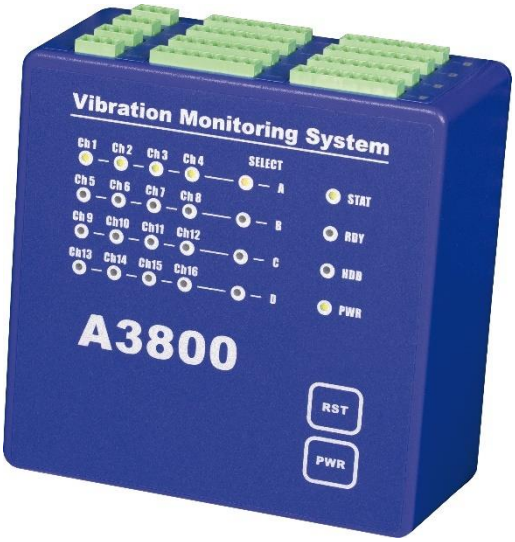
USER MANUAL

A3716, A3800
Online Monitoring Systems



Updated: June 2025

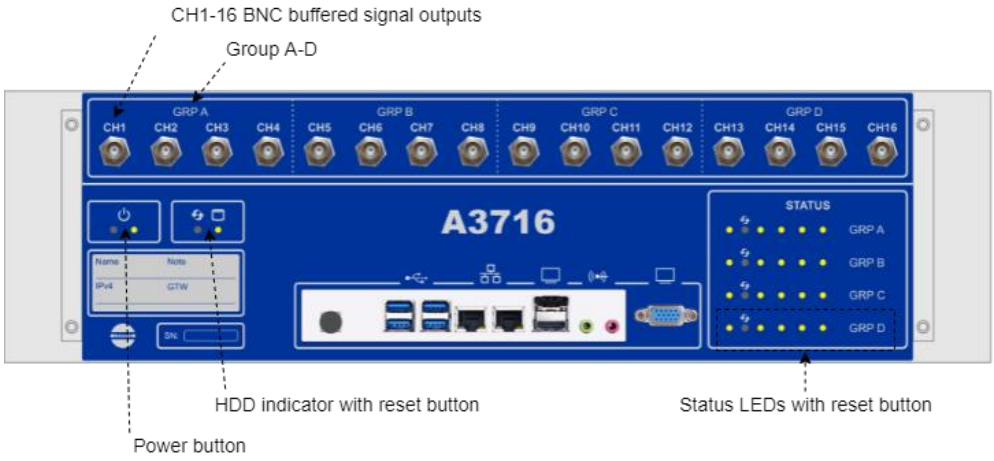
Content:

Introduction

Online monitoring systems are used for reading the vibrations on machines continuously.

We use two types of devices for online monitoring.:

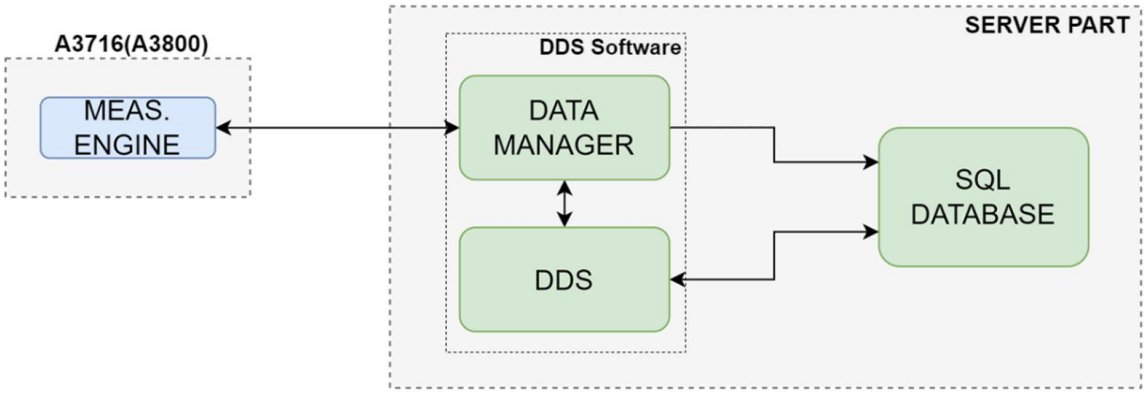
1. First one is online unit **A3716**. This unit contains 4 DSP boards (digital signal processing boards – more information in chapter Adash DSP board). Each board contains 4 input channels (it means A3716 has 16 input channels overall). These channels are divided into groups A – D (as you can see in picture below: GRP A, B, C, D). All of them allow you to measure/collect data simultaneously. We have two types of A3716 – 2U and 3U. 3U version also includes more outputs – relay outputs, loop outputs and BNC signal outputs (you can see BNC inputs in the screenshot below). More details about A3716 are in the chapter **Online unit A3716 description**.



2. Second one is online unit **A3800**. This unit also contains 16 input channels. The difference is that A3800 contains only one DSP board. It means, you can measure only on one channel group simultaneously (for example group A - Channel 1 to 4, or group B - Channel 5 to 8, etc.). Multiplexer is used for switching in between these channel groups. Lighting channels LEDs indicate where measurement is running (see picture below – measurement defined on group A). Online unit A3800 do not contain any relay or loop outputs. But we do have additional module for relays and loops. More information about A3800 relay and loop modules are in the manual **A3800 – RELAYS, LOOPS module** (available on Adash web).
   More details about A3800 are in the chapter **Online unit A3800 description**.

Online units are more described in following chapters.

Units A3716 and A3800 are controlled and set by **DDS software**. It basically assures communication between online unit and database. This software also allows you to create a structure (database) for your measurements and analyze the data.



MeasEngine – Every online unit contains this software. It is performing measurements, collects data and provides them to Data Manager (part of DDS).
Data manager – As mentioned above, it is part of DDS software. It reads the data from online unit and saves them to the database.
DDS (Digital Diagnostic System) – DDS is used for measurements configuration, data visualization and following data analysis.
SQL database – All structures you create in DDS are stored in SQL database. All data you get by measurements are also stored in database.

More details about DDS software are included in DDS manual.

Getting started

Online unit is actually PC with Windows operating system. It has its own IP address which is set during production. You can find it on unit's front panel.
Communication between online unit and PC is always provided by network connection.

It is not recommended to install any software, SQL server (Adash, Microsoft SQL) or our DDS software directly to online unit!

Turn on your online unit. Do it by power button on the front panel of online unit.

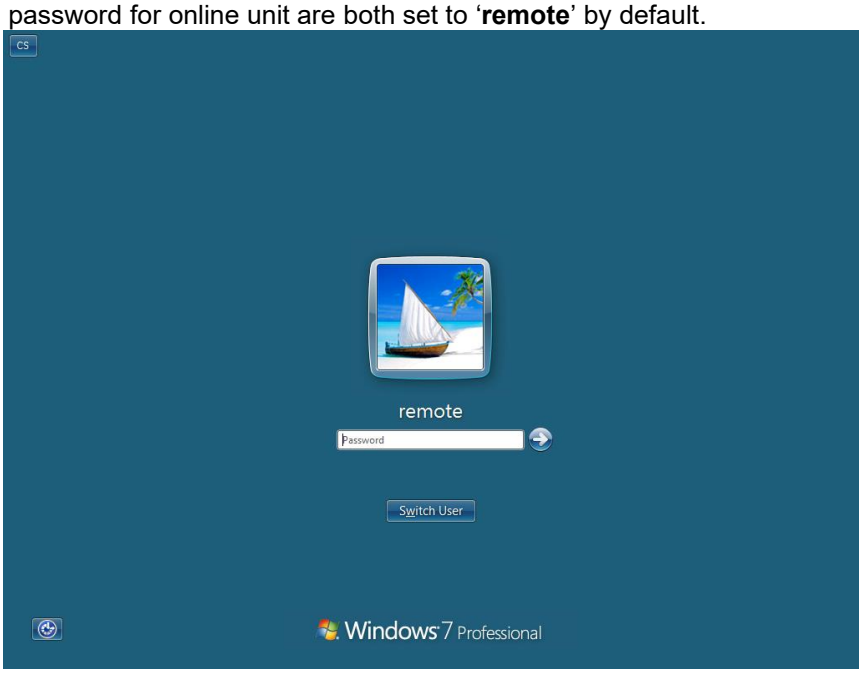
Step 1: Online unit's connection to network

First of all, configure your online unit for network connection. It means, change IP address for online unit itself so it can communicate with other devices in the same network.
Online unit A3800 has port with static IP address configuration (newer devices has two ports – one for dynamic and one for static IP address configuration). Online unit A3716 has two ports for network connection – one for static IP address and second for dynamic (DHCP) IP address.
In case you will connect A3716 (or newer A3800) to network with DHCP port, you can immediately go to **Step 2: Sensor connection**. Otherwise please follow guide below.

You have two options how to configure IP address. First one is using online unit as standalone computer. Second option is to connect online unit with PC through ethernet cable. See description below.

Online unit as a standalone PC

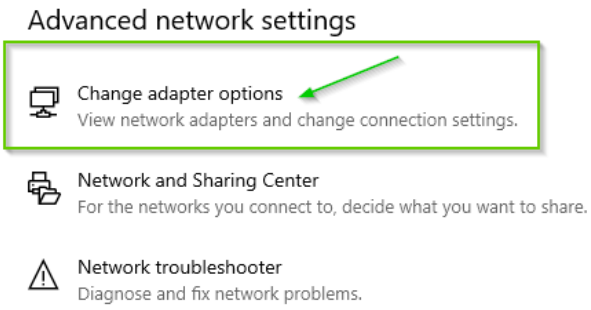
This is the easiest way to change IP address of online unit. You just connect monitor, keyboard and mouse to online unit. Monitor is connected via HDMI port. Mouse and keyboard are connected with USB ports.
Username and password for online unit are both set to '**remote**' by default.



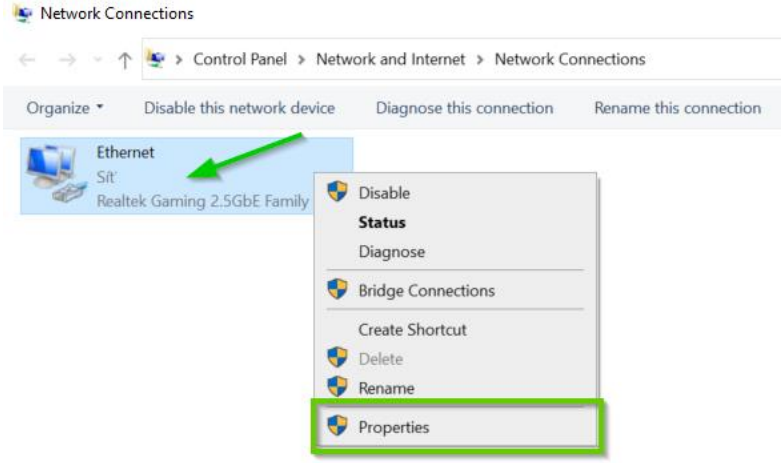
When you are logged in, you need to change IP address of your online unit. Please see following steps how to do it.

Go to Windows start menu on main panel .

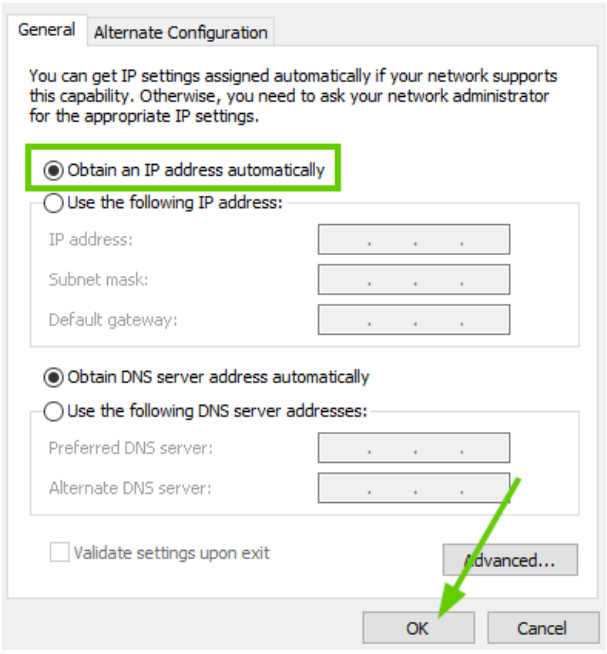
Search for '***Settings'.*** *Choose* ***'Network and internet'*** and go to ***'Change adapter options'*** part.



You can see options for Ethernet after click with right mouse button – choose ***'Properties'***.

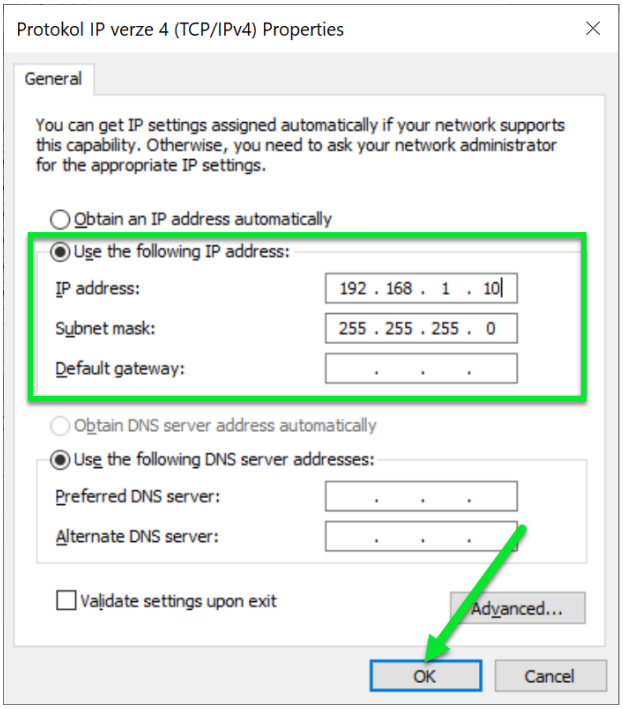


Choose option ***TCP/IPv4*** and click on ***'Properties'***. Now you have two options how to set IP address for unit. First one is set it automatically with DHCP. See below.



Note! *If DHCP is used, IP address is assigned to online unit automatically from available range of IP addresses.*

Second option how to set IP address for online unit is to choose static IP address for it.



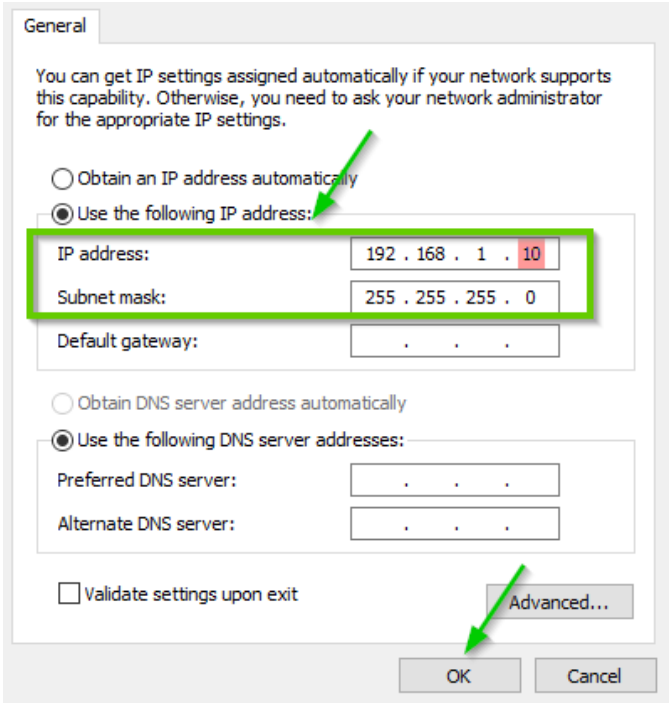
Click OK. IP address is set to your online unit.

Online unit connected to PC with ethernet cable

Second option how to change IP address for online unit is to connect remotely. Follow the steps below.:

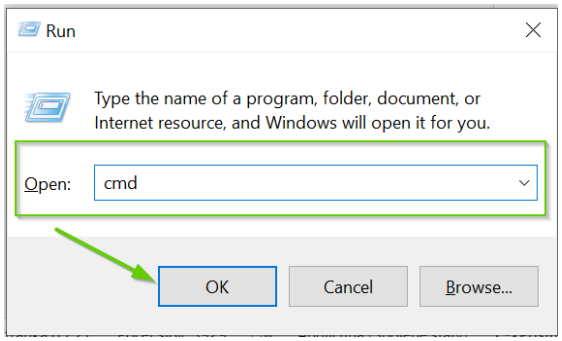
1.Connect online unit with PC through ethernet cable.

2.IP address of your PC needs to be changed according to online unit's IP address. Do it the same way as in previous option (unit as standalone PC – follow the steps), but for your PC. Choose option ***'Use the following IP address'***. First three numbers in IP address are the same as in IP address for online unit (online unit's IP address is on its front panel). Last number has to be different (e.g., 10 as in picture below). Click to field for subnet mask – you should always get subnet mask 255.255.255.0 (it automatically should fill itself when you click into this field). Confirm with OK.

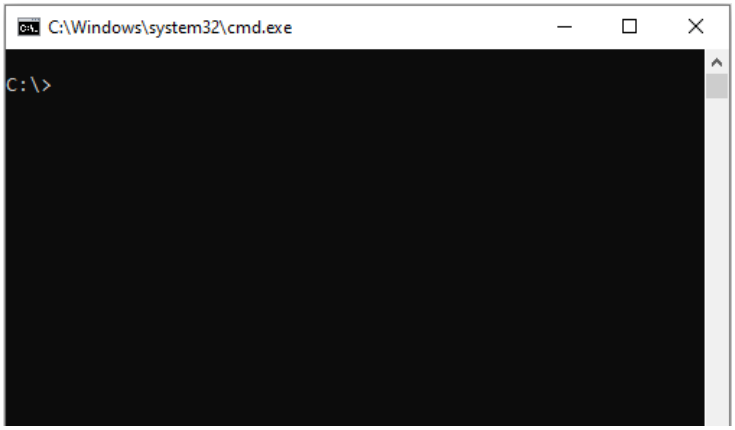


3.Check connection between online unit and PC. You can check this connection by using command line and connection test (“ping” test).

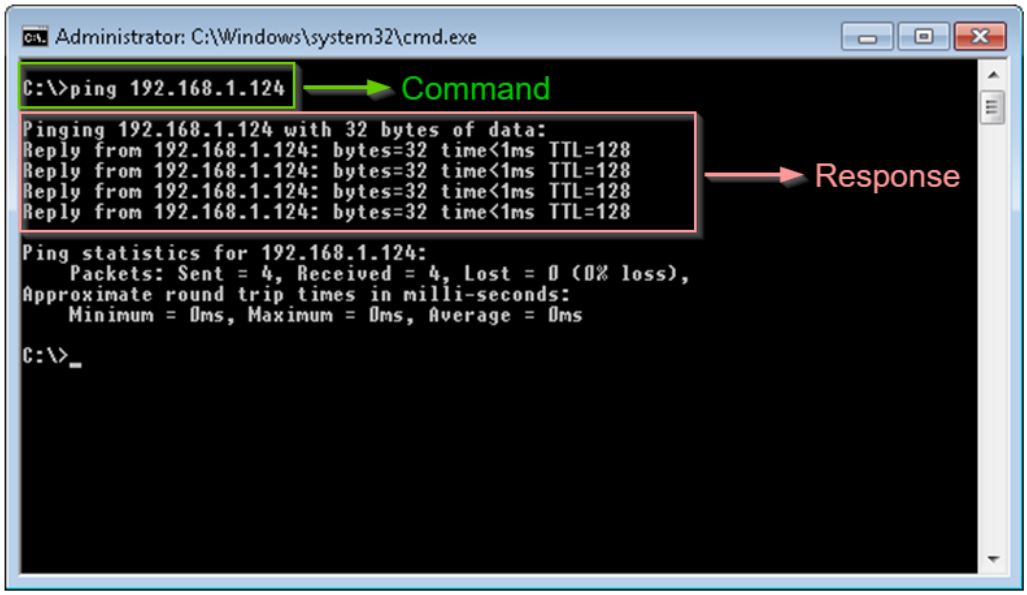
Launch command line - press Win + R, enter ‘cmd’ and press Enter/OK.



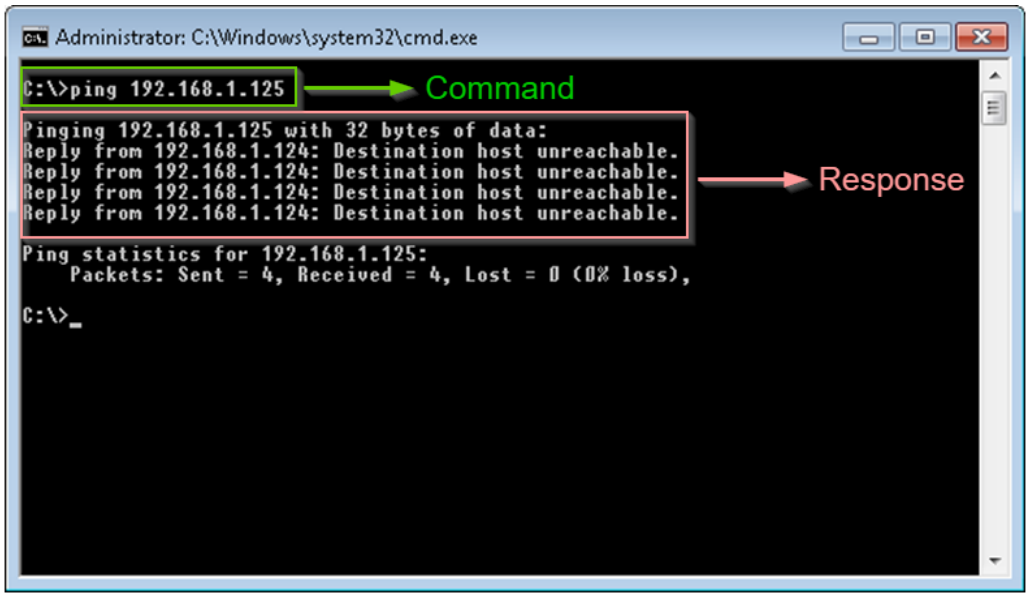
The cmd.exe window appears.



Enter command ‘ping’ with IP address of the online unit (for example ping 192.168.1.124). **If connection is successful**, this computer will respond with list of reply times (like in the picture below).



If connection is not successful, you can see 'Request time out' or 'Destination host unreachable' (see picture below).



If you did not establish a connection with computer, make sure the computers (online unit and PC) are physically connected by a network cable. Check if the cable is not damaged. Furthermore, make sure that required IP addresses of computers are correct. If you still fail, contact the IT department.

If ping test was successful, connection between online unit and PC was established successfully.

After this you can connect to online unit with remote desktop connection with username/password – **remote/remote**. If you need more information how to connect with remote desktop to your online unit, please see chapter **Remote desktop connection** .
When you are remotely connected, change IP address for online unit same as in previous option **'Online unit as a standalone PC'** based on your network settings.

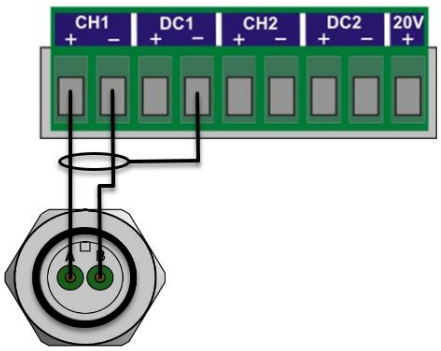
Note! In case you have ordered online unit A3800 with Wi-Fi module, please see **Appendix G – Wi-Fi connection.**

Step 2: Sensor connection

Commonly used sensor is acceleration sensor 100mV/g with ICP® (constant current power source). There is difference in sensor connection for online units. See below:

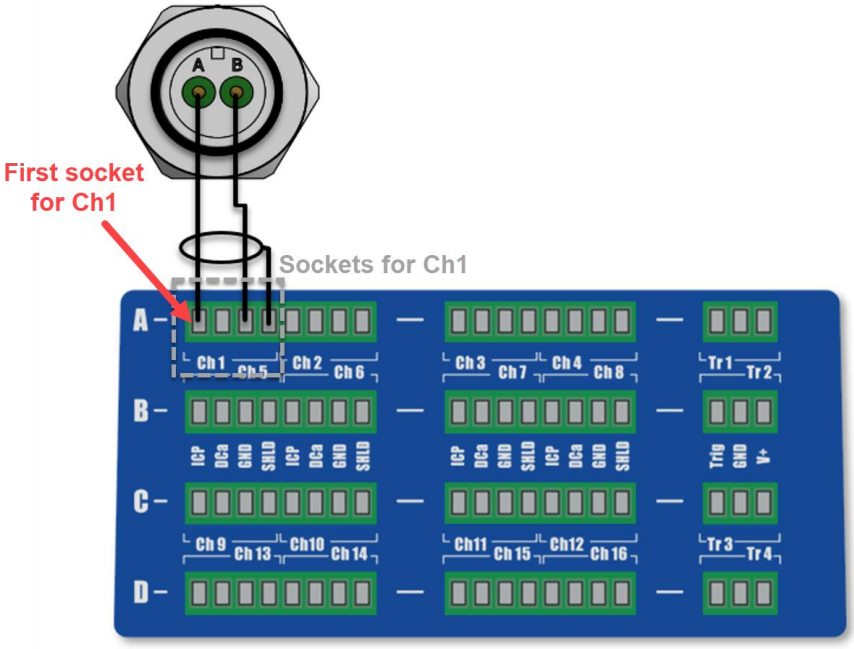
Sensor connection for unit A3716

Sensor connection is the same for ICP® powered sensors and also for not powered sensors. For A3716 it is necessary to set ICP® powering **in DDS software** (sensors settings see **Step 6: DDS database creation**).

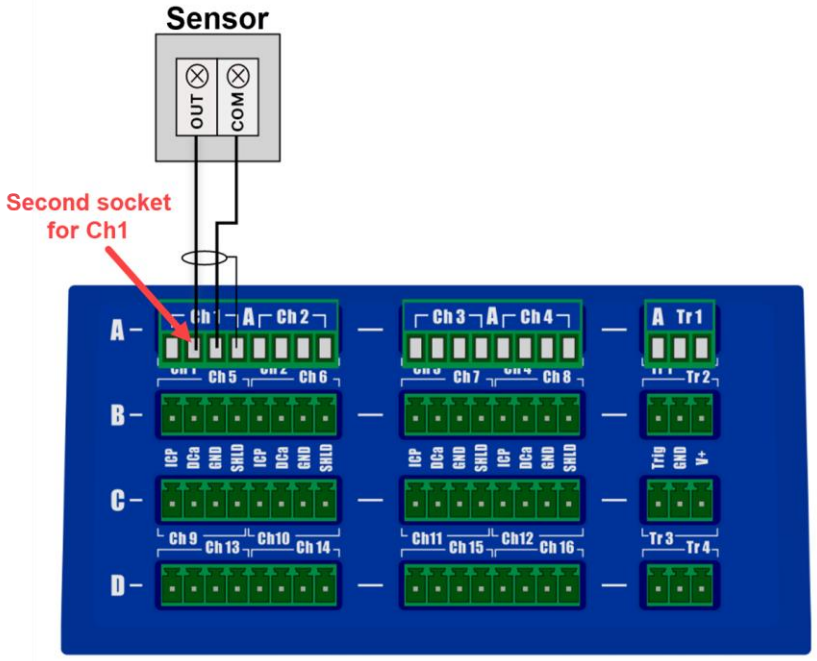


Sensor connection for unit A3800

A3800 sensor connection depends on sensor powering. In case that **sensor is ICP® powered**: connect sensor as in following picture (using input for ICP® – first socket for Ch1).:



In case that **sensor is not ICP® powered:** connect sensor as below (using input DCa, regardless of whether sensor is AC or DC – second socket for Ch1).:



Step 3: Server installation

You can choose MySQL – Adash server (for smaller projects) or Microsoft SQL server (for larger projects). Keep in mind, that free version of Microsoft SQL server is limited with size 10GB.

Note! *Microsoft SQL Express can be used also.*

It is not recommended to install any SQL server (Adash, Microsoft SQL) directly to online unit!

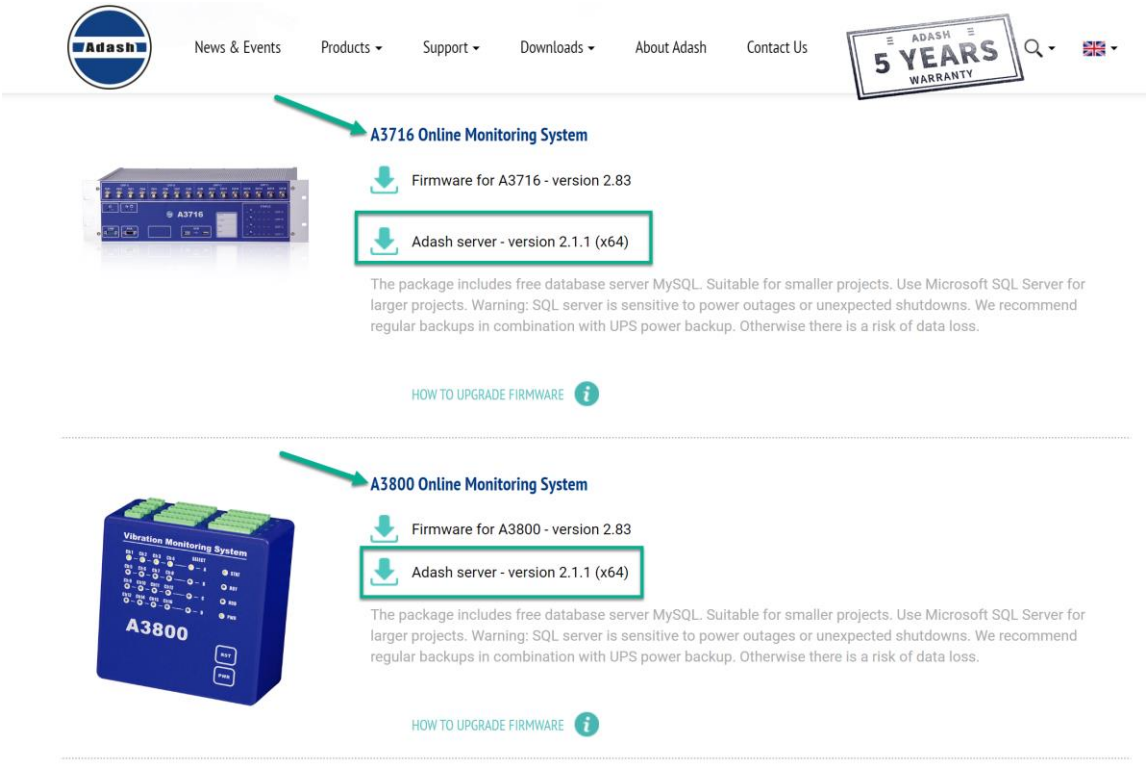
ADASH server (MySQL)

Using of MySQL server: Keep in mind that this is **server** application. The computer (where server operates) should not be exposed to accidental power outages or repeated shutdowns. SQL server is very sensitive to these events and database corruption can occur.
Standard port for MySQL: **3306 TCP**
Note! *Adash is not responsible for data loss caused by a failure of third-party hardware or software. When using SQL Server, regular backups as well as UPS power backups are recommended.*

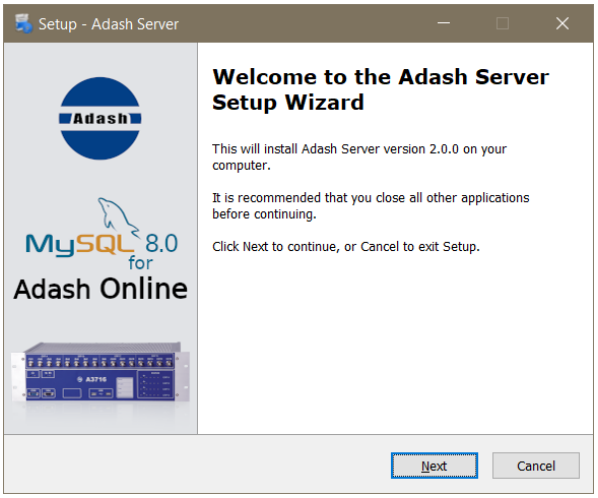
The latest versions of the Adash Server package no longer support 32-bit architecture. The package requires a 64-bit OS and at least Windows 7 SP1.

Adash server installation (MySQL) can be found on flash drive you received or on Adash website:
https://adash.com/downloads/adash-firmware

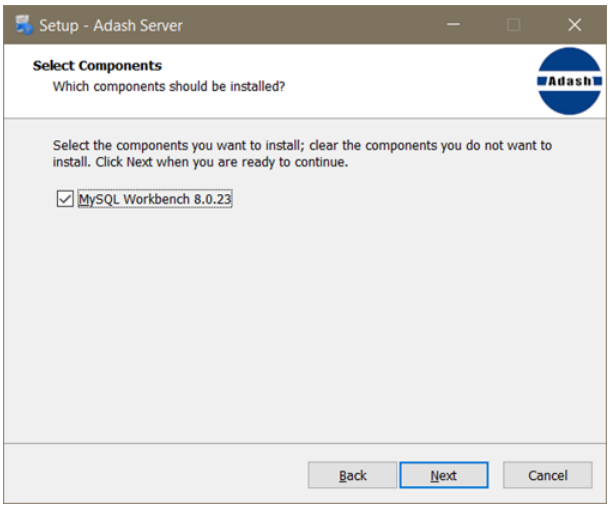
Note! *Under 'Adash Firmware' you need to find your type of online unit (A3716, A3800).*



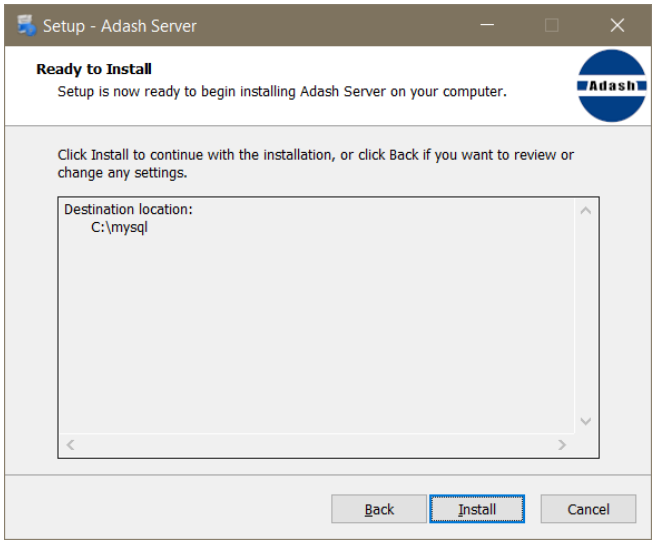
Go through installation wizard. Press '**Next**' once you read information in particular windows.



As the last part, there is '**Select components**' window. There is check box for **'MySQL Workbench'**. Confirm the installation of MySQL Workbench if you want to manage SQL database outside of DDS. Otherwise, you can unmark the check box and continue with **Next** (MySQL Workbench will not be installed).



After this step, press **'Install'** to start installation itself.



Now you have Adash server installed.

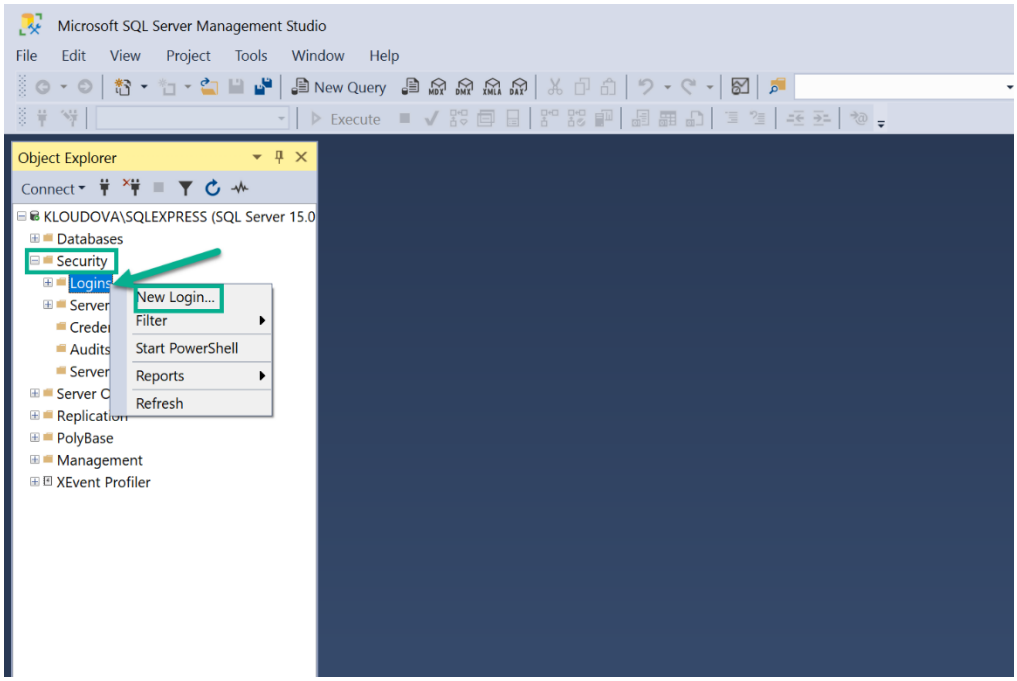
Microsoft SQL server

You can decide that Adash server is not the proper server option e.g., to your project size or you just prefer Microsoft SQL server. In this case, you need to pay attention to following instructions.

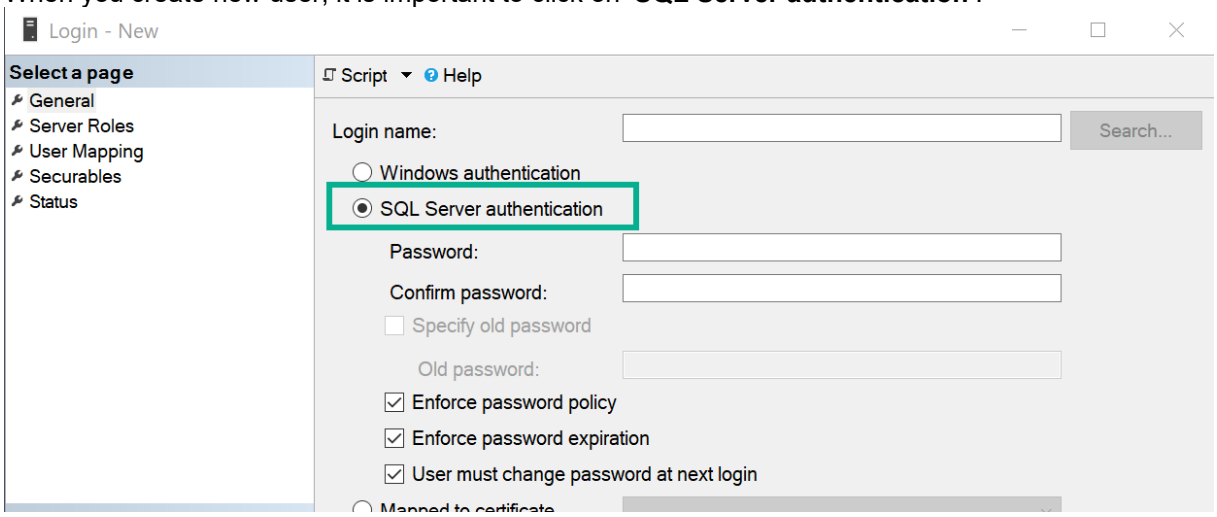
Standard port for Microsoft SQL server: **1433 TCP**

It is necessary to create **SQL user** on the server (if this was not done during Microsoft SQL server installation). Otherwise, you may not be able to connect to the database on this server. Use '**Microsoft SQL server management studio**' tool for it.
You can see '**Object Explorer**' column on the left. Open '**Security**' item with double click. You get more items below it.
Click on '**Logins**' item with right mouse button and choose option '**New login**'. You can create here new user.

Note! *Screenshots were made in* ***Microsoft SQL Server Management Studio 18****. It can be a little bit different in other versions.*



When you create new user, it is important to click on '**SQL Server authentication**'.



