User's Guide

DDS 2014

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Content:

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Installation

System Requirements

The DDS2014 is designed for MS Windows 7 and higher systems. It could be also run on MS Windows XP, but we do not fully guarantee 100% functionality. Some procedures will take more time or freeze, especially on computers with one core only.

License Key

The license is saved in hardware dongle. Please be aware of that. The dongle is not the spare part. Actually you buy the dongle, not the software which is free of charge. No need of donge key for DDS2014 used with Vibrio M.

You can install software to many computers, but you can run it only when the dongle is found (connected) on the computer. This is the advantage comparing with PC-based license file. You can simply move the license between computers.

The LAN dongle is also available for multiple running applications. Contact us for details.

Advanced Note: If you have more Adash software products, you have only one dongle. All additional details about the products properties are saved in file with the lic (aky for older products) extension in main directory (folder). When you will contact us regarding licenses, please always send the dongle serial number to us.

Upgrading

The newest released version is always prepared on our website for free downloading and installation.

DDS2014 Installation

DDS 2014

You can always find installation file on Adash website (http://adash.com) in Download/Software Adash section. Installation has one file DDS2014_setup.exe and you need appropriate rights for running (if you have problem to run DDS2014_setup.exe, contact your IT administrator). Follow the installer instructions during installation.

DDS 2014 will be installed to C:\Program Files(x86)\Adash\DDS 2014 or C:\Program Files\Adash\DDS 2014). It depends of 32/64bit system. You can choose another specific location.

IMPORTANT: License file is usually provided on CD and DDS2014 tries to import it after first run. License can be later changed/imported using dialog in Help/ Licenses.

HASP Dongle driver

You will find the HASP driver on the CD or you can download it from Adash (http://adash.com) website, section Download/Third parties' software/DriverHASP… (choose your Windows version).

Language selection

On first run on PC where was not DDS2014 installed before, DDS2014 asks which language to use. Use the Tools/ Global/ General and the language is the last item in the list. If the proper language file is not found (removed by user), then the default English version is used.

Troubleshooting

All necessary steps should be done during the installation of DDS2014.

Data Structure

Tree

The TREE is the base of data structure. It has the same meaning as database in the past. We are trying to leave the database in terminology, because in many situations it can be confusing. This is the reason why you open the tree, create the new tree, delete the tree etc. Each tree is saved in one specific database file. The tree size is limited only by the free space on your hard drive.

The tree structure is hierarchical. You are free in the number of levels of the tree.

Tree Item vs. Data Cell

We define two different types of cells in the tree.

Tree item

It is used for developing of tree structure (e.g. site, production line, machine, machine parts, measurement points, ...). The tree item doesn't contain measurements (recordings, readings).

Data Cell

It is the item which contains measurements (overalls, spectra, time waveforms,...). Typically the data cells are created under (in) the Points. However cell can be defined anywhere, e.g. the speed data cell is usually under the machine.

Static and Dynamic Data Cells

There are two kinds of data cells:

Static this kind of cell contains measurements which data are represented by one value. It is e.g. wideband, speed or process value. The value may be complex (real+imaginary parts) and also may contain some condition information (e.g. the speed).

Dynamic this kind of cell contains measurements which data are represented by array (many) of values. It is e.g.spectrum, time waveform, order analysis.

Route and Online Data Collection

The DDS2014 is designed for both uses. The data formats and database structures enable to use one software for both collections.

Database Files Options

There are two options of Database Files available. The most of users will use the database, which is saved in one file with .ndb extension. This is the SQLite option.
The DDS2014 also can work with MS SQL Server database. You can use the full license or only MS SQL Server Express (free, but some limits exist).

Machine Label

Somewhere in tree hierarchy you need to define the Machine label. By others words you need to tell the software, where is the machine position. The route is generally the list of the machines. It is the reason why to define that machine label.

Point Label

Under the machine label you need to define the measurement points. It is the location on the machine, where the sensor is mounted. You can define one, two or three axes in one point. Following properties are available for the point:

technical - bearings, gears, speed conversion, ...), ...

measurement - default sensor, default RPM, ...

alerts - bands, overalls, ...

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Where are Data stored in the computer

The default location of the SQLite databases is for all users in C:\ProgramData\DDS\DB\ folder. For Windows XP it is C:\Documents and Settings\All Users\Application Data\DDS\DB\). You can use any other user location.

If you need to find a location of the tree (*.ndb file) then select the Open Tree function. The window with the list of trees appears. Use the right click on any tree and choose Open folder with database.

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TREE Menu Item

Run the DDS2014 on your system. The main window appears. The main menu is on the top (Tree, Graph, Route, ...). Every menu item contains the set of functions, which are displayed in the panel below the menu.

Select the Tree menu item and the Open icon. We will use the short Tree/Open in manual. The Tree Open window appears. The DDS2014_DemoTree should be in the list (if not use the Open existing Tree chapter below). Select it and press Open.

The tree navigator appears on the left side. Open and close the branches by double left click or Enter or right arrow. Use +/- symbols for complete opening and closing of branch.

Moving in tree is also available using keyboard arrows and TAB key (jumping to next same tree items type, with SHIFT jumps to the previous).

Selected data cells and measuring points data are displayed in Preview tab (“Preview” must be enabled).

New Tree (new database)

Select the Tree in the menu and the New icon. In the next window define the name of new tree (the top item) and location. For beginners we recommend the default location (see the chapter Data Structure/ Where are Data stored in the Computer).

