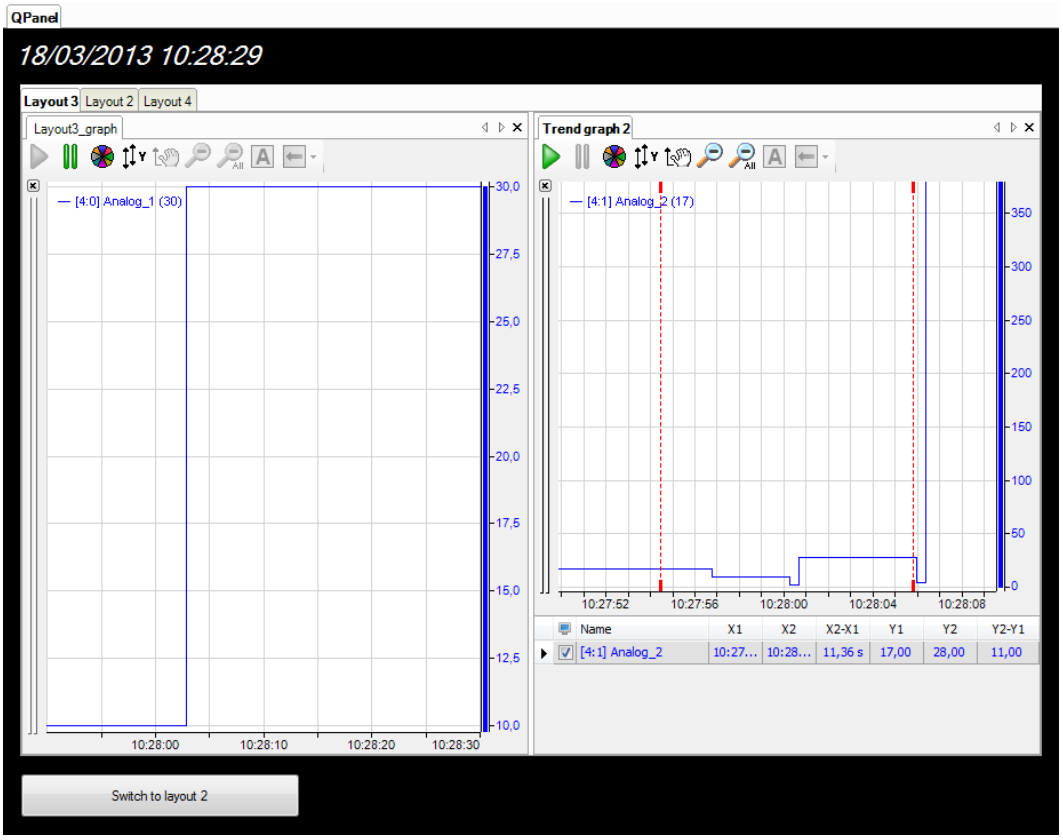
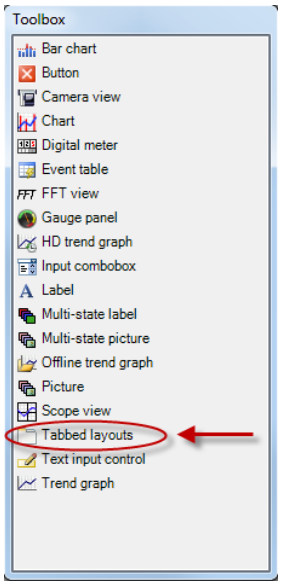
New features in ibaPDA v6.30.0

1 QPanel – Tabbed Layouts

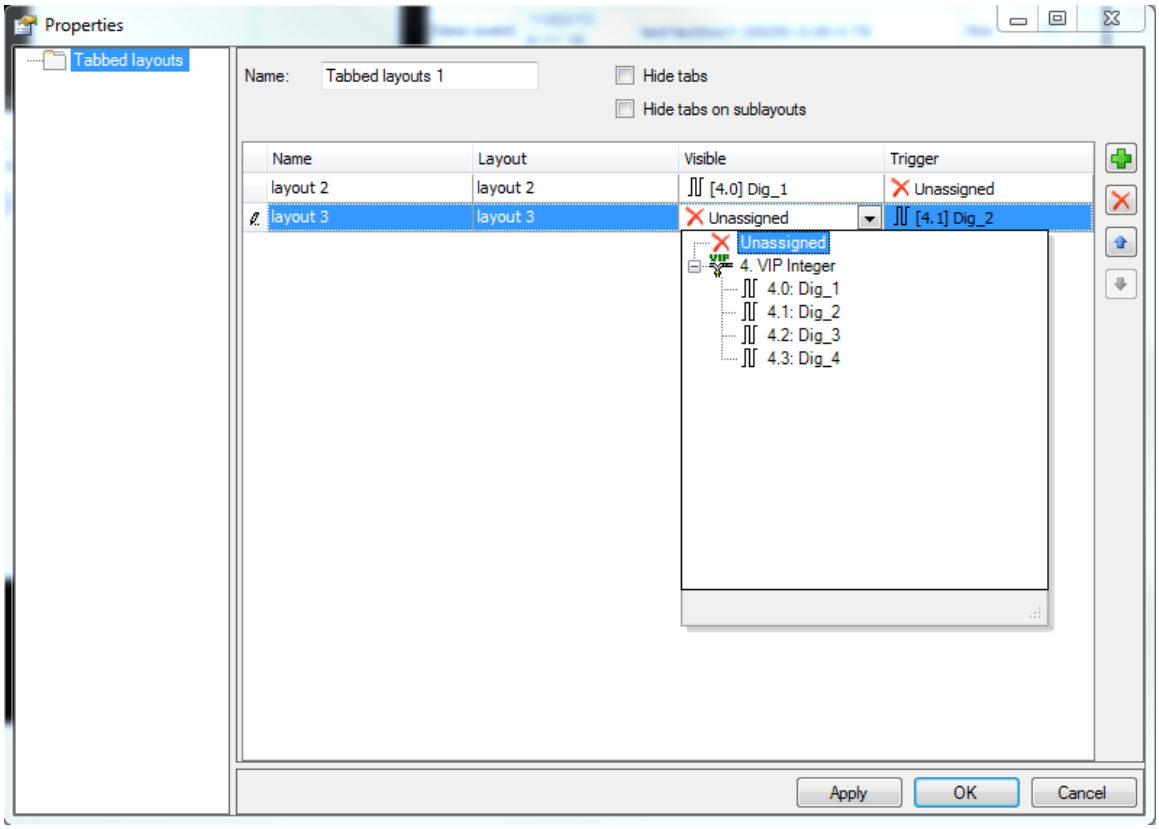


Tabbed Layouts is a new control that can be placed in a QPanel. It is basically a tab-structure where each tabpage refers to an already existing layout and displays its contents.
Although user interaction is allowed in the tabpages, the layout can not be edited and all child controls are locked. To make changes to a layout, the actual layout to which a tabpage refers should be edited.