***Note!** Keep in mind, that this can be always set in cooperation with your IT department if you have any troubles to set this up. These guys usually know how to proceed with this SQL user creation. Or you can use Microsoft SQL Express and this user is for you created automatically with the installation.*

Step 4: Insert dongle key

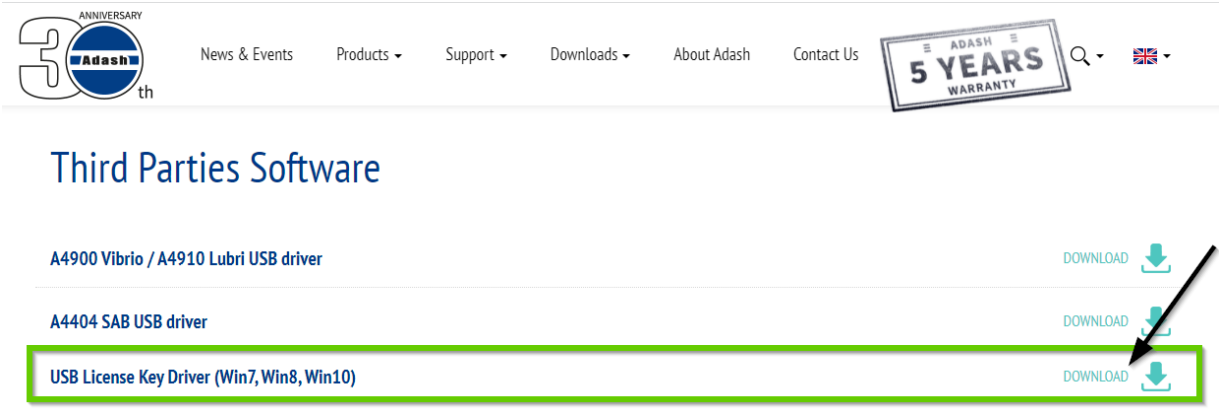
To make software (DDS – described in next steps) run properly you need to insert dongle into USB port of your computer (more details see in DDS license).
Ports for dongle key/DDS: **475 TCP+UDP**
Note! Ports can be disabled in some companies due security policies and dongle key may not work correctly because of it. That is why we mentioned which ports needs to be allowed.

Drivers for dongle need to be installed. Otherwise, it will not run correctly. You can check very easily if the drivers are installed or not.

✓ If drivers for dongle ***are installed*** in your computer – you can see dongle is lighting.

✖ If drivers ***are not installed*** (dongle is not lighting) – installation of drivers can start automatically. If it will not start – you can go to website below:

https://adash.com/downloads/third-parties-software

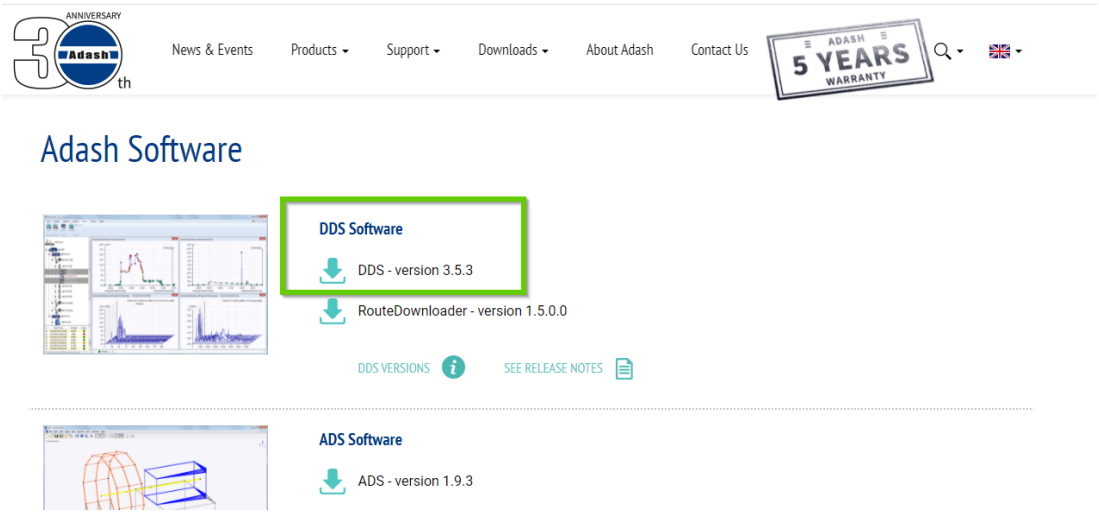


Download drivers and install them to your PC.

Step 5: Software installation – DDS

DDS installation can be also found on website *adash.com:*

https://adash.com/downloads/adash-software



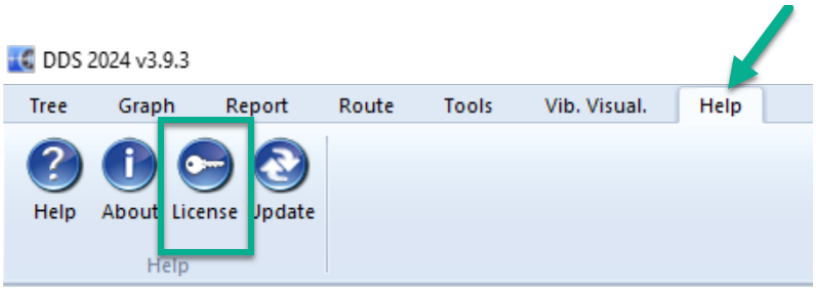
We recommend to install DDS on the server (it means install it to computer with Adash_Server software).
Do not install it directly to online unit!

Go through installation wizard.
Now you have DDS installed (free version). It is necessary to have DDS license for online monitoring. Online module is not available in free DDS version.
Free version is marked with red ribbon – 'FREE' (see picture below). Once you will import your license to DDS, this information disappears.

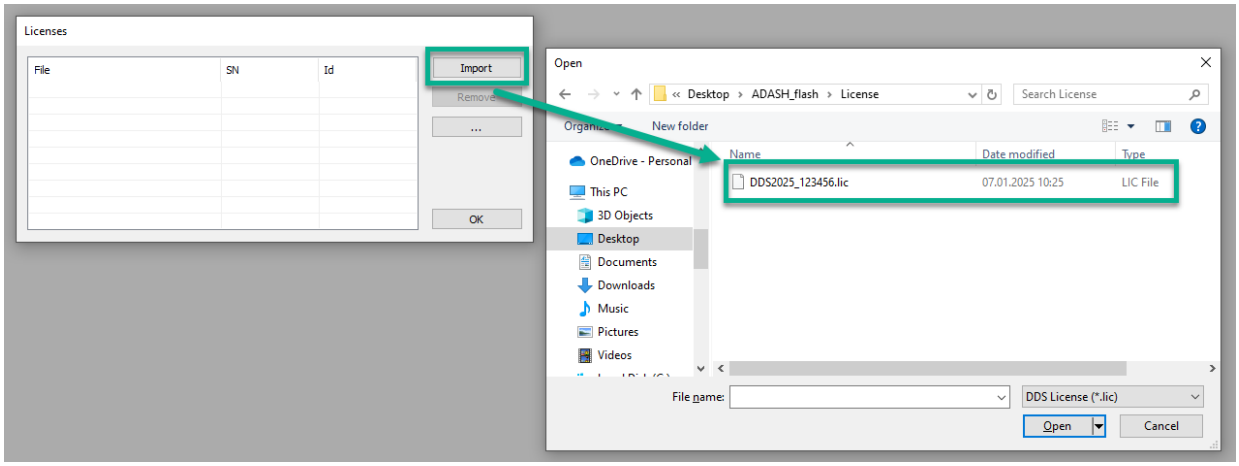
DDS license

License is needed for more options and modules in DDS. This license you have received on USB flash drive. Follow steps below to import your license into DDS (if it was not done automatically):

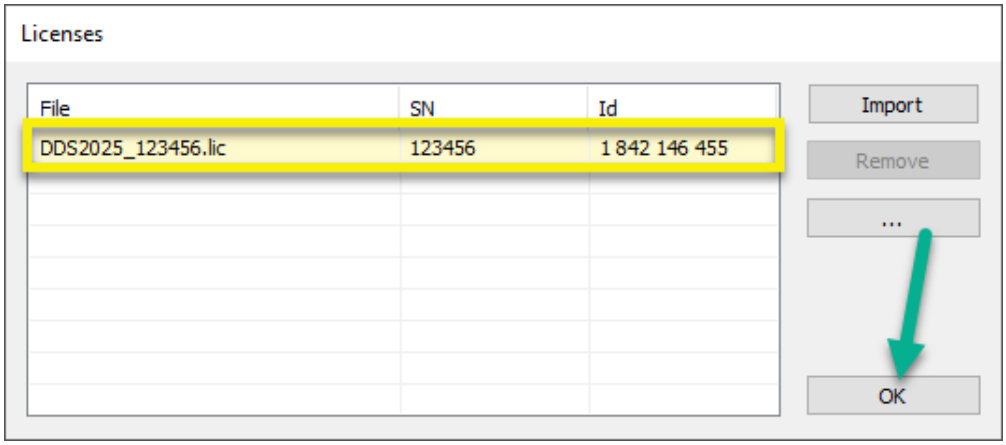
Open DDS and go to tab ***'Help'***.



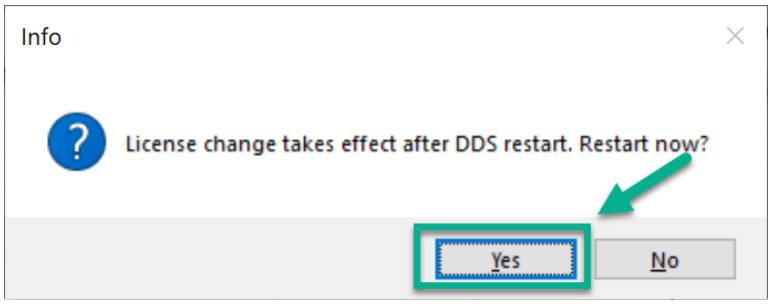
Click on license and you get pop up window below. License can be added by button ***'Import'***. Find your license and click 'Open'.



After that, you can see the license in the list below. Confirm by OK.:

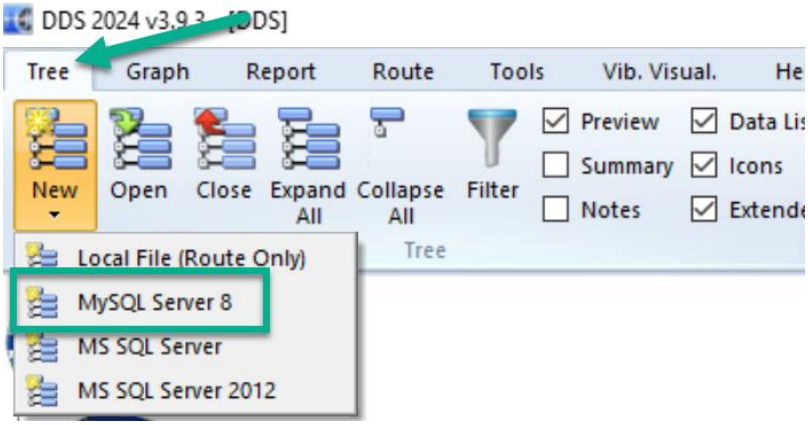


Note! *Once license is loaded, DDS restart is needed (picture below):*



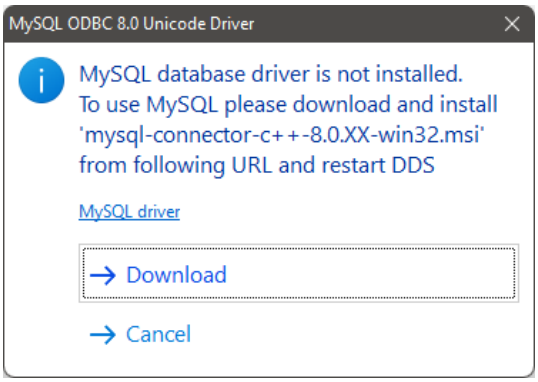
Step 6: DDS database creation

Structure for your machine's measurements is created in DDS. Firstly, you need to create ***'NEW TREE'*** in DDS.



If you have Adash server installed you choose MySQL Server 8. If you decided to install Microsoft server then you choose – MS SQL Server.

Note! *If drivers for MySQL server are not installed, you will see the following window when you click on MySQL Server 8.:*



You can download the drivers immediately with 'Download' button.

You need to fill in basic information for new database creation, such as:

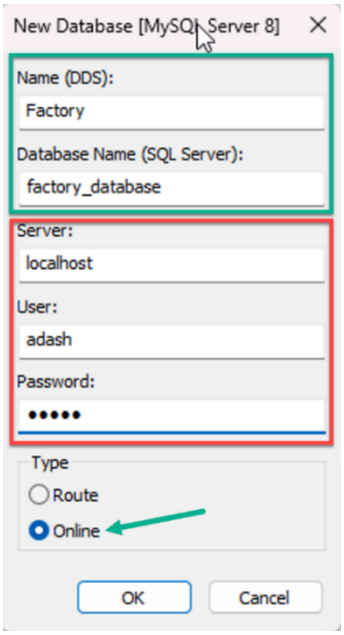
- *Name (DDS)* – you can see this name in DDS software,
- *Database name (SQL)* – database name, you can see it on database server (it should be without capital letters, special characters, etc.),

(DDS name and SQL name depends on you. You can see it in green frame in the picture below.)

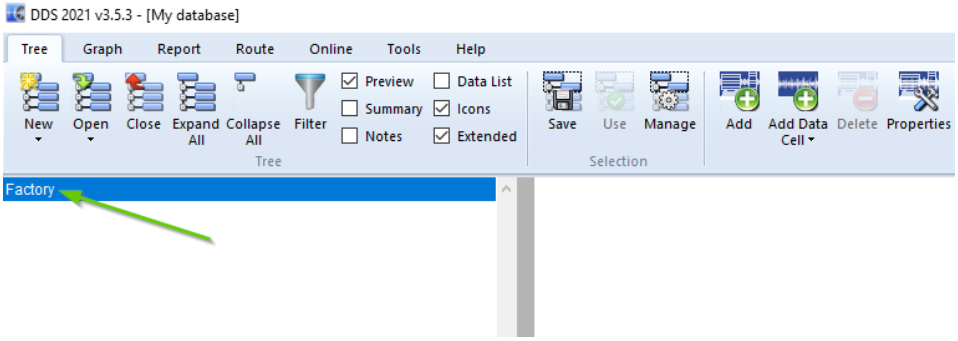
- *Server* – location (name or IP address) where Adash server is installed,
- *Username and Password* (adash/adash),
- *Type*.

Server is set by location of Adash server. In case Adash server is installed on your local computer you write **localhost** as server. Username/password and type is set by default. It is marked with red frame in picture below.

The username and password are set to adash for MySQL server.

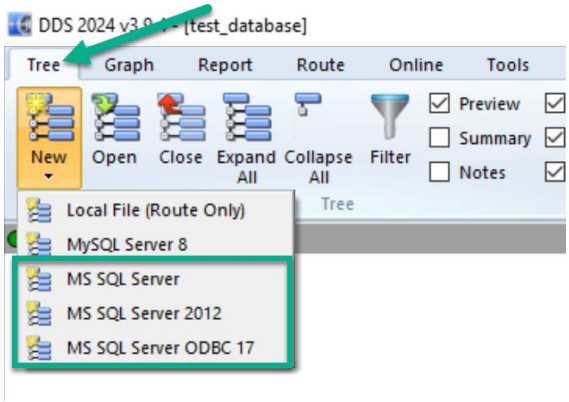


Press OK and now you have the database created. New window with your database name opens.



In your database you will create departments (e.g., halls, …) with machines.

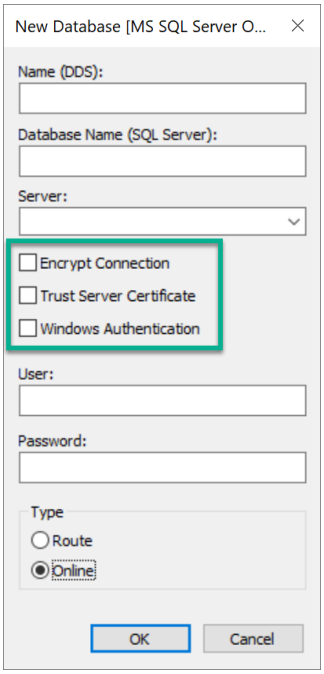
In case you have **MS SQL server** choose it when you create new database.:



There are 3 more options in database creation window. These options are:

- **Encrypt Connection** – this option is available only for ODBC drivers 17. It is greyed out for older versions. The communication is encrypted when you mark this option.

- **Trust Server Certificate** – this option is available only for ODBC drivers 17. It is greyed out for older versions. The client does not consider this certificate as trusted certificate automatically. But when you choose this option, the certificate is taken as trusted certificate.
- **Windows Authentication** – Windows user is used to connect to MS SQL server. You will not enter username and password for connection. It is 'taken' from Windows.

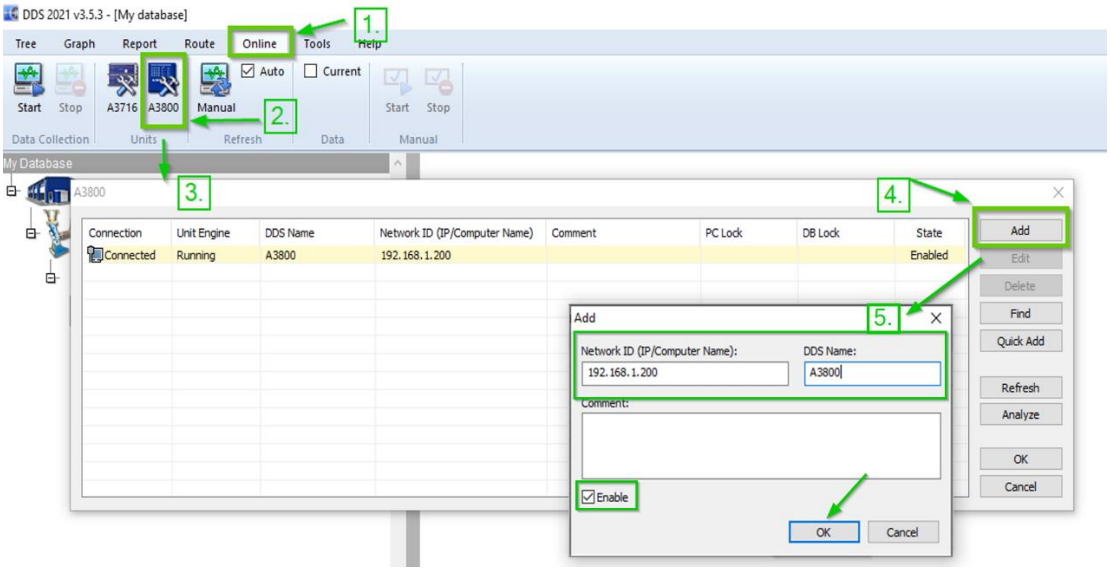


Add online unit itself to DDS

Online unit is connected in your network (how to do that is mentioned in previous steps). You need to add it into DDS. You add online units to DDS list via tab ***'Online'***. Then you are able to work with online unit and select particular unit for individual channels.

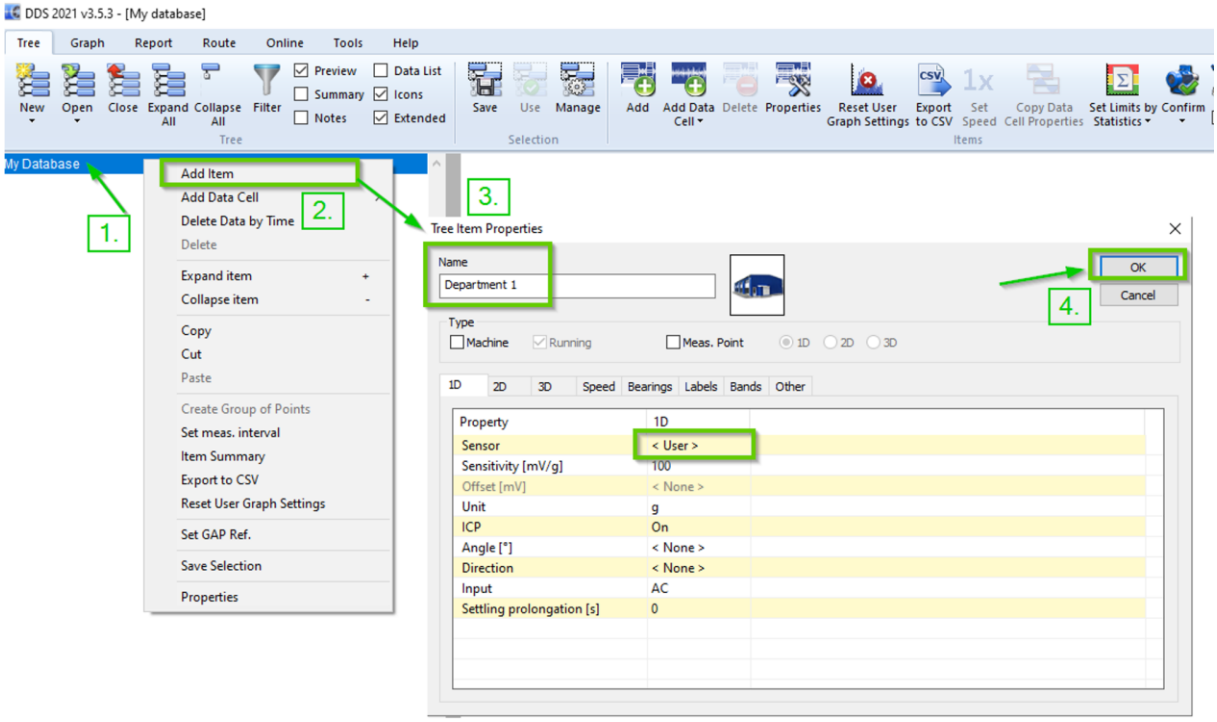
You need to add online unit **every time you create NEW database**.

Choose online unit type (A3800, A3716). Online unit itself is added by button ***'Add'***. Enter Network ID and DDS name. You can also enter a comment (if needed). Click OK. For better understanding see picture below.



Department creation

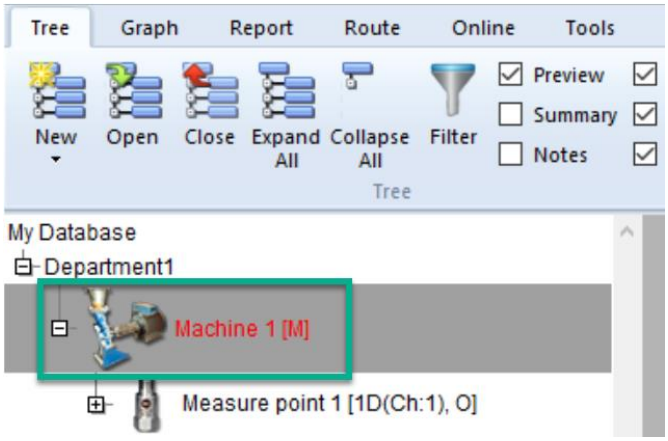
Click with right mouse button on your database name (as an example we have used DDS name – My Database). Pick from menu ***'Add item'***. Then you are able to set the properties for department as name, icon or sensor properties. After OK you see under your database Department 1 (in left column).



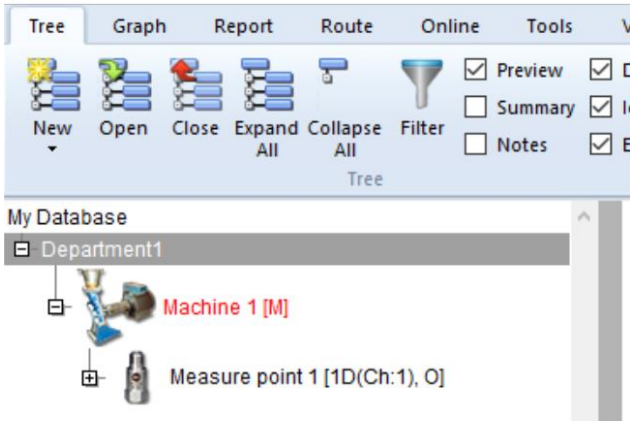
Sensor can be set already here. It is great and simple solution when you use the same sensor type in the whole database. You set the sensor with its properties here and then you can inherit it to lower levels of the database structure. You don't have to set sensors one by one.
It is important to set **sensitivity** [mostly used: 100 mV/g], **unit** [g] and **ICP®** for sensor. ICP® is set to value 'On' when sensor is connected and ICP® powered – this has to be correctly set! Also, keep in mind, that sensor with ICP® 'On' has to be **connected differently** than sensor with ICP® 'Off' for online unit A3800. How to connect the sensor is described in **Sensor connection for unit A3800**.

Note! To make creation of department, machines and measurement points easier, you can copy already created items. Click on the tree item. Press **Ctrl+C** (copy this item). Click on the tree item where you want to paste this item and press **Ctrl+V**. It works for all the tree items in the structure.

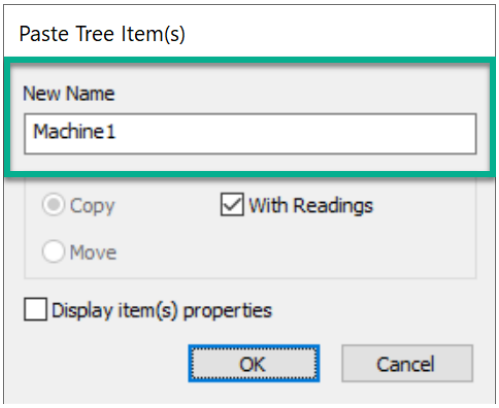
Example: Machine 1 is red in the picture below. It means that you pressed Ctrl+C.



Click on Department 1.



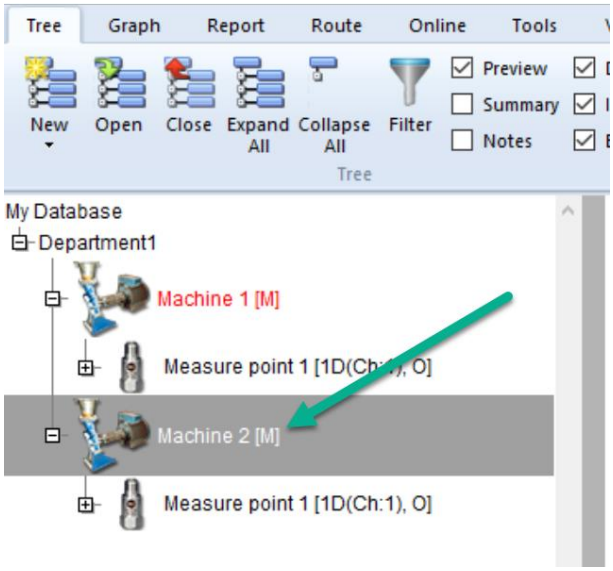
Press Ctrl+V. You get window where you can edit the name of the machine (e.g. to Machine2).



You can choose if you want to copy the machine structure also with the measurement readings or not. If you mark the option 'Display item(s) properties' – once the machine is copied to Department 1, the properties window appears automatically. You can edit the Machine 2 settings.

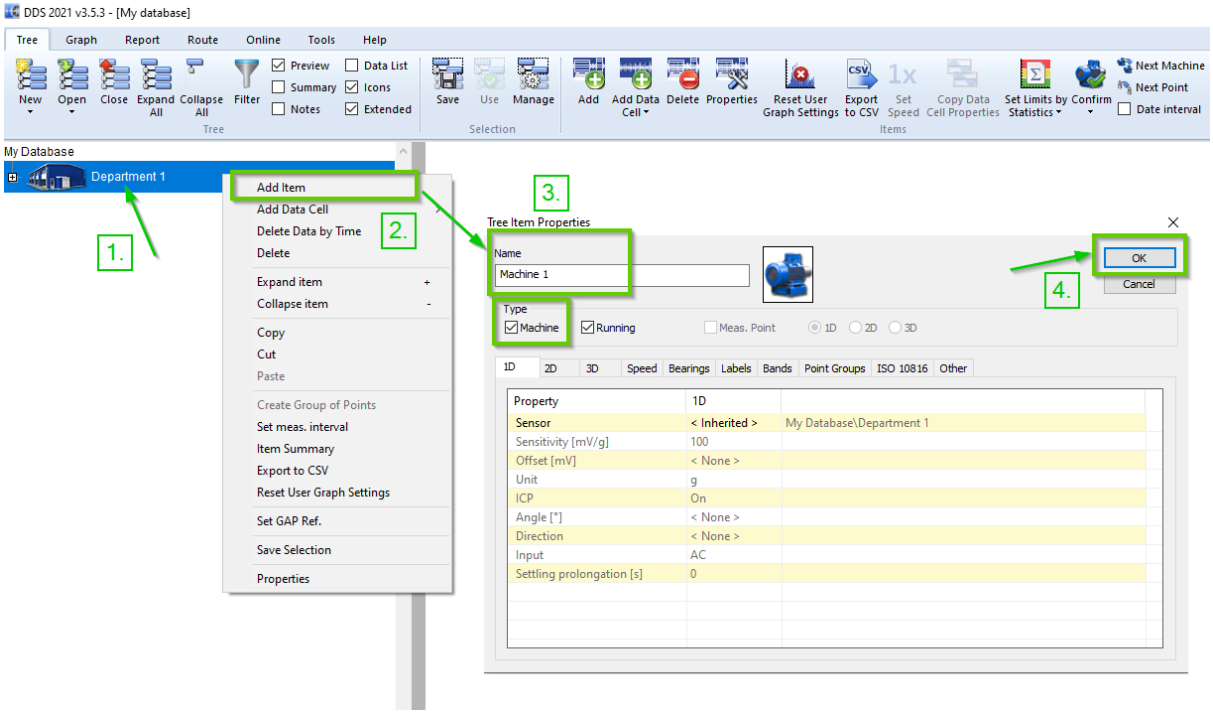
Confirm with OK.

Machine 1 (renamed to Machine 2) was copied to Deparment 1 with its structure.



Machine creation

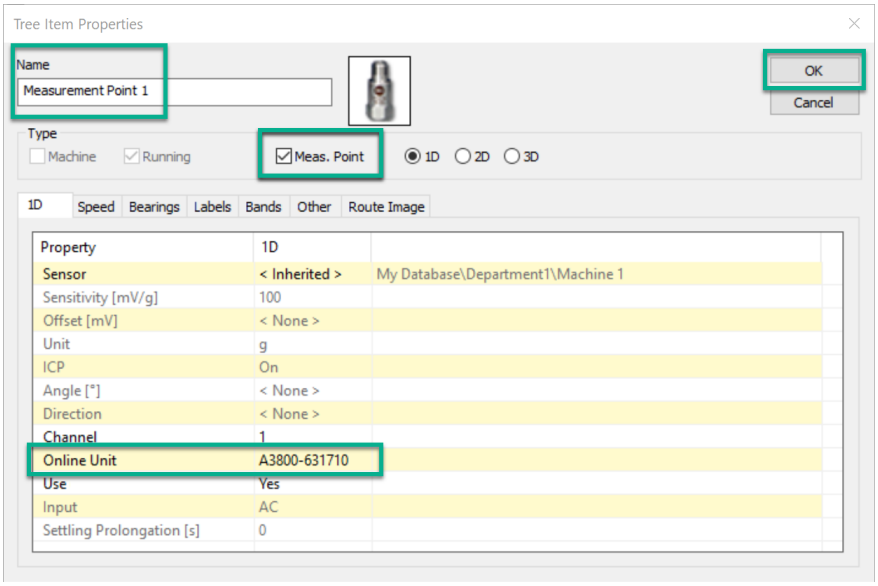
We are able to create Machines under departments the same way. Click with right mouse button on Department 1. Select ‘Add Item’. Enter machines name and set it properties. Check the Machine (Type section), it defines this item as machine.



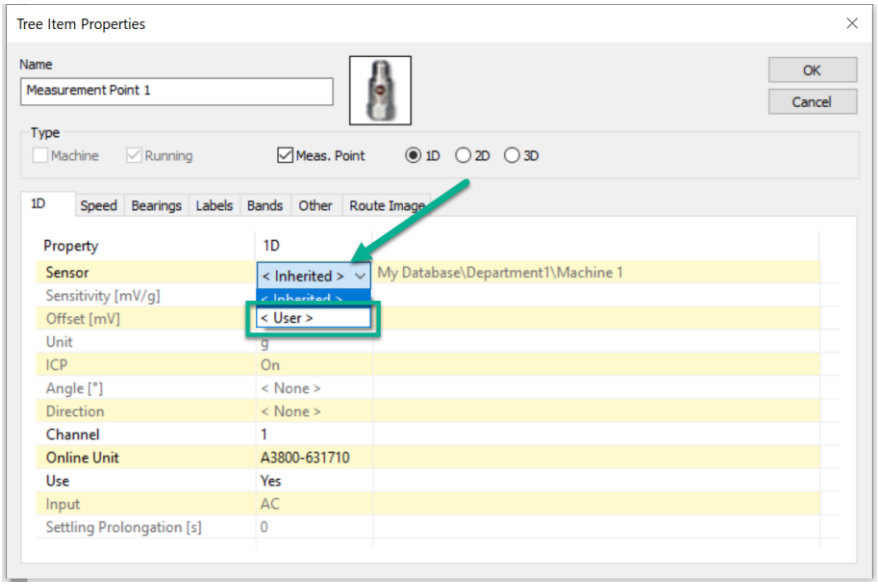
You can see that sensor for the machine is inherited from the department (see picture above). If different sensor is used (different type than set on the machine level) you can change this inherited setting and set other sensor properties (User option).

Measurement points creation

Measurement points are created the same way – click on Machine 1 with right mouse button. Select ‘Add Item’. Type will be Meas. Point. Choose measure point dimension (1D, 2D, 3D). 1D means standard sensor with measurement in one axe, typically accelerometer. 2D means point with measurement in two axes, typically two eddy current sensors in one plane. 3D means measurement in three axes, typically triaxial accelerometer. It is important to choose Online unit (see picture below) and channel where sensor is connected. Channel 1 is first input of online unit.



Note! You can see that sensor with its parameters is inherited from the Department 1 in the picture above. Usually, the same sensors are used. It means that it is easier for you to set the sensors parameters for whole machine or department and it is inherited to lower levels of the structure (measurement points). If different sensor is used for one measurement point, just change it with click on <Inherited> and choose User. Now you change properties of this one sensor.



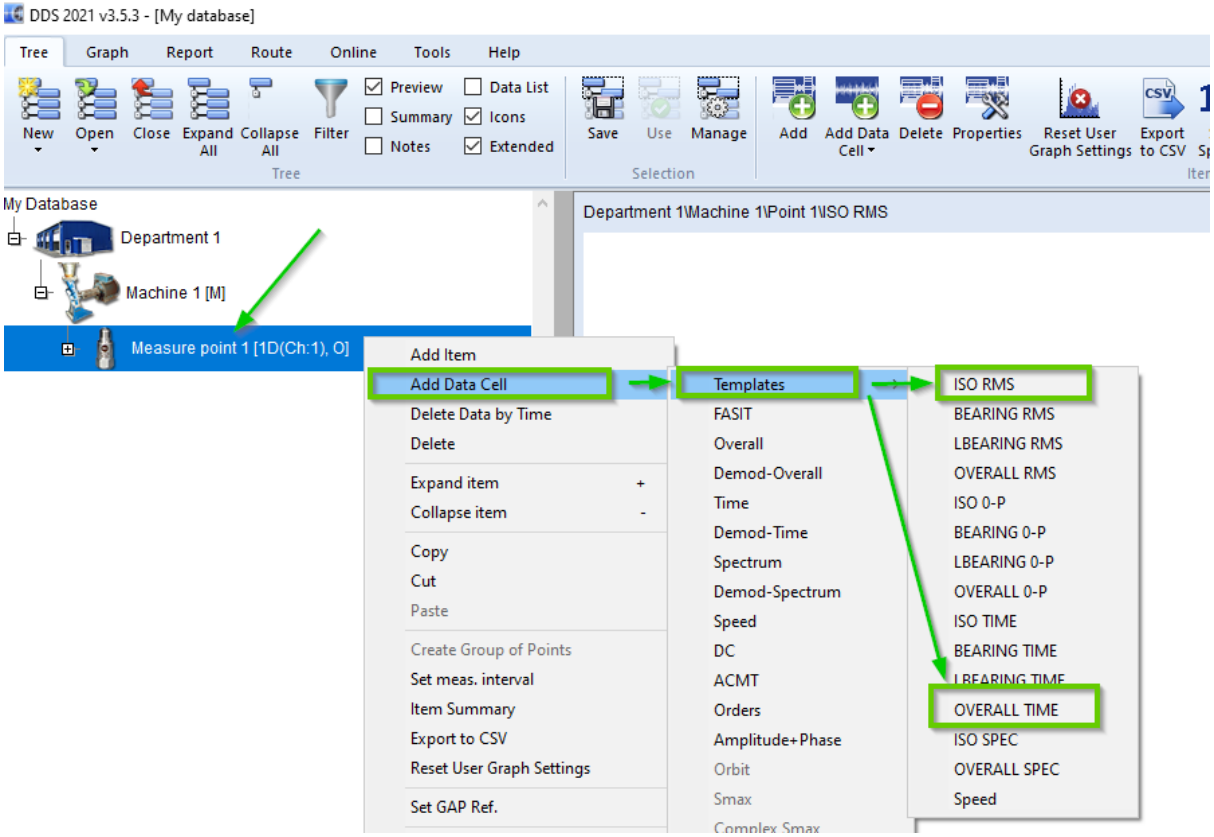
Add measurements

Every measurement point contains measurements. As an example, we add ***'ISO RMS'*** *and* ***'OVERALL TIME'***.

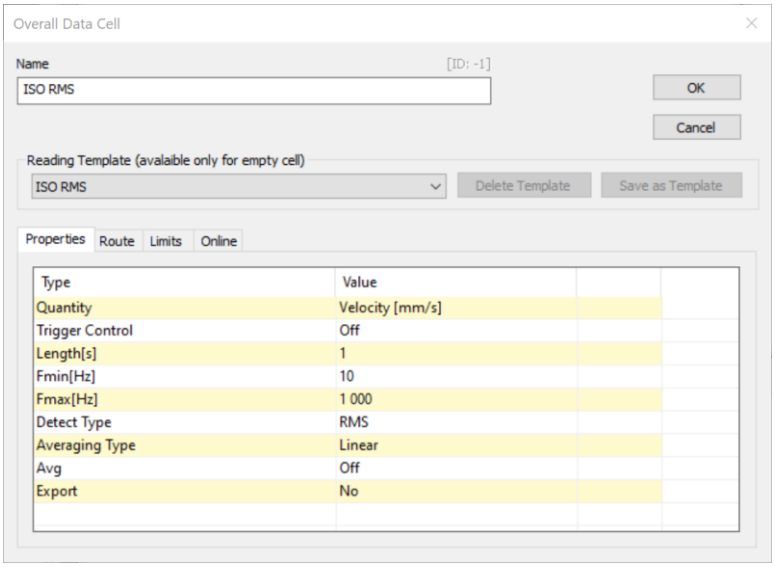
Click with right mouse button on measure point.

Choose ***'Add Data Cell'***. You can choose predefined measurements from templates or create your own.

We used predefined measurements from templates as you can see in the picture below.



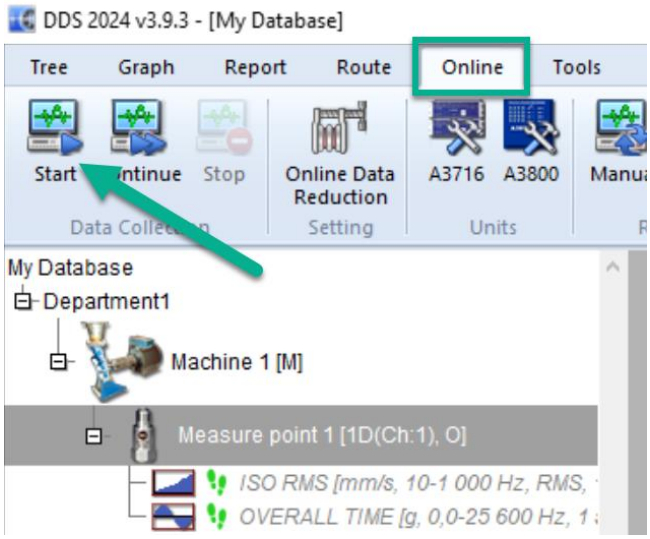
ISO RMS settings:
For now, keep the default data cell settings. Click OK to create data cell.



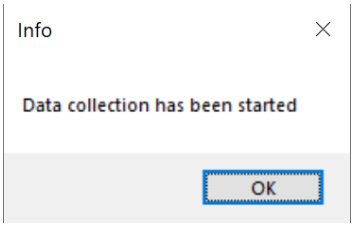
At this moment:

You have database with one department.
This department contains one machine.
This machine contains one measurement point.
And this measurement point contains two measurements.

Now you can finally start to collect data. Click on '**Start**' button under '**Online**' tab.



Once you start the data collection you get the window below – **Data collection has been started**.

