New Features in ibaPDA v6.35.0

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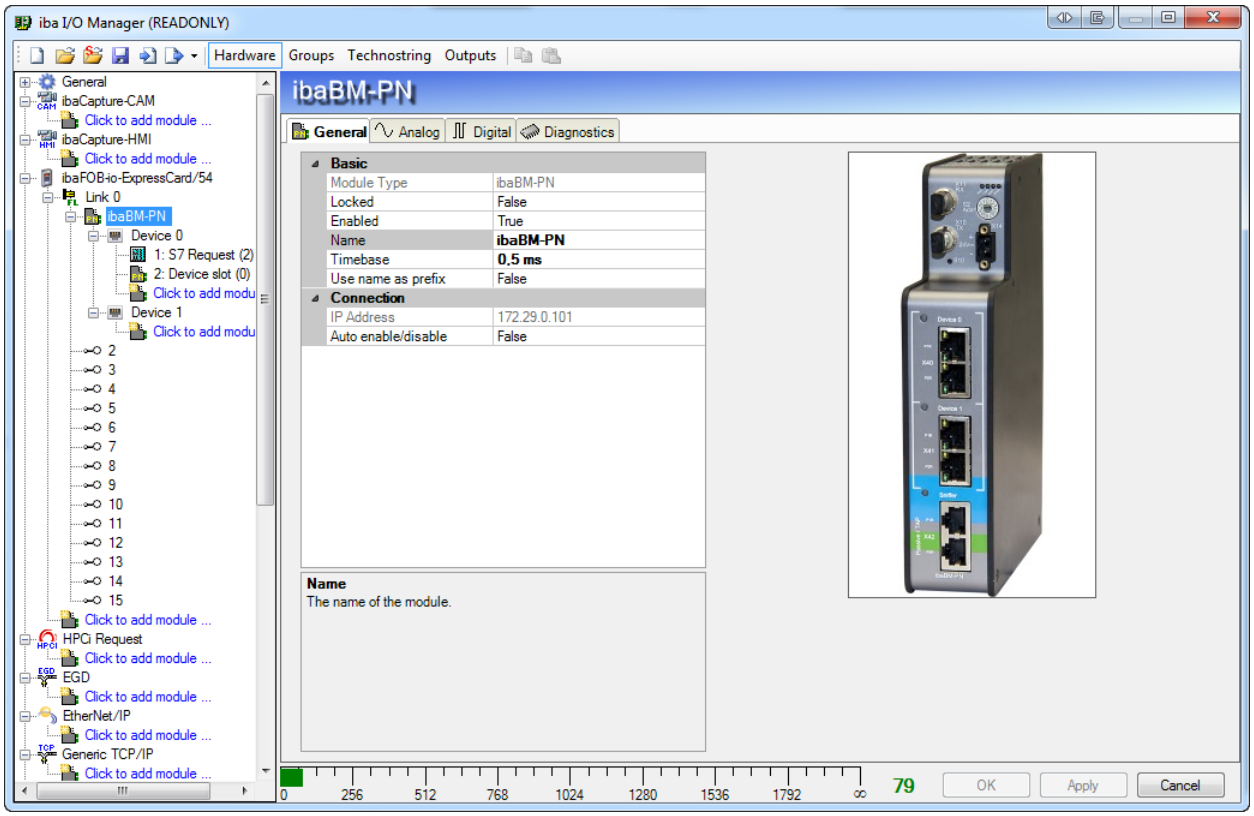
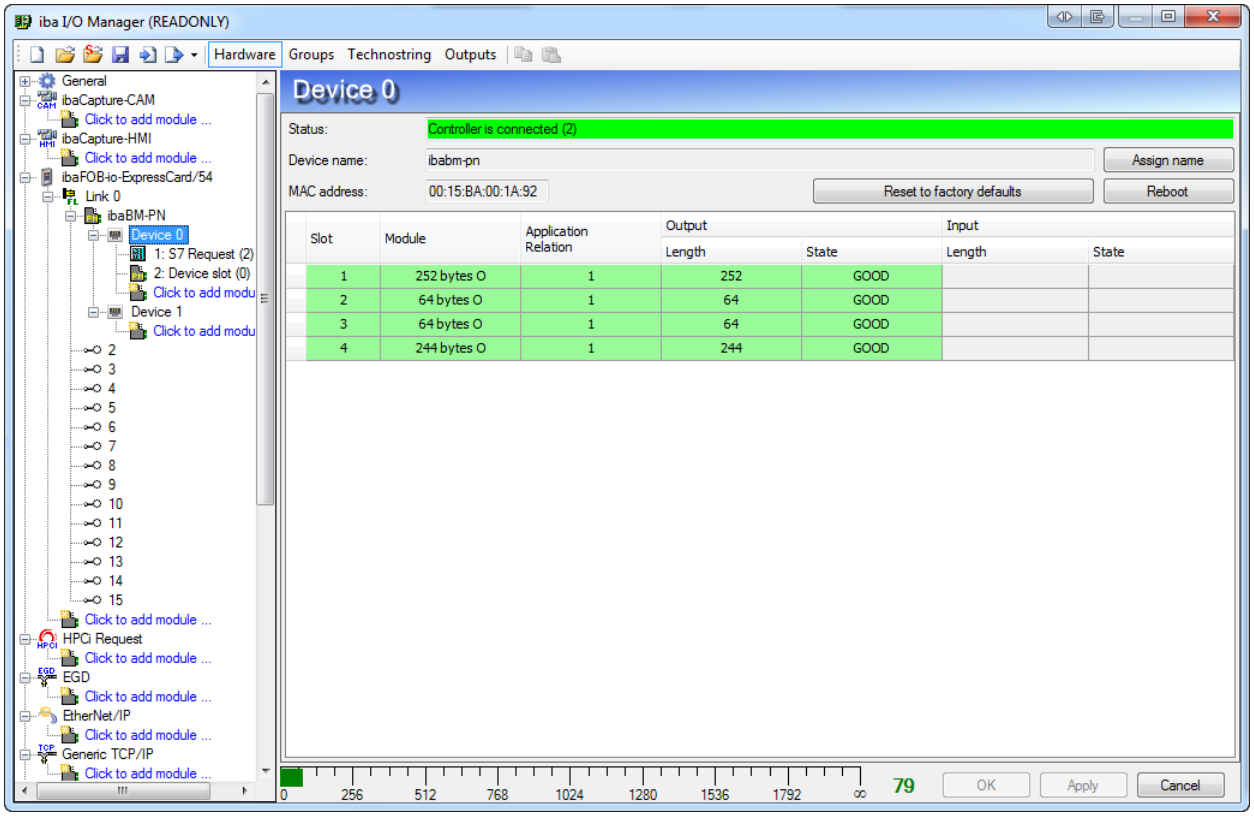
1 ibaBM-PN

The ibaBM-PN device is a PROFINET bus module. It contains 2 active devices and 1 sniffer interface. In version 6.35.0 of ibaPDA only the 2 active devices are supported. The sniffer interface is not used.





In the I/O manager the ibaBM-PN module has 2 sub nodes, one for each active device. The device node shows the current status of the device, its PROFINET device name, its MAC address and the slot configuration.

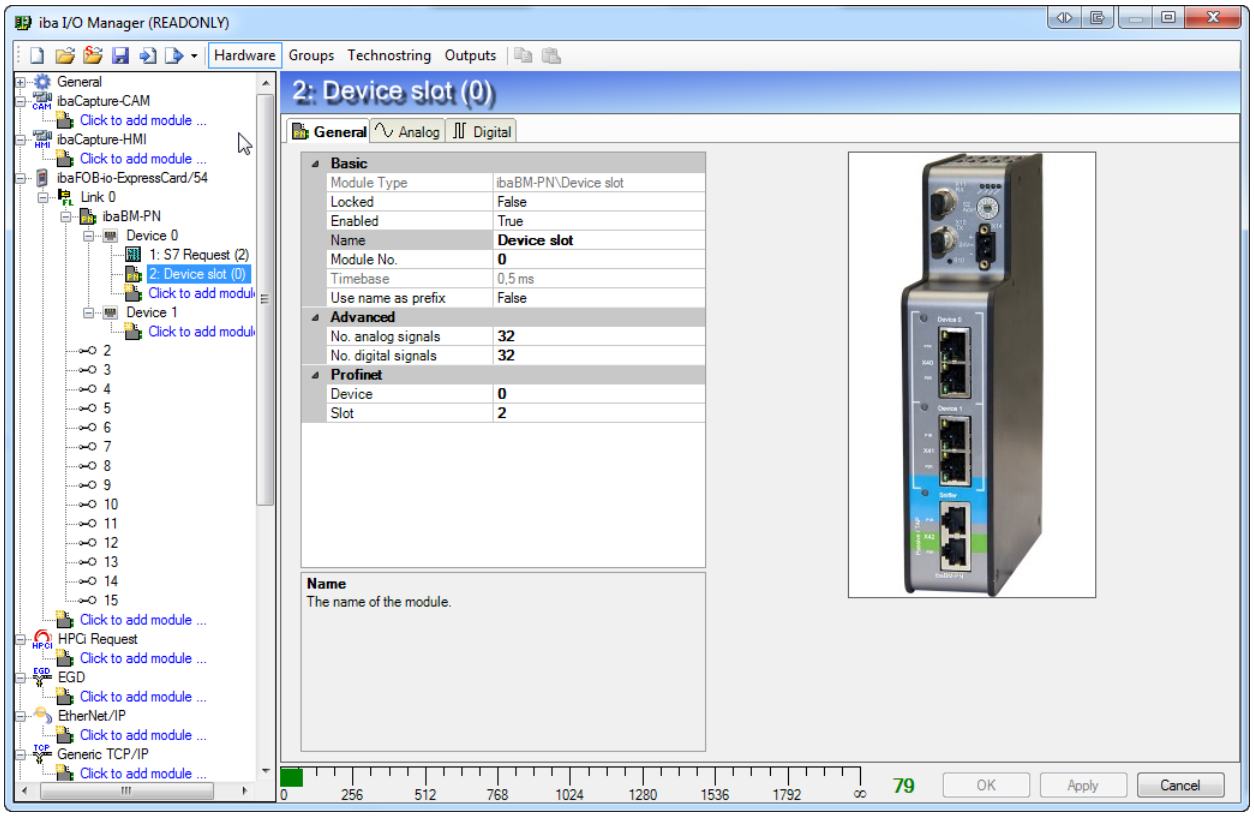
You can use the *"Assign name"* button to set the PROFINET device name. The device name can also be set via STEP 7. There are also buttons to reboot the device and to reset it to factory defaults.

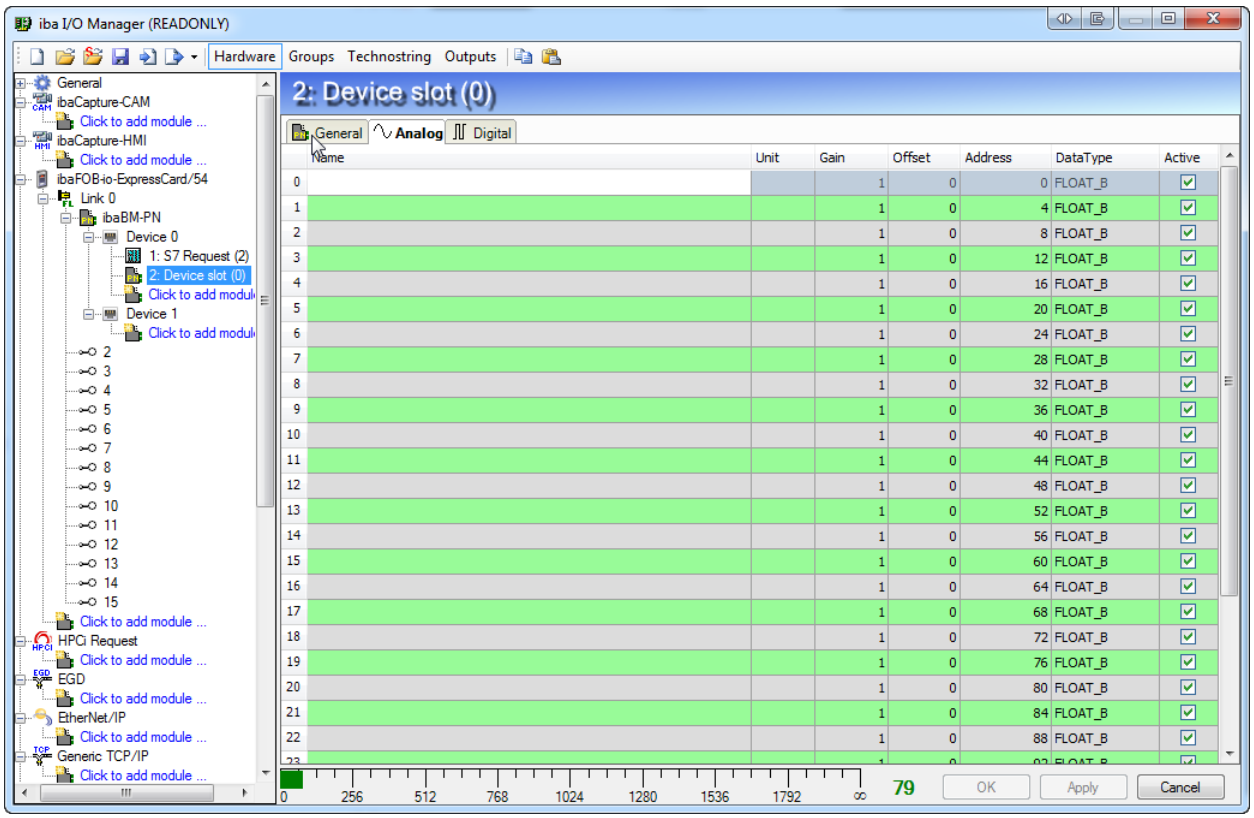
The slot configuration is written to the device by the connected PROFINET controller. The slot configuration table shows a row per slot. The *"Slot"* column shows the slot number. The *"Module"* column shows the module type configured in the slot. The known module types are shown with their description text. The unknown module types are shown with their module type id formatted as a hexadecimal number. The ibaBM-PN devices are shared devices. This means that multiple PROFINET controllers can be connected to the device at the same time. Each controller can be connected to 1 or more slots. Each slot is assigned to only one controller. The *"Application Relation"* column shows the index of the connected controller for that slot. A slot can consist of output and input bytes. The next columns show the sizes of these data bytes. The state is also shown. The state can be GOOD, BAD or empty. It is GOOD when the controller is writing data for outputs and reading data for inputs. It is empty when the slot is no longer configured in the controller. In all other cases the state will be BAD. Each row can have the following colors:

- Green: A controller is connected and the slot state is GOOD.
- Orange: A controller is connected and the slot state is BAD (e.g. the controller is in STOP).
- Red: No controller is connected

Under each device you can add modules. Each module corresponds with a device slot. In version 6.35.0 there are 3 module types supported:

1. Device slot
2. S7 Request
3. S7 Request Decoder





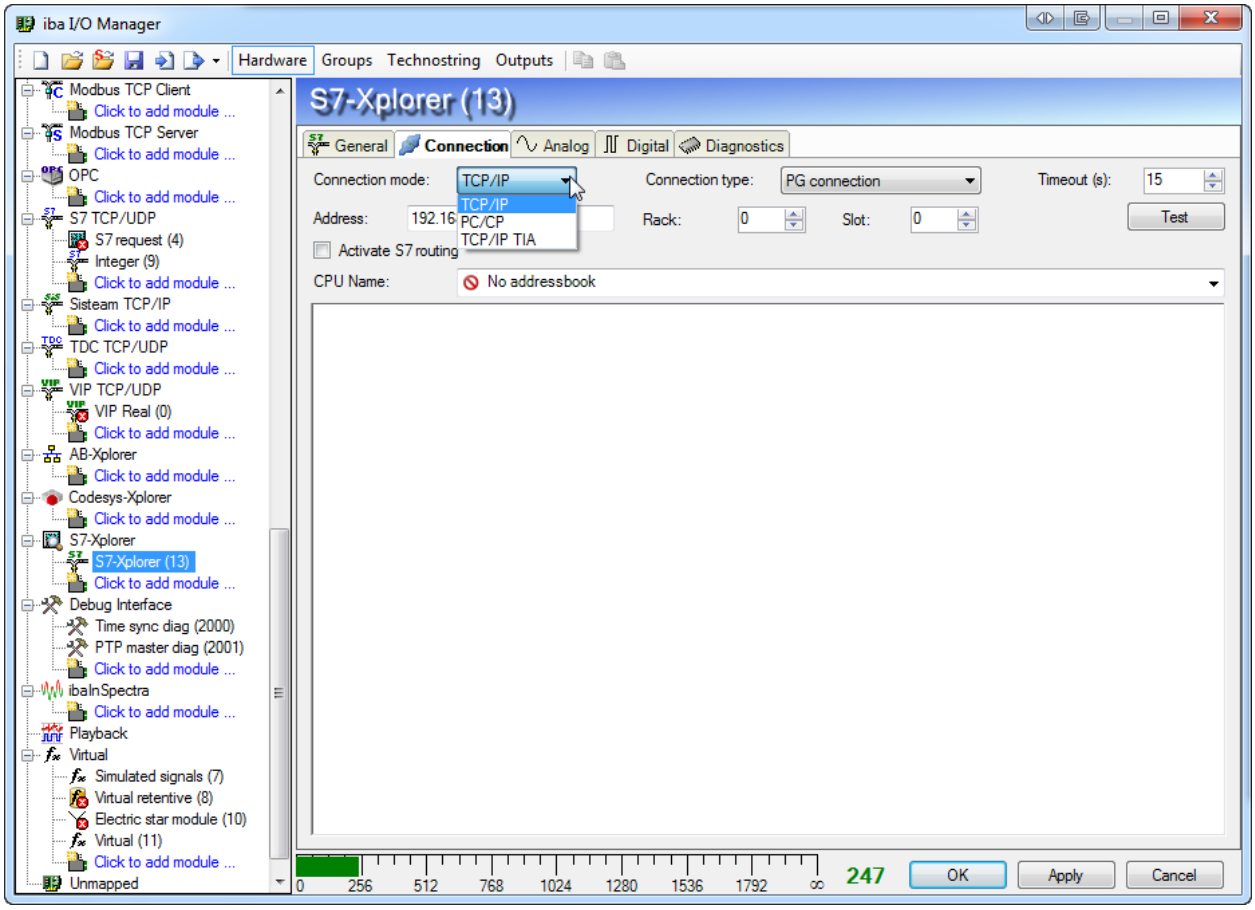
The device slot module allows you to configure the data bytes of the slot. You can configure the number of analog and digital signals that are mapped to that slot. For the analog signals you have to configure the byte offset within the slot and the data type. For the digital signals you have to configure the byte offset within the slot and the bit number (0…7) within the byte.