The main advantages of this new control are that the user can easily switch between layouts and the ability to link digital trigger signals to each tabpage. A first digital signal determines whether a tabpage is visible or not while a second one controls which tabpage is selected.

To define which layouts are referred to, the user has to open the Properties window belonging to the TabbedLayouts object. Note that in the context menu, there is already an option to hide or show the tab header.

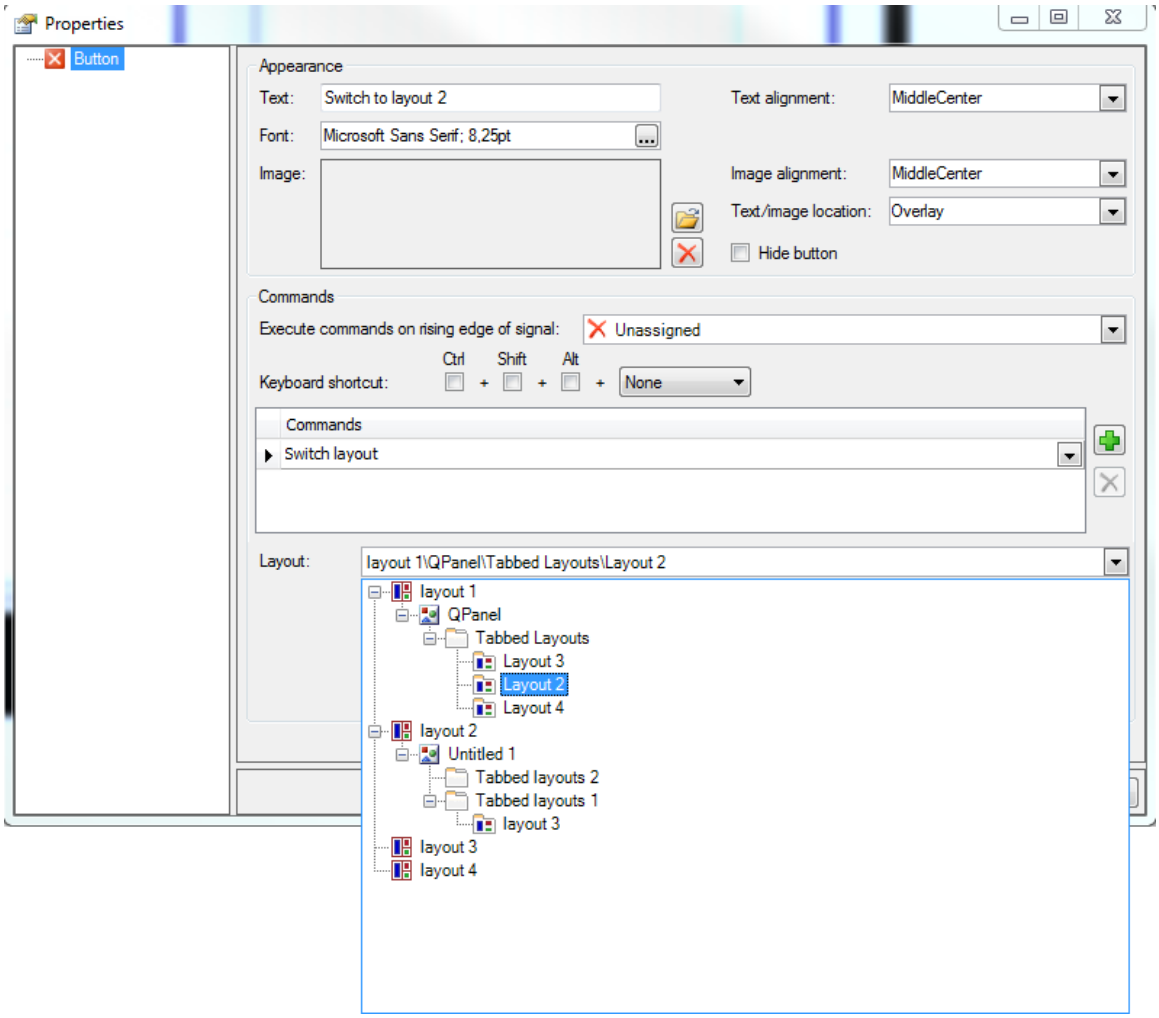


The main part of the Properties window consists of a table with 4 columns:

- Name: This is the name of the tabpage which is displayed in the tab header. It is advised to choose a unique name (by default, the name corresponds to the chosen layout).
- Layout: Here, the user can select one of the available layouts to refer to. In order to avoid circular references, the user cannot select the layout in which the current Tabbed Layouts object is being configured nor can he select layouts that contain Tabbed Layouts referring to the current layout.
- Visible: A digital signal from the signal tree can be selected to determine whether a tab page is displayed. At first, the tab page is visible. At a falling edge of the selected signal, the page will no longer be displayed in the tab header. At a rising edge, the page will be available again.
- Trigger: At a rising edge of the selected digital signal, the corresponding tab page will be selected.

Apart from this table, it is also possible to change the name of the control and indicate whether its own tab header (Hide tabs) and those of its child controls (Hide tabs on sublayouts) should be displayed.

It is also possible to control a Tabbed Layouts object using a Command Button. The Switch layout command has been extended for this.



Instead of a simple drop down list containing all layouts, a tree structure is now available that lists all layouts including the Tabbed Layouts objects and their pages.

Apart from using a Command Button to switch to a certain Tabbed Layouts object, it is also possible to select a tab using the Event Table.