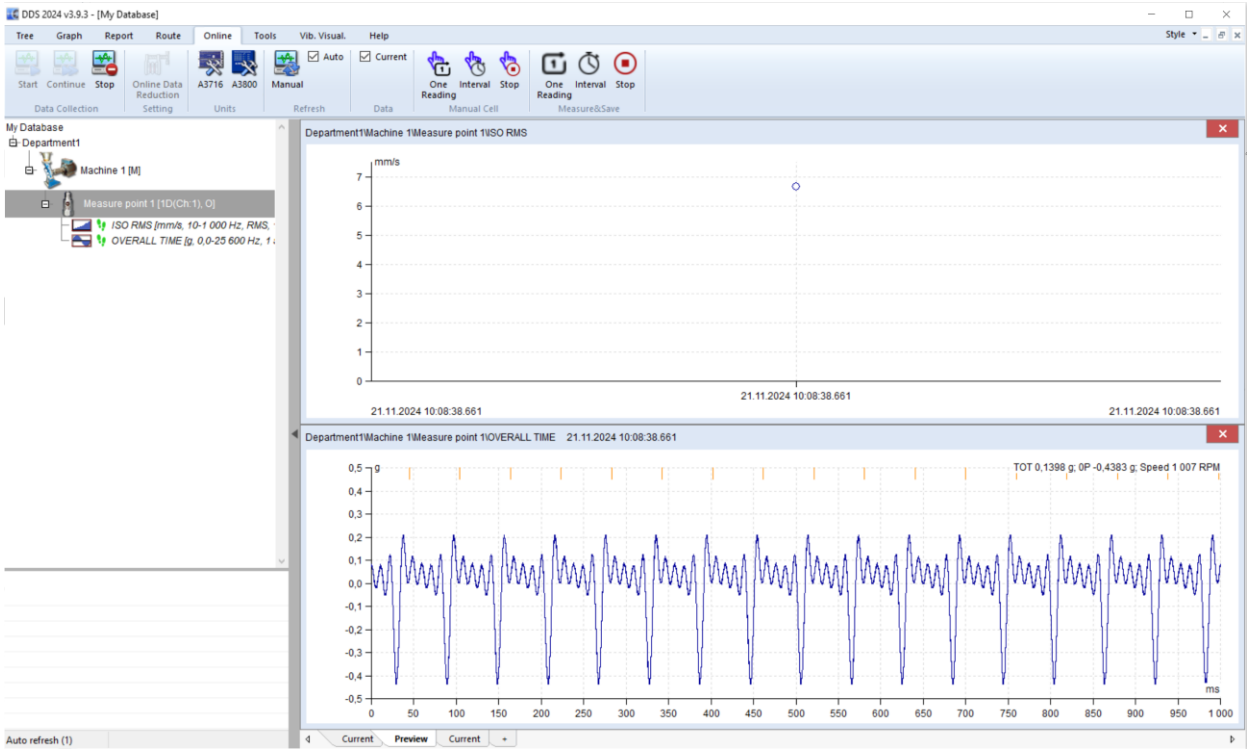


Note! One project can use several online units. But one online unit can be used just in one project. It means more projects cannot use one online unit.

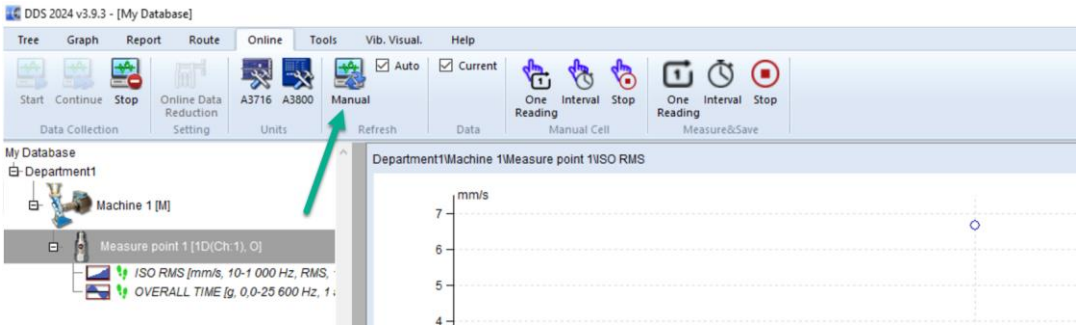
Note! If there is some problem while data collection is started, you get the informative window with error message.

After all steps mentioned above you will have graph of your measured data shown in DDS (as in the picture below).
You can see one RMS ISO value in the first graph. It is the first value after the collection was started.

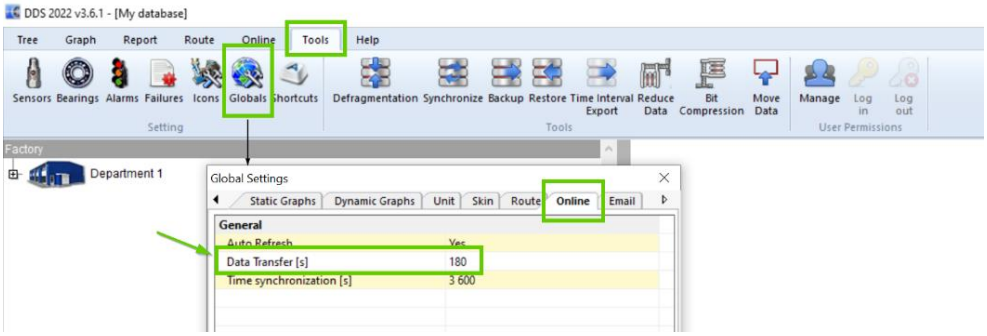
When more RMS values are saved into the graph, you will see the trend of these values.
Second graph shows the time wave saved.



Note! If you do not see the measured value immediately, the reason could be simple – automatic graph refresh time interval is long. You can use **Manual refresh** button. It downloads the data from online unit immediately. But it is working only on PC where Data Manager is running.



Or you can change the graph refresh time interval to lower value. "**Data transfer**" interval is set by default to 180 seconds. This means it takes 180 seconds to send data from unit into database (you can see the first data after this interval) – **Auto Refresh**.
This setting you can find in **DDS – Tools tab – Globals – Online tab – Data Transfer**. *It is not recommended to use shorter time interval than 60 seconds. Server can be overloaded with data.*



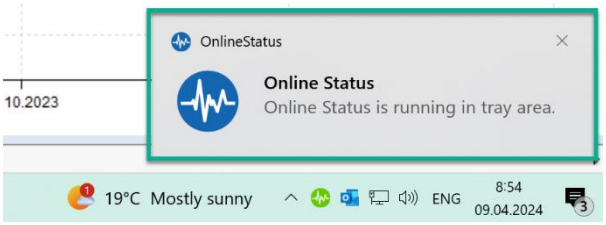
Always stop the data collection (Online tab – Stop button) when you change settings in DDS! Then do changes. Start (use the button Start or Continue) the data collection again.

Current status of online monitoring

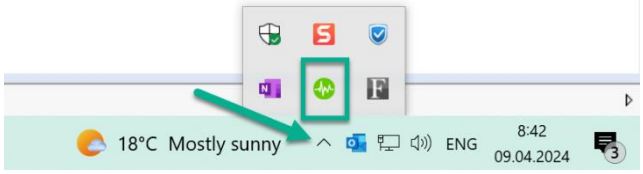
Online monitoring is used to measure the vibrations on the machines continuously. If anything is happening with online monitoring process or online unit itself, you have **Online status** application where you can find it out.

Online status

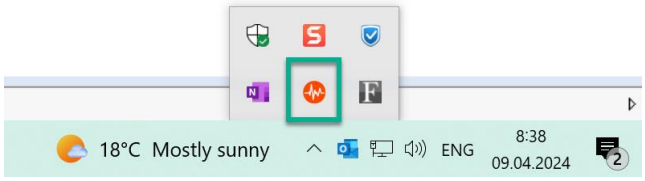
Online status runs as **NDM_Status.exe** in the computer where DDS/DM is running. Once the data collection is started by start button and the project is sent to online unit, you can see that in the right bottom corner popped up this informative window (it is shown just for a moment and then it is hidden again).



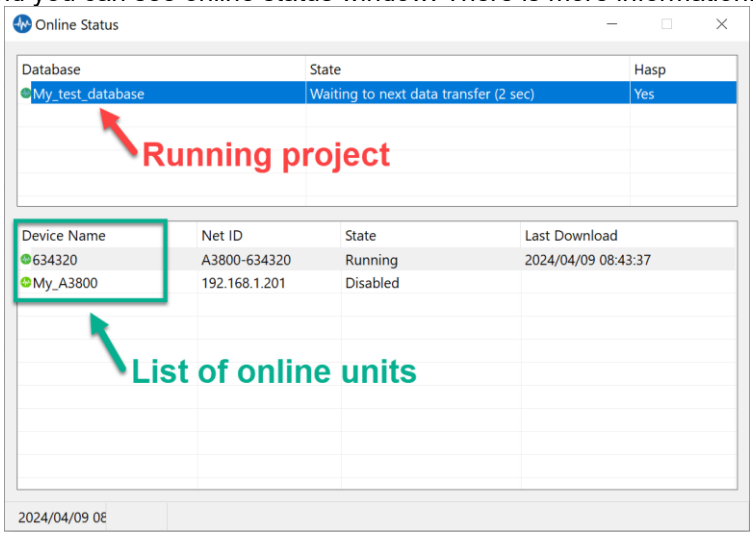
It is window for online status. This application basically shows what online project is running at the moment, online units which are included in it and their actual state. Online status icon is hidden on the main panel once its popup window disappears.
You need to click on the arrow on the panel and show all the applications. See the picture below. In this case, everything is running smoothly in online status because you can see that icon is green. So, everything is perfectly fine.



On the other hand, it can happen, that some issue occurs. In such a situation, icon on the main panel is red. You know, something is going on with online monitoring and you can take some actions to resolve it.



Online status window is opened from the main panel also. You find the icon for it as described above. Double click on it and you can see online status window. There is more information.



The first part of the window (the upper part) is related to running DMs. You can see database column. Also, there is state and the information if dongle key is connected.

The second part of the window (the lower part) is related to online units. You can see the list of online units there, their Net ID (it means IP address or its name), online unit state and last date of data download. The list is shown for the marked database – it means that you need to click on the running project (in our case My_test_database) and you get the list of online units.

Online unit's hardware

Basic technical terms and detailed description of online units are included in this part of manual.

Adash DSP board

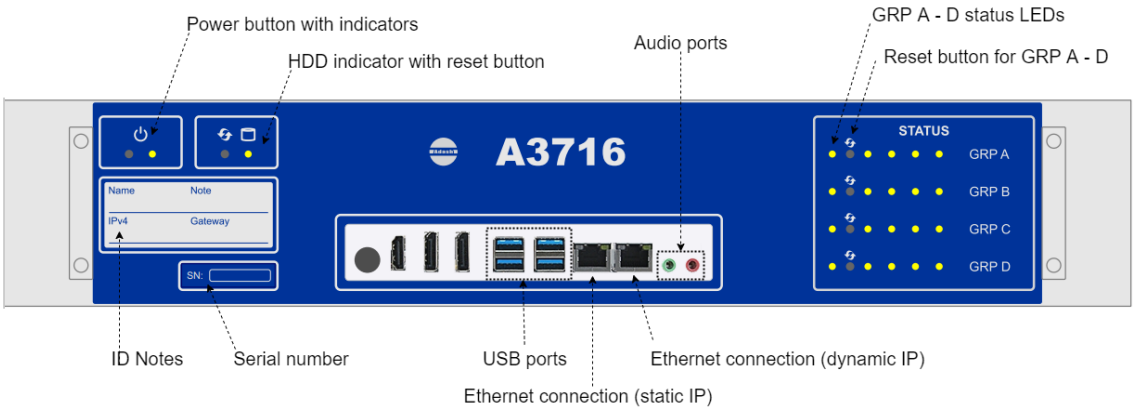
The Adash DSP (Digital Signal Processing) board is the most important part of the instrument. This board provides all necessary operations, which are required for achieving of 4 channel synchronous measurement. A3716 has 16 measurement channels overall – it means 4 boards. This unit allows to measure all 16 channels simultaneously.

Online unit A3716 description

Two types of online unit A3716 exists – type 2U and type 3U.

2U – Front panel description

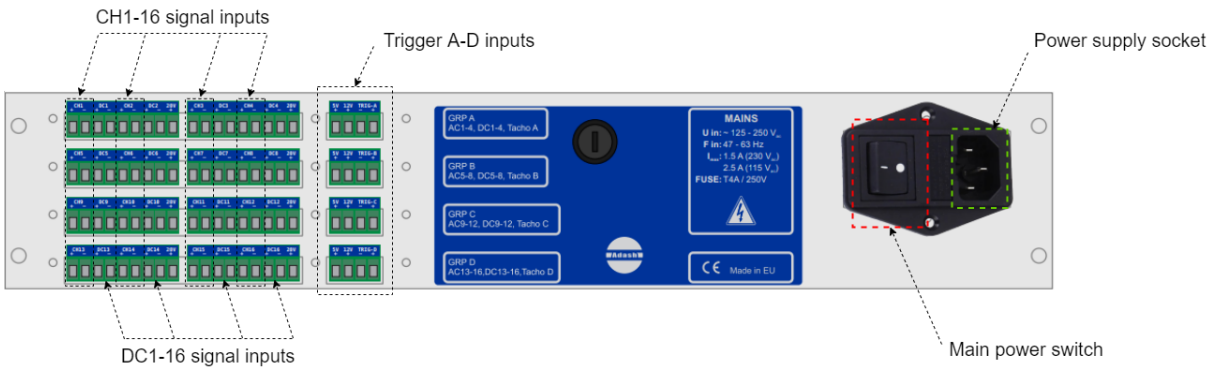
You can see type 2U in the following picture.



Power button runs the A3716 unit. There is a status LED.
HDD status LED indicates operation state of the hard drive.
Reset button enables to reset each Adash DSP board (A, B, C, D).
Serial number is 6 digits number provided by Adash. If more A3716 unit is used, it helps to recognize them in setting.
VGA output allows connecting monitor in case you use the A3716 as a 16 channel vibration analyzer. It is shorted with the same output on the front panel.
USB ports allow connecting of mouse and keyboard for control of the A3716 unit in case you use the A3716 as a 16-channel vibration analyzer.
Ethernet connection to LAN for setting and data transfer.
GRP A – GRP D status LEDs enables to monitor each DSP board. Three states can appear:

- **OK** – green light blinks in 0.25sec time interval (four times per sec) – measurement is running
- **OK STANDBY** – green light blinks in 1 sec time interval – measurement is stopped
- **ERROR** – red light.

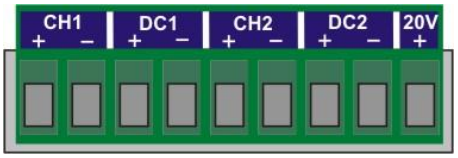
2U – Rear panel description



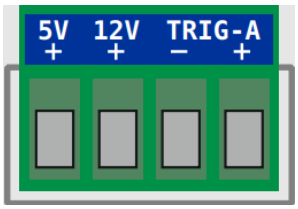
CH 1 – 16: AC inputs (ICP® powering available) for AC signals measurement, usually for vibration measurements (acceleration sensor connected). Max. Peak/Peak voltage range is +/- 12 V.

DC 1 – 16: DC inputs for DC signal measurement (e.g. process values like temperature, pressure, flow etc.). Max. voltage range is +/- 24V.

20V output, max.10mA. It is available for external powering of sensors. Use the minus pole from the appropriate input.

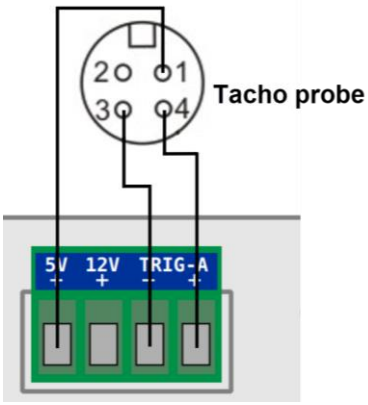


TRIG A-D inputs are for trigger connection for GRP A-D.
+5 V: power for tacho (speed) probe (max 100 mA)
NC: not connected
- ground
+ trigger signal input

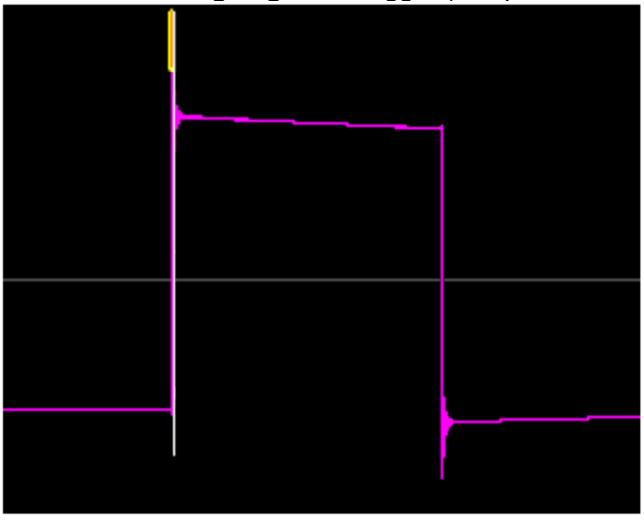


Tacho trigger connection

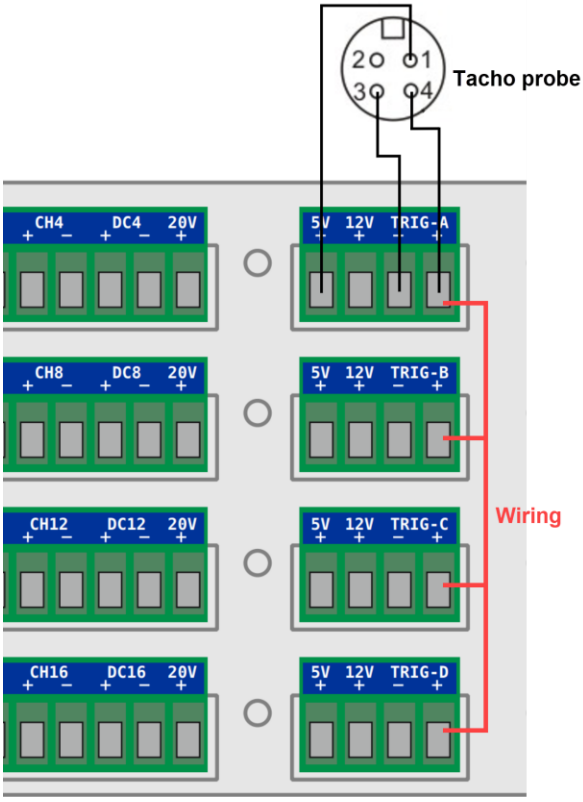
Tacho trigger input range is + 10V.



The TRIG input signal should contain pulses which can be used for speed calculation or for measurement triggering.
The tacho signal (magenta line), the trig level (grey line) and the created tacho pulse (yellow line) are displayed on the picture. We use the **rising edge** as a trigger (see picture below).



Note! Each measurement board contains trigger input. But if you need just one tacho sensor for more boards, you can reconnect it to other boards. It is possible to use one tacho probe as trigger for whole A3716 unit. You just need to connect probe like in the picture and wire the tacho inputs together.

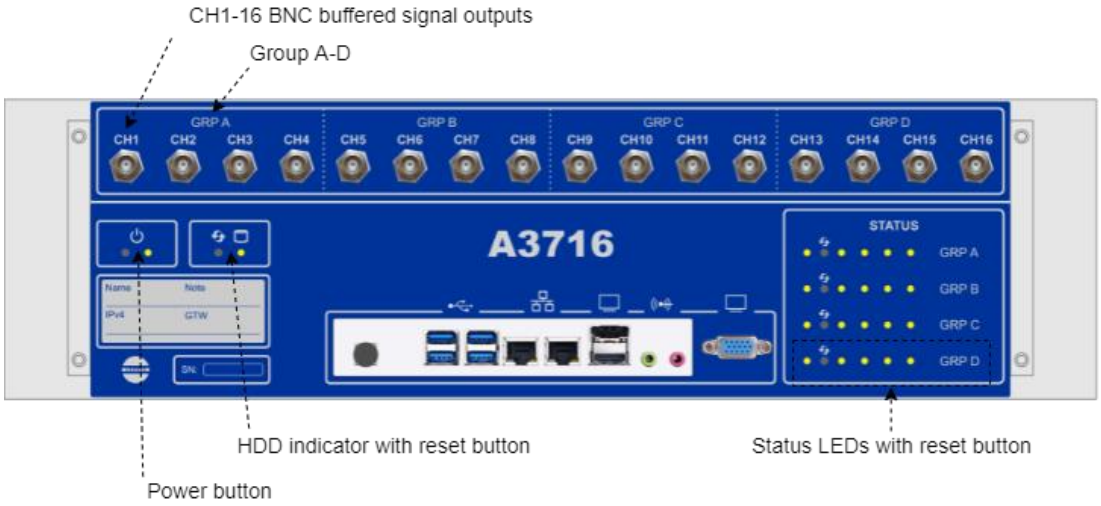


Power supply socket requirements

U: 100-240 V
I: 2,5-4,5A
f: 50-60 Hz

3U – Front panel description

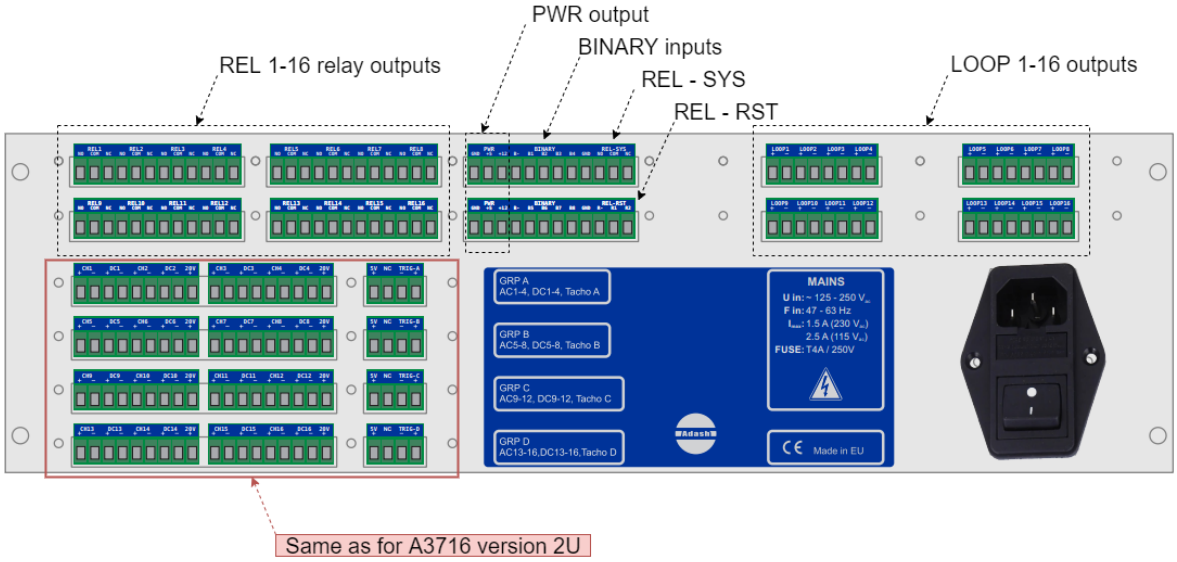
You can see type 3U in following picture. The difference is that BNC buffered signal outputs are included on the front panel on 3U. They allow connecting of portable vibration analyzer and performing further analysis on required channel.



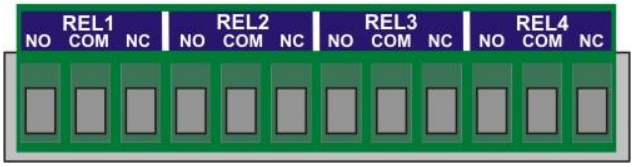
CH1 – CH16 BNC buffered outputs.

3U – Rear panel description

Version 3U has more inputs/outputs on the rear panel than 2U. You can see it on the following picture.



REL 1-16 Relay outputs contain relay clamps (NO, COM, NC).



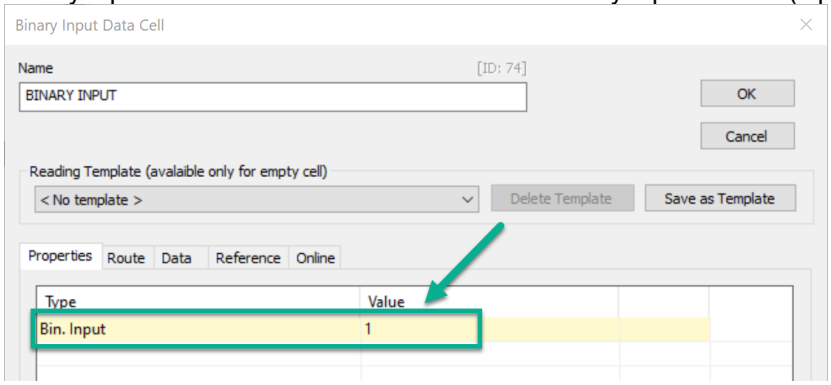
PWR output is the source of +5V/1A and +12V/1A voltage outputs. All GND (ground) clamps are shorted (connected together).

BINARY inputs (A3716/3U only) are logical inputs (states 0 or 1)
B- Common negative pole
B1-B8 – Isolated inputs 5-30V/4mA max (isolated inputs = galvanically separated inputs from the unit, they do not have a common conductive connection). The level of voltage on each input defines the logical state.

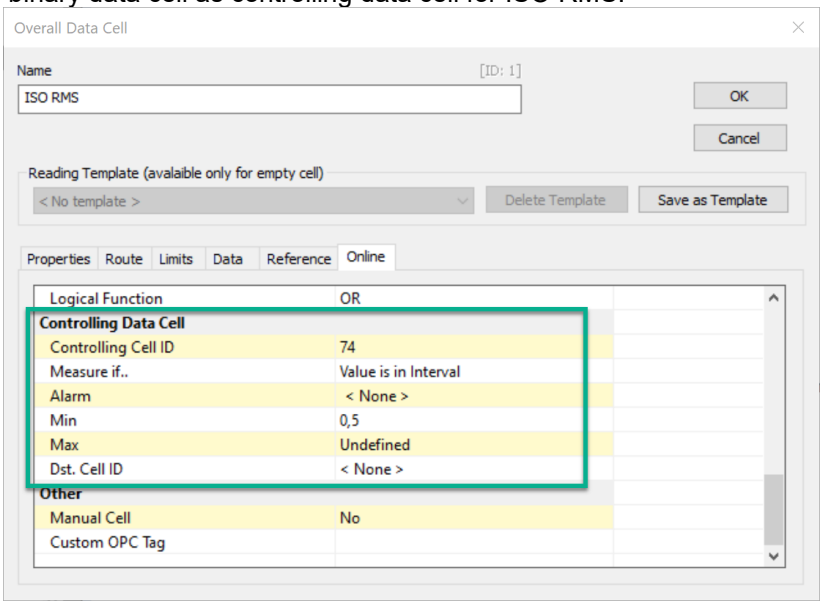
Logical 0 - DC voltage 0-3V is required
Logical 1 - DC voltage 5-30V is required.

You should avoid the voltage in 3-5V range. The response of the circuit is unclear and unpredictable. It may oscillate and accidentally change logical values.

Create data cell Binary Input in DDS. Click on measurement point with right mouse button – click on Add Data Cell – Binary input. Name data cell and select which binary input is used (input 1-8).



Now we use this binary data cell as controlling data cell for ISO RMS.



Controlling Cell ID – it is ID of binary input data cell.
Measure if.. – defines the condition of the measurement (more information is in chapter **Conditional measurements**).
Min/Max – defines the minimum/maximum of the interval. Only values inside this interval are saved.
I set only minimum value to 0.5. In case that binary data cell (the controlling data cell) reads 0 value on the input – it is lower than 0.5 and therefore values for ISO RMS value are not saved.
In case that binary data cell (the controlling data cell) reads 1 value on the input – it is higher than 0.5 and therefore values for ISO RMS value are saved. The condition is met.

This can be used for example to determine the state of machine (running/not running). If machine is not running you do not want to save measured values for this machine. Not running is logical 0. Running state is logical 1.
If **logical 0** is read from the binary input – machine is not running and values are not saved.
If **logical 1** is read from used binary input – machine is running and values are saved as usual.

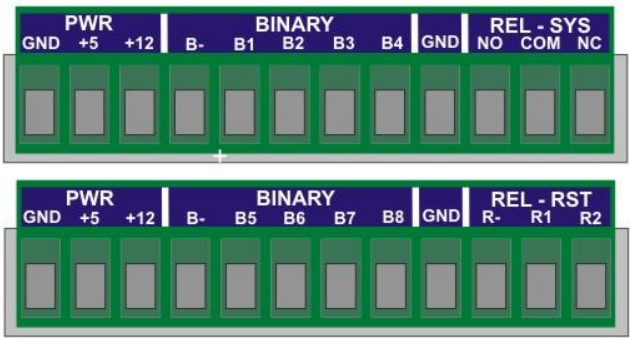
REL - SYS - if the A3716 system is in correct operation (it means that Meas Engine is running – measurement is ongoing) then this system relay is energized and it keeps this state. In case of DSP board error or ICP® error - relay is deenergized.

REL - RST resets all latched relays.

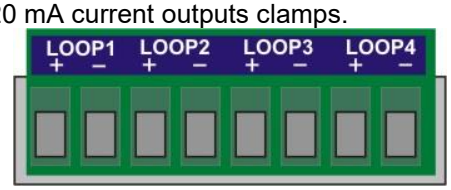
R-: Common negative pole.

R1, R2: DC voltage 5-30V/4mA max.

When the voltage appears on R-R1 or R-R2 then all latched relays will be reset. You may have a question: why two clamps are used (R1 and R2)? It enables to reset latched relays by two buttons which could be in two places. E.g. one reset button is near of the A3716 and second reset button is in the control room.



LOOP 1-16 outputs contain 4–20 mA current outputs clamps.



Online unit A3800 description

Front panel description

Ch1 – Ch16: Channels LEDs indicate on which channels the measurement is defined.

- **Green color** – indicates good condition of the channel input, sensor and cable.
- **Flashing red color** – indicates sensor or cable error.

A – D: Groups LEDs indicate which channel group is taking the measurement. This channels group LED is lighting with orange color.

STAT (Status) LED indicates status of A3800 DSP board.

- Fast flashing green color (four times per sec) – measurement is running.
- Slow flashing green color (one time per sec) – waiting for measurement
- Red color – DSP board error.

RDY (Ready) LED indicates status of A3800 processing board.

- Green color – processing board OK.
- Red color – processing board error.

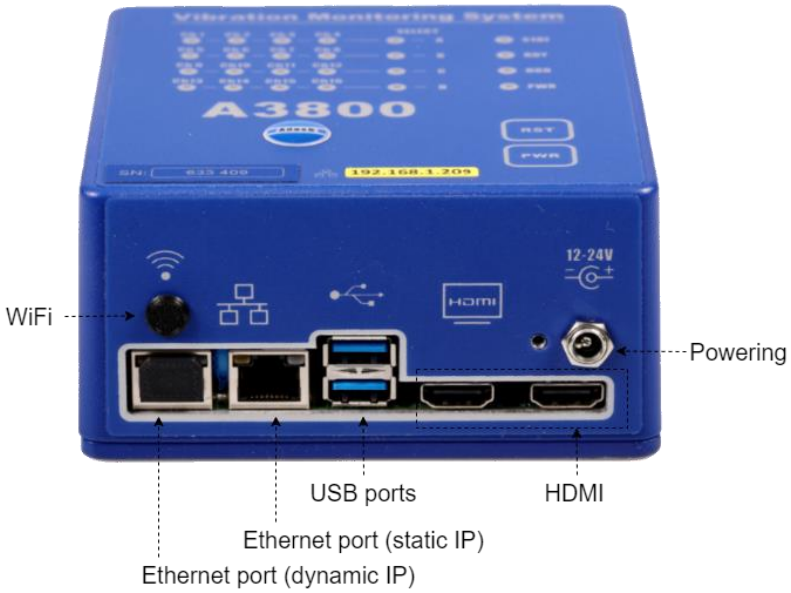
HDD LED indicates r/w operation on HDD. Red color means that r/w operation is in progress.

PWR (Power) LED indicates power on of A3800 unit. When unit is on, led is green.

Reset button – press and hold for at least 5 seconds to reset processing board.

Power button – press and hold for at least 5 seconds to switch ON/OFF A3800 unit.

Bottom panel description



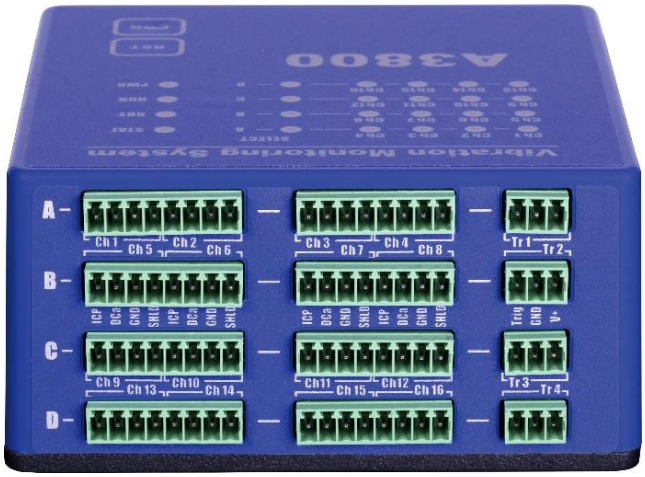
Description:

WiFi: Port for WiFi connection
Ethernet port (dynamic IP): port for ethernet cable, dynamic setting of IP address for online unit (DHCP)
Ethernet port (static IP): port for ethernet cable, static IP address set to online unit
USB ports: two USB ports (for mouse, keyboard)
HDMI: two HDMI display connectors
Powering: socket for powering

Note! There are few differences in bottom panel for older online units (manufactured before 2022). You can see its description in **Appendix C – Older A3800 units**.

Top panel description

The connectors for connecting the sensors are located on the top panel. Connectors are divided into groups A, B, C, D.

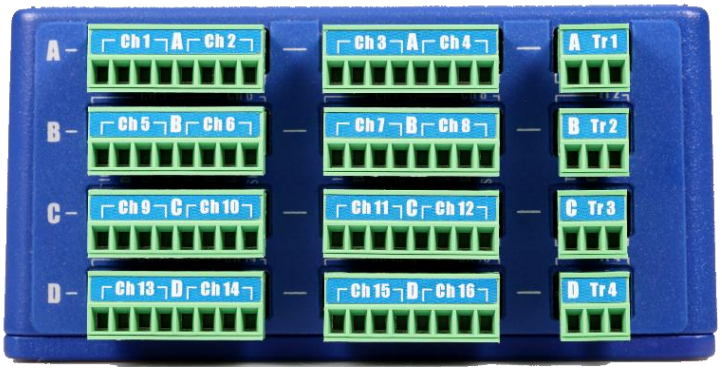


Group A: AC and DC channels 1 – 4, Tr1 tacho input 1.
Group B: AC and DC channels 5 – 8, Tr2 tacho input 2.
Group C: AC and DC channels 9 – 12, Tr3 tacho input 3.
Group D: AC and DC channels 13 – 16, Tr4 tacho input 4.

Note! Online unit A3800 does not contain individual AC and individual DC input channels. It offers combined AC/DC measurements. Because it cannot turn on/off ICP® powering of used sensor on the channels input. The sensor connection for the ICP® powered and ICP® not powered sensors is different for this online unit type. See how to connect the sensors in **Sensor connection for unit A3800**.

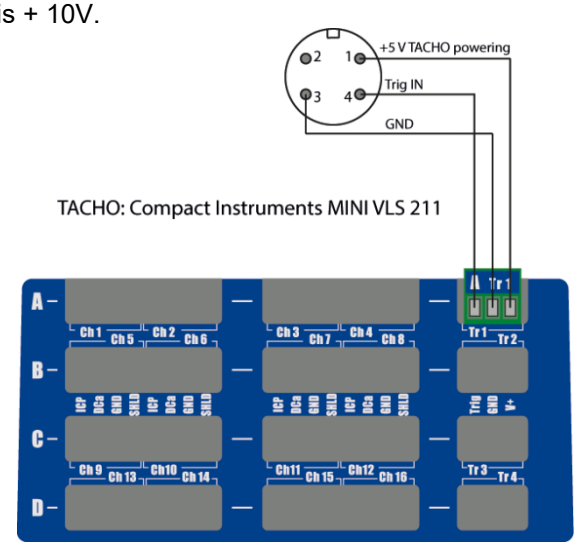
Input ranges:
AC input: +/- 12 V peak - peak
DC input: +/- 24 V
TACHO +10 V

You can see top panel with installed plug-ins (terminal blocks) in picture below.

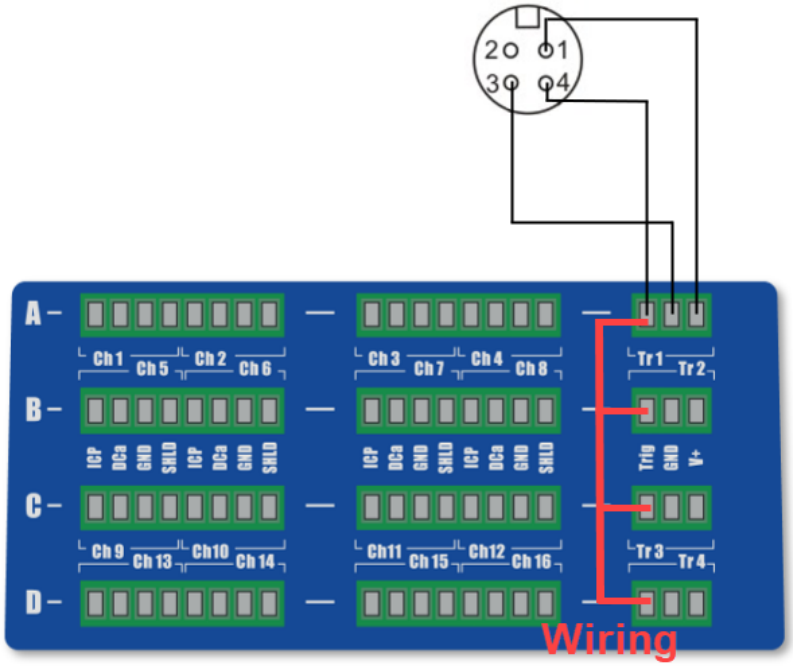


Tacho trigger connection

Tacho trigger input range is + 10V.



If you want to use just one tacho probe for whole unit it is possible. You just need to wire the particular sockets. It means that **Trig** sockets have to be wired together.



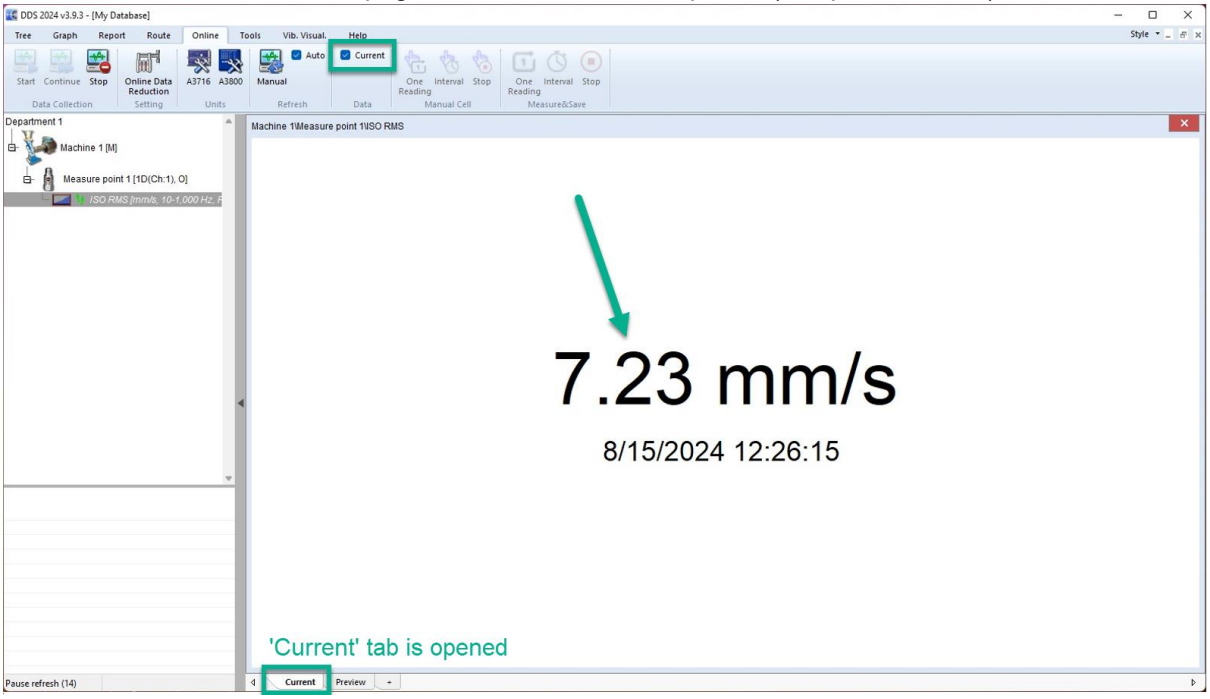
Note! It is available relays and loops module for A3800. See more information in manual for A3800 – RELAYS, LOOPS module on Adash website.

