



User's guide



DDS2000/DDS2007 Data Interface for the A4300-VA3 Instrument

Application :

- ☞ Transfer and archiving of data from instrument A4300 to DDS2000/DDS2007
- ☞ Transfer route from DDS2000/DDS2007 to instrument A4300
- ☞ Definition of wide range of sensor types

Characteristics :

- ☞ Standard communication via RS232
- ☞ Auto-detection instrument on all serial ports
- ☞ Route administration and off-route measurement

Ref: 12022008 MK2

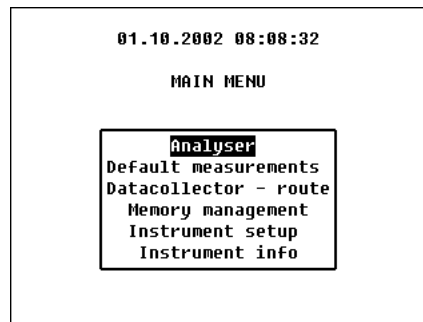
Contents:

Connection of the instrument A4300 to DDS2000 software	4
Connection of the instrument to PC.....	4
A4300 route creation	4
Uploading data from instrument to DDS2000.....	6
Storing and loading route from file.....	6
Deleting route	6
Working with sensors.....	7
The sensor definition error in old databases.....	10
Measurement conditions.....	11
Measurement conditions of spectrum.....	12
Measurement conditions of time.....	13
Measurement conditions of static.....	15
Parameters for Order analysis.....	17
Balancing	18
Transferring balancing data from instrument to DDS2000.....	18
Viewing balancing records.....	19
Balancing data cell local menu	20
Cooperation with A4300 BDL Application	22
The standard procedure of using A4300 BDL interface and A4300 BDL application:	22

Connection of the instrument A4300 to DDS2000 software

Connection of the instrument to PC

Switch on the instrument, the main menu appears.

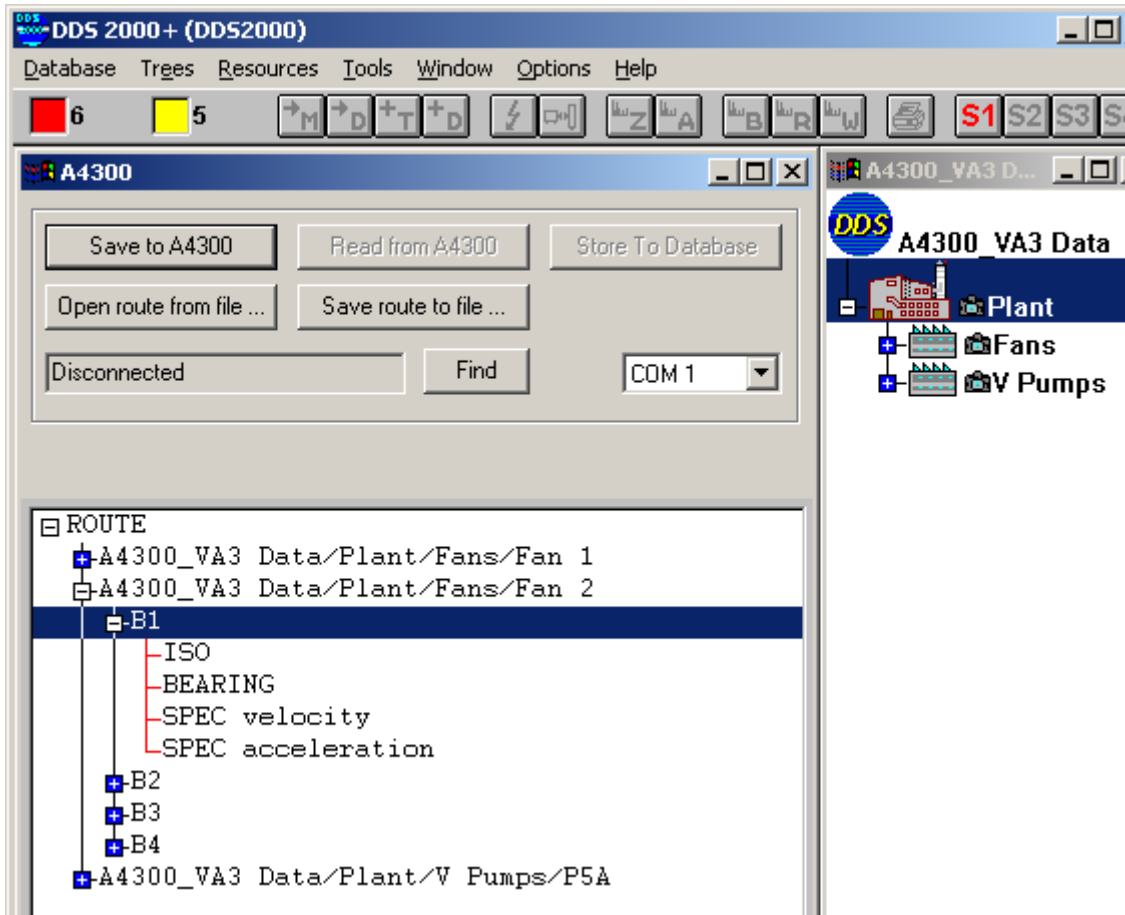


Connect the instrument via serial cable, which you receive with instrument. On the instrument use the connector RS232 on the bottom. On the computer use any free serial port.

A4300 route creation

Select **Tools / Connect Instrument / A4300** item in main menu. A new empty transfer window for data with the instrument appears.

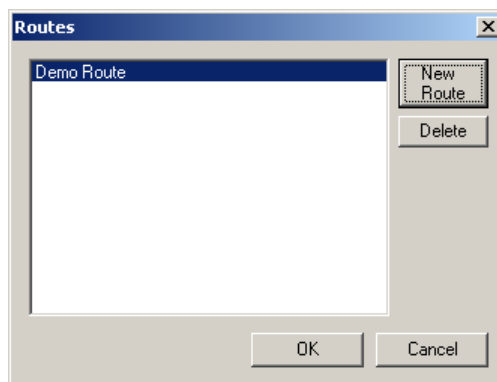
In the window on the right containing the data tree, open the tree to show those items which you want to measure in your route. By drag and drop move these items to the **A4300** window on the left of the screen. In this window the list of all measurement points appears. By double click or Enter button it is possible to open each item in the list to show all the sub-items. This is very similar to the DDS2000 tree.



In transfer window A4300 push **Find** button (ATTENTION - the instrument has to be in main menu!). When the connection is created, the **Instrument found** report appears. In the case of problems check the correct selection of COM port first and correct cable connection in both side.

In transfer window A4300-VA3 click **Transfer to A4300** button. A new window with a list of routes in the instrument appears (instrument can include max. 30 routes). Click the **New route** button and enter the name.

