</b>
1.1. Legend	6
1.2. Online versions	7
1.2.1. Online SIRIUSi-XHS® technical reference manual	7
1.2.2. DewesoftX User Manual	7
<b>2. Getting started</b>	<b>8</b>
2.1. Software installation	8
2.2. Connecting SIRIUSi-XHS®	9
2.2.1. Connection over 3.0 USB	9
2.2.2. Connection over EtherNET	9
2.2.2.1. Ethernet configuration on the PC	10
2.2.2.2. DewesoftX settings for SIRIUSi-XHS®	10
2.2.2.3. Autodetect	11
2.2.2.4. Configuring the IP address inside the discovery module	12
2.2.2.5. Sample rate	13
2.2.3. Device overview	13
2.2.3.1. Connecting settings	14
2.2.3.2. Info	14
2.2.3.3. Network settings	14
2.2.3.4. Device settings	15
2.3. Synchronization	15
2.3.1. System configuration with multiple devices synchronized with PTPv2	16
2.3.1.1. Recommended/Tested PTPv2 switches	17
2.3.2. A system with old-generation devices and SIRIUS-XHS (PTPin-IRIGout option)	17
2.4. Channel Setup SIRIUSi-XHS®	19
2.5. Simple Measurement	19
2.5.1. Help - Manual	19
2.5.2. Analog channel setup	20
2.5.3. Sample rate	21
2.5.4. Measurement Mode	22
2.5.5. Analyze Mode	23
2.6. RT mode	23
2.6.1. RT mode status	24
2.6.2. RT controller module	25
2.7. Advanced configuration	27
2.8. Firmware upgrade	27
2.9. Licensing	28
<b>3. System overview</b>	<b>29</b>
3.1. Main features	30
3.1.1. Hybrid ADC technology	31

3.1.2. Perfect synchronization	31
3.1.3. Open interface protocols	32
3.1.4. Data Acquisition Software Included for Free	32
3.2. System specifications	33
3.3. Single slice: Front site	34
3.3.1. LED light indicator	34
3.4. Single slice: Rear side	35
3.5. Connectors	36
3.5.1. Power supply	36
3.5.1.1. Power in connector	36
3.5.1.2. Power out connector	36
3.5.2. SYNC connector	37
3.5.3. CAN / CAN-FD	38
3.5.4. GND connector	39
3.5.5. Ethernet Connector	39
3.5.6. USB connector	40
3.6. Connections examples	41
3.6.1. Connection with slow ECAT devices (TH, RTD)	41
3.6.2. Connection with other SIRIUS modules	41
3.6.3. PTP synchronization when XHS devices are connected over USB (data)	42
3.6.4. Connection of multiple SIRIUSi-XHS devices with SBOX	43
3.6.5. System for more demanding measurements with SIRIUSi-XHS	43
3.6.5.1. PC-GPU-PWR-BASIC	43
3.6.5.2. PC-GPU-PWR-SUPER	44
3.6.6. Multiple devices over EtherNET	44
3.6.7. Storing on high sample rates	44
<b>4. SIRIUSi-XHS® measurement modules</b>	<b>45</b>
4.1. SIRIUSi-XHS® slice configuration	45
4.1.1. Standard slices	45
4.1.1.1. SIRIUSi-XHS-4xHV-4xLV	45
4.1.1.2. SIRIUSi-XHS-4xHV-4xLV-BAN	45
4.1.1.3. SIRIUSi-XHS-8xHV	45
4.1.1.4. SIRIUSi-XHS-8xLV	45
4.1.1.5. SIRIUSi-XHS-8xLV-BNC	46
4.1.1.6. SIRIUSi-XHS-8xACC	46
4.1.1.7. SIRIUSi-XHS with 8xCNT	46
4.1.2. Customized slice	46
4.2. SIRIUSi-XHS® specifications	47
4.3. SIRIUSi-XHS® dimensions	48
4.4. HV: Specifications	49
4.4.1. HV: Banana connector	50
4.4.1.1. HV: Banana connector Pinout	50

4.4.1.2. HV: Banana connector Wiring diagram	50
4.4.1.2.1. Voltage	50
4.4.2. Magnitude response	50
4.5. LV: Specifications	52
4.5.1. LV: DSUB9 connector	54
4.5.1.1. LV: DSUB9 connector Pinout	54
4.5.1.2. LV: DSUB9 connector Wiring diagram	54
4.5.1.2.1. LV: Voltage	54
4.5.2. LV: BAN connector	55
4.5.2.1. LV: BAN connector Pinout	55
4.5.2.2. LV: BANconnector Wiring diagram	55
4.5.2.2.1. LV: Voltage	55
4.5.3. LV: BNC connector	56
4.5.3.1. LV: BNC connector Pinout	56
4.5.3.2. LV: BNC connector Wiring diagram	56
4.5.3.2.1. LV: Voltage	56
4.5.4. Magnitude response	57
4.6. ACC: Specifications	58
4.6.1. ACC: BNC connector	60
4.6.1.1. ACC: BNC connector Pinout	60
4.6.1.2. ACC: BNC connector Wiring diagram	60
4.6.1.2.1. ACC: Voltage, IEPE	60
4.6.2. Magnitude response	60
4.7. CNT: Specifications	63
4.7.1. CNT: GLAN and USB support	63
4.7.2. CNT: LEMO connector	65
4.7.2.1. CNT: LEMO connector Pinout	65
<b>5. Filtering</b>	<b>66</b>
5.1. Advanced channels	69
5.1.1. LP filter OFF (RAW)	70
5.1.2. HW 1 MHz filter ON	71
5.1.3. AAF (zero-phase distortion) ON	72
<b>6. Accessories</b>	<b>74</b>
6.1. Fibre Optic USB 3.0 Extender	74
<b>7. FAQ section</b>	<b>75</b>
7.1. Device not recognized when connected over USB	75
7.2. Clear static configuration	75
7.3. Setting static IP on the PC	75
7.4. Locating the XHS device	76
7.5. Setting Firewall exception	77
7.6. Connecting SIRIUSi-XHS with automatic IP assignment to network without DHCP server	78
7.7. Troubleshooting	78

---

<b>8. Safety instructions</b>	<b>79</b>
8.1. General Safety Instructions	79
8.1.1. Environmental Considerations	79
8.1.2. Product End-of-Life Handling	79
8.1.3. General safety and hazard warnings for all Dewesoft systems	79
<b>9. Notice</b>	<b>82</b>
9.1. Warranty Information	82
9.2. Calibration	82
9.3. Support	82
9.4. Service/repair	82
9.5. Restricted Rights	82
9.6. Copyright	83
9.7. Trademarks	83
9.8. Documentation version	84

# 1. About this document

This is the Technical Reference Manual for SIRIUSi-XHS® device, version **V23-2**.

SIRIUSi-XHS® is a high performance, high speed line of SIRIUS® real time data acquisition hardware used for the most demanded power measurements, specially designed for E-mobility applications. 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 detailed description of the SIRIUSi-XHS® hardware
- 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 DewesoftX
- Detailed technical data: Specifications, etc.

## 1.1. Legend

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



### Important

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



### Hint

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



### Example

Give 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.

## 1.2. Online versions

### 1.2.1. Online SIRIUSi-XHS® 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 *SIRIUSi-XHS® technical reference manual*.

### 1.2.2. DewesoftX User Manual

The DewesoftX tutorials 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://download.dewesoft.com/list/manuals-brochures/software-manuals>

In the *Software Manuals* section click the download link of the DewesoftX tutorials entry.



#### **Important**

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

## 2. Getting started

This chapter will help you to install the software, connect your SIRIUSi-XHS® device to the PC via Ethernet or via USB, and will show you how to configure DewesoftX software.

To follow these steps, you need the following items:

- your brand new SIRIUSi-XHS® system (included in the shipment)
- your network cable (included in the shipment)
- Your USB cable (included in the shipment)
- Your PC with Windows 10 or higher and the DewesoftX software

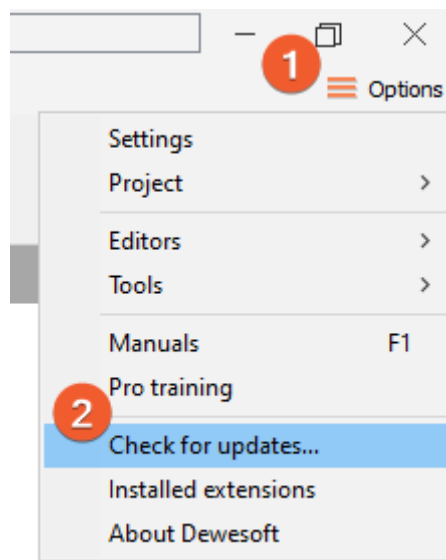
### Hint



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

### 2.1. Software installation

For optimal working, we recommend that you install the latest version of DewesoftX. If you already have DewesoftX installed, you can always check if a newer version is already available. You can either check on the website under the Support/Downloads/DewesoftX section or directly in the software under the Options/Check for updates. In both cases, the changelog is included.



*Check for updates*

## 2.2. Connecting SIRIUSi-XHS®

In this chapter, you can see the basic instructions for connecting SIRIUSi-XHS® devices over a 3.0 USB and RJ-45 Ethernet connection. Advanced connections are described in the following chapters.



### Important

The XHS device is not supported on Windows 7 OS.

### 2.2.1. Connection over 3.0 USB

First connect the power supply cable (PS-120-L1B2f) to the PWR-IN 2-pin LEMO 1B male connector. Then connect the USB cable with the USB-C connector to the appropriate connector on the back of the XHS device. Finally, connect the other side of the USB cable with the USB-A or USB-C to 3.0 USB connector on the PC. The 3.0 USB connector is usually coloured blue.



Connection over 3.0 USB

When the device is connected via 3.0 USB the device is automatically detected and added to the HW list and all 8 channels can run with the full sample rate of 15 MS/s.



### Important

A **good quality USB 3.0** cable needs to be used otherwise the device can be recognized as a 2.0 USB device and can not acquire data at high sampling rates (higher than 1M). Recommended cable length for standard cable is up to 1.8 m. For longer cables, an active fibre extender can be used; [more in accessories](#).



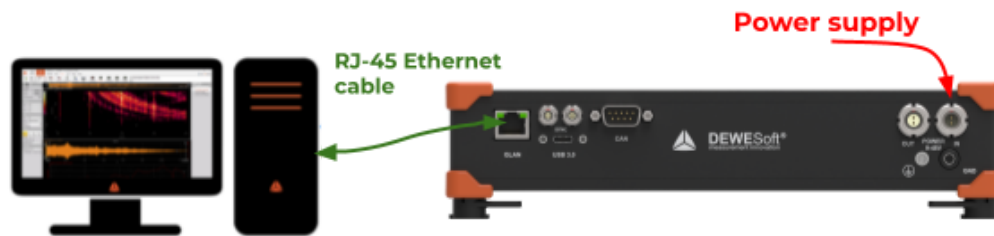
### Important

When using a 3.0 connection the default **Windows power settings** turn off the device after some time. This setting can be turned off in Windows power-saving settings. This is mostly important for long-term measurement

### 2.2.2. Connection over EtherNET

First, connect the power supply cable (PS-120-L1B2f) to the PWR IN 2-pin LEMO 1B male connector. Then connect the Ethernet Cable with the RJ-45 connector to the appropriate GLAN connector on the back of the XHS device. Finally, connect the other side of the ethernet cable to the LAN port of the PC.

When the connection is established over ethernet the device is automatically added only if connected directly to PC, if any switch is in between you will need to add the device manually. When the device is added also all the RT features and modules in DewesoftX are available.



*Connection over Ethernet*

### 2.2.2.1. Ethernet configuration on the PC

A SIRIUSi-XHS® can work in two different operation modes.

Sirius-XHS® will be properly connected to DewesoftX software when the IP address of the device and the IP address of the network card, where the device is connected, are in the same subnet. More information is available in the [FAQ](#) section.

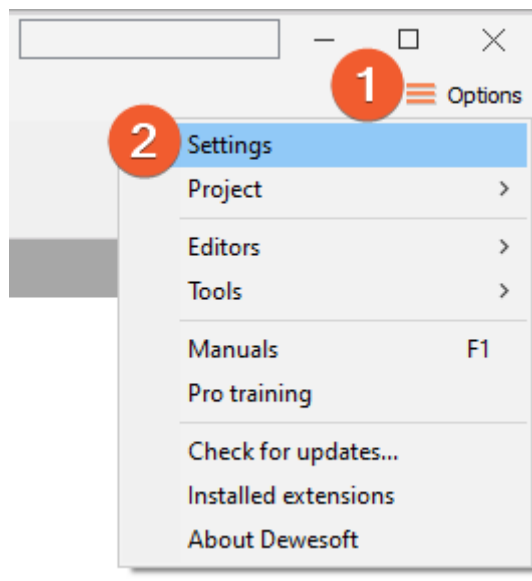
#### **Warning**



As a network device with DHCP enabled it can use dynamic IP assignment. The DHCP server has to be running to locate the device with DewesoftX software. When a DHCP-enabled device is connected to a network without a DHCP server, the device has no IP address configuration and it is unreachable over the network. Locating the device in that scenario is described in the [FAQ](#) section.

### 2.2.2.2. DewesoftX settings for SIRIUSi-XHS®

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



*Settings in DewesoftX*

In case the SIRIUSi-XHS® device is connected via USB, the device will automatically be listed under the Dewesoft devices.

In case the device is connected via Ethernet, the device is treated as a RT connection. To add it to the DewesoftX you can use multiple procedures which are described in the following chapter

### 2.2.2.3. Autodetect

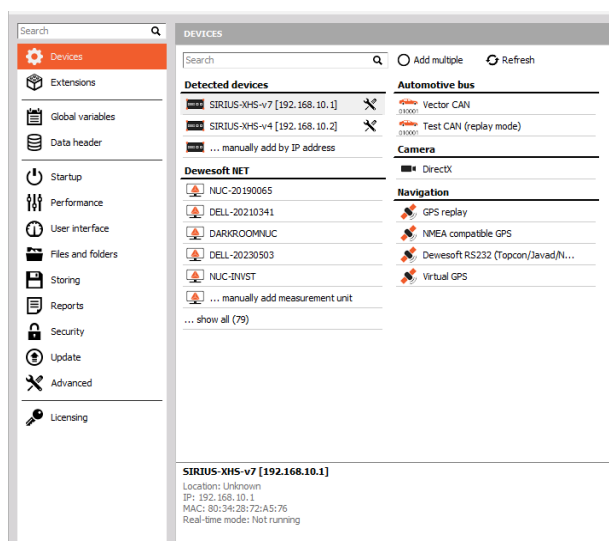
The device is automatically detected and added in HW settings when connected directly to the network port on your SBOX, data logger, or PC.

When multiple devices are connected over a network switch then the devices will be automatically detected but will not be automatically added to the HW settings list. All the found devices will be listed in the Network devices settings. The devices can be easily added by pressing the plus button.



#### **Important**

DewesoftX has to be set as a firewall exception, otherwise, Windows can block connection to the device. In the [FAQ](#) section, you can find the chapter describing the procedure.



Autodetect

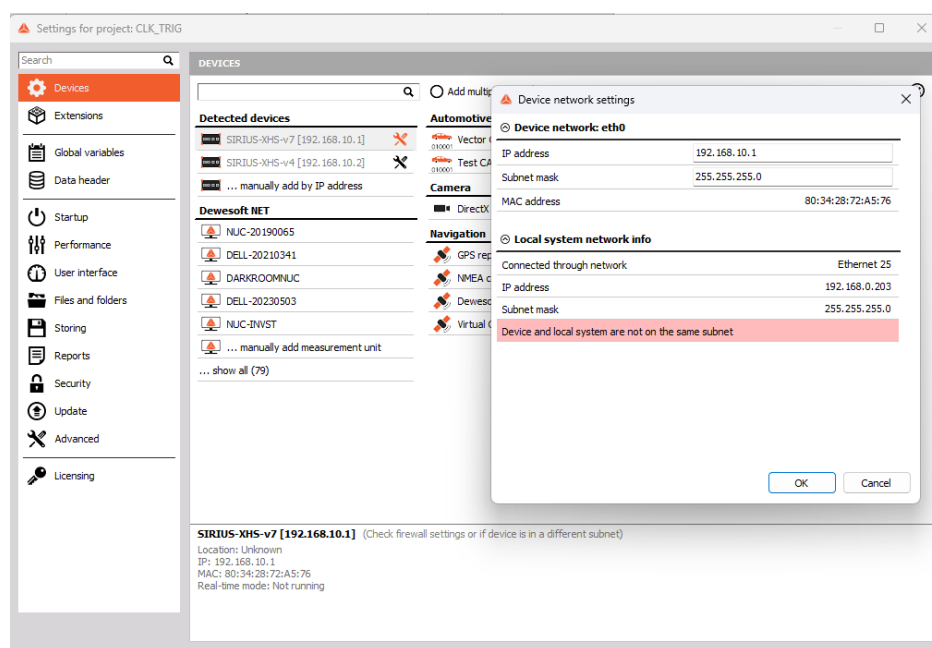
#### 2.2.2.4. Configuring the IP address inside the discovery module

If the IP address is different the discovery module will raise a warning “Check networks settings”. By pressing the three-dotted button the advanced settings will appear and the network card IP address will be shown in red. The user can then modify the IP of the SIRIUSi-XHS device to match it to the IP of the network card. When the IP addresses will match, the user will be able to add the device in the settings.



#### NOTE

If you have two devices with the same IP address, only one will be detected. Configure the devices' IP addresses one device at a time so that each device has a unique IP address.



*Changing the IP in autodetect*

### 2.2.2.5. Sample rate

When connecting the device via Ethernet there is a limitation of sample rate, depending on how many channels we want to use. Take notice that the SIRIUSi-XHS device has a 1Gbit Ethernet port. Channels up to 2MS/s can be filtered and if filtered their sample size is 4B. Channels above 2MS/s are unfiltered with a sample size of 2B.

Nr. of channels used in measure	Max sample rate per channel
2	15 MS/s
4	7.5 MS/s
6	5 MS/s
8	2 MS/s

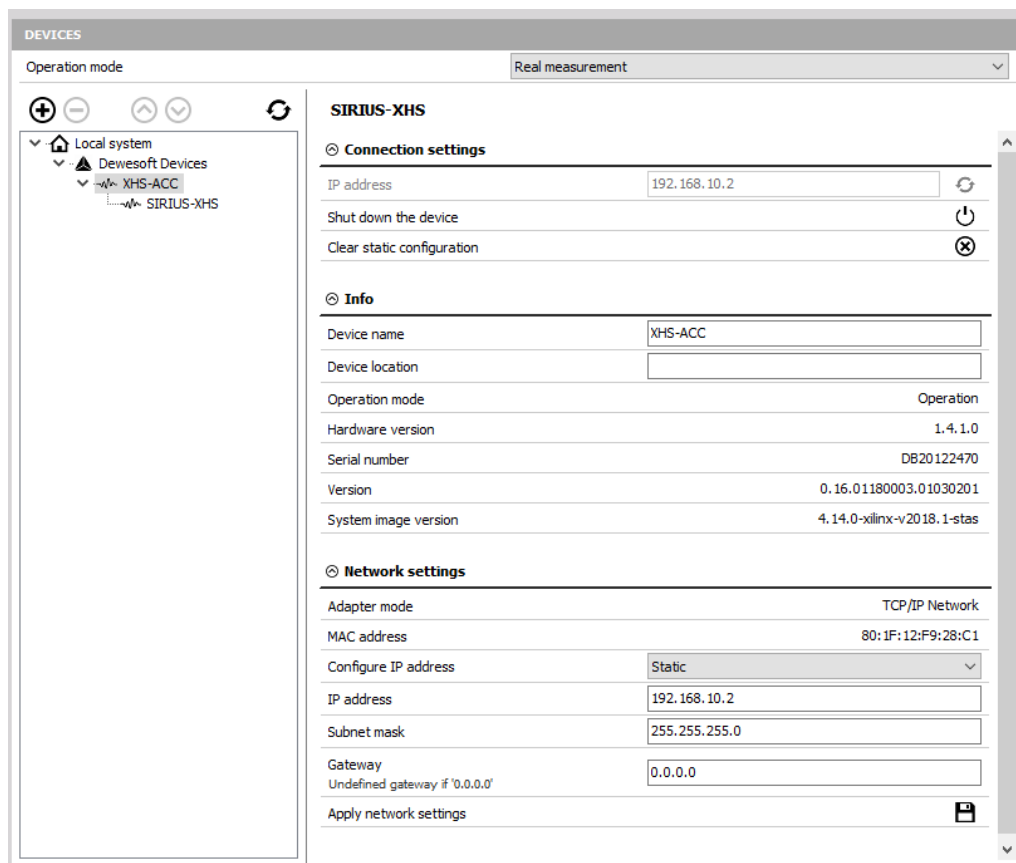


#### **Important**

You can run all 8 channels on SIRIUSi-XHS® device on 2 MS/s if you have a good PC with an embedded network card. We do not recommend using a USB-Ethernet adapter as its performance can be poorer.

### 2.2.3. Device overview

After the device is properly added it will be listed in the HW tree view list. When you select the device the properties pane at the right will show the related data e.g. Serial number, Firmware version, IP address etc.



*SIRIUSi-XHS® device overview*

### 2.2.3.1. Connecting settings

Under the connecting setting you will see the IP address of the device, which relates to the IP of the currently connected device. Changing this IP will not change the IP of the device, but will search for a device with the IP address you entered.

You have an additional button to “Shut down the device” remotely. This will shut down the application on the device. To enable back the amplification you need to power-cycle the device.

You have an additional button “Clear static configuration”, which clears the configuration on the device.

### 2.2.3.2. Info

In the info section you can change the Device name, enter the Device location and see the HW version, Serial number, FW version and System image version. Also, the operation mode can be seen in the info section - if the Operation mode is showing “Operation” this means that the device is in standard OPC-UA mode. If the Operation mode is showing RT mode the device is in RT mode. When the RT mode is enabled, the device's properties are locked and can not be changed.

### 2.2.3.3. Network settings

Under Network settings you will find the connection parameters and device MAC address. In the field “Configure IP address” the device IP address to static or dynamic (DHCP). If set to static you can configure it in the bottom three fields. In the last row, you can save the configuration.