DDS – Digital diagnostic system

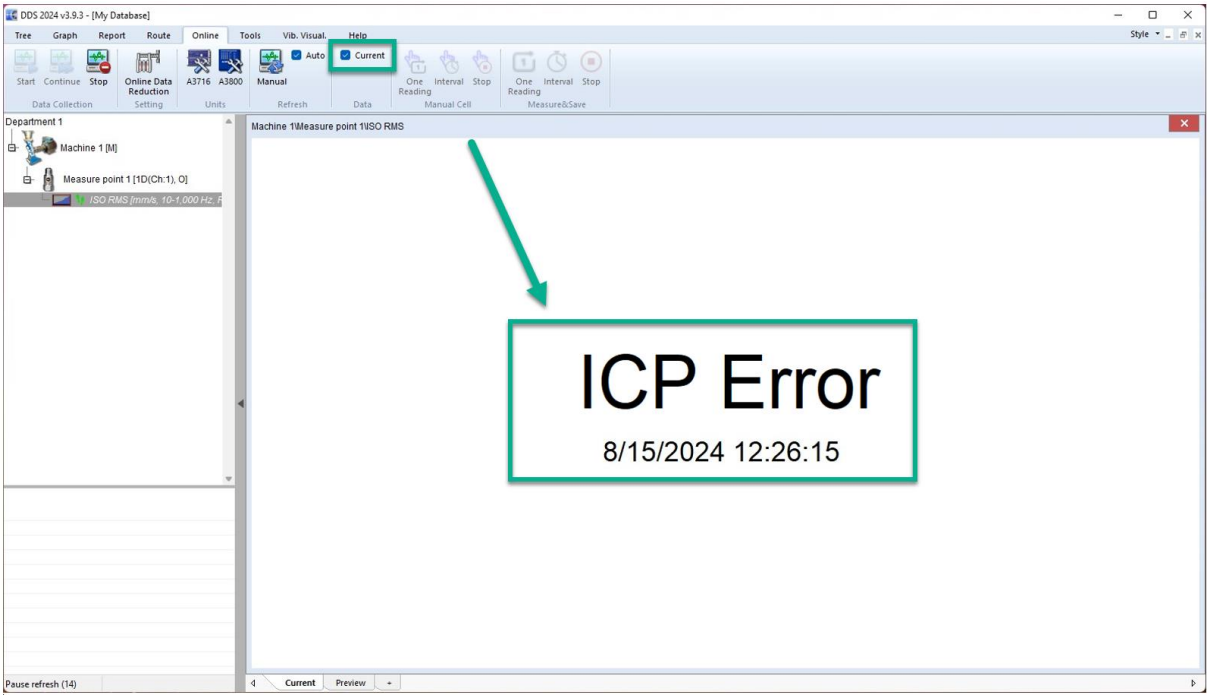
DDS is a software for database's (project's) changes and creation. DDS is used for measurements configuration, data visualization and following data analysis. DDS installation is described in first chapter of this manual (**Step 5: Software installation – DDS**). Basic of DDS database creation is also described in this chapter (**Step 6: DDS database creation**).
This manual describes only DDS settings related to online monitoring systems. More information is in DDS manual.

Current data readings

Database creation and start of online data collection was described in **Step 6: DDS database creation**. How can you check that data are really measured?
You can display the current value measured by online unit. For such a purpose there is '**Current**' checkbox in data section. New page with current value is opened (see picture below).



If data collection is not running properly or some condition is not met, you can see an error message instead of measured value.

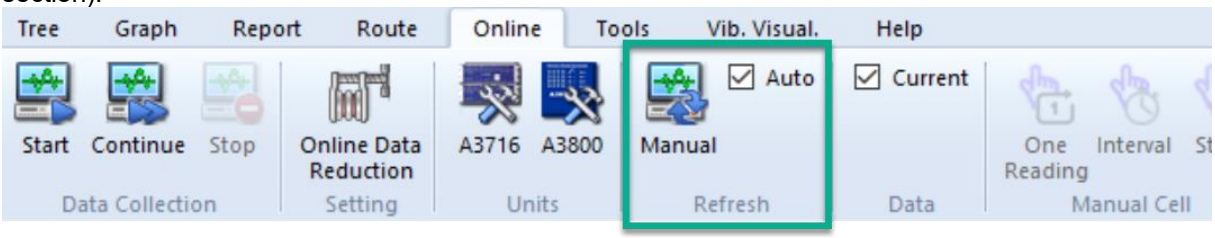


List of statuses:

ICP Error – Message shown in case of ICP® error. It could be due to incorrect setting of sensor powering, cable damage, etc. There may be also a fault in the ICP® power generator inside the hardware. Atypical sensors can cause a false ICP® error (DC component of the input voltage must be 4 - 17V)
Overload – The input signal voltage value is higher than the allowed limit for the input channel.
Not measured yet – This error is shown immediately after the online data collection is started. No data was measured yet in that time.
No trigger – The measurement requires tacho trigger, which did not come in required time (timeout).
Tacho – This error is shown when speed value is very high and the system is not able to proceed this information or when the speed is too low and there is not enough tacho pulses to read the speed.
Waiting for manual start – Shown in manual data cells. When you started data collection with Start/Continue button but you did not press One reading or Interval in Manual Cell section.
Machine not running – You set machine threshold value. Measured values are lower than this set threshold value. Therefore, the machine is considered as not running.
Condition not met – This message is shown for conditional measurements. For example, you want to measure spectra only when ISO RMS value is higher than 3 mm/s. If measured value is lower, the condition is not met and this message is shown.
Control cell error – This error is only for conditional measurements. The error of controlling data cell.

Graph refresh time interval

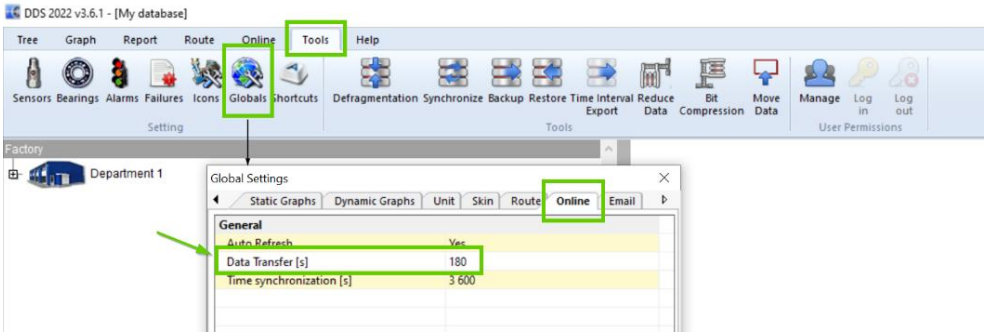
Graphs are refreshed manually (Manual button) or automatically (check the 'Auto' box in Refresh section).



Refresh options are located in 'Refresh' part in 'Online' tab. Click on 'Manual' or use 'Auto' refresh interval.

Manual refresh will show the measured and saved values (trend) immediately when you press the '**Manual**' button. In that moment, it downloads also the data from online unit which are not saved to DDS yet. This works only for PC where Data Manager is running (it basically means, on PC where data collection was started).

Auto refresh will refresh the graph automatically. You don't need to press any button. Just mark the checkbox 'Auto' in refresh section. Keep in mind that the graph is refreshed in defined time intervals. So, you will not see any values before this time interval runs out.
This setting you can find in **DDS** – **Tools** tab – **Globals** – **Online** tab – **Data Transfer**. *It is not recommended to use shorter time interval than 60 seconds. Server can be overloaded with data.*

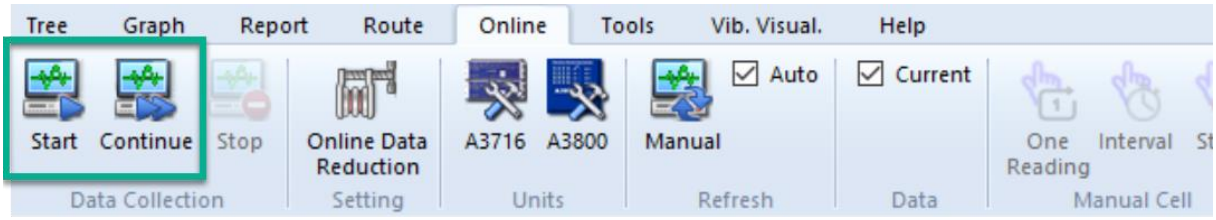


Keep in mind, that you have to stop the data collection first (Online tab – Stop button) when you change settings in DDS! Then do changes. Start (use the button Start or Continue) the data collection again.

Note! Graph refresh time interval is not applied on 'Current' value – this is refreshed approximately every 2 seconds.

Start/Continue

These buttons are located under Online tab in Data collection section. What is the difference between 'Start' and 'Continue' for data collection?



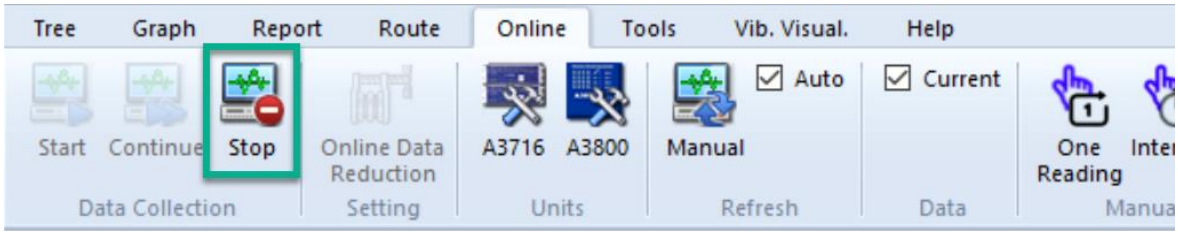
Let's explain it on this example.
You have stopped your data collection by clicking on 'Stop' button. Online unit still measures data and save them into its memory. But these data are not sent to database (DDS).

When you press '**Start**' button, data collection is started from the beginning. It means that project structure is send again to online unit (with changes made, if there are some). Also, the data measured after you pressed 'Stop' **are thrown away** (these data were saved only in the online unit's memory). You are collecting completely new data.

When you press '**Continue**' button, data from unit's memory (after 'Stop' was pressed) are saved to database. Data collection continues.
When you make some changes (in the project structure or its settings) and then press 'Continue' button – data which was saved into online unit's memory are firstly transferred and saved to the DDS database. Then new project structure with changes is send to online unit. **No data are thrown away if 'Continue' is used!**

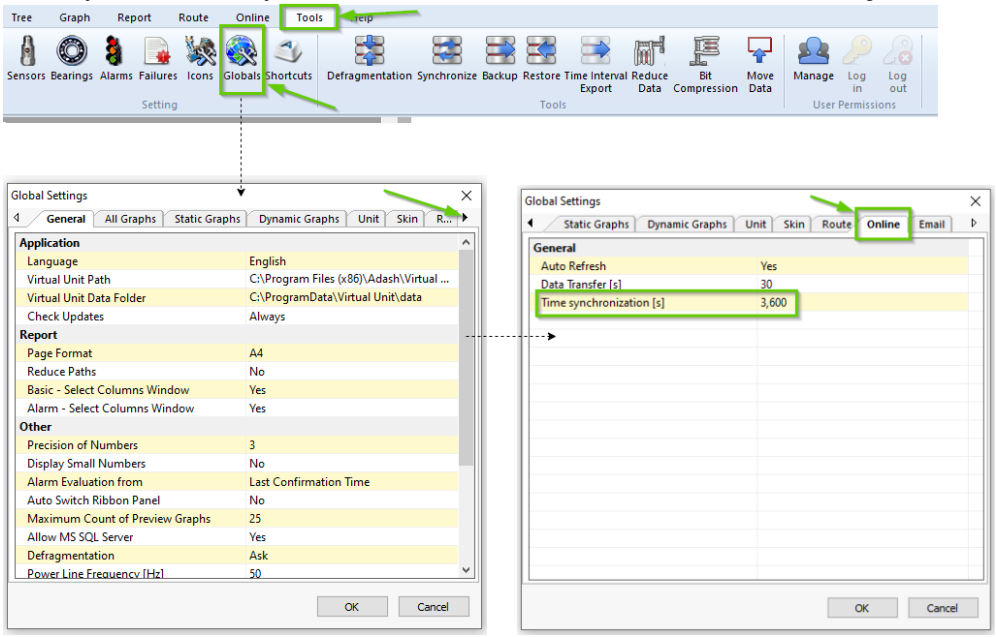
Stop

Button is located under Online tab in Data collection section. Stop button is used to stop the data collection. When you need to change DDS parameters **you always need to stop the data collection** first. Do changes and start (continue) data collection again.



Unit Time Synchronization

It is important to keep internal time of all A3716 units up to date. In the beginning set the correct time zone in A3716. The **Data_Manager** synchronizes time in all A3716 units with the time on Adash server. The interval of synchronization you can find in **DDS/Tools/Globals/Online/Time synchronization.**



Measurements and data saving

Adash online systems are measuring continuously all the time.

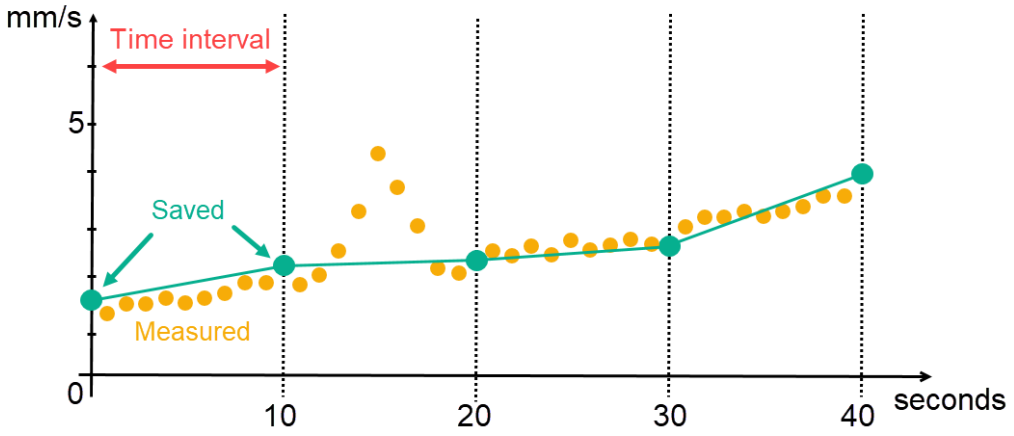
Imagine that you measure at the same time overall RMS value, spectrum and time signal. And you want to save all measurements. Every short time interval (e.g. second) you measure new value. Each new measured value is saved. It means that you save extremely huge number of values every day, every week, etc. Database size is growing really fast. This is not good because drive space for data storing is limited.
It is also more difficult to work with such a big database. It takes more time to open it and show the data. It is the reason why it is necessary to decide which values will be saved and which will not. Our main goal is data reduction based on significant changes of measured data. But we offer several different data reduction procedures and you can decide what type of reduction is the best for your data saving.
First reduction is performed directly in online units A3716, A3800 during measurements. You set data saving parameters in DDS software. These parameters include **time intervals** and **significant changes**. Measured values are evaluated based on these saving parameters. If measured values met the set parameters, the values are saved and you can see them in DDS. Otherwise, the measured values are not saved into database. This procedure saves a lot of disk capacity if you set the parameters properly.
Second reduction procedure is DDS reduction. This reduction is applied to data which already are saved in database (from online unit). This reduction procedure follows after the first type.

Data reduction in A3716 and A3800 units

Basic data reduction is done by time intervals and significant changes.

Intervals

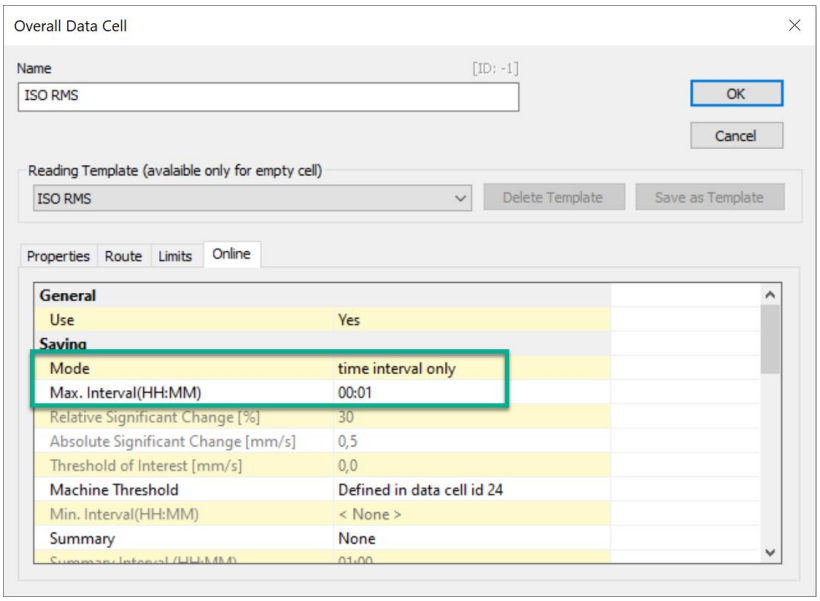
This is the most known option for data saving. It comes from the attribute of older online systems. Back in the days the online systems were not measuring all the time. It measured only in defined time intervals. Time interval saving is still kept as an option in DDS and it still can be used. The main difference from the past is that data are measured during whole time interval. For better explanation of time interval saving, see following picture.



Time interval is set to 10 seconds. You can see that in time 0s there is first value saved (first green point). Then new value is measured every second (yellow points) – because Adash online units measure continuously all the time. These orange points are not saved because time interval is set to 10s. **During this time interval no value is saved**. Next value **is saved** after 10 seconds. Next value is saved again after 10 seconds (20seconds from the start), etc. Basically, this is the principle of time interval saving. Disadvantage is that you don't know what values are measured between the saved ones. If there is a peak, you just miss it (as in the picture above between 10 and 20 seconds).

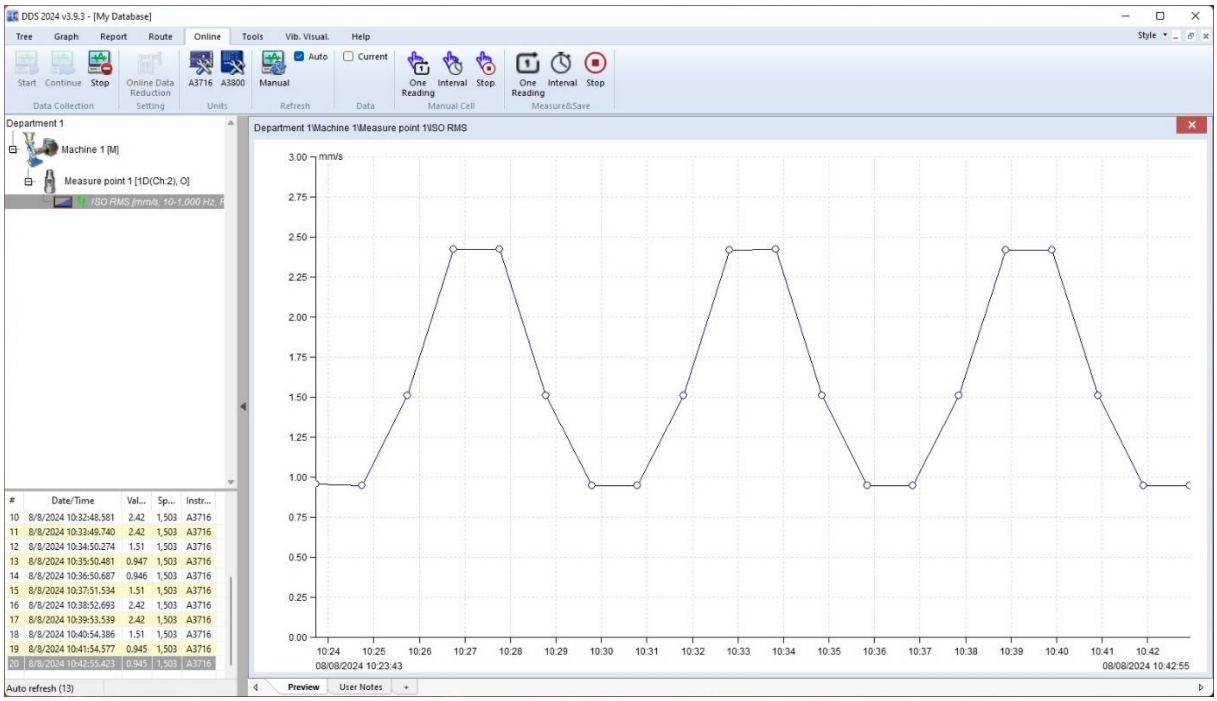
Time interval is set with parameter **Mode**. This parameter is in data cell **Properties – Online** tab – **Saving** section. Set Mode to '**time interval only**'. Time interval is set to 1 minute ('**Max. Interval**' parameter). **It means, that every 1 minute, the measured value is saved in DDS.**

Note! Keep in mind that data are measured continuously, not just in time interval. Time interval is just a **SAVING** parameter.



Name '**Max. Interval**' may be a little confusing for you in this context but it does make sense in other mode option.

Here you can see the trend of saved values. Every minute there is a point – it means value saved.



Interval and changes

You can choose different option for data saving instead of simple interval saving. Adash offers option Interval and changes. We can say that it is smarter and better data saving option. You don't need to save a lot of similar values. It is enough to save new value, when it differs from the last saved value. The required difference we call the significant change.

But the time interval saving is also used in the same time. Now it means the longest permissible time between two saved measurement values. For example, I set the interval to 3 hours. When 3 hours have passed since the last saved value, then the value is saved. Although the significant change did not occur.

To compare the measurements, which consist of a single value is easy. We will just compare two values. But what to do for example with time signal. They consist of arrays of numbers. And we need just one

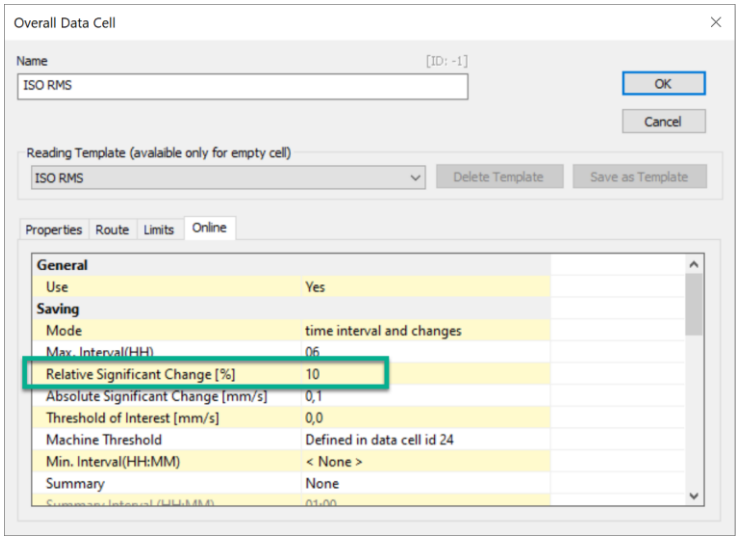
value for comparing. We create the quantifiers. For time signal it is RMS TOT value. And this one value we use for comparing. It means the RMS TOT value must to be significantly changed to save next measurement.
Complete table of quantifiers is given later. Just for spectrum and order analysis is not their quantifier (TOT) used for reduction. The special methods are used for them.

Significant change consists of two parts/parameters. It is relative significant change and absolute significant change. For value saving it is necessary to meet the condition of both significant changes simultaneously (relative and also the absolute).
Relative significant change is a percentage difference.
Absolute significant change is an absolute difference.

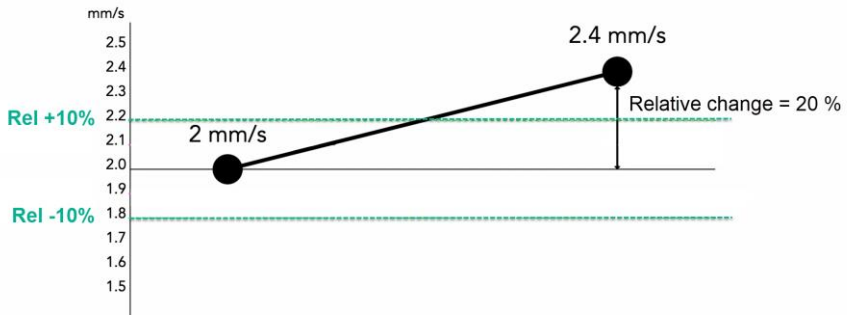
Imagine that last saved value for RMS is 2 mm/s. The new measured value is 2.4 mm/s. The difference between these values is 0.4 mm/s. This is compared to the set parameters for significant change (absolute and relative significant change). If they meet the conditions – significant change occurred and value is saved.

Significant change occurs when difference between the last saved value and new measured value is equal or higher than set parameters.

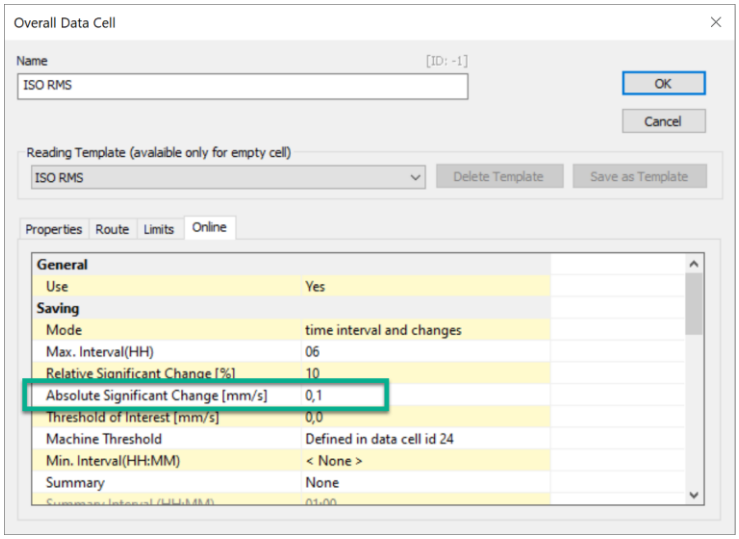
Relative significant change is a percentage difference between the last saved value and new measured one. Let's explain it on following example. I set the parameter to 10 %.



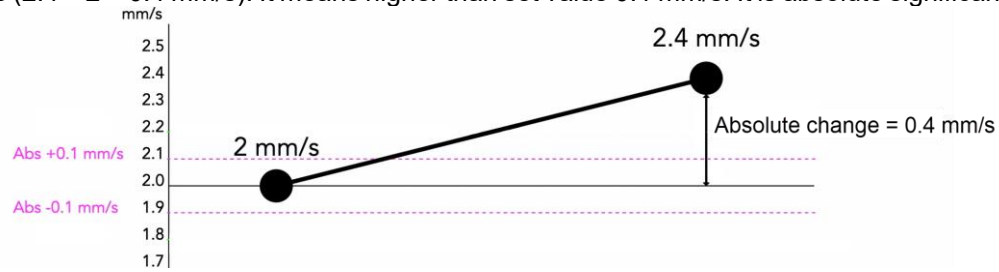
The last saved value is 2 mm/s. The new measured value is 2.4 mm/s. The percentual difference between them is 20%. It means higher than set value 10%. It is relative significant change.



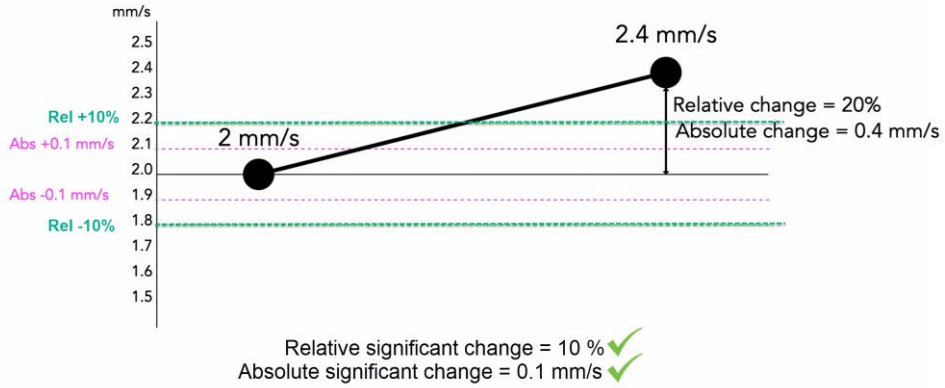
Absolute significant change is an absolute difference between the last saved value and new measured one. See following example. The parameter is set to 0.1 mm/s.



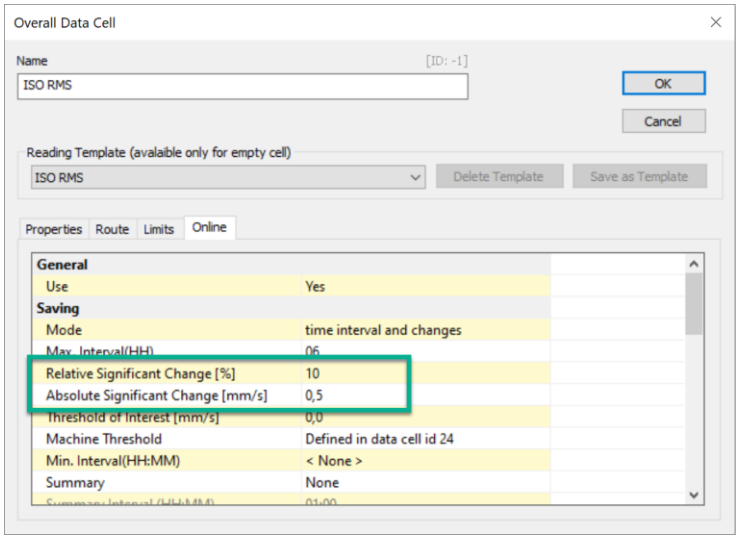
The last saved value is 2 mm/s. The new measured value is 2.4 mm/s. The difference between them is 0.4 mm/s (2.4 – 2 = 0.4 mm/s). It means higher than set value 0.1 mm/s. It is absolute significant change.



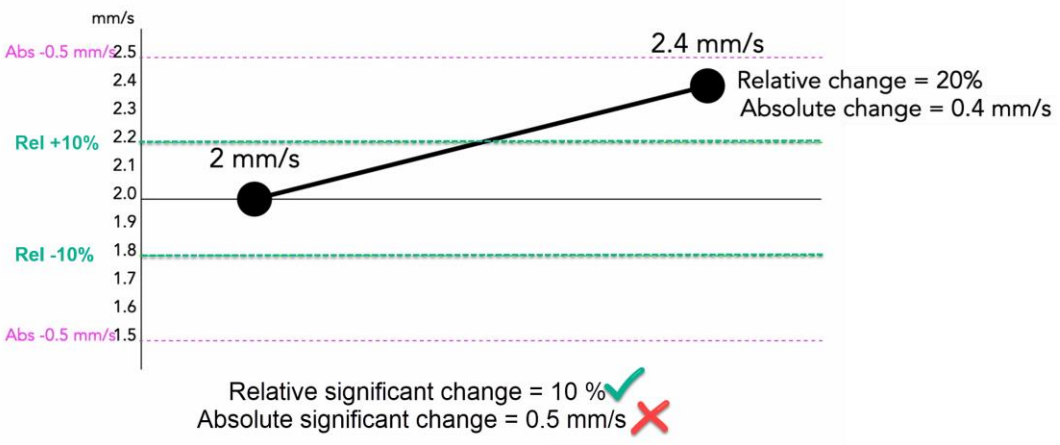
In the mentioned example, both conditions are met – **significant change occurred** (see picture below). It means, that **new measured value 2.4 mm/s will be saved**.



I set parameters for significant change differently in next example. I decided that relative significant change is still set to **10%**. Value for absolute significant change will be different. I set absolute significant change value to **0.5 mm/s**.



The last saved value is 2 mm/s. The new measured value is 2.4 mm/s.



Relative change between the last saved value and new measured one is 20 %. It is significant change.
Absolute change between the last saved value and new measured one is 0.4 mm/s. It is not significant change. I set absolute significant change to value 0.5 mm/s.
The condition of absolute significant change is not met. New measured value will not be saved.

Note! Why use both changes relative and absolute? Relative change is applied to high values mostly. Absolute change is important mostly for the low values (noise values). Condition of relative change is met for low values very often – a lot of noise values would be saved. This is why the absolute change is applied also.

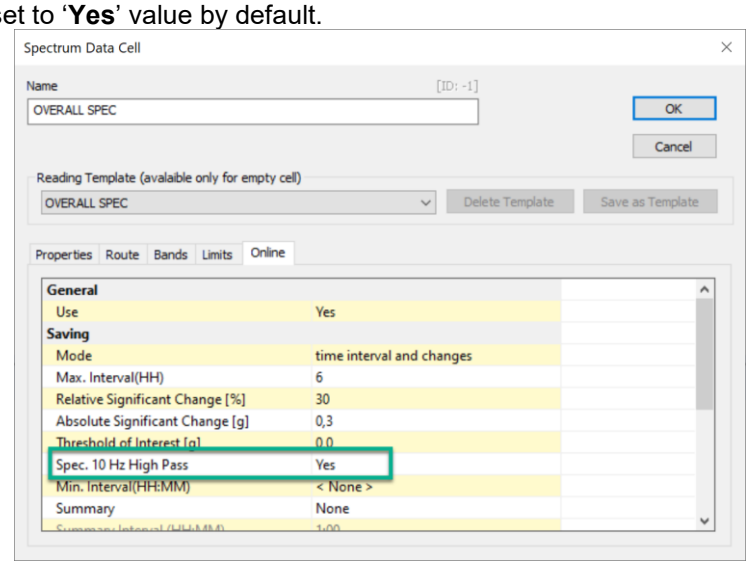
Time and changes mode combines conditions of significant change and time interval. The reason why we combined these two conditions is simple. When you have very stable vibrations on the machine and no significant change occurs, you have no data saved. So, your trends would be empty for very long time until some significant change occur.
For such a situation you set the Max. time interval. If you set this parameter to default value – which is 6 hours – you have value saved every 6 hours. It means that the longest time interval between two saved values will be 6 hours, never more. So, even if the significant change did not happen for whole one day, you still have 4 values saved in six hours long time intervals.

10 Hz High Pass

Special data saving parameter **only for spectrum** data cells. You set here option Yes or No. In case, option 'Yes' is set, spectrum lines between 0-10 Hz are not included into reduction algorithm. You can

imagine that all lines bellow 10Hz are set to zero. If 'No' is set, data reduction is applied to complete measured spectrum.
If you are not interested of lines bellow 10Hz, then set the 10Hz High Pass.

This parameter is set to '**Yes**' value by default.



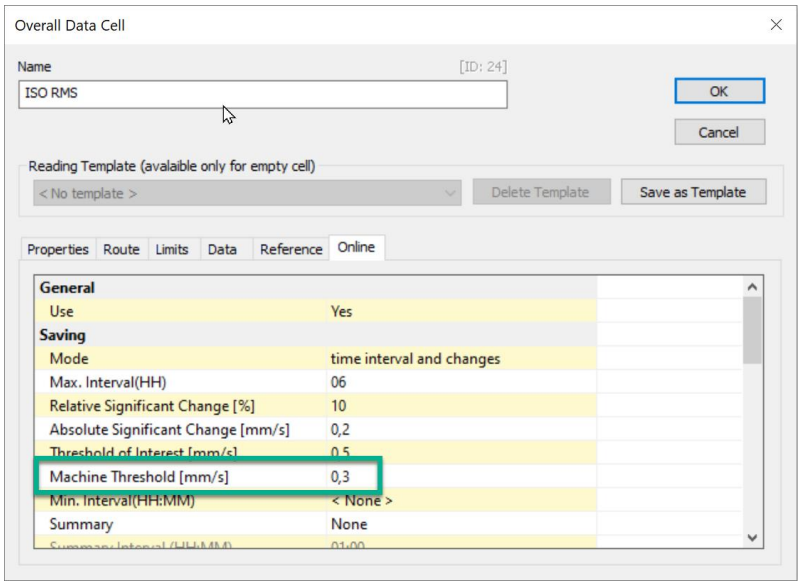
Thresholds

Next saving parameters are machine threshold and threshold of interest. It is brand new concept developed by Adash.

Machine threshold

The machine threshold idea came from the vibration measured on machines which are not running continuously. These machines (for example hydroelectric turbines) are run and stopped several times every day. We want to save only running values.
When the machine is turned off, noise values still remain there. We don't want to save them. So, we apply a machine threshold value.
The machine threshold value can be set just for one static data cell on the machine. If measured values for this data cell are below set threshold, then whole machine is considered as not running. Usually, this threshold value is set for data cell which measures the highest running vibration values. This one selected data cell controls saving for all data cells in machine.

Machine threshold is set in data cell **properties** (click with right mouse button on data cell) – go to **Online** tab – **Saving** section – **Machine Threshold**.

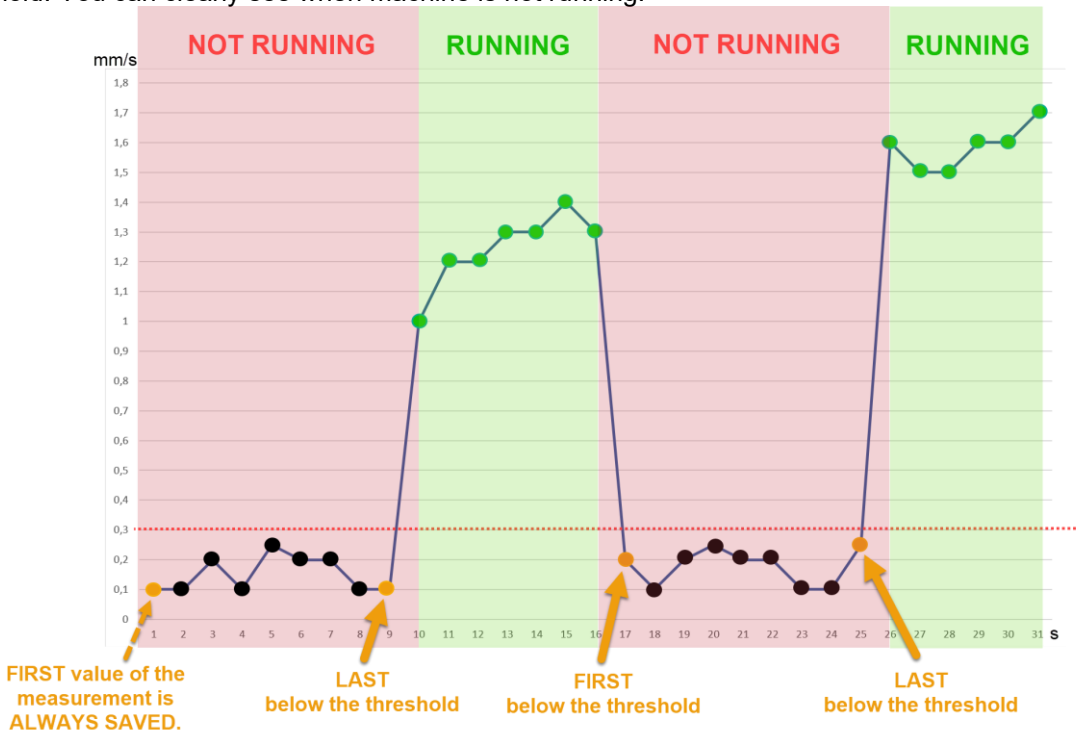


So, values below the machine threshold are not saved.

But there is an exception in saving procedure. Let's explain it on following example.
The threshold value (for example 0.3 mm/s) prevents saving of noise values when machine is not running. Values which are lower than threshold are saved only in this situation:

- the **first** value below the threshold is saved (it is the moment when measured value falls under the chosen threshold),
- the **last** value below the threshold is saved (it is the moment when measured value rises above the chosen threshold value).