Open existing Tree

We defined the user list of often used trees. The opening of tree is faster, because you only need to select one from the list. You don't need to waste your time to find every tree on your hard drive by Explorer. Once you create a new tree, it is automatically included to the list. If you received some external tree from other user e.g. by email, then you need to add the tree file (with .ndb extension) into the list manually.

When you click on the arrow bellow the Open icon, the user list appears and you can select required tree.

When you click on the Open icon, the next *Open Tree* window appears. It contains the user list, you can select required tree and press Open or use double right click directly in the list.

The *Open Tree* window contains following functions:

Add to List	it allows to add the next tree to the user list (add the next .ndb file)
Remove from List	removes the tree from list (not from the computer)
Set as default	the default tree will be automatically opened when you run the software
Import MDB	for user of old DDS software to import old databases
Delete DB File	removes the .ndb file from computer

Close Tree

Closes the opened tree and closes the tree window.

Expand All, Collapse All

Opens or closes all branches in the tree. The "*" button has the same effect.

Filter

It is a useful function which enables you to select only required part of the tree. Push the Filter button or press Ctrl+F and new window appears. The window is divided into two parts. Selection of tree items is in the first part. The selection of data cells is in the second part.

Two main functions are available, filtering and selection. Filtering displays the tree which contain only items which are in compliance with defined conditions. The selection selects (makes active - blue colored) items which are in compliance with defined conditions.

You can use the Filtering first and then use the Selection in filtered tree.

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Both functions are always applied under the tree item, which is selected when the Filter window appears.

If the case sensitive searching is required, use the checkbox.

Tree item searching

Write required text to the Find text box in Tree Item section. You can find in all tree items or only in Machines or Points. If you write e.g. "fan", then all items, which contain the "fan" in the name will be selected.

If you need to use more then one text strings, then use the "+" (plus) symbol between them. E.g. "fan+pump" means finding all fans and pumps.

You can also use the advanced conditions, which enables to define items and also their parent items. You use the "/" symbol. E.g. if you enter LineA/motor, then will be selected all items which contains "motor" and at least one of parents contains "LineA". This system is similar like folders system in computer.

Data Cell searching

Write required text to the Find text box in Data Cell section. If you write e.g. "NDE", then all cells, which contain the "NDE" in the name, will be selected.

If you need to use more then one text strings, then use the "+" (plus) symbol between them. E.g. "NDE+DE" means finding all NDEs and DEs.

You can also use the advanced conditions, which enables to define items and also their parent items. You use the "/" symbol. E.g. if you enter motor/NDE, then will be selected all items which contains "NDE" and at least one of parents contains "motor". This system is similar like folders system in computer.

Additionally you can define also the data cell type. Next data cell key-words can be used:

wb	wideband
dmd_wb	wideband demodulated (enveloped)
time	time waveform
dmd_time	time waveform demodulated (enveloped)
spec	spectrum
dmd_spec	spectrum demodulated (enveloped)
speed	speed
dc	discrete current or voltage or manually entered cell for process values.

If you need to use more then one key-words, then use the "+" (plus) symbol between them.

Finally you can select only data cells which are in over some alert limit. Use the function Find equal or Higher alert then.

Filter, Turn OFF filter

Push the Filter to apply the rules for selection. Push the Turn OFF filter for cancellation of filter. When no corresponding item is found then the message "Not found" is displayed. The filter rules are always applied to complete tree. You can use the multiple task with the + symbol (e.g. Point1+Point2).

Multigraph

If you selected more static or spectrum data cells, then you can use the right click on any selected item and use the Create Multigraph function. All compatible data will be displayed in one graph.

Preview, Notes, Data List, Icons, Extended

This check boxes switches on/off the displaying of properties or information.

DataList

It displays the list of measurements in selected data cell with their properties:

- Id number
- Date/Time of measurement
- Value (only for static measurement)
- Speed
  - measured by tacho
  - inherited from parent tree items, the symbol * is used
- Reached Alert
- Instrument which made the measurement

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Extended

If it is ON then the text information is added to tree items.

M	machine
1D, 2D, 3D	point with the dimension
S	the speed is defined
B	the bearing is defined

Add Tree Item

Select the top tree item first and then you can create a new item under it (the child item). Push Add (Items section) and the next Tree Item Properties window appears. Now let's suppose we want to create e.g. the site, not the machine, not the point. Then you can define the name only and maybe the icon. You see several tabs in window. They enable to define many properties. The Notes can be used in every item for maintenance control, supervising and reporting.

Surprised by sensor definition

Now you probably want to ask why it is possible to define the sensor in standard tree item, like the site. You expected it in Point only, didn't you?

The DDS2014 enables the inheriting of many properties. E.g. when you define the sensor type in the root (top) tree item, then this sensor will be used for all points. There is No need to define it individually in every point item. But if the individual sensor is defined directly in the Point, then it is preferred and no inheriting is used.

It enables to define sensors, default speed, bearings, bands, etc. in proper items and then inherit them down in the tree.

Tree Item Icon

Every tree item can have own icon. In the Tree Item Properties window it is displayed next to the item name. Click on that and the Icon Setting window appears. You can select one icon from the list or push the No Icon button.

Notes Tab

Every line in the table is one note. Select the New or use the double click.

Every note has the date, text and status.

The status is an optional property. You can use it to highlight some information. It is made for the situations when you need to make some important note and make it understandable for anybody who will read it. E.g. you can make a note that certain part needs repair and the person in charge who will read the note should repair the part and confirm the note that it is done.