2 ibaInSpectra

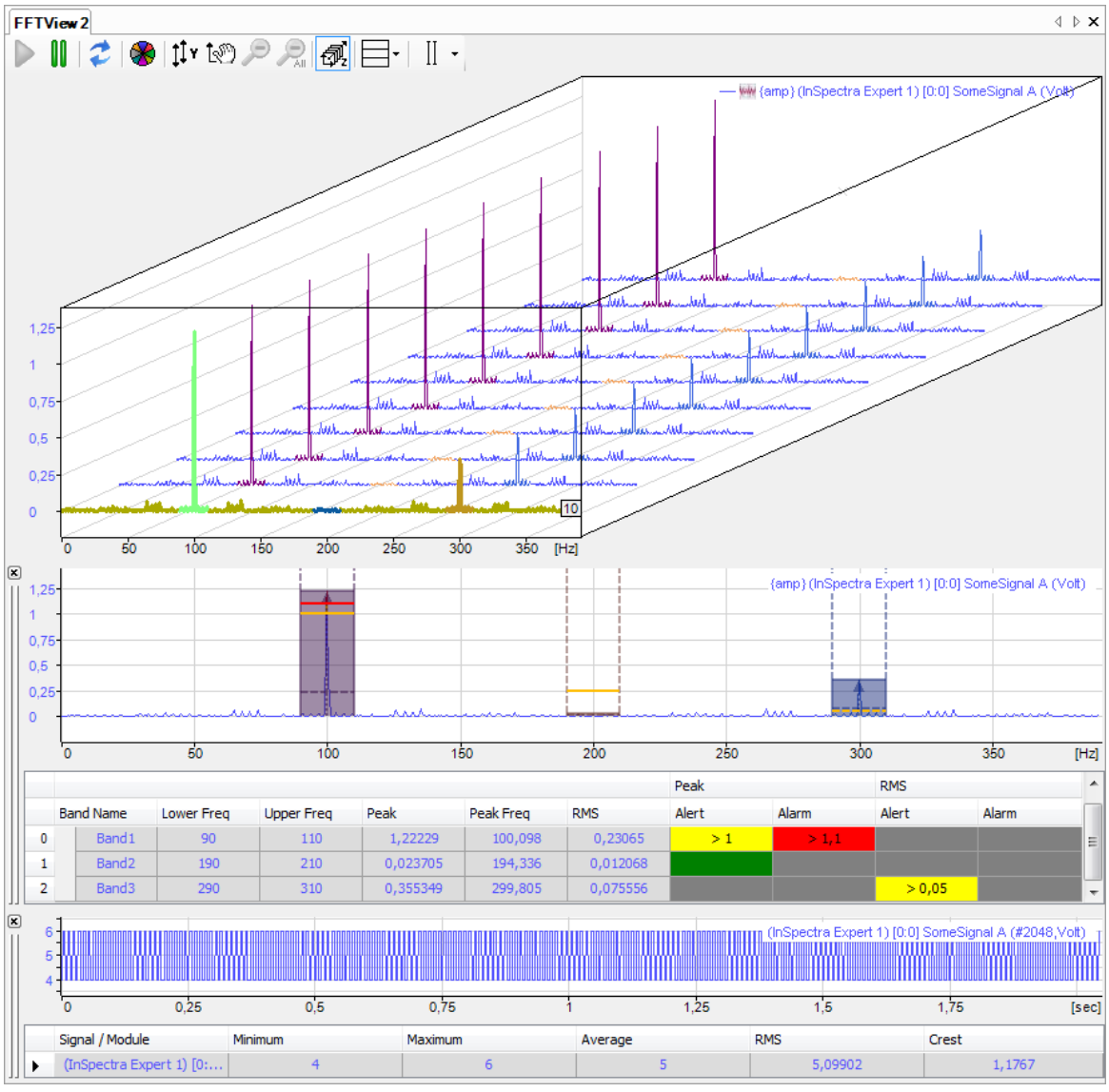
2.1 InSpectra Expert modules

InSpectra Expert technology modules are supported in ibaPDA. More details regarding the iba Condition Monitoring solutions on request.

2.2 Updated FFT View

The FFT View is extended so that it can easily be used with InSpectra Expert modules. The FFT View will automatically be configured from the settings defined in the InSpectra Expert module.

Further general improvements independent from ibaInSpectra are available in the FFT-View:



In ibaPda < V6.30.0 the FFT View contained one graph. This graph corresponds to the graph visible at the top of the screenshot. We will refer to it as the **main window**. In this new version, four sub windows have been added. They can be switch on or off independently by using the toolbar:

- Spectrum slave graph window:
- Spectrum slave table window
- Time slave graph window
- Time slave table window

The main window is always shown on the top (but it can be hidden by using the toolbar). The spectrum graph and table slave are grouped together. The time graph and table slave are also grouped together. The position of the time slaves and the spectrum slaves can be switched with the mouse by using the grippers on the left of the slaves.

The height of the main window and of each slave can be changed with the mouse.

2.2.1 New features of the FFT View main window

1) It is possible to drag an InSpectra Expert module in the main window: a new curve in the FFT View will be generated. The mathematical settings of the FFT are downloaded automatically from the server and are available in the property window of the curve.

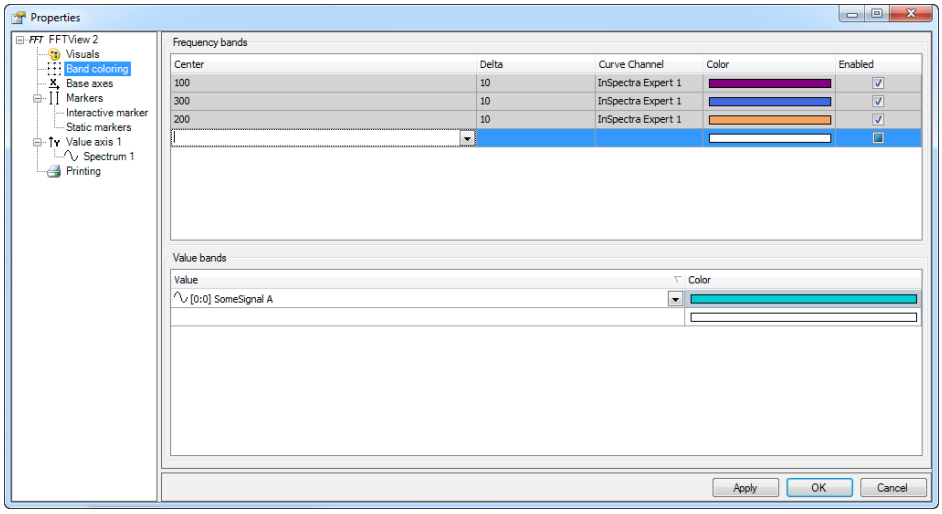
   The legend item of the InSpectra Expert curve contains:
   - {amp} or {pow}: amplitude spectrum versus power spectrum
   - The InSpectra Expert module number
   - The id of the input signal of the InSpectra Expert module
   - The name of the input signal of the InSpectra Expert module
   - The unit of the spectrum (this unit depends on the InSpectra Expert profile settings)

2) By pressing the control button when the waterfall is visible and dragging the mouse at the same time, one can change the perspective angle. Additionally, by pressing shift at the same time, the perspective angle will change to zero degrees.

3) Band colors. In the old FFT View one could already add color bands:
   - Horizontally: color the curve around frequency [center-delta ,center+delta], where center and delta can be specified. Multiple bands can be defined.
   - Vertically: color the curve so all spectrum values above some Y value are in a specific color. Multiple Y levels can be defined.