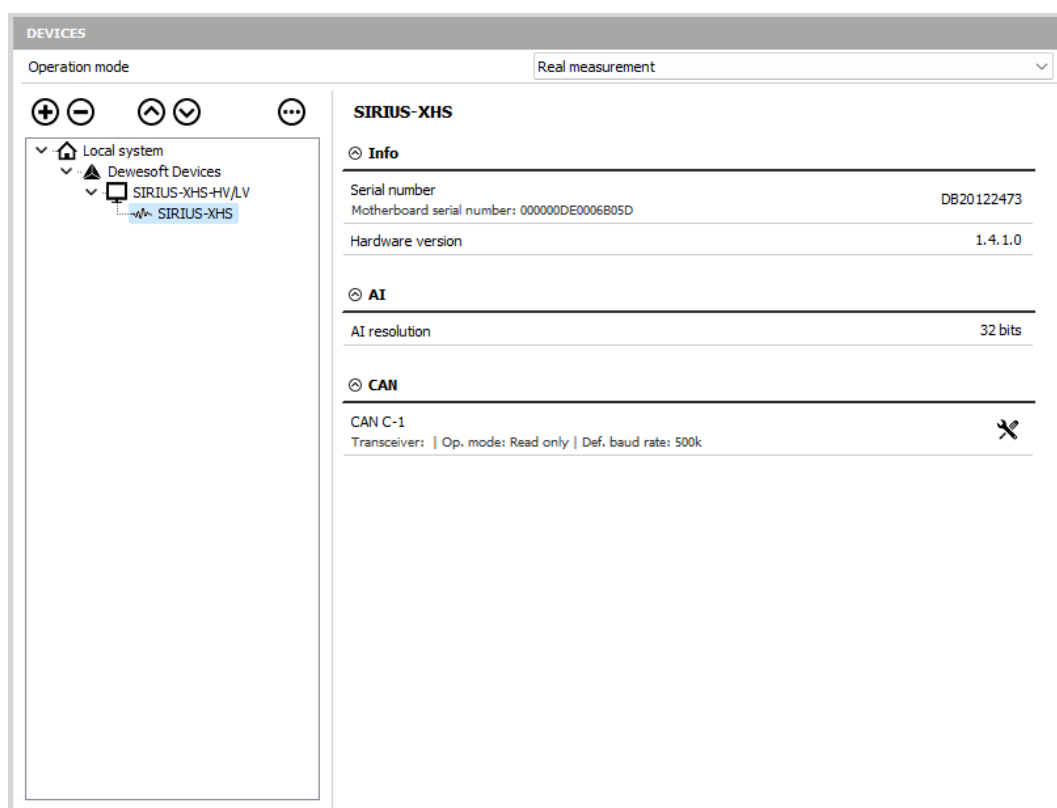
#### Important

If you set the device to dynamic IP and connect the device to a network without the DHCP server, you can not locate the device with DewesoftX. The procedure for detecting a device in such a manner can be found under [FAQ](#).

### 2.2.3.4. Device settings

With a click on SIRIUSi-XHS (in the left device overview list) more information shows up. Here you can find the device serial number and its hardware version.

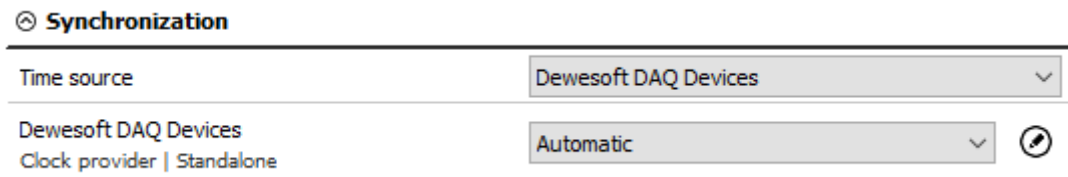
In the last section, all settings regarding CAN ports on your device are available.



*SIRIUSi-XHS® device settings*

## 2.3. Synchronization

Before measurement you need to set the synchronization for the used system. The synchronization is set in HW settings under the Local system. When only one SIRIUSi-XHS® device is connected, the synchronization can be set as “Standalone”.



*Synchronization options*

When you have more than one device connected in system configuration, you can either choose between External time synchronization or you can choose XHS device to be a master synchronization source.

As an external source the SIRUSi-XHS® device accepts the following synchronization signals:

- PPS
- PTPv2
- IRIG-B-DC

The SIRIUSi-XHS device can generate (can be a master source for other devices) the following signals (For both options to be enabled please use the latest FW on the web-page):

- PTPv2
- IRIG-B-DC



### Hint

When the SIRIUSi-XHS device is connected over USB, PTP synchronization can be used if the device is simultaneously connected over Ethernet.

### 2.3.1. System configuration with multiple devices synchronized with PTPv2

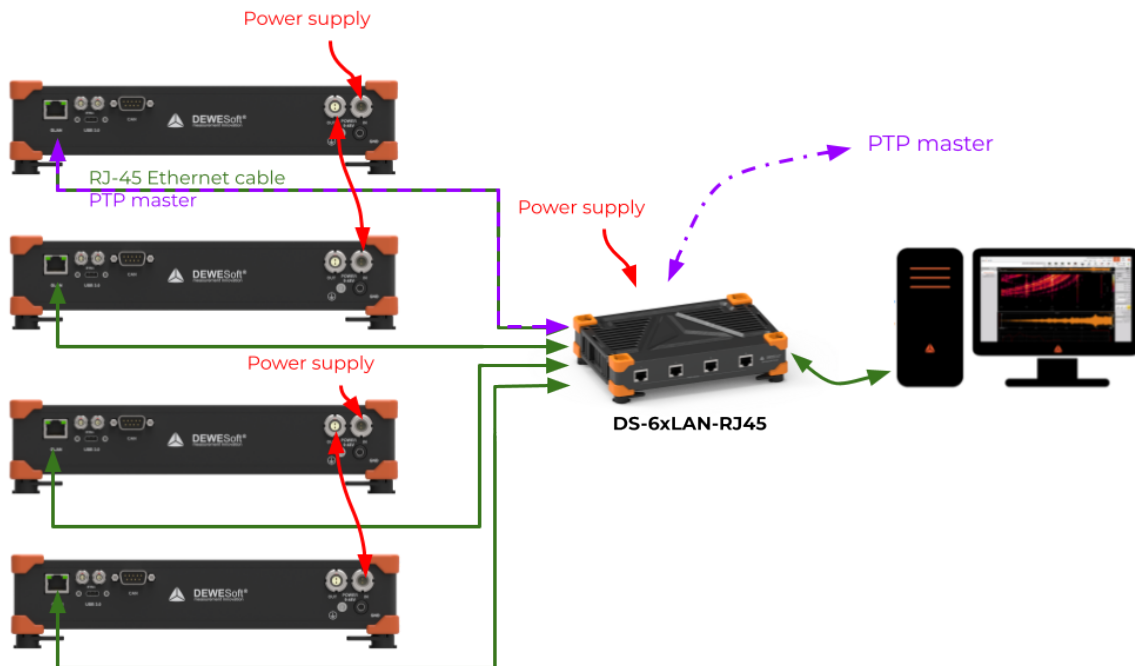
When you use multiple SIRIUSi-XHS® devices in one system configuration and want to synchronize them with PTP they need to be connected to the same Ethernet switch that also supports the PTP synchronization. For this purpose, a Dewesoft DS-6xLAN-RJ45 switch can be used. The switch is described in the [Accessories chapter](#).



### Warning

**Don't start the RT mode if devices are not synchronized.**

When going to a measurement screen, devices need a certain amount of time to be synchronized. With PTP synchronization it can take up to 60 seconds.



*System configuration over EtherNET with PTP synchronization*

The SIRIUSi-XHS can work in two different configurations; as a PTP master or PTP slave. SIRIUS-XHS device does not support the free mode option of the PTPv2 synchronization), where the devices decide which device is the master clock and which are then set in slave mode.

When the device is a PTP master, its synchronization settings must be set to “PTP out”. When there is another PTP master in the measurement chain, the device can become a PTP slave, with synchronization settings set to “PTP in”.

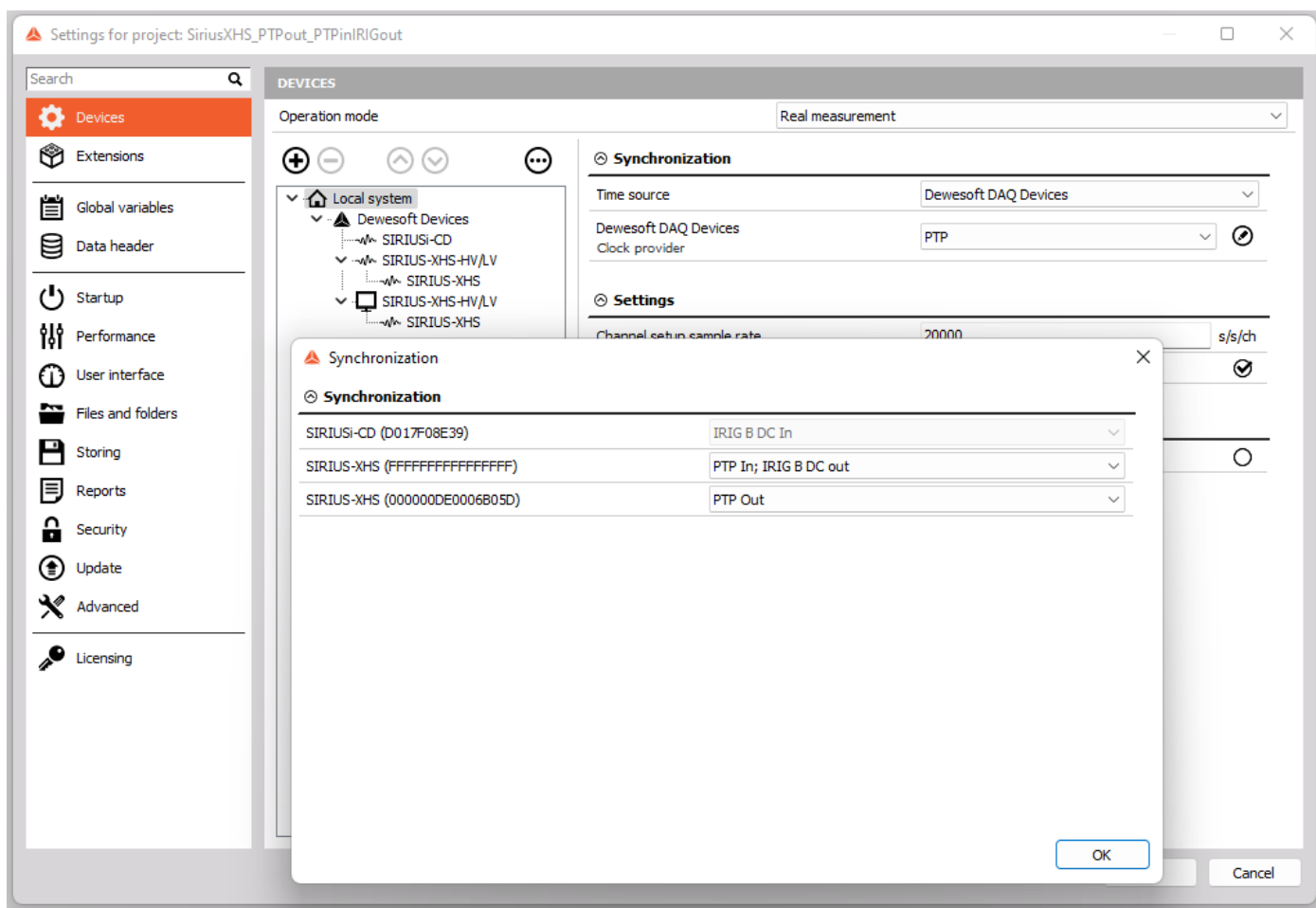
### 2.3.1.1. Recommended/Tested PTPv2 switches

Other PTP switches that were tested and are confirmed from our site:

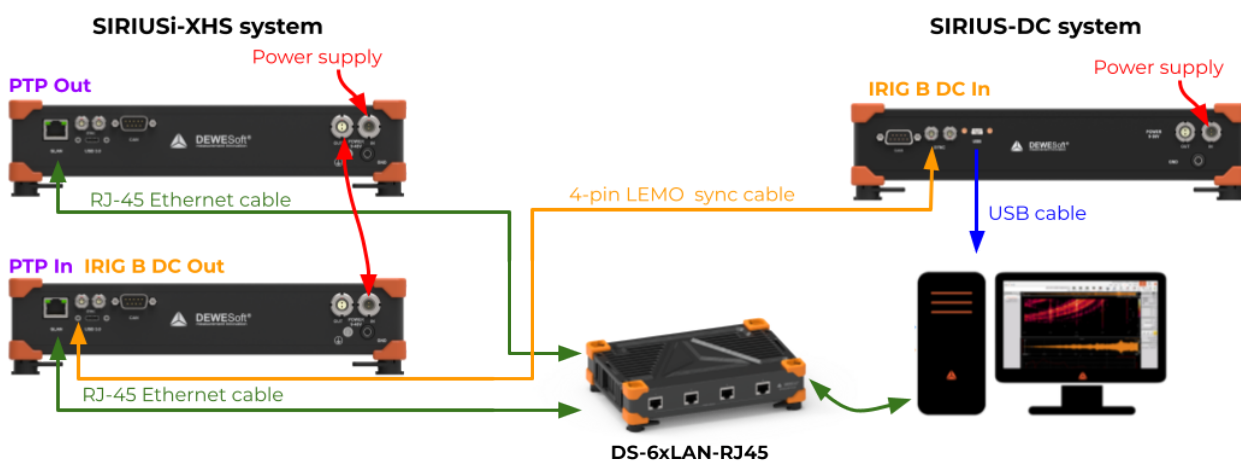
- DS-6xLAN-RJ45
- PLANET IGS-5225-4T2S
- PLANET IGS-5225-8P2S2X
- Cisco Catalyst IE3200

### 2.3.2. A system with old-generation devices and SIRIUS-XHS (PTPin-IRIGout option)

SIRIUSi-XHS® can be used as a bridge between the PTP and IRIG-B synchronization. The SIRIUS-XHS devices can be synchronized with the PTPv2 signal and in the same step output the IRIG-B signal to other devices in the measuring chain that only supports IRIG-B. That means you can use our older generation SIRIUS devices with the new XHS ones in one measurement.



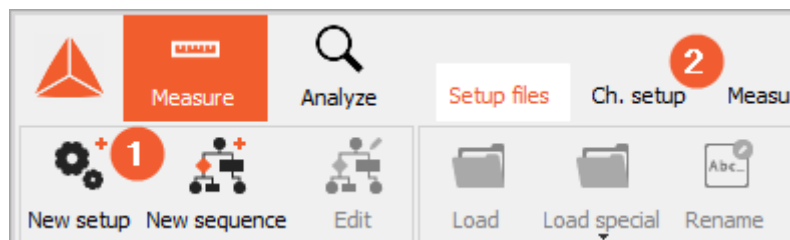
PTPin-IRIGout Synchronization settings



PTPin-IRIGout schematic

## 2.4. Channel Setup SIRIUSi-XHS®

When you configure all the HW settings you can then continue into the Measure mode and choose between already saved Setup files or 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 inside the Analog In the module, you will see the Dynamic acquisition rate and list all the AI channels of the currently connected devices.



*DewesoftX New setup*

In channel setup mode you can adjust the properties of the channels. You can set the wanted channel name, wanted sample rate per channel, range etc. and select channels you want to use/store for data acquisition.

ID	Used	C	Name	Ampl. name	Range	Measurement	Min	Values	Max	Physical quantity	Units	Zero	Setup
1	Used		AI 1	XHS HV	20	Voltage	-20.00	-3.372 / 3.491	20.00		V	Zero	Setup
2	Used		AI 2	XHS HV	20	Voltage	-20.00	-1.669 / 1.792	20.00		V	Zero	Setup
3	Used		AI 3	XHS HV	20	Voltage	-20.00	-3.312 / 3.435	20.00		V	Zero	Setup
4	Used		AI 4	XHS HV	20	Voltage	-20.00	-1.495 / 1.616	20.00		V	Zero	Setup
5	Used		AI 5	XHS LV	5	Voltage	-5.00	-1.653 / 1.778	5.00		A	Zero	Setup
6	Used		AI 6	XHS LV	5	Voltage	-5.00	-0.449 / 0.572	5.00		A	Zero	Setup
7	Used		AI 7	XHS LV	5	Voltage	-5.00	-2.257 / 2.368	5.00		A	Zero	Setup
8	Used		AI 8	XHS LV	5	Voltage	-5.00	-0.837 / 0.948	5.00		A	Zero	Setup

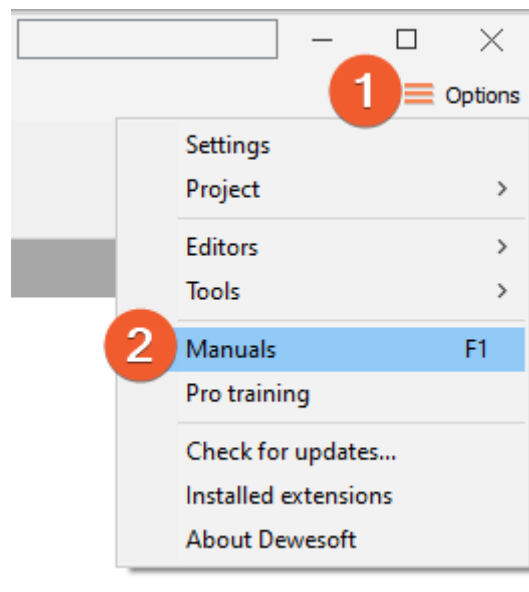
*Channels inside DewesoftX*

## 2.5. Simple Measurement

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

### 2.5.1. 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 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. Click on Ch. setup (on the right of Setup files) to switch to the Channel setup mode.

### 2.5.2. Analog channel setup

In the analogue channel setup screen you can see all channels of your connected SIRIUS 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 6 **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 SIRIUS **4**.

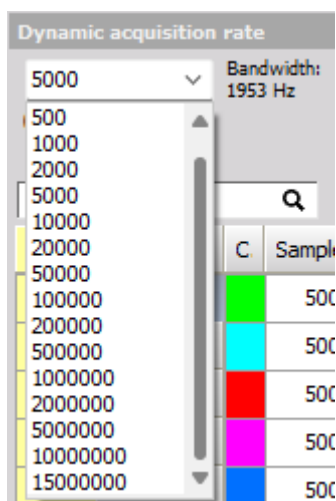
ID	Used	Stored	Exported	C	Name	Ampl. name	Range	Measurement	Min	Values	Max
1	Used	Store	Exported		AI 1	SIRIUS-HS-HV	20 V	Voltage	-20,00	0,000102	20,00
2	Unused	Store	Exported		AI 2	SIRIUS-HS-HV	20 V	Voltage	-20,00	-0,000121	20,00
3	Unused	Store	Exported		AI 3	SIRIUS-HS-HV	20 V	Voltage	-20,00	0,001571	20,00
4	Unused	Store	Exported		AI 4	SIRIUS-HS-CHG +	0,1 V	Voltage	-0,10	-0,008985	0,10
5	Unused	Store	Exported		AI 5	SIRIUS-HS-ACC +	0,2 V	Voltage	-0,20	0,017206	0,20
6	Unused	Store	Exported		AI 6	SIRIUS-HS-STG	0,1 V	Voltage	-0,10	-0,087849	0,10
7	Unused	Store	Exported		AI 7	SIRIUS-HS-STG	0,1 V	Voltage	-0,10	0,207745 OVERLOAD	0,10
8	Unused	Store	Exported		AI 8	SIRIUS-HS-LV	0,1 V	Voltage	-0,10	-0,000163	0,10

Channel setup screen

### 2.5.3. Sample rate

One of the most important settings is the sample rate. The sample rate defines how many data points SIRIUSi-XHS will transfer to the Dewesoft. A higher sample rate also means that more data needs to be transferred via USB or network to your computer.

The sampling speed mainly depends on your application. To display your signal in a 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.



Sample rate

## 2.5.4. Measurement Mode

A click on Measure (at the right side of Ch. setup) 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.



Measure mode

In measure mode you can have several measurement screens (5). Dewesoft will create 2 default displays: Recorder and Custom but you can also create new displays or change the widgets on existing displays as you like.

The most important sections of the Measure mode are highlighted in the screen-shot Illustration “Measure mode”:

① shows the live measurement data in different widgets which are depending on the selected measurement screen. In this case, we see a simple recorder widget where data is presented in the time domain. You can use the channel-selector list ② to assign measurement channels to the widgets. Each widget has different settings, ③ shows the settings of the currently selected recorder widget.

To start storing the data, press the Store button ④. When you are done with recording, press the Stop button.



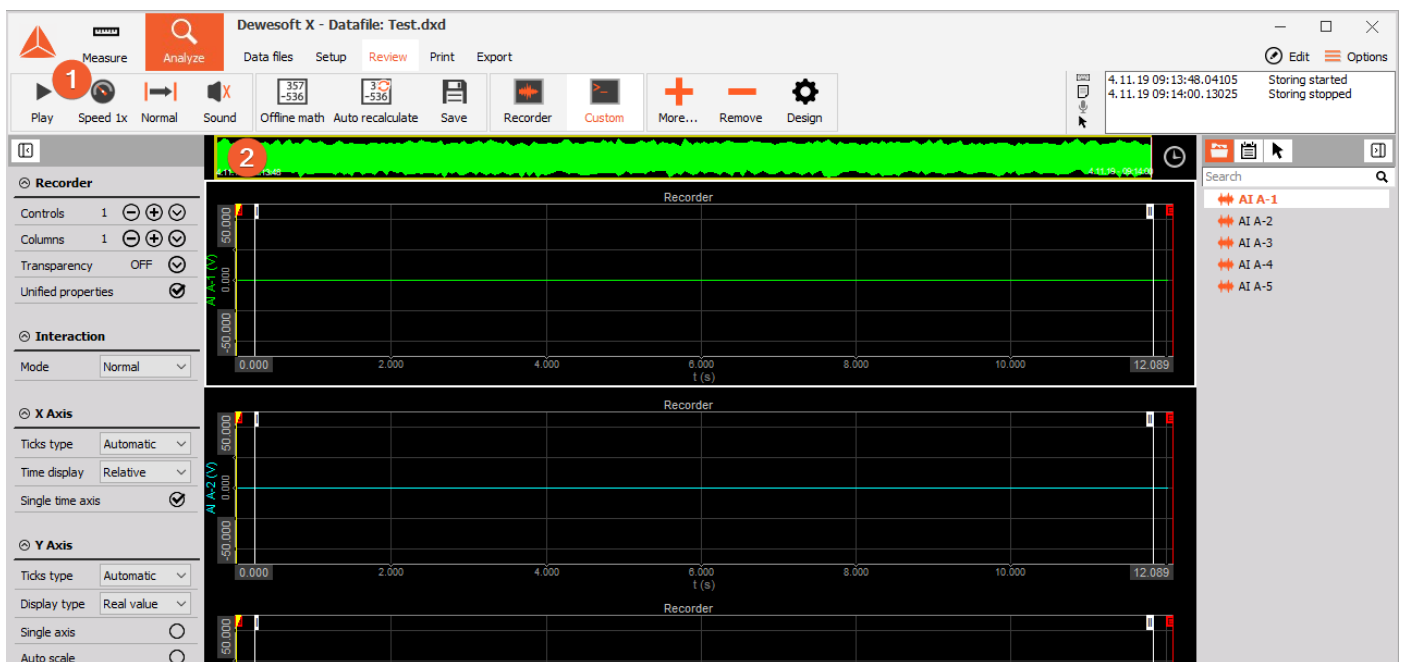
### Important

Usage of online math with high sample rates is not suggested. In that case, offline math in analyze mode is recommended.

Now Dewesoft has created a data file with all the data that you have seen during the recording session. You can now click the Analyze button (on the left-top of the screen to the right of the Measure button) to go to Analyze mode.

## 2.5.5. Analyze Mode

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



Analyze 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 analyze 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.

## 2.6. RT mode

SIRIUSi-XHS can also be treated as a stand-alone device and can run without the use of DewesoftX - we also refer to this as the RT mode. When the device is connected over a Network connection, the user has the option to enable the RT mode inside DewesoftX. Once the RT mode is enabled, all the device settings are locked and can not be changed.