Items Moving in the Tree

Mouse

You can move one or more items together by drag and drop.

Two symbols are displayed when you move the mouse cursor inside tree:

Left arrow	The selected item will be moved to the new position with all child items.
[+]	The selected item will be copied, in the next window you will decide whether to copy with recordings or not. You change also the function to *Move*. ??

Clipboard

You can copy/move selected items by standard Copy/ Cut/ Paste functions. The items in Clipboard are in red color. Clear it using Esc.

Multi-selection in the tree

Use the standard Ctrl or Shift buttons.

Add the Machine

We need the Machine label for route definition, because generally the route is list of machines.
Use the same procedure as described in Add Tree Item, but check the Machine box.

Running

This checkbox enables to switch on/off the machine from route. It will not be loaded into the route when the checkbox is not checked.

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Speed Tab

Default Speed is the value, which is used when the speed is not measured directly by tacho. Tacho value has always the priority in front of all defaults defined in the tree.

Gear Ratio enables to use inherited Default Speed and to multiply it. E.g. the default speed is defined in the motor item and the recording is made on gearbox output.

Tacho Factor is similar but it works with direct tacho speed, which is measured on another shaft. It means that the speed value (measured by tacho) is multiplied by tacho factor and that value is saved to database.

Add the Point

Use the same procedure as described in Add Tree Item, only check the Meas.Point box.

The Point is the basic term for measurement. It is the actual place, where the sensor is mounted. Several different orientation/axis may be used in one point. The 1D, 2D, 3D properties are new approach to the point.

1D It means one sensor used in one direction/orientation/axe.

2D It means use of two sensors in one point. Typical use of 2D is the shaft displacement measurement, when two proximity (eddy current) sensors are used. To be precise, it is not point - it is the plane. The directions are marked as A and B.

3D This point is designed for tri-axial sensors. The directions are marked as X, Y and Z.

1D, 2D, 3D tabs

For each direction select one sensor from the Sensors list or select the User for manual entry of all parameters. When you use the predefined sensor from the list, then you can edit any parameter too (usually the correct sensitivity). Changes are saved only to this tree item, not to the sensors list. The sensor properties are COPIED from the predefined sensor. If in the future when you change the predefined sensor parameters or remove it, it has NO effect for item where it was used.
If the properties is displayed for more selected Points, then the <Ignore> is written in the sensor line. No change of sensor will be done in any selected point. If you define the other sensor (not the ignore) the such sensor parameters will be written to all selected points.

Bearings tab

The list contains bearings, which will be used for fault frequencies analysis. The grey colored names are the inherited bearings from parents' levels. The black bearings are defined in this point.

Use the Add button to select another bearing. Select required bearing from the bearing database in the new window. Use the Find button with the part of name or full name of the bearing which you are looking for.

Use the Remove button to remove bearing from the list.

Add the Data Cell

Select the Point item and press the Add Data Cell button and next window with several tabs appears.

Properties

Define the recording (measurement) properties. See chapter Measurement (Recording) Properties for details.

Route

Transfer to Route	the Off cells will not be loaded to route
Interval	required time interval for measurements
Last Measurement Time	info about last measurement
Manual Entry	manually entered value

States

Define one or more states. Every state has the name and the value interval, in which is applied. See the States chapter.

Spectrum Alarm Bands

Bands are the special property of spectra. Select the Bands tab. It contains the list of created bands or it is empty. Push the New button and define the name of band and frequency interval.

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Abs Alert Limits

All limits can be displayed in two ways - Basic or Advanced. It is only the displaying, limits set is only one. You can change the style in tab by Basic/Advanced switch.
The basic view contains only three basic limits. In the demo tree we use the names Warning, Alert, Danger. If more alerts are defined, the only Advanced view is available.
See firstly the Alerts chapter for details about general approach to alerts. The abs (absolute) alert limits use the exact values (e.g. 2g).

Select the Abs Alert Limits tab. The Packs of limits list is on the left. Push Add to create new pack. Define the name and the state for which will be applied. You can use every state, which is defined in whole tree. Of course you can define the Default pack of limits, which is used always independently of states. Only one limit pack (in each data cell) may be defined for each state.

In the most cases the default pack will be enough. (always state).

Abs Alert Limits for Spectrum

The limits for spectrum are related to defined spectral alarm bands. Each defined band represents the individual value to which limit values will be applied (max 6). You need to select the quantity as well (acc, vel,...), unit and detect type (RMS, 0-P, P-P, Max, ...).

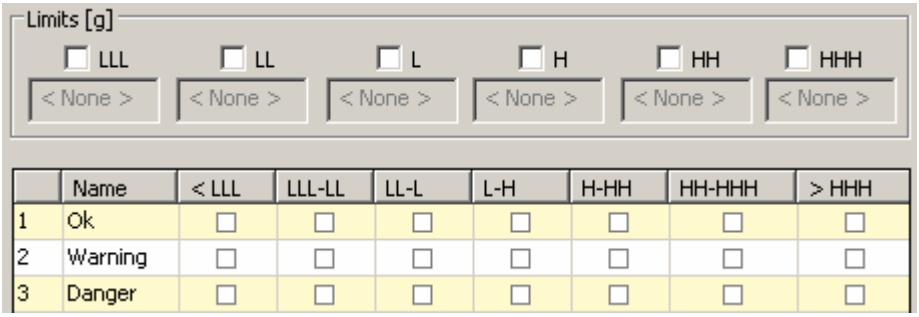
Basic Limits Definition

Use the check for selected alert and define the value.