The S7 Request and S7 Request Decoder modules are explained in the next chapter about S7 connectivity.

2 S7 Connectivity

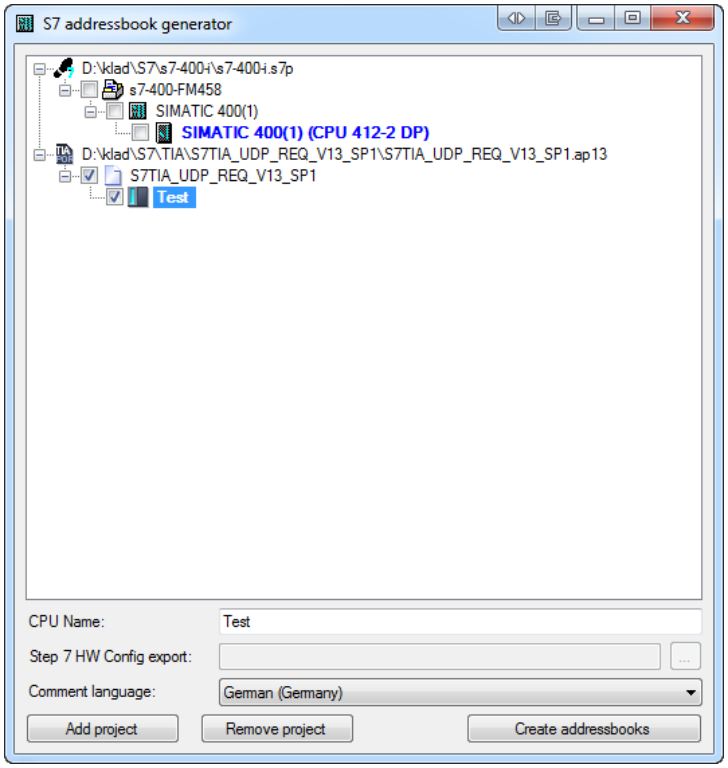
2.1 S7-Xplorer

The S7-Xplorer TCP/IP and S7-Xplorer PC/CP module types have been replaced by a new S7-Xplorer module type.

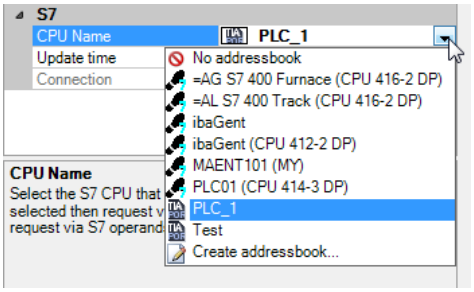


On the connection tab you can select the connection mode:

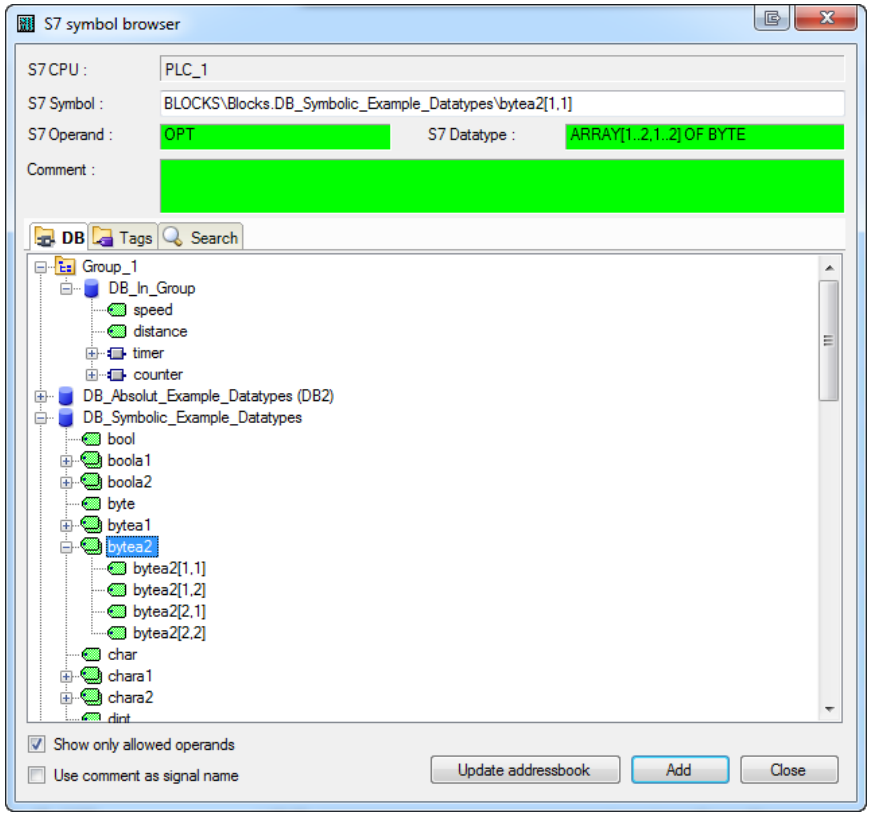
- TCP/IP: This corresponds with the old S7-Xplorer TCP/IP module. It makes a direct TCP connection to the S7.
- PC/CP: This corresponds with the old S7-Xplorer PC/CP module. It uses Simatic NET to connect to the S7.
- TCP/IP TIA: This is a new mode. It connects symbolically via TCP to S7-1200 and S7-1500 CPUs. The symbolic connection means that it can read optimized DBs and the PUT/GET communication doesn't have to be enabled in the CPUs.



The TCP/IP TIA mode requires an addressbook to be able to read data from a CPU. The S7 operand column is not shown in the analog and digital signal grids in this mode. The addressbook generator can now open TIA Portal projects. It supports TIA portal v13 projects. An S7 addressbook contains comments in one language and a TIA project can contain comments in multiple languages. So in the addressbook generator you can select the language you want in the addressbook.



The S7 addressbook list shows an icon for each CPU. The icon is determined by the project type: STEP 7 or TIA.



The S7 symbol browser is also changed for TIA addressbooks. It shows a DB, Tags and Search tab for TIA addressbooks and a CFC, DB, Symbols and Search tab for STEP 7 addressbooks. Non-optimized DBs have their DB number shown in brackets. All members of optimized DBs have OPT as S7 operand.

The S7 symbol browser has some more improvements that work with both STEP 7 and TIA addressbooks.

It contains an *"Update addressbook"* button that allows you to quickly regenerate the addressbook. This requires an addressbook generated by ibaPDA 6.35.0 and later and access to the S7 project. If ibaPDA can't access the project then the addressbook generator is opened and you manually have to browse to the S7 project.

Arrays can now be expanded in the tree. This makes it easier to add a complete array since you can multiselect all the sub nodes.

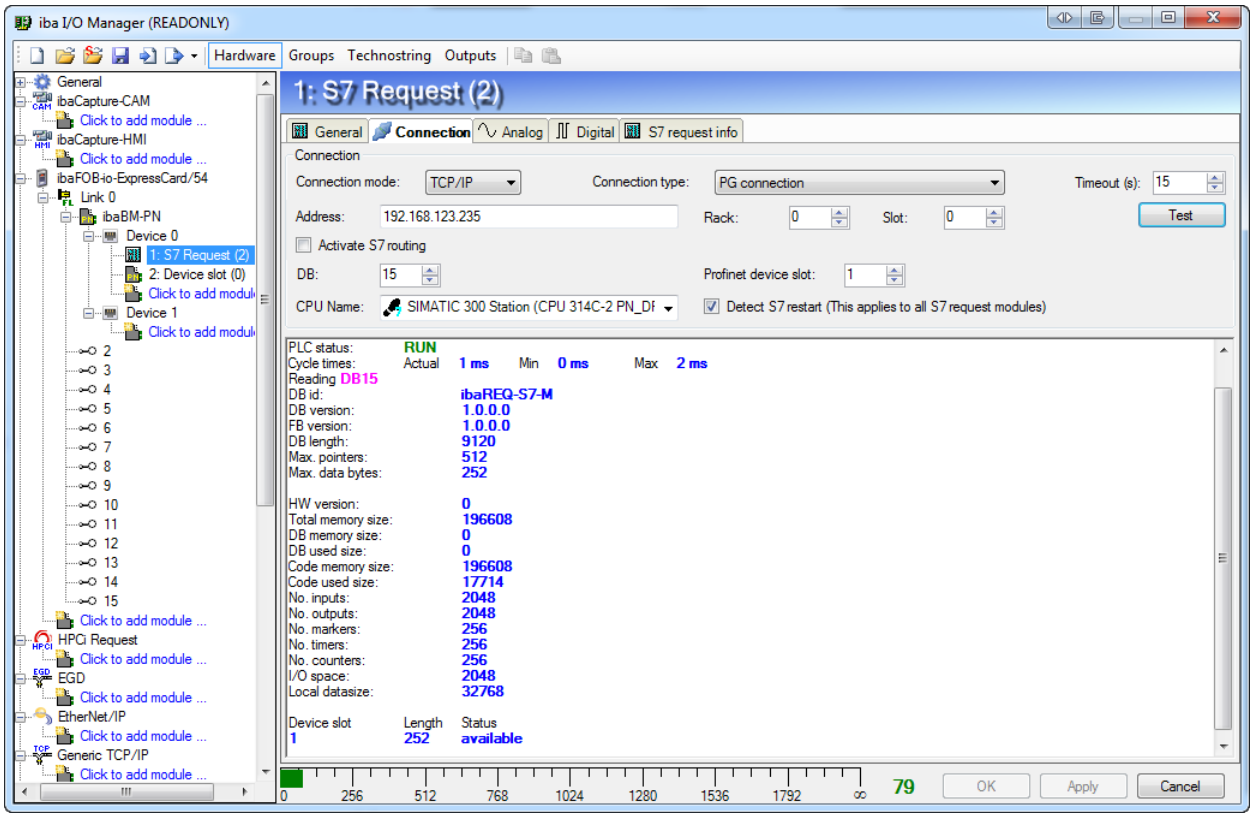
When you click the *Add* button and the module doesn't have enough signals for all the selected symbols then ibaPDA will ask to increase the number of signals in the module.

The S7-Xplorer technostring also supports TCP/IP TIA mode.

2.2 S7 Request

The S7 request functionality is now available for S7-1500 CPUs. Data can be measured via ibaBM-DP (PROFIBUS) or ibaBM-PN (PROFINET). There is a separate manual *ibaPDA-Request-S7-DP/PN.pdf* that describes the required FB/FCs and DBs in the S7 program. There is one management FB (ibaREQ_M) and multiple data transfer FBs (one for each data path PROFIBUS or PROFINET). IbaPDA communicates with the management FB and sends it a list of pointers that the data transfer FB needs to cyclically copy to the data path. In ibaPDA you

have to use the existing S7 request module on ibaBM-DP to do S7 request via PROFIBUS. For PROFINET there is a new S7 request module on ibaBM-PN.

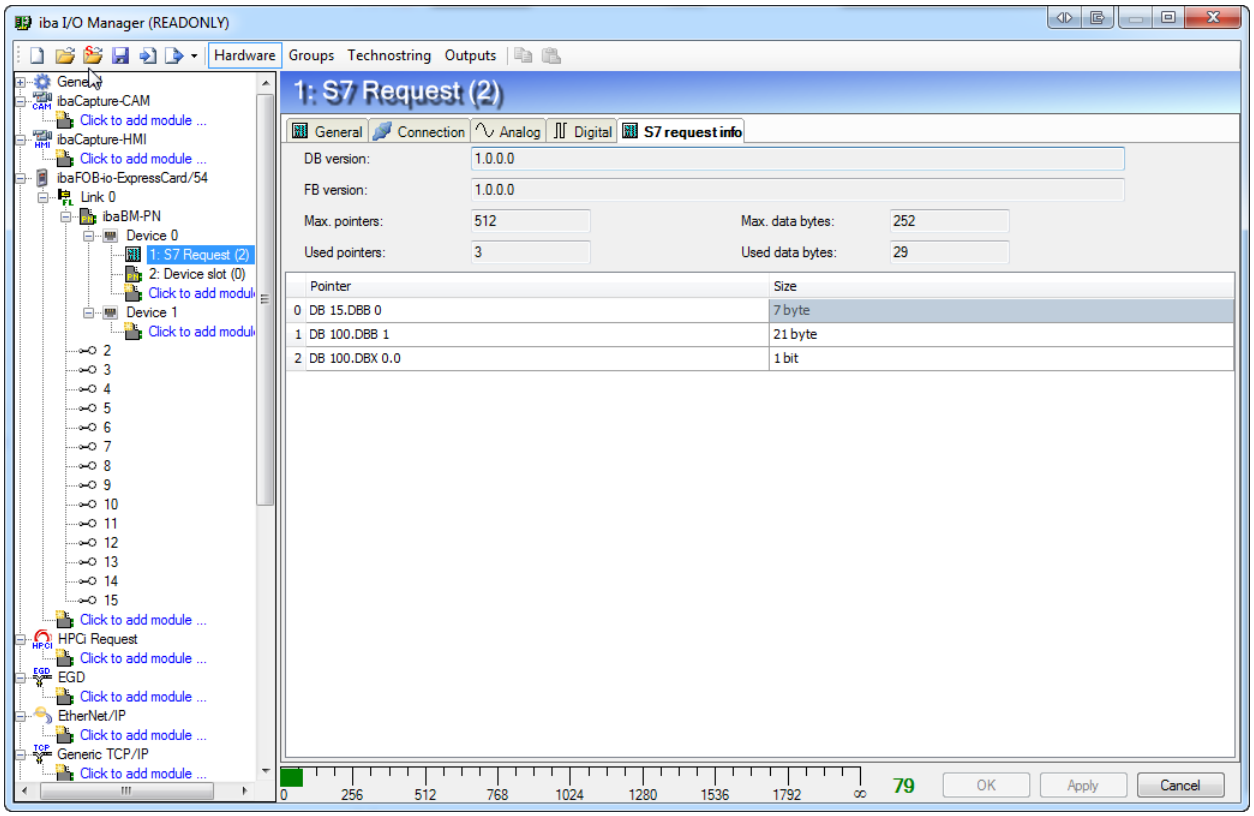


The request modules have a connection tab where you can determine how ibaPDA communicates with the management FB. The connection settings are the same as the ones of an S7-Xplorer module. There are only 2 additional settings:

1. DB number of the datablock that is used to communicate with the management FB.
2. PROFIBUS slave number or PROFIBUS device slot that needs to be used to transfer the data.

When you click the “Test connection” button then ibaPDA will try to communicate with the management FB. It will respond with some version information and with information about the configured data path. IbaPDA will automatically update the PROFIBUS slave number or PROFINET device slot.