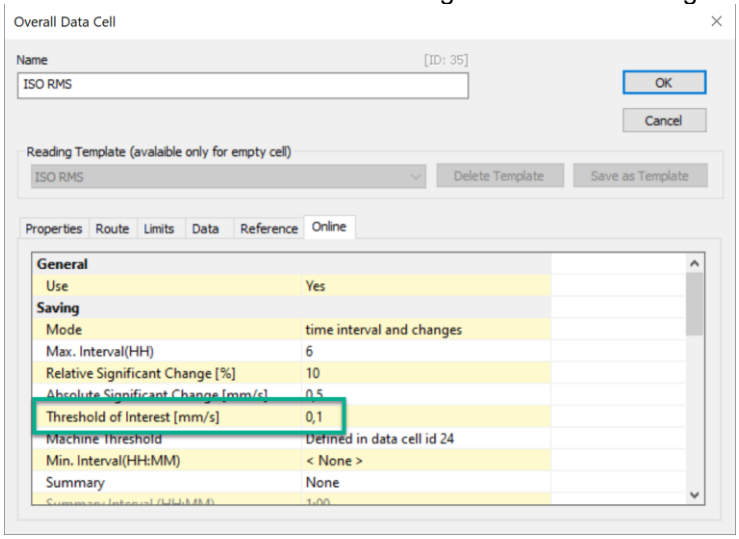
To make this explanation clear, see the picture below. Green points are saved as values are above the threshold 0.3 mm/s (machine is running). Yellow points are saved also as the values are first or last measured under the threshold. Black points are not saved because these values are below the threshold. You can clearly see when machine is not running.



Important note! We are just reminding, the first and the last values below the threshold are saved in all data cells on the 'not running' machine. Not only in that one data cell where threshold was set!

Threshold of interest

Threshold of interest can be set for all measurement types. Basically, it is a value chosen by user. User decides that values below this set value are not interesting for him and the diagnostics.

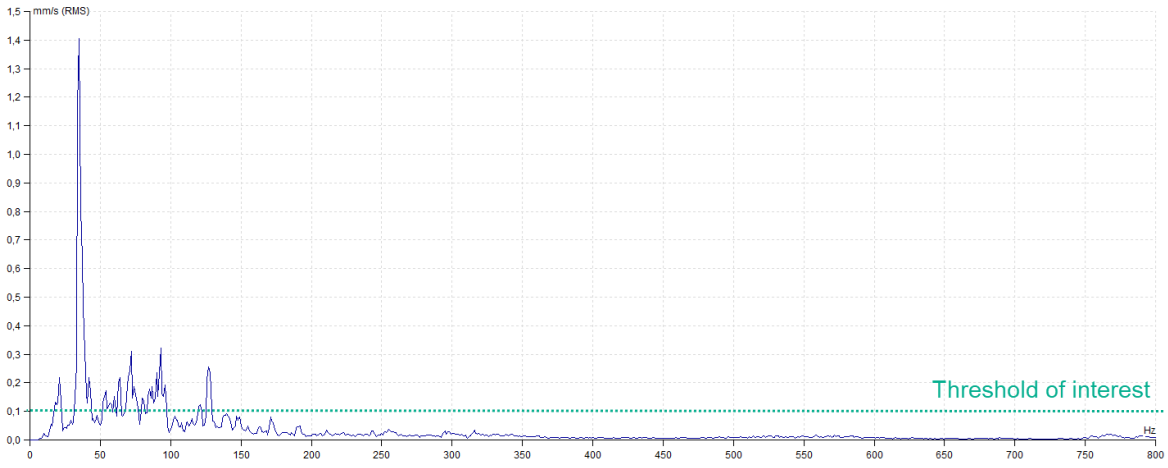


Static measurements: Threshold of interest is working basically the same as machine threshold for static values. It means, that values below this set threshold are not saved. You decided that these values are not interesting for you from a diagnostic point of view.

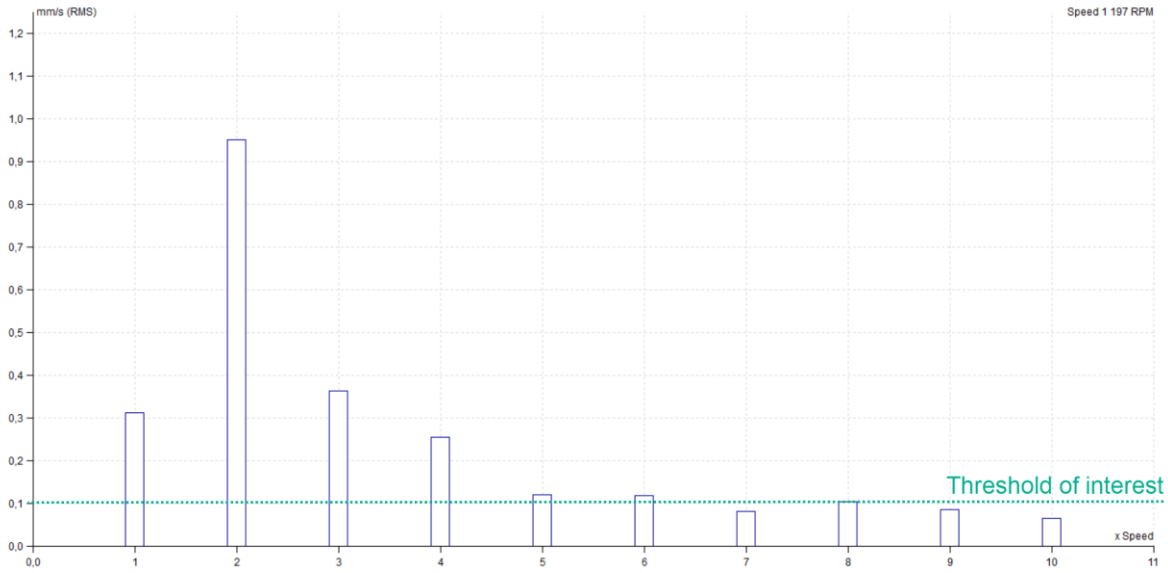
Dynamic measurements with the exception of spectrum and order analysis: For these measurements the interest threshold is related to the RMS TOT value.

Spectrum and order analysis: The threshold value represents the line in the graph. It means, that all lines (orders) bellow this line is not used for analysis. The user by setting of this threshold tells, that these lines represent the noise. You can imagine, that all these lines can be equal zero. It is applied just for amplitude values, not for phase values.

Spectrum graph:



Order analysis:



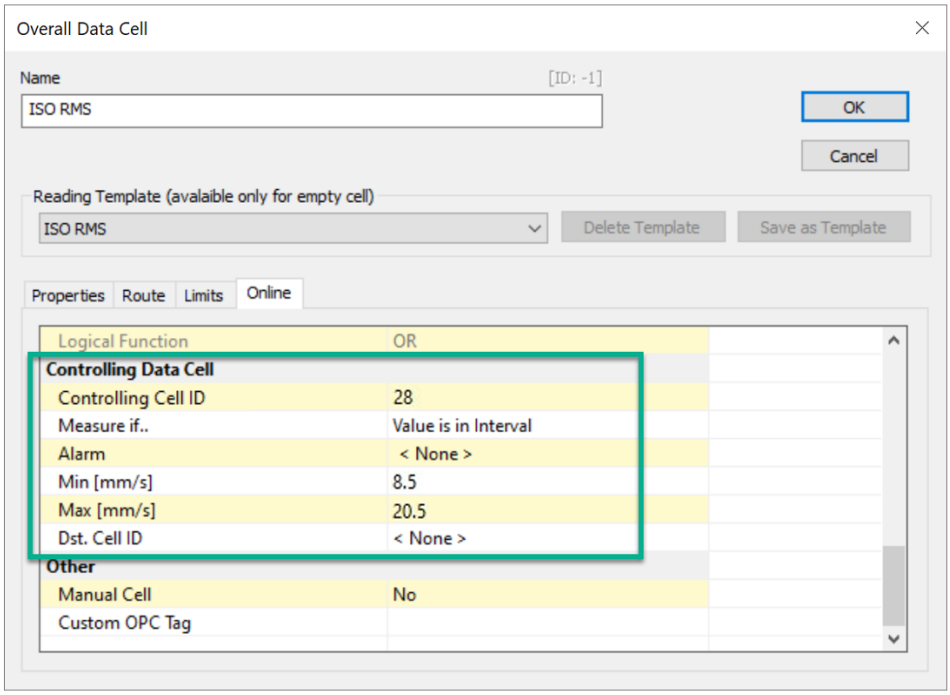
Special methods of measurements/saving

Adash offers also special methods of measurements and saving.
- Conditional measurements,
- Measure and Save function,
- Manual data cells.

Conditional measurements

There are machines running under variable conditions, with load changing, speed changing, etc. Such variables conditions generate variable vibration values. For correct diagnostics we need to repeatedly measure always at the same conditions.
Measurements taken only in time intervals do not make sense here from a diagnostic point of view. This is handled by **conditional measurements.** You define controlling measurement (the speed is mostly used) and controlled measurement (for example ISO RMS overall, spectrum, etc.).
Controlling data cell defines the conditions when measurement is taken on the machine (Controlling Data Cell ID is entered in the parameter window in the example below).
Controlled data cell takes measurement when conditions are met.

For example: the speed data cell (ID=28) is the controlling data cell for ISO RMS data cell. Required interval is 8.5 – 20.5 Hz (Min and Max parameters) – the measurement of ISO RMS value is taken only when speed is in this interval.



Data cell ID is shown in the tree structure:

If the conditions are met, then the values are saved using data saving parameters: as time interval and significant changes. See chapter **Interval and changes** for details.

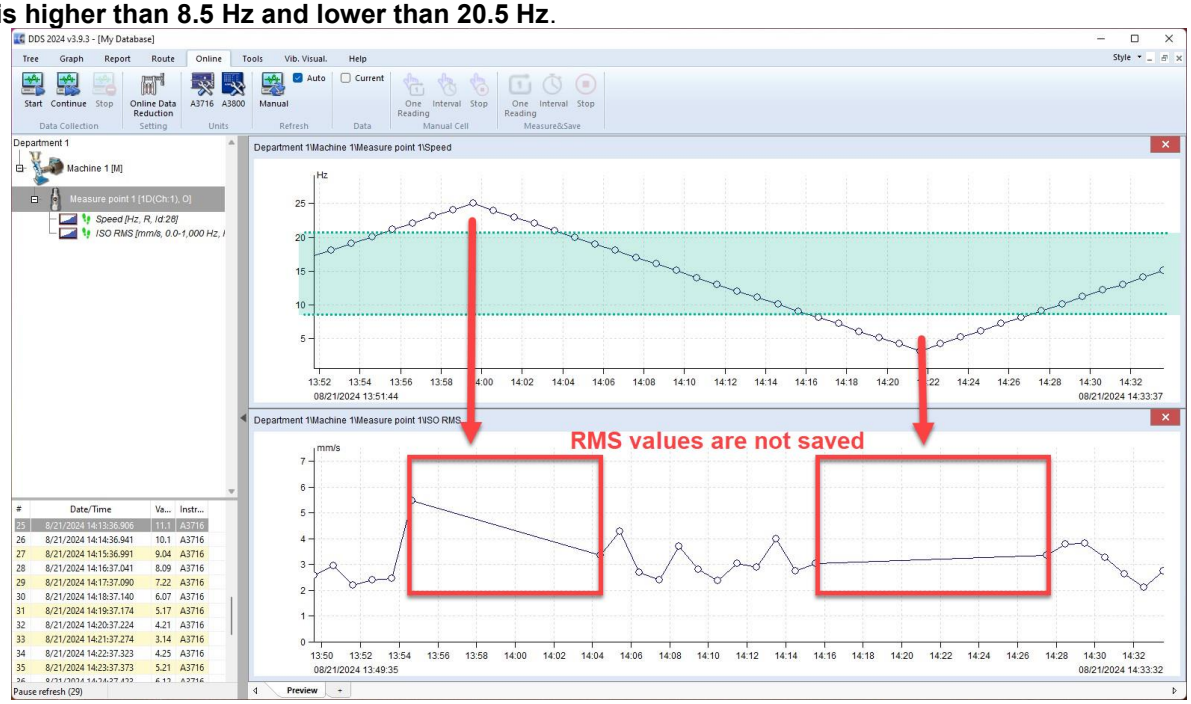
Each data cell can be controlled by different controlling data cell.

Controlling and controlled data cells have to be measured on the **same online unit**!

Every data cell can be controlled only with **one** controlling data cell (basically, you can enter only one control cell ID for each data cell).

Conditional measurements are set under data cell **Properties – Online** tab – '**Control Data Cell**' section. We set the conditional measurements as following – the ISO RMS value (controlled data cell) is measured when values in controlling data cell are in set interval ('**Measure if..**' parameter – you can choose from option 'Value is in Interval' or 'Value is in Alarm').

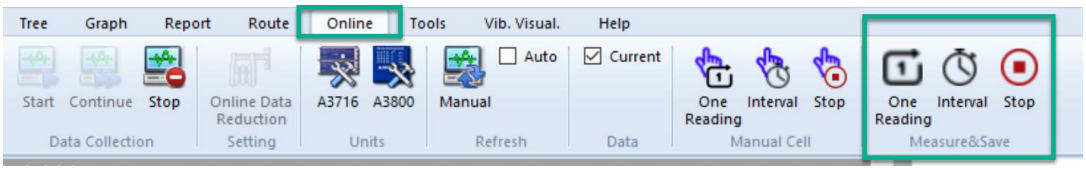
See the graphs from DDS below. First is graph for controlling data cell (speed data cell, ID: 28). This data cell controls the ISO RMS data cell. Second graph is showing ISO RMS saved values.
Note! According to the screenshot above, **ISO RMS value is measured when speed (data cell ID: 28) is higher than 8.5 Hz and lower than 20.5 Hz**.



You can clearly see when ISO RMS value is not measured (and saved). This is related to the condition set in the window above. **If speed value is below 8.5 Hz and above 20.5 Hz** (in the first graph) – the ISO RMS data are not saved.
If the speed value is in interval between 8.5 Hz and 20.5 Hz – the ISO RMS data are saved.
Data are saved using the data saving parameters – such as time interval, significant changes. See chapter **Interval and changes** for more details.

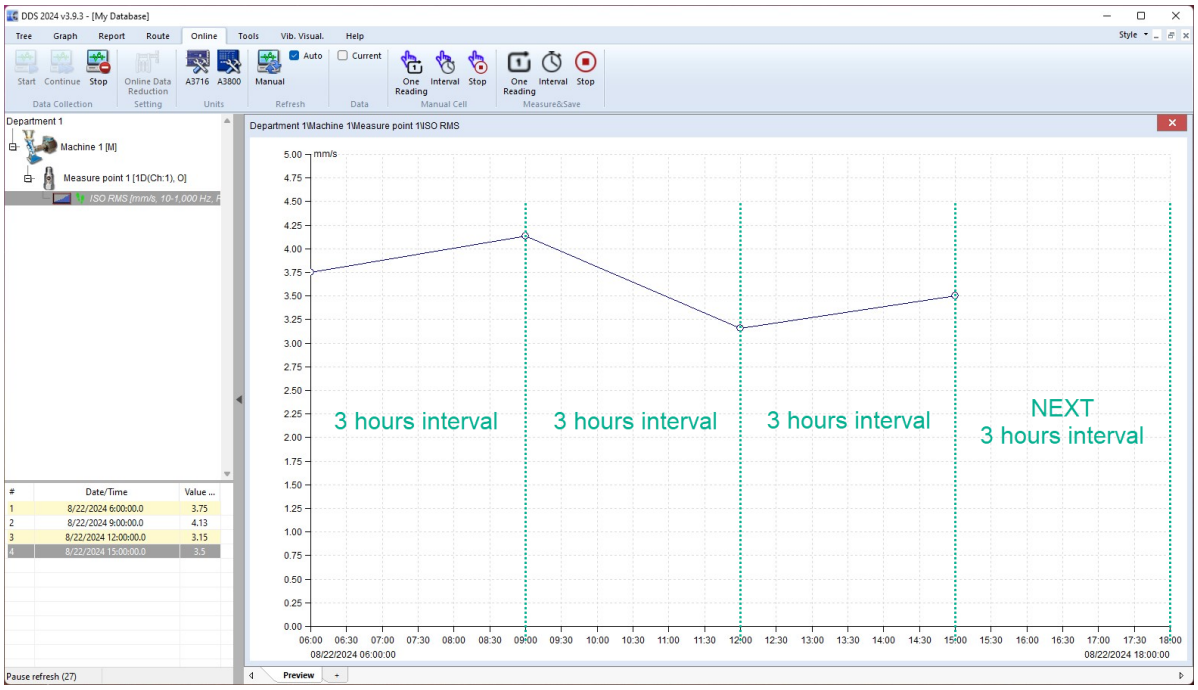
Measure and Save

For example, we set the time interval to 3 hours. But imagine that somebody comes to you and wants to see the current value. The 'Measure and Save' function enables it. Measure and Save section is located in Online tab. You can use one of the 3 buttons in **Measure&Save** section.

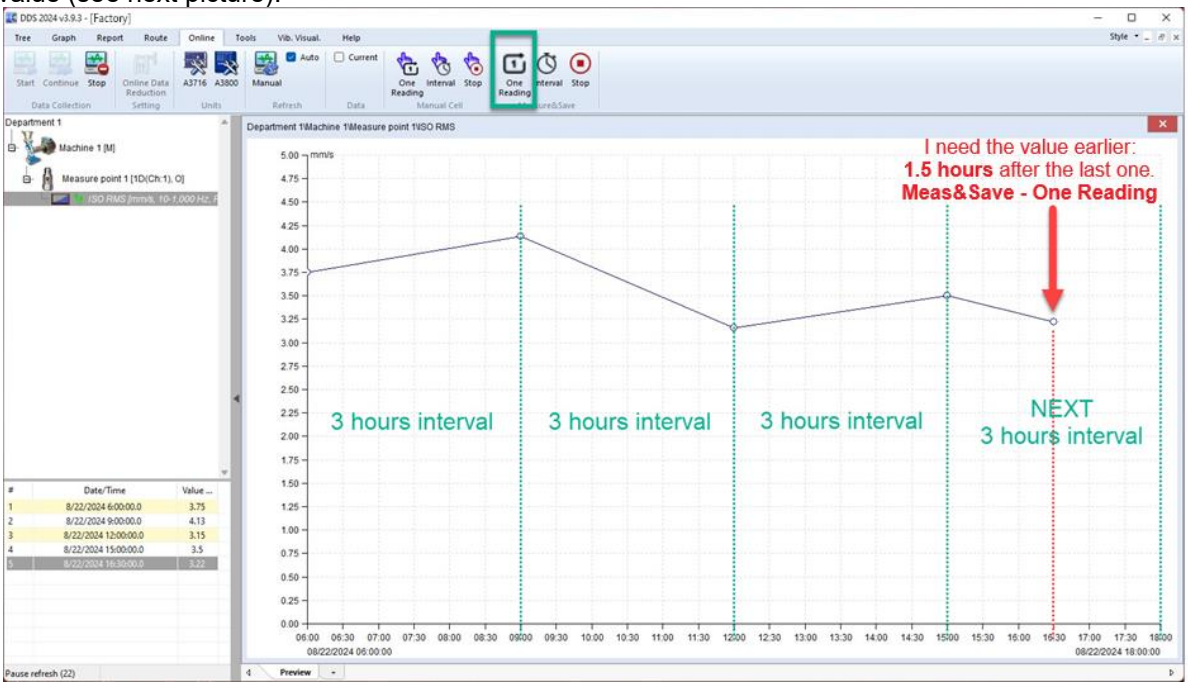


See the explanation of particular buttons.

One reading

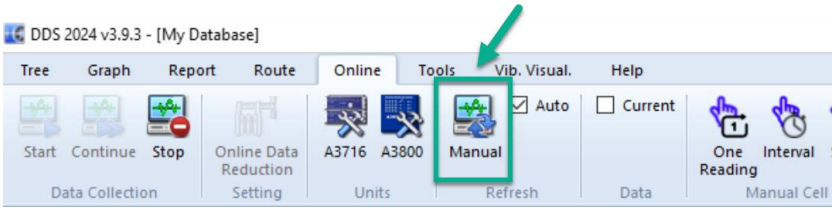


You can see that every 3 hours there is one value saved. But I want to save value right now at 16:30, in this moment. It is 1.5 hour from the last saved value. I don't want to wait for the next 1.5 hour to get value again after 3 hours. So, I will use Measure and Save function – One Reading button and save the value (see next picture).



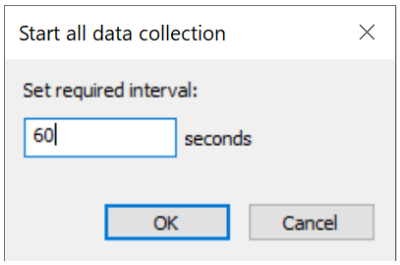
Note! Value is always saved when you use this function. No **saving/reduction** parameters are used. It can happen that you press the button for measure and save and you cannot see the value in the trend immediately.

In such a situation you can refresh the graph manually to see the saved value immediately. Press 'Manual' button in Refresh section. Data from online unit are downloaded and saved to DDS. You can see the value.

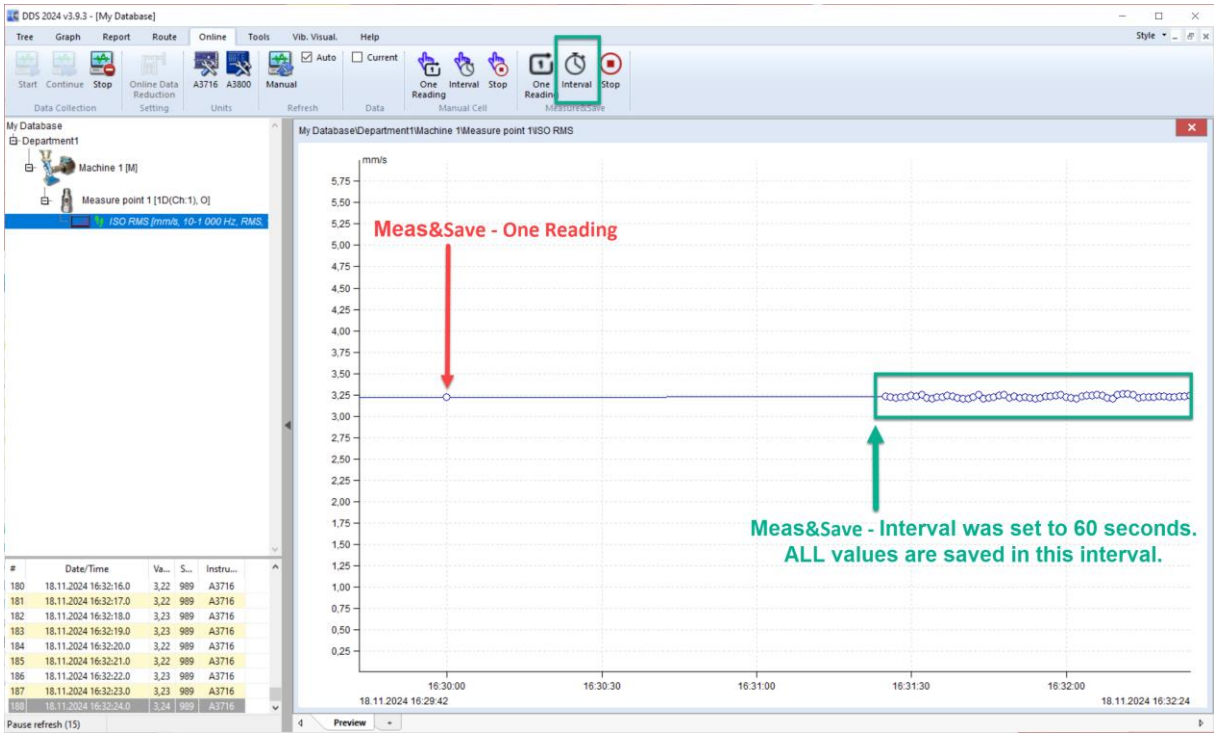


Interval

Press this button and all measured values will be saved in defined time interval. Set required interval.



All measured data will be saved in next 60 sec. It means, that every 1 second there is value saved in our case. ISO RMS value is measured every second.
No data saving or reduction parameters are used. This is an option how to save all values in required time interval. You can see how it looks like in DDS trend.



Note! There is a limitation for the length of the interval. You can set interval maximally to 60 seconds. But it is recommended to set short time intervals. Because all measured values are saved, a lot of disc space is filled and also the database is larger and slower.

Once the Measure&Save interval is completed, graph is automatically refreshed.

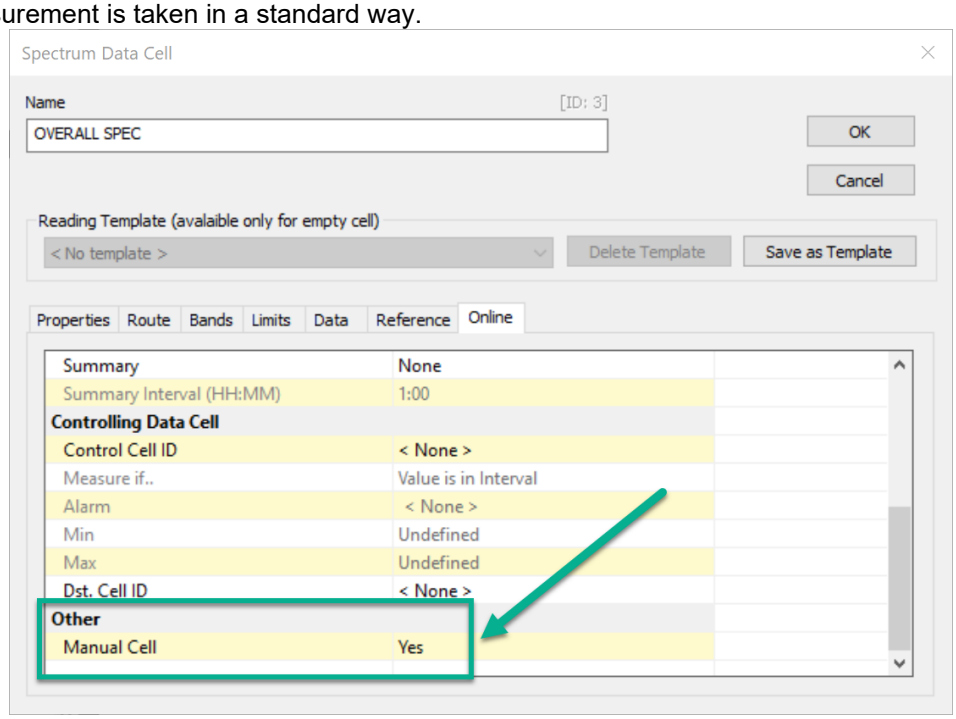
Stop

You can always stop the Measure&Save Interval function.

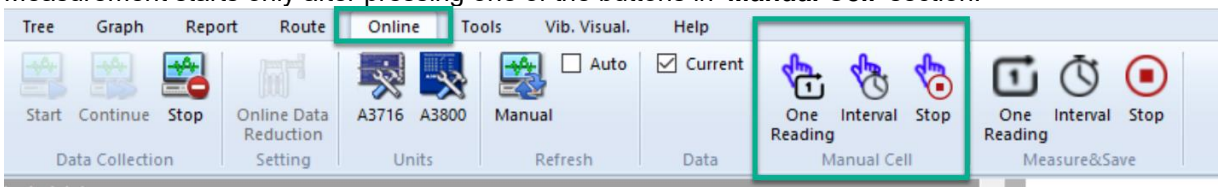
Manual data cells

System allows also measurements manually started. It was made for machines where conditional measurements cannot be used. These machines can run e.g. in a specific mode. We want to take the measurements only in this machine mode. For such situation manual data cells were created.
You can also use this for example when you have a lot of data saved in dynamic data cells (e.g. spectrum). So, you set dynamic data cell as manual. Static data cells are still saving the values (as it does not take that much drive space). Once you see that these static values (e.g. ISO RMS) are getting worse you press the button for manual data cells. Now the spectrum is saved to the database and you can analyze this spectrum data cell further.

This parameter is under data cell properties. Click on data cell with right mouse button and pick **'Properties' – tab 'Online' – 'Manual Cell'** – No (this is default setting) / Yes. If manual is set to No, then measurement is taken in a standard way.



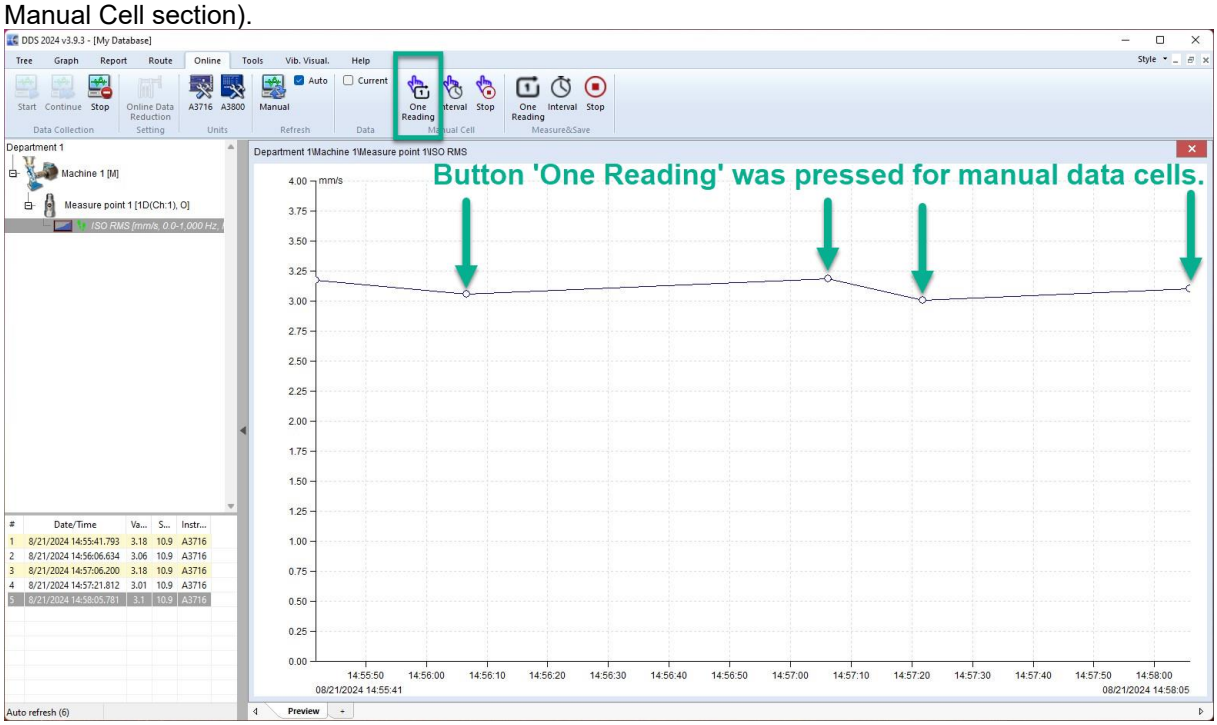
If measurements are set as Manual (value set to Yes), no measurement is performed automatically. Measurement starts only after pressing one of the buttons in '**Manual Cell**' section.



You can use one of the 3 buttons in **Manual Cell** section: One Reading, Interval, Stop.

One Reading

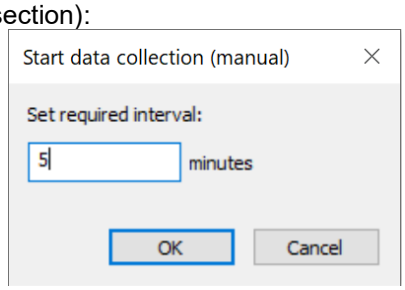
Once this button is pressed, one value is saved. It works only for data cells which are set as ‘Manual Cell’. It means, that all data cells set as ‘manual’ saves one value when ‘One Reading’ button is pressed. You can see the example below. Every one value stands for the press of the button One Reading (in Manual Cell section).



Graph is automatically refreshed when one reading is taken.

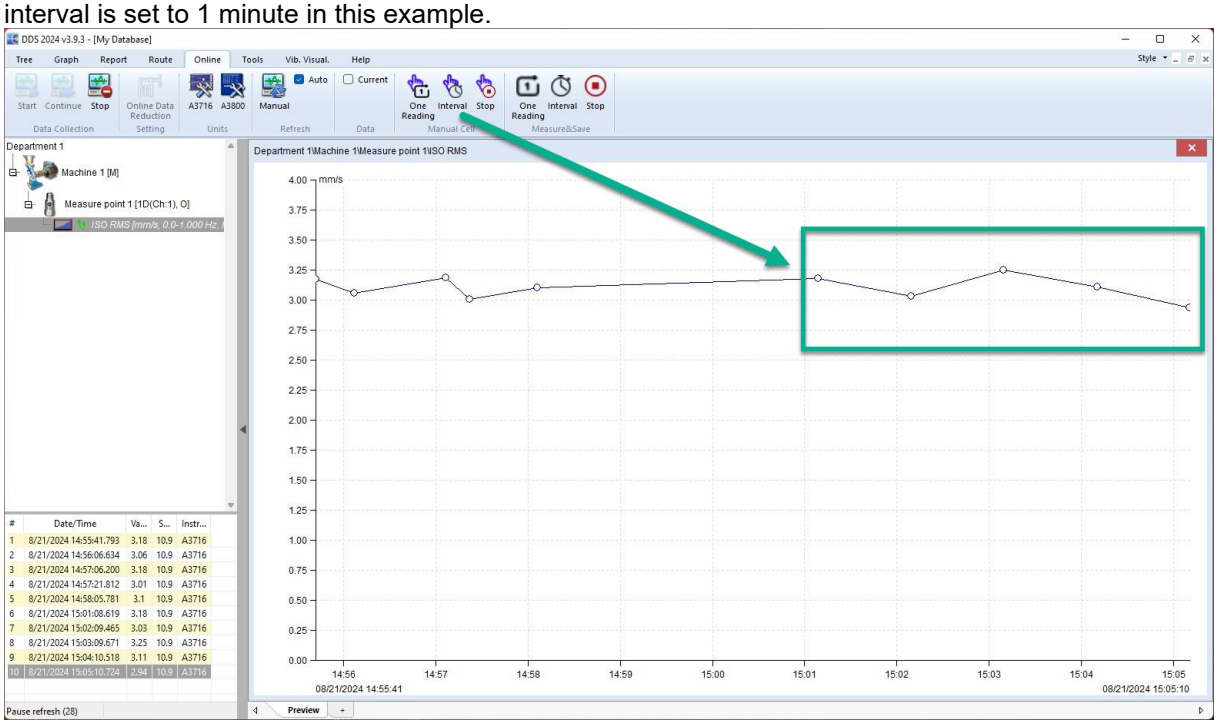
Interval

All manual data cells will save values in defined time interval. The first value is always saved. Next values in this interval are saved according to data saving parameters (it means use the saving interval and changes parameters). Length of the time interval is set in following window (it shows once you click on button Interval in Manual Cell section):



Note! There is a limitation for the length of the interval. You can set interval maximally to 60 minutes.

Interval for manual data cells is set to 5 minutes. When I press 'Interval' button in manual section – all manual data cells start to save data for 5 minutes. You can see in DDS trend where 5 values are saved in this time interval.
How many values are saved in this manual interval depends on data saving parameters set – time interval is set to 1 minute in this example.



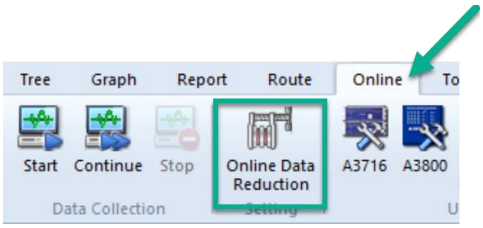
Graph is automatically refreshed when interval is completed.

Stop

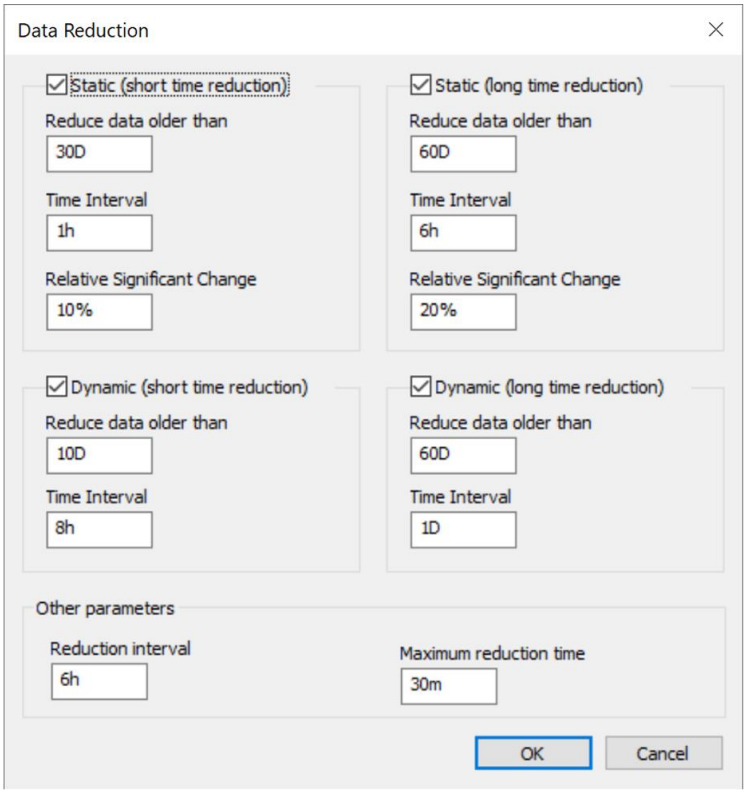
You can always stop the Manual Interval measurements.

Online Data Reduction in DDS

This function is used to reduce a number of measurements in the database and therefore reduce its size. However, this is not a simple dilution of values. This online data reduction is done automatically in set time intervals.
Go to 'Online' tab in DDS. Click on 'Online Data Reduction'.



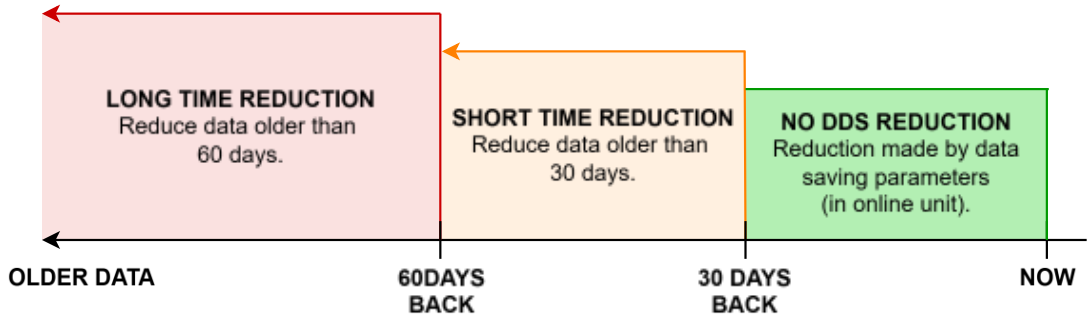
This window appears.



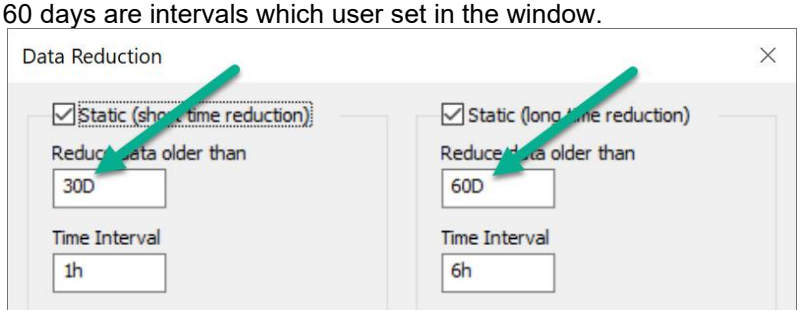
We have two types of data cells – static and dynamic. How the reduction is done to each one of them is described below.

Static data cells

Static data cells reduction is managed by two parameters. The first is time interval between the measurements. The second one is a significant change of measurement.
Firstly, we will show how static data reductions are divided on the timeline. Static reductions are divided into short time reduction (orange part) and long time reduction (red part).
Green part on the timeline is without DDS reductions. These values are saved according to data saving parameters (such as time interval and significant changes).