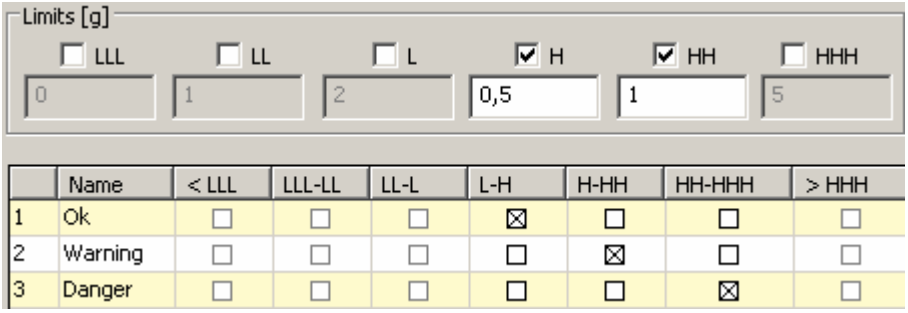
Advanced Limits Definition

The 6 limit values are available for each pack. We use the letters L for low and H for high. The lowest limit is LLL (we talk about low-low-low). The LL (low-low) must be larger the LLL. The L (low) must be larger then LL. Generally speaking the L limits are designed for negative direction (values). When you use the eddy current proximity sensor for relative shaft vibration, then gap (middle position) is the reference value. If the distance is smaller then the gap, then it is negative direction (closer to the shaft) and the L limits should be used for checking. The H (high) limits are designed for positive movement of values. The system is the same like for L limits.

If you measure e.g. overall wideband value, then this value is always larger the zero. That is why you should use the H limits. See the example.



We defined two new alerts - Warning and Danger (see Alerts chapter), then three rows are in the list (OK is default and cannot be removed). We want to define the OK condition for values smaller then 0.5g, the Warning for value larger then 0.5g and the Danger for value larger then 1.0g.



If we want enter the limit value, at first we need to check the box for H and HH limits. The other gray limit values have no effect. We manually enter the 0.5 and 1 values.

Now we need to define the intervals for each alert. Because we do not use the L limits, then we define the OK alert for L-H interval, it means for any value smaller then H limit.

The Warning alert is valid for H-HH interval. The Danger is valid for HH-HHH interval, it means anything larger then HH because the triple-H (HHH) is not used.

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The ability to select any limit interval for any alert enables to define huge number of combinations. It should work for any possible user requirement.

All defined alerts are initially displayed in the list. You can use all or only some of them. Use the button Display All or Display Used to look of the list.

Rel Alert Limits (not done yet)

The rel (relative) alert limits use the % values (e.g. 200%). The percentage is related with last measurement or reference measurement (e.g. first after repair).

Multi edit limits

Selected more data cells of the same type, e.g. more static cells ISO RMS. Display the properties and the Alert Limits tab. It looks the same as for one selected cell. But each field has the special grey state added. When the properties displays, all is in grey. It means that nothing will be rewritten. It means - ignore this field. When you want to rewrite any limit value or checkbox in all selected cells, then change the state from gray to the next. You can return back to the grey state.

Data

This tab contains all measured values in the cell. You can edit them , delete them.

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States

One or more states can be defined for every static data cell. Each state has the name, which usually expresses exact state (condition) of machine. Let us specify the example:

The machine (e.g. generator in power station) contains the speed data cell. We can define several typical states for the speed values:

Running	The machine is running, when the speed is in 3000+/-30 RPM (3600+/-30 RPM).
RunUp	When the speed is in interval 350-2970 RPM (350-3570 RPM). This state is also used for coast down.
Stopped	Speed less then 350 RPM.
Over	Speed more then 3030 RPM (3630 RPM).

The states are used for alerts application, when various limit values are used for various states.

Mainly states are used in the online applications. It enables control the data collection. E.g. no measurements are made, when machine is not running.

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Tree Item Properties

1D, 2D, 3D tabs

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The status is an optional property. You can use it to highlight some information. It is made for the situations when you need to make some important note and make it understandable for anybody who will read it. E.g. you can make a note that certain part needs repair and the person in charge who will read the note should repair the part and confirm the note that it is done.

Bearings tab

The list contains bearings, which will be used for fault frequencies analysis. The grey colored names are the inherited bearings from parents' levels. The black bearings are defined in this point.
Use the Add button to select another bearing. Select required bearing from the bearing database in the new window. Use the Find button with the part of name or full name of the bearing which you are looking for.
Use the Remove button to remove bearing from the list.

Bands tab

Bands are the special property of spectra, which are used for spectral alarm band evaluation. It contains the list of created bands or it is empty. Push the New button and define the name of band and frequency interval.
Inherited bands from parent items are displayed in grey.

Labels

You can define special frequencies labels, which will be drawn to every spectrum graph in this tree item.
The labels are divided into three groups - General, Gear and Blades. The general group should contain all labels except gears and blades frequencies. But you can e.g. save all your labels only to general group. The dividing to 3 groups has one meaning. When you push the Change Group (it means groups mentioned above) then all the groups are displayed circularly. The user labels are displayed always together with them.
See the Labels in Graph chapter for more details.