Click the **OK** button, now the route is downloaded to the instrument. In case of success the **OK** report appears.



Disconnect the cable and now you can take route measurements with the A4300-VA3.

Uploading data from instrument to DDS2000.

Select **Tools / Connect Instrument / A4300** item in main menu. Switch on the instrument and connect it via serial cable. In transfer window A4300 push **Find** button (ATTENTION - the instrument has to be in main menu!). When the connection is created, the **Instrument found** report appears.

In the case of problems check the correct selection of COM port first and correct cable connection in both side.

In transfer window A4300-VA3 click **Transfer from A4300** button. Select your route from the list of routes in the instrument. Click the **OK** button, now the route is uploaded to the computer.

Click to the **Store To Database** button. All measured data will be saved to relevant data cells.

IMPORTANT: IF YOU DO NOT PRESS STORE TO DATABASE BUT SIMPLY CLOSE THE SCREEN THE DATA WILL NOT BE STORED TO THE DATABASE AND YOU MUST REPEAT THE UPLOAD PROCESS.

Disconnect the cable and now you can make next data acquisition in DDS2000 software.

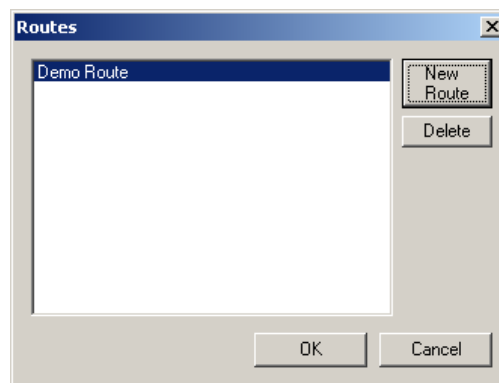
Storing and loading route from file.

Route list shown in instrument window can be saved by pressing button **Save route to file ...** When user presses button **Load route from file ...** previously saved route list can be loaded backwards into instrument route list. Stored files has extension ***.route**.

ATTENTION The file contains only route description, not any measured data. Any references needed in moment of creation of the route are loaded from database in that moment.

Deleting route

To delete a route, select the route in routes select dialog and click on button **Delete**.



Working with sensors

DDS2000 enables to define setting for sensors on three levels of data tree. These levels are **ROOT**, **MACHINE** and **MEASUREMENT PLACE** (tree item with machine flag=ON is called MACHINE and tree item with measurement place flag=ON is called MEASUREMENT PLACE, ROOT is on the top of tree and has no parent. The very useful feature of VA3 items is the possibility to define the sensor type. The list contains several types:

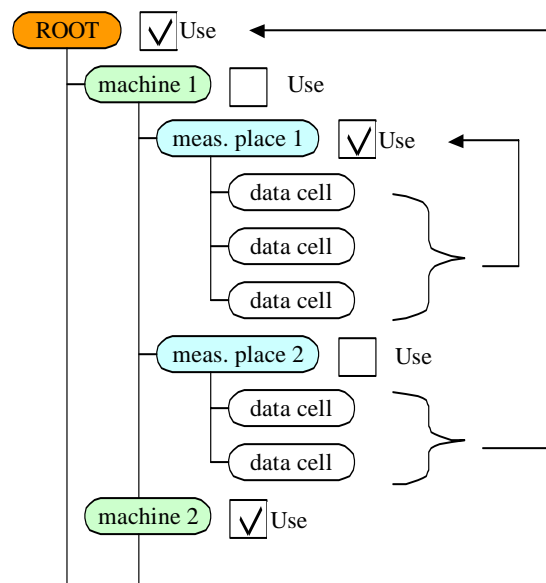
- ACC acceleration (probably the most often used sensor),
- VEL velocity,
- DISP displacement,
- Speed (for tachometer sensor)
- Volt AC (any type of AC voltage signal, which user can in DDS2000 convert to any quantity),
- Volt DC (any type of DC voltage signal),
- User DC (similar like Volt DC, but user can define the unit, which is displayed on VA3)
- Not defined (no sensor defined - default selection).

When the sensor type is defined, then all data cells below this item use this one. In the tree more than one sensor can be defined in one branch, each data cell will always use the nearest sensor. It is the same way, how the DDS operates with speed information. See the **Use** checkbox, this is the important thing. User can define sensor in the dialog, but without the **Use** flag=ON this definition will not be used.

Summary:

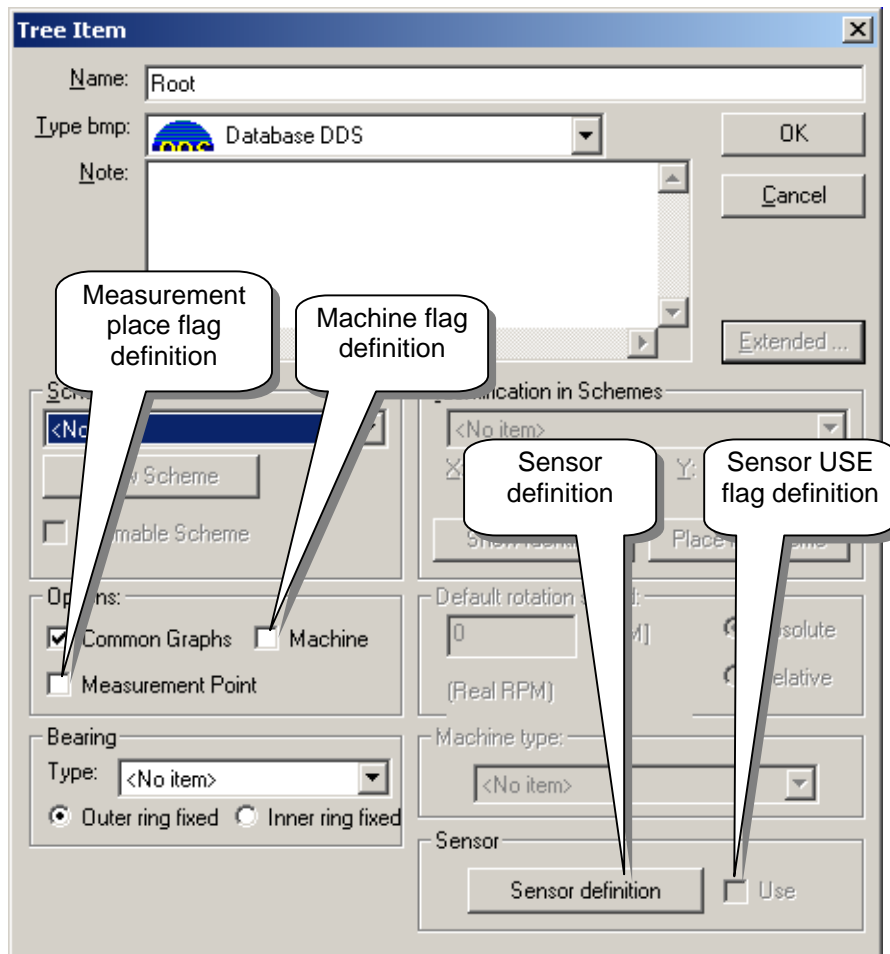
When we store the route to the instrument window, then DDS handles with sensor definition by this way:

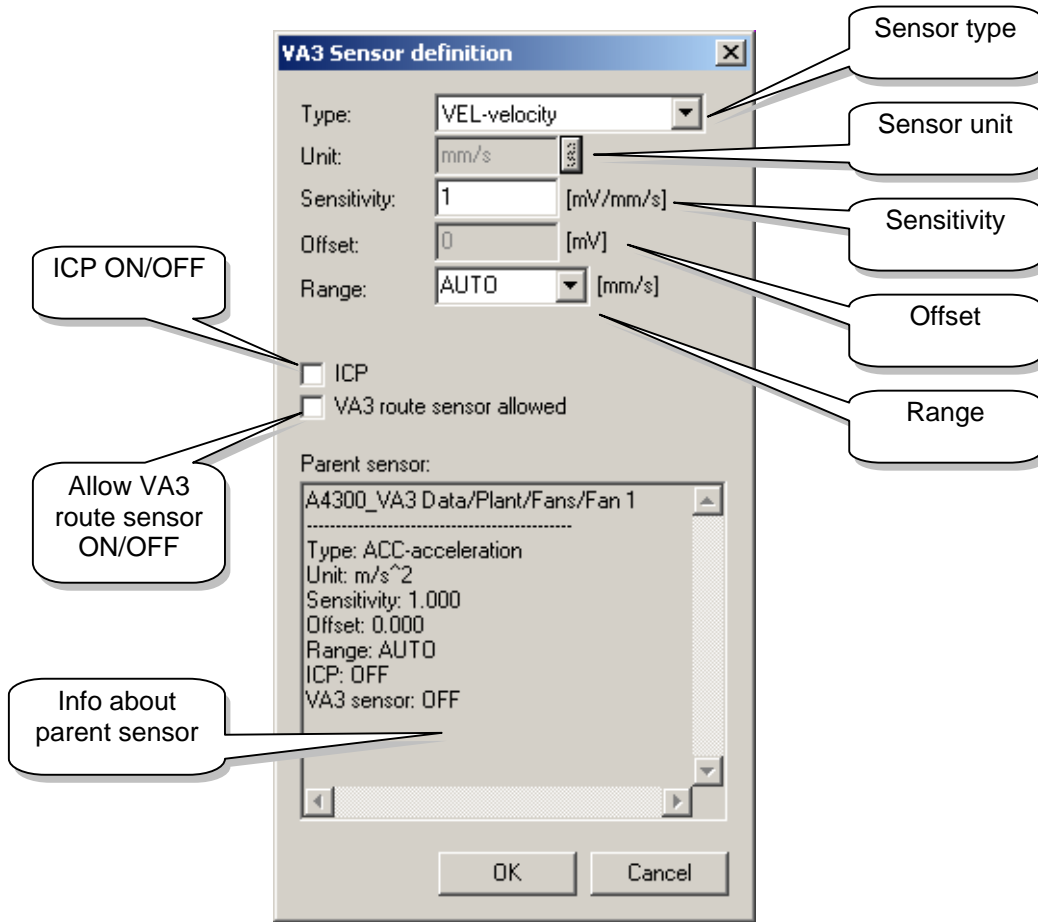
- 1) if it is checked Use box on measurement place, sensor settings are taken from meas place else
- 2) if it is checked Use box on machine, sensor settings are taken from machine else
- 3) if it is checked Use box on root, sensor settings are taken from root else
- 4) data cells **will not be transferred to the instrument**, because there is no sensor defined on the path.



Example of using sensor definition on various levels

To invoke sensor definition dialog, click on **Sensor definition** button, which is accessible from tree item edit dialog (see picture below). Next to sensor definition button there is a check box **Use**. If we don't want to use sensor settings from this current level, we leave this box unchecked.





Sensor definition dialog

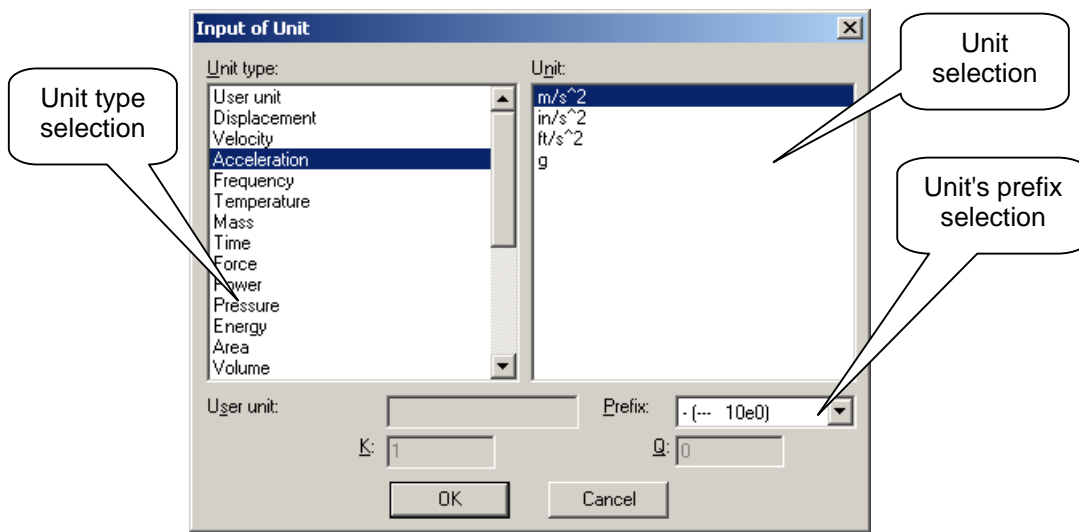
Combo box **Type** is enabled only if there are no data in data cells under this tree item. Once user load data into data cells under this tree item, then it is impossible to change sensor type.

When User is creating new tree item, default sensor for this item is **"Not defined"** sensor. This sensor is impossible to use, that's why the **Use** checkbox on tree item is disabled.

Each sensor type has defined group of units, which are compatible with instrument. So we can select unit only from this group.

VA3 route sensor allowed - we check this box, if we want to use VA3 route sensor. This sensor is defined in instrument. When we allow to use it, then the sensitivity of sensor is not exactly required (e.g. we can have defined the 100mV/g in DDS and the VA3 uses the 50mV/g sensor, then the VA3 automatically will use current sensor and will not remind to user the change of sensor).