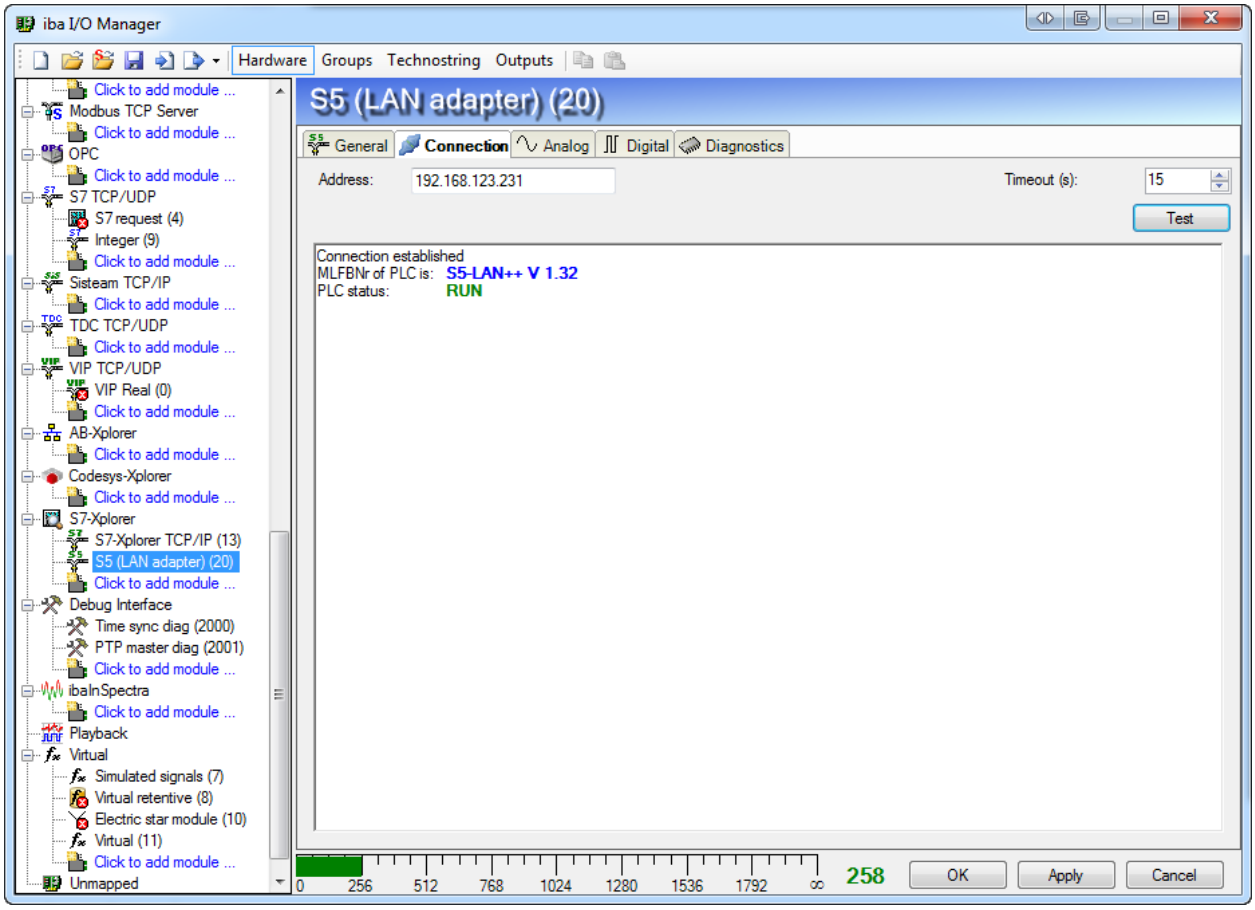
The data transfer FBs can only copy data from an address. This means that only signals with a valid operand can be measured. So members of optimized DBs are not accessible. At the start of the acquisition ibaPDA will sort the requested signals by operand. It will create pointers for all consecutive address ranges. These pointers are transferred to the management FB. The number of pointers that is supported depends on the size of the communication DB. On the diagnostics tab of the S7 request module you can see the list of pointers that ibaPDA has generated. You also see how many pointers are used from the available pointers and also how many data bytes are used from the available data bytes.



2.3 S5 (LAN adapter)

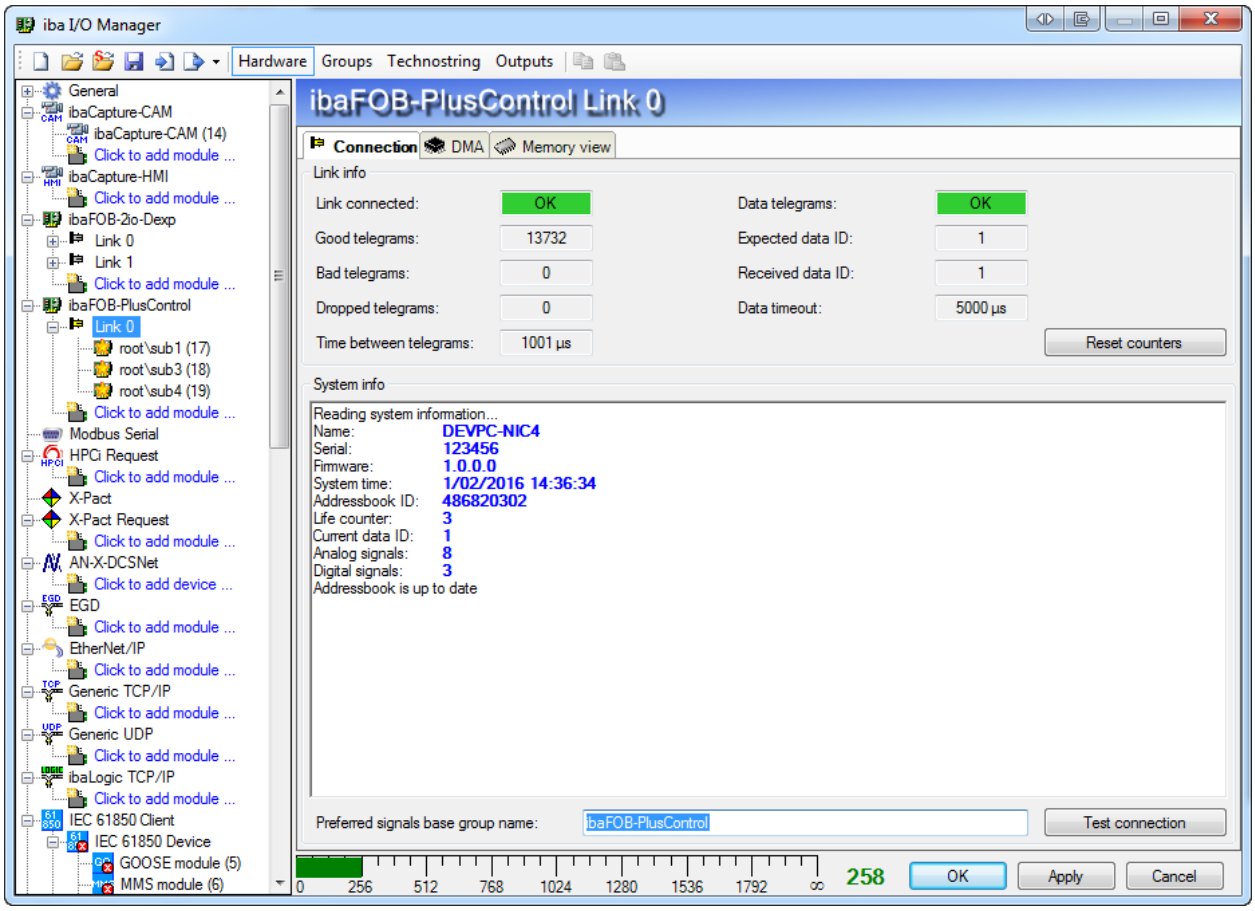
This module allows you to measure data from an S5 that is connected via a LAN adapter. The interface was tested with the ACCON-S5-LAN adapter of Deltalogic. S5 LAN adapters from other suppliers should also work.

The module is very similar to the S7-Xplorer module. The only difference is that you have to enter S5 operands instead of S7 operands. There is also no symbolic access possible.


iba I/O Manager
Hardware
Groups
Technostring
Outputs
Click to add module ...
Modbus TCP Server
OPC
S7 TCP/UDP
S7 request (4)
Integer (9)
Sisteam TCP/IP
TDC TCP/UDP
VIP TCP/UDP
VIP Real (0)
AB-Xplorer
Codesys-Xplorer
S7-Xplorer
S7-Xplorer TCP/IP (13)
S5 (LAN adapter) (20)
Debug Interface
Time sync diag (2000)
PTP master diag (2001)
ibaInSpectra
Playback
Virtual
Simulated signals (7)
Virtual retentive (8)
Electric star module (10)
Virtual (11)
Unmapped
S5 (LAN adapter) (20)
General
Connection
Analog
Digital
Diagnostics
Address:
192.168.123.231
Timeout (s):
15
Test
Connection established
MLFBNr of PLC is:
S5-LAN++ V 1.32
PLC status:
RUN
0
256
512
768
1024
1280
1536
1792
∞
258
OK
Apply
Cancel

3 ibaFOB-PlusControl interface

The ibaFOB-PlusControl board can be used to connect to a Siemens PlusControl system.

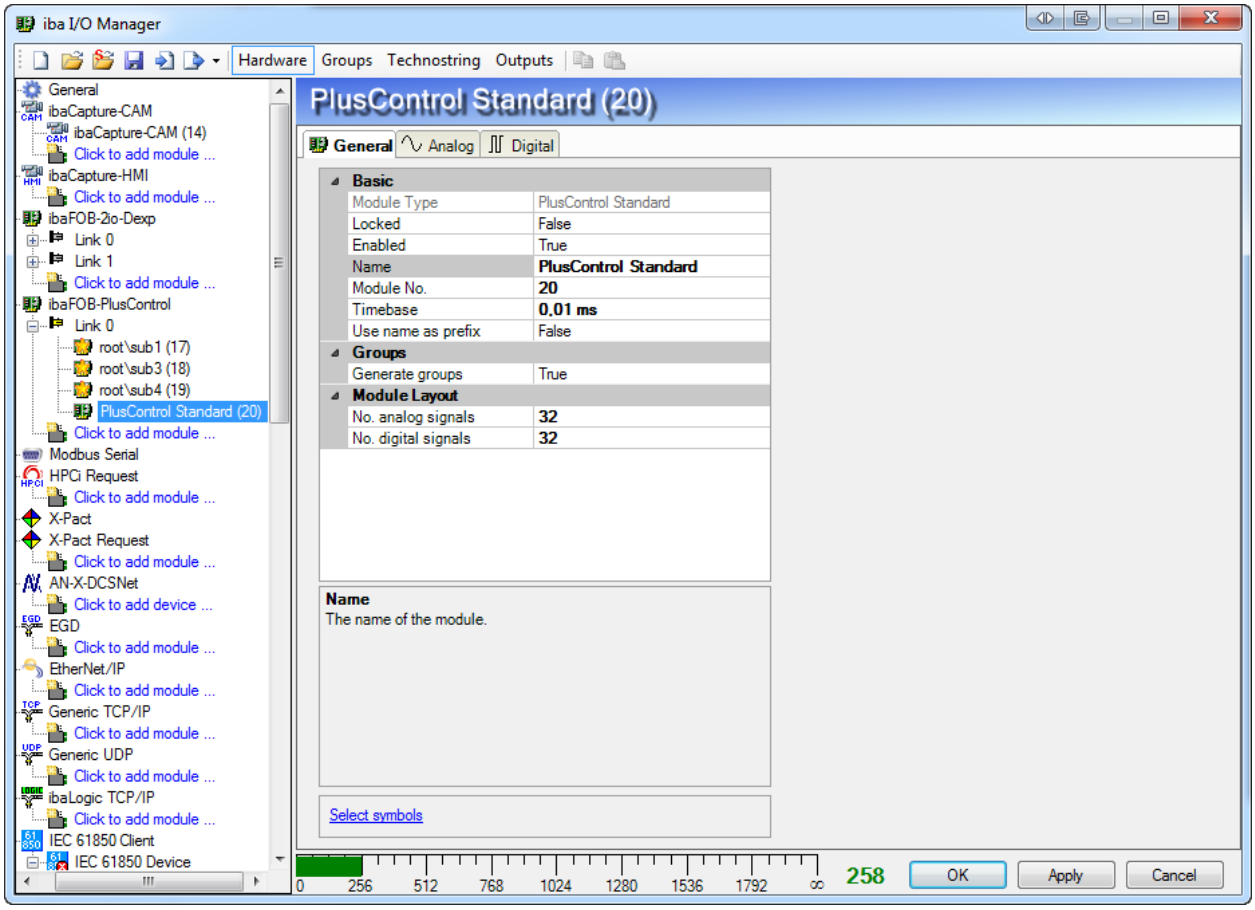


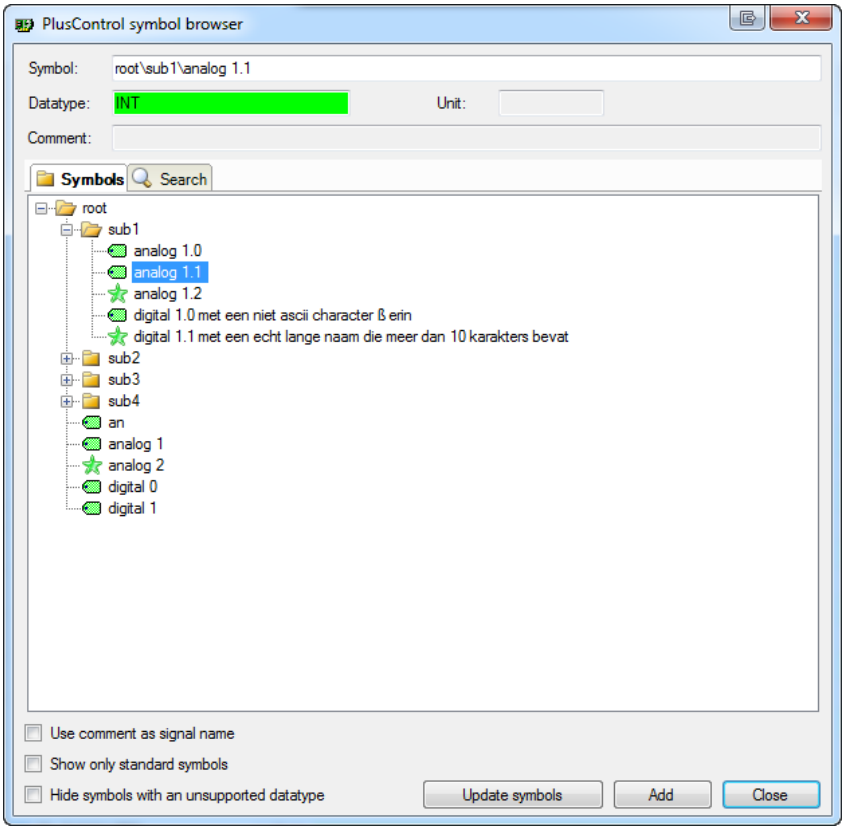
On the link node you can click the *"Test connection"* button. This will try to communicate with the PlusControl. It will show some information about the connected PlusControl and it will also update the addressbook. The adddressbook contains a list of signals organized in a hierarchical structure. Some signals are marked as preferred signals. IbaPDA will automatically create modules for the preferred signals. There are 3 possibilities when creating the preferred modules:

1. Update preferred modules: Update the current preferred modules with the preferred modules from the addressbook. The signal IDs of existing preferred signals will not change.
2. Replace preferred modules: Remove all the current preferred modules and create new preferred modules from the addressbook. The signal IDs of the existing preferred signals could change
3. Don't change preferred modules: This keeps the current preferred modules as they are.

You can only change some properties of the preferred modules: module number, timebase, enabled and locked state. You also can't change the symbol associated with a signal.

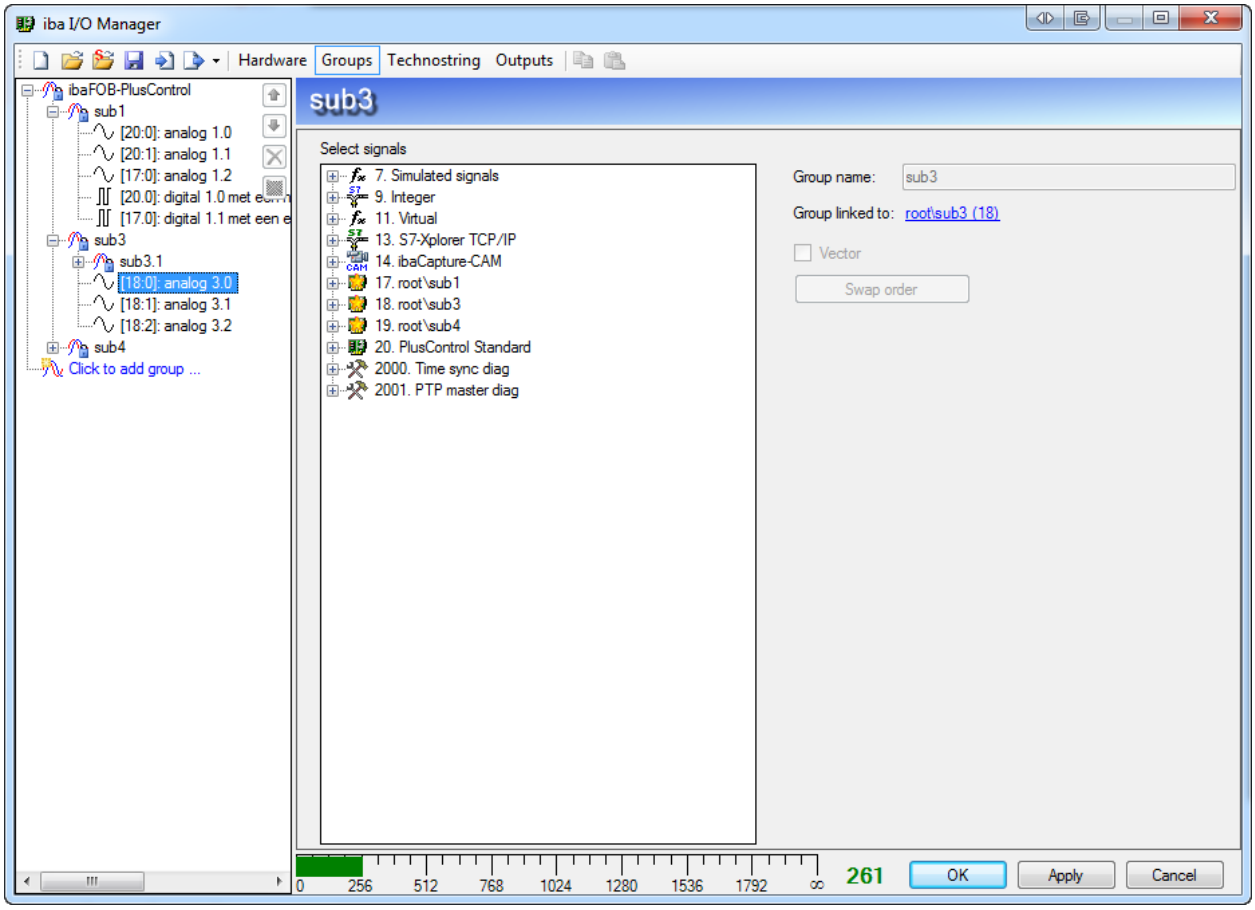
Next to the preferred modules you can also manually create standard modules. In the standard modules you can change all properties and you can add both preferred and standard symbols.