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Measurement (Recording) Properties

The measurements are saved in data cell, which is special tree item. It differs from other tree items like Machine, Point, etc. which don't contain measured data.

Vibration Measurements

The most often used measurements in route are in the following list. Usually for all of them the accelerometer is used. The main properties will be mentioned for each of them.

Wideband, Demod Wideband

Quantity	physical quantity (acceleration, velocity, displacement, ...)
Length	measurement length in seconds
Fmin	highpass filtering frequency, Fmin and Fmax define the frequency band
Fmax	lowpass filtering frequency
Detect Type	RMS, 0-P, P-P
Avg	Off or number of averages
Averaging	Linear, Peak Hold

Time (time waveform)

Quantity	physical quantity (acceleration, velocity, displacement, ...)
Length	measurement length in seconds
Fmin	highpass filtering frequency, Fmin and Fmax define the frequency band
Fmax	lowpass filtering frequency
Avg	Off or number of averages

Demod Time

Quantity	physical quantity (acceleration, velocity, displacement, ...)
Length	measurement length in seconds
Fmin	highpass filtering frequency, Fmin and Fmax define the frequency band
Fmax	lowpass filtering frequency

Spectrum

Quantity	physical quantity (acceleration, velocity, displacement, ...)
Fmin	highpass filtering frequency
Range	spectrum range, lowpass filtering frequency (Fmax)
Lines	number of lines
Window Type	Hanning, Rectangular
Avg	Off or number of averages
Overlap	percentage overlaping
Averaging	Linear, Peak Hold

Demod Spectrum

Quantity	physical quantity (acceleration, velocity, displacement, ...)
Range	spectrum range, lowpass filtering frequency (Fmax)
Lines	number of lines
Demod Fmin	highpass filtering frequency, Demod Fmin and Demod Fmax define the frequency band
Demod Fmax	lowpass filtering frequency
Avg	Off or number of averages
Averaging	Linear, Peak Hold

Next Measurements

Speed

Avg	Off or number of averages
Averaging	Linear, Peak Hold

Process

Quantity	physical quantity (voltage, current, power, ...)
Avg	Off or number of averages
Averaging	Linear, Peak Hold

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Plotting of graphs

Screen Areas

The screen is divided into 3 main areas. The tree area is on the upper left side. The data area (DataList of measurements) is below the tree on the left side. The plot area on the right side is prepared for graphs.

Plot Area and Pages

The plot area contains pages (like in MS Excel). Various graphs can be plotted in each page. Preview is the basic page. It enables fast preview of measurements.

Notes Page

The notes can be written in each tree item (Item Properties/ Notes). All notes from selected item and from all its children items are displayed in the Notes page.

Add Page

See the bottom of plot area. There are names Preview, Notes and the plus symbol (+). Push the + and you can define new user page, which can be used e.g. for reporting.

Next functions for Page

Use the mouse right click on the page name and the items menu appear.

Close

Closes page.

Close All

Closes all pages except PreView and Notes.

Print

Prints page.

Clean PreView

Removes all graphs and cleans the Preview area.

PreView Page

This page is a default page for graph plotting. If we open the branch in the tree, then the several basic plottings are available:

One measurement or trend

Select one data cell in point. The static cell (e.g.overalls) creates the trend graph. The dynamic cell (e.g.spectra) creates the graph with last reading or waterfall.

All data cells from one point

Select the Point with several data cells. All cells graphs will be created together in the PreView.

User multiselection

Use the standard Windows buttons (Shift, Ctrl) for multiselection in tree. All selected cells graphs will be created together in the PreView.

Create Pages

If you select the tree item (usually machine or point, but it works also for multiselection), no graphs are directly created in PreView. Use right click and select the Create Pages. Several new pages will be created depending of data cells types. The same types of readings are in each page.

Trend Page

If the static data cell is selected then the trend graph appears.

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Confirm State

When the limits (alerts) are defined, the trend contains measurements with various colors. E.g.the machine was in bad condition in the past. It means you received high vibration values. But now it is fixed and you do not want display that old alert. The Confirm state function (mouse right click) enables to you the time (use the cursor) and all older readings will be ignored (regarding limits).

Waterfall

This plot works with spectra.

Maximum number of spectra

The maximum number of spectra in waterfall is defined in Tools/ Globals. If e.g. this number is 32 and you select more recordings (e.g.320) then only 32 spectra will be drawn and each of them will be the PEAK HOLD average (10 spectra in each drawn spectrum) related to total number. The "compressed view" is written aside from Y unit.

Properties

You can control the properties of the plot by the mouse. We need to define several positions for next explanations. Every axe has the beginning (min value) and the end (max value). We will use following positions: Xmin, Xmax, Ymin, Ymax, Zmin, Zmax.

Xmin, Ymax, Zmin Move the cursor to this point. You can (drag and drop) change the size of Y axe. When you move the end point, the % of max size is displayed.

Xmin, Ymin, Zmax you can change the size of Z axe and its angle.

Xmax, Ymin, Z anywhere You can look the times of readings. In compressed view case you look the time intervals which are averaged to one spectrum.

Cursors

All cursors work also in waterfall. Additionally you see the cuts through all spectra. If you use the delta cursor, then the delta cut is drawn in cursor position.

Amplitude + Trend

This plot works with spectra.

The amplitude spectrum is drawn in the top half and the trend wideband value in the bottom half. Initially the overall values are displayed in the trend.

Use the delta cursor to define different frequency range.