   This functionality is extended:
   - One can specify that a horizontal band is only active for a specific curve (in the old version these bands where applied to all curves)
   - If an InSpectra Expert module is dropped in the FFT View, the InSpectra Expert bands are automatically added to the horizontal bands. They cannot be removed (to show this, they are in a grey color), but
     - You can change the color of a band (colors are generated randomly)
     - You can disable or enable the band coloring of the band

   This is demonstrated in the following screenshot:



4) The functionality of the markers has been revisited. Now, there are two types of markers:
   - One interactive marker which is movable. This marker can be switch on or off.
   - Multiple static markers (same name as in ibaAnalyzer) can be used. A static marker is a marker that cannot be moved, **but it's position is not always static**, because it's position can be steered by a signal. This means that, in case the main window shows the waterfall, the marker can have a different value in every plane.

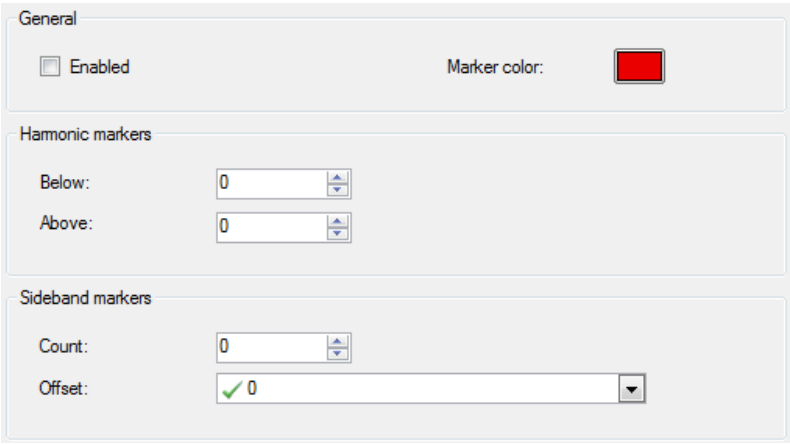
For each marker, one can define harmonics and side bands. For static markers, it is possible to show the odd or even harmonics only (by changing the mode of a static marker). Another change is that for each type of marker, it is possible to have a sideband offset that is a signal. Consequently, also the sideband offset can be different for each plane if the waterfall is shown.

Note that:
- if a static marker is linked to a signal, the marker will not be shown if this signal is negative
- if the sideband offset static marker is linked to a signal, the offset will be zero in case this signal is negative (this means no side bands are displayed).

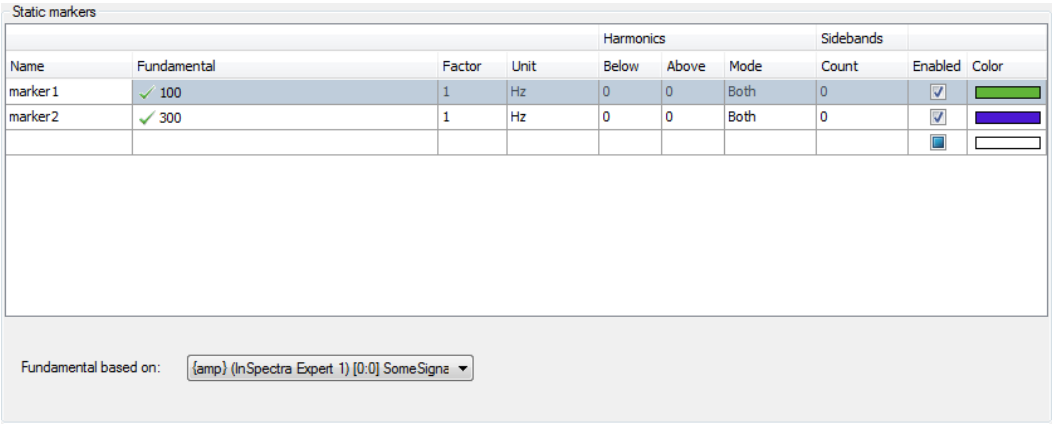
For each static marker, the position of the marker is determined by multiplying the following parameters:
- fundamental: static value or signal
- factor (useful in case one wants to have a marker that is a multiple of a signal)
- unit conversion factor, in case the unit of the static marker is set to RPM, factor=1/60. In case the unit of the static marker is set to Hz, factor=1.

The two controls to set up the markers in the properties window look like this:

Interactive marker:



Static markers:



In the screenshot of the static markers, you see the option named "Fundamental based on". This is an advanced option which is only useful if an FFT View contains multiple curves.
The marker position of a static marker is calculated as the average of the values of the fundamental during the time of the FFT, multiplied by the factor and the unit factor.

So, one plane -> one average -> one marker position. But it is possible that the FFT View contains multiple curves. This means that each plane can have two or more FFT's.

➔ This option determines what FFT results are used for averaging the fundamental.

For instance, there are two curves A and B. In the front plane there are two FFT results, one result from A and one result from B. The result from A is generated based on the input with timestamps [1..1024], the result from B is generated based on the input with timestamps [100,1123]. In case this option is set to curve A, then the marker position belonging to the front plane will be the average of the fundamental in [1..1024], multiplied by the factor and the unit factor.

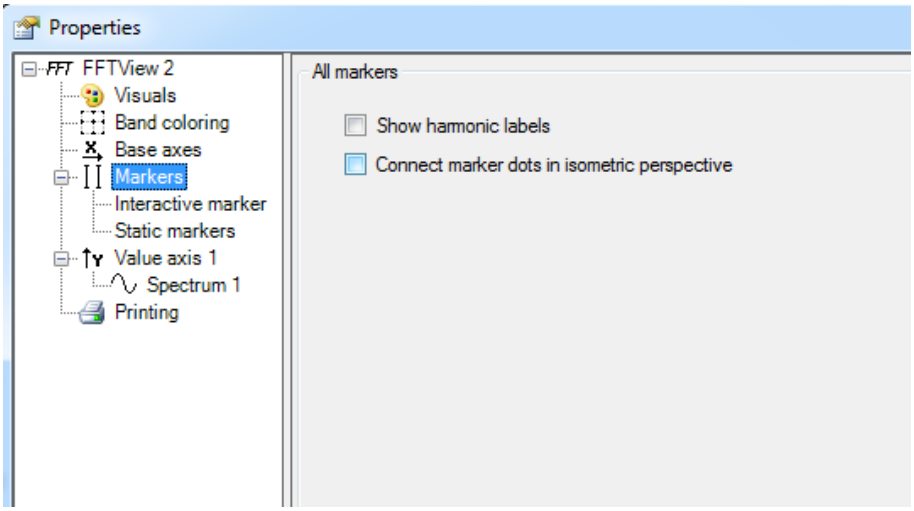
The marker can be centered by using the marker button in the toolbar (this is useful if the graph displays some zoomed area, but does not display the marker).