Use the *"Select symbols"* command to open the symbol browser. The symbols with a star icon are preferred symbols. The others are standard symbols. You can filter the standard symbols by enabling the *"Show only standard symbols"* option.

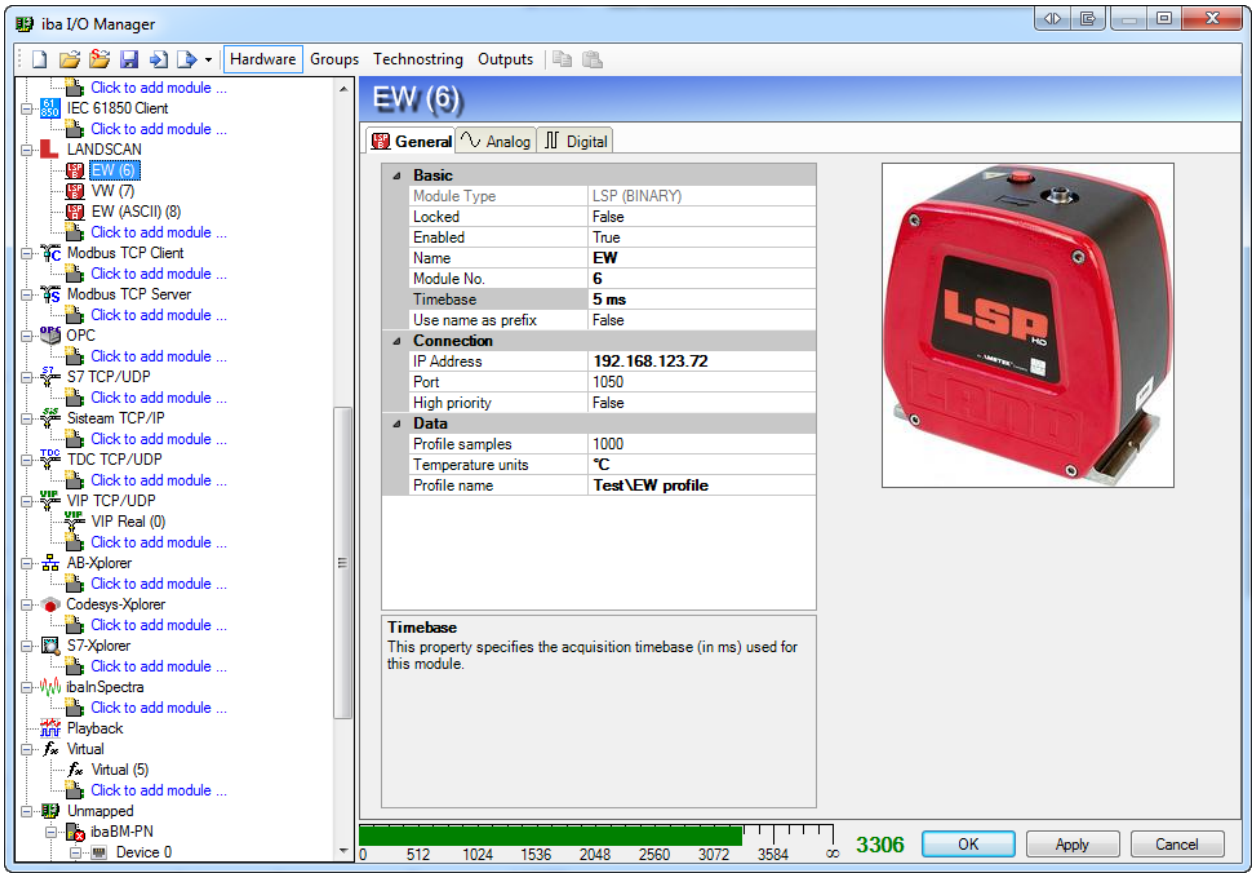
Both the preferred and standard modules have an option to automatically generate groups for the signals of the module. The groups will have the same structure as the addressbook. The root group name can be configured on the ibaFOB-PlusControl link. It is called the *"Preferred signals base group name"*. The generated groups are depicted with a lock icon in the groups section. You can manually add additional signals to the automatically generated groups. On the right you also see a hyperlink to the module(s) that created the group.



4 LANDSCAN interface

The LANDSCAN interface can be used to measure data from LAND (Ametek) temperature line scanners. The scanners generate 1000 samples per line and they can scan at up to 150 lines per second. The scanners can send their data in ASCII or binary mode. Binary mode is more efficient and is therefor recommended if the scanner supports it. Older versions of the scanner only support ASCII mode. IbaPDA has 2 module types:

1. LSP (BINARY) for binary mode
2. LSP (ASCII) for ASCII mode



You have to enter the IP address of the scanner and the port number. You can configure the temperature unit (°C or °F). The scanner always sends 1000 samples per line in binary mode. You can reduce the number of samples via the *Profile samples* property. If you set the *Profile samples* to 200 then ibaPDA will take every 5th sample. There is no aggregation done.

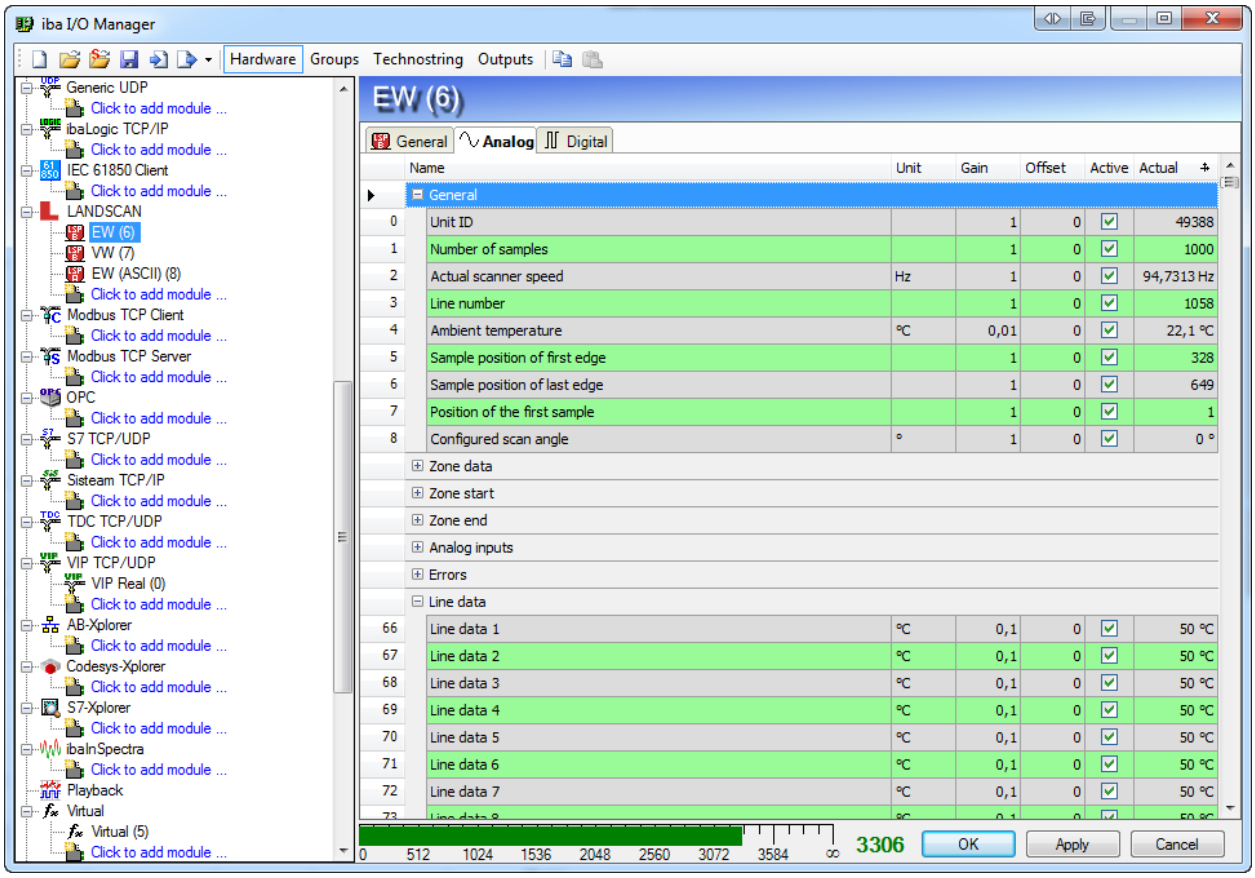
In ASCII mode you can configure how many samples per line the scanner sends. You have to configure this in the scanner itself via the LANDSCAN configuration software. In ibaPDA you have to set the *Profile samples* property to the same value as configured in the scanner.

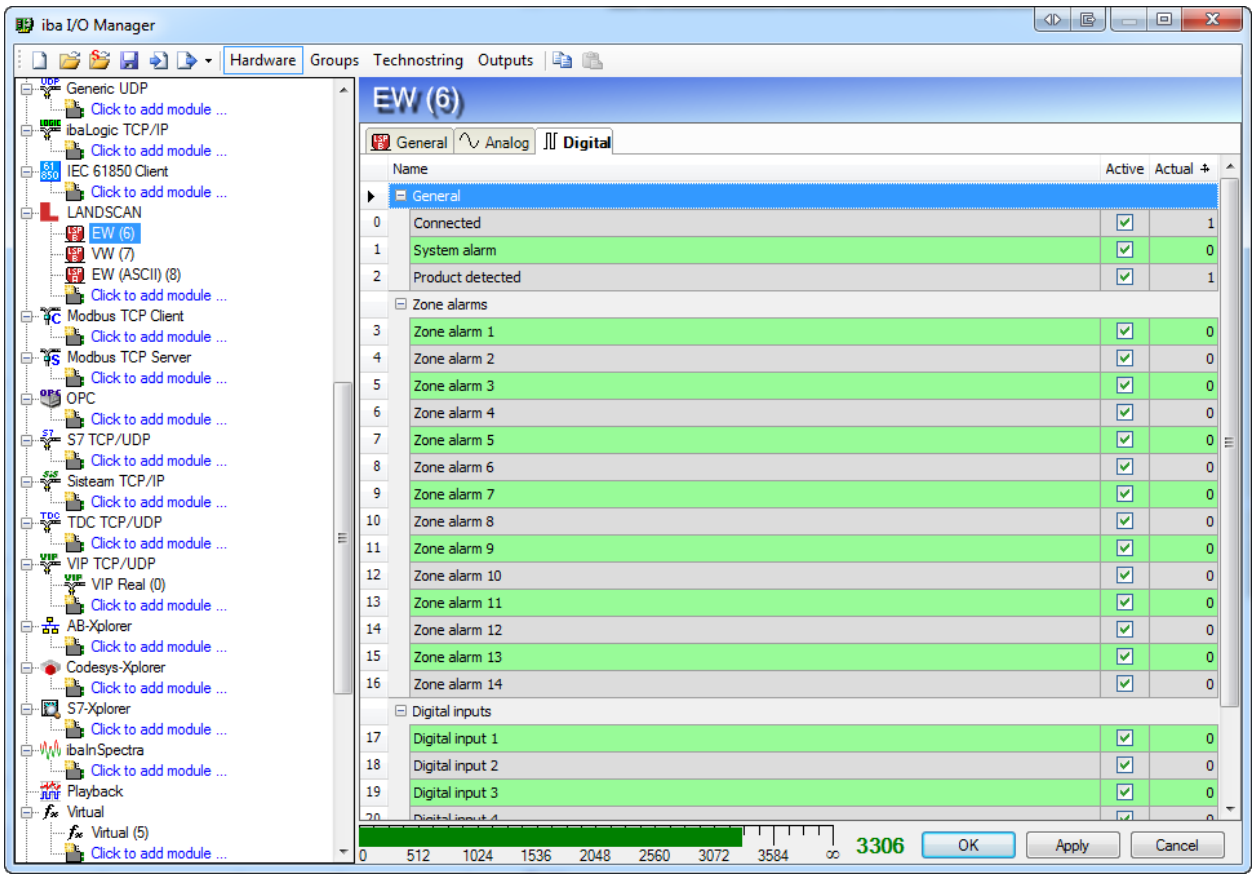
In ASCII mode the data is polled. You have to configure how often ibaPDA reads the data from the scanner. You do this via the *Update time* property.

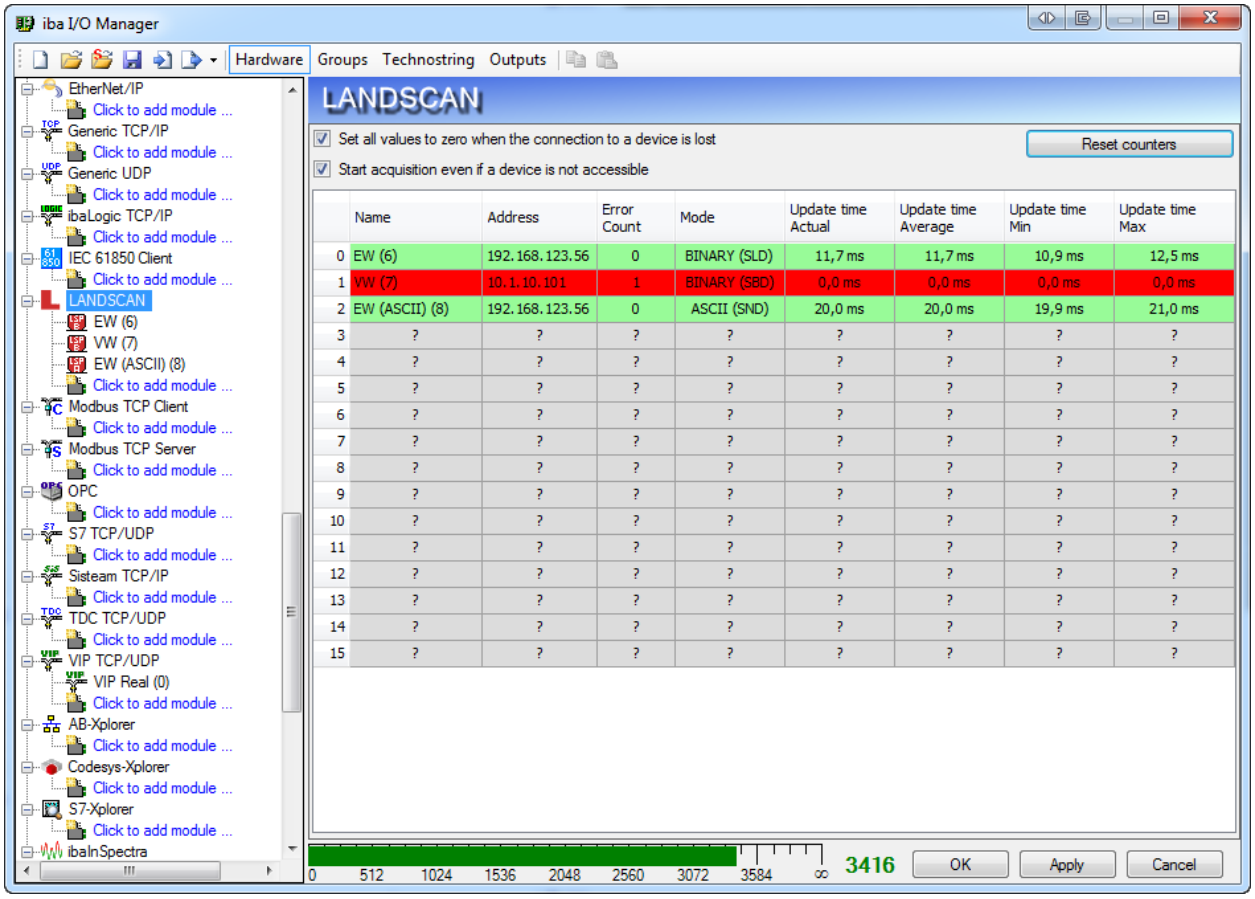
In BINARY mode the data is streamed. This means that the scanner will send the data by itself as soon as he is finished with a line. A scanner supports up to 4 connections. There is 1 connection that can have the highest priority. This connection will get the full speed of up to 150Hz. If you want this to be the ibaPDA connection then set the *High priority* property to true.