If the single cursor is displayed, then the trend on cursor frequency is drawn.

If bands are defined, then their trends are drawn. Use the band cursor for selection.

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GRAPH Menu Item

The main target of vibration diagnostics is to recognize the condition of machines. The graphs (plots) drawing and evaluating is the main tool how to do that. Especially checking of the trends is usually useful way for that.

Cursor

Cursor Type

None	no cursor displayed
Single	one cursor line only
Harmonic	1X, 2X, ..., NX frequencies
Sideband	central frequency and sidebands in spectrum
Periodic	for frequency evaluation in time waveform
Delta RMS	RMS, 0-P, P-P value of delta frequency interval in spectrum (related to detect type)
Delta Max	max peak value (highest line) of delta interval in spectrum
Delta 0-P, Delta P-P	amplitude ranges for time signal
Band	band value in spectrum

PeakJump

It finds the accurate peak position (frequency) in spectrum. It is often used for speed frequency determining.

Lock

Check the Lock checkbox. When more graphs of one type are plotted in the page (e.g.6 spectra cells) then you can move with cursor position in one graph and the cursor moves also in other graphs. The movement is not continuous, but all new positions are plotted after you release the mouse button.

If you uncheck the Lock, then each cursor is separated from the others.

Align

It keeps the same (accurate saying the nearest) time of measurement in all drawn graphs. E.g. the trend of wideband values and spectrum are displayed. When you move cursor in trend then the corresponding spectrum is displayed.

Settings

Graph Type

For spectra only.

Amplitude	single spectrum standard graph
Waterfall	more spectra plotting in 3D
Amplitude + Trend	additional trend of overall values or trend of cursor values

Y-Unit

Next window appears. The selection of Y axe unit. Integrated units of original reading are available for spectrum.

X-Unit

Selection of X axe unit. When you push the down arrow, then you can select unit from the list. When you push the icon, then the used unit is changed to the next one (circular shift).

Quantity

It enables shifting between acceleration, velocity and displacement.

Enter Speed

The manual enter of speed to the reading data head. It uses the cursor position.

Bands View

If band is defined, then three display modes are available - Off, Basic, With Limits

Zoom

Standard zoom definition.

Mouse zooming is also available. When you operate with mouse in the plot, then both axes are zoomed. When you operate below the X axe, then only the X zoom is applied. When you operate on the left of Y axe, then only the Y zoom is applied.

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The mouse zoom works normally when the cursor is off. If the cursor is on, then the mouse has the cursor priority. The mouse zoom is available with CTRL button on keyboard.

When you place the mouse symbol inside the plot area, then also the mouse wheel (roller) can be used for zooming.

Autoscale

Cancellation of zoom.

Graphs

Several standard windows arrangements.

Labels

Please see the special chapter Labels in Graph for details.

Add

Add user label.

Add Cursor

Add user label linked to the cursor position. Cursor must be displayed.

Scroll Line

If more label sets are define (e.g. more bearings), then it scrolls the rows of values.

Tree (Change Group now)

Display tree labels (defined in Labels tab in Tree Item Properties) and change the groups.

Display

Display On/Off of labels.

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Labels in graph

The software enables to add labels (notes) to the graphs. E.g. you can create the description of several peaks in spectrum plot.

User Label

The user can create new text windows (rectangles) inside the graph. Use the command Add Label and write your message in the appeared (showed) window. The With Line option enables to create the line, with which you can connect the label text rectangle with some point (location) in the graph.

The labels are saved together with one reading (e.g.spectrum) and every next time will be displayed with it.

The difference between user labels and others (bearings, general, gears and blades) is that user labels are displayed only e.g. with one individual spectrum. Other labels are displayed with all spectra in data cell.

Bearings

The fault frequency labels are displayed when bearings are defined for point (or inherited from parent item). The speed must be known for spectrum (measured by tacho, manually entered or inherited). Use the Change Group button to shift between user labels, bearing labels and general/gears/blades labels.

General, Gears, Blades

The following frequency labels can be defined also in each tree item properties. The labels are divided into three groups. The general group should contain all labels except gears and blades frequencies. But you can e.g. save all your labels only to general group. The dividing to 3 groups has one meaning. When you push the Change Group (it means groups mentioned above) then all the groups are displayed circularly. The user labels are displayed always together with them.

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Plotting and Reporting

In DDS2014 you can work with various pages. It is similar to the MS Excel. Each page has the flag with name. Flags are in the bottom of plotting area.

Kinds of Pages

We generally talk about two kinds of pages.

Plot Page

This page doesn't have the scrollbar on the right side. It means that all objects (graphs) are visible in the same time. The feature is good for data acquisition, when we want to see all data together. Use the + tab symbol below the graph area to create the new plot page.

Report Page

This page has initially the printing format (e.g. A4, ISO B4, ...). This page has the scrollbar on the right side. It means that all objects (graphs) are not visible in the same time. The size of page is defined in Tools/ Globals/ General. Use the New menu item to create the new report page.

Template

Every page can be saved as template for future using. The template contains only empty graphs windows, no direct links to data cells. It gives you the freedom to use them on any position of tree.

Report menu item

Report menu item contains two sections of functions. The Page and the Add.

Report section

This section contains following functions:

New

Click on the button New and enter the report name. The + button below has the same function.

Open

The list of saved reports appears. Select one of them and open it.

Expand

When you create a new reporting report, then only the first printing page is created. In the process of report development you will probably need a longer document. The Expand function makes the document longer and creates new empty space for writing. The page separators are also displayed.