The marker button in the toolbar always corresponds to the window that is selected:

- either the main window or the spectrum graph slave (the marker in the main window and the marker in the spectrum graph slave are the same, they are synchronized).
- either the time slave graph which has it's own marker

For all markers, there are also two options as you can see in the screenshot below.

- this option is not new: show harmonic labels
- this option is new: connect marker dots in isometric perspective (if the waterfall is shown, the marker dots of each plane are connected)



How can we move the interactive (movable) marker?

- (A) With the mouse one can drag the marker
- (B) With the left and right arrow.
  - Note: if pressing shift in the meantime, each step is higher!
  - Note: if pressing control in the meantime, each step is very small!
- (C) With the mouse wheel while pressing shift.

In case of (B): the longer you press the key, the faster the marker moves!
In case of (C): the longer you scroll without stopping, the faster the marker moves!

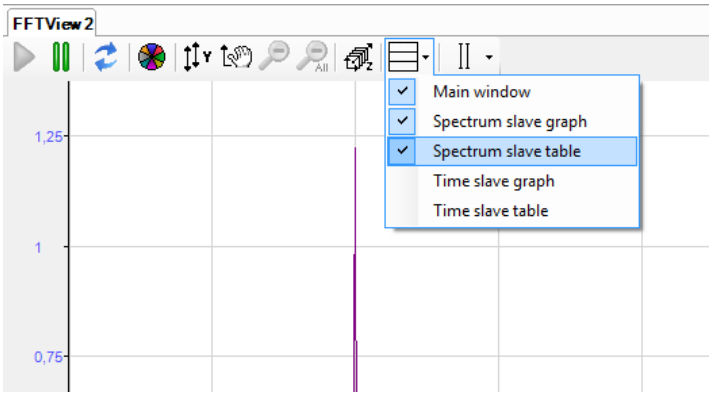
- (D) With the **p** key, the marker will move to the nearest spectrum **peak** (only investigating a small area around the current position of the marker)

5) Value axis: An axis can be set in decibels in the property window of the value axis (checkbox).

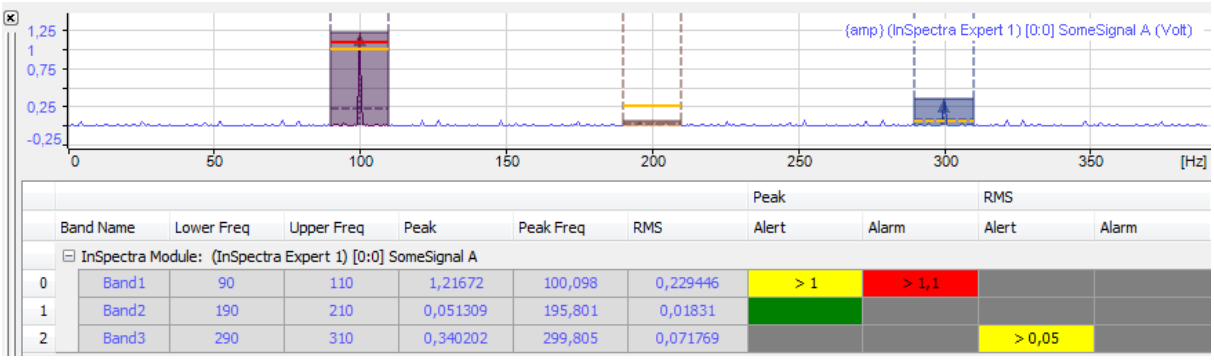
6) Curve settings
   - In case of an InSpectra Expert module, the settings of the spectrum are filled in automatically based on the profile and the other settings of the module.
   - In the property window of each curve one can now select the option "improve isometric visibility". This option is only important if the main window shows the waterfall (isometric perspective). It will only work well if the FFT view contains only one curve! This setting can only be set if the curve style is set to bars or curve.
   - A new window was added: Blackman-Harris.

7) Curves can be hidden temporarily, by right clicking the label and then clicking "Hide signal".

2.2.2 New: the spectrum slave graph and table in the FFT View



By using the toolbar one can enable the spectrum slave graph and/or the spectrum slave table. An example screenshot is shown here:



One can also close both slaves at the same time by using the small close button on the top left of both slaves. The spectrum slave graph and the spectrum slave table are interlinked. If a curve is on the graph it is also in the table and vice versa.

The spectrum table slave is only useful when the FFT View contains an InSpectra Expert module (otherwise it is empty).

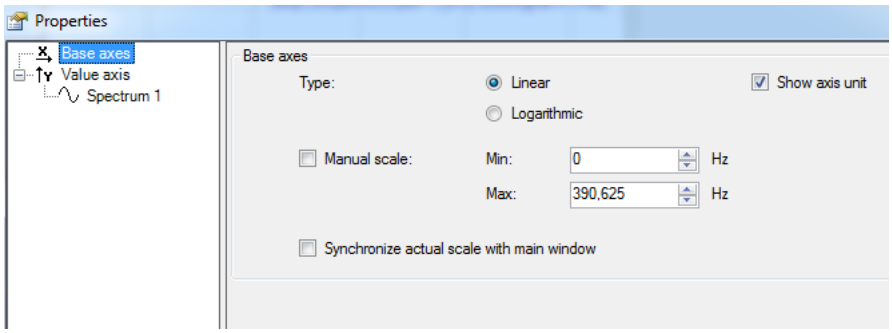
About the spectrum graph slave:

1) The curves in the spectrum slave are a subset of the curves in the main window.
   - One can drop curves from the main window in the spectrum slave graph.
   - One can also drop curves from the client signal tree or from another view in the spectrum slave graph.
   - One can add curves through the context menu of the graph (you can open it by right clicking the graph area).

   Of course one can also remove curves from the spectrum slave by right clicking the legend of the spectrum slave graph. One can also remove curves through the context menu of the graph.

2) If the spectrum slaves are selected (by clicking on the gripper on the left of the slaves, or by simply clicking on the slaves), all buttons in the toolbar now affect the spectrum slave graph in stead of the main window graph (e.g. marker button, zoom buttons, …). Also the shortkeys F3-F4-F5 will affect the spectrum slave graph if the spectrum slave is selected.