The module contains all analog and digital signals that the scanner sends. They are grouped by functionality in the signal grids. There is also a vector generated for the line data. You can

determine the name of this profile vector by setting the *Profile name* property. You can use the '\' character to put the profile vector in a subgroup.







The LANDSCAN interface shows a connection grid. There is one row per connection to a scanner. Each LANDSCAN license allows 2 scanners. A maximum of 16 scanners is supported.

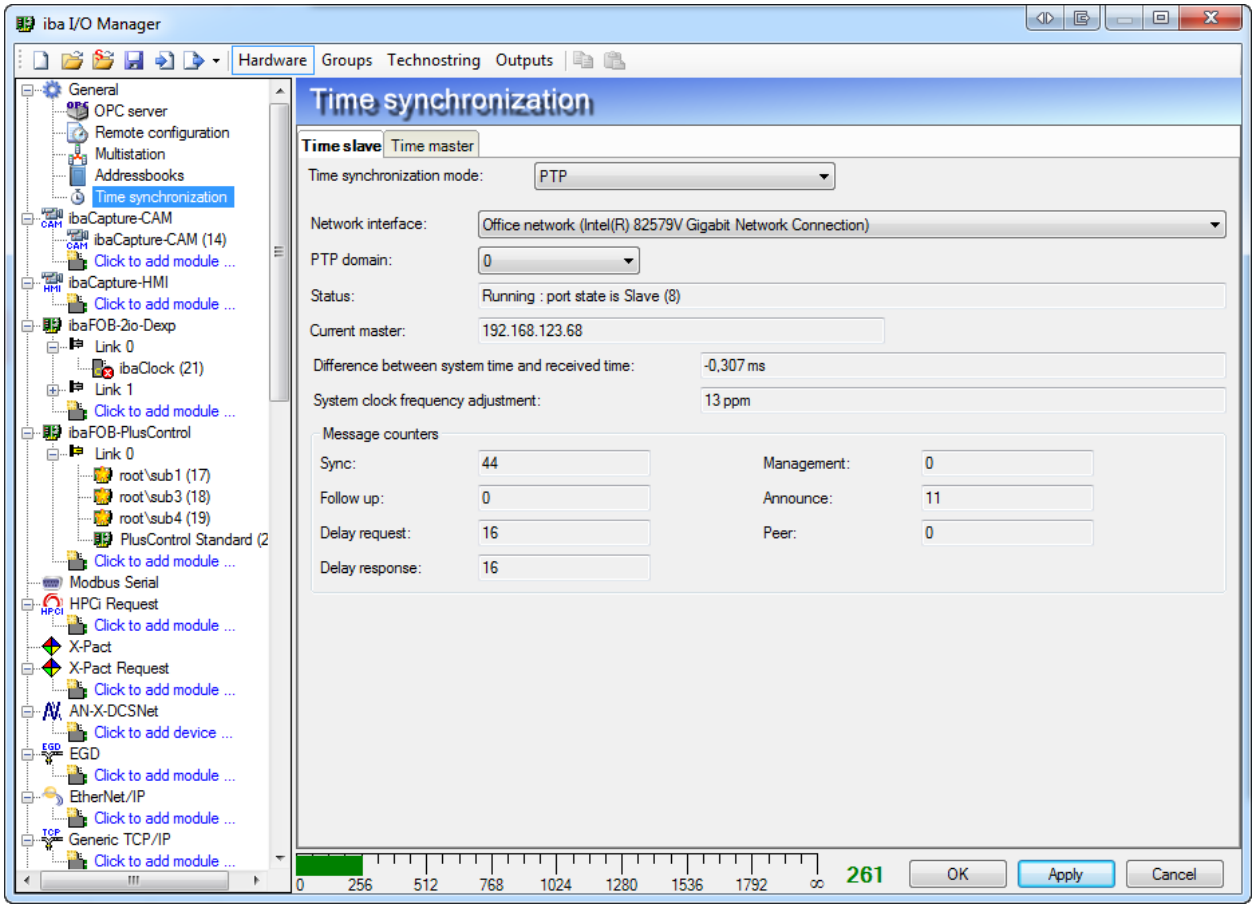
A row is green when the connection is ok and it is red when there is no connection.

These are the columns in the grid:

- Name: Name of the module.
- Address: IP address of the scanner.
- Error count: The number of communication errors that occurred.
- Mode: This indicates how the data is transferred from the scanner to ibaPDA. The possible values are:
  - BINARY (SBD): Streaming binary data
  - BINARY (SLD): Polling binary data
  - ASCII (SND): Polling ASCII data
- Update time actual, average, min, max: The update time is the time between consecutive data messages. It should be the same as the configured scan speed in the scanner when using binary mode. It should be the same as the *Update time* property in ASCII mode.

5 Time synchronization

The time synchronization has been rewritten completely in ibaPDA 6.35.0. In previous versions the time was synchronized by periodically setting the system time when a new time was received from the time source. In 6.35.0 the synchronization is now done by tuning the system clock frequency. This provides a much more accurate clock with less jitter than in the previous implementation.

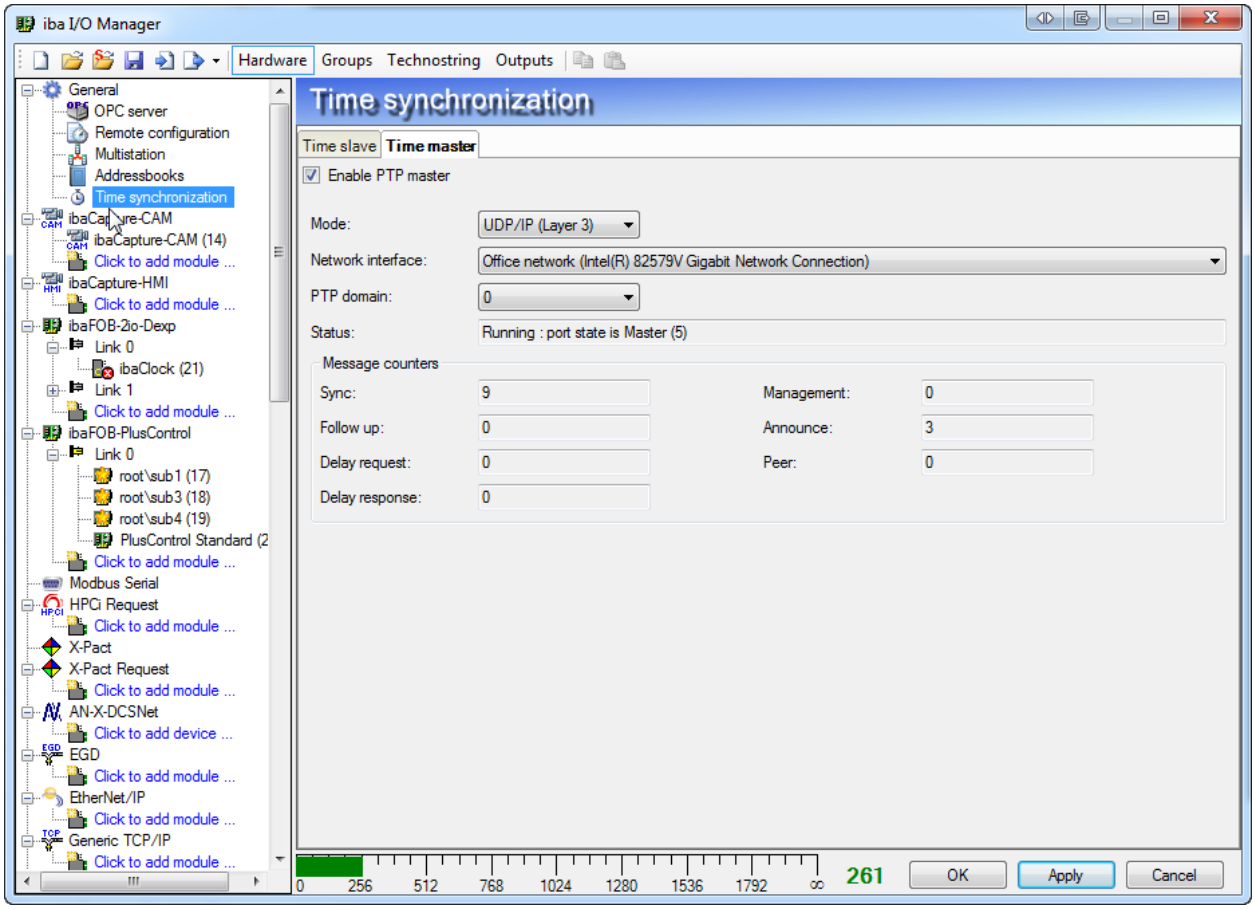


The time synchronization configuration has been moved from a tab on the general node to a separate time synchronization subnode of the general node. On the time slave tab you can configure the time synchronization mode used to synchronize the system clock.

All time synchronization modes show the same 2 diagnostic values about the system clock frequency tuning:

- Difference between system time and received time: This measured difference is the input for the clock frequency tuning algorithm. It gives an indication of the time synchronization accuracy.
- System clock frequency adjustment: This is the amount by which the system clock frequency is changed in order to synchronize it to the clock source. It is expressed in ppm = parts per million. A value of 10 ppm means e.g. that the original frequency of 1000000 Hz was changed to 1000010 Hz.

The TimeSinceLastSync and TimeSyncStatus functions now work for all time synchronization modes.

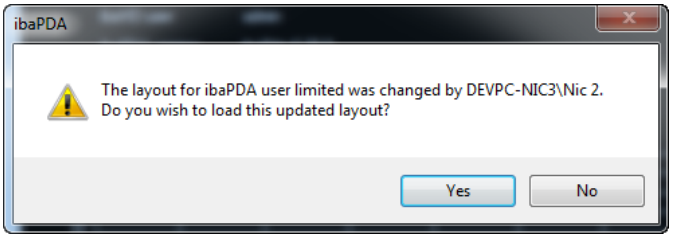


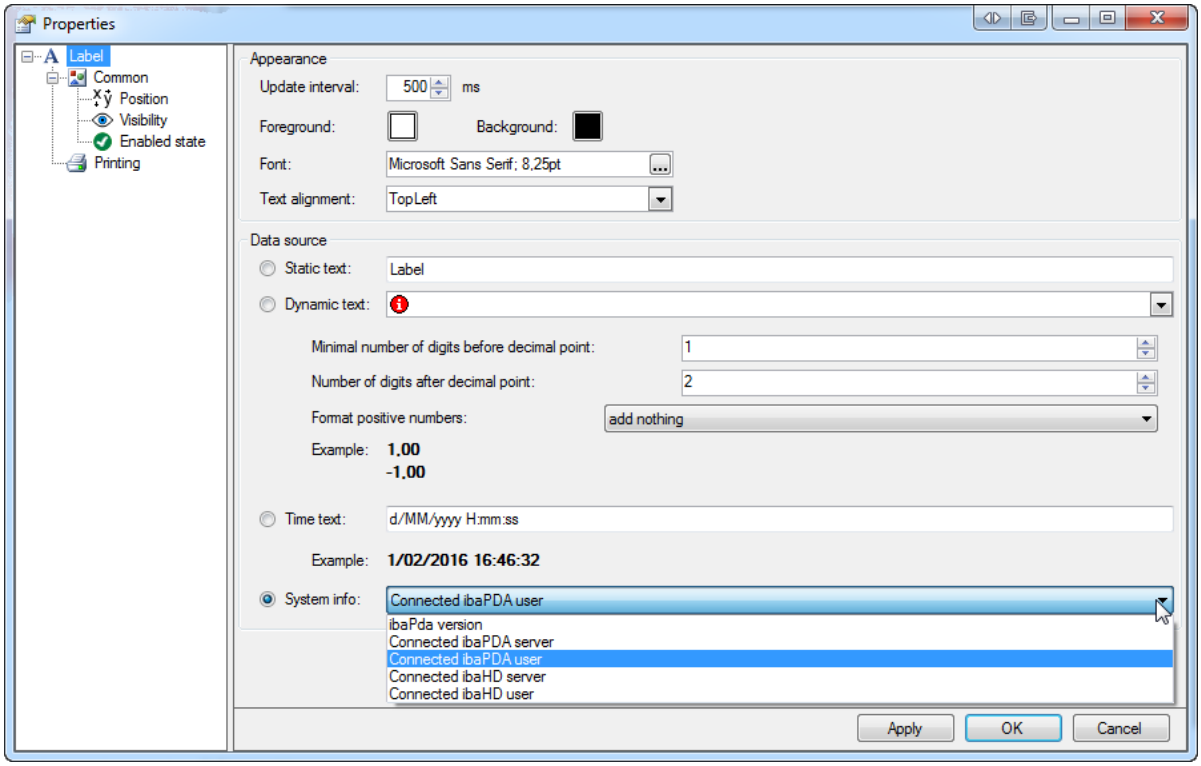
The time master tab allows you to enable PTP master. You can even enable this when the PC is synchronized by another time synchronization mode. E.g. this PC can be synchronized by DCF-77 and it can synchronize other ibaPDA systems via PTP.

IbaPDA now supports PTP also on layer 2 (=Ethernet). For PTP master you have to explicitly set the used layer. PTP slave works on both layers in parallel.

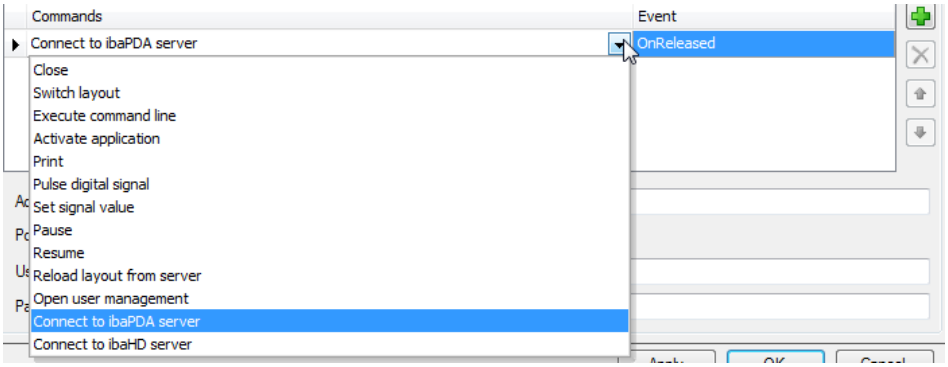
6 User management improvements

Since a long time layouts for users can be saved on the ibaPDA and ibaHD servers. Up to now when the layout was changed on the server the client had to reconnect in order for the layout to be updated on the client. This is now improved. All connected clients that are logged in with the user account whose layouts were saved will get a notification. This notification asks the user whether he wants to reload the layouts from the server or not.



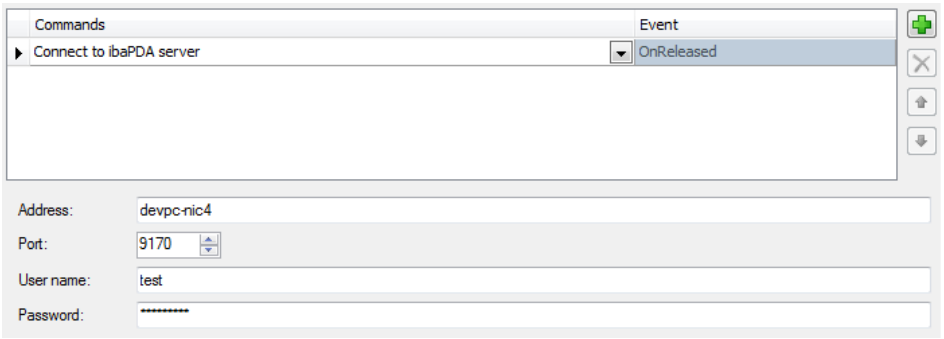


The QPanel label control has also been updated with extra system information. It can now show the connected ibaPDA server and user. It can also show the connected ibaHD server and user.



The QPanel button control also has some new commands related to user management. First there is a command to open the user management form. There is a command to reload the layout from the server. This requires the current logged in user to have the *Load layout from*

server right. Finally there are commands to connect to a specific ibaPDA or ibaHD server with or without user credentials.