Save

It saves the selected report.

Save as Report

Enter the new name and save the selected report.

Save as Template

Enter new name and save selected report as template.

Print

It prints selected report.

Rename

It renames selected report.

Close

It closes the selected report in plotting area.

Delete

The list of saved reports appears. Select one of them and delete it.

Add section

Text

It adds the empty text box into the report. Use the right click and select the Edit or do the double click in the box. Next edit window appears. Write your comments, use formatting of text.

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Use the drag and drop to move the box.
Use the right click and select the Delete to remove the box.

Time

It adds the date+time box with actual date and time. Use the drag and drop for moving of box. Use the double click to update the value.
Use the right click and select the Delete to remove the box.

Image

It adds the image into the report. Initially the empty box is created and the window Image Select appears. Initially it contains the empty list. Use the Add button and select image file or images from the computer. Selected images are added to the list and saved to the tree. If the list contains required image select it and press OK. The image appears in the image box.
Use the right click and select the Select Image or do the double click in the box for change of image.
Use the drag and drop for moving of box.

Report

Several predefined reports are available. See the following chapter.

Predefined Reports

If you choose required report, the report box appears. It contains the required report information.
Use the **Shift button + drag and drop** for moving of box.

Alarms

It develops the list of all alarms of the selected tree item and its all children. If the selected item is below the machine, then all alarms of that machine will be displayed.

Structure

It develops the text print with the tree structure of the selected tree item and its all children.

Basic

This report enables to print:

- all static measurements from defined time interval
- last static measurements
- static measurements from last N days (N is manually entered)

Missed Measurements

In process.

Statistics

In process.

Up to Date of report

When you developed the report page in the past, you can use it again and update all graphs and reports which are used inside the page. It means that you can update the report page when you have there e.g. one spectrum one month old and all alerts to that date.
Then you can change the written notes and description and print it as new actual report.

Printing of colors in printer

When you print reports, you can switch on or off the colors. It depends of your MS Internet Explorer browser. Such parameter is in Page Setup section.

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ROUTE Menu Item

Select the Route menu item. The plotting area is closed and the list of existed routes appears. Each route is the list of machines. You can expand every branch in the list by mouse.

Basic Operations

Create New Route

Drag the required part of the tree on the left and drop it to Route list.

If you drop it to empty area (the cursor symbol is arrow), then you manually enter the name and new route appears in the list.

Add next machines or point to the route

Drag the required part of the tree on the left and drop it to selected route in the list. The cursor symbol is [+]).

Buttons

The New creates empty route. The machines must be added (drag and drop) separately.

The Delete deletes and Rename renames route selected in the list.

The Delete Items removes selected tree items in route.

VA4Pro data collector

Push the A4400 VA4 Pro button in the Instrument section.

The new window appears in the bottom of screen. This window represents the instrument.

Connect

Once the instrument is connected to the PC (via USB), the connect button connects the instrument with the software.

Find

When measurements were made by Virtual Analyzer in the computer, the you need to find the folder with saved data.

Receive

The list of all routes which are in the instrument are sent to the computer. You can select each route and look at the structure and some (not all) measurements.

Send

Drag the route in the Routes window list (top) and drop it to the list in VA4Pro window. Select the route (blue colored). Press Send button.

Store

Select one received route in the list in VA4Pro window. Press Store. The complete route with all measurements will be loaded from instrument and saved to the database.

A4900 - Vibrio M data collector

Push the A4900 Vibrio M button in the Instrument section.

The new window appears in the bottom of the screen. This window represents the instrument.

Connect

Ones the instrument is connected to the PC (via USB), the connect button connects the instrument with the software.

Disconnect

Closes the USB connection with software.

Send

Drag selected route in the list and drop it to the table in instrument window. The route will be added to the list. The list contains the name of route or "off-route", the type (route, off-route), status (blue - the route was not loaded to instrument yet, grey - downloaded from instrument but empty, green - downloaded from instrument with data).
Select one route in the list and push Send button. The route will be loaded to the instrument.

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Receive

Connect the instrument and press Receive button. All measured data will be downloaded to the computer. There are two types of data - the route and off route data.

Store

If the route data are downloaded, push the Store. All data will be saved to the tree database. You can save off route data to the tree by mouse – drag and drop.

Delete

It deletes selected route from the list in instrument window.

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TOOLS Menu Item

The Tools menu item contains functions for settings of DDS2014.

Fonts

You can define your user font for tree items and data cells separately in standard Windows procedure.

Sensors

This list contains all predefined sensors, which can be used in Point properties definition.

Push the Sensors icon. The new window with sensors list or empty box appears. Push Add and define the new sensor. You can edit the existing sensors by Edit button or by double click.

Bearings

This list contains all bearings in the tree, which can be used in e.g. Point properties definition. The list is empty for new tree. You need to import required bearings from the default bearing database (file bearings.lbr in the DDS2014 folder). Press Import and select bearings.lbr file. The complete list of bearings appears (aprox.30 000 bearings). Select one or more bearings and press Add. You can repeat this step until all required bearings are in the list.

You can also add bearing, which is not in the list. There are two ways how to do it.

One is to define the size parameters of bearing (number of balls, ball diameter, pitch diameter and contact angle).

The second is to define directly the relative fault frequencies values (coefficients). When these values are multiplied by speed you get the final values.

Press the Save As when you entered the new bearing values. Enter the name in next window.