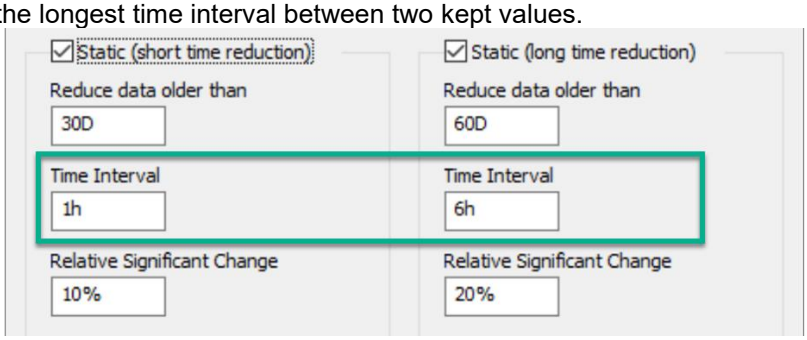


The 30 days and 60 days are intervals which user set in the window.

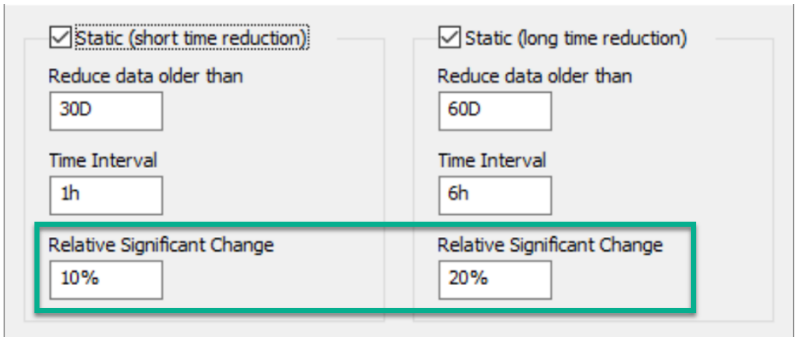


Note! Keep in mind, that we go back in time with the measurements – it means from the last (the newest) measurement saved to the older ones (previous values).

Interval defines the longest time interval between two kept values.



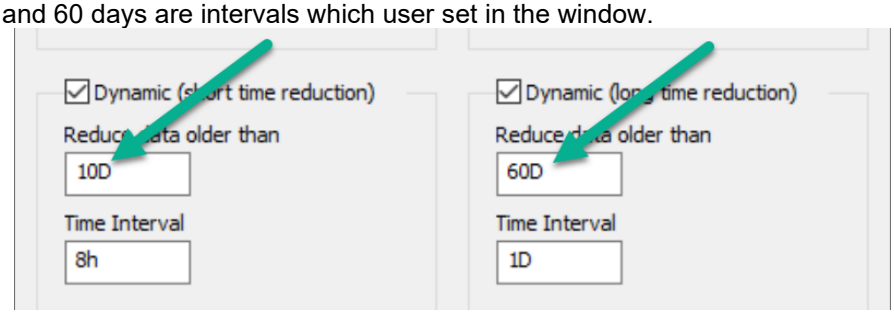
Significant change is the last parameter for static reductions. It is a percentage difference between the two following values.



Dynamic data cells

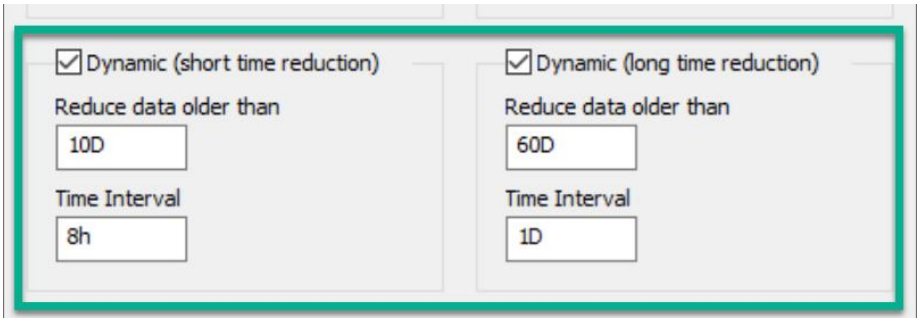
Dynamic data cells reductions are working differently. There is only one parameter for dynamic reduction – this one parameter is time interval.

The 10 days and 60 days are intervals which user set in the window.

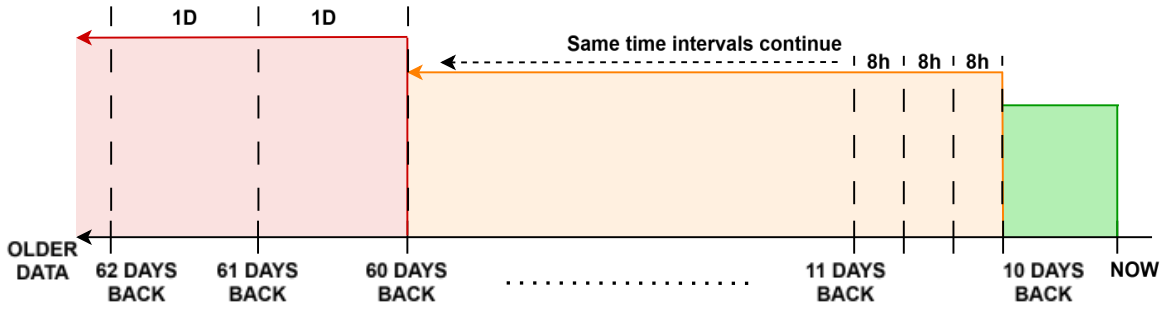


The main idea here is to find the maximum quantifier value in the set time interval.

The timeline is divided into smaller parts – time intervals. This time interval is set in DDS setting window. In this case, for short time reduction it is 8 hours interval for data older than 10 days. And it is 1 day interval (24 hours interval) for the long time reduction, it means for the data older than 60 days.



Reduction starts on 10th day back from now (orange part of the graph – it is **short time reduction** to be exact). It is set in DDS parameter 'Reduce data older than 10D'. This short time reduction timeline is separated into smaller intervals – each of them lasts 8 hours (8h in the picture).
Time of intervals is changed when **long time reduction starts**. Based on our parameters, it is on the 60th day from now (red part of the graph). It is set with the parameter 'Reduce data older than 60D' under Dynamic (long time reduction). Now, each interval is 1 day long (1D in the picture).



Now, when the timeline is separated into smaller time intervals, the reduction is searching for the **maximum** quantifier value in each time interval. This interval's maximum is kept after the reduction. Then it can be proceeded to the previous time interval (and search for maximum quantifier value here).

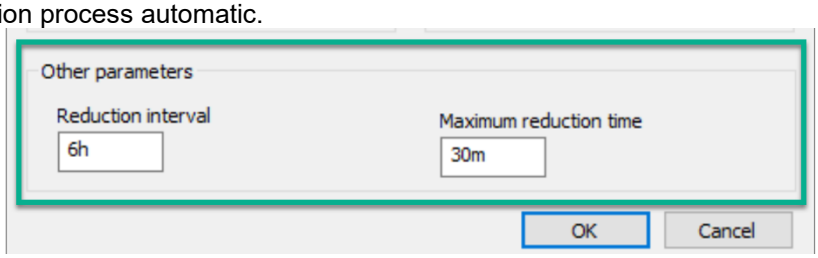
Table of quantifiers for particular measurements

What is the quantifier? It was not mentioned in reduction explanations above, so it is necessary to do it here. When you think of static data (e.g. overall value), it is clear how measurements will be compared with each other. Static measurements are basically "one number" value/measurements. But in case of dynamics, it is not that easy. Dynamic measurements are arrays of values. It is not one value as in static measurements. How can we compare them? What will be evaluated in such a measurement?
Each measurement in DDS (also the static ones) has its quantifier. It is just one number.
See the table below to know what exactly the quantifier is in particular measurement types. You can see TOT value as a quantifier for dynamics. It is total effective value.

Measurement type	Reduction principle	Data reduction quantifier
Overall	Static	Amplitude
Spectrum	Dynamic	TOT
Time	Dynamic	TOT
Demod Overall	Static	Amplitude
Demod Spectrum	Dynamic	TOT
Demod Time	Dynamic	TOT
FASIT	Dynamic	The highest percentage fault of the overall machine's/bearing's condition
Amplitude+Phase	Static	This is evaluated differently: saved only in time interval.
Speed	Static	Amplitude
ACMT Time	Dynamic	TOT
ACMT Demod Spectrum	Dynamic	TOT
ACMT Demod Time	Dynamic	TOT
Orders	Dynamic	TOT
Orders Spectrum	Dynamic	TOT
Orbit	Dynamic	TOT of signal A + TOT of signal B
Octave Spectrum	Dynamic	TOT
DC	Static	Amplitude

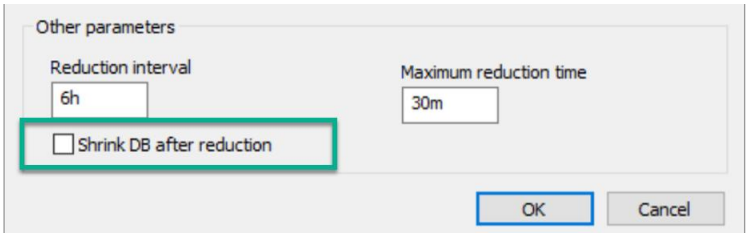
Other parameters

These parameters are in the lowest part of reduction parameters window. Setting of these parameters make the reduction process automatic.



Reduction interval – it means how often you want the data reduction to be done. You don't have to run it manually; it is repeated in this set time interval.
Note! Manual starting of reductions are located under 'Tools' tab in DDS. It is similar window like for this online reduction, but it is not automatic. See more information about manual reduction in DDS manual.

Maximum reduction time – data reduction takes a lot of time if lot of data is saved. This parameter affects the maximum time of the reduction. If the reduction is not completed in this maximum reduction time it is stopped in that position. When next data reduction comes, it will continue from that position where it was stopped.

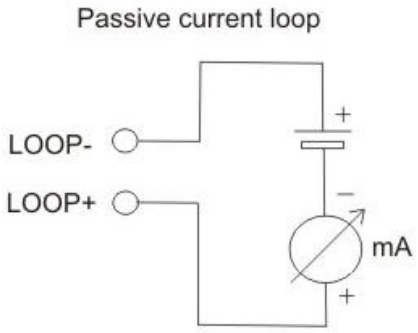


Shrink DB after reduction (checkbox) – this parameter is available only for **Microsoft SQL databases**. When the reduction is done, database size is shrinked – it means after reduction process, the database has smaller size.

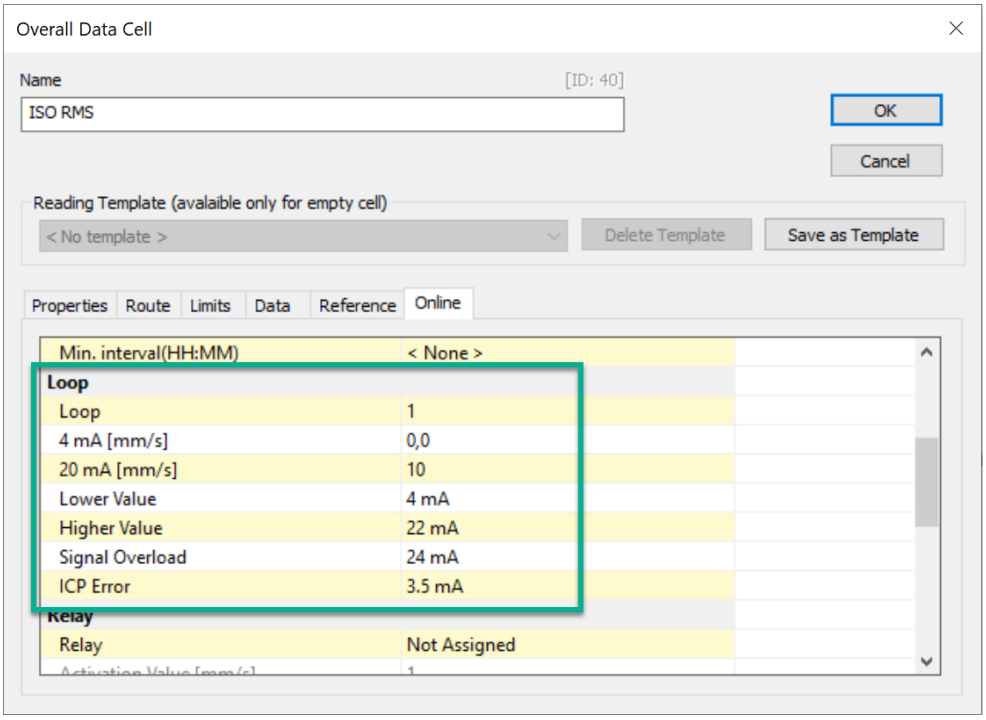
Loops and Relays

Current Loops in A3716

Analog 4-20 mA current loops are commonly used for analog signaling in industrial control instruments. Current loop outputs of actual value are used in control systems (PLC).
The current loops used in the A3716 are isolated from measuring circuits. They must be externally powered (they use passive mode).



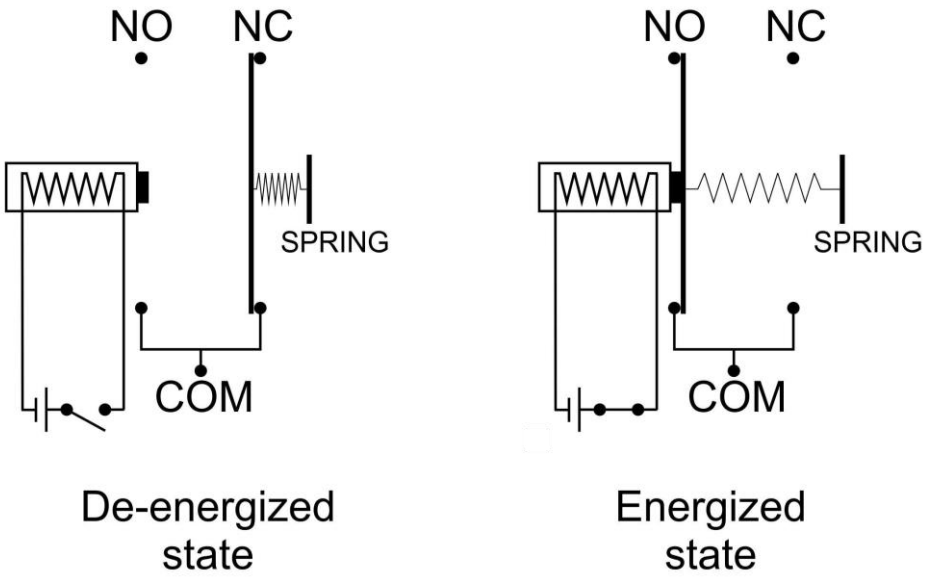
Loops parameters are set in DDS. Current loops can be used only for static (e.g. overall values) measurements. You can find it under 'Online' tab in 'Properties' of data cell window. You need to scroll down to see them.



Loop – current loop number where measurement is ongoing,
4 mA and 20 mA – the lowest and the highest range for current loops values, the quantity depends of measurement quantity. Based on the example above 0 mm/s is 4 mA on the loop output and 10 mm/s is 20 mA on loop output.
Lower/Higher value – you can set mA values, which are send in case that measured value is under the range or over the range. It means, when measured value is out of the range 0 – 10 mm/s, you define what value is shown on the output. **Example:** we set this range for current loops: 0 mm/s as 4 mA, 10 mm/s is set to 20 mA. Measured value is 12 mm/s. It means that this value is higher than defined range values. Based on the screenshot **Higher Value** is set to **22 mA**. So, in the current loop output is value 22 mA. It works the same way for the parameter Lower Value.
Signal overload – mA value sent when the A3716 input is overloaded
ICP Error – mA value sent in case of ICP® error

Relays in A3716

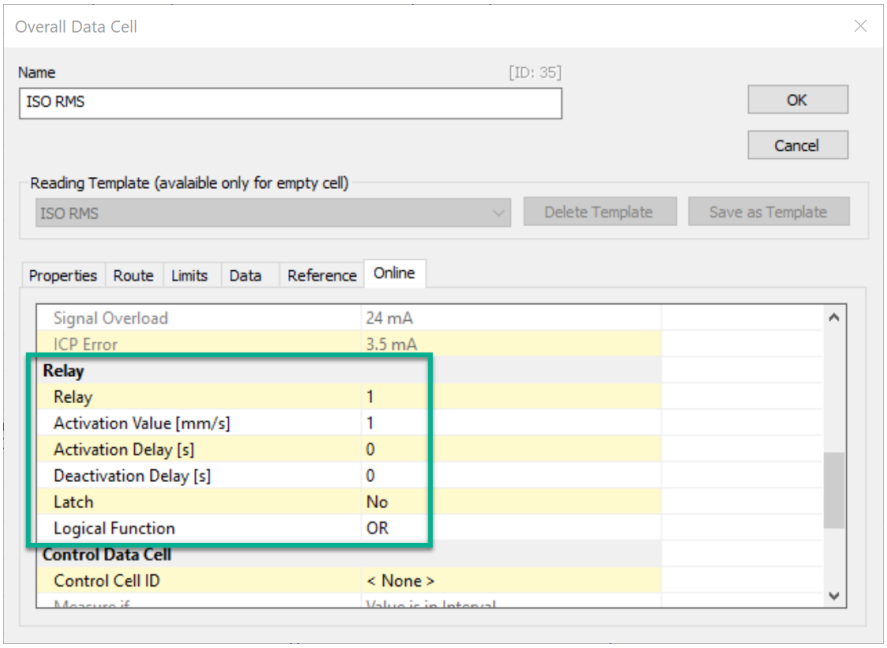
Two relay states exist. Energized (the power is connected to coil) and de-energized (no power sent to coil).



Legend:
NO – Normally Opened (normally means that the coil is not powered),
NC – Normally Closed,
COM – common – standard electrical terms.

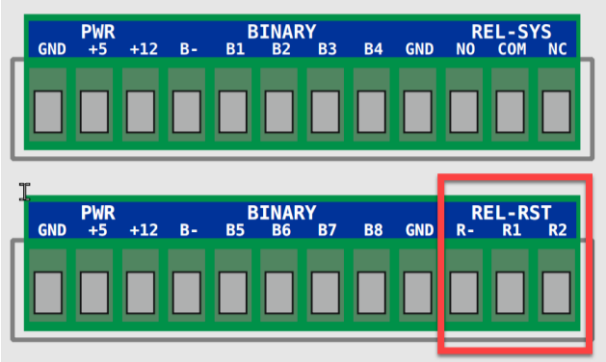
The order of the contacts does not matter. The important is the description of COM, NC and NO, which tells its function. When the relay is not powered (deenergized), it has COM and NC contacts connected. After applying voltage to the coil (energized), the contact switches and connects COM to NO.

Relay parameters are set in DDS. Relays can be used only for static (e.g. overall values) measurements. You can find it under 'Online' tab in 'Properties' of data cell window. You need to scroll down see them.



Relay – relay number used
Activation Value – the measured value which switch the relay
Activation/Deactivation Delay [s] – delays for activation and deactivation

Latch – if latch function is used, then deactivation is done only manually. Use REL RST contacts (rear panel) and connect 4-20V to **R-**(ground) and **R1** or **R2** (voltage).



As latch relay can be little bit difficult to understand, **let's describe it on following example:**
The factory initial state of the relay is de-energized (i.e. NC and COM are connected). The ISO RMS (10-1000Hz) value is measured on the machine. When the RMS value will exceed 1 mm/s, then the relay will switch the red light in a control room.
If the Latch = NO (it means do not hold): When the vibration value will decrease under the 1 mm/s, then the relay will switch off the light.
If the Latch = YES, then the relay will not switch off the light when the vibration decreases less than 1 mm/s. The relay keeps the switch ON until it is manually switched off (through the use of REL–RST).

Logical function – logical function OR/AND which is used. This is used when one relay is assigned to more measurements.
For example, imagine that one relay is assigned to ISO RMS on 4 individual points.
Logical function **OR** is used. The relay is activated when at least ONE data cell activates it.
When logical function **AND** is used, then relay is activated when ALL 4 data cells activate it.

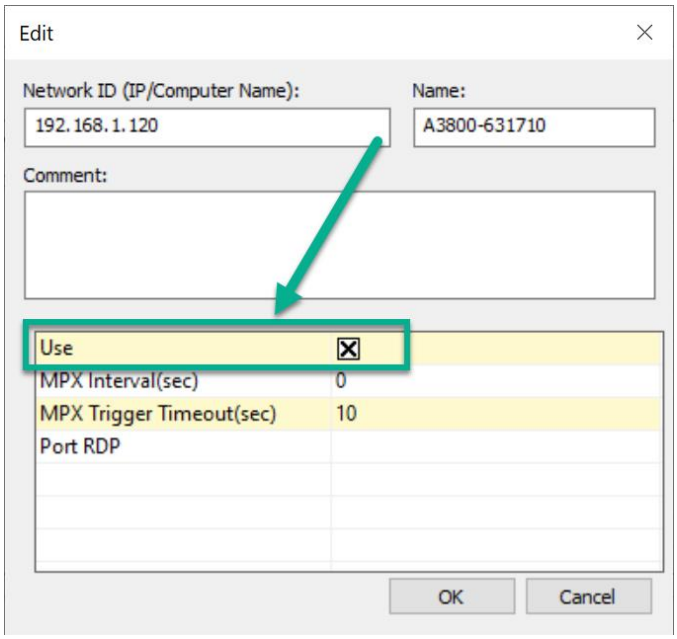
Note! Relays and loops module for A3800 are described in individual manual. It is available on Adash website.

Temporary stop of readings

Readings can be stopped easily for whole online unit, for one measure point (it means one channel) or just for one data cell.

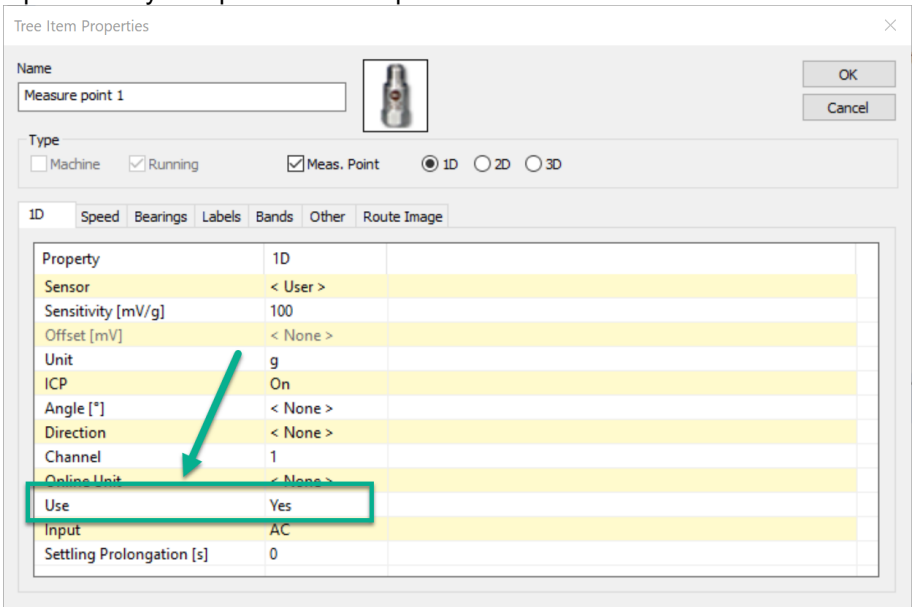
Online unit

To stop readings for whole online unit you can follow steps below. It is useful for example when you need to repair your machine. You don't need to measure vibrations until the machine is working well again. So, you can disable whole online unit which is taking measurements on this broken machine.
Go to 'Online' tab in DDS – pick your online unit type (eg. A3800) – choose online unit from the list and click on 'Edit' on the right side of this menu window.
Unmark check box '**Use'** in this 'Edit' window and click OK. After this, online unit will not take any readings.



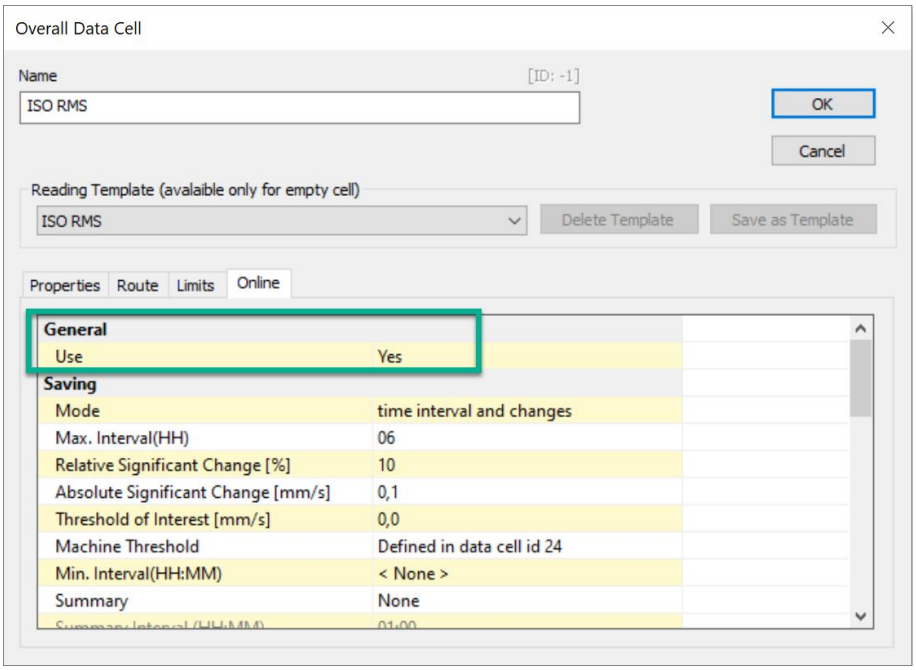
Measurement point

If you need to disable (temporarily) all measurements in measurement point, you can simply do it. Open the properties of selected point and set '**Use (Send to Online)**' to **No**. It is available for all point dimensions (1D/2D/3D).
This could be useful for example when the sensors cable is broken. You just disable affected measurement point until you replace the corrupted sensors cable.



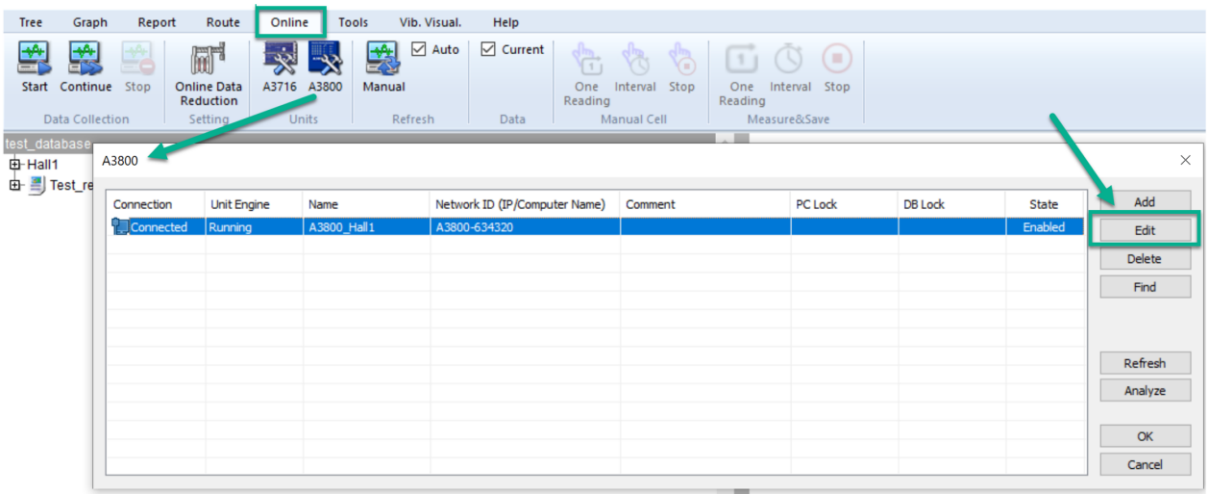
Data Cell

To disable one measurement, open properties of selected data cell, go to Online tab and set the **'Use'** to **No**.

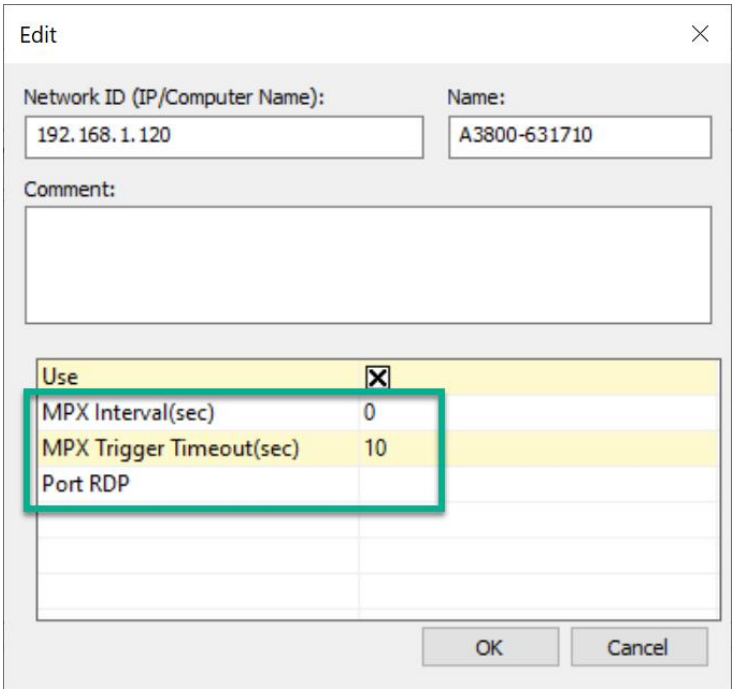


A3800 MPX Properties

Online unit A3800 contains a multiplexer. It is used for switching between the measurement channels. Parameters – such as interval and trigger timeout – can be set for the multiplexer (explained below). Multiplexer properties are set or changed in 'Edit' window. Go to 'Online' tab. Select online unit type. Click on 'Edit' button.



'**Edit**' window appears.:

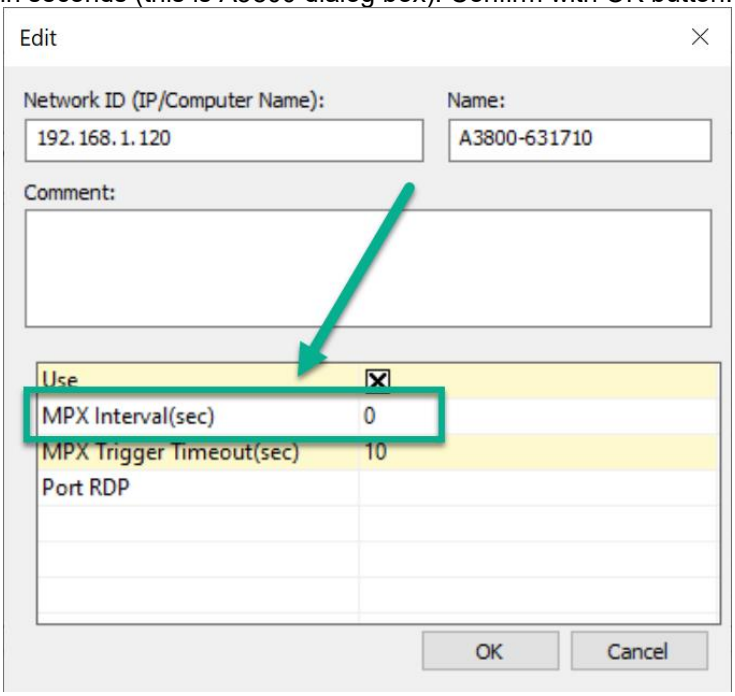


You can edit here the IP address of online unit (it does not change IP address of online unit!), its name, add comment if you want to, set the multiplexer properties (MPX Interval, MPX Trigger Timeout) and define RDP port (port for remote desktop connection).

MPX Interval

MPX interval is a parameter which is used to set time interval for multiplexer switching. When this time interval is exceeded, then multiplexer switch to next measuring channels. For example, when you set MPX time to 1 minute (you need to fill in 60 seconds), then you measure on first channel group (channels 1-4) for one minute. Afterwards multiplexer switches to second group of channels (channels 5-8, etc.). Measurements are taken repeatedly during this set time interval. It will not take only one reading. Saving depends on the measurement data saving parameters.

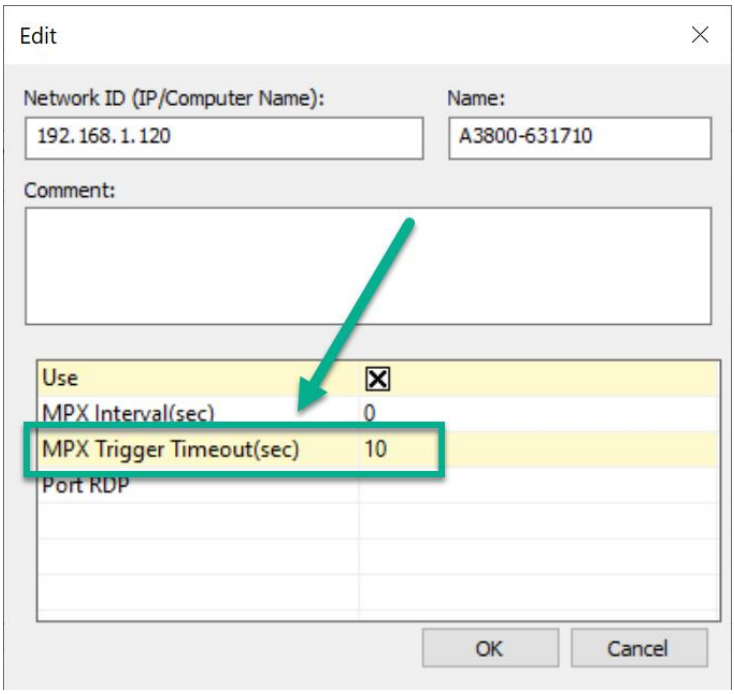
MPX interval is set in seconds (this is A3800 dialog box). Confirm with OK button.



Note! Default interval value is set to 0 seconds. In this situation the multiplexer is switched after one measurement of all defined data cells.

MPX Trigger Timeout

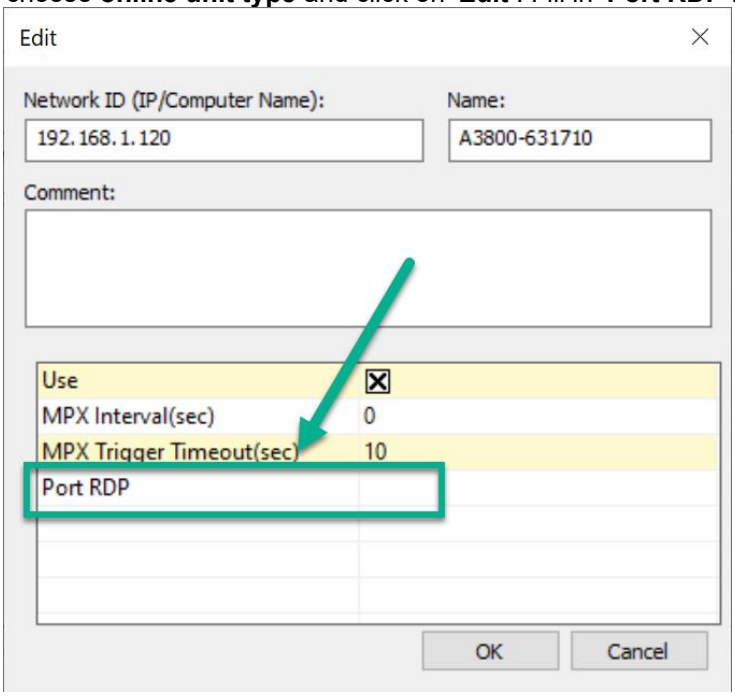
It is parameter which defines how long multiplexer should wait for trigger (if trigger is required, for example tacho) before it is switched to another channels group. It is value in seconds. Confirm with OK button.



Port RDP

RDP (Remote Desktop Protocol) is a Microsoft proprietary protocol that enables remote connections to other computers. Standardly this connection is assured through port **3389**. In case you would like to use different port for remote connections, it needs to be configured in online unit (in production). When different port is used, you can fill in directly in DDS (so you don't need to enter it manually in window for 'Remote desktop connection').

Go to '**Online'** tab – choose **online unit type** and click on '**Edit'**. Fill in '**Port RDP'**. Confirm with **OK**.

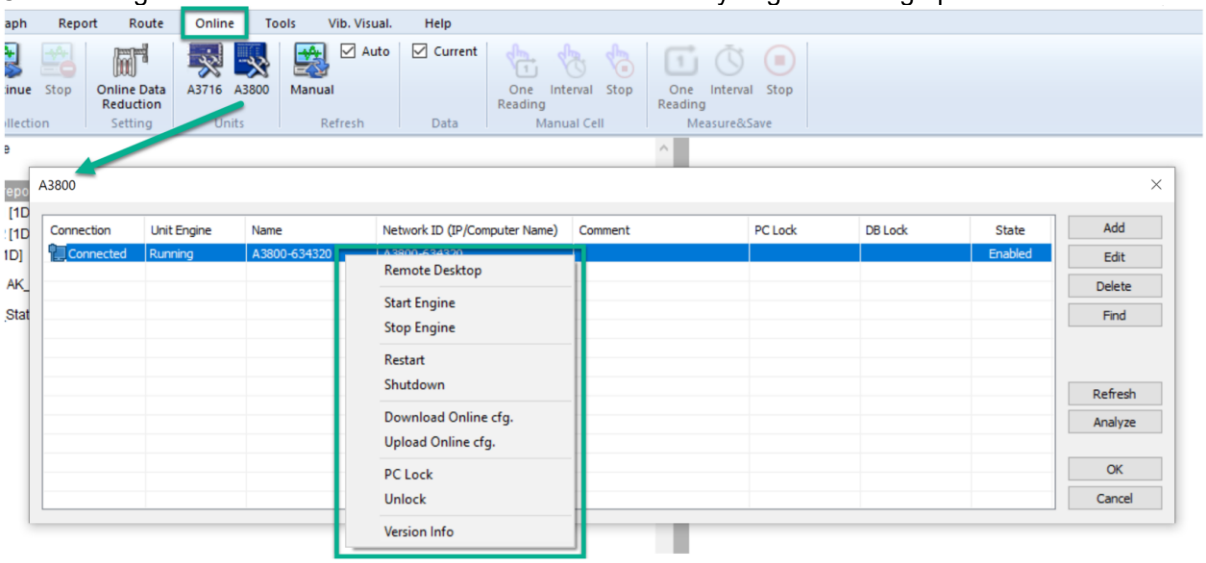


Note! If no RDP port is shown (as in the screenshot above), it means that for remote connection there is set default port number **3389**. It may be important to change RDP port because of company security policies. Some companies disable the default port 3389 for remote desktop connection.

Advanced functions

There is set of advanced functions for online units. To get them, go to tab **Online**. Pick online unit type – **A3716** or **A3800**.
Every online unit contains **MeasEngine** software. It is performing measurements, collects data and provides them to Data Manager (part of DDS).

Click with right mouse button on the selected online unit and you get following options.



Functions description

Remote Desktop – opens window for remote desktop connection, enter username and password to your online unit and confirm with OK – you are connected.
Start Engine - starts MeasEngine of online device.
Stop Engine - stops MeasEngine of online device.
Restart - remotely restarts the online device. Online unit is turned off and on again (restarted) remotely.
Shutdown - remotely turns off the online device, turn it on again with power button on online device.
Download Online cfg. - downloads the configuration file. This configuration file contains data saving parameters. It is valid for older databases (for older DDS version) where data saving parameters was not set directly in DDS.
Upload Online cfg. - once you made changes to configuration file, you can again upload it to online unit.
PC Lock - locks the online device only for your computer. Name of your computer is shown in the column PC lock for the unit. More information in **PC Lock/Unlock**.
Unlock - unlocks the online device for everybody. It unlocks the columns PC Lock and DB Lock (you can see it in the screenshot above). More information in **PC Lock/Unlock**.
Version Info - displays a detailed description of the device.