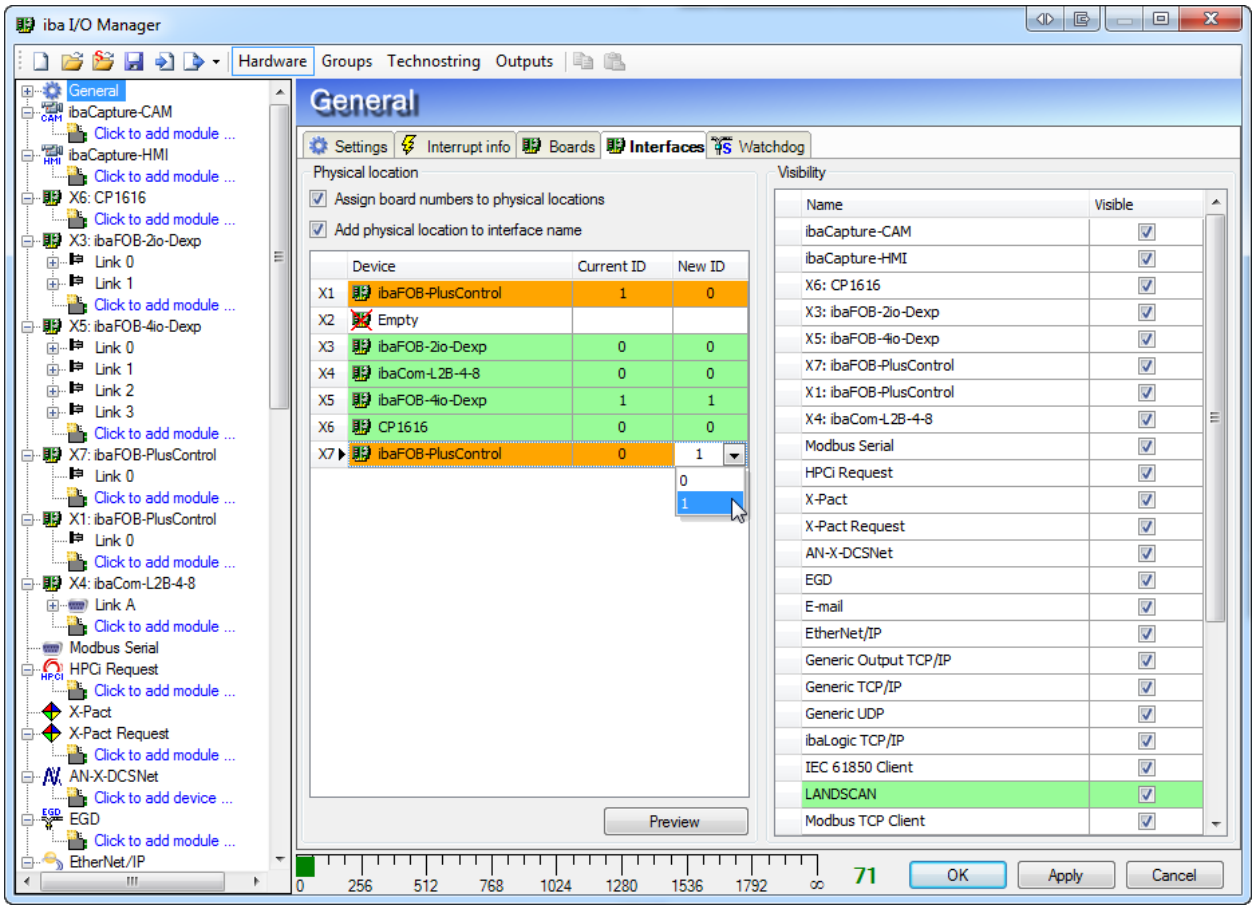


If you leave the address blank then the ibaPDA client will just disconnect. If you leave the user name blank then the login form will appear when you connect to an ibaPDA or ibaHD server. If you enter a user name and password then the ibaPDA client will use them to connect to the server. If they are not correct then the login form will appear.

7 Physical locations

The physical locations concept has been changed completely in ibaPDA 6.35.0. It now only works on the following supported motherboards:

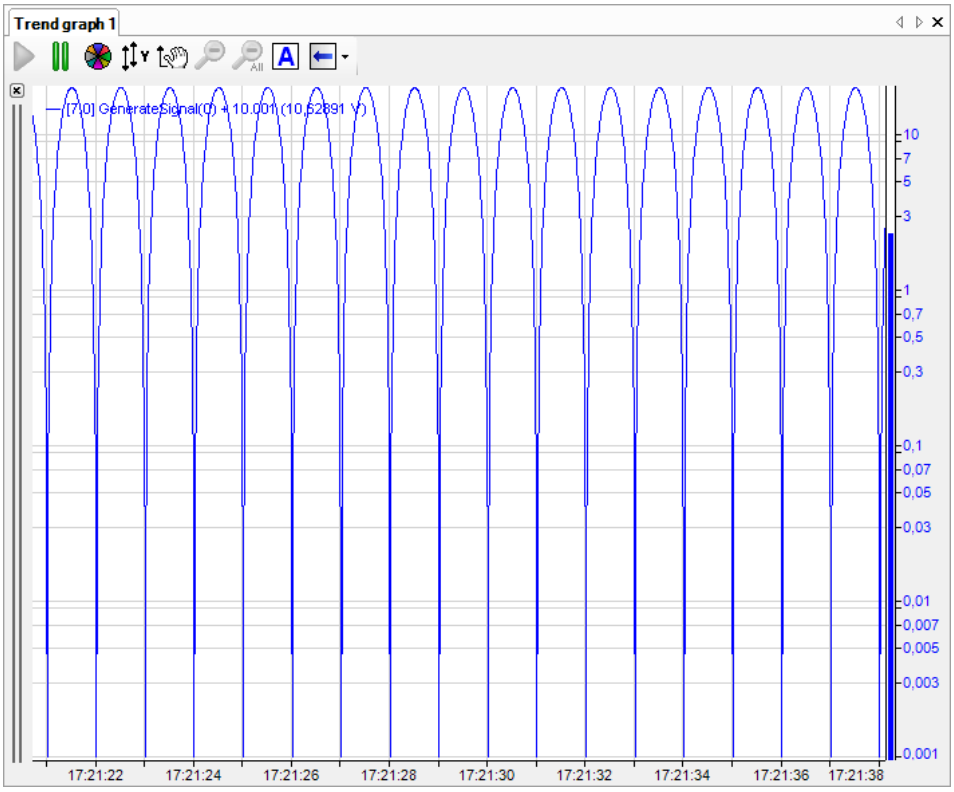
- SuperMicro C2SBC-Q
- SuperMicro X10SAT
- SuperMicro X10SAE



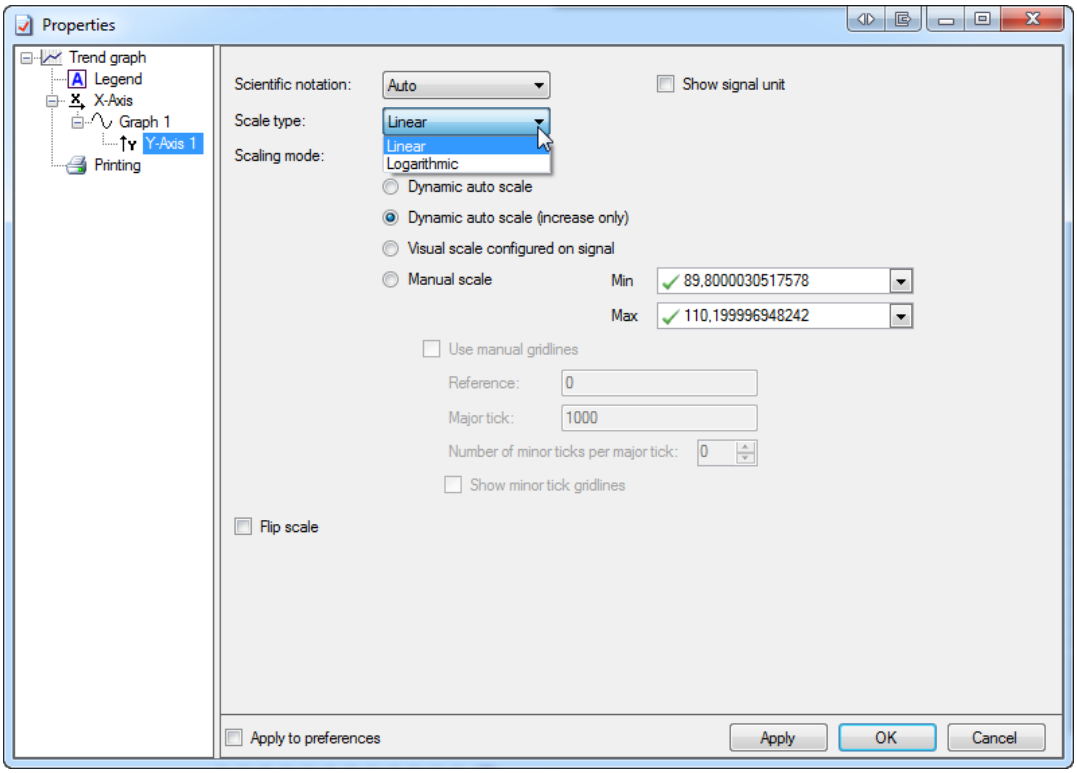
The grid shows the currently installed boards that are supported by ibaPDA. It shows their current ID as shown on the 7-segment display of the boards. By setting the New ID value you can change the ID of the board. Boards where the ID is changed are shown in orange. By clicking the Preview button the new IDs will blink on the 7-segment displays. The modules are not moved together with the board when you change the ID of the board. So you must be sure that the modules are connected to the correct physical board when you change the board IDs. Otherwise you will have to manually move the modules to the correct board in the configuration.

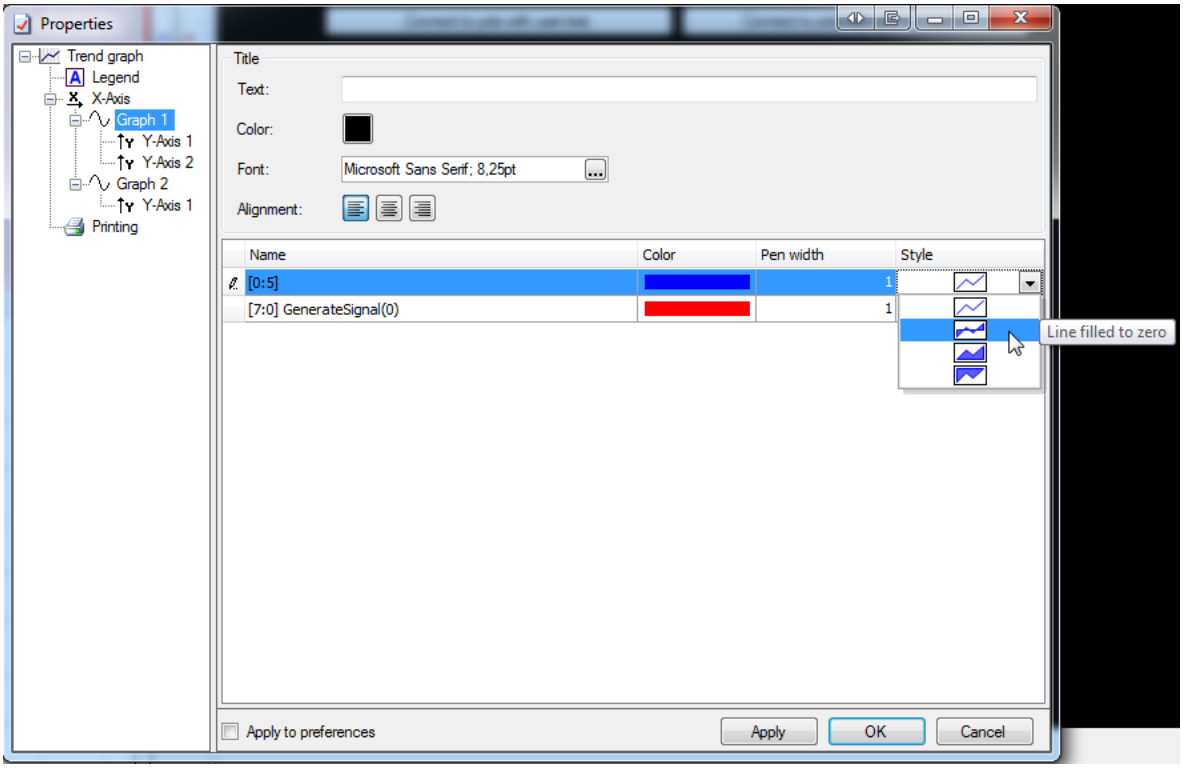
IbaPDA makes sure that a board will get the same logical ID when other boards are added. If a board of the same type is removed then it could happen that the logical ID of a board changes. E.g. if you have 3 ibaFOB-D boards installed and you remove the one with logical ID 1 then the board with logical ID 2 will get logical ID 1 because there can be no gaps in logical IDs.

8 Trend graph improvements



The trend graph now supports a logarithmic Y scale. To enable it go to the Y axis properties and set the scale type.

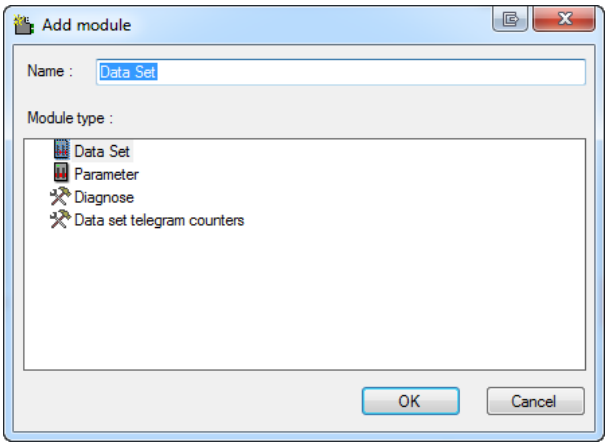




There are also new paint styles for the analog signals. Before 6.35.0 there was only line and filled. In 6.35.0 there are now 3 filled styles:

1. Line filled to zero. This fills to the zero value of the Y-axis scale. It is the same as the old filled style.
2. Line filled to bottom. This fills to the bottom of the Y-axis independent of the Y-axis scale.
3. Line filled to top. This fills to the top of the Y-axis independent of the Y-axis scale.

9 ibaBM-DDCS improvements



The ibaBM-DDCS devices now support 2 extra module types:

- Diagnose
- Data set telegram counters

The diagnose module can be used to measure some general information about the ibaBM-DDCS device itself like e.g. the timing of the parameter channel.

The data set telegram counters module provides a counter for data coming from and going to a drive on the data set channel. These counters can be used to check if a drive is still alive on the bus.

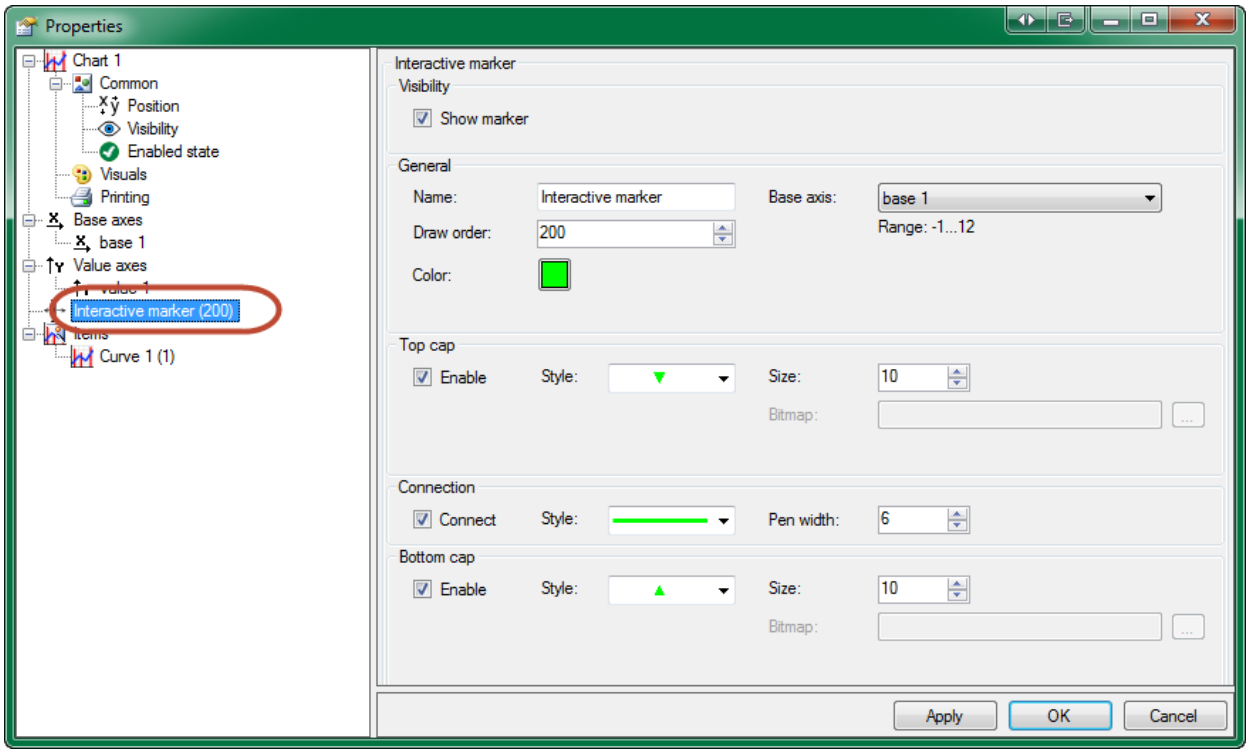
10 ibaChart

The ibaChart was revisited. Multiple improvements and bug fixes were implemented. Some important new features are mentioned below.