### Important

Device is treated as an RT device only when connected over an Ethernet connection. The maximum output rate is then 2MHz (XCP out RT)

If the RT mode is enabled and you connect the device over USB a warning will appear in DewesoftX. The RT mode can be disabled inside DewesoftX in the RTC module or directly over functional buttons on top of the DewesoftX screen.



### Warning

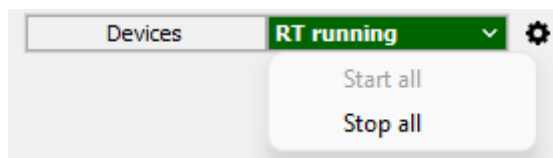
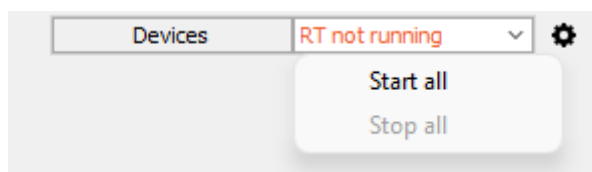
#### **Don't start the RT mode if devices are not synchronized.**

Before starting RT mode, go to measure mode and make sure the devices are synchronized. This can take up to 60 seconds.

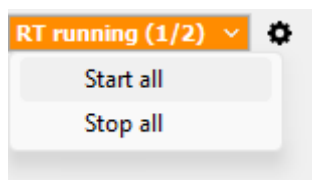
### 2.6.1. RT mode status

When the SIRIUSi-XHS device is connected over the network all the RT modules (RTC device, XCP output RT, CAN output RT, AO output RT) will be enabled and additionally a new setup status will appear at the top of DewesoftX window.

The status gives the user an overview of the current status of the device. If the RT-mode is disabled, you will see "RT not running" status, if RT-mode is enabled you will see RT running status. The setup status also has a functional behaviour, meaning that you can enable/disable the RT mode over the status and do not need to go to the RTC module.



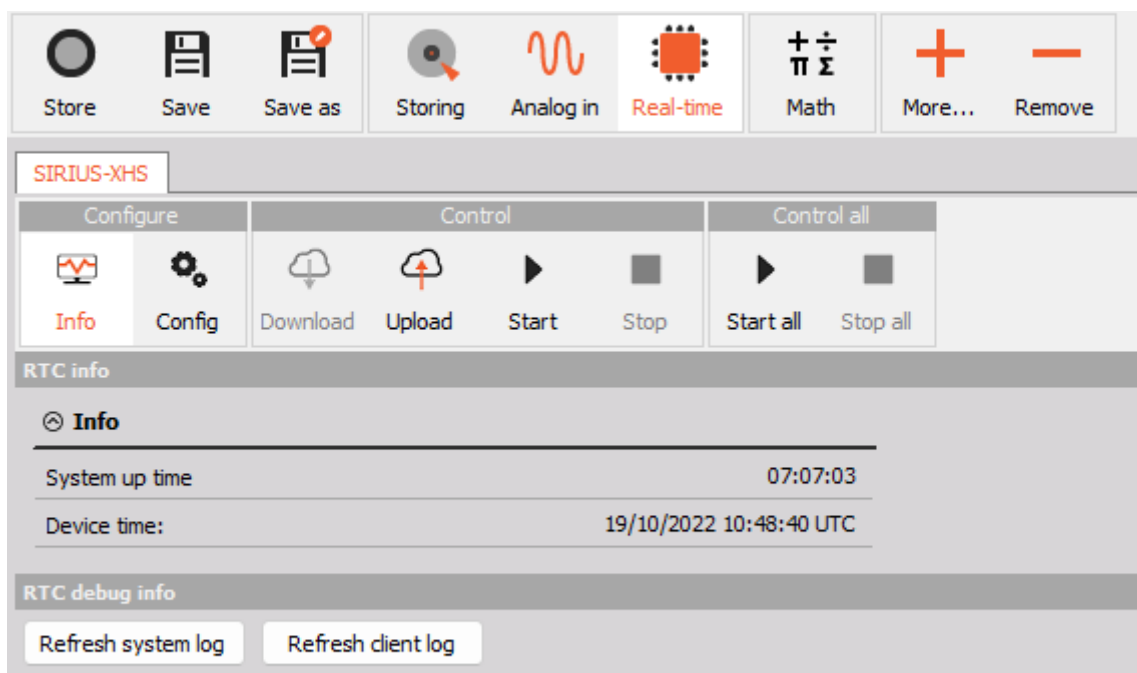
When multiple devices are connected in the system and one of them had the RT-mode enabled and the second one has the RT-mode disabled the status will “RT running ½” will be presented.



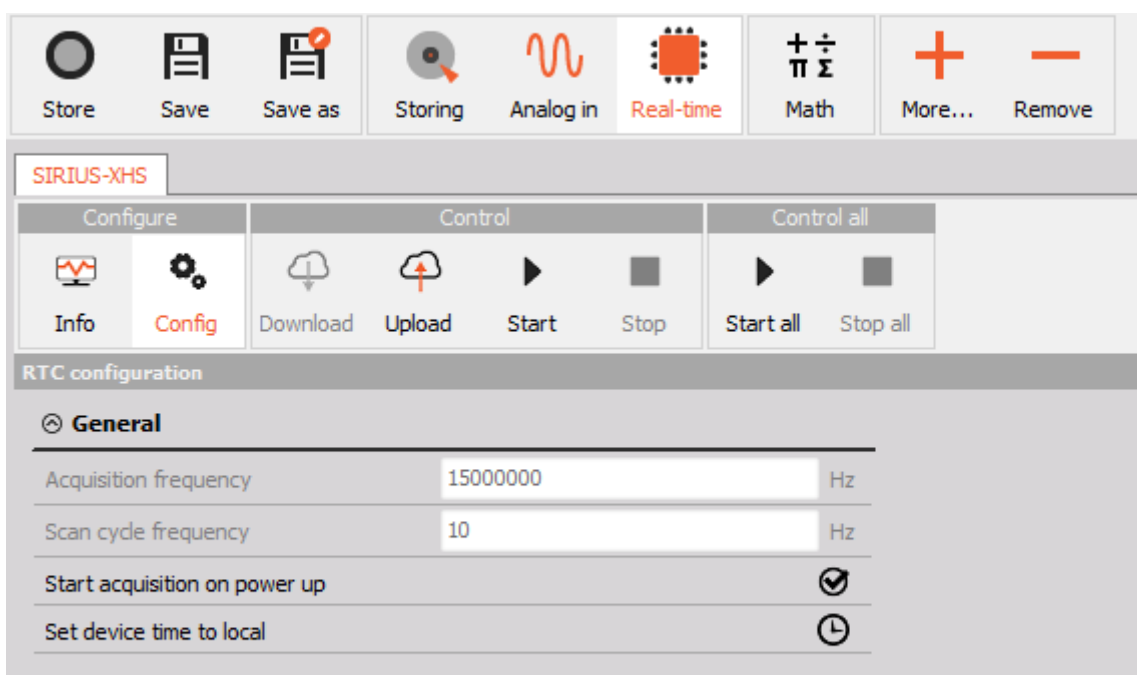
## 2.6.2. RT controller module

All the additional information and the configuration of the device are done inside the RT controller module, which is automatically added when the SIRIUSi-XHS device is connected over the network cable.

All your connected devices that have the ability to be treated as stand-alone devices ( SIRIUSi-XHS, IOLITE-LX) are listed as tabs, with controls for that device below. In the Info window, you can see basic parameters, with the device RT log.



In the Config menu, you can configure device parameters, with acquisition and scan cycle frequency. When checking the option “Start acquisition on power up” the device will start acquisition automatically after boot in RT mode when connected. There is also an option to set the device's time to local.



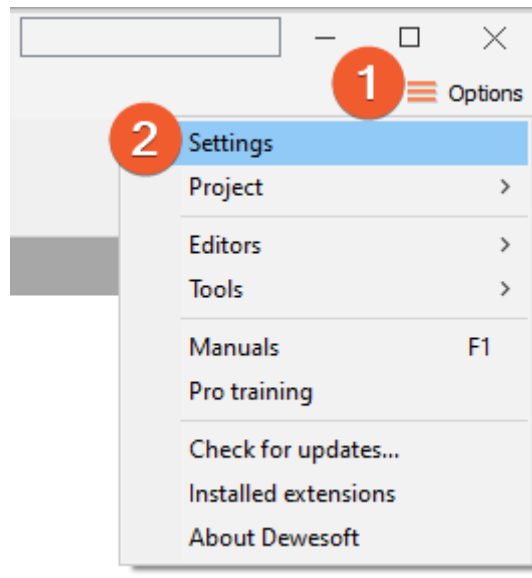
In the Control group, there are four important buttons. With the download button, you download the RT configuration from the RT device to the DewesoftX. With the upload button, the RT configuration is

uploaded; which includes an amplifier, XCP, and CAN settings. With start and stop buttons you can start and stop the RT mode on the device.

Lastly, with group control all, you can start and stop all your connected RT devices similarly as from the RT bracket on the top right of the DewesoftX screen.

## 2.7. Advanced configuration

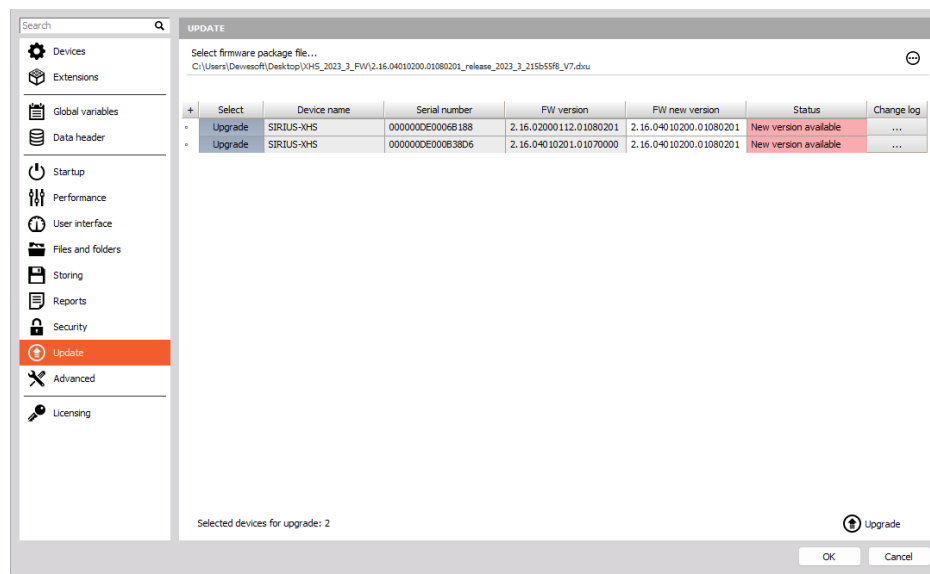
Note, that the Dewesoft launcher has already done the hardware setup for you – you can check this in the Settings dialogue. Click the Options button **1** – and then click the Settings menu item **2**.



*Open settings dialogue*

## 2.8. 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 Dewesoft installation (e.g. DewesoftX\System\Firmwares).
- Connect the Dewesoft instrument to the PC and run DewesoftX.
- Go to settings under the Update tab:

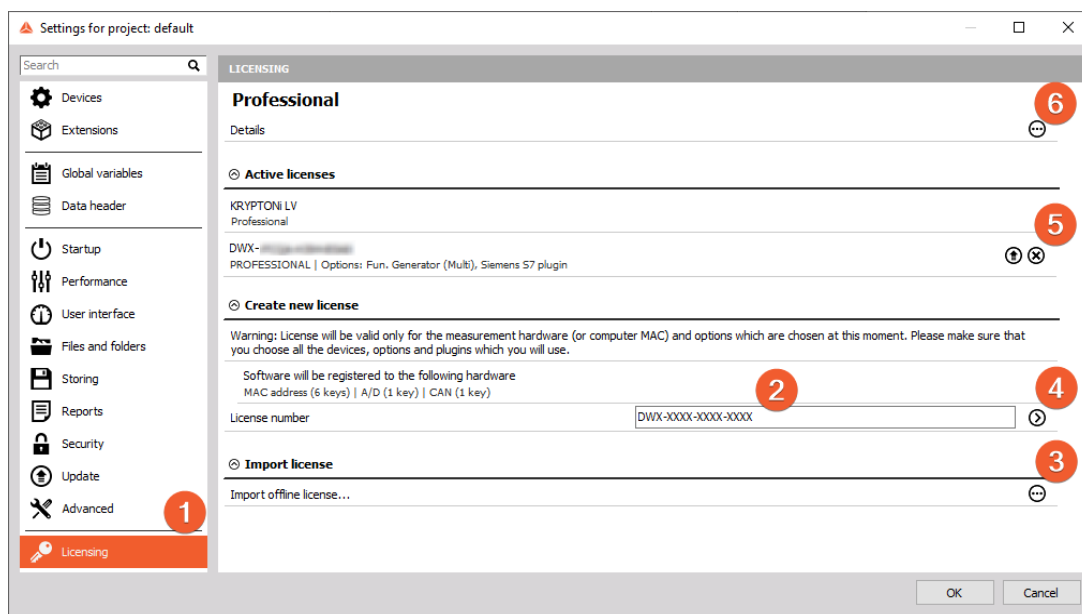


- If the firmware package isn't selected, select it by pressing the button and find the folder with the firmware file in it.
- Select the device you want to upgrade and start the firmware upgrade by pressing the "Upgrade" button.

## 2.9. Licensing

SIRIUSi-XHS® or any other Dewesoft device already comes with an embedded Dewesoft license. You can check the license details with all the available options in the Licensing tab **1** by pressing the three-dotted button **6**. However, if the user decides to upgrade the license with an additional extension, Dewesoft 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. The 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.



*Licensing*



### Hint

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



### Important

Adding the license directly to the device is supported by Dewesoft 2021.5 version.

## 3. System overview

### SIRIUSi-XHS®

Sirius XHS is the first device ever with Hybrid ADC technology capable of doing both high bandwidth transient recording and very high dynamic alias-free acquisition - software-selectable per channel. Modern interfaces and protocols allow open and flexible connectivity.



Voltage



High Voltage



Current

**IEPE**

IEPE



Charge

**LVDT**

LVDT



Thermocouple



RTD



DSI compatible



TEDS Compatible



Vibrations



Sound



Sound pressure



USB 3.0



Ethernet



XCP/CCP



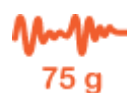
OPC UA



IP20



-10°C to 50°C



Shock rating 75g

### 3.1. Main features

- **HYBRID ADC SIGNAL CONDITIONING TECHNOLOGY:** HybridADC offers the best of both worlds. The high dynamic alias-free acquisition of 24-bit ADC systems with up to 1 MS/s acquisition rate and high bandwidth (5MHz) of 16-bit ADCs up to 15 MS/s. Modes are software selectable for every input channel.
  - **HIGH-SPEED DATA ACQUISITION - 15 MS/s @ 5 MHz BANDWIDTH:** SIRIUS XHS offers up to 15 MS/s sampling rate with 5 MHz bandwidth. It captures transients down to microsecond levels. The sampling rate is software selectable for every analogue input channel.
  - **HIGH DYNAMIC ALIAS-FREE ACQUISITION:** SIRIUS XHS implements alias-free filtering which allows the acquisition of analogue signals with up to 150 dB dynamic range at 1 MS/s sampling rate.
- **PERFECT SYNCHRONIZATION:** even though users can select some channels to be high bandwidth and some to be alias-free, filtering is made in a way that all signals are perfectly time aligned with zero phase shift.
- **MODERN DATA INTERFACES:** GLAN interface allows the distribution of devices with PTPv2 synchronization; the USB3 interface allows the fastest data transfers with a quick connection to the computer.
- **OPEN PROTOCOLS:** data is transferred to any host using open OPC UA industry-standard protocol; in parallel the data is available over XCP protocol, allowing connection to ECU calibration software packages.
- **HIGH GALVANIC ISOLATION:** High channel-to-channel and channel-to-ground isolation up to CAT II 1000V prevents damage to the systems from excessive voltage and avoids ground loops.
- **SMALLEST FORM FACTOR:** With the standard Sirius size you can easily carry the XHS in your backpack along with your laptop for field measurements.
- **SOFTWARE INCLUDED WITH FREE LIFETIME UPGRADES:** The easy-to-use but rich in functionality, award-winning DewesoftX software is included. All upgrades to the software are free forever with no hidden licensing costs.

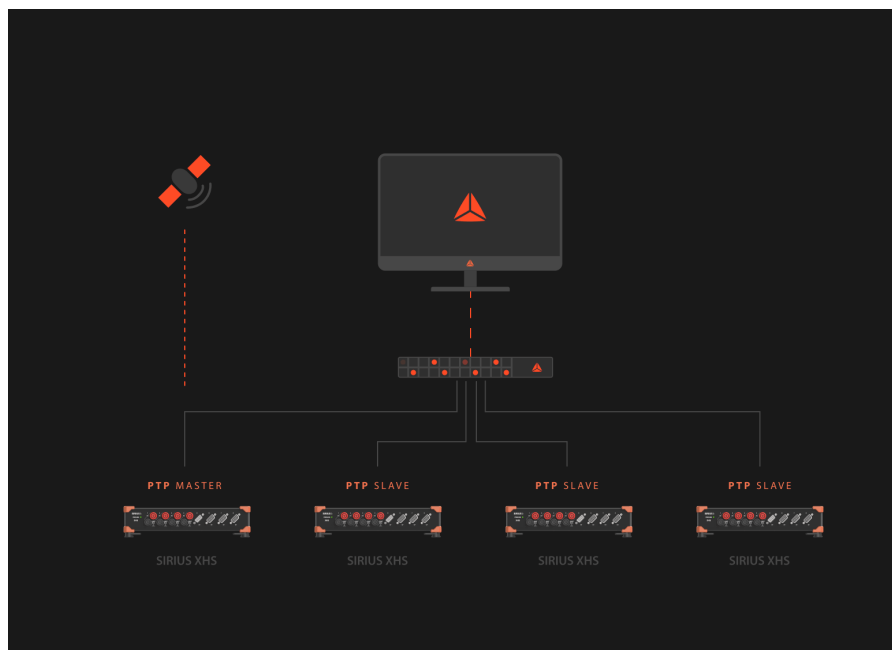
### 3.1.1. Hybrid ADC technology

User can select for each channel two modes of operation:

- a) **High bandwidth mode:** with 5 MHz bandwidth and 15 Ms/sec sampling rate, XHS can perfectly acquire impulse, step and square signals without any ringing or overshoot. Such a mode is perfect for transient recording and power analysis. Such acquisition mode is typically in SAR ADCs.
- b) **Alias free mode:** up to 1 MS/sec data can be acquired with extremely high dynamic range, similar to SIRIUS dual-core. The data is totally alias-free, so all higher frequencies are fully rejected. Such a mode is perfect for sound, vibration, and general data recording applications. Such acquisition mode is typically in Sigma-Delta ADCs.

Usually, you would need two totally separate devices for the above-mentioned applications. But on SIRIUSi-XHS® you can select channel per channel, depending on the application, the appropriate mode of ADC operation.

### 3.1.2. Perfect synchronization



If you mix channels from Sigma-Delta and SAR devices (high bandwidth and alias-free), then channels are delayed due to Sigma-delta filtering group delay. But with SIRIUS XHS, due to the nature of the chosen filter, both modes are perfectly aligned and synchronized.

As on any Dewesoft device, data can be synchronized to other data sources, such as vehicle bus interface, GPS, IMU, video, and others.

Devices can be synchronized with each other using the PTPv2 mechanism, IRIG or PPS signal. This also provides absolute time synchronization using in-house time servers or GPS.

### 3.1.3. Open interface protocols

In today's world of open toolchains and intercommunication, each device should be compliant with standard protocols. All protocols can be used at the same time.

**OPC UA:** is the industry standard. Actually, it is more than a standard, it is a perfect framework where the device can be described and set up in any system, including SCADA, MES, ERP, mobile devices and others.

**XCP output RT:** Starting with version 1.4 XCP became a very powerful interface protocol in the automotive industry for data exchange. In the modern age of e-mobility, the required sampling rates are much higher than ever and 1 Gbit XCP interface allows data transfers with as high as 2 MS/s.

**CAN:** All SIRIUSi-XHS devices support the CAN read and transmit option.

**CAN output RT:** When the device is connected over the network, the RT mode can be enabled. The RT mode also enables the possibility to transfer data over the CAN protocol. Currently, the maximum output rate over CAN in RT mode is 1000Hz.

### 3.1.4. Data Acquisition Software Included for Free

All Dewesoft data acquisition systems are bundled with award-winning DewesoftX Professional DAQ software. DewesoftX is the world's most advanced and easy-to-use data acquisition and analysis software. DewesoftX's flexibility and power will help you unleash the DAQ system to its full potential and gives you many advantages over other DAQ systems. Functionalities like plug-and-play, hardware auto-detection, smart TEDS sensors, advanced storing and data analysis features will take your measurement and analysis needs to a whole new level.

## 3.2. System specifications

Power specs	
Power Supply 9 - 48 V DC	
Power consumption Typ. 30 W	
Environmental	
Operating Temperature -10 to 50 °C	
Storage Temperature -40 to 85 °C	
Humidity 5 to 95 % RH non condensing @ 60 °C	
IP rating IP20	
Shock & Vibration Shock (EN 60068-2-27:2009) 75 g, 6 ms, half-sine (25x pos./neg in each axis) Random Vibration (EN 60721-3-2: 1997 - Class 2M2) Sweep sinus Vibration (EN 60068-2-6:2008)	
Dimensions	266 mm x 149 mm x 55 mm 266 mm x 149 mm x 69 mm (extended slice)
Interfaces	
1 GbE (XCP, OPC UA) incl. IEEE1588v2 synchronization Ethernet (PTP) (RJ45)	
USB USB 3.0 (Type C)	
CAN CAN 2.0, CAN-FD (DSUB9)	
Sync Input/Output	
Level (Input/Output) TTL compatible	
Max. Output Current $\pm 24$ mA ( $\pm 50$ mA for 1 sec)	
Synchronization	
Delay between slices $\pm 1 \mu\text{s}$ ( to the reference clock )	
Max. Sync-cable length 100 m (Master/Slave), 200 m (IRIG)	

3.3. Single slice: Front site





A single SIRIUSi-XHS® slice can have up to 8 measurement modules; currently HV, LV and ACC modules are supported.



SIRIUSi-XHS® 8xACC

3.3.1. LED light indicator

The LED indicator on the front side shows the system status.