Alert Types

Introduction

The DDS2014 uses a new approach of regarding of the alerts. We use this term for limits of measurement values. This new concept enables user to define number of alerts. The only two alerts (e.g. warning and danger) are usually enough in many applications. But if somebody needs more, he can define it. You should understand that in this moment we define only alert types (generally words, which will be used). The limits for each type will be defined individually for data cells.

Example:
In Alerts types we defined the Warning and Danger alerts types. The OK alert is default type.
For two data cells we will define exact limits:

wideband velocity	5 mm/s (0.2 ips) for Warning, 9 mm/s (0.35 ips) for Danger
wideband acceleration	0.5 g for Warning, 1 g for Danger

Create the alert types

Use the Tools/ Settings/ Alert Types icon. The Alert Types window appears with the list of types. The default first type is OK, which cannot be deleted. You can only change the name and color.

Push the Add button for new type. Define the new name and select the color. You can change the severity (order) in the list.

Icons Setting

Every tree item can have own icon. Push the Icons. New window contains the list of available icons.

Add	it allows to add the new icon to the list
Delete	removes icon from list

You can also define the default icons for items with labels. It means the machine, 1D point, 2D point and 3D point. Such default icon is automatically used for that items type. Use the Default Type buttons to do it.

Templates

In process.

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Globals

In the Global window you can define many parameters, which enable to customize DDS2014 or define defaults parameters.

General

Display Small Values — Some users do not like to display very small values in exp format (e.g.4.54e-6) and rather see the zero. You can define whether display small values or not.

Grid — Default grid selection.

Align — on/off

Lock Cursor — on/off

Waterfall Overlap — Default percentage. See Graph chapter for explanation.

Waterfall Angle — Default angle.

Harmonic Lines, Periodic Lines, Sideband lines — Auto or default number of lines, Auto means that number of lines is determined by X graph range.

Harmonic Cursor Symbol — Selection of symbol.

Cursor Movement by — Single Mouse Click or Drag&Drop

Route Interval defined in — day, week, month — default time unit

Default Route interval — value — default value related to selected time unit, e.g. 3 days, 4 weeks, 3 months

Alerts Evaluation from — The alerts can be evaluated in two different time intervals.
Last Confirmation Time - interval from last confirmation to last reading
Last Measurement Only - only last reading is checked.

Display Measurement from last — the default time interval for initial data in graph (last week, month, year, ...)

Page Format — default format for printing

Language — DDS2014 language

Graph Plot

User definitions of all colors used in graph drawing.

Spectrum

Graph Type — Default drawn graph - Amplitude, Waterfall, Amplitude+Trend.

Detect Type — Default Y axe type - RMS, 0-P, P-P.

X Axe Unit — Default unit.

Number of Spectra in Waterfall — Maximum number of spectra in waterfall. If e.g. this number is 32 and you select more recordings (e.g.320) then only 32 spectra will be drawn and each of them will be the PEAK HOLD average (10 spectra in each drawn spectrum) related to total number.

Z Axe in Waterfall — The position of each spectrum on Z axe can be related to time of reading, speed of reading or regular (independent of them).

Order in Waterfall — First or Last in front regarding time of readings.

Band Pattern, Color, View Type — The properties of band drawn in spectrum. Pattern is used only for band view type With Limit Levels, not for Basic.

Trend

Display Limit Levels — on, off — Drawing of limit lines in trend drawings.

Order analysis

Graph Type — Default drawn graph - Amplitude, Amplitude+Phase.

Detect Type — Default Y axe type - RMS, 0-P, P-P

Labels

Default Display Labels — initial drawing of labels in graphs On/Off

Line Style — Select the line style.

Link Symbol — select the symbol, which will be drawn on the end of the link line.

Label Text — Select font properties.

Units

Contains default unit for every physical quantity, which is usable in data cell.

Settings/ Shortcuts

You can define the shortcut for any command. Push the Shortcuts button. Select the Menu Item and required command. Enter new key and press Assign. During this procedure you are informed whether

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your new key is already used or not. If it is used, then there is also command for which it is used displayed.

You can define more keys for one command.

You can remove any already assigned key using the delete button.

Default shortcuts	
S	Single cursor
D	Delta RMS cursor
H	Harmonic cursor
B	Sideband cursor
N	cursor OFF
Ctrl+P	Peak Jump
Ctrl+E	tree item properties
Space	switches the focus between tree and graphs
Tab	select next item
Ctrl+Q	graph min/max
Ctrl+F	Filter (tree menu item)

Use Global as Default

When you use right click on the tree item, the Use Global as Default function is in the list.

You define properties for every data cell. E.g. the mm/s ie in the Global list, but you define ips for one data cell. Then this definition has the priority and graph will use ips.

When you want to remove such special defined properties, then use the Use Global as Default function. Then will be used the Global options again.

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Import and Export Tree (database)

SQLite Tree

If you use the SQLite tree, then all data are saved in one file with .ndb extension. You can send this file to somebody else and he needs only to add this tree to his list. Then he can work with this tree. All information like bearings, images, limits, ... are included in that file. There is no need to have any other file.

SQL Server Tree

In procces.

Data Selection

In procces.
If you need to export the tree with not all data, then you can select time interval for measurements which will be exported.

Data Backup

In process.
You can export the tree with selected old measurements and that exported measurements will be removed from original tree.

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HELP Menu Item

Help

Open the help file.

About

The version details of installed DDS2014.

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