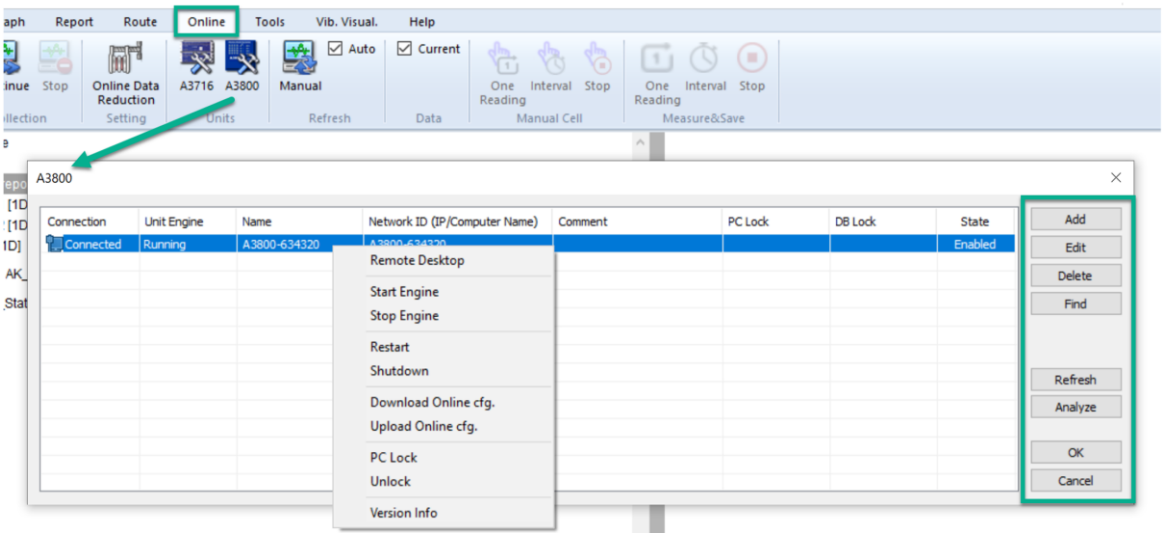
PC Lock/Unlock

Just one computer should have the access to online unit to change the configuration.
When you use the **PC Lock function**, your computer is registered in the unit as the only one computer which can change the configuration. No other project (database) or PC can lock this online unit for their data collection.

Unlock function is used to unlock online unit from your PC and also the database when you no longer need to work with it (e.g. you want to free the online unit for different project to collect the data, etc.).

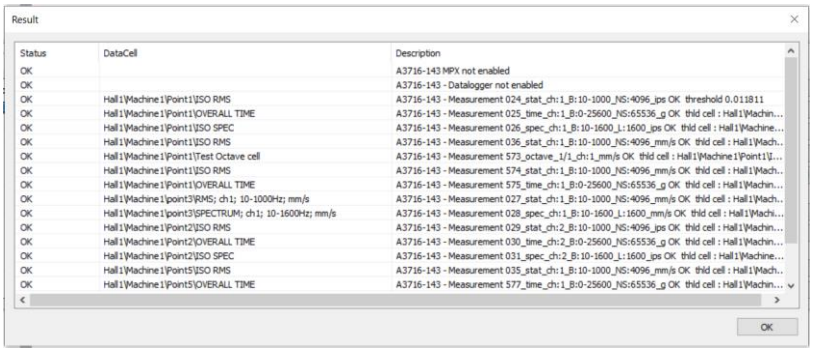
Note! When you start the data collection, online unit is locked by your computer and the database. No other project can be sent to online unit for data collection in that time.

Buttons descriptions



Add – Opens the window to add new online unit to the project.
Edit – Opens edit window. You can edit and change the settings for individual online units here.
Delete – Delete the selected online unit from the list.
Find – Searches for online units connected in the same network as your PC. If there are some, you will see them in the new window.

Refresh – Refreshes the list of online units in this window.
Analyze – Opens a new window. You can see what configuration (data cells, settings, …) was sent to online unit.



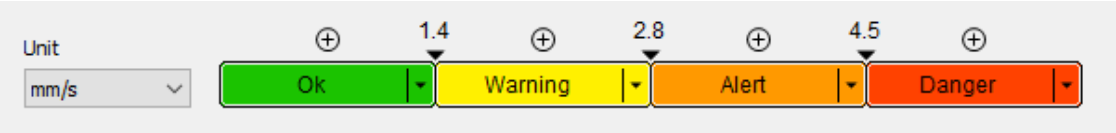
OK – The changes in this window are confirmed and saved. The window is closed.
Cancel – The changes in this window are cancelled. The window is closed.

Email notifications

DDS allows sending of email notifications when limits defined in DDS are exceeded. Notifications are being send from the computer running the Data Manager (the computer where the online data collection was started). The Data Manager processes the data in packages, i.e. once every X minutes downloads the data from all online devices and stores it in a database. Notifications are always processed while downloading this data, and therefore the response speed to direct value increase is proportional to the download interval settings (DDS -> **Tools / Global Settings / Online / Data Transfer [s]**).

Measurement limits and Machine alarms

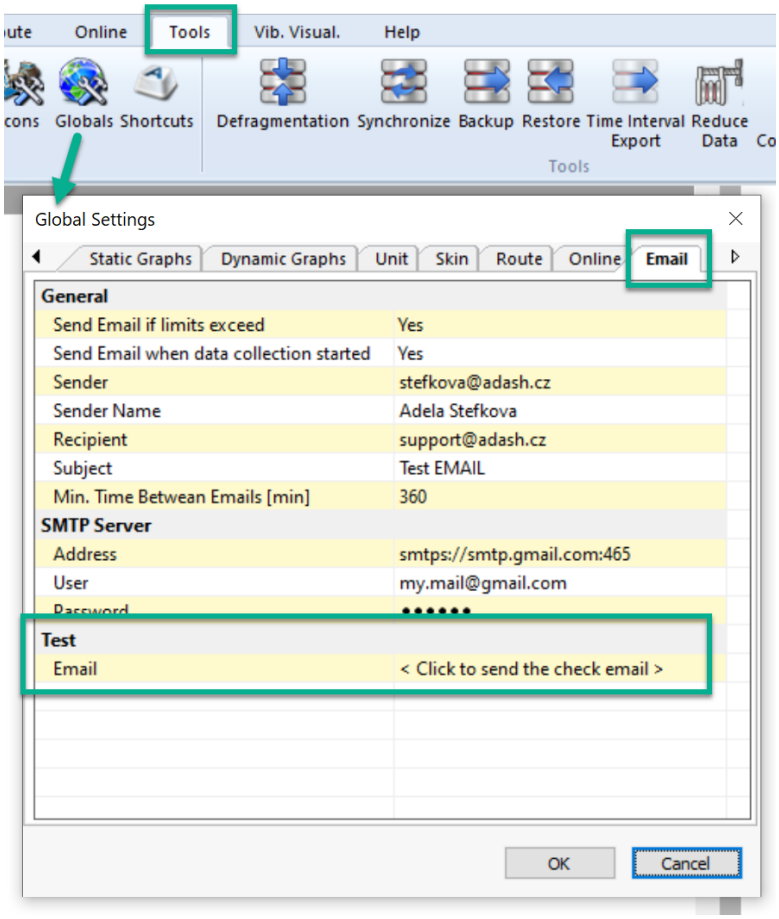
User can define limit values for static measurements. Alarm is activated (traffic light colors) once the limit values are exceeded.



Alarms are assigned to a certain interval between limit values as per picture above.
If some alarm occurred (it means that some of the set measurement limits was exceeded), Data manager sends the email notification immediately about it. If there is a lot of emails like this generated and sent, you can set the time interval between these alarm notifications.

Outgoing email server

Data Manager does not create a mail server, but it uses the client's mail server to send notifications.
It is necessary to set parameters of outgoing mail server (SMTP server) correctly in order to send notifications. Outgoing mail server settings is located in **Tools/Globals Settings/Email**. All items have to be entered correctly. Use an Email Test button to check email notification functionality. You get error message when something is not set correctly.



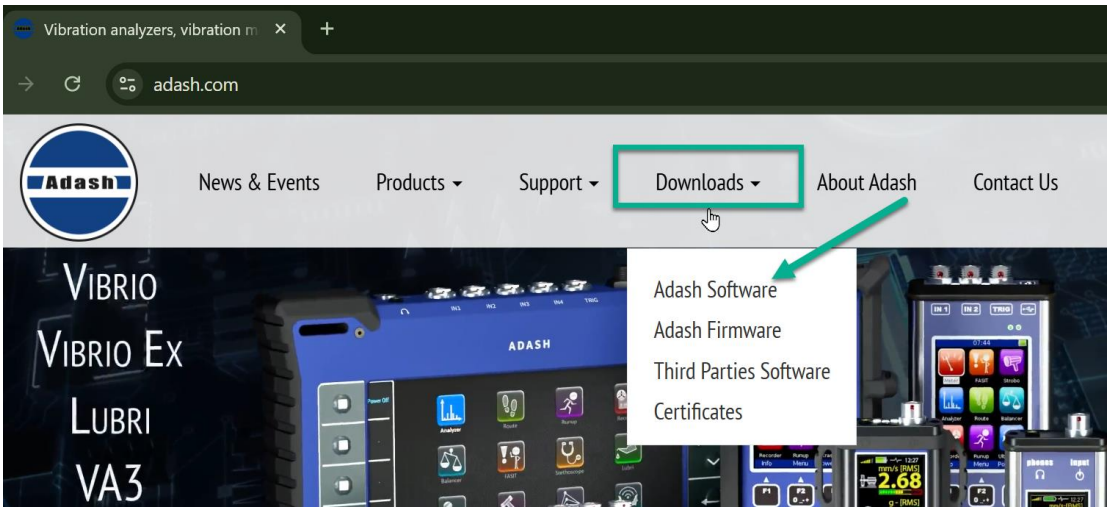
Send email if limits exceed – YES/NO – email is sent when alarm is exceeded
Send email when data collection started – YES/NO – email is sent when data collection is started

Sender – displayed sender's address. It does not have to bet be the same as SMTP server user.
Sender Name – displayed sender's name.
Recipient – email address of email notification recipient
Subject – e-mail notification subject
Min. Time Between Emails [min] – minimal time between sending emails. It reduces number of emails from one machine.
Address – your SMTP server address (for example: smtps://smtp.gmail.com:465). Address requires "smtp://" or "smtps://" prefix to determine correct protocol.
User – user account (for example: my.mail@gmail.com)
Password – user account password
Email Test – sends testing email

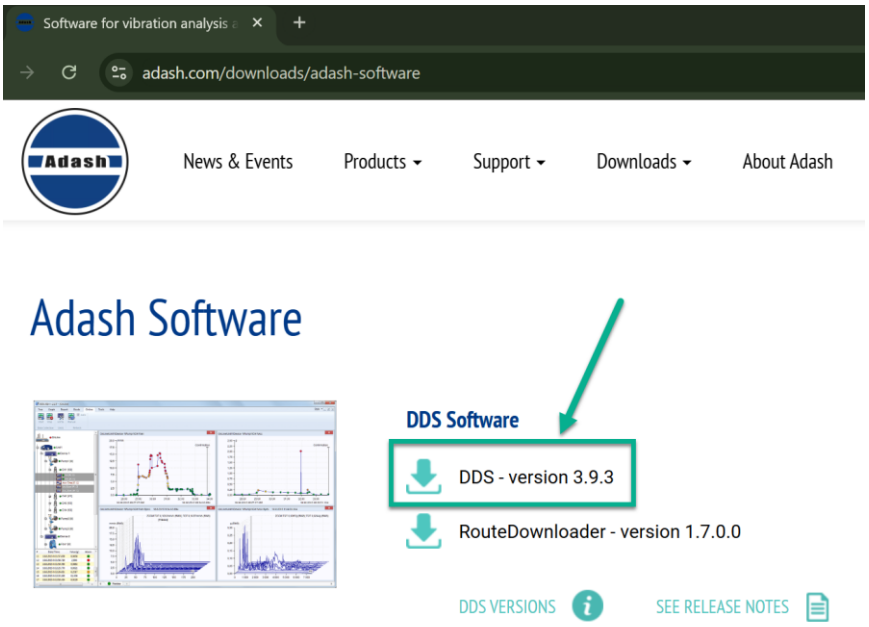
DDS update

DDS cannot be updated while data collection is running. If you need to update DDS, please keep in mind, that it is **always necessary to stop** data collection first.

Installation file of latest DDS version is always uploaded to Adash website and you can download it for free.
Just go to www.adash.com. Click on **Downloads** – **Adash Software**.

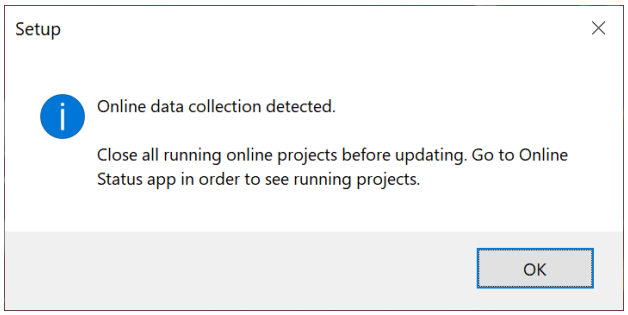


See **DDS Software** section and download latest version of DDS.



When installation file is downloaded, double click on it and run the installation setup.

If you forgot to stop the data collection before DDS is updated, you get following window during the installation process:



Stop the data collection in DDS. Run again the installation file for DDS.

Go through installation itself.

Once it is done, you can start data collection again (Online tab in DDS – button Start/Continue).

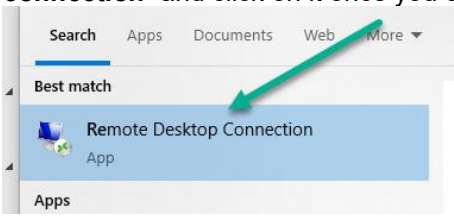
Advanced features

You can find more information about advanced features such as remote desktop connection or virtual unit in this chapter.

Remote desktop connection

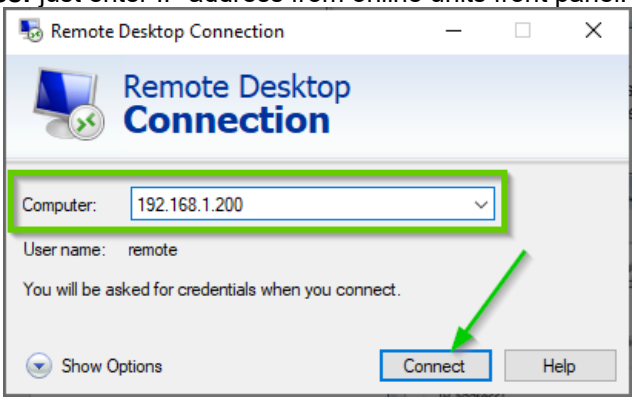
Remote desktop connection is a program which allows you to control another PC on the network from your PC.
Remote desktop connection can be used when online unit is connected to network. It can be connected with ethernet cable directly to your computer or to switch.

Connect unit to your computer. Change IP address of your computer as described above in chapter **Online unit connected to PC with ethernet cable**. Now you can use remote desktop connection.
How to connect remotely is described below:
Go to Windows start menu on main panel (just press on the keyboard).
Start to write ***'Remote desktop connection'*** and click on it once you can see it in results.

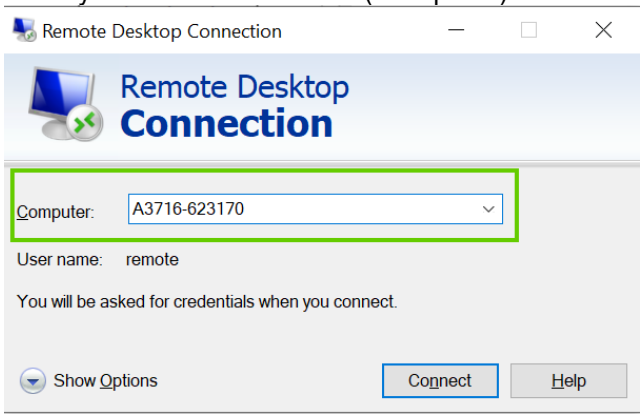


Fill IP address or name as a computer.

Connect with IP address: just enter IP address from online units front panel.



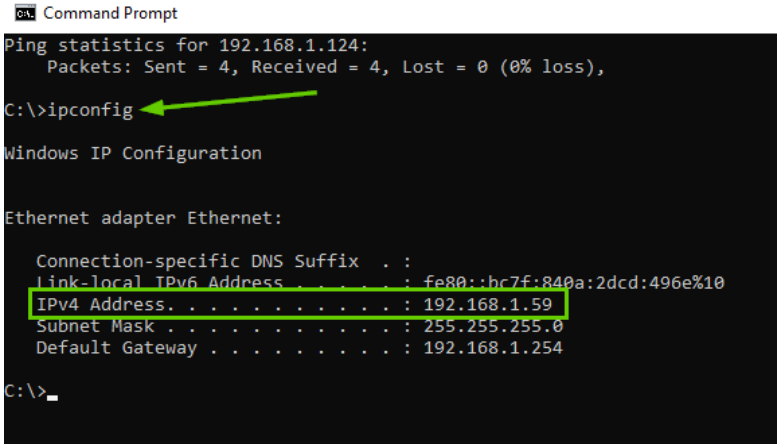
Connect with name: just enter units name like this **A3716-xxxx** or **A3800-xxxxxx**, xxxxxx is for serial number. Serial number is always written on online unit (front panel).



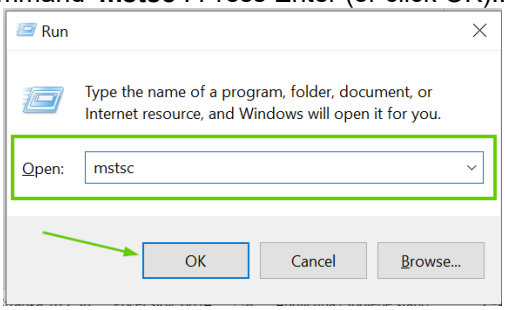
Click ***'Connect'***.

You will be asked for **credentials (login parameters)** once you will connect (username, password). Both are set to '**remote**' from production.

Note! If you set that your online unit obtains IP address automatically when you connect it to the network it is necessary to use online unit's name for connecting via remote desktop.
IP address from front panel of online unit could be (and most probably will be) different than the one obtained automatically. Remote desktop would not connect with IP address from production in this case. That is why you can login with unit's name.
After login you can check what IP address unit obtained (192.168.1.59 in the picture below) when you connect to remote desktop and go to Windows start – open command prompt (cmd) and use command ipconfig.



Faster way to get into 'Remote desktop connection' window is press + R on keyboard. You get following window and fill in command '**mstsc'**. Press Enter (or click OK).:



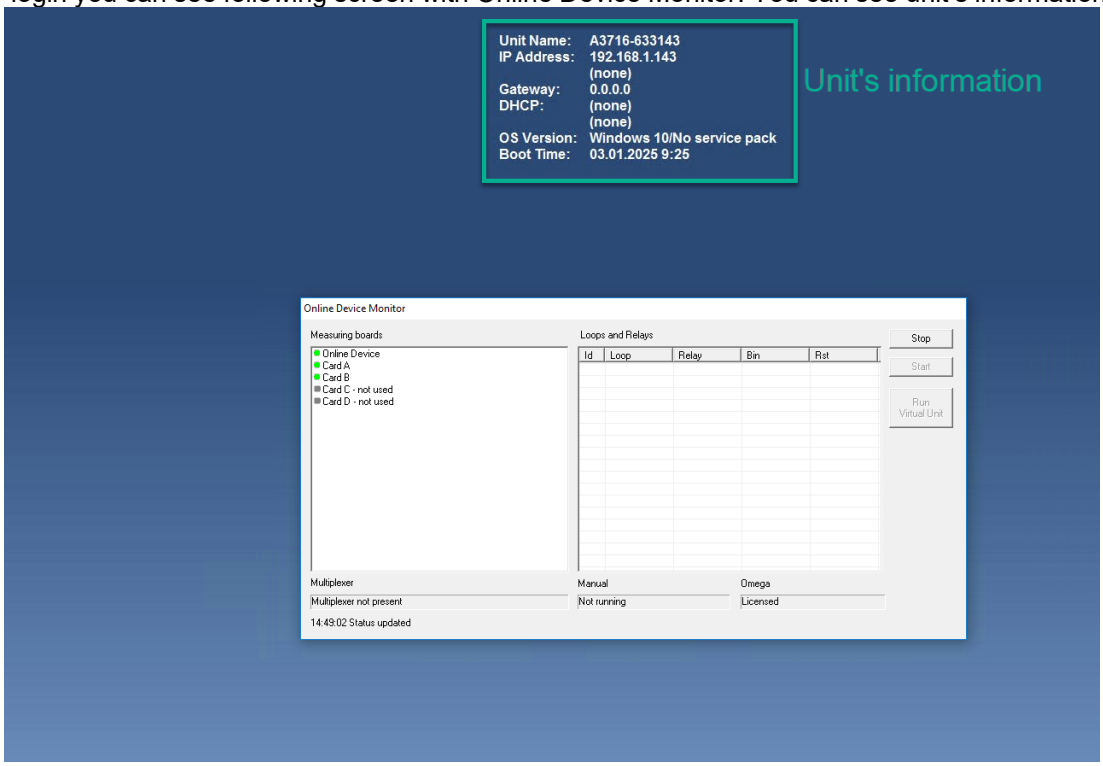
The window for remote desktop connection opens.
Connections - unit as a stand-alone PC and Remote desktop connection - are mostly used for setup (IP address settings, values changes, online unit updates, etc.). These connections are also used for working with **Virtual unit** (described later in this manual).

Operating system

Online units run with Windows operating system. You can connect them as a computer when needed (connect monitor, keyboard, mouse through USB ports). Then you can work with Virtual unit or check Online device monitor directly on online unit itself (Virtual unit and Online device monitor are described later).

You can login with following credentials.
User: **remote**
Password: **remote**

You can also use Remote desktop connection. This connection allows you to work with Virtual unit or Online device monitor (described later) on your computer. This remote connection was described previously in this chapter.
After login you can see following screen with Online Device Monitor. You can see unit's information too.



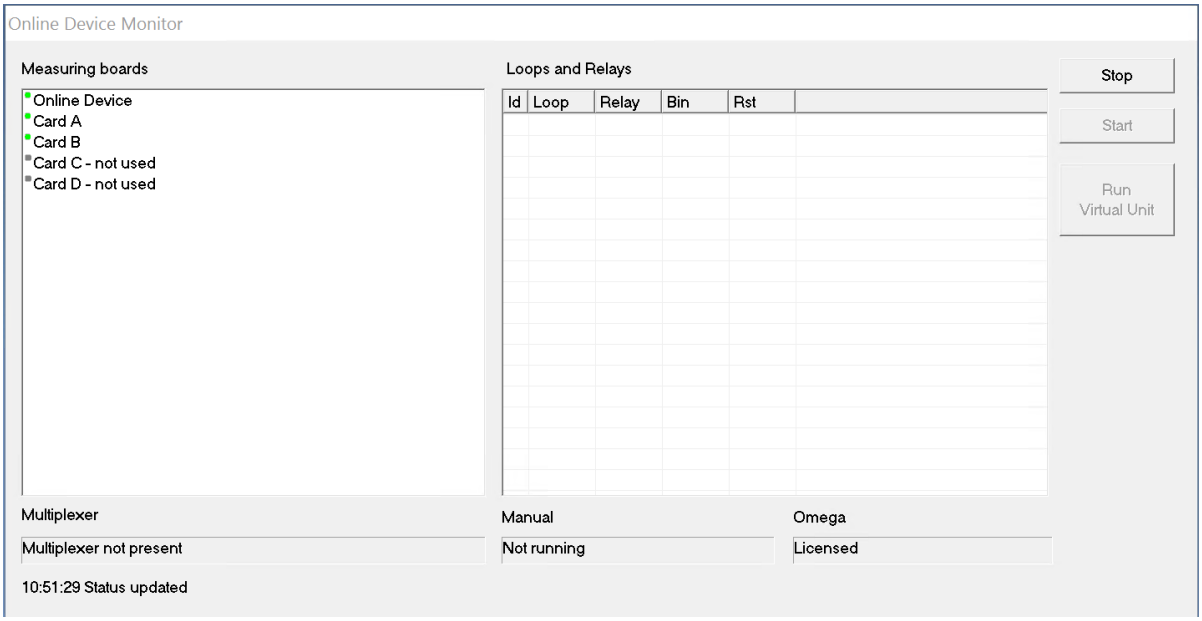
The window contains next information and functions:
Measuring boards – You can see boards where measurement is running – green point. If any error occurred on measurement board you can see it also here.
Multiplexer – Multiplexer status.
Manual – You can see if manual measurements are running or not.
Omega – Shows that Omega software is licensed/not licensed on this online unit. Omega is expert system for vibration diagnostics. See Adash website for more information.
Loops and relays – Show the information about used loops/relays.
Buttons:

- **Stop** – stops the measurements.
- **Start** – starts the measurements.
- **Run Virtual Unit** – opens window for working with Virtual Unit application.

Note! *You can see that button for Virtual unit is greyed in the picture. You can run virtual unit* ***only*** *when measurement in Online device monitor is* ***stopped****.*

Online Device Monitor

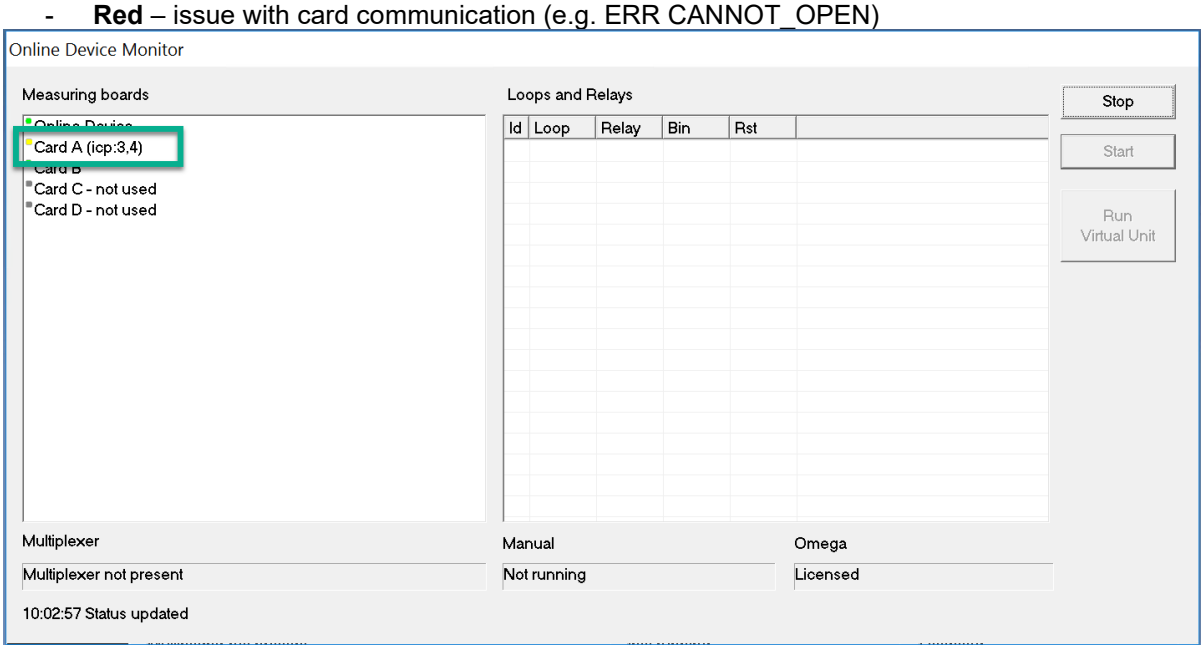
Online device monitor is running on online unit directly as **A3716_Monitor.exe**. Once you check this window, you can see if there is any problem with online unit and its channels. Online device monitor window looks like this:



Measuring boards

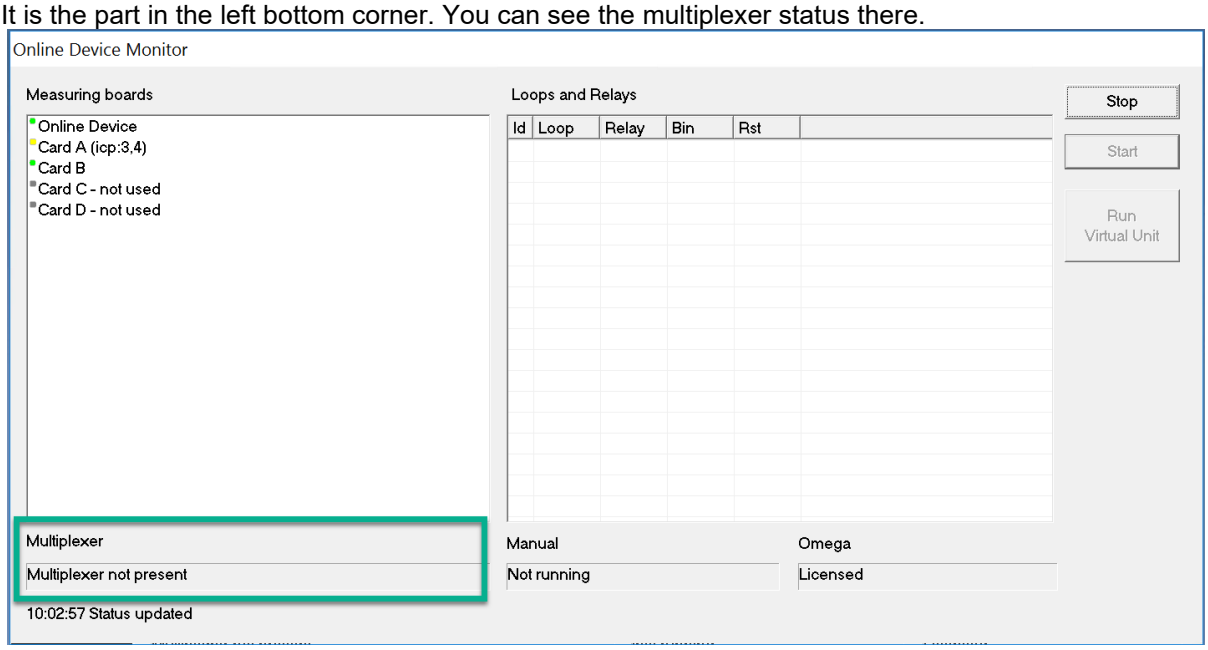
You can see information and errors related to measuring boards in this section. You can see that there is green and red color shown in the screenshot. You can get there only these colors:

- **Green** – everything is working fine with the card
- **Grey** – card is not used
- **Yellow** – card is is use and there is one of the following errors: ICP®, AC/DC Overload
- **Red** – issue with card communication (e.g. ERR CANNOT_OPEN)



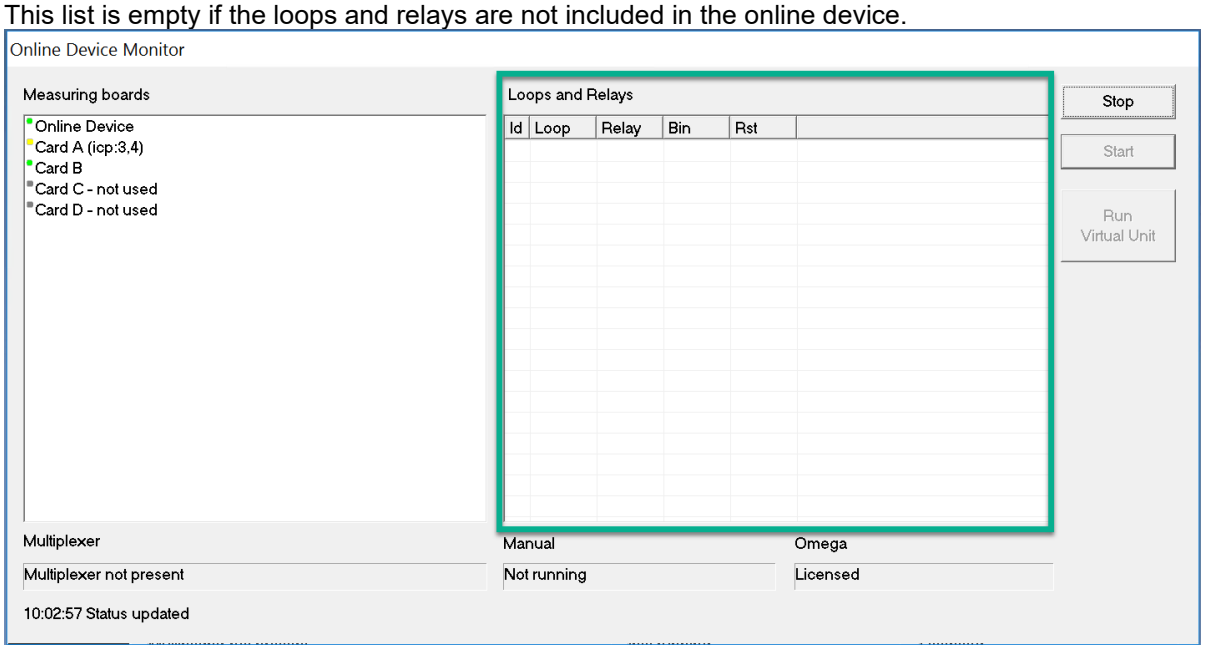
Multiplexer

It is the part in the left bottom corner. You can see the multiplexer status there.



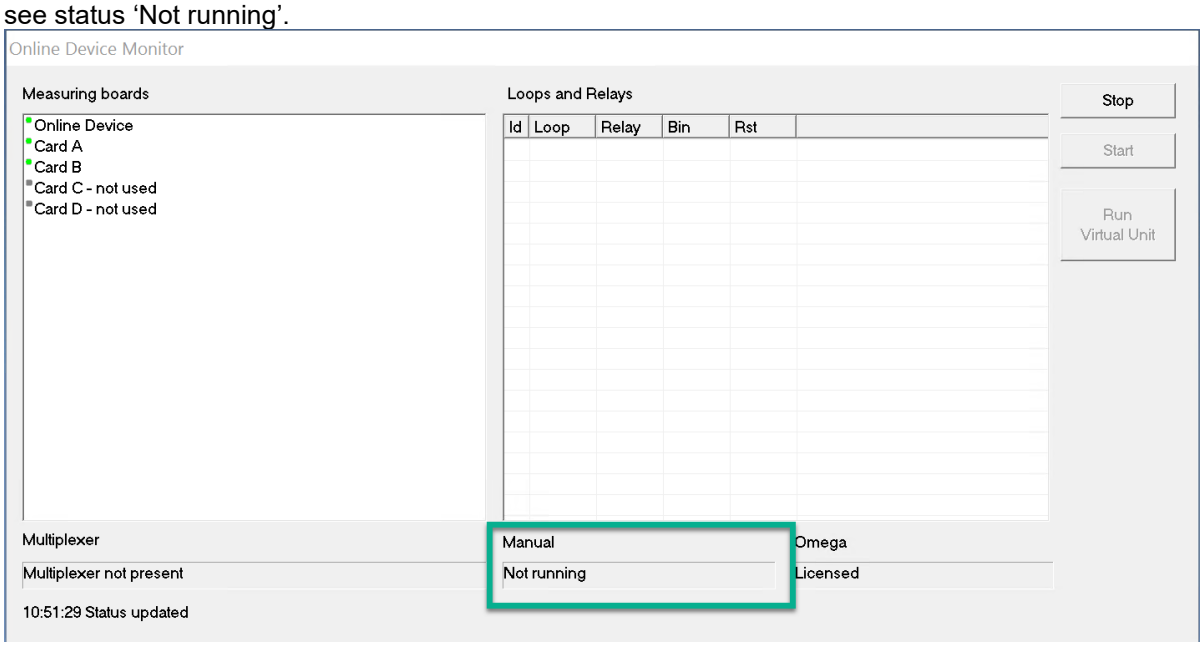
Loops and relays

This list is empty if the loops and relays are not included in the online device.



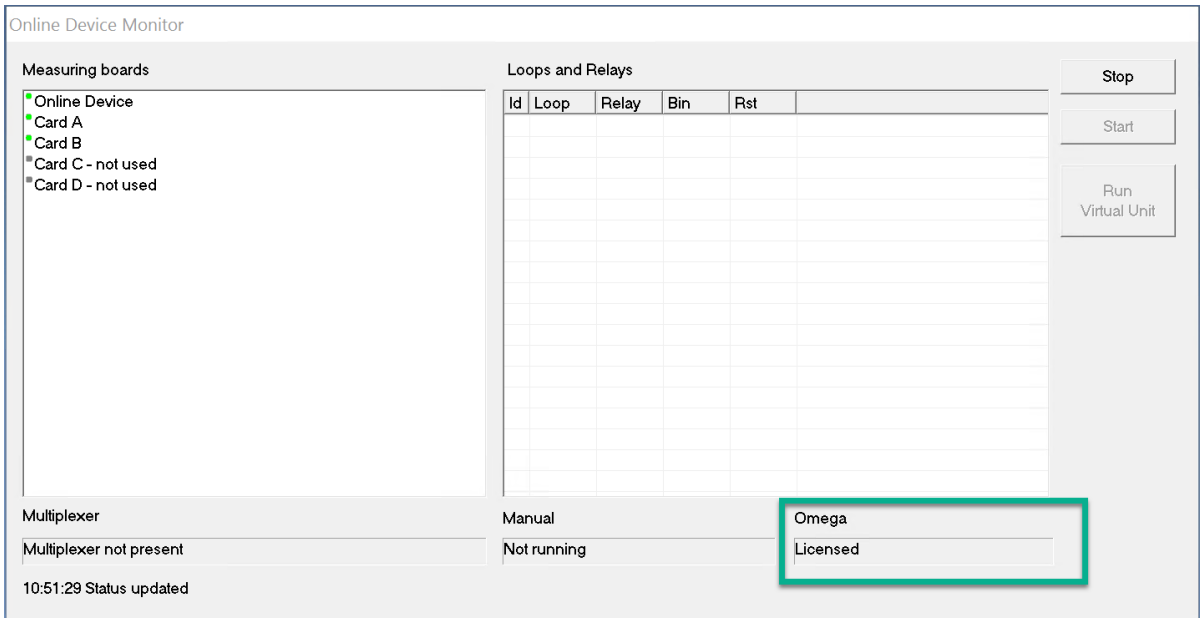
Manual

This part is related to manual data cells. If measurement is not started for manual data cells, you can see status ‘Not running’.



Omega

You can see here if online unit contains license for Omega software or not.



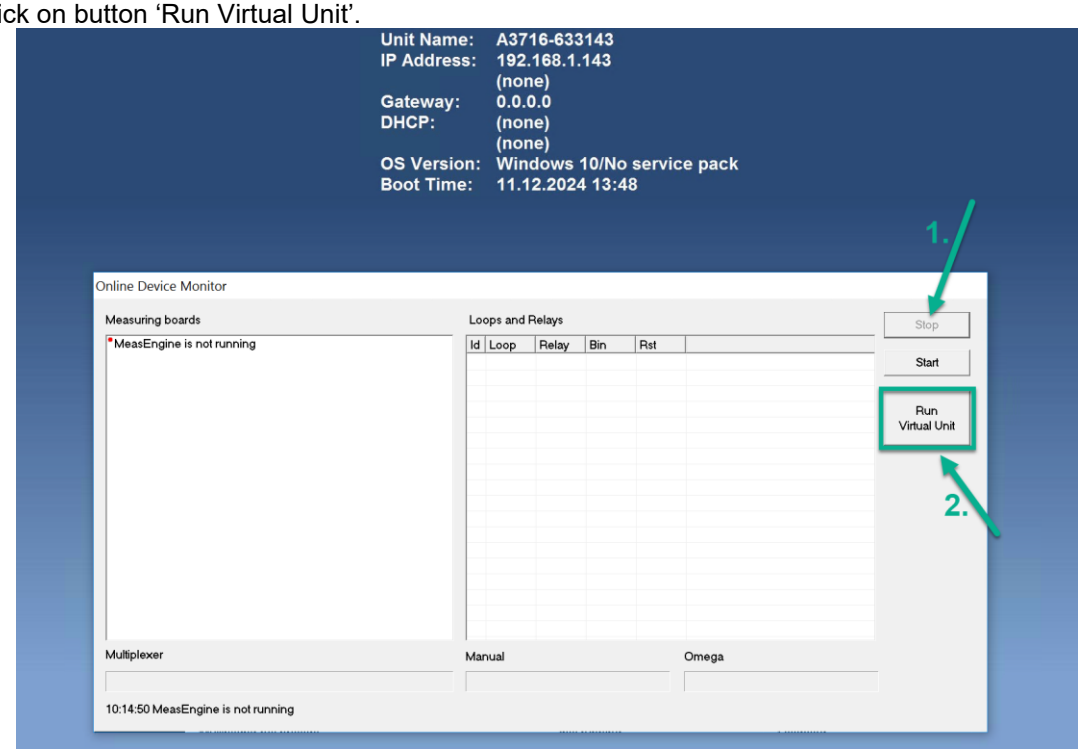
VA5 - Virtual unit

Virtual unit is a software which works basically same as VA5 device. You have it installed in your PC (or directly in online unit) and you can use it for data analysis, etc.
Virtual unit can be launched via remote desktop connection from your computer. You can start it with button ‘Run Virtual Unit’. More information about Virtual unit can be found in manual for VA5 device.