LED status	Description
 Green	Power is connected, system self-test PASSED. Normal operation
 Red	At the start of the device and at Device Error, the Power cycle required
 Green Blinking	“RT mode enabled”. When the LED indicator is blinking green it shows the device is in Real-time mode.
 Orange Blinking	When the LED indicator is blinking orange it shows that the FW upgrade is in process

3.4. Single slice: Rear side

The SIRIUSi-XHS® chassis has the following connectors at the rear side:



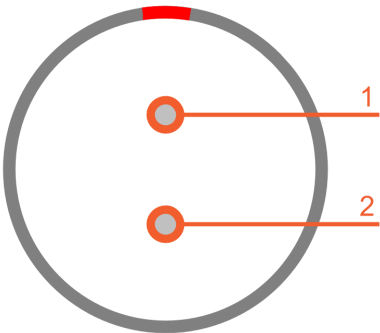
SIRIUSi-XHS® Rear side

Name	Description
CAN	CAN bus DSUB-9 male connector
SYNC	Two 4-pin LEMO 00 series female sync connectors
USB	USB-C to transfer the data to the SBOX or PC
GND	Protective Ground banana plug and M4 screw insert.
POWER IN	2-pin LEMO 1B series male connector
POWER OUT	2-pin LEMO 1B series female connector
GLAN	RJ-45 connector

3.5. Connectors

3.5.1. Power supply

3.5.1.1. Power in connector

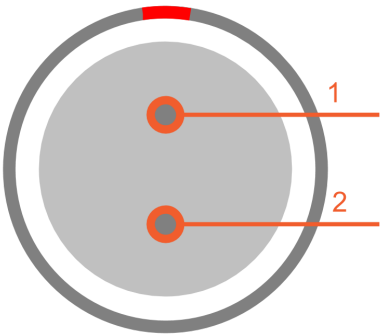


Pin	Name	Description
1	V +	Supply
2	V -	Ground

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

Power In connector (on the device): ECJ.1B.302.CLD  
Mating connector (for the cable): FGJ.1B.302.CLLD52Z

3.5.1.2. Power out connector



Pin	Name	Description
1	V+	Supply
2	V-	Ground

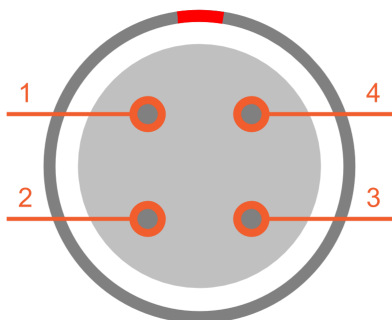
Power out connector: pin-out (2-pin LEMO female)

Power Out connector (on the device): ECG.1B.302.CLN  
Mating connector (for the cable): FGG.1B.302.CLAD52Z

The Power Out power plug can be used to daisy-chain several devices together. Daisy chain cable: L1B2m-L1B2f

### 3.5.2. SYNC connector

The sync connectors are required when you want to use multiple SIRIUSi-XHS® slices in the same system configuration. The signal that is transferred over this cable makes sure that the measurement data of the different slices are perfectly synchronized with each other.



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

Pin	Name	Description
1	CLK	Clock
2	Trigg	Trigger
3	GPS-PPS	GPS - PPS
4	DGND	Digital Ground

Interface connector: EEG.00.304.CLL

Mating connector: FGG.00.304.CLAD27Z

#### Important



When IRIG-synchronization is used, the IRIG differential signals are on pins 1, 2.  
When a Clock / Trigger is used, the signals are on pins 1, and 2.  
When PPS-GPS synchronization is used, the PPS signal is on pin 3.

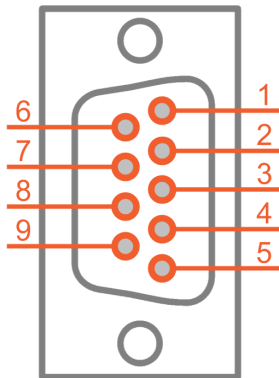


*Sync cable*

3.5.3. CAN / CAN-FD

A Controller Area Network (CAN bus) is a vehicle bus standard often used in automotive applications. SIRIUSi-XHS slices have a CAN connector (DSUB9) on the backside, with CAN or CAN-FD available.

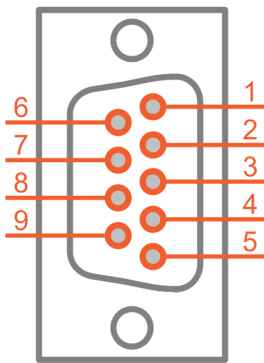
Up to Hardware version 1.4



CAN connector: pin-out (DSUB-9 male)

Pin	Name	Description
1	RES	Reserved
2	CAN_LOW	CAN low
3	DGND	Digital Ground
4	RES	Reserved
5	+5 V	5 V, 100 mA supply
6	RES	Reserved
7	CAN_HIGH	CAN high
8	RES	Reserved
9	RES	Reserved

Hardware version 1.6 and later



CAN connector: pin-out (DSUB-9 male)

Pin	Name	Description
1	+5V	5 V supply (max. current: 500 mA)
2	CAN_LOW	CAN low
3	DGND	Digital Ground
4	RES	Reserved
5	RES	Reserved
6	DGND	Digital Ground
7	CAN_HIGH	CAN high
8	RES	Reserved
9	+12V	12 V supply (max. current: 200 mA)



### Important

CAN RT transmit is currently supported up to 1 kHz with and without transmit delay.



### Important

CAN-FD is supported only on devices that have the compatible hardware, hardware version 1.6 and later.

## 3.5.4. GND connector

For correct measurements, it is highly recommended to ground the SIRIUSi-XHS®. The GND connector is usually a banana connector.



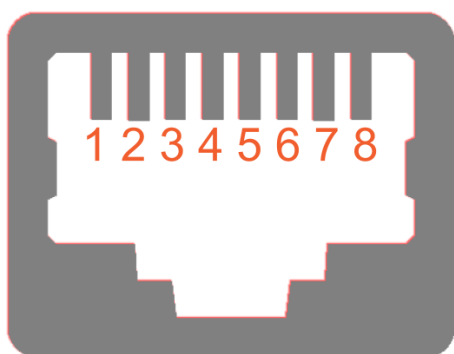
### Warning

It is mandatory to connect a ground cable to the GND connector when you are working with high voltages: e.g. when you are working with the HV modules.

## 3.5.5. Ethernet Connector

Connector used on the device is a standard ethernet connector (RJ45).

A standard ethernet cable with a standard connector can be used to connect SIRIUSi-XHS® with a PC.



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 C-	Receiving pair C-

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.

### 3.5.6. USB connector

The USB connector is used to connect the SIRIUSi-XHS device and transfer the data to the SBOX (or PC). With XHS devices type USB-C connector is used. **USB 3.0** has a maximum signalling rate of 5 Gbit/s.



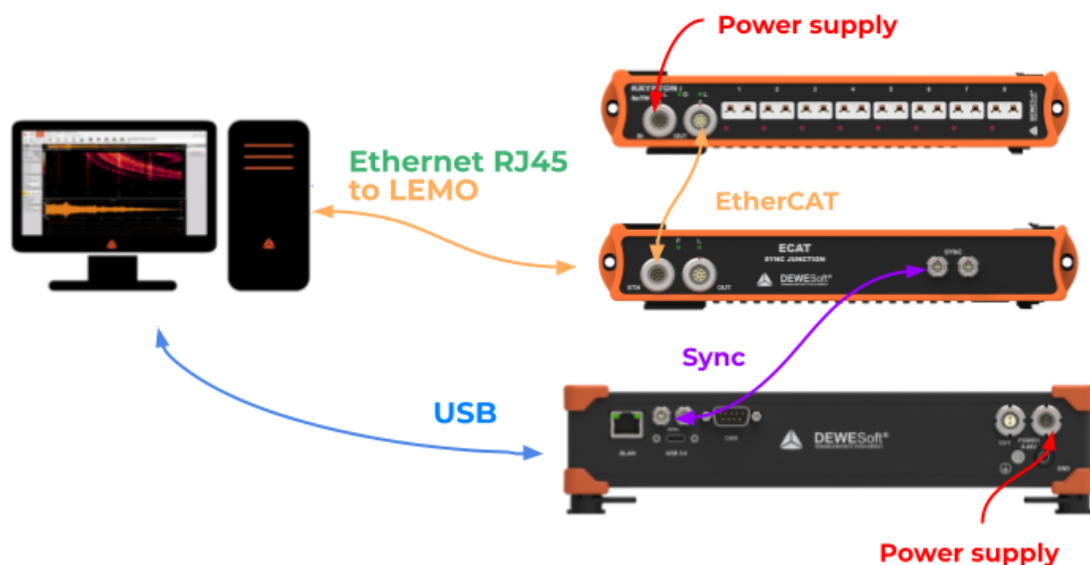
*USB-C connector on the device*

## 3.6. Connections examples

In this chapter it is possible to find some connection examples to give an idea of what combinations of devices are possible and what are the important limitations you need to consider before mounting the Dewesoft system.

### 3.6.1. Connection with slow ECAT devices (TH, RTD)

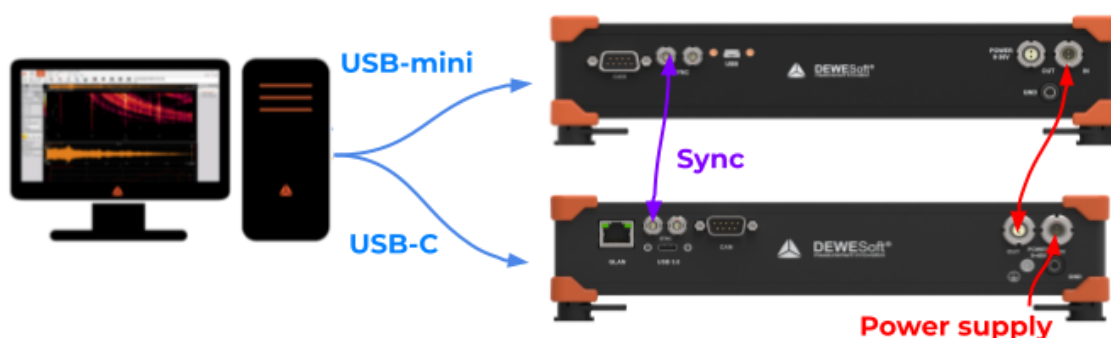
When a SIRIUSi-XHS device is in the same system with slow ECAT devices such as Krypton-TH, you have a limitation on the sample rate. When you have a 100Hz module connected with XHS on a 15MHz clock you get 5M SR on XHS, with a 10MHz clock you get 10MHz.



*System configuration with SIRIUSi-XHS device and Krypton-8xTH device*

### 3.6.2. Connection with other SIRIUS modules

Connection with other SIRIUS units (Dual Core, High dynamic, High speed) is straightforward. You need to connect an additional sync cable between the devices. The user needs to be aware that in DewesoftX we only support sample rate dividers  $2^n$  or  $5^m$  - this is also the reason for some limitations of Sample rate combinations.



*System configuration with SIRIUSi-XHS device and SIRIUS-HS device*

Here is the table of the maximum sample rates when the SIRIUSi-XHS® device is connected with other devices, such as a standard SIRIUS Dual-core or SIRIUS High-speed module.

	SIRIUSi-XHS	SIRIUS	SIRIUS-HS
<b>15MHz clock</b>	15 MHz	187.5k	937500 Hz
<b>10MHz clock</b>	10 MHz	200 kHz	1 MHz

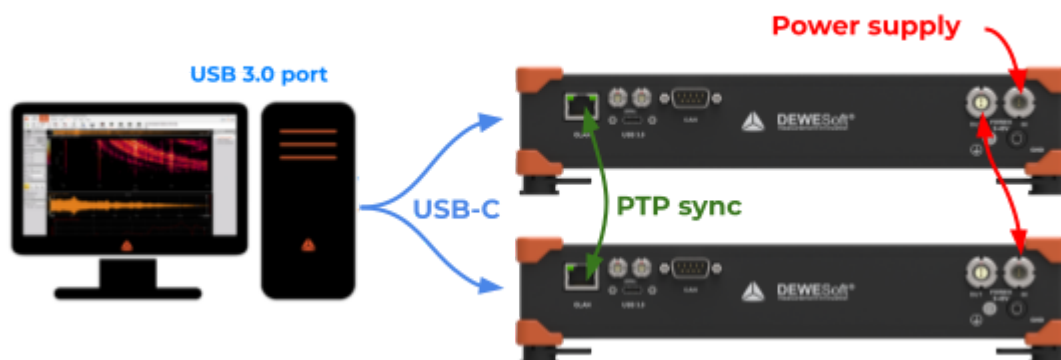


**Important**

The 15MHz clock and 10MHz clock are changing automatically, so the user doesn't need to adjust any additional parameters.

### 3.6.3. PTP synchronization when XHS devices are connected over USB (data)

When the devices are connected over USB and a PTP synchronization is needed you can simply connect the Ethernet cable between the two devices. If you have multiple devices in the system a PTP switch is also needed.



*System configuration with SIRIUSi-XHS connected over USB with PTP synchronization*



**Important**

For the PTP synchronization to work properly, the devices need to have different IPs, this need to be done manually by the user.

### 3.6.4. Connection of multiple SIRIUSi-XHS devices with SBOX

To connect SIRIUSi-XHS devices to the SBOX you need to use USB-C to USB-A and plug it in one of the available USB ports. It's recommended to use the cable which has arrived with your device since its quality was tested and confirmed.



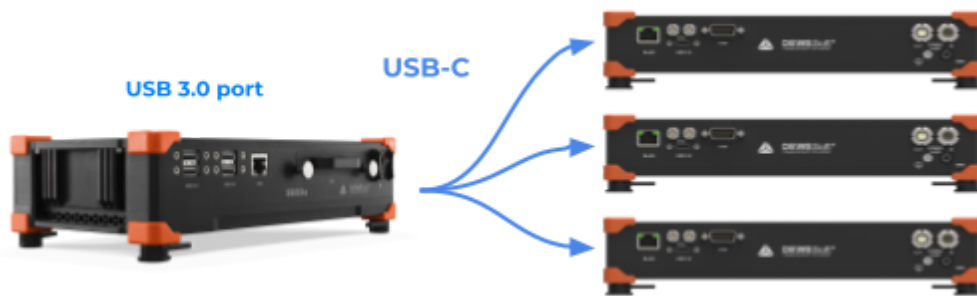
#### Important

Don't use USB dongles to connect multiple devices to one USB port in SBOX.



#### Warning

With the current SBOX and SBOXfe only three SIRIUSi-XHS devices can be connected with USB ports while measuring all channels with 15MHz. Using USB dongles can present additional restraint, so a direct connection is advised. Connecting them via Ethernet connections, you can run only 2 channels at 15MHz, since the 1Gbit line is the bottleneck.



*System configuration with multiple SIRIUSi-XHS devices and SBOX device*

### 3.6.5. System for more demanding measurements with SIRIUSi-XHS

To measure with more than three SIRIUSi-XHS devices at max sample rate or if you demand a bigger computing power, you can find in our offer two custom PC towers, which are built to handle all the required load.

#### 3.6.5.1. PC-GPU-PWR-BASIC

Basic configuration is meant for lighter power measurements or measurements with a higher number of XHS devices. With Nvidia GPU acceleration it can run a single 3-phase power module with all features enabled at 15 MHz. It consists of:

- CPU: AMD Ryzen 9 5900X
- GPU: Nvidia RTX 3060, 12 GB RAM
- RAM: 64 GB RAM
- Storage: 1 TB SSD NVMe

### 3.6.5.2. PC-GPU-PWR-SUPER

Super configuration presents the best of the best components on the market. It is built for high-demand power measurements at the highest sample rates. With Nvidia GPU acceleration it can run three 3-phase power modules with all features enabled at 15 MHz. It consists of:

- CPU: AMD Ryzen 9 5950X
- GPU: Nvidia RTX 3090, 24 GB RAM
- RAM: 128 GB RAM
- Storage: 2 TB SSD NVMe

### 3.6.6. Multiple devices over EtherNET

You can connect multiple devices to a measuring computer using an Ethernet connection. When you connect them in such a manner you need to ensure to have an appropriate switch with enough downlink and a PTPv2 synchronization feature. More about sample rate limits can be found in [Chapter 2.2.2.5. Sample rate](#).

### 3.6.7. Storing on high sample rates

Storing data with SIRIUSi-XHS at full sample rates demands a high write disk speed. In the table below you can find some examples if multiple devices are recording with all channels running on the same sample rate.

Number of SIRIUSi-XHS	Sample rate	Data per second	Data per second with additional channel
1	15 MS/s	240MB/s	300MB/s
2	15 MS/s	480MB/s	600MB/s
4	5 MS/s	320MB/s	480MB/s
4	15 MS/s	960MB/s	1.2GB/s



#### Important

You need to use an NVMe drive with the highest sample rates when multiple devices are connected. SATA drives are too slow for the most demanding applications with write speeds only reaching around 500MB/s.

## 4. SIRIUSi-XHS® measurement modules

### 4.1. SIRIUSi-XHS® slice configuration

SIRIUSi-XHS® device is currently only available in a standalone single slice version.

#### 4.1.1. Standard slices

##### 4.1.1.1. SIRIUSi-XHS-4xHV-4xLV



*SIRIUSi 4xHV-4xLV*

##### 4.1.1.2. SIRIUSi-XHS-4xHV-4xLV-BAN



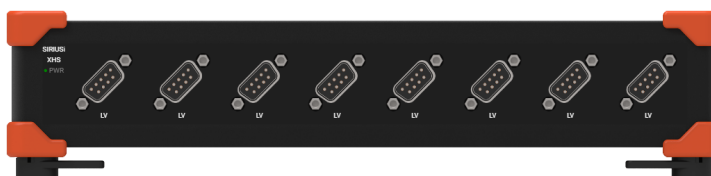
*SIRIUSi 4xHV-4xLV-BAN*

##### 4.1.1.3. SIRIUSi-XHS-8xHV



*SIRIUSi 8xHV*

##### 4.1.1.4. SIRIUSi-XHS-8xLV



*SIRIUSi 8xLV*

#### 4.1.1.5. SIRIUSi-XHS-8xLV-BNC



*SIRIUSi 8xLV-BNC*

#### 4.1.1.6. SIRIUSi-XHS-8xACC



*SIRIUSi 8xACC*

#### 4.1.1.7. SIRIUSi-XHS with 8xCNT



*SIRIUSi 8xCNT on the back of the device*

### 4.1.2. Customized slice

We can build a customized slice with modules that you choose and in any order.



#### Example

SIRIUS costume slice containing: 3xHV, 3xLV and 2xACC module.

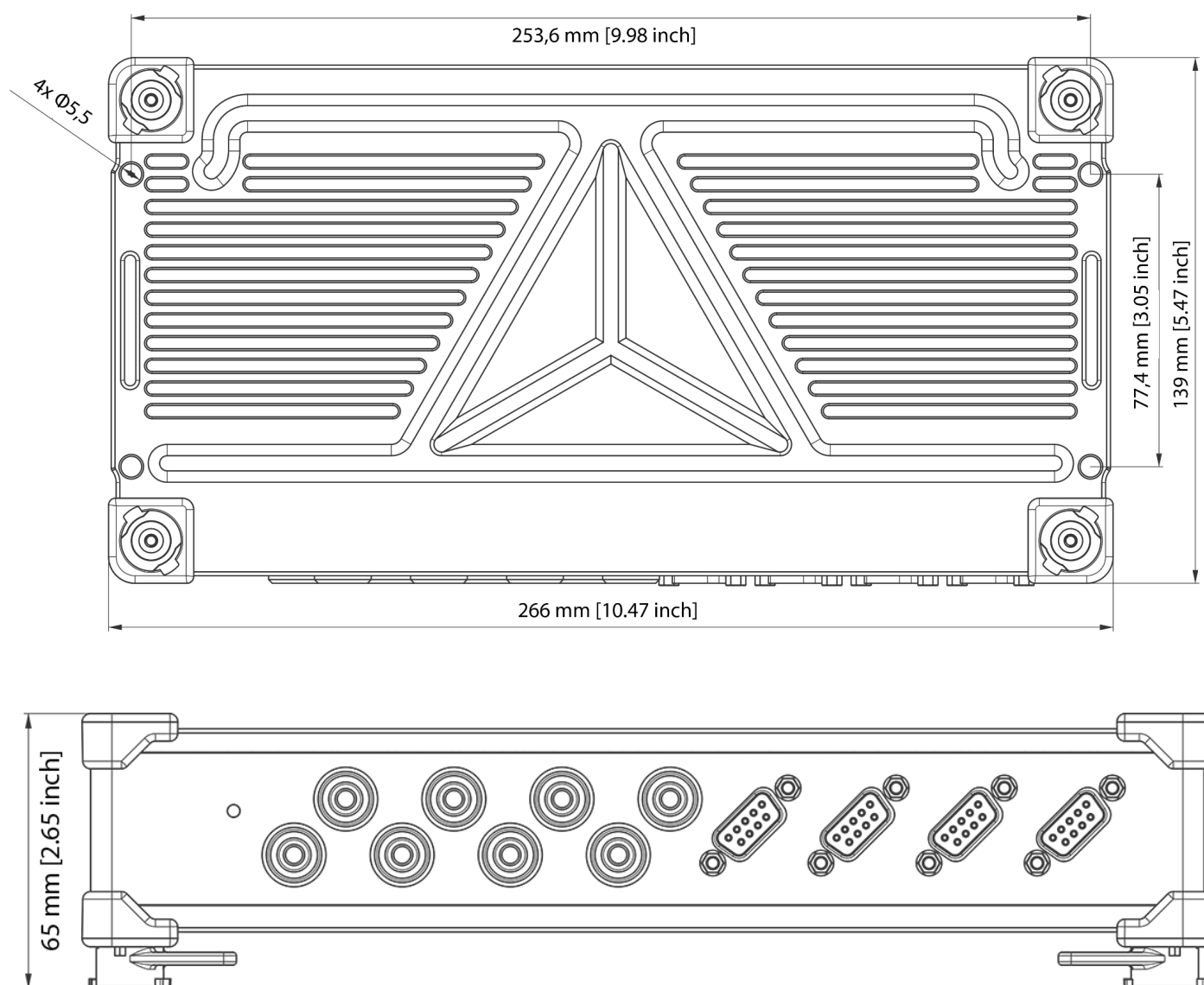


*SIRIUSi 3xHV-3xLV-2xACC*

## 4.2. SIRIUSi-XHS® specifications

	<b>XHS-HV</b>	<b>XHS-LV</b>	<b>XHS-ACC</b>
Connectors	BANANA	DB9, BNC, BANANA	BNC
Channels per slice	8	8	8
Data rate / channel	15 MS/s	15 MS/s	15 MS/s
Resolution	16-bit (24-bit @ 1 MS/s)	16-bit (24-bit @ 1 MS/s)	16-bit (24-bit @ 1 MS/s)
Bandwidth	5 MHz	5 MHz	5 MHz
Voltage ranges	±2000 V ... ±200 V	±100 V ... ±50 mV	±10 V ... ±200 mV
Input coupling	DC	DC, AC 1 Hz	DC, AC 0.1 Hz, AC 1 Hz
Sensor excitation	X	2.5..30 V bipolar, 2..24 V unipolar, max. 0.2 A / 2 W	IEPE 2 mA, 4 mA, 8 mA, 12 mA, 16 mA, 20 mA
Bridge connection	X	X	X
Programmable shunt	X	X	X
IEPE input	X	DSI-ACC	✓
Resistance	X	X	X
Temperature (PTx)	X	DSI-RTD	X
Thermocouple	X	DSI-TH	X
Potentiometer	X	X	X
LVDT	X	DSI-LVDT	X
Charge	X	DSI-CHG	X
Current	X	ext. shunt DSI20mA, DSI5A	ext. shunt
TEDS	X	✓	✓
Isolation voltage	CATII 1000 V	1000 V	1000 V
Power consumption per channel (typ.)	1 W/ch	1.2 W/ch	1.3 W/ch
Advanced functions	High voltage, high bandwidth, high isolation	High sensor excitation and multi range	Sensor error detection, high speed
<b>Rev: 1610438400</b>			

### 4.3. SIRIUSi-XHS® dimensions



*Dimensions of SIRIUSi-XHS device*

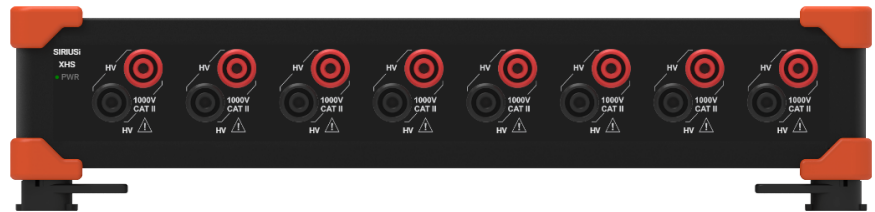
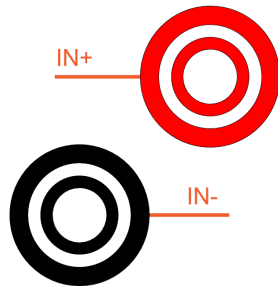
## 4.4. HV: Specifications

The HV modules offer safety and isolation for high voltage measurements up to 2000 V.