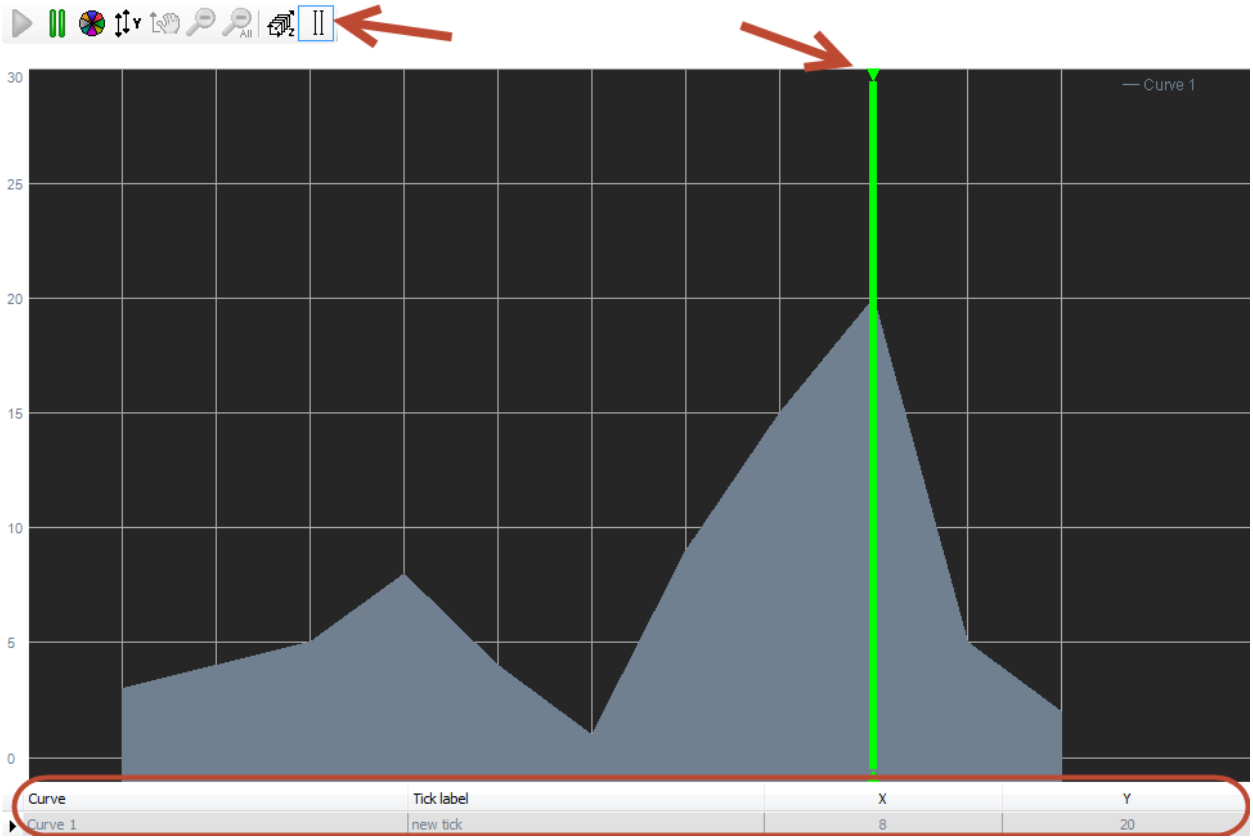
10.1 Interactive marker

An interactive marker was introduced. This marker can be moved by a mouse click and is attached to a custom horizontal axis.

Its position always coincides with one of the tick values of the base axis it is attached to. The visual characteristics of this marker can be customized in the same way as custom markers. The look of the connection line can be fully configured. Top and bottom caps can be added, they can have a predefined figure or a custom image.

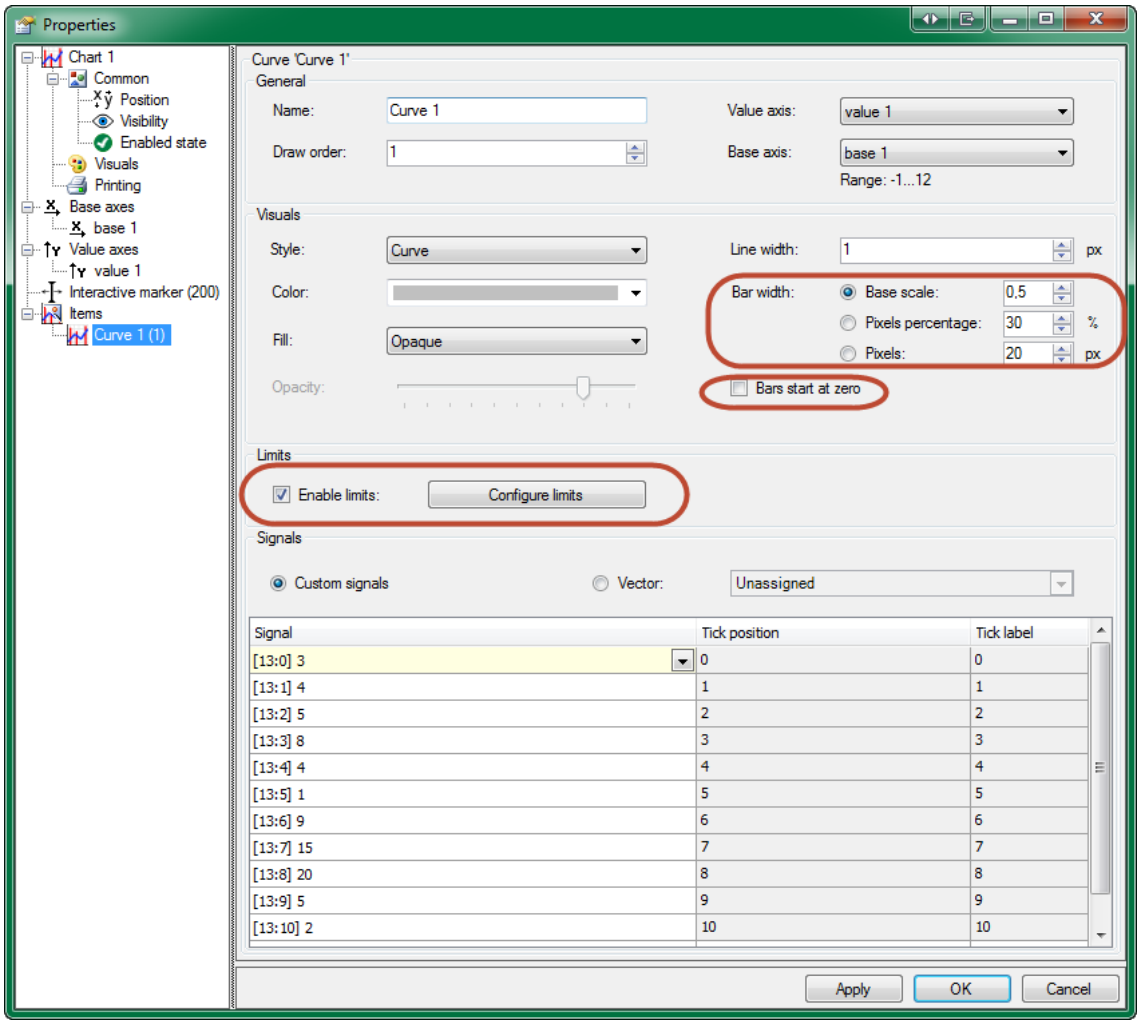


The interactive marker can be customized in the properties dialog of the ibaChart. It can be enabled or disabled via the toolbar. When enabled, a table appears at the bottom of the view. This table contains the x and y values of all curves defined at the selected tick position.



10.1 Curve item

The settings for the curve item were reorganized and extended.

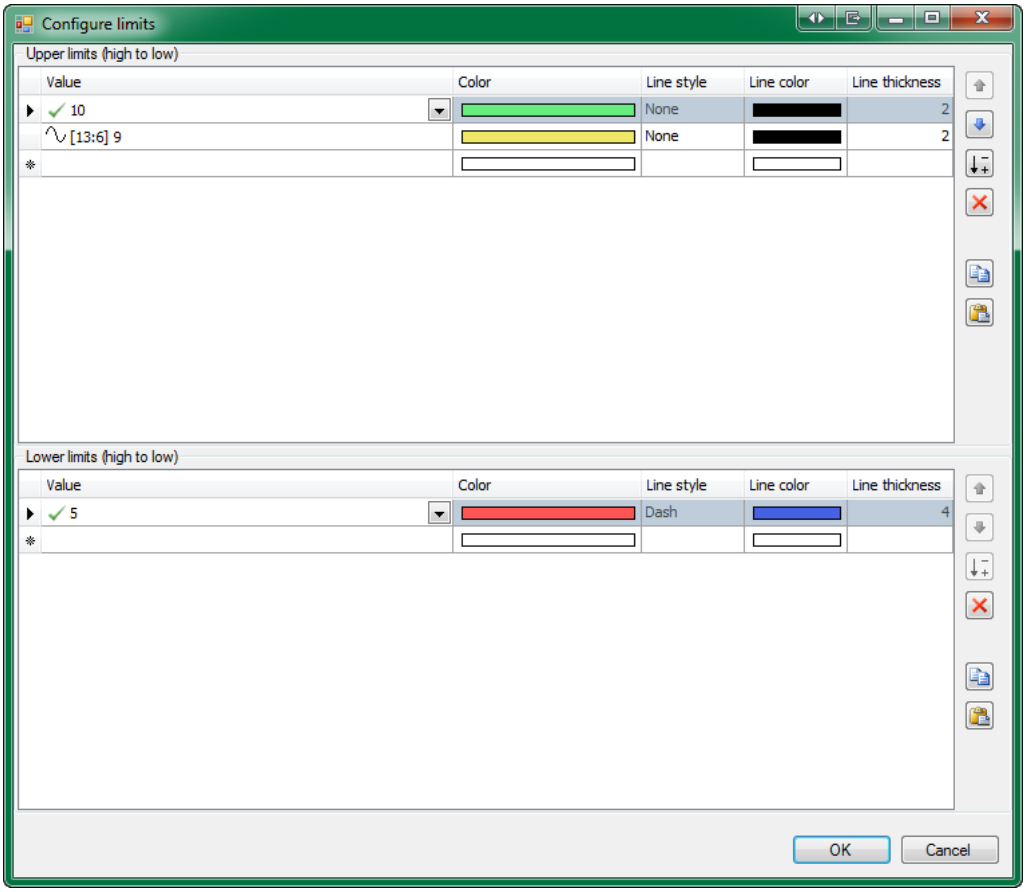


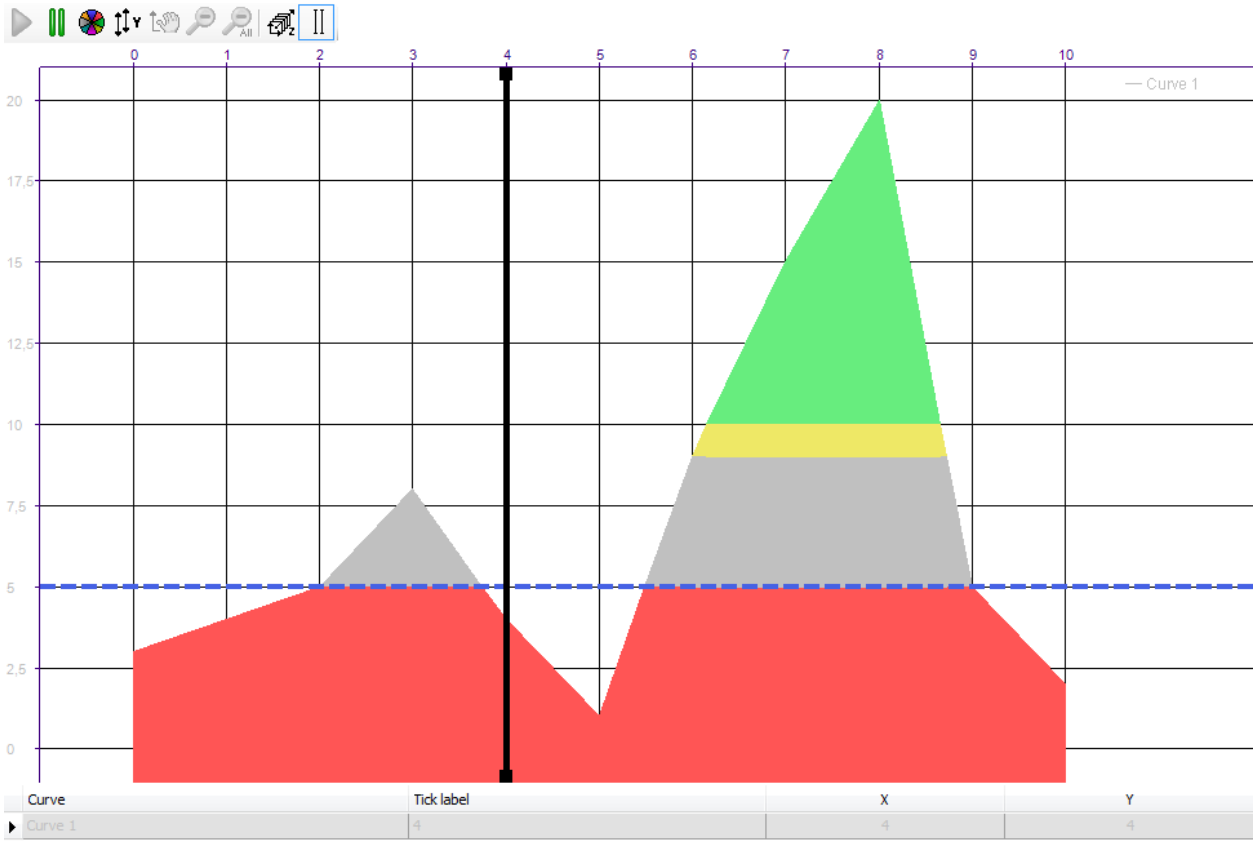
The curve style “*Lines*” was removed. Instead, the user can use the curve style “*Bars*”. The new setting “Bars start at zero” determines whether the bars start at the bottom of the graph or at zero.

The bar width can be configured in three ways:

- *Base scale* (new default): bar width as a width on the scale of the attached base axis
- *Pixels percentage*: bar width as a percentage of the available pixel space
- *Pixels* (previous default): bar width in pixels

This new version allows configuring a custom number of lower and upper limits. For each limit, a color can be configured. If a limit is exceeded, the curve part exceeding the limit is painted in the color configured for the limit. Also, for each limit, one can visualize a line, with custom color, thickness and line style.It is important that the limits are sorted in the correct order; the highest limits must be listed first.


Configure limits
Upper limits (high to low)
Value
Color
Line style
Line color
Line thickness
10
None
2
[13:6] 9
None
2
Lower limits (high to low)
Value
Color
Line style
Line color
Line thickness
5
Dash
4
OK
Cancel


Curve 1
Curve
Tick label
X
Y
Curve 1

10.2 Base axis configuration

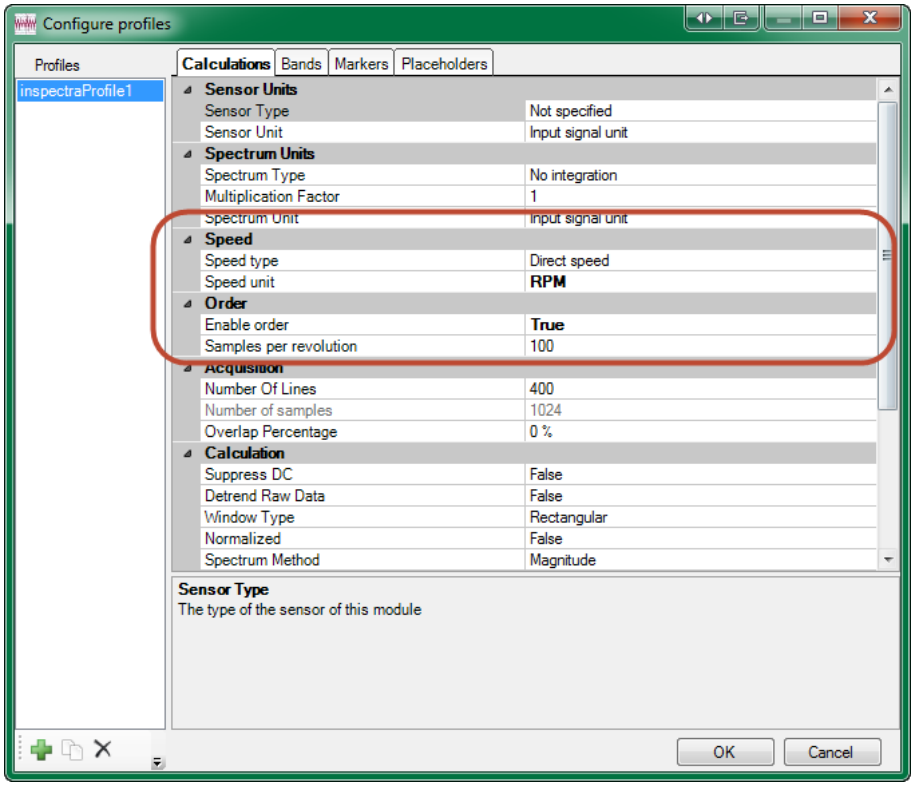
The table and buttons to configure the ticks of a base axis were revisited. The “*Clear all*” button was removed. Multiselection is now possible. To delete multiple ticks, one can use multiselection in combination with the “*Delete*” button.