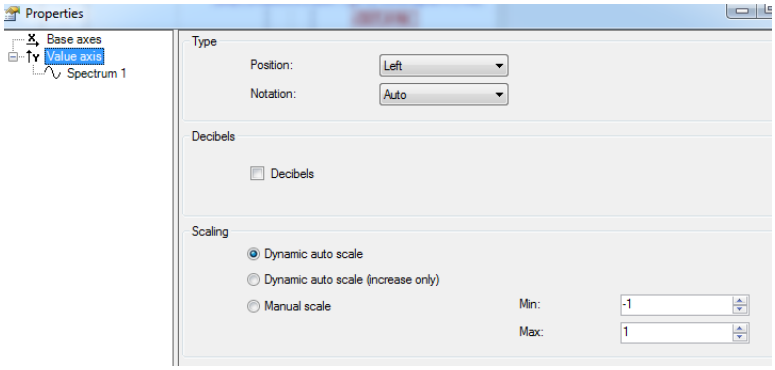
3) The base axes of the spectrum slave graph correspond to the axes in the main window. However, you can set up the base axes from the property window of the spectrum slave window:



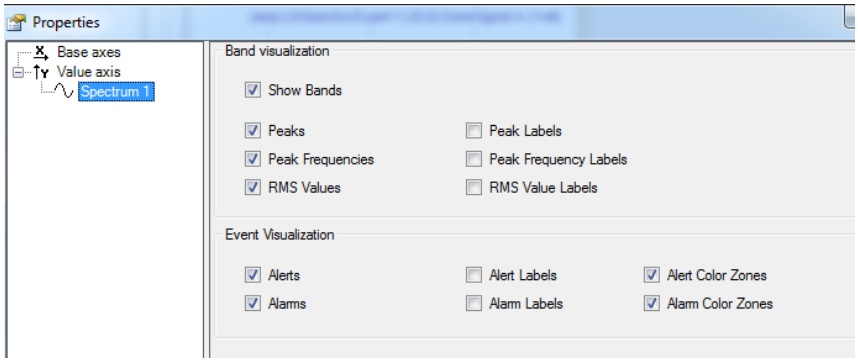
The option "Synchronize actual scale with main window" allows synchronizing the scale of the main window and the spectrum slave graph in the horizontal direction.

If you do a zoom operation in one of both graphs, the other one does the same zoom operation automatically (but only the horizontal component).

4) The spectrum slave graph **has only one value axis**; all curves are always on the same axis. You can set up this axis by entering the properties dialog of the spectrum slave graph.



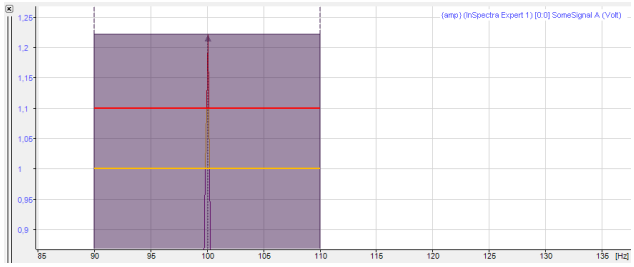
5) The bands and the alert/alarm levels can be visualized in the spectrum slave graph. This is optional, the belonging settings can be set in the properties dialog of the spectrum slave graph. For each curve in the slave, one can have different settings.



The checkboxes in the screenshot that are not checked are related to the visualization of the labels:

- If checked, one can only see the label if hoovering value levels in the graph
- If not checked, one sees the labels all the time

6) If a band and its alerts and alarms are visualized, and some peak alert and/or peak alarms are defined, and the "alert/alarm color zones" options are checked on, then the curve is colored yellow/red if the peak is higher than the alert/alarm level respectively. This is demonstrated in the following screenshot:



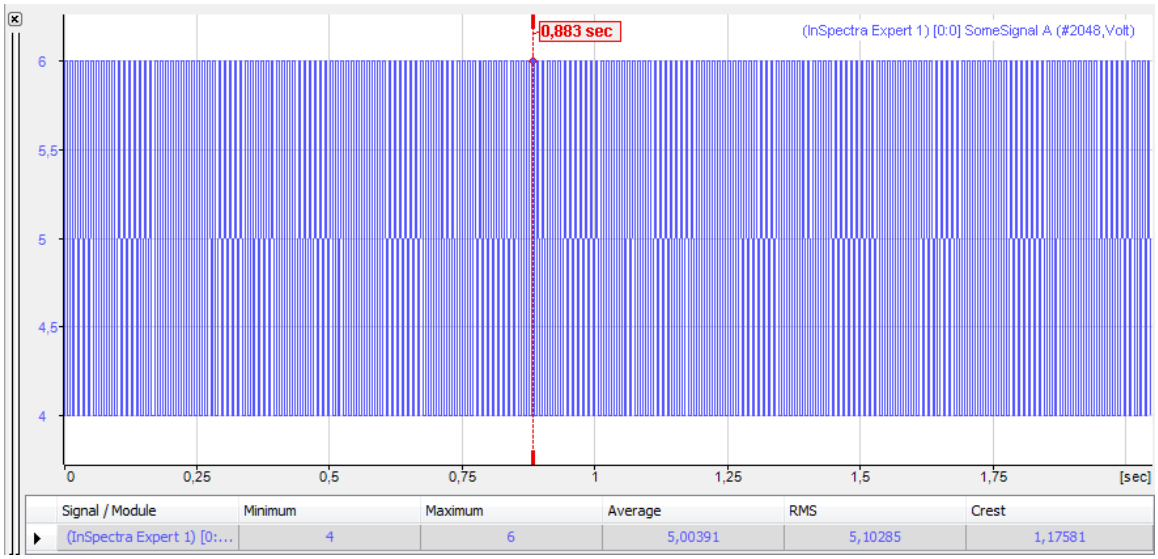
About the spectrum table slave:

The spectrum slave table contains one row for each band of the InSpectra Expert curves in the slave. The lower and upper frequency of the band are shown. The peak, peak frequency, rms, alerts and events of each band are shown if they are active in the InSpectra Expert module. For the events, the same color codes are used as in the diagnostics TAB of the I/O Manager.

Note that the properties of the spectrum slave are not configurable in the preference dialog of the client. They are never saved in the registry at this time.

2.2.3 New: the time slave graph and table in the FFT View

This is a screenshot of the time slave graph and time slave table:



Signal / Module	Minimum	Maximum	Average	RMS	Crest
(InSpectra Expert 1) [0:...	4	6	5,00391	5,10285	1,17581

These slaves give information about the time signal that was used as input for the spectrum calculations. In case the option "Averaging" in the calculation settings is on, the time slave only shows the time signal of the last internal FFT calculation (while the FFT result displayed in the main window and the spectrum slave depends on earlier values of the input signal too).

About the time graph slave:

1) The curves in the time slave are a subset of the curves in the main window.
   - One can drop curves from the main window in the time slave graph.
   - One can also drop curves from the client signal tree or from another view in the time slave graph.
   - One can add curves through the context menu of the graph (you can open it by right clicking the graph area).

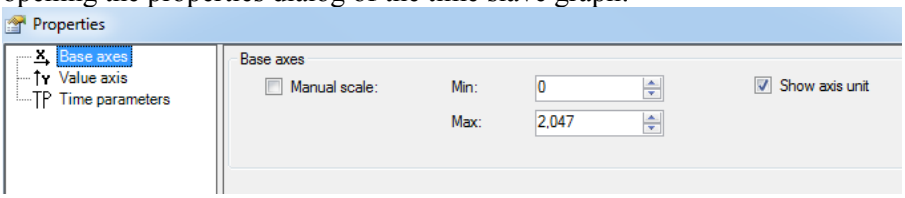
   Of course one can also remove curves from the spectrum slave by right clicking the legend of the time slave graph. One can also remove curves through the context menu of the graph.