Parent sensor info - if there is a sensor at the higher level with **Use** flag set to ON, then setting of that sensor is shown in info window, otherwise "Not defined" message appears.



Sensor unit selection dialog

The sensor definition error in old databases

When user downloads the route into instrument window, then every data cell is checked, whether the sensor definition is correctly defined. All founded errors are displayed in new notepad window. The data cells with not correctly defined sensors are then not transferred to the instrument. When user has old database, then this conflict will occur. Because all users probably used only the accelerometer sensor, the it is possible to define this sensor type to root item and all route functions will work correctly again. Do not forget check the **Use** box.

Measurement conditions

There exists two basic data cell types for A4300 instrument in DDS:

1. predefined – STATIC VALUE (ISO, BEARING, L-BEARING, RPM, DC)
2. definition free - with measurement conditions enabled - STATIC VALUE (GENERAL, MANUAL), TIME, SPECTRA, ORDER ANALYSE

For predefined data cells measurement conditions are given by DDS and can't be changed, they are read only. See A4300 manual for definition of those predefined measurements.

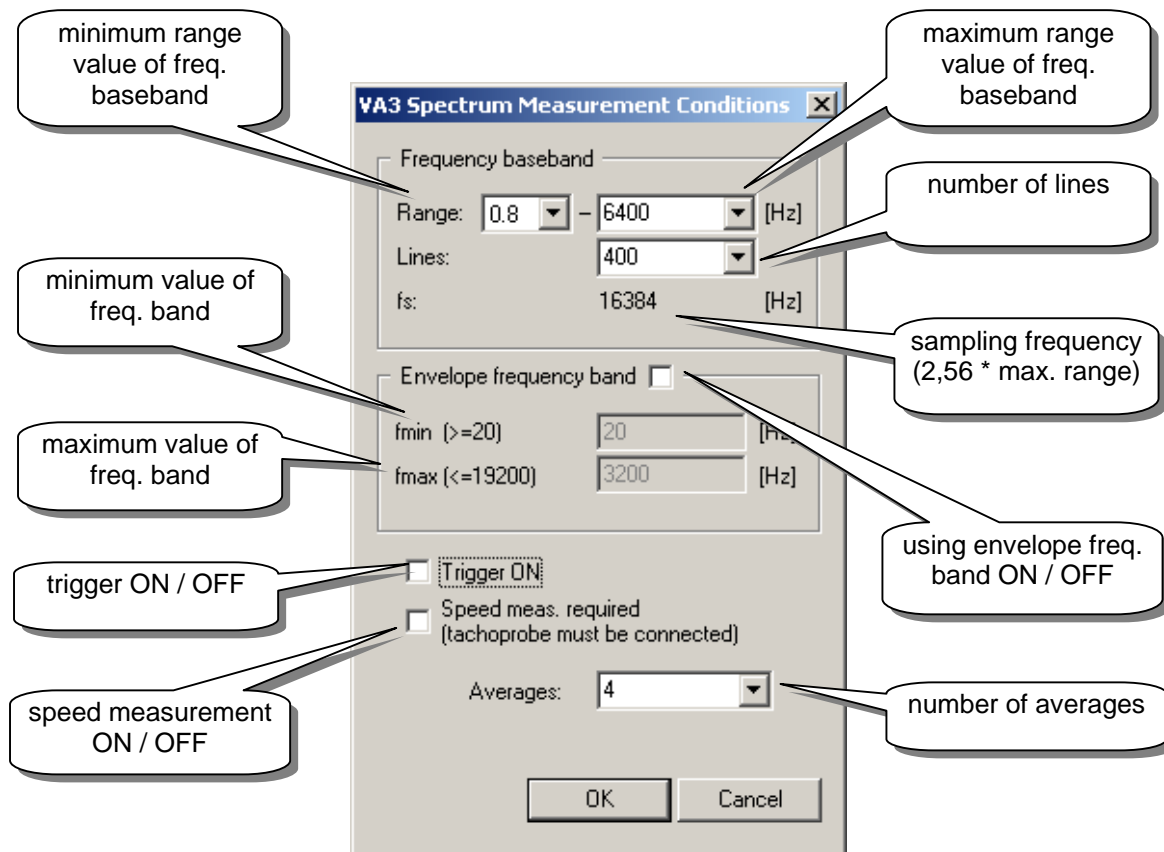
For definition free data cells user can specify parameters of a measurement.

Each data type has its own dialog for editing measurement conditions. The most important thing is the measurement path which depends on sensor settings and data cell settings particularly on sensor type and unit and data cell unit. From this dependence we can determine meas. path, which is:

- 1) **direct path** - sensor unit type is the same as data cell unit type (e.g. ACC sensor and ACC data cell unit type, VEL sensor and VEL data cell unit type, ...)
- 2) **1 integration path** - data cell unit is the first integration of sensor unit (e.g. ACC sensor and VEL data cell unit, VEL sensor and DISP data cell unit,)
- 3) **2 integration path** - data cell unit is the second integration of sensor unit (e.g. ACC sensor and DISP data cell unit)
- 4) **1 derivation path** - data cell unit is the first derivation of sensor unit (e.g. VEL sensor and ACC data cell unit, DISP sensor and VEL data cell unit,)
- 5) **2 derivation path** - data cell unit is the second derivation of sensor unit (e.g. DISP sensor and ACC data cell unit)

Note: 1 and 2 derivation path is unacceptable and **data cells will not be transferred** into the instrument.