Inputs					
ADC Type	Hybrid ADC - alias free up to 2 MS/s, 16-bit up to 15 MS/s				
Sampling Rate	Simultaneous 15 MS/s				
Filtering	AAF 1 MHz (6th order)				
Analog bandwidth (-3 dB)	5 MHz				
Voltage Mode					
Ranges	±2000 V, ±1000 V, ±400 V, ±200 V				
Input Accuracy	Signal frequency	Accuracy			
	DC to 1 kHz	±0.03 % of reading ±0.02 % of range			
	Up to 10 kHz	±0.1 % of reading ±0.05 % of range			
	Up to 100 kHz	±4 % of reading ±0.1 % of range			
	Up to 1000 kHz	±5 % of reading ±0.5 % of range			
Noise floor, Typ.	Sample rate / Range →	2000 V	1000 V	400 V	200 V
	15 MS/s	-84 dB	-82 dB	-79 dB	-75 dB
	1 MS/s	-95 dB	-93 dB	-85 dB	-78 dB
	100 kS/s	-108 dB	-106 dB	-100 dB	-95 dB
	10 kS/s	-117 dB	-115 dB	-109 dB	-104 dB
CMR, Typ.	101 dB @ 50 Hz, 74 dB @ 400 Hz				
Channel Crosstalk	-116 dB typ. @ 50 Hz, -89 dB typ. @ 1 kHz				
Gain Drift	Typical 20 ppm/K, max. 40 ppm/K				
Offset Drift	Typical 1.5 mV/K + 1 ppm of range/K, max 3 mV/K + 2 ppm of range/K				
Gain Linearity	< 0.01 %				
Input Coupling	DC				
Input Impedance	10 MΩ    1 pF				
Overvoltage category	CAT II 1000 V				
Maximum input voltage	2000 Vdc or 2000 Vpk (1414 Vacrms)				
Additional Specifications					
Input connector	Banana				

#### 4.4.1. HV: Banana connector

##### 4.4.1.1. HV: Banana connector Pinout



*SIRIUSi-XHS-8xHV*

*HV connector: pin-out (Banana plug)*

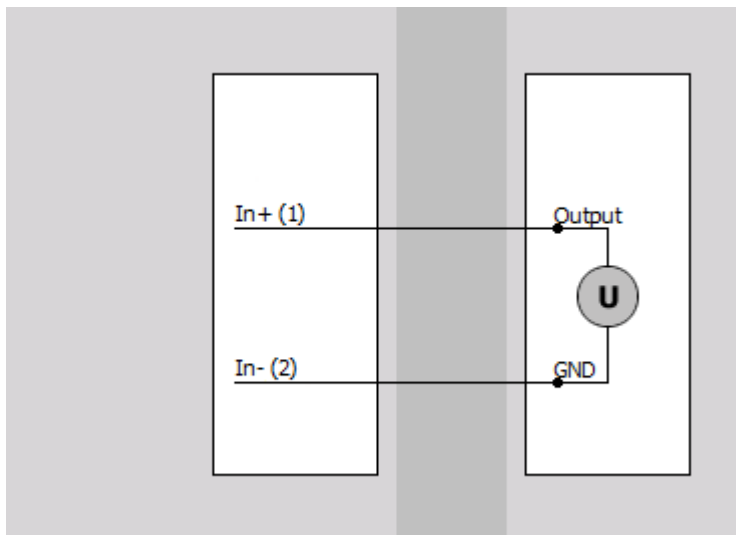


#### **Warning**

It is mandatory to connect a ground cable to the GND connector of the SIRIUS® when you are working with high voltages.

##### 4.4.1.2. HV: Banana connector Wiring diagram

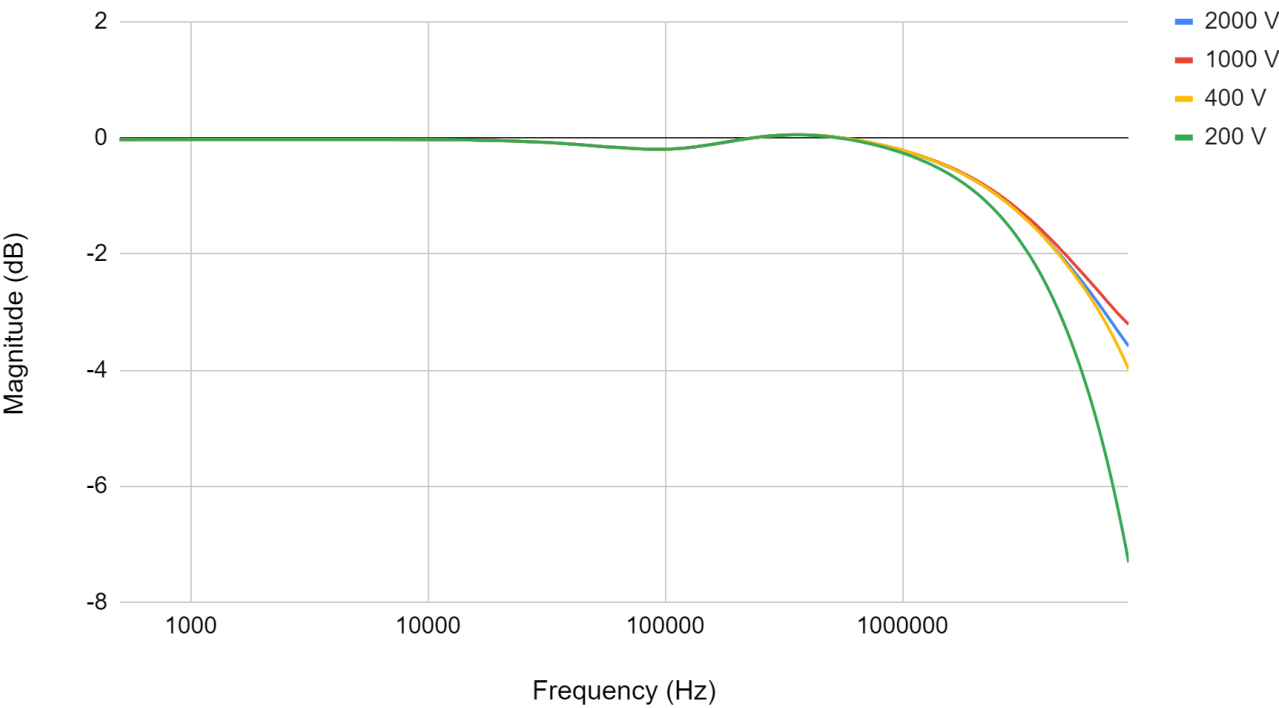
###### 4.4.1.2.1. Voltage



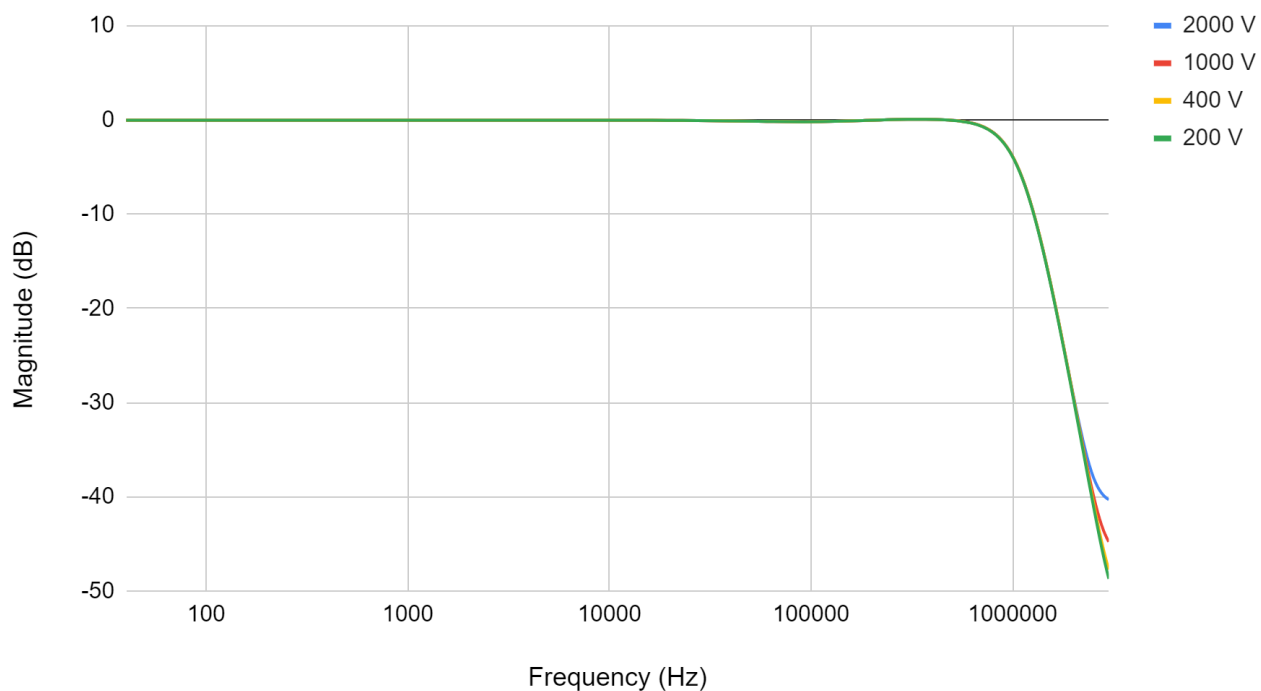
4.4.2. Magnitude response

Filter Mode	High-bandwidth	1 MHz LPF	High-dynamic
Max. SR	15 MS/s	15 MS/s	2 MS/s
SW settings	Off	1 MHz	AAF
Bandwidth (-3 dB)	5 MHz	1 MHz	0.49 fs
Passband frequency (-0.1 dB)	500 kHz	500 kHz	0.45 fs
Passband flatness	± 0.1 dB	± 0.1 dB	± 0.1 dB
Alias-free bandwidth	×	7.5 MHz	0.45 fs
HW filter	×	✓	✓
Stopband frequency	×	7.5 MHz	0.55 fs
Stopband attenuation	×	-100 dB	-100 dB

XHS-HV High-Bandwidth LP off

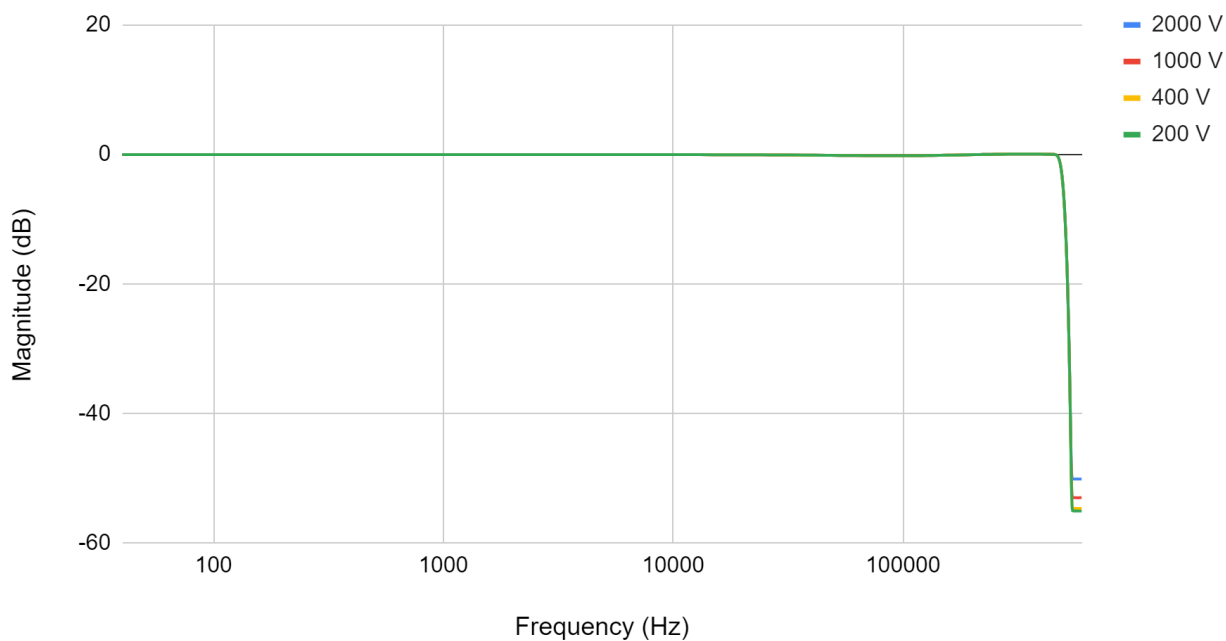


### XHS-HV High-Bandwidth LP 1 MHz



### XHS-HV High-Dynamic

1 MS/s, LP 1 MHz



## 4.5. LV: Specifications

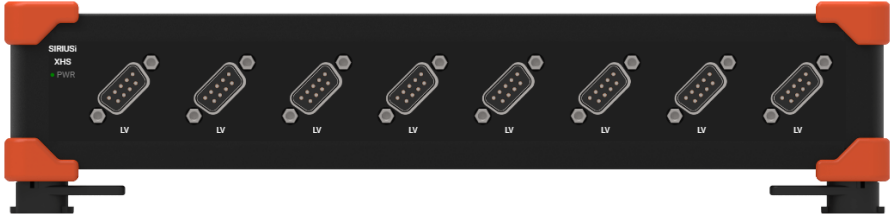
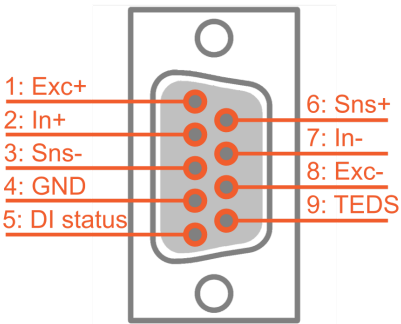
The LV modules are perfect for low voltage and current measurements in combination with current clamps.

Inputs	Voltage			
ADC Type	Hybrid ADC - alias free up to 2 MS/s, 16-bit up to 15 MS/s			
Sampling Rate	Simultaneous 15 MS/s			
Filtering	AAF 1 MHz (6th order)			
Analog bandwidth (-3 dB)	5 MHz			
Voltage Mode				
Ranges	±100, 50, 20, 10, 5, 2.5, 1, 0.5, 0.25, 0.1 and 0.05 V			
Input Accuracy	DC	±0.03 % of reading ±0.02 % of range ±100 µV (2 mV for Ranges ≥ 10 V)		
	Up to 1 kHz	±0.03 % of reading ±0.02 % of range		
	Up to 10 kHz	±0.1 % of reading ±0.05 % of range		
	Up to 100 kHz	±2 % of reading ±0.1 % of range		
	Up to 1000 kHz	±5 % of reading ±0.5 % of range		
Noise floor, Typ.	Sample rate, filter \ Range →	100 V	5 V	0.5 V
	15 MS/s, Filter off	-82 dB	-78 dB	-65 dB
	1 MS/s, Filter on	-94 dB	-95 dB	-88 dB
	100 kS/s, Filter on	-104 dB	-105 dB	-100 dB
	10 kS/s, Filter on	-113 dB	-114 dB	-107 dB
CMR, Typ.	Frequency \ Range →	100 V	5 V	0.5 V
	50 Hz	91 dB	102 dB	98 dB
	400 Hz	86 dB	75 dB	90 dB
	10 kHz	66 dB	74 dB	82 dB
Channel Crosstalk	Range ≥ 10 V: -105 dB @ 10 kHz Range < 10 V: -120 dB @ 10 kHz			
Gain Drift	Typical 10 ppm/K, max. 30 ppm/K			
Offset Drift	Range ≥ 10 V: Typ. 100 µV/K + 1 ppm of range/K, Max 250 µV/K + 2 ppm of range/K Range < 10 V: Typ. 4 µV/K + 1 ppm of range/K, Max 8 µV/K + 2 ppm of range/K			
Gain Linearity	< 0.03 %			
Input Coupling (see 1)	DC, AC 1 Hz			
Input Impedance	Range < 10 V: 10 MΩ; Range ≥ 10 V: 1 MΩ    110 pF between INx to GND			
Overvoltage Protection	Range ≥ 10 V: 300 V continuous Range < 10 V: 100 V (200 V peak for 10 msec)			
Max. common mode voltage				
Isolation voltage	420 Vdc (300 Vacrms)			
Excitation Voltage				
Polarity	Unipolar or Bipolar Software selectable (programmable 16-bit DAC)			
Excitation Level	unipolar 2 .. 24 V; Predefined levels: 2, 2.5, 5, 10, 12, 15, 20 and 24 VDC			
Excitation Level	bipolar 2.5 .. 30 V; Predefined levels: 2.5, 5, 10, 12, 15, 24 and 30 VDC			
Drift	±10 ppm/K ±150 µV/K			

Stability 10% to 90% load (bipolar)	< 0.01 %
Current limit	200 mA (2 Watt max. per Channel, 12 Watt max. per Slice)
Additional Specifications	
Input connector	DSUB 9, BNC, Banana (others on request)
TEDS support	Standard + DSI® adapters
1) In- must be within ±10 V referred to GND (iso); for Ranges ≥ 10 V the DC value of In- is not rejected	

4.5.1. LV: DSUB9 connector

4.5.1.1. LV: DSUB9 connector Pinout



SIRIUSi-XHS-8xLV

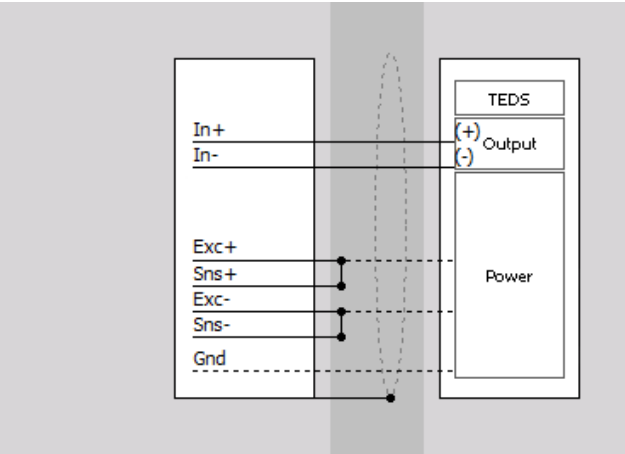
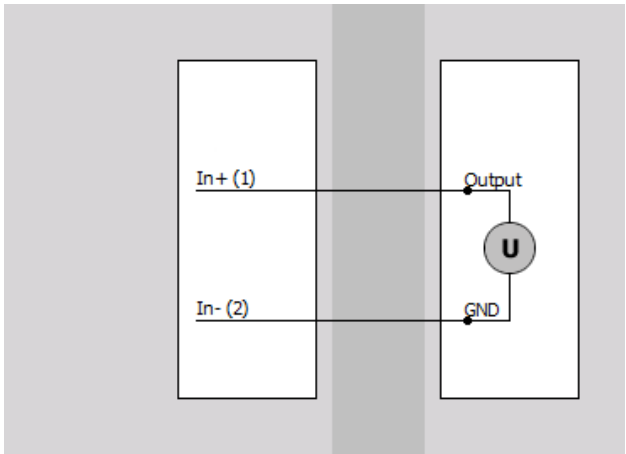
LV connector: pin-out (DSUB-9 female)

4.5.1.2. LV: DSUB9 connector Wiring diagram

4.5.1.2.1. LV: Voltage

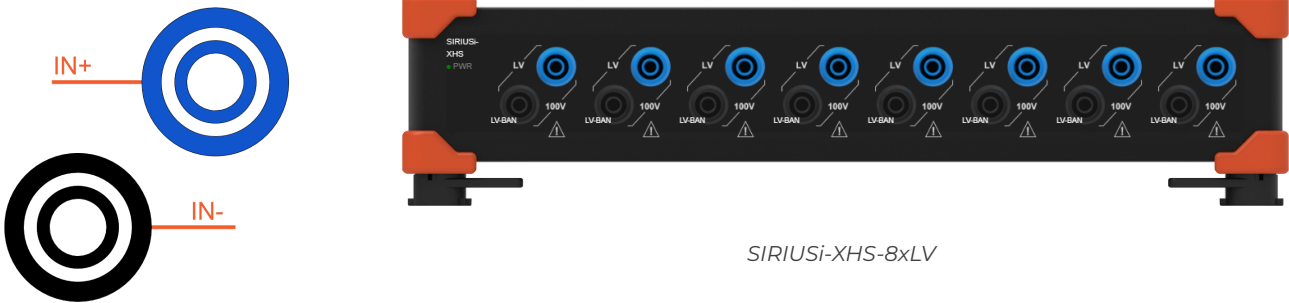
Single ended

Differential



4.5.2. LV: BAN connector

4.5.2.1. LV: BAN connector Pinout

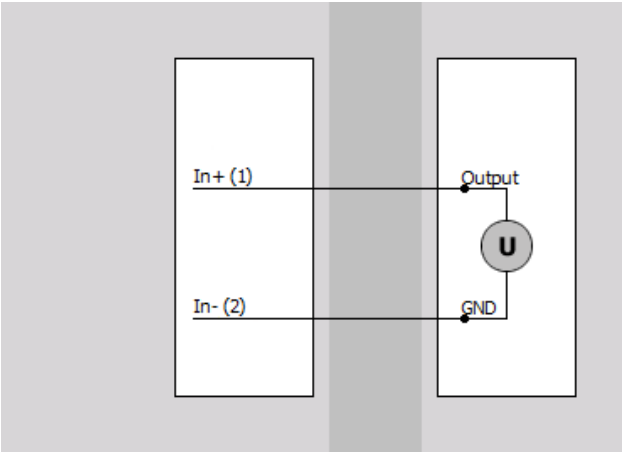


LV connector: pin-out (Banana plug)

4.5.2.2. LV: BANconnector Wiring diagram

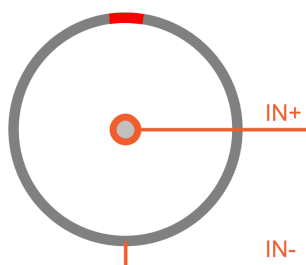
4.5.2.2.1. LV: Voltage

Single ended



### 4.5.3. LV: BNC connector

#### 4.5.3.1. LV: BNC connector Pinout



LV-BNC connector: pin-out (BNC)