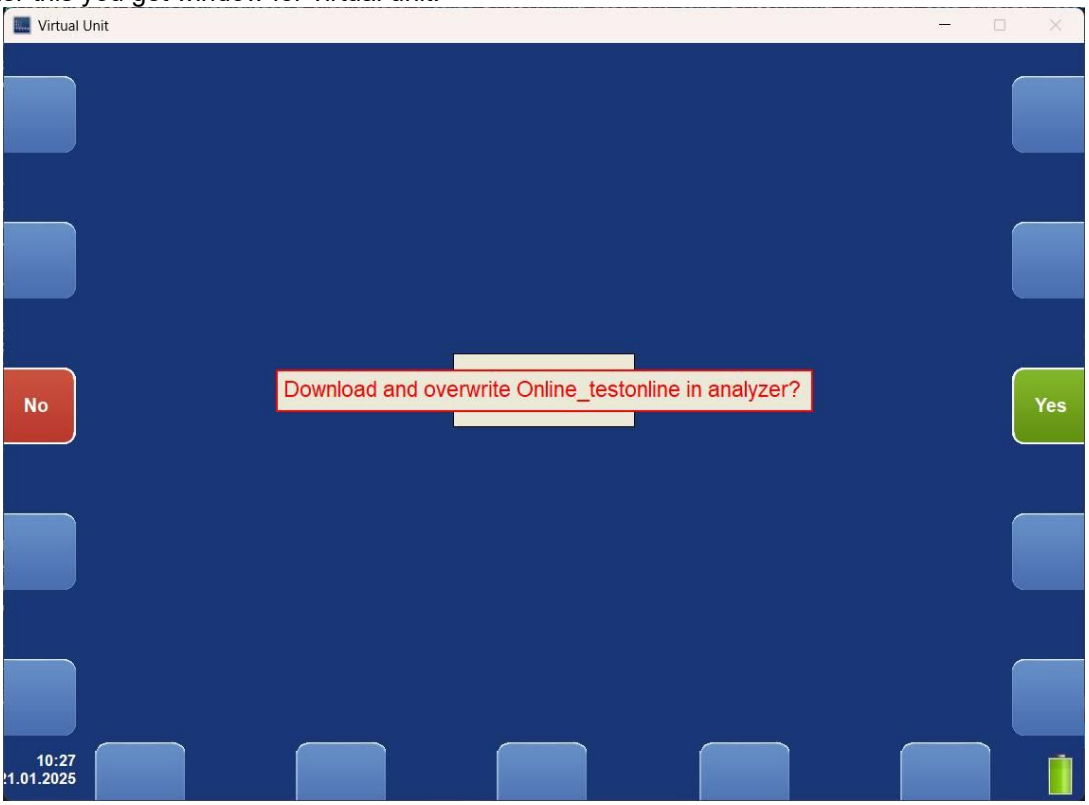
How to run Virtual unit?

Once you are connected to online unit via remote desktop you will get window ‘Online Device Monitor’. Follow steps below to start working with virtual unit.:

1. Stop measurements.
2. Click on button ‘Run Virtual Unit’.

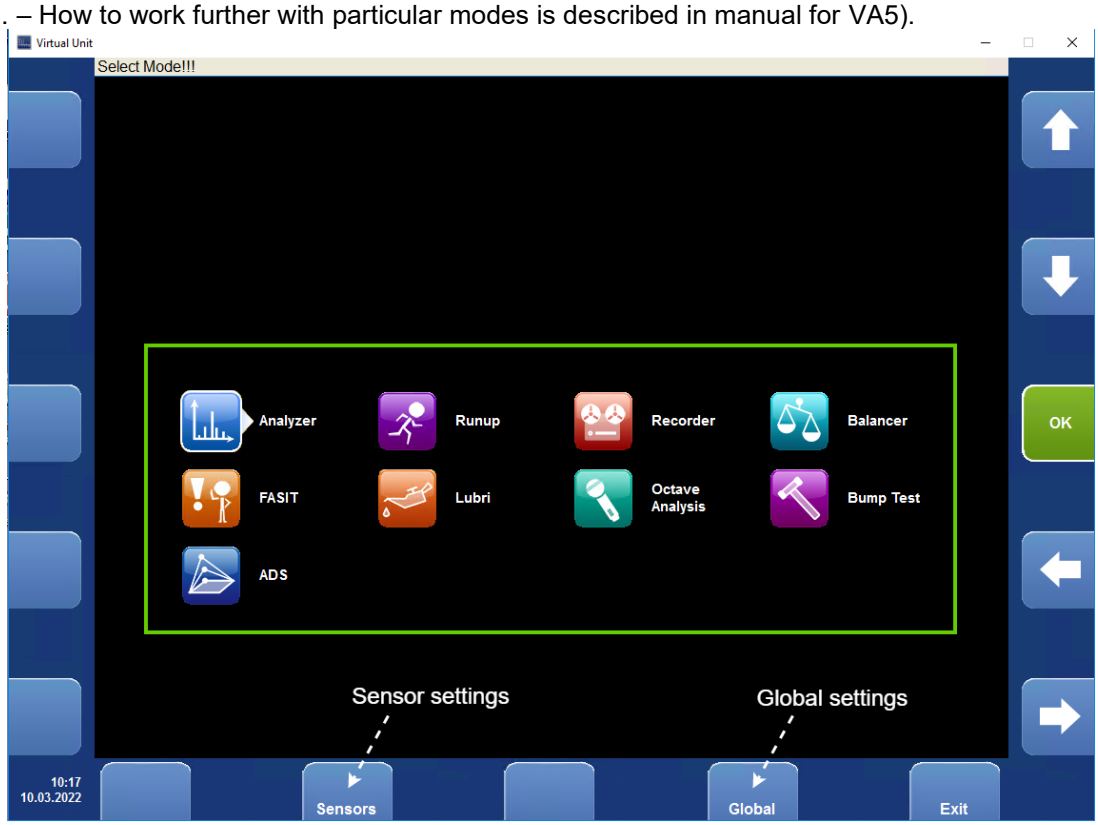


3. After this you get window for virtual unit:

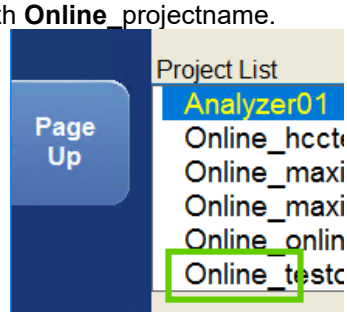


When you launch Virtual unit, you will be **always** asked if you want to download and overwrite the project data from DDS in analyzer (same question is there also for runup).
‘**Yes**’ button – creates online project in Analyzer mode (completely the same settings as in DDS tree structure).
‘**No**’ button – no project will be created in Analyzer for your online project. You can create completely new project and its structure. Or you can open older projects saved in Virtual Unit memory.

4. Now you get main screen. You can choose what mode you want to use (analyzer, balancer, runup, etc… – How to work further with particular modes is described in manual for VA5).



If you decided to download and overwrite your DDS project into analyzer, you can find it in analyzer mode saved under name starting with **Online**_projectname.



You can leave virtual unit window with 'Exit' button or close window as usual with × in right top corner.

Note! *More information you can find in manual for VA5.*

A3716 (A3800) update

This chapter is appointed for advanced users only.

For unit update please follow steps below:

- Connect a keyboard, a mouse and a monitor to your A3716 device (or you can use remote desktop connection).
- Login as:
  - **User**: remote
  - **Password**: remote
- Copy A3716_ver02xx.exe file anywhere to A3716 (eg. folder C:). Use usb flash drive or network to copy it.
- Run it.
- A3716 Setup Wizard will open.
- Choose the language of installation and follow the wizard's instructions.
- Finish the installation.
- Restart online unit.

Online unit restarted. Firmware is successfully updated.

Appendix A – Technical specifications: A3716

Input channels AC:	16 AC, ICP® power supply on/off input impedance 100kΩ integration single, double high pass filter 1 Hz – 12 800 Hz low pass filter 25 Hz – 90 000 Hz
Input channels DC:	16 DC for process values input impedance 100 kΩ (VDC), 250 Ω (mADC)
TACHO inputs:	4 independent TACHO for external trigger speed range 0,8 Hz - 1000 Hz
Input range	AC +/- 12 V peak-peak DC +/- 24 V TACHO +24 V (Trig. Level set to +10 V)
AD conversion:	24 bit, 64 bit double floating point internal signal processing No AutoGain function!
Dynamic range S/N:	120 dB
Frequency ranges:	max. 25,6 kHz (16 Ch, 65.5 kHz sampling, for DC max 8Hz sampling)
Sampling mode:	Fully simultaneous for 16 channels
FFT resolution:	Min. 25 lines Max. 3276800 lines
Data acquisition:	Overall values Time signals FFT real time analysis DEMOD - ENVELOPE analysis ACMT - low speed bearing analysis order analysis user band pass analysis RPM measurement DC measurement Orbit measurement Speed measurement
Signal Recorder:	64 kHz sampling frequency 4 Ch memory consumption 3 GB/hour 4 Ch total recording - 35 hours
Trigger:	free run, TACHO, external (voltage)

General

Memory RAM:	4 GB
Internal data disc:	SSD 128GB
Communication:	Ethernet 1GB RJ45
Temperature range:	-10˚C to +50˚C
Power:	AC 110 - 240 V, 45 - 65 Hz
Case:	19´´aluminium rack
Size & Weight (2U):	430 x 360 x 90 mm 4,7 kg
Size & Weight (3U):	430 x 360 x 135 mm 6,2 kg

Appendix B: Technical specifications: A3800

Input channels AC:	4 - 16 AC, ICP® power supply on/off input impedance 100kΩ integration single, double high pass filter 1 Hz - 12 800 Hz low pass filter 25 Hz – 90 000 Hz
Input channels DC:	4 - 16 DC for process values input impedance 100 kΩ (VDC), 250 Ω (mADC)
TACHO inputs:	1 - 4 independent TACHO for external trigger speed range 0,8 Hz - 1000 Hz
Input range:	AC +/- 12 V peak-peak DC +/- 24 V TACHO +24 V (Trig. Level set to +10 V)
AD conversion:	24 bit, 64 bit double floating point internal signal processing No AutoGain function!
Dynamic range S/N:	120 dB
Frequency ranges:	max. 25,6 kHz (16 Ch, 65.5 kHz sampling, for DC max 8Hz sampling)
Sampling mode:	Fully simultaneous for group of 4 channels
FFT resolution:	Min. 25 lines Max. 3276800 lines
Data acquisition:	Overall values Time signals FFT real time analysis DEMOD - ENVELOPE analysis ACMT - low speed bearing analysis order analysis user band pass analysis RPM measurement DC measurement Orbit measurement Speed measurement
Signal Recorder:	64 kHz sampling frequency 4 Ch memory consumption 3 GB/hour 4 Ch total recording - 10 hours
Trigger:	free run, TACHO, external (voltage)

General

Memory RAM:	4 GB (units before 2022 – 2 GB)
Internal data disc:	SSD 128 GB (units before 2022 – SSD 32 GB)
Communication:	Ethernet 1GB RJ45
Temperature range:	-10˚C to +50˚C
Power:	DC 12 V
Case:	aluminum box
Size & Weight:	117 x 117 x 58 mm (without connectors) 800 g

Appendix C – Older A3800 units

Older A3800 units (devices manufactured before 2022) look a little bit different. There are some differences at the bottom panel. See picture below.

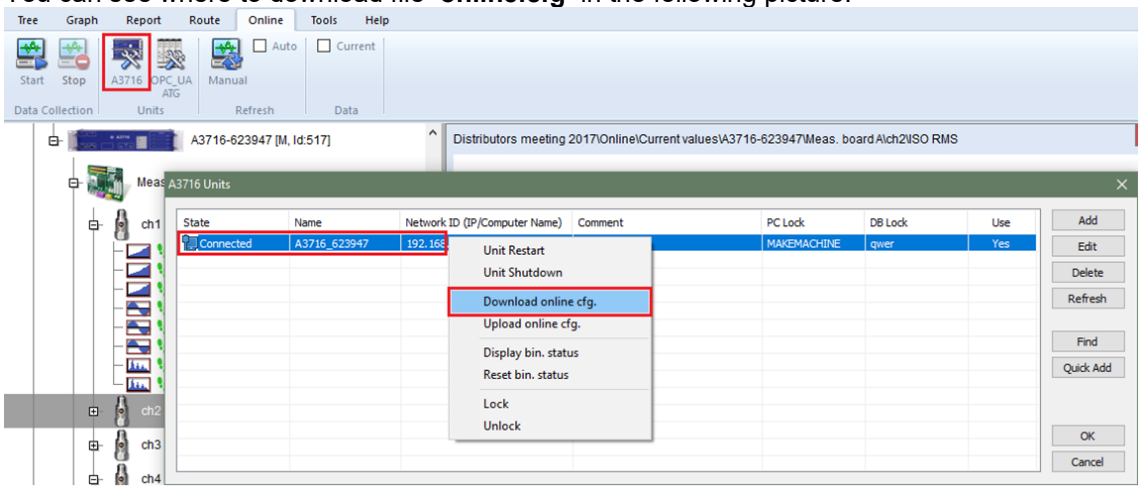
Description:

AUDIO I/O: socked for audio 3.5 jack.
USB 2.0: two USB ports.
ETHERNET: socked for Ethernet connection.
DISPLAY: HDMI display connection
POWER: socked for 12 V DC powering

Appendix D – Data saving for older firmware and DDS

In DDS version 3.5.3 and older, the data saving parameters were stored in cfg file **C:\A3716\data\online.cfg** for each A3716 itself. This file is still used if A3716 FW version is 027804 (and older) or tree was created in DDS version 3.5.3 (and older).

You can edit the **online.cfg** directly in the A3716 unit using the remote desktop connection. Or you can download the file to your PC from DDS and then upload it back after editing. New parameters are valid after the restart of MeasEngine (or the A3716).
You can see where to download file **'online.cfg'** in the following picture:



Code in **cfg.** file looks like this:

```
[Regulator]
all readings=0
short dynamic max samples=4096
statics interval save=30
short dynamics interval save=600
long dynamics interval save=600
adaptive=1
```

Find the section [**Regulator**] (as in picture above) and modify parameters (description of particular parameters is below).

all readings
0 = 'check changes algorithm' or 'time interval savings' is used for data storing.
1 = all data will be saved to database (only for limited time recommended, the disc can be full filled very quickly)

adaptive
0 = 'check changes algorithm' is disabled
1 = 'check changes algorithm' is enabled

short dynamic max samples
In terms of data storage algorithm, measurements are divided into three groups: static (single-value measurements), short dynamics measurements and long dynamics measurements. Each has a different saving strategy.
A dynamic measurement is considered short when its number of samples is less than the value of the short dynamic maximum samples value. Significant changes are saved only for statics and short dynamics. Long dynamics are stored only in a time interval.

statics interval save
Maximum time interval between two saved values (in seconds) for statics.

short dynamics interval save
Maximum time interval between two saved values (in seconds) for short dynamics.

long dynamics interval save
Time interval between two saved values (in seconds) for long dynamics. Remember that significant changes are never checked for long dynamics.

min
Values below threshold are saved when time interval elapses only (these values are typically noise values). Only the first noise value lower than the threshold is saved.
The value differs for each physical unit and is stored in following format (unit, value; …):
min=µm,5; mm/s,0.5;g,0.3;mV,5;Hz,0.01

abs
The new value is saved if the absolute and relative change (between new and last saved value) is higher than the set value. The abs param is an absolute part of a significant change. The value is stored in the same way as min.
abs=µm,10;mm/s,0.1;g,0.1;mV,5;Hz,0.5

rel
The rel param is the relative part of the significant change. The 0.05 value means 5 %.
rel=0.05, 0.1, 0.2, 0.5
In A3716 FW version 027804 and newer only the first value is taken account. In older versions the adaptive algorithm uses the values in the row.

Examples

To save all data:

all readings=1

All readings will be saved. Beware that this option can fill the hard drive very quickly.

To save data only in defined intervals:

all readings=0
adaptive=0
statics interval save=60
short dynamics interval save=180
long dynamics interval save=3600

'Check changes' algorithm is disabled (adaptive=0). Static readings (measurements) will be saved every minute, short dynamics every 3 minutes and long dynamics every hour. Intervals are always in seconds.

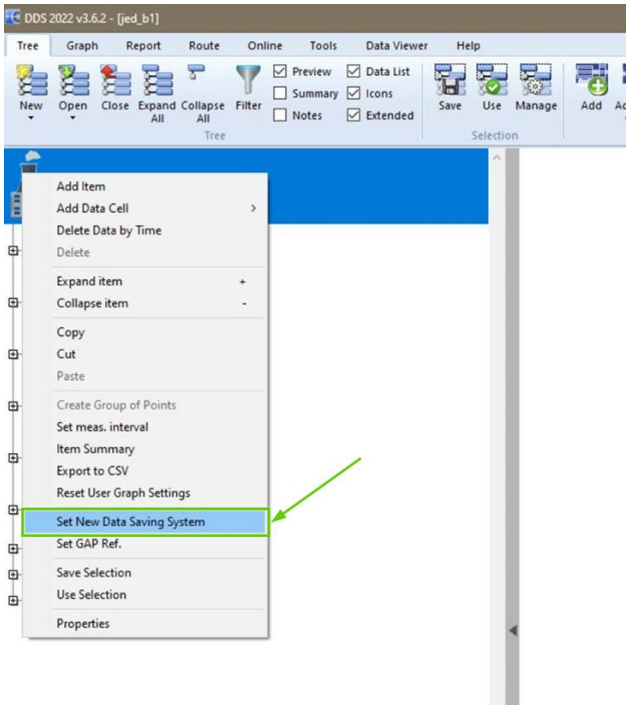
Use 'check changes' algorithm

all readings=0
adaptive =1
statics interval save = 21600
short dynamics interval save = 21600
long dynamics interval save=21600

Check changes algorithm is enabled. Static values, short dynamics and long dynamics are saved every 6 hours until there is no significant change in value.

Set new data saving system

After upgrade to firmware versions 2.79 and higher, you would like to use new data saving system also for older databases (created in older DDS and firmware versions). This is not done automatically. Follow these steps to change data saving system for databases created in older versions of firmware and DDS.:
1. Click on any item in the tree with right mouse button.
2. From menu choose option **'Set New Data Saving System'**. Warning messages and question windows will pop up. Click through them.



3. After this change, default values are set to the database. You need to change parameters for it based on your needs and preferences as in the older one.

Appendix E – OPC UA (OPC DA)

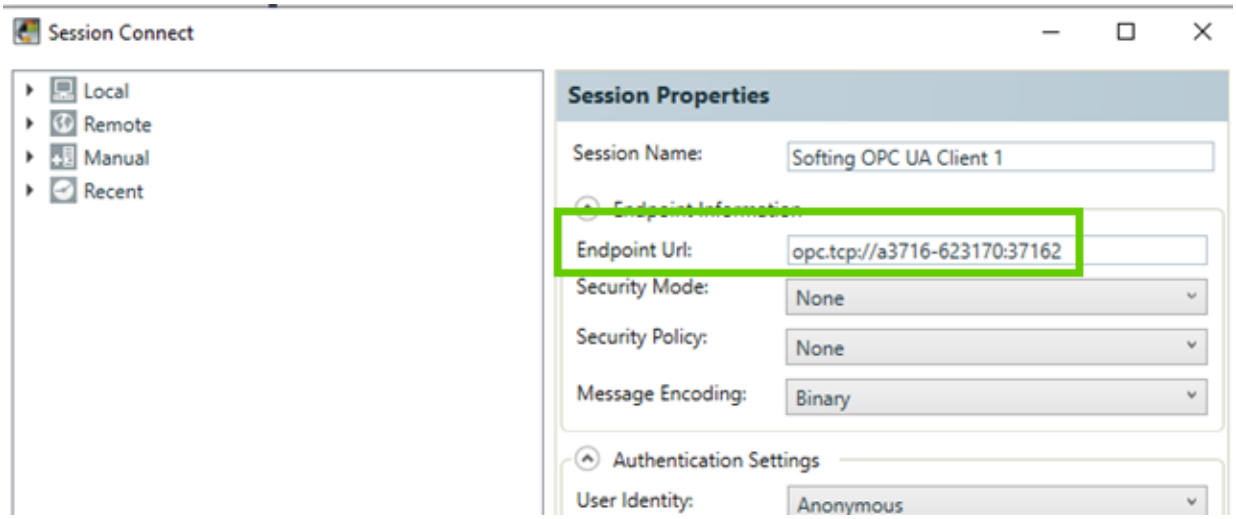
OPC is for Open Protocol Communication. It was developed for data transferring between different applications in predefined form using predetermined principles.
Each online unit has OPC UA server implemented. It means you can view data in client application. A3716 is partially implemented OPC DA server – it is enabled only upon request and we provide it only on "as-is" basis without support as it lacks as some basic features.
You can use OPC interface only for static measurements (e.g., wideband value, DC, …), in different words – for measurements represented by one number value.

Requirements

Technical requirement is online unit's firmware on version 2.67 and newer.

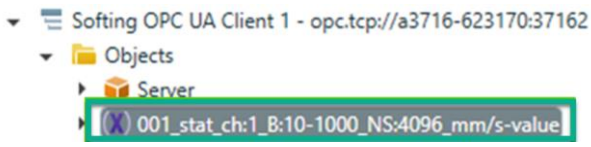
OPC UA Connection parameters

Login is anonymous. No username or password is used. You connect with following URL: opc.tcp://<***A3716/A3800 IP address***>:37162
Instead of IP address of online unit you can use online unit's name (as in screenshot below).

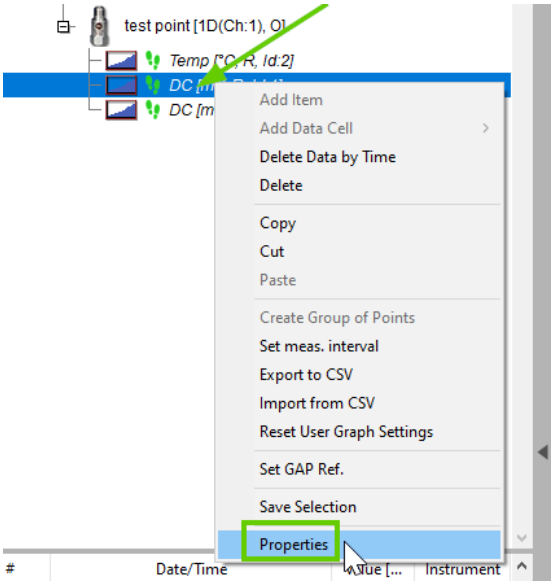


OPC Tags

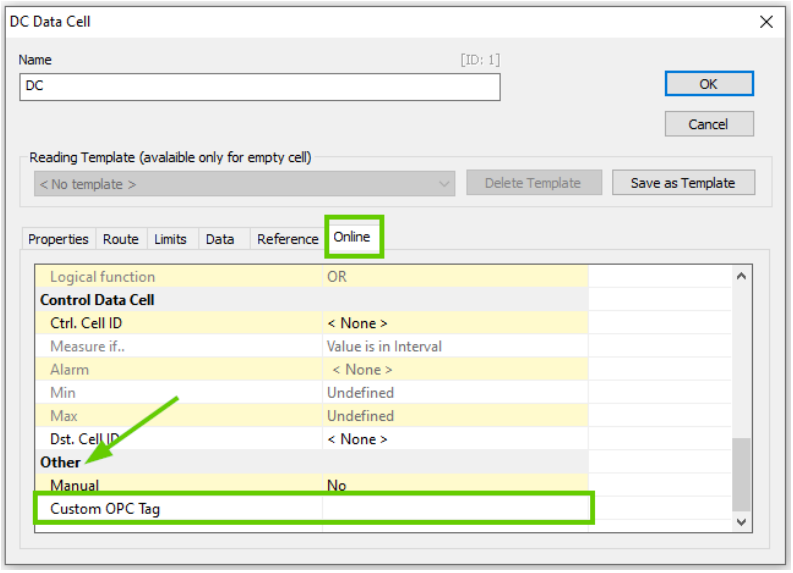
Rows containing static values are ending with '**-value**'. There are names (OPC tags) like this by default:



OPC UA tag is parameter you can change in DDS based on your preferences. Default name of OPC row contains some measurement parameters. If you change them, new OPC row with different name is generated. This can cause troubles. If you name your data cell with OPC tag, it remains still the same even if you change measurement parameters. OPC tag is set in Properties of data cell. Click with right mouse button on data cell and choose properties (see below).



Pick ‘Online’ tab and scroll down to ‘Other’.



Set your own OPC tag for the particular data cell. Confirm with OK button.

Appendix F – DDS licensing and dongles

DDS license

License for DDS consists of two following parts (for appropriate function of DDS you need both of them):

- license file,
- dongle (hasp) key.

License file: it is the first part of the licensed version. This file you get from Adash. It contains information what kind of license for software you have. It is a file with **.lic** extension.

Dongle key: It is basically the hardware (USB) key to which license file is related. It is used for license verification. We have two types of them: **local** (purple) dongle and **net** (red) dongle. See the difference below.

Local dongle contains only to one license. It means, you connect it to your PC and you run DDS in licensed version. When you disconnect the dongle and give it to your colleague – he can run licensed DDS but you cannot. ***Local dongle enables to run only one license.***

Net dongle contains more licenses at the same time. For example, we have net dongle which contains 5 DDS licenses. You connect the dongle to PC in the network and in this time 5 licensed DDS versions can be used by different 5 clients (***these clients PCs has to be in the same ethernet network as PC where net dongle is connected!***).

Note! Dongle (local and also net) needs to be connected to PC all the time when you work with licensed DDS. Otherwise, DDS is running only in limited FREE version.

When you ordered net dongle, it is necessary to have one PC in the network which will be taken as a 'server' PC. There is dongle connected and also more software needs to be installed there. See following steps what needs to be installed on server PC and on client PC to make net dongle work correctly.

Net dongle Installation (Server)

1. Install dongle (Sentinel) driver https://adash.com/data/hasp/net_install/haspusersetup.exe
2. Install License Manager https://adash.com/data/hasp/net_install/lmsetup.exe
   During installation:
   - Select option: Install as a service
   - Skip installation Hasp HL Drivers at the end (Older driver version)
3. Connect dongle (Sentinel) key to the server
4. Restart the server

DDS Installation (Client)

1. Install dongle (Sentinel) driver https://adash.com/data/hasp/net_install/haspusersetup.exe
2. Install DDS https://adash.com/downloads/adash-software
3. Run DDS
4. License
   - if DDS was installed previously or with another license, please import license file DDS2023_123456.lic in DDS menu: **Help/License/Import**
5. If dongle key was not found (DDS runs in Free Mode):
   - Ensure that Client and Server PCs are in the same ethernet network
   - Import the license manually (in DDS Help/License)
   - Copy **nethasp.ini** into DDS installation directory (ProgramFiles(x86)\Adash\DDS) and change NH_SERVER_ADDR parameter to your Nethasp Server IP address and restart DDS

The most common reasons why NET dongle is not working

1. *Dongle key is not lighting* – download and install dongle key drivers.

2. *Check if dongle key is connected and visible to your PC* – search for Device manager in your PC and check if dongle key is shown in Universal serial bus controllers (search for Sentinel components).
3. *License is not imported automatically* – import license file manually from Adash flash drive. Go to tab Help – License – Import in DDS.
4. *Service for dongle is not running* – search for 'Services' in your PC and search for 'HASP Loader'. Status for it has to be 'Running'. If there is not service with this name, install license manager and run the service.
5. *Check nethasp.ini file* – check that there is correct server IP address filled into this parameter NH_SERVER_ADDR.

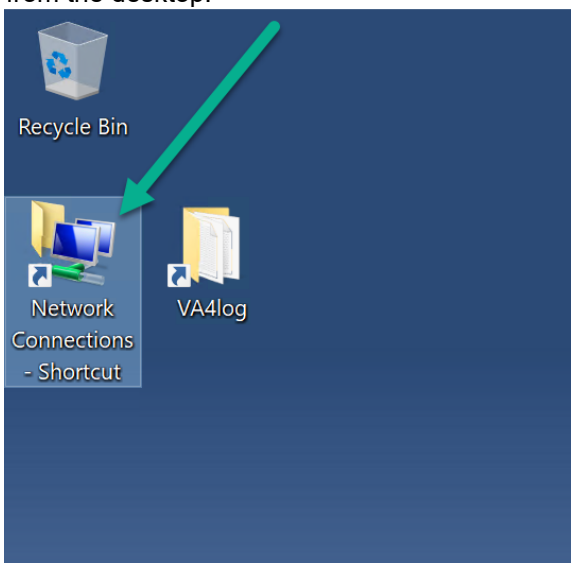
If nothing helped (from the list above), please contact Adash support (**support@adash.cz**) and we will help you with the issue.

Appendix G – Wi-Fi connection

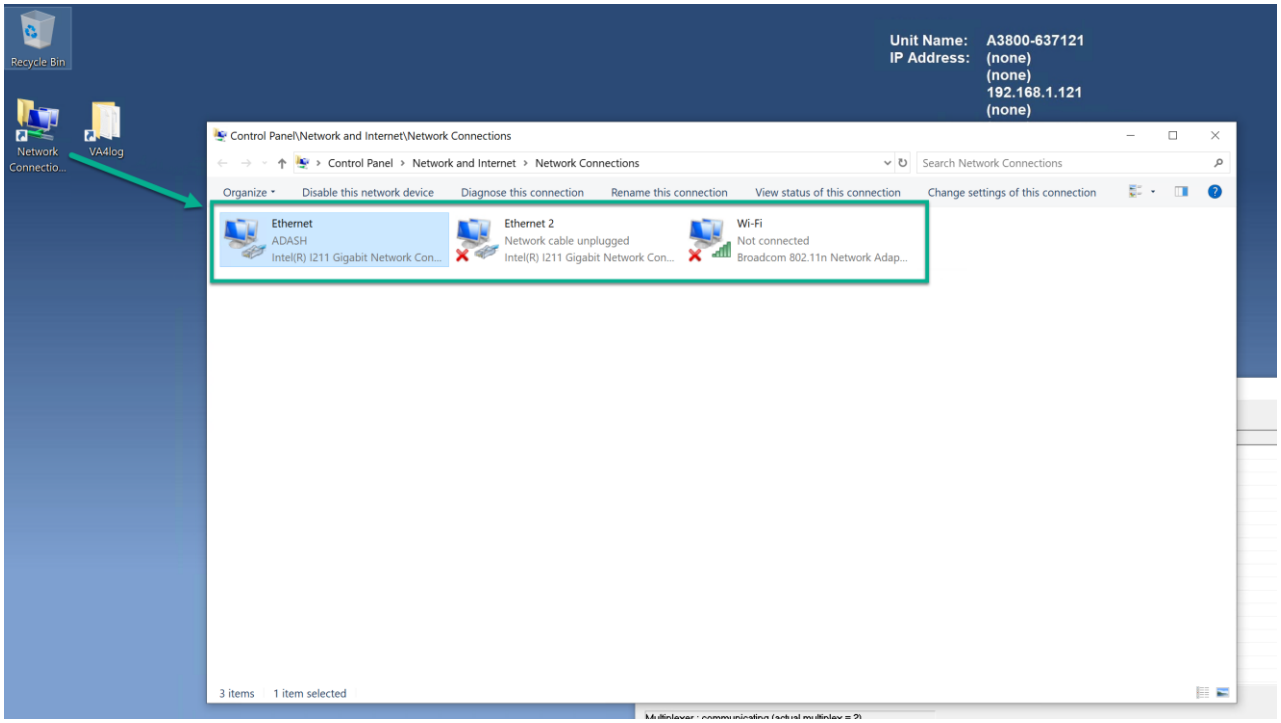
Optionally you can order the online unit A3800 with Wi-Fi module. It means that your online unit is connected to network with Wi-Fi connection, not standardly with Ethernet cable.
In this case it is necessary to set online unit correctly. It is needed to set IP address of your online unit and connect it to the Wi-Fi.
See following steps.

Connect remotely to your online unit. This was described in the previous chapter of this manual – see **Remote desktop connection**.

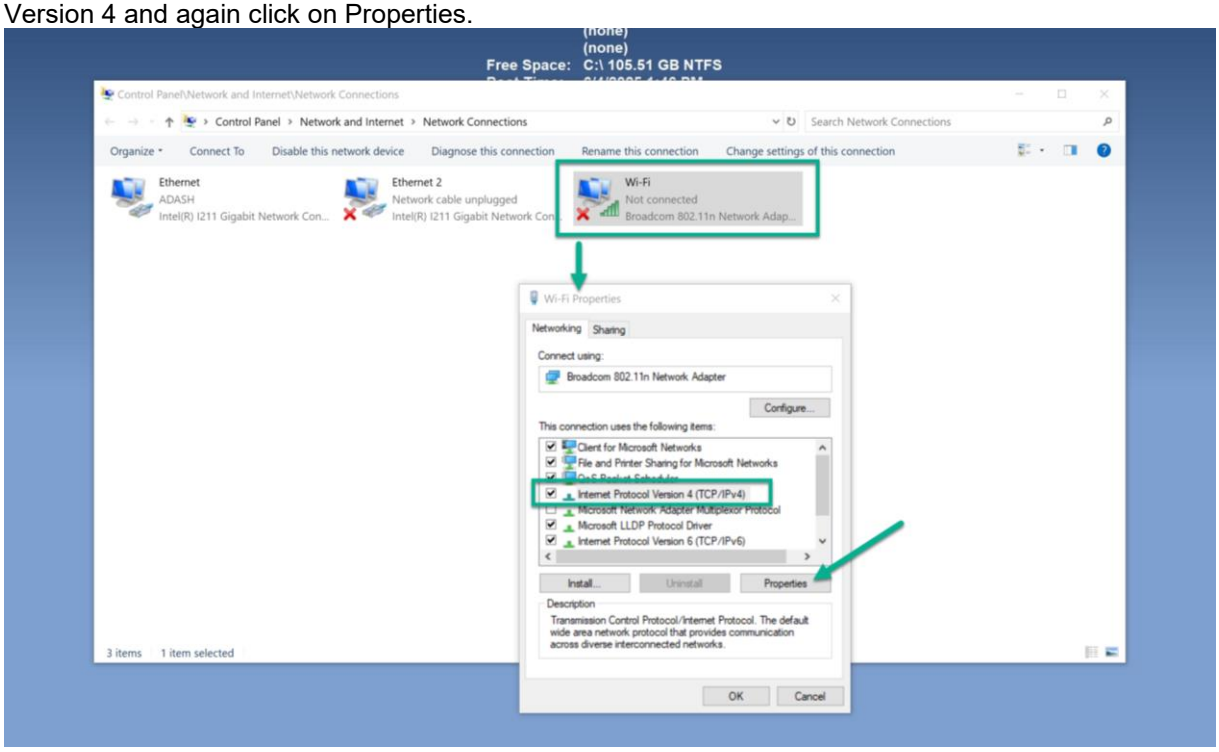
Open network connections from the desktop.



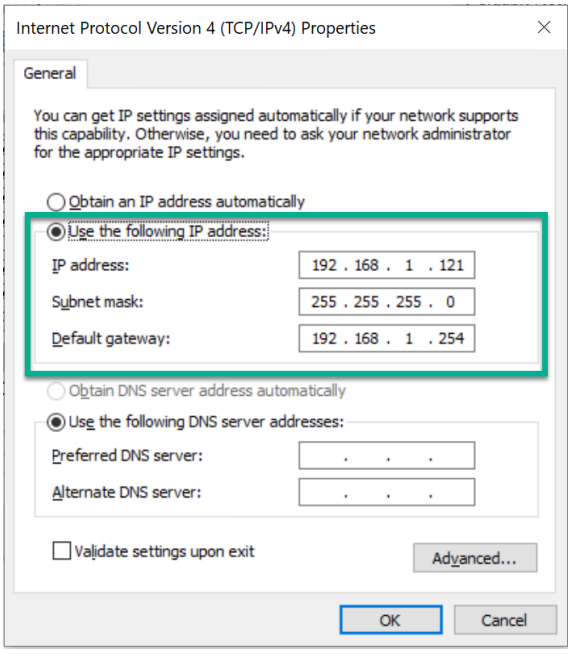
You can see there 3 options. Two of them are for Ethernet connection (static, dynamic IP address connection) and the third one is for the Wi-Fi.
Note! The third icon for Wi-Fi is visible only when you have Wi-Fi module implemented in your online unit.



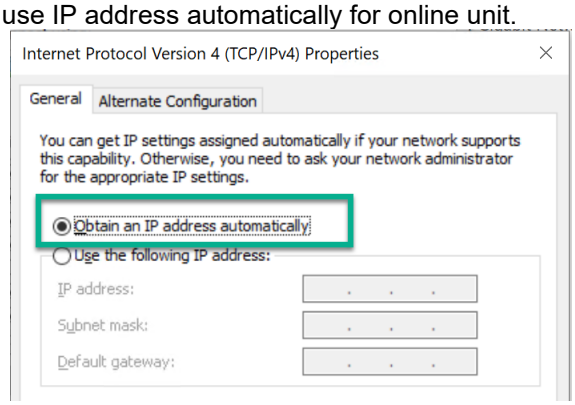
Click on Wi-Fi connection with right mouse button and choose Properties. Click on Internet Protocol Version 4 and again click on Properties.



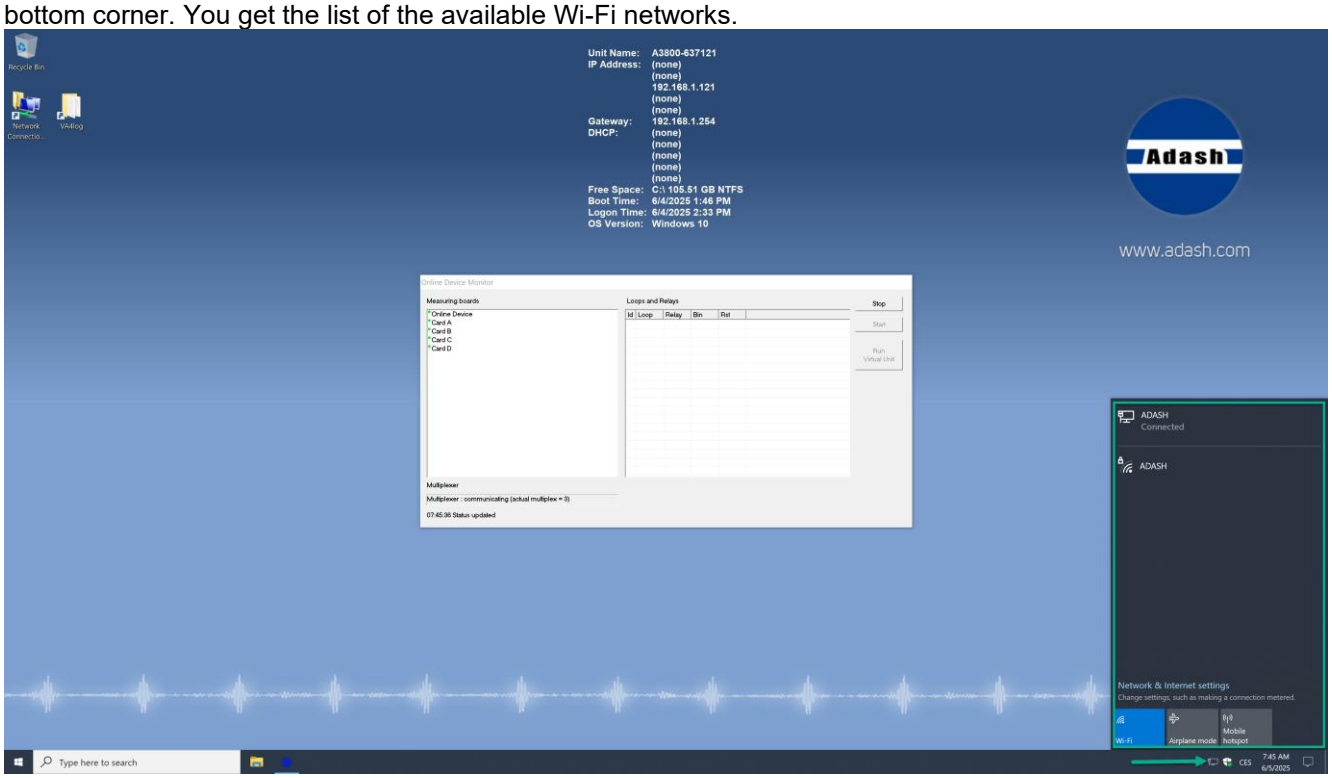
Set IP address for online unit.



Note! It is also possible to use IP address automatically for online unit.



Next step is to connect online unit to the network through Wi-Fi. Click on the Network icon in the right bottom corner. You get the list of the available Wi-Fi networks.



Click on the preferred Wi-Fi network and connect to it as you usually do with other devices. Fill in the password if needed and that's it!
Online unit is connected to the Wi-Fi network.