Measurement conditions of spectrum



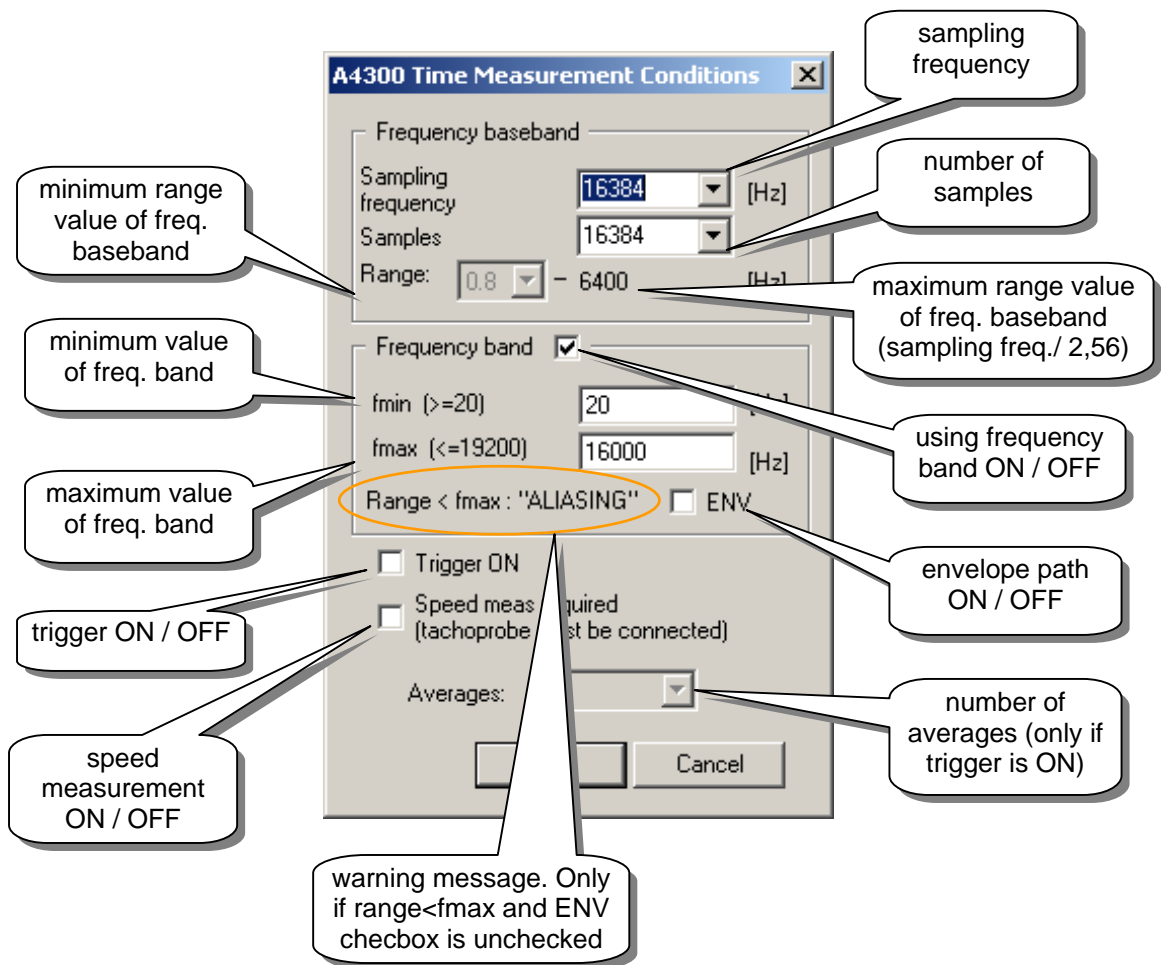
Range:

User can choose minimum value from combo box and this value depends on meas. path. If path is direct, then min. range is always 0,8Hz. For 1 integration path we can select between 1 or 10Hz and for 2 integration path is min. range 10Hz. We can choose maximum range value from predefined values in combo box or we can edit this combo box and type value manually. Maximum range is 19200Hz.

Sampling frequency is here just for information and it is $2,56 * \text{max. range}$.

If we are on direct path, we can use **envelope frequency band**, for other paths is this control disabled. Then we can edit minimum a maximum value of frequency band in range 20 - 19200 Hz.

Measurement conditions of time



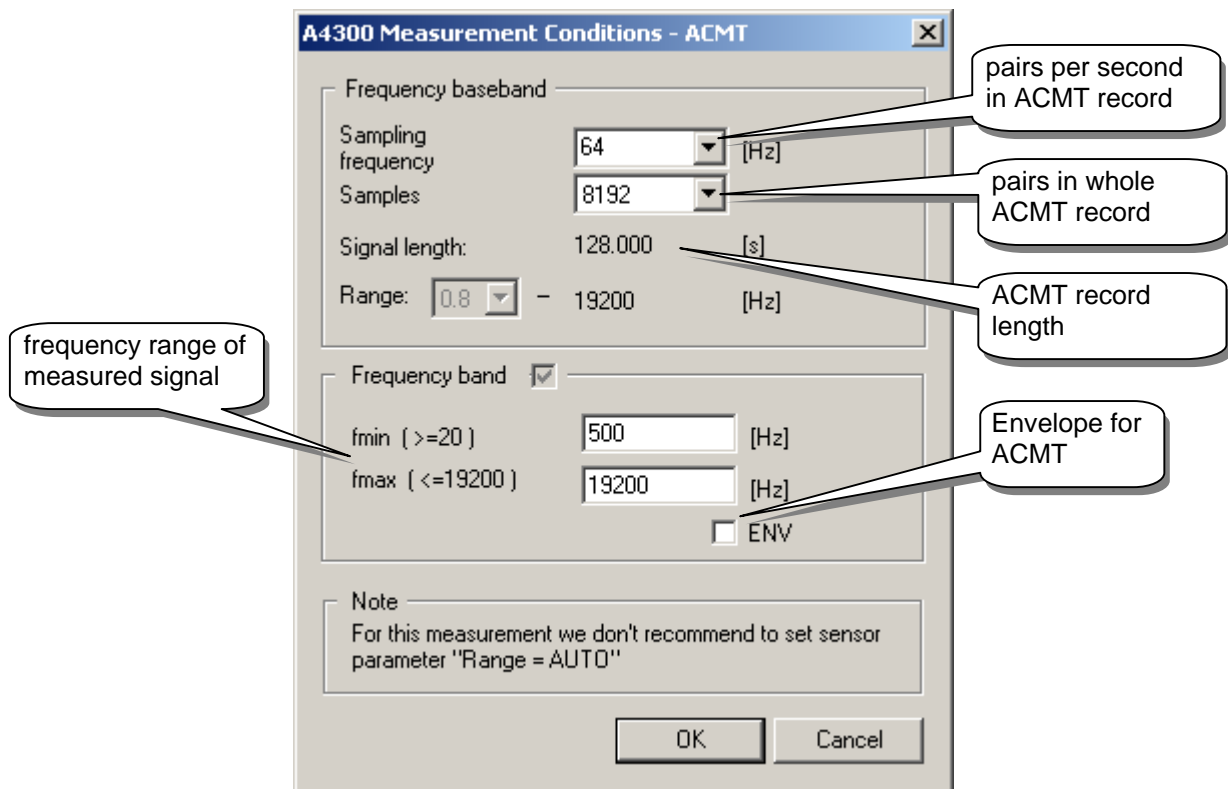
Sampling frequency- we can select value from predefined values in combo box or edit value manually.

Samples - here we choose number of samples

Range - maximum range value has information character here and it is sampling frequency / 2,56. Minimum range value is enabled only if we are not using frequency band and its value depends on the meas. path. If path is direct then min. range is 0,8Hz, if it is 1 integration path we can select 1Hz or 10Hz value and if it is 2 integration path, min range is 10Hz.