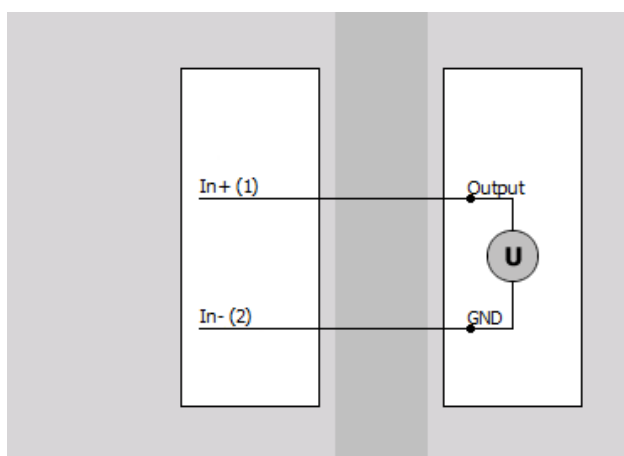


SIRIUSi-XHS-8xLV-BNC

#### 4.5.3.2. LV: BNC connector Wiring diagram

##### 4.5.3.2.1. LV: Voltage

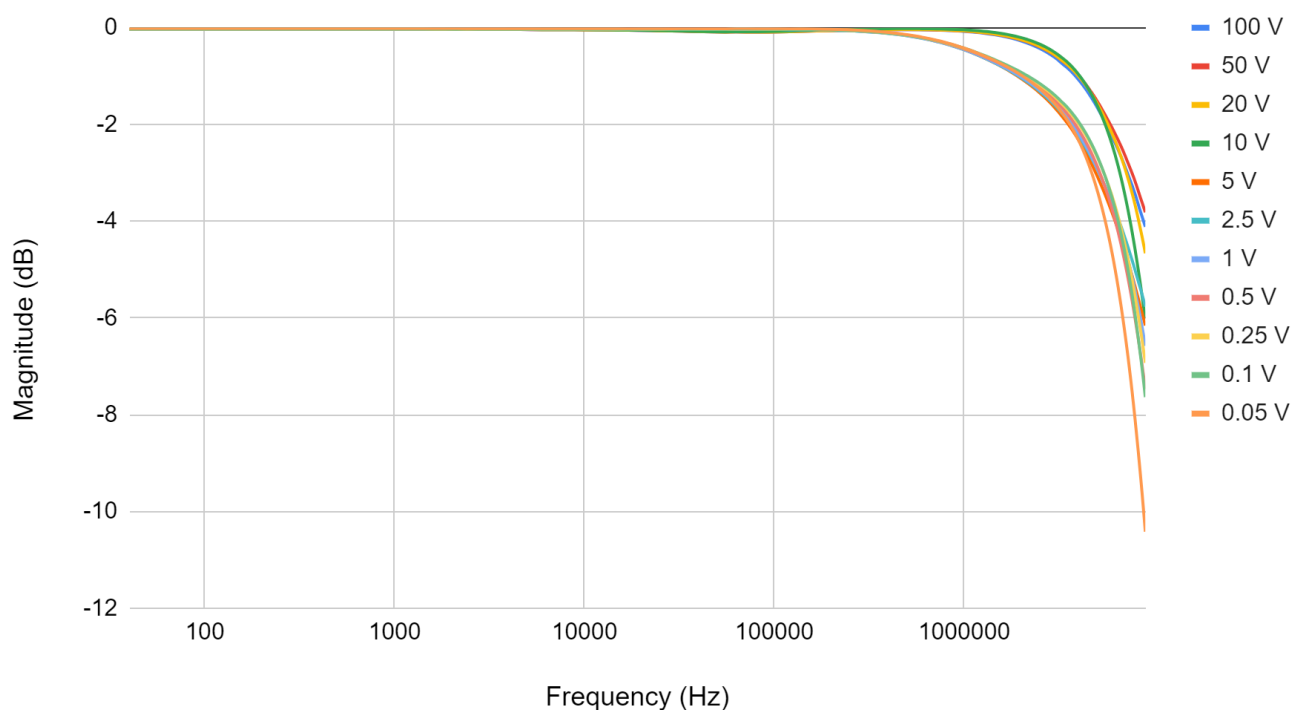
###### Single ended



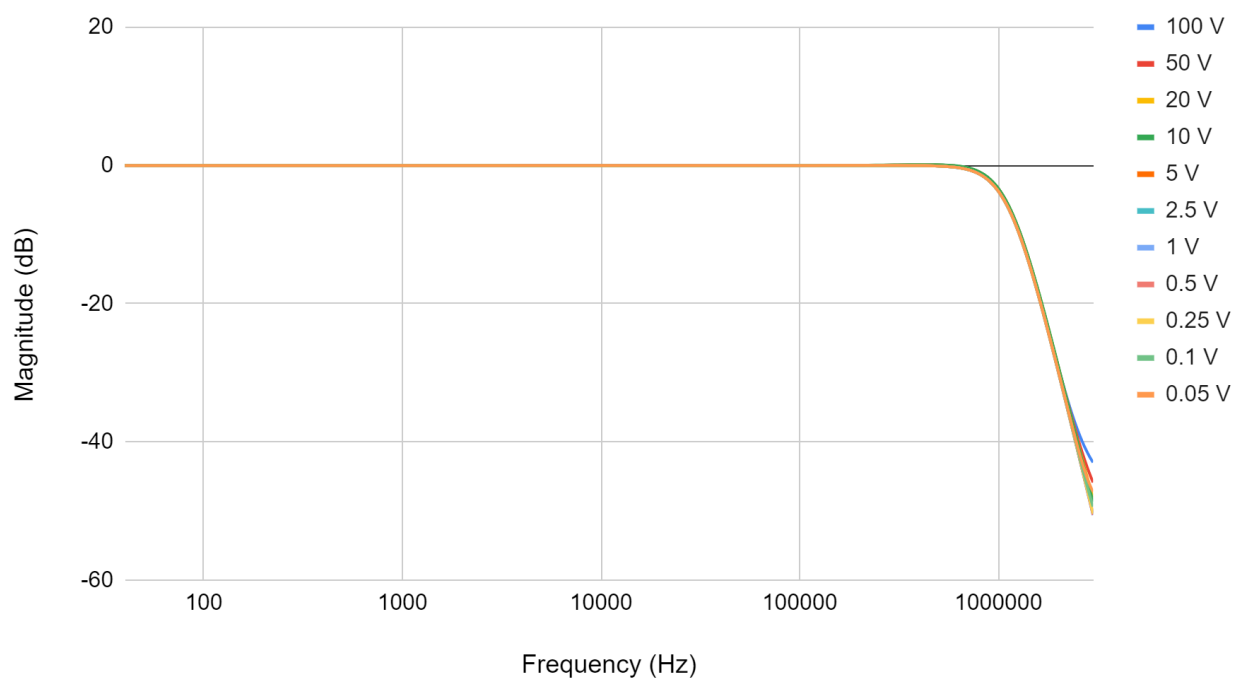
#### 4.5.4. Magnitude response

Filter Mode	High-bandwidth	1 MHz LPF	High-dynamic
Max. SR	15 MS/s	15 MS/s	2 MS/s
SW settings	Off	1 MHz	AAF
Bandwidth (-3 dB)	5 MHz	1 MHz	0.49 fs
Passband frequency (-0.1 dB)	500 kHz	500 kHz	0.45 fs
Passband flatness	± 0.1 dB	± 0.1 dB	± 0.1 dB
Alias-free bandwidth	×	7.5 MHz	0.45 fs
HW filter	×	✓	✓
Stopband frequency	×	7.5 MHz	0.55 fs
Stopband attenuation	×	-100 dB	-100 dB

XHS-LV High-Bandwidth LP off

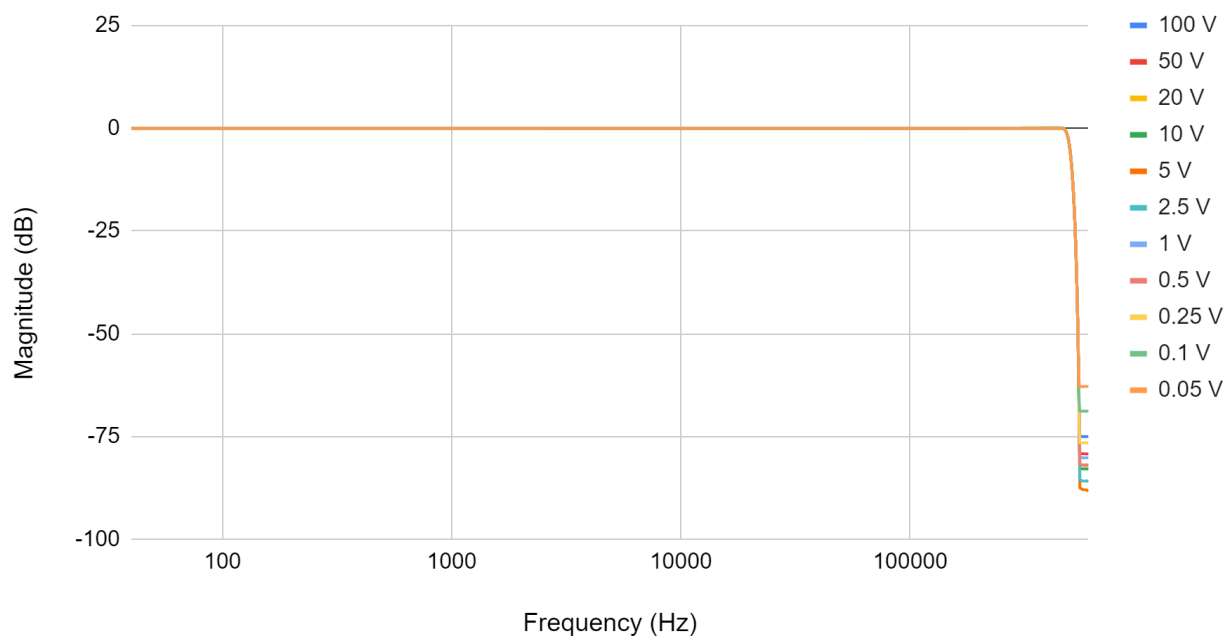


### XHS-LV High-Bandwidth LP 1 MHz



### XHS-LV High-Dynamic AAF

1 MS/s, LP 1MHz



## 4.6. ACC: Specifications

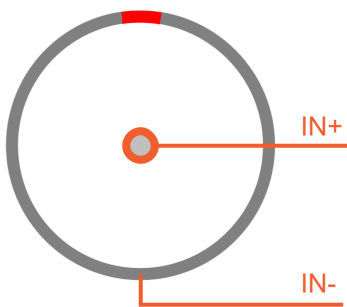
The ACC modules are perfect for sound and vibration IEPE channels.

Inputs						
Input types	Voltage, IEPE					
ADC Type	Hybrid ADC - alias free up to 2 MS/s, 16-bit up to 15 MS/s					
Sampling Rate	Simultaneous 15 MS/s					
Filtering	AAF 1 MHz (6th order)					
Analog bandwidth (-3 dB)	5 MHz					
Voltage Mode						
Ranges	±10, 5, 2, 1, 0.4 and 0.2 V					
Input Accuracy	DC	±0.03 % of reading ±0.02 % of range ±50 µV				
	Up to 1 kHz	±0.04 % of reading ±0.02 % of range				
	Up to 10 kHz	±0.06 % of reading ±0.05 % of range				
	Up to 100 kHz	±0.1 % of reading ±0.1 % of range				
	Up to 1000 kHz	±5 % of reading ±0.5 % of range				
Noise floor, Typ.	Sample rate, filter \ Range →	10 V	5 V	2 V	1 V	0.4 V
	15 MS/s, Filter off	-85 dB	-84 dB	-83 dB	-82 dB	-77 dB
	1 MS/s, Filter on	-98 dB	-98 dB	-97 dB	-95 dB	-92 dB
	100 kS/s, Filter on	-109 dB	-107 dB	-108 dB	-107 dB	-103 dB
	10 kS/s, Filter on	-119 dB	-119 dB	-119 dB	-118 dB	-114 dB
CMR, Typ.	Frequency \ Range →	10 V	5 V	2 V	1 V	0.4 V
	50 Hz	141 dB	141 dB	139 dB	133 dB	121 dB
	400 Hz	130 dB	133 dB	136 dB	137 dB	137 dB
	1 kHz	122 dB	125 dB	127 dB	129 dB	130 dB
Gain Drift	Typical 10 ppm/K, max. 30 ppm/K					
Offset Drift	Typical 0.5 µV/K + 1 ppm of range/K, max. 2 µV/K + 4 ppm of range/K					
Gain Linearity	< 0.02 %					
Inter Channel Phase-mismatch	0.005° * fin [kHz] + 0.0002°					
Channel Cross talk	-145 dB typ. @ 1 kHz					
Input Coupling	DC or AC (1 Hz, 0.1 Hz)					
Input Impedance	1 MΩ					
Overvoltage Protection	50 V continuous; 200 V peak (10 msec)					
IEPE mode						
Excitation	2 mA, 4 mA, 8 mA, 12 mA, 16 mA, 20 mA					

Compliance voltage	24 V
Output Impedance	> 10 kΩ
Sensor detection	Shortcut: < 4 V; Open: > 19 V
<b>Additional Specifications</b>	
Input connector	BNC
TEDS support	IEPE mode only

4.6.1. ACC: BNC connector

4.6.1.1. ACC: BNC connector Pinout



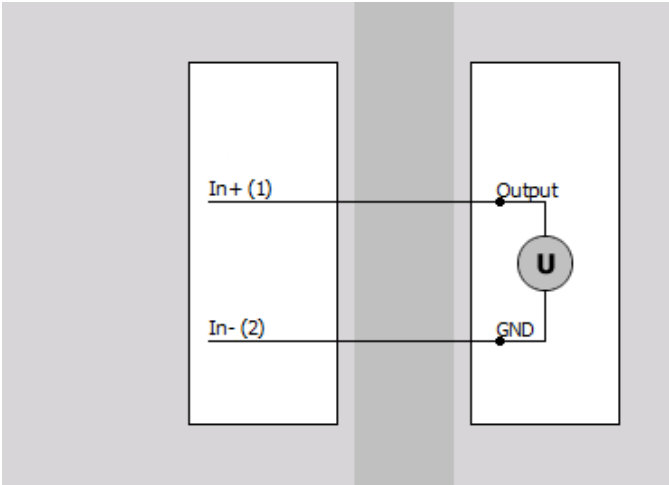
SIRIUSi-XHS-8xACC

ACC connector: pin-out (BNC)

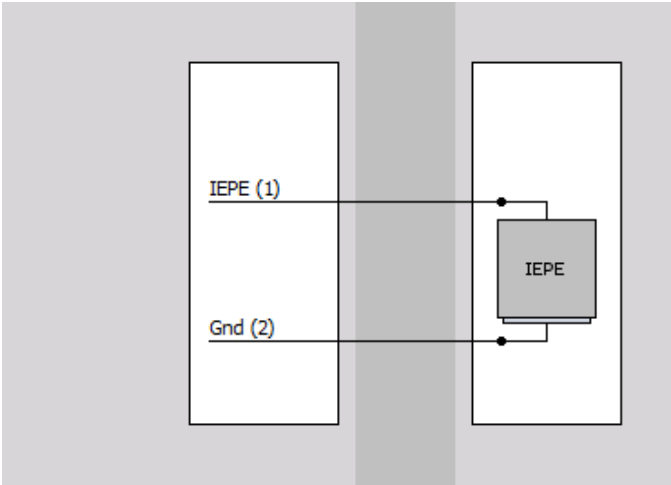
4.6.1.2. ACC: BNC connector Wiring diagram

4.6.1.2.1. ACC: Voltage, IEPE

Voltage



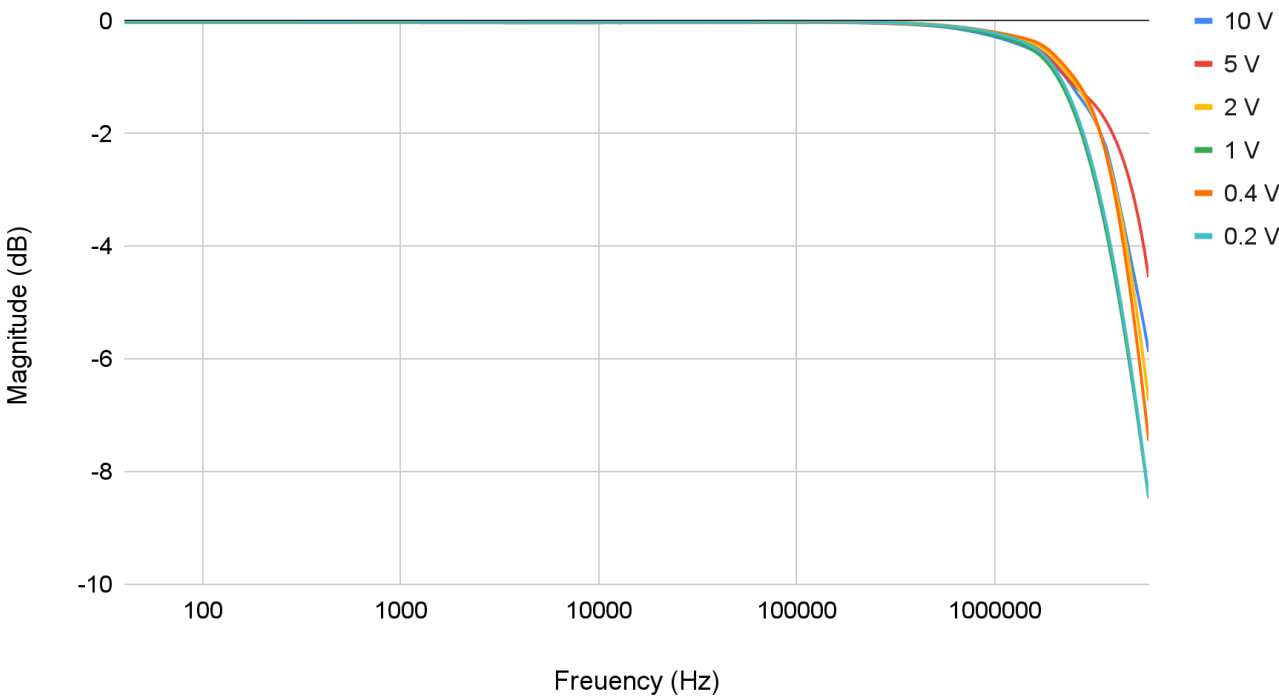
IEPE



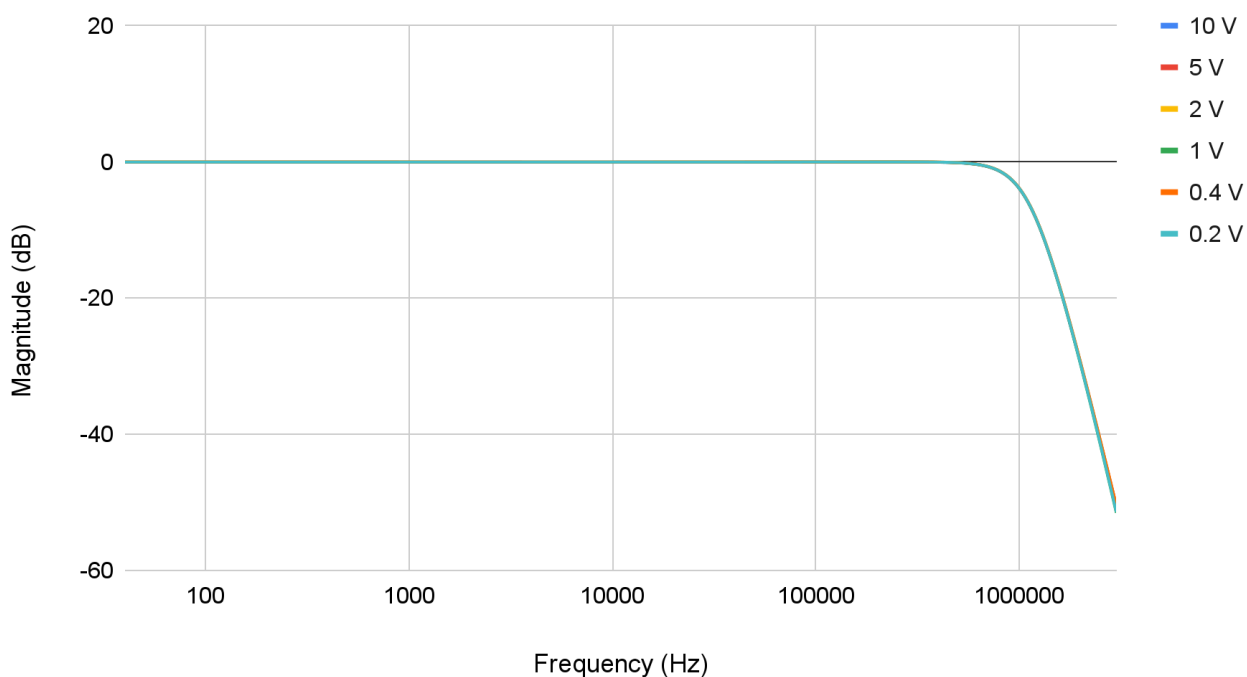
4.6.2. Magnitude response

Filter Mode	High-bandwidth	1 MHz LPF	High-dynamic
Max. SR	15 MS/s	15 MS/s	2 MS/s
SW settings	Off	1 MHz	AAF
Bandwidth (-3 dB)	5 MHz	1 MHz	0.49 fs
Passband frequency (-0.1 dB)	500 kHz	500 kHz	0.45 fs
Passband flatness	± 0.1 dB	± 0.1 dB	± 0.1 dB
Alias-free bandwidth	✗	7.5 MHz	0.45 fs
HW filter	✗	✓	✓
Stopband frequency	✗	7.5 MHz	0.55 fs
Stopband attenuation	✗	-100 dB	-100 dB

XHS-ACC High-Bandwidth LP off

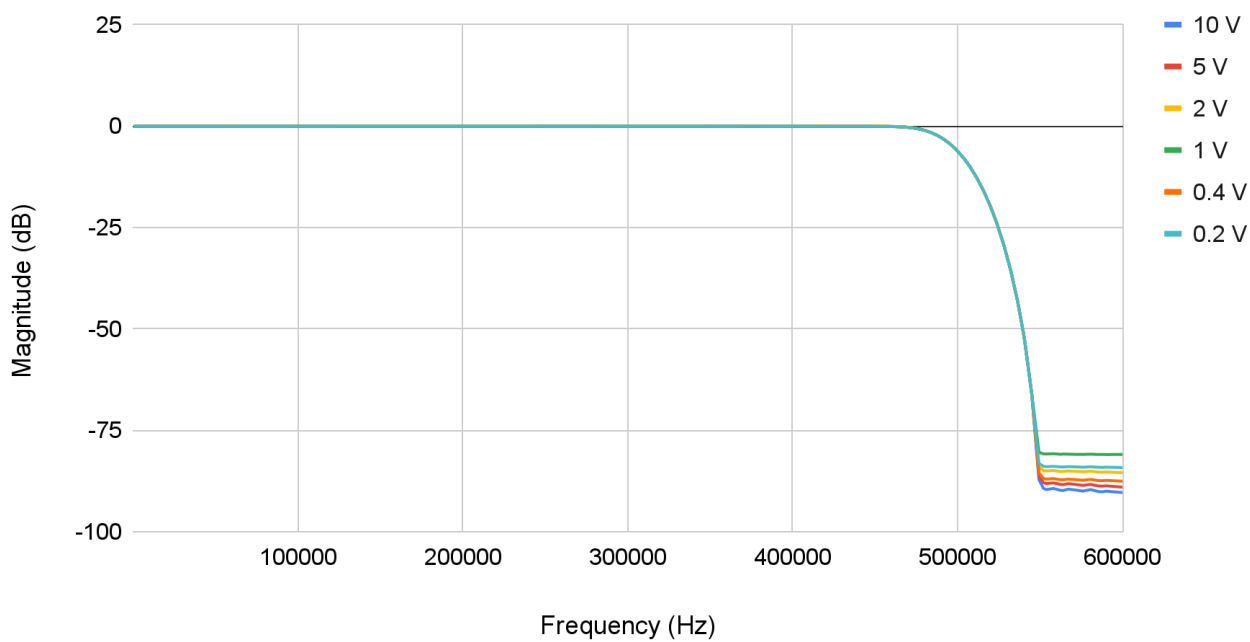


### XHS-ACC High-Bandwidth LP 1MHz



### XHS-ACC High-Dynamic

1 MS/s, LP 1MHz



## 4.7. CNT: Specifications

The CNT channels are perfect for event counting and for applications requiring sensors such as encoders.