2) If the time slaves are selected (by clicking on the gripper on the left of the slaves, or by simply clicking on the slaves), all buttons in the toolbar now affect the time slave graph in stead of the main window graph (e.g. marker button, zoom buttons, …). Also the shortkeys F3-F4-F5 will affect the time slave graph if the time slave is selected.

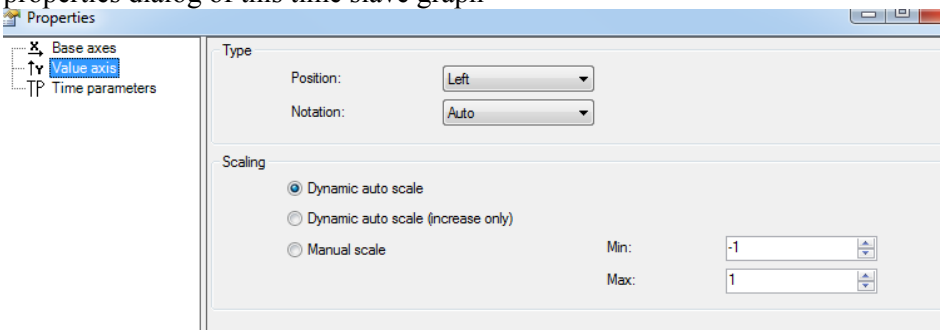
3) One can show or hide the marker of the time slave graph through the context menu of the graph, or by using the toolbar (in case the time slaves are selected).

4) The label of the time slave graph contains the number of samples used for each FFT between curly brackets. It also contains the unit of the input signal).

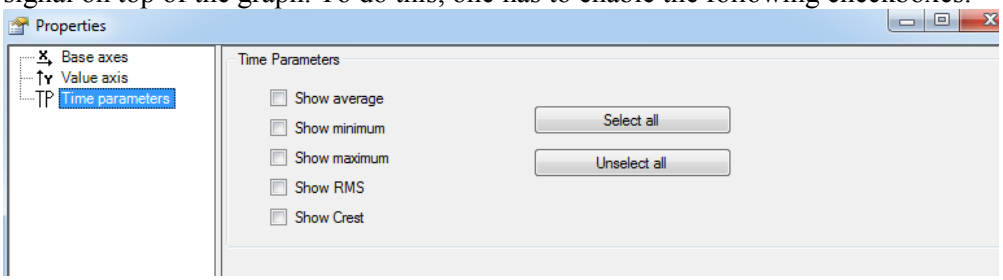
5) The time slave graph has only one base axis. It's properties can be changed by opening the properties dialog of the time slave graph.



6) The time slave graph has only one value axis. Some settings can be changed in the properties dialog of this time slave graph



7) One can display the time parameters (minimum, maximum, average, …) of the time signal on top of the graph. To do this, one has to enable the following checkboxes:



Note that the Crest value is not always visible in the graph, as it can be much higher/lower than the highest/lowest value of the time signal.

About the time graph table:

This table shows some statistics of the input signal visualized in the time slave graph. It works for all type of curves, either InSpectra Expert modules or normal curves.

Note that the properties of the time slave are not configurable in the preference dialog of the client. They are never saved in the registry at this time.

3 64 bit support

IbaPDA can now run on Windows 7 64 bit and on Windows 2008 server R2. Other 64 bit operating systems like Vista 64 bit and XP 64 bit are not supported. The ibaPDA client and server processes are still 32 bit processes. It is only the drivers that are 64 bit. There are actually 3 drivers included with ibaPDA:

1. The Plug&Play driver called ibaw7drvX64.sys. This one is responsible to display the hardware in the device manager under the iba devices node. It gets installed via the ibawdmdrvinstaller.exe during the installation of ibaPDA.
2. The FOB-D network driver called ibaFobDNetworkX64.sys. This one is responsible to support network communication over the fiber optic link using the flex protocol. It gets installed via the ibaFobDNetworkInstallX64.exe during the installation of ibaPDA.
3. The Pda driver called pdadrv.sys. This one is responsible for the data acquisition. It gets installed by the ibaPDA service when the service is loaded.

The following hardware has been tested and is fully supported on 64 bit operating systems:

- ibaFOB-D (all types)
- ibaFOB-io-ExpressCard
- ibaFOB-SD
- ibaFOB-TDC
- ibaCom-L2B
- VMIC-5565
- VMIC-5576
- DGM200P

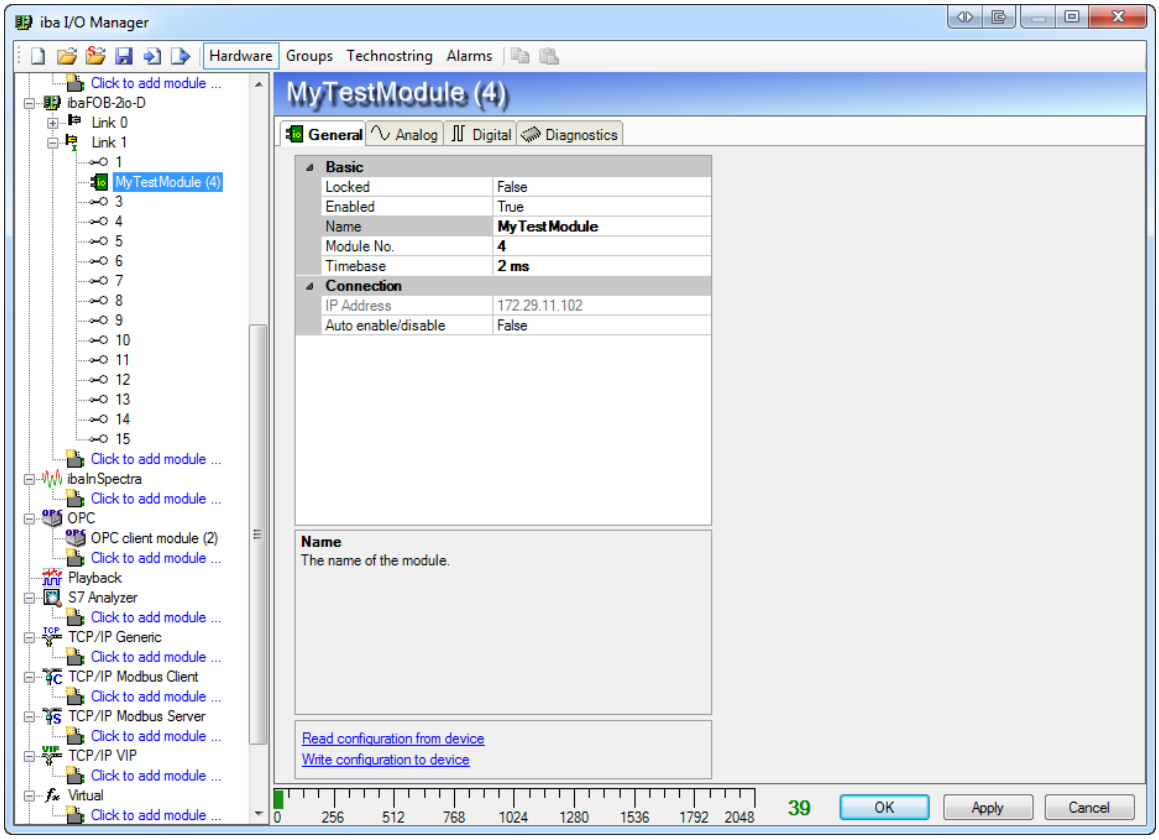
The following hardware is not supported on 64 bit but still supported on 32 bit:

- ibaFOB-F
- ibaFOB-S
- ibaFOB-X
- PCMCIA
- VMIC-5579
- VMIC-5587
- VMIC-5588
- PCLink
- Scramnet SC150
- Toshiba ADMAP JAMI1
- CP1616

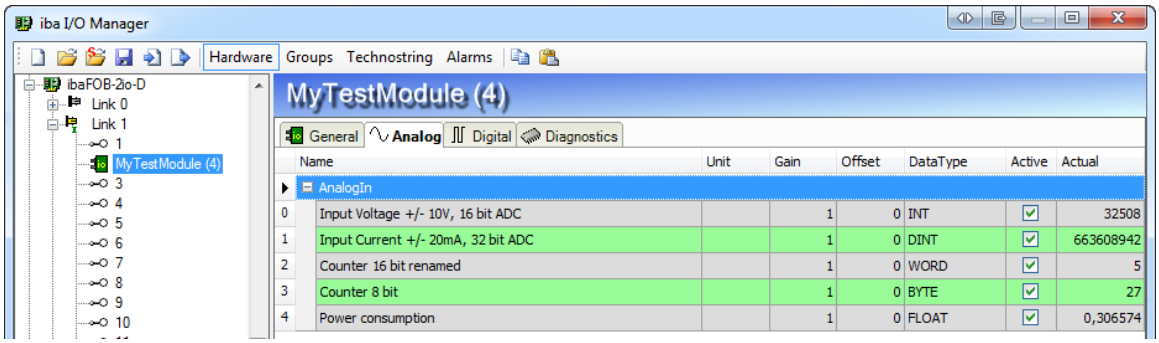
All network protocols are also supported on 64 bit.

4 ibaLink-io-embedded

The ibaLink-io-embedded is an embedded module for OEM customers, that allows to exchange data over fiber optic (FO) with iba measuring systems. This module supports the 32 Mbit/s protocol and the 32 Mbit/s flex protocol. When it is configured to use the 32 Mbit/s protocol then you have to use a generic fob fast module in ibaPDA. When it is configured to use the 32 Mbit/s flex protocol then ibaPDA can autodetect the module and also the signals configured on it.

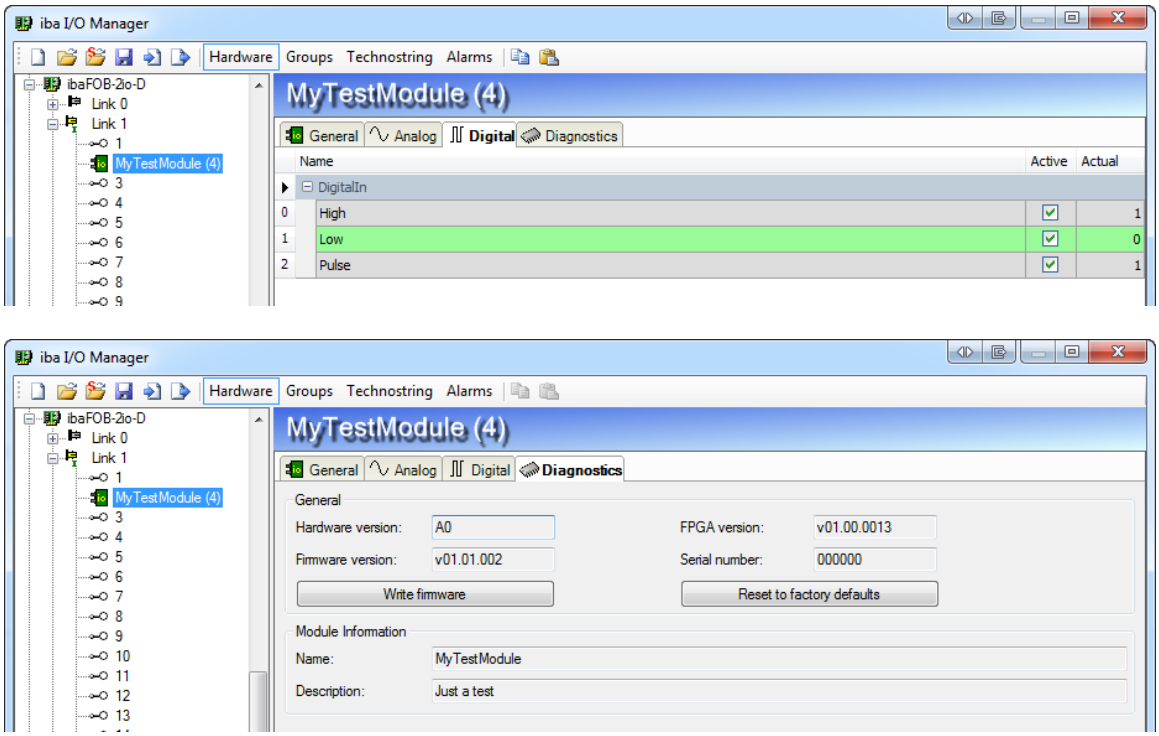


The "*Read configuration from device*" link can be used to update the list of signals that the OEM defined.



The name, unit, gain and offset of the analog signals can be changed. The active column determines if the signal is measured. Only the measured signals are transferred over the fiber optic cable. The datatype of the analog signals cannot be changed it is just shown for diagnostic

reasons. The actual value is shown for the active signals when the current configuration corresponds with the last applied configuration.



The diagnostic tab shows the version information of the module. On the tab you can write new firmware to the device and also reset it to its factory defaults. The OEM can write a name and description on the device. During autodetect in ibaPDA this name is used as the name of the generated module.