If we use **frequency band** then we edit minimum and maximum frequency value in range 20-19200Hz. Then if fmax > max range and ENV checkbox is unchecked, **aliasing** occurs and we can see warning message. Checkbox ENV is enabled in case we are on direct path, so we can use this to set envelope path in instrument.

Measurement conditions of ACMT



Frequency band of measured signal is defined in section **Frequency band**. Maximum frequency range is 20Hz - 19200Hz.

Sampling frequency item and **Samples** item define ACMT record.

Sampling frequency item defines number of samples (maximum/minimum pairs) per second in ACMT record. Minimum value is 8Hz and maximum value is 8000Hz (values in range 64-8000Hz can be chosen in combo-box, a lower value must be typed manually).

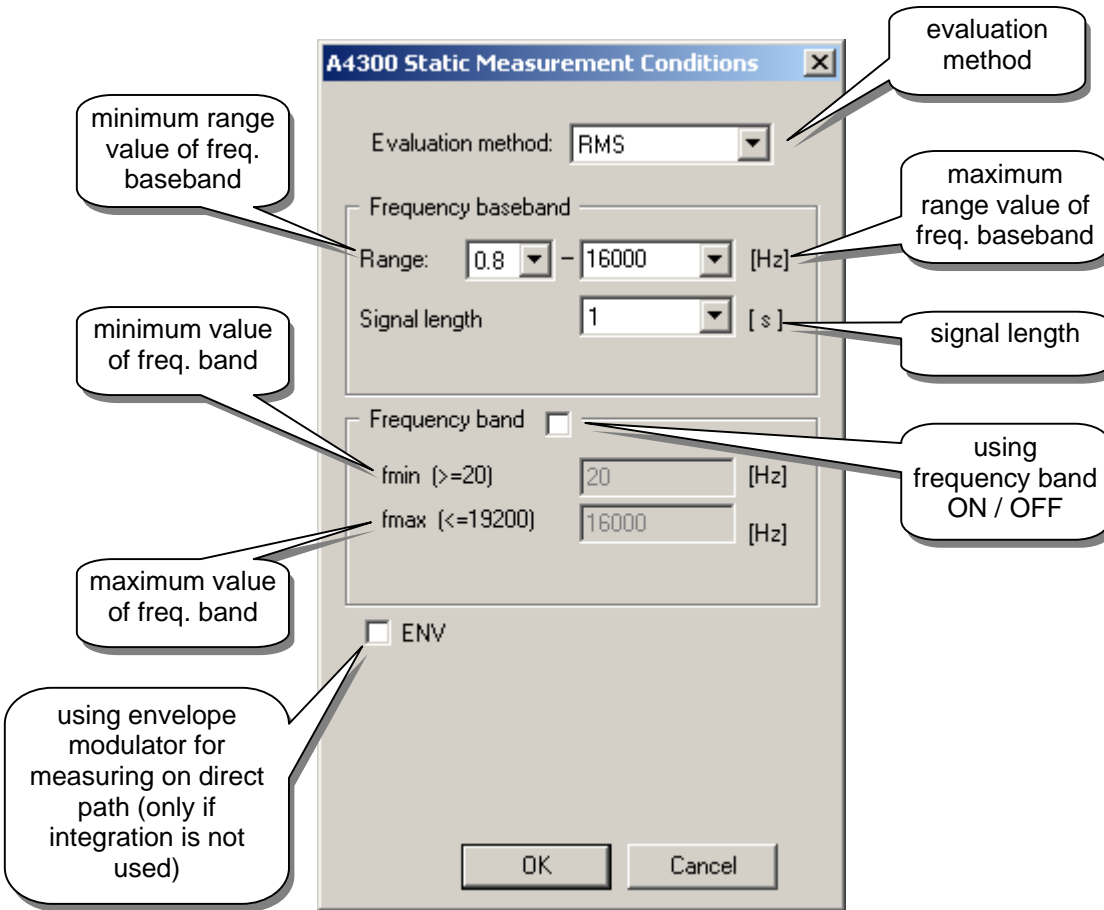
Samples defines number of samples (pairs) in whole ACMT record. Minimum value is 256 samples (pairs) and maximum value is 8192 samples (pairs)

Signal Length shows ACMT record length in second. It depends on **Sampling frequency** and **Samples** item.

Maximum ACMT record length is **1024** second (**Sampling frequency = 8** and **Samples = 8192**).

Measurement conditions of static

This dialog is editable only for static types GENERAL and MANUAL, for others is this dialog read only.

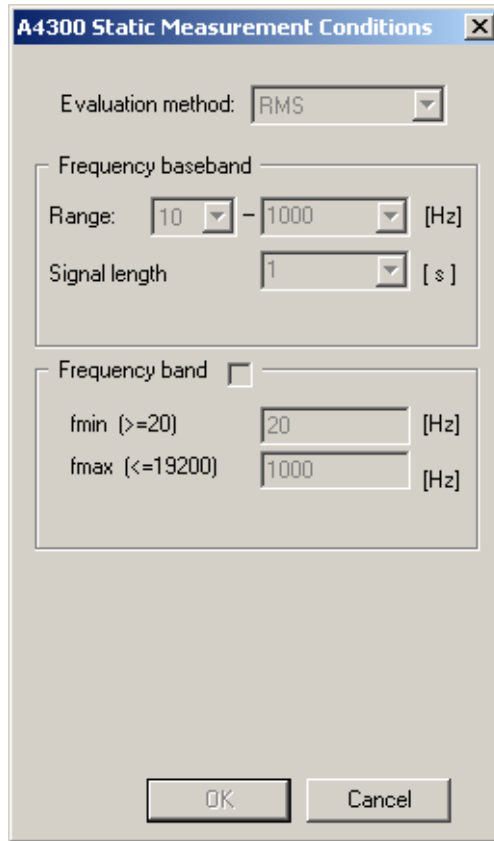


Evaluation method - we can select between RMS, 0-PEAK, PEAK-PEAK, CREST, KURT, RMS-ENV
 Note: RMS-ENV is accessible only if we are on direct path.

Range - enabled only if we don't use frequency band. Minimum range depends on meas. path. For direct path it is 0,8Hz, for 1 integrator path it is 1Hz or 10Hz and for 2 integrator path it is 10Hz. Maximum range we can select from predefined values in combo box or edit value manually. Maximum possible value is 19200Hz.

Signal length - length of signal in seconds

If we use frequency band, then we fill values fmin and fmax in range 20-19200Hz



read only dialog for ISO static

Parameters for Order analysis

Number of computed lines defines number of computed lines (amplitude+phase). Minimum is three lines (one rotation speed frequency and two nearest harmonics). Maximum is ten lines (one rotation speed frequency and nine nearest harmonics).