<b>SIRIUS-XHS CNT (counter) specifications</b>	
<b>Counter Input</b>	
Input Channels (See 1)	8
Modes	Event counting, waveform timing, encoder, tacho, geartooth,...
Counter timebase	150 MHz
Time base accuracy	Typical: 0.5 ppm, Max: 2 ppm
Max. Bandwidth	15 MHz
Max. Sampling Rate	5 MS/s
Input Filter	Off, 500 ns, 1 $\mu$ s, 2 $\mu$ s, 4 $\mu$ s, 5 $\mu$ s and 7.5 $\mu$ s
Counter resolution	32-bit
Input Compatibility, Level	3.3 V TTL/CMOS (Low: <0.8 V, High >2 V)
Input termination, impedance	100 k $\Omega$ pull-up to +3.3 V
Input Protection	$\pm$ 25 V continuous
<b>Digital Output</b>	
Output Channels	8 connectors, 1 line per connector
Output	5 V digital output
Maximum current	32 mA
Output series resistance	50 $\Omega$
<b>Sensor Power Supply</b>	
Output Voltage +5 V	5 V $\pm$ 10 % 500 mA typ. Output short protected (Shared between 8 ports)
Output Voltage +12 V (See 2)	12 V $\pm$ 10 % 300 mA typ. Output short protected (Shared between 8 ports)
1) Digital inputs on Counter (individual A, B, Z input) can be used only for Trigger condition 2) Maximum 2x DS-TACHO4 laser probes supported.	
<b>Rev: 1702296000</b>	

### 4.7.1. CNT: GLAN and USB support



#### Caution

In 2023.6 support of CNT over Ethernet. In 2024.1 RC and after support of CNT over USB 3.0.

Be sure to keep in mind the bandwidth available when using CNT channels and AI channels at maximum sampling rate.

Communication protocol	Theoretical bandwidth	Available bandwidth
GbE	1 Gbit/s	approx. 750 Mbit/s
USB 3.0	5 Gbit/s	approx. 3.2 Gbit/s

To calculate the bandwidth keep in mind:

	Filter off / Basic	Additional functionalities
AI	2 Bytes	4 Bytes (Digital filter on) Note: only available up to 2 MS/s
CNT	4 Bytes 4 Bytes (Event counting mode)	8 Bytes (Sensor mode) 8 Bytes (Event counting Advanced mode)

Example configurations (maximum bandwidth) available via Ethernet:

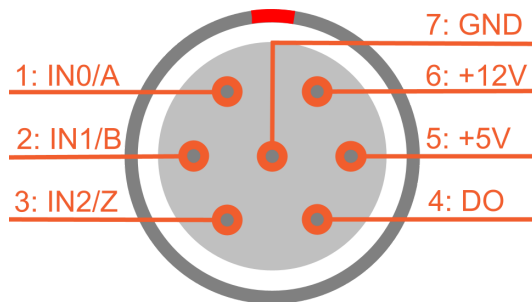
- 8 x AI non-filtered @ 1 MS/s + 8 x CNT (Event counting mode) @ 1 MS/s
- 8 x AI non-filtered @ 5 MS/s + 1 x CNT (Sensor mode) @ 1 MS/s
- 8 x AI filtered @ 2 MS/s + 1 x CNT (Sensor mode) @ 2 MS/s

Example configurations (maximum bandwidth) available via USB:

- 8 x AI non-filtered @ 15 MS/s + 8 x CNT (Event counting mode) @ 1.875 MS/s
- 8 x AI non-filtered @ 15 MS/s + 1 x CNT (Sensor mode) @ 5 MS/s
- 8 x AI non-filtered @ 5 MS/s + 8 x CNT (Sensor mode) @ 2.5 MS/s
- 8 x AI filtered @ 2 MS/s + 8 x CNT (Sensor mode) @ 2 MS/s

## 4.7.2. CNT: LEMO connector

### 4.7.2.1. CNT: LEMO connector Pinout



*CNT connector: pin-out (Lemo)*

*SIRIUSi-XHS-IP2-CNT*

Connector on the module: EGG.1B.307.CLL  
Mating cable connector: FGG.1B.307.CLAD52



#### Hint

The Triggers out RT module enables digital outputs from the DO pin on the counter channel of the SIRIUS-XHS device under custom conditions. Check the F1 manual for more information about Triggers out RT module.

## 5. Filtering

SIRIUSi-XHS-PWR features Hybrid ADC technology.

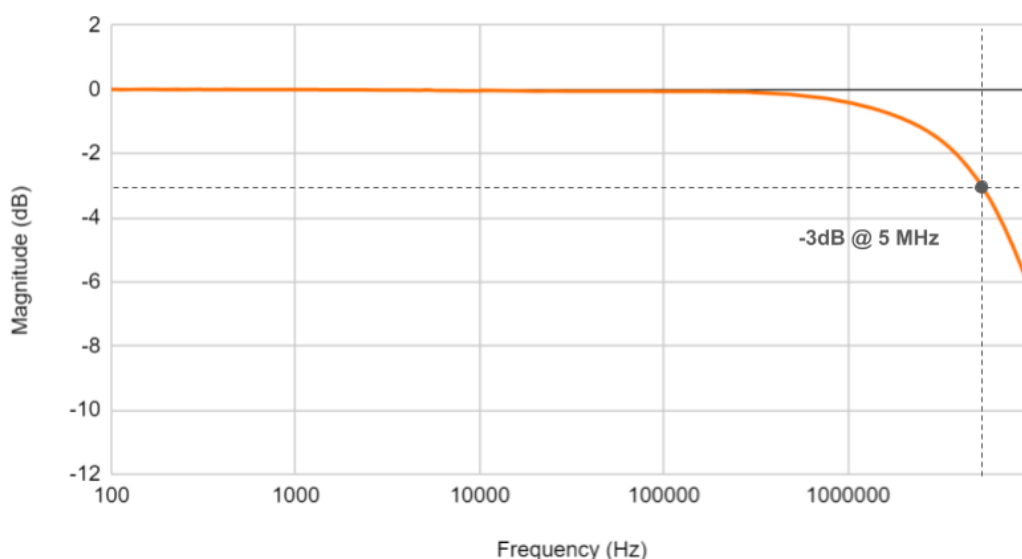
Some channels can be selected as high bandwidth others as high dynamic - signals are still perfectly time aligned with zero phase shift.

Users can select three different filtering modes in DewesoftX software:

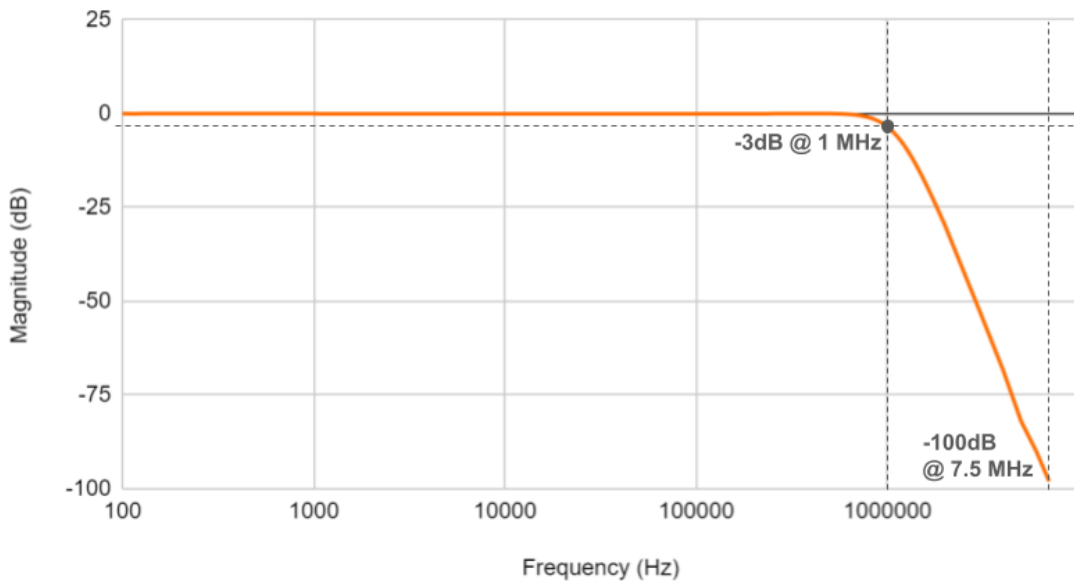
- **Off** (Full High-bandwidth mode)
- **1 MHz** (High-bandwidth mode + 1 MHz LPF On - Analog anti-aliasing filter)
- **AAF** (High-dynamic mode - 1 MHz LPF is turned On)

Filter Mode	High-bandwidth	1 MHz LPF	High-dynamic
Max. SR	15 MS/s	15 MS/s	2 MS/s
SW settings	<b>Off</b>	<b>1 MHz</b>	<b>AAF</b>
Bandwidth (-3 dB)	5 MHz	1 MHz	0.49 fs
Passband frequency (-0.1 dB)	500 kHz	500 kHz	0.45 fs
Passband flatness	± 0.1 dB	± 0.1 dB	± 0.1 dB
Alias-free bandwidth	×	7.5 MHz	0.45 fs
HW filter	×	✓	✓
Stopband frequency	×	7.5 MHz	0.55 fs
Stopband attenuation	×	-100 dB	-100 dB

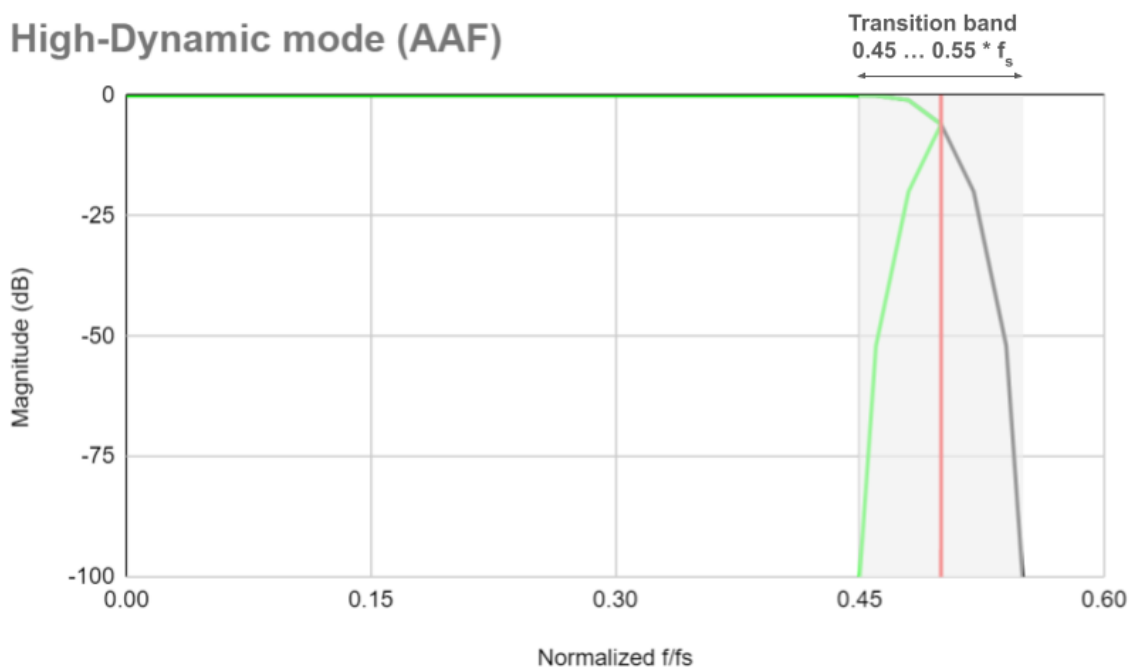
High-bandwidth mode (LPF off)



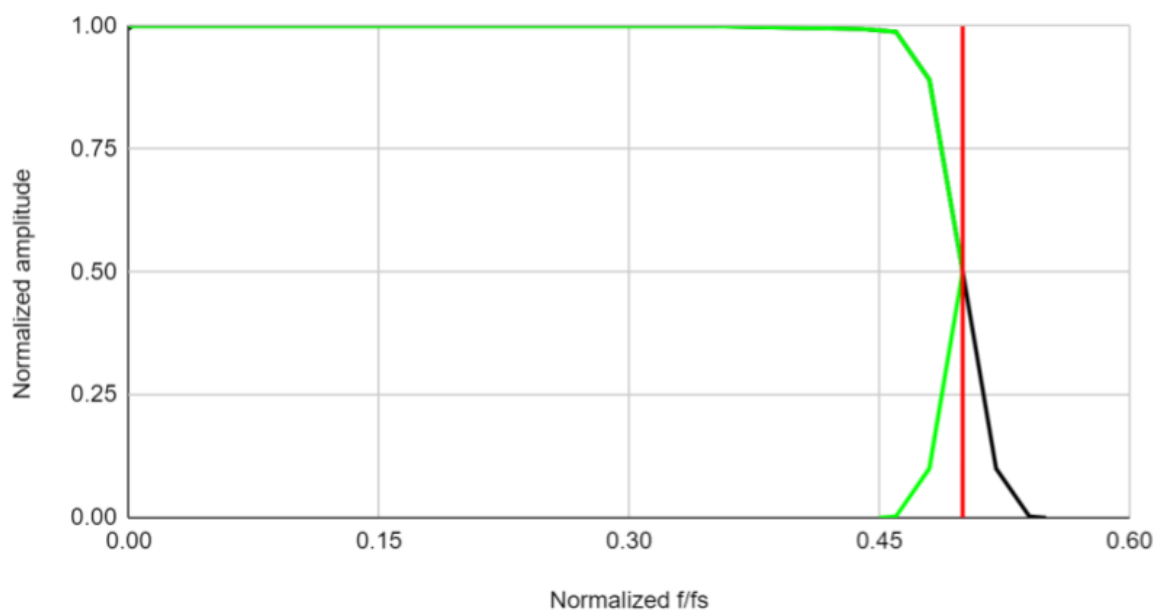
## High-bandwidth mode (LPF on) analog 1MHz AAF



## High-Dynamic mode (AAF)



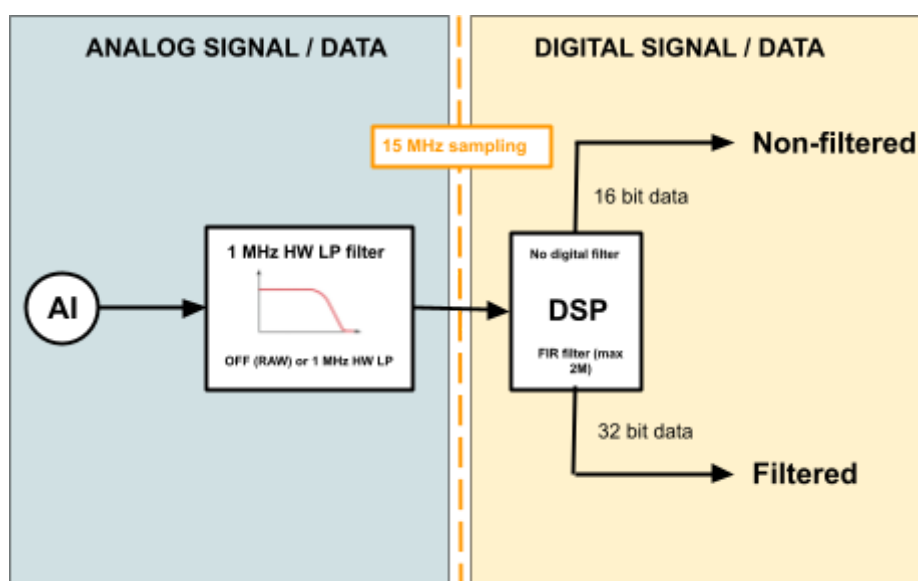
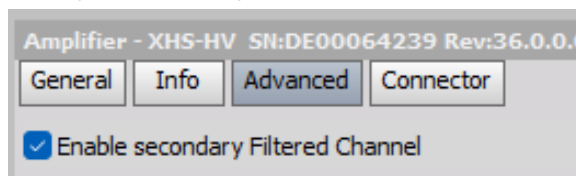
## High-Dynamic mode (AAF)



ZERO-PHASE DELAY

## 5.1. Advanced channels

SIRIUSi-XHS devices offer an additional option to add the additional secondary channel to your primary ones. For example, if you want the primary channel to be non-filtered, then the additional channel will be digitally filtered and vice versa. There are some other limitations, which can be easily shown with some examples. Below there are 4 special examples, which will show all the possible channel outputs.



Advance channels schematics

### 5.1.1. LP filter OFF (RAW)

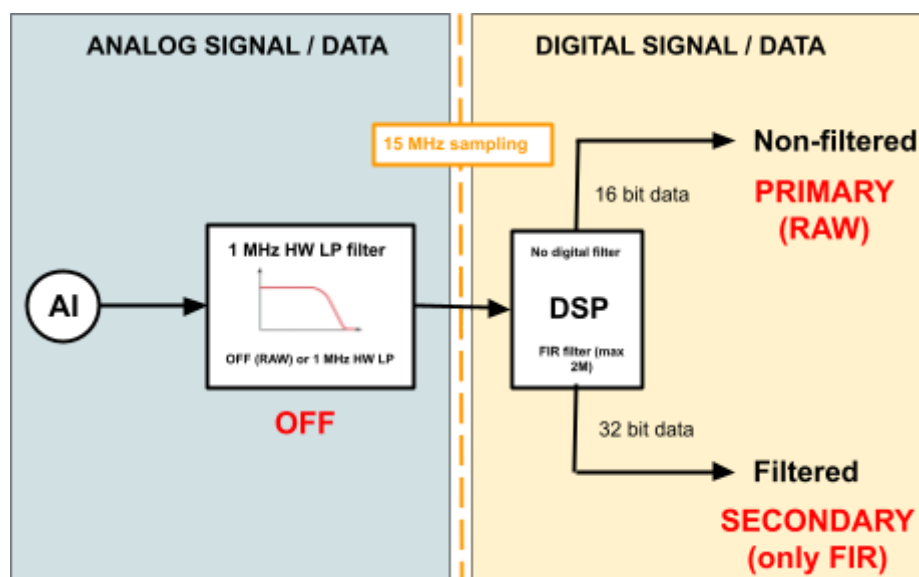
A-1	Used	3000000	AI A-1	XHS-HV	200 V	Off	Voltage
A-2	Unused	3000000	AI A-2	XHS-HV	2000 V	Off	
A-3	Unused	3000000	AI A-3	XHS-HV	200 V	1 MHz	
A-4	Unused	3000000	AI A-4	XHS-HV	200 V	AAF (zero-phase distortion)	

In this case the **HW low pass filter is turned off**.

Sampling is done on **raw data**.

**The primary channel will be Non-filtered.**

**The secondary channel will be Filtered with an FIR filter** and its sampling rate will be maximized to the highest possible sampling rate to the dynamic acquisition rate.



Dynamic acquisition rate	Channel sample rate	Primary channel sampling rate	Primary channel sample size	Secondary channel sampling rate	Secondary channel sample size
15 MHz	15 MHz	15 MHz (RAW)	16 bit	1.875 MHz (only FIR)	32 bit
10 MHz	10 MHz	10 MHz (RAW)	16 bit	2 MHz (only FIR)	32 bit
2 MHz	2 MHz	2 MHz (RAW)	16 bit	2 MHz (only FIR)	32 bit
500 kHz	500 kHz	500 kHz (RAW)	16 bit	500 kHz (only FIR)	32 bit
15 MHz	3 MHz	3 MHz (RAW)	16 bit	1.875 MHz (only FIR)	32 bit
15 MHz	300 kHz	300 kHz (RAW)	16 bit	1.875 MHz (only FIR)	32 bit
7.5 MHz	7.5 MHz	7.5 MHz (RAW)	16 bit	1.875 MHz (only FIR)	32 bit
5 MHz	5 MHz	5 MHz (RAW)	16 bit	1.25 MHz (only FIR)	32 bit
3 MHz	3 MHz	3 MHz (RAW)	16 bit	1.5 MHz (only FIR)	32 bit

## 5.1.2. HW 1 MHz filter ON

A-1	Used	300000	AI A-1	XHS-HV	200 V	1 MHz	Voltage
A-2	Unused	1,5E7	AI A-2	XHS-HV	2000 V	Off	
A-3	Unused	1,5E7	AI A-3	XHS-HV	200 V	✓ 1 MHz	
A-4	Unused	1,5E7	AI A-4	XHS-HV	200 V	AAF (zero-phase distortion)	

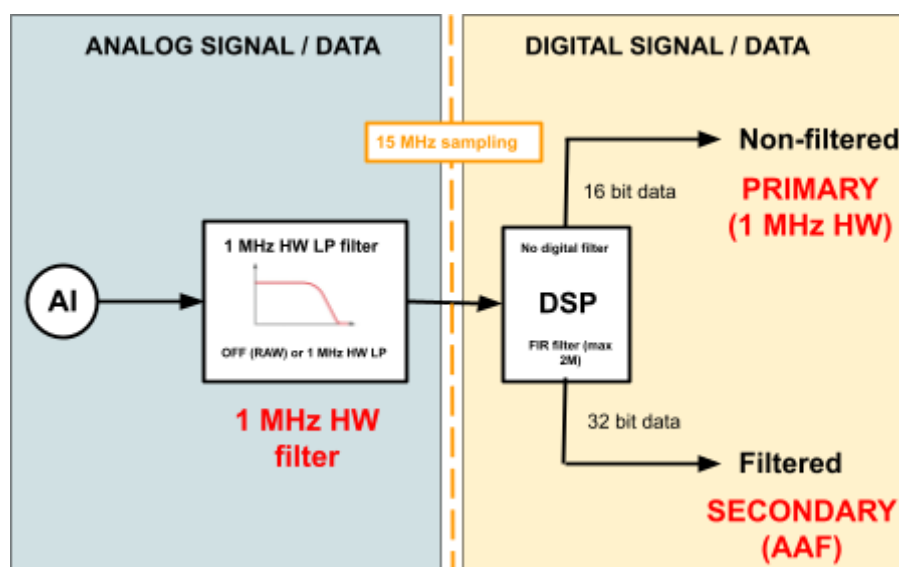
In this case the **HW 1 MHz low pass filter is turned on.**

Sampling is done on **data filtered by a 1 MHz HW filter.**

**The primary channel will be Non-filtered.**

**The secondary channel will be Filtered with an FIR filter** and its sampling rate will be maximized to the highest possible sampling rate to the dynamic acquisition rate.