Line width [Hz] is width of a line in hertz. It defines frequency range for order analysis computing. Minimum is $\pm 0,5$ Hz and maximum is ± 10 Hz.

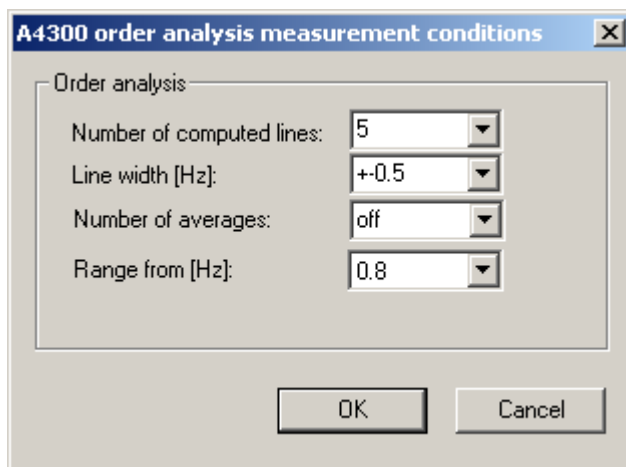
Number of averages. Minimum is **off** (no average) and maximum is **100** averages.

Range from [Hz] defines low-pass filter for measurement.

direct path - value is 0,8Hz and cannot be changed

1 integration path - 1Hz or 10Hz value can be chosen

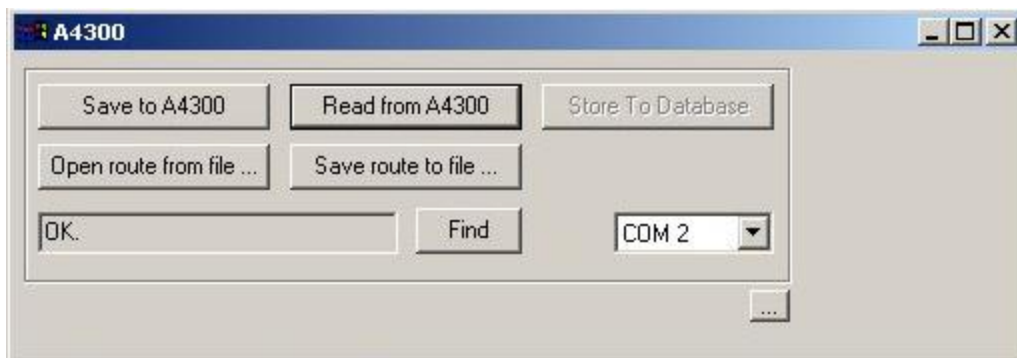
2 integration path - value is 10Hz and cannot be changed



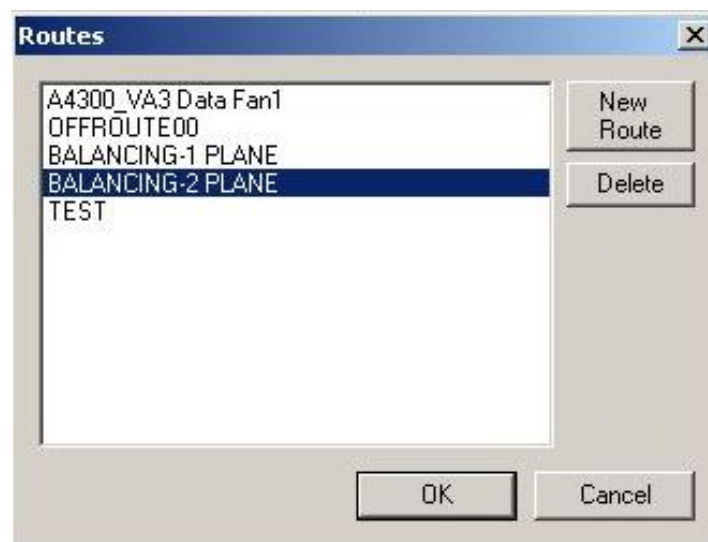
Balancing

Transferring balancing data from instrument to DDS2000

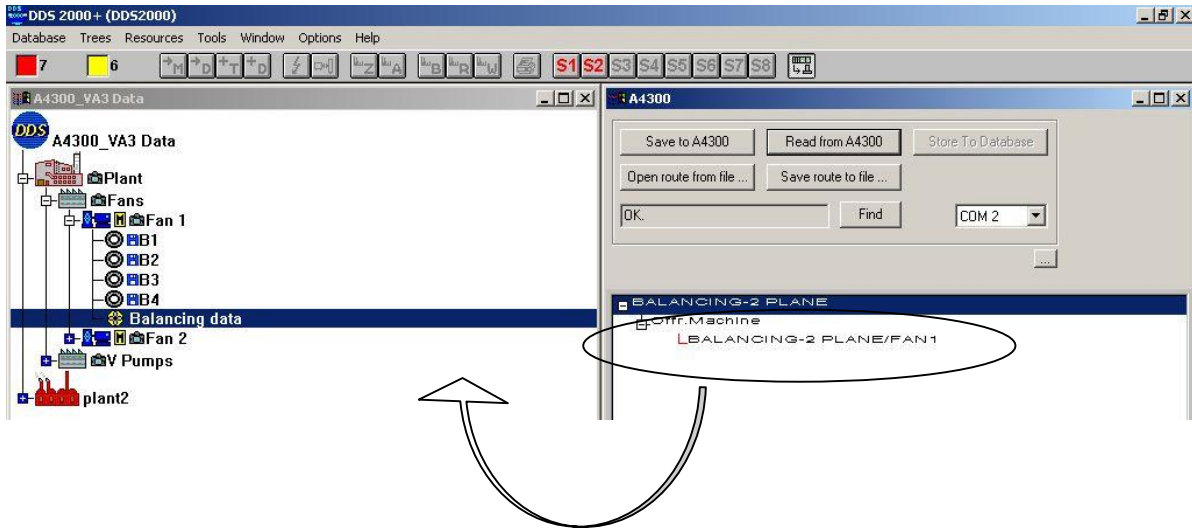
- from menu **Tools/Connect instrument** choose instrument **A4300**
- in dialog A4300 select COM port on which instrument is connected to your PC and click on **find** button .
- if instrument is founded, **Read from A4300** button becomes enabled.



- after click on **read from A4300** button you can see a list of routes in the route manager window, from which select balance route and click on OK button.



Now it is time to import balance data to DDS2000. Just use drag&drop operation to store balancing data into the DDS2000. After that, new balance data cell is created in the actual database.



Viewing balancing records

Open a DDS tree up to the level containing a balancing data cell. Now you have three possibilities to view signal in the data cell.

- by left mouse double-click on selected data cell,
- by activating the data cell and pressing the **Enter** key,
- by activating the data cell and using the **Draw Data** local menu command (right mouse button).

Now the balancing record from this data cell appears on the screen.

Balancing report

Project name: BALANCING-2 PLANE
Machine: A4300_YA3 Data/Plant/Fans/Fan 1
Date, time: 10.8.2004 10:53:23
Database: DDS2000
Data cell: Balancing data\BALANCING-2 PLANE\FAN1

Number of planes: 2
Machine speed: 1200 RPM

	Left		Right	
	Magnitude/Mass	Angle	Magnitude/Mass	Angle
Initial Reading	0.80 mil,RMS	53 °	1.02 mil,RMS	-47 °
Left Trial Reading				
Weight	0.50 ounce			
Reading	0.99 mil,RMS	-83 °	1.22 mil,RMS	123 °
Right Trial Reading				
Weight	0.50 ounce			
Reading	1.12 mil,RMS	20 °	1.31 mil,RMS	-12 °
Primary Balance				
Weight	0.23 ounce			
Reading	0.16 mil,RMS	77 °	0.10 mil,RMS	-10 °

Open Browser Print Done

From this report dialog we can use followed commands by clicking on particular buttons:

Print - command to print protocol to the printer. Having selected this command the standard window for printer output appears.

Open Browser - command to open internet explorer and view balancing protocol.

Done - command to close protocol dialog.

Balancing data cell local menu

To access commands from local menu, click right mouse button on balancing data cell

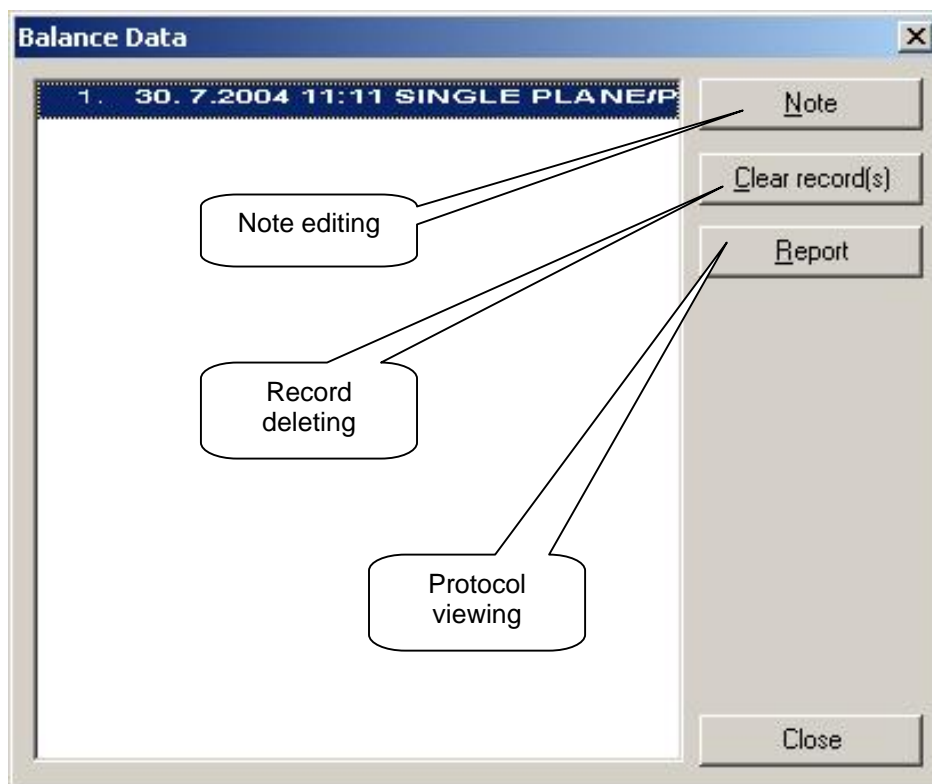
Edit Data Cell	Ctrl+E
Add Data Cell	Ins
Delete Data Cell	Del
Draw Data	
Edit Data	
Fast View	
Print	
Save to Clipboard as Bitmap	
Confirm Status	
Data Reduction	

Add Data Cell - add new data cell into actual tree branch.

Delete Data Cell - remove actual data cell.

Draw Data - view balancing protocol.

Edit Data - opens edit dialog for editing balance data.



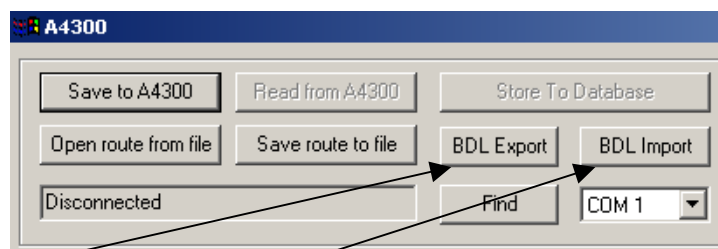
Save to Clipboard as Bitmap - save copy of tree window into the clipboard as bitmap.

Cooperation with A4300 BDL Application

DDS 2000 does not need to have the A4300 instrument connected directly to set route or download measured data. The route and data can be transferred by standalone application A4300 Binary Downloader (A4300 BDL in next text). Of course only the DataCollector modification of A4300 instrument, which allows measuring routes is intended to communicate with A4300 BDL.

Routes and data are transferred as the files. Route files have the extension of .a4300r, the data file have the extension of .a4300d. You need to have licensed A4300 BDL interface for DDS. The person responsible for measuring needs the A4300 BDL application license (see also A4300 BDL user's guide for more).

There appear two additional buttons in the A4300 instrument connection window when you have the A4300 BDL interface for DDS available.



BDL Export – exports the A4300 route into the file with extension .a4300r. The file can be loaded into instrument by **A4300 BDL** application.

BDL Import – imports the A4300 data file. It is the file created by **A4300 BDL** application, having extension of .a4300d.

The standard procedure of using A4300 BDL interface and A4300 BDL application

1. In DDS, open A4300 instrument connection window
2. Create the route as described in the **A4300 route creation** chapter
3. Click the **BDL Export** button
4. Standard **Save File As** dialog appears with the file name equal to the name of your route (we recommend to keep this file name)
5. Click the **Save** button to save route file
6. Get the saved route file and send it to the person who will perform all measurements.

The person responsible for measurements gets the route file. Then he/she loads it into A4300 instrument (using A4300 BDL standalone application) and performs all the measurements. After that he/she downloads the measured data into the data file and sends this file to you.

7. In DDS, open A4300 instrument connection window
8. Click the **BDL Import** button
9. Standard Open File dialog appears
10. Select the data file and click the **Open** button to load the route with measured data - the **Store To Database** button in the A4300 connection window becomes enabled
11. Click the **Store To Database** button to transfer measured data into database