**A combination of a 1 MHz HW filter and FIR filter creates a true Anti-alias filter (AAF) on the secondary channel.**



Dynamic acquisition rate	Channel sample rate	Primary channel sampling rate	Primary channel sample size	Secondary channel sampling rate	Secondary channel sample size
15 MHz	15 MHz	15 MHz (1 MHz HW LP)	16 bit	1.875 MHz (AAF)	32 bit
10 MHz	10 MHz	10 MHz (1 MHz HW LP)	16 bit	2 MHz (AAF)	32 bit
2 MHz	2 MHz	2 MHz (1 MHz HW LP)	16 bit	2 MHz (AAF)	32 bit
500 kHz	500 kHz	500 kHz (1 MHz HW LP)	16 bit	500 kHz (AAF)	32 bit
15 MHz	3 MHz	3 MHz (1 MHz HW LP)	16 bit	1.875 MHz (AAF)	32 bit
15 MHz	300 kHz	300 kHz (1 MHz HW LP)	16 bit	1.875 MHz (AAF)	32 bit
7.5 MHz	7.5 MHz	7.5 MHz (1 MHz HW LP)	16 bit	1.875 MHz (AAF)	32 bit

<b>5 MHz</b>	<b>5 MHz</b>	5 MHz (1 MHz HW LP)	16 bit	1.25 MHz (AAF)	32 bit
<b>3 MHz</b>	<b>3 MHz</b>	3 MHz (1 MHz HW LP)	16 bit	1.5 MHz (AAF)	32 bit

### 5.1.3. AAF (zero-phase distortion) ON

A-1	Used	2000000	AI A-1	XHS-HV	200 V	AAF (zero-phase distortion) ▼	Voltage
A-2	Unused	2000000	AI A-2	XHS-HV	2000 V	Off	
A-3	Unused	2000000	AI A-3	XHS-HV	200 V	1 MHz	
A-4	Unused	2000000	AI A-4	XHS-HV	200 V	✓ AAF (zero-phase distortion)	

In this case the **HW 1 MHz low pass filter is turned on.**

Sampling is done on **data filtered by a 1 MHz HW filter.**

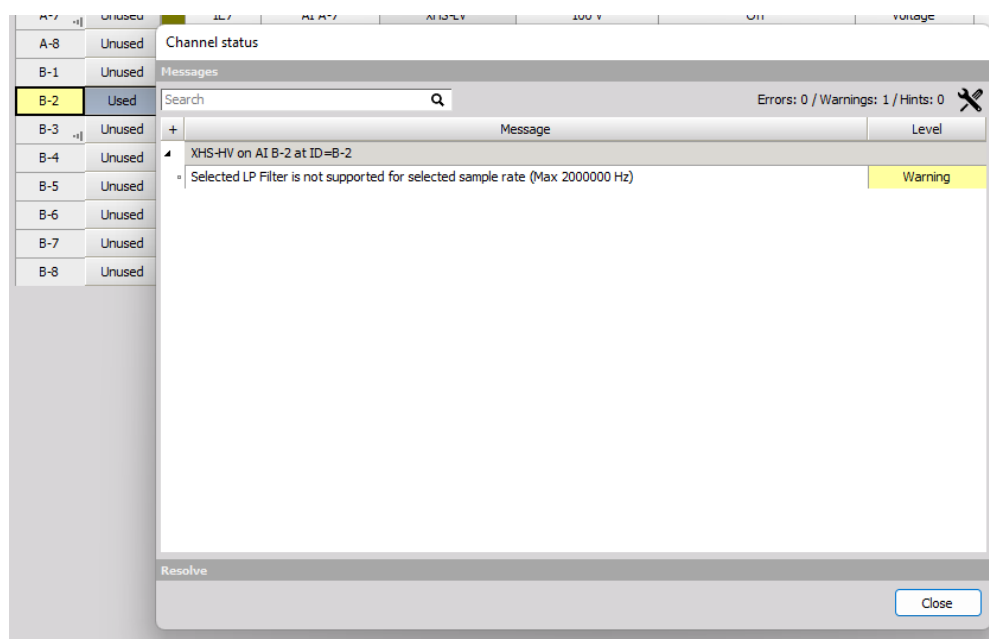
**The primary channel will be Filtered.**

**A combination of a 1 MHz HW filter and FIR filter creates a true Anti-alias filter (AAF) on the primary channel.**

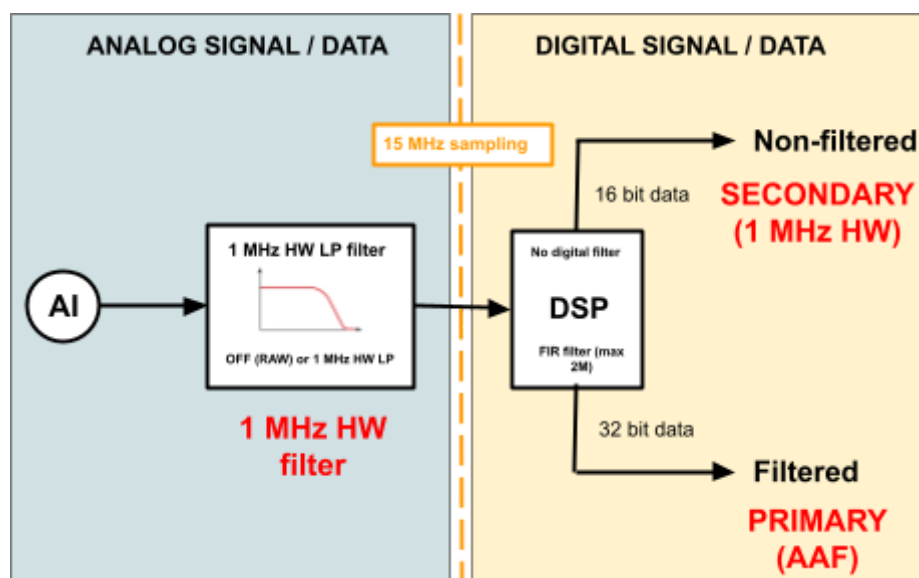


#### Important

FIR filter can be applied to a max 2M sampling rate. If a higher sampling rate is chosen the logic fall-back to section [2.5.2 HW 1 MHz filter on](#) (primary Non-filtered, secondary Filtered). Channel gets a warning:



**Secondary** channel will be **Non-filtered** and its sampling rate will be maximized to the highest possible sampling rate to the dynamic acquisition rate



Dynamic acquisition rate	Channel sample rate	Primary channel sampling rate	Primary channel sample size	Secondary channel sampling rate	Secondary channel sample size
15 MHz	15 MHz	15 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	1.875 MHz (Fall-back → Filtered (AAF))	32 bit
10 MHz	10 MHz	10 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	2 MHz (Fall-back → Filtered (AAF))	32 bit
2 MHz	2 MHz	2 MHz (AAF)	32 bit	2 MHz (1 MHz HW LP)	16 bit
500 kHz	500 kHz	500 kHz (AAF)	32 bit	500 kHz (1 MHz HW LP)	16 bit
15 MHz	3 MHz	3 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	1.875 MHz (Fall-back → Filtered (AAF))	32 bit
15 MHz	1.875 MHz	1.875 MHz (AAF)	32 bit	15 MHz (1 MHz HW LP)	16 bit
10 MHz	2 MHz	2 MHz (AAF)	32 bit	10 MHz (1 MHz HW LP)	16 bit
7.5 MHz	7.5 MHz	7.5 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	1.875 MHz (Fall-back → Filtered (AAF))	32 bit
5 MHz	5 MHz	5 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	1.25 MHz (Fall-back → Filtered (AAF))	32 bit
3 MHz	3 MHz	3 MHz (Fall-back → Non-filtered (1 MHz HW LP))	16 bit	1.5 MHz (Fall-back → Filtered (AAF))	32 bit

## 6. Accessories

Manuals for accessories that can be used with SIRIUSi-XHS® devices are available on our website, <https://dewesoft.com/download/manuals>.

### 6.1. Fibre Optic USB 3.0 Extender

The Fibre Optic USB 3.0 Extender allows for longer distances data transfer while maintaining high transfer speeds of up to 5Gbps. It supports cascading of up to 3 cables for a total length of 300m. It is lightweight, flexible, and suitable for sensitive environments with high RFI/EMI.

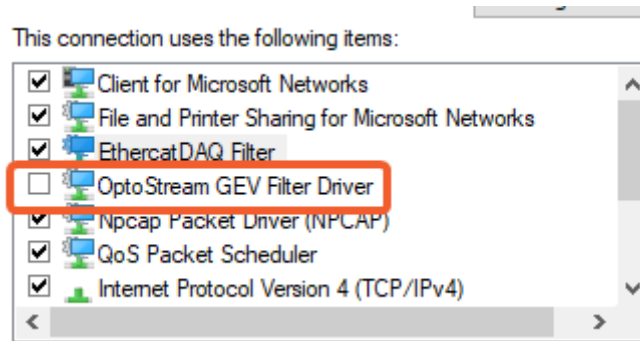


*Fibre Optic USB 3.0 Extender*

## 7. FAQ section

### 7.1. Device not recognized when connected over USB

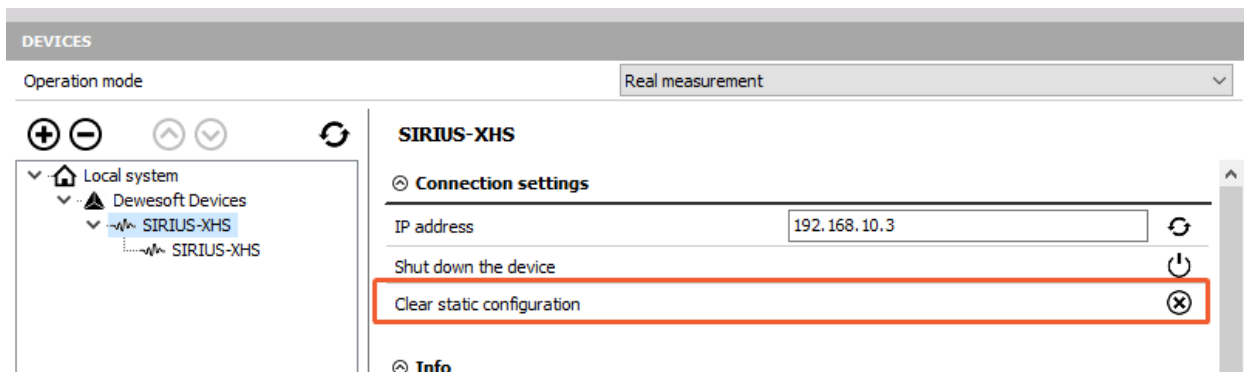
When the device is connected over the USB an additional Ethernet network card is created. If the USB device is not seen in Dewesoft the user needs to disable the OptoStream drivers in the Ethernet network card.



*Opto Stream drivers disabled*

### 7.2. Clear static configuration

In any case that the device got stuck in channel setup and the user can not proceed to measure mode, you can clear all the configuration from the device with the “clear static configuration” button that can be found in Device settings.



*Clear static configuration button*

### 7.3. Setting static IP on the PC

When the SIRIUSi-XHS has the static IP, the measurement computer needs it as well. To set it up, you need to open Network connections in the Windows control panel. With a right-click on the correct connection and opening settings, you can change the IP address under “Internet Protocol Version 4 (TCP/IPv4)”.



### Important

SIRIUSi-XHS and computers have to have different IP addresses set. If they have the same one, XHS cannot be located.

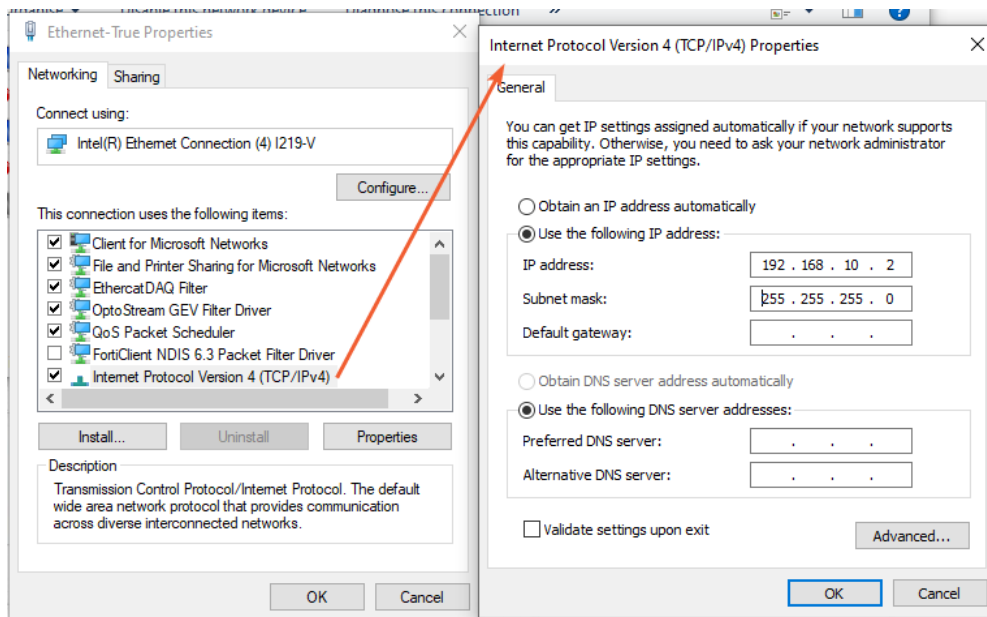


### Example

SIRIUSi-XHS® has the IP address 192.168.10.1

Your network adapter should be set to:

- IP: 192.168.10.x, where x is number from 2-255
- Subnet mask: 255.255.255.0

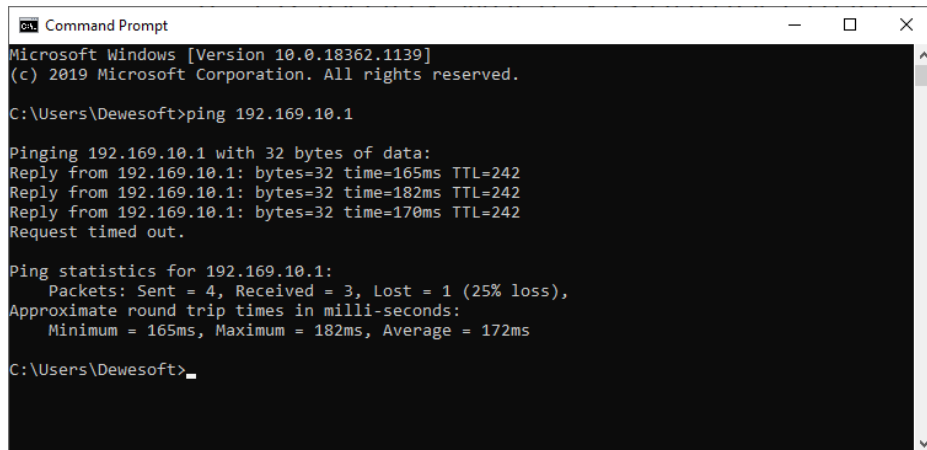


Network configuration

## 7.4. Locating the XHS device

If DewesoftX doesn't detect your devices you should try pinging them via command prompt. In the command prompt write: ping IP (replace IP with IP that is set on your device).

If the device can be located the result should look something like this:



```
Microsoft Windows [Version 10.0.18362.1139]
(c) 2019 Microsoft Corporation. All rights reserved.

C:\Users\Dewesoft>ping 192.169.10.1

Pinging 192.169.10.1 with 32 bytes of data:
Reply from 192.169.10.1: bytes=32 time=165ms TTL=242
Reply from 192.169.10.1: bytes=32 time=182ms TTL=242
Reply from 192.169.10.1: bytes=32 time=170ms TTL=242
Request timed out.

Ping statistics for 192.169.10.1:
    Packets: Sent = 4, Received = 3, Lost = 1 (25% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 165ms, Maximum = 182ms, Average = 172ms

C:\Users\Dewesoft>
```

*Command prompt troubleshooting*

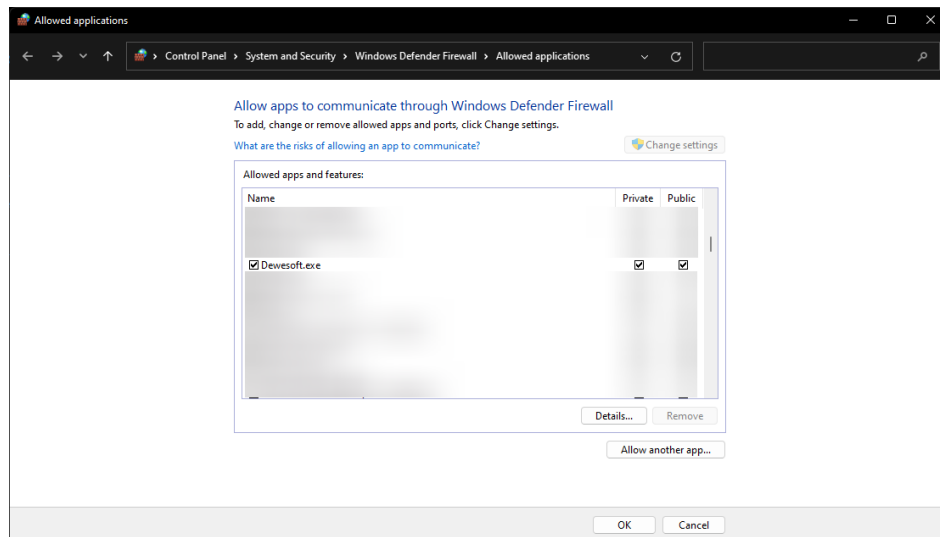
## 7.5. Setting Firewall exception

To allow DewesoftX to access the connection to SIRIUSi-XHS you need to allow the program a firewall exception. You need to open the Windows control panel and select System and Security. Under Windows Defender Firewall select Allowed applications. Locate the DewesoftX program in the list and allow it in Private and Public networks.



### Important

You need to have administrator privileges to be allowed to add firewall exceptions.

*Firewall exceptions*

## 7.6. Connecting SIRIUSi-XHS with automatic IP assignment to network without DHCP server

If your SIRIUSi-XHS is set to have automatic IP assignment and you connect it to the network that hasn't got a DHCP server, you will not be able to locate the device. The device will wait for 2 minutes for an IP address configuration, but since this will not happen, it will start the USB mode after the time has passed. You can then connect to the device with a USB cable and change the IP settings to static assignment. Select the available IP address and power cycle the device. You can now access the device by the IP you have set up.

## 7.7. Troubleshooting

If your SIRIUSi-XHS® device is not found by DewesoftX:

- If you did not restart Windows after the software installation, restart now
- Make sure that you have started DewesoftX version Release Candidate 2020.2, Development 2021.1 or higher
- Make sure that the external power supply is connected and okay
- Disconnect the network cable and reconnect it. If this does not work, try to connect the network cable to another Ethernet port of your PC
- Try to restart DewesoftX
- Try to restart the PC

## 8. Safety instructions

Your safety is our primary concern! Please be safe!

### 8.1. 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.

#### **8.1.1. Environmental Considerations**

Information about the environmental impact of the product.

#### **8.1.2. 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](http://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.

#### **8.1.3. 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 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 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.

## 9. 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.

### 9.1. 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/distributors>.

### 9.2. 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.

### 9.3. 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](mailto: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)

### 9.4. 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>.

### 9.5. Restricted Rights

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

## 9.6. Copyright

Copyright © 2015-2020 Dewesoft d.o.o.

This document contains information which is protected by copyright. All rights are reserved. Reproduction, adaptation, or translation without prior written permission is prohibited, except as allowed under the copyright laws.

All trademarks and registered trademarks are acknowledged to be the property of their owners.

## 9.7. 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.

## 9.8. Documentation version

Doc-Version	Date [dd.mm.yyyy]	Notes
V23-2	14.12.2023	<ul style="list-style-type: none"> <li>Added new CNT</li> <li>Added CAN-FD and additional CAN functionalities</li> </ul>
V23-1	02.06.2023	<ul style="list-style-type: none"> <li>Update Connection over 3.0 USB</li> <li>Chapters "Ethernet configuration on the PC", "DewesoftX settings for SIRIUSi-XHS®", "Autodetect", "Configuring the IP address inside discovery module" updated and moved under "Connection over EtherNET"</li> <li>Removed the 10MHz clock column in chapter "Sample rate" table</li> <li>Example and Troubleshooting in "Ethernet configuration on the PC" moved to "FAQ section"</li> <li>Picture update with new DewesoftX version in "Autodetect" and "Configuring the IP address inside the discovery module"</li> <li>Added chapter Device overview</li> <li>Updated chapter "Synchronization"; added subchapter "A system with old-generation devices and SIRIUS-XHS (PTPin-IRIGout option)"</li> <li>Added hint in chapter "Measurement Mode"</li> <li>Picture update in "Analyze Mode"</li> <li>Added chapter "RT mode"</li> <li>Picture update in chapter "Firmware upgrade"</li> <li>Chapter Troubleshooting moved to FAQ section</li> <li>Added CAN and CAN output RT in chapter "Open interface protocols"</li> <li>Updated chapter "USB connector"</li> <li>Updated chapter "Connection of multiple SIRIUSi-XHS devices with SBOX"</li> <li>Added chapter "System for more demanding measurements with SIRIUSi-XHS"</li> <li>Updated chapter "Multiple devices over EtherNET" and "Storing on high sample rates"</li> <li>Removed chapters "Two XHS devices with different Dividers" and "Measure on 15MS/s with additional Math channels"</li> <li>"HV: Filter modes", "LV: Filter modes", "ACC: Filter modes" renamed to "Magnitude response"</li> <li>Added chapters "LV: BAN connector"</li> <li>Added description in chapter "Filtering"</li> <li>Added subchapter "Advanced channels" in "Filtering"</li> <li>Added warning in chapter "DS-6xLAN-RJ45"</li> </ul>

		<ul style="list-style-type: none"> <li>• Added subchapter "Fibre Optic USB 3.0 Extender" in "Accessories"</li> <li>• Chapter "Troubleshooting" renamed to "FAQ section"</li> <li>• Added subchapters "Setting static IP on the PC", "Locating the XHS device", "Setting Firewall exception", "Connecting SIRIUSi-XHS with automatic IP assignment to network without DHCP server" and "Troubleshooting"</li> <li>• Grammar fixes</li> </ul>
V22-1	27.10.2022	Autodetection, standard single slices, Added accessories, LED indicators, Different system connections, Additional channels, Added synchronization options, Added Filter specifications,
V21-2	4.4.2021	Licensing, PTP synchronization
V20-1	18.1.2021	Added XCP option, Few small fixes
V20-1	13.05.2020	Initial version