11 Order calculations

11.1 InSpectra Expert module

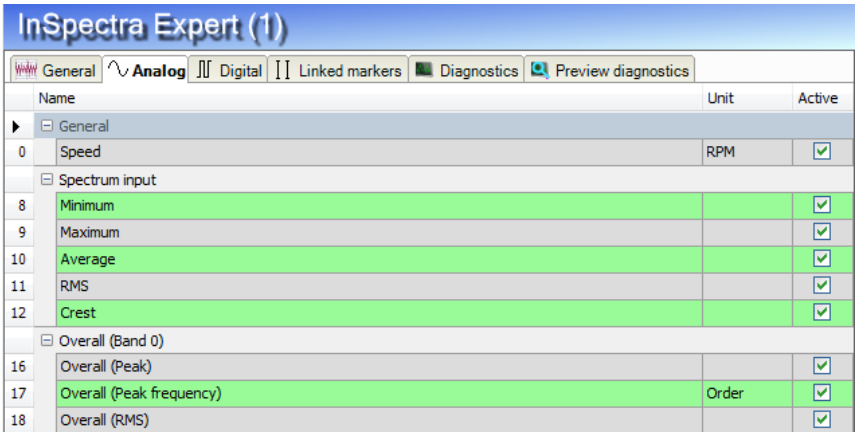
The InSpectra profiles now support order calculations. The system resamples the vibration signal based on a speed signal. Three speed types are supported:

- *Direct speed*: analog speed, e.g. in m/s
- *Pulsetrain*: digital, each pulse indicates a (part of a) single rotation
- *Pulsecounter*: analog, each count indicates a (part of a) single rotation



Several speed units are supported. The system can parse the unit of the speed signal automatically.

In case *"Order"* is enabled, the expression for the bands and markers need to be specified in order.



The (direct) speed was added to the analog signals of the Expert module. In this way, the speed can be recorded in a data store.

11.2 FFT view

The settings to choose the speed type for order calculations are reorganized. Now it is possible to enable or disable the order mode, without loosing the choice between speed or length calculations.

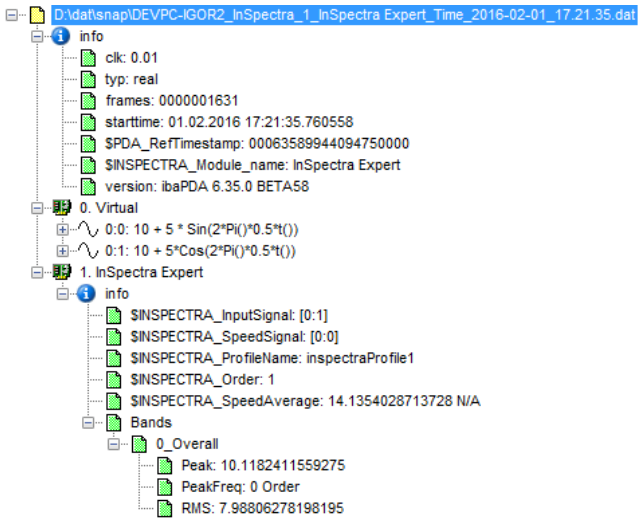
The order calculations can be enabled or disabled easily by means of a new button in the toolbar:

In case an InSpectra Expert module with order calculations is visualized in an FFT view, the order settings are adopted automatically in the properties of the view.

12 InSpectra info fields

Some info fields were added to the snapshot dat files generated by the InSpectra Expert module:

- Expert module: band values (rms, peak, peak frequency) in a human readable way, order enabled, profile name and average value of the speed
- Universal CM module: input signal, interval and snapshot duration
- Fan module: interval and number of blades

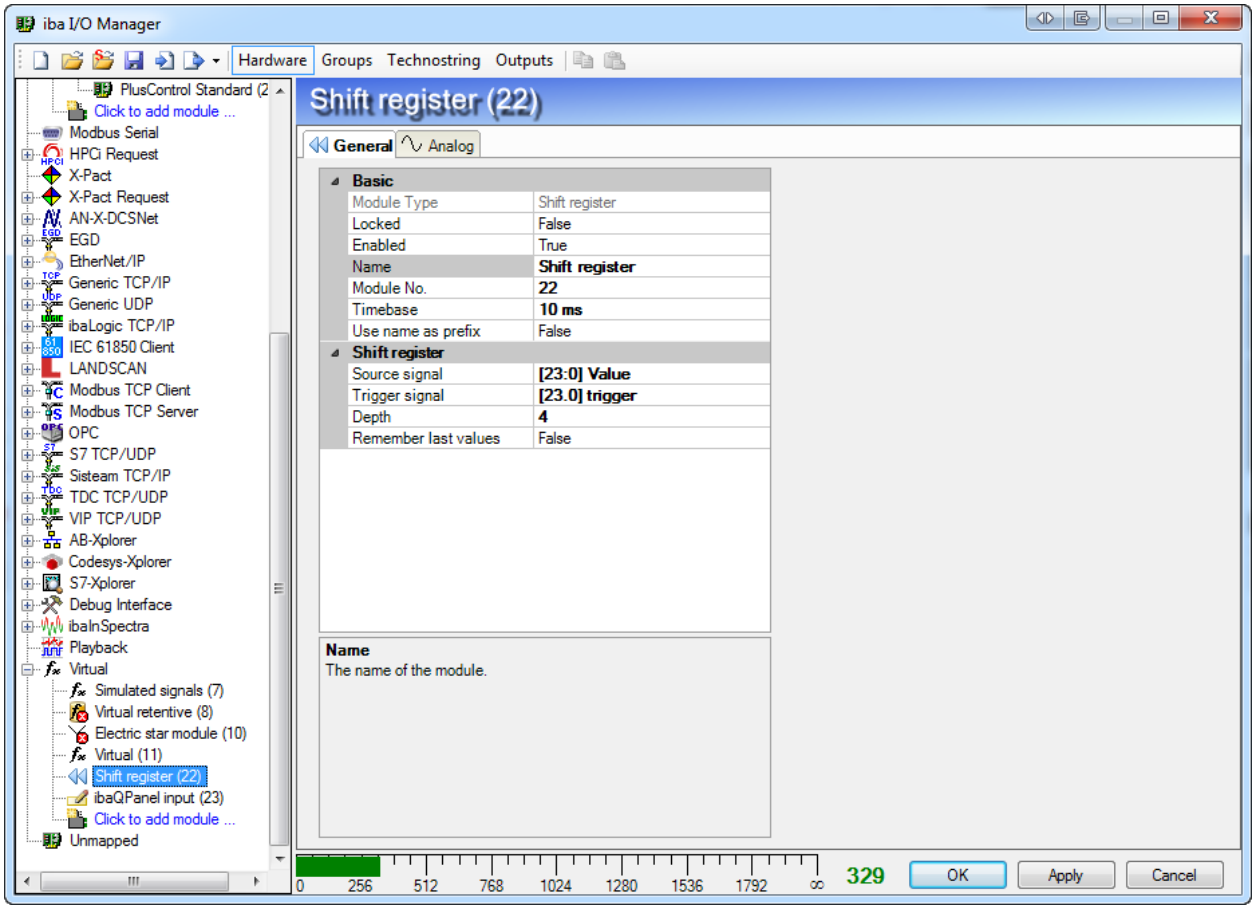


Normal dat files include 2 new module info fields for Expert modules: profile name + order enabled.

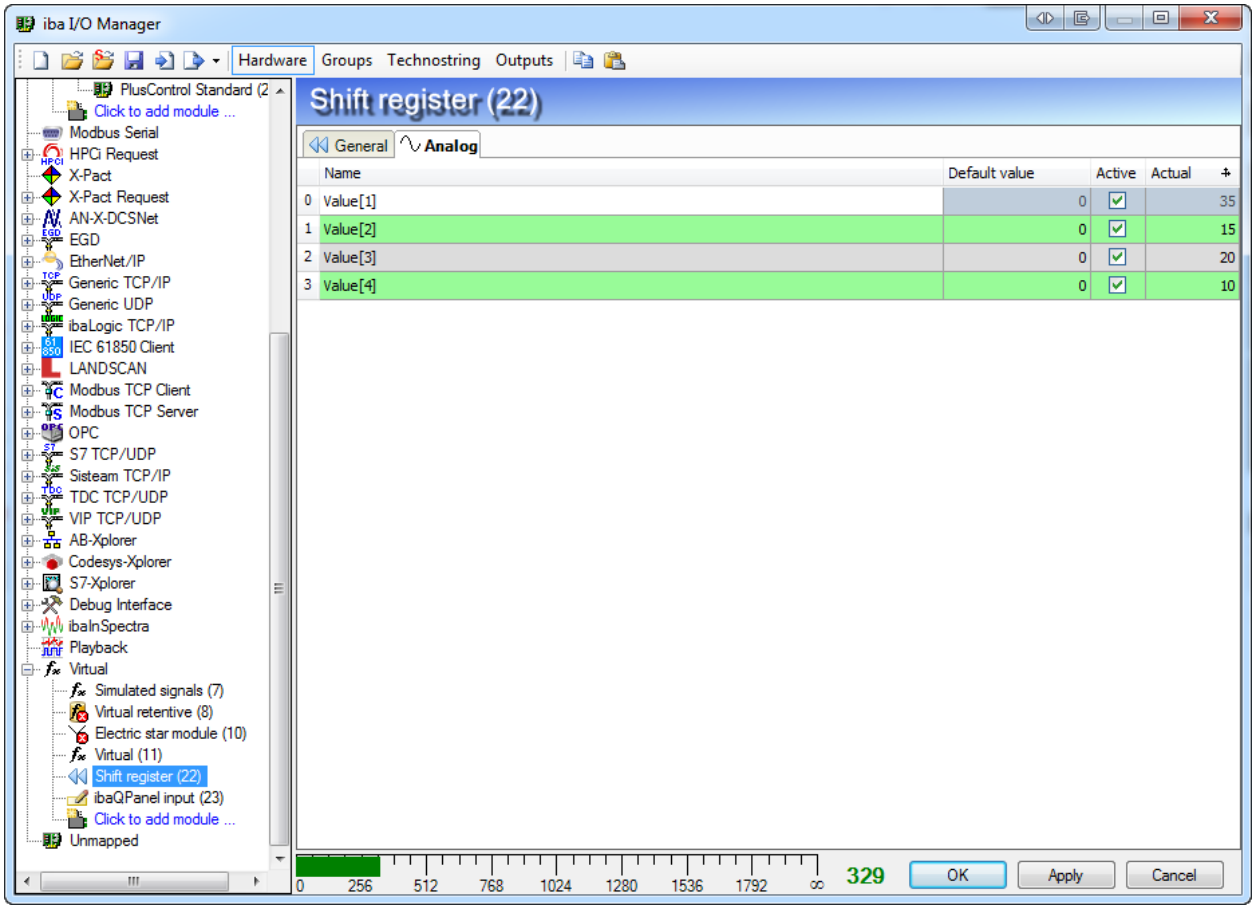
13 Shift register

Since ibaPDA v6.34.2 there is a shift register module and a shift register technostring. They can be used to store historical values.

13.1 Shift register module

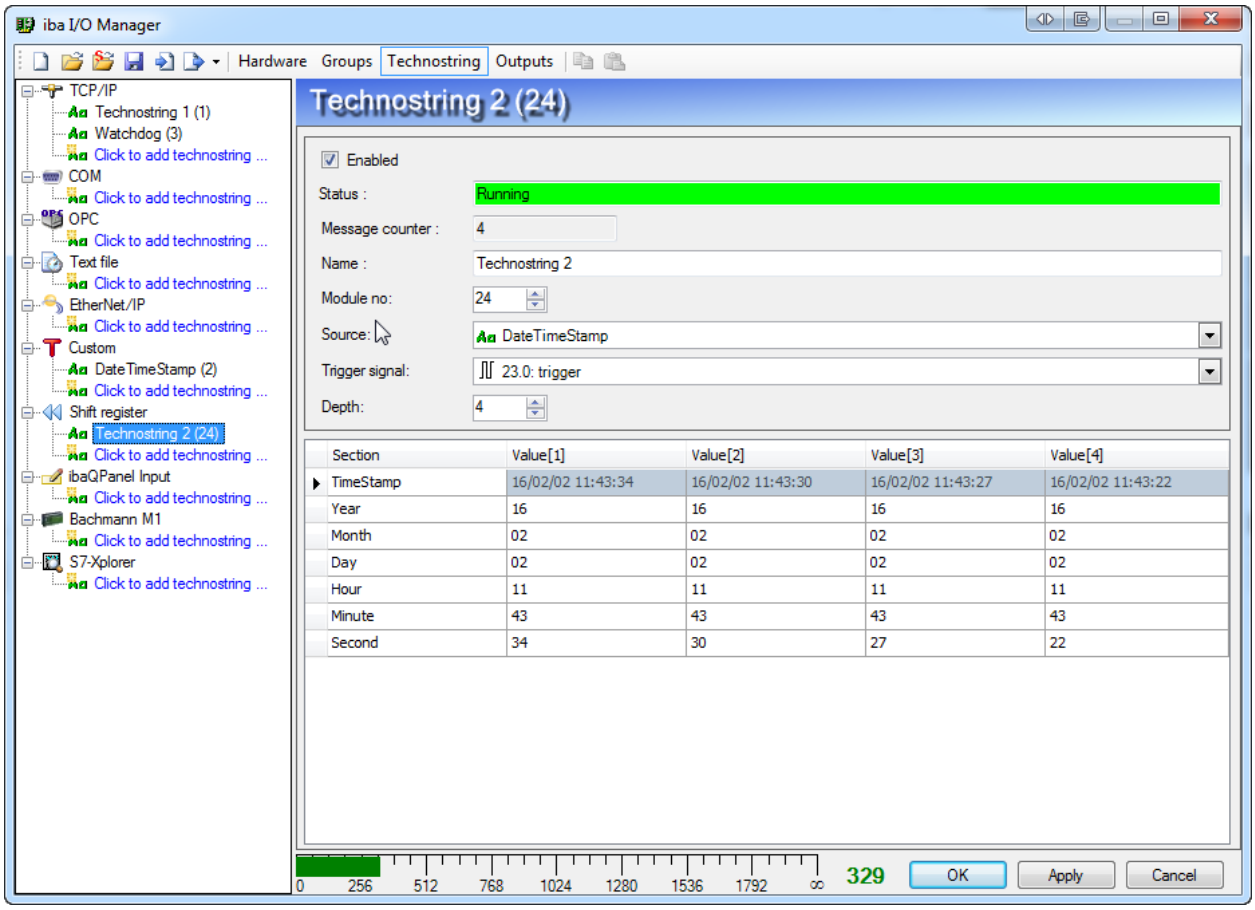


The shift register module requires an input signal and a trigger signal. A shift register has a depth. This determines the number of previous values of the input signal that will be saved. Each signal of the shift register module represents a position in the shift register. Signal 0 contains the most recent value of the input signal. Signal 1 contains the previous value of the input signal. Signal 2 the value before that and so on for the other signals. Each time there is a rising edge on the trigger signal the current value of the input signal is put in the shift register. This moves the previous value one place further down the shift register.

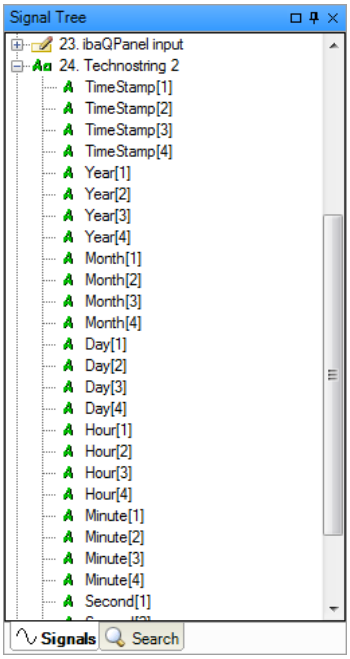


If the input signal is analog then the shift register signals will also be analog. If the input signal is digital then the shift register signals will also be digital. The name of the shift register signals is derived from the input signal name. An index is added to the input signal name for each shift register signal. You can set a default value for each shift register signal. You can also enable the *Remember last value* property. This will update the default values with the last measured values when the acquisition is stopped. So then the next time the acquisition is started the shift register will have the same values as when the acquisition was stopped.

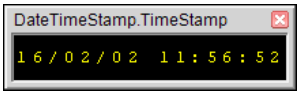
13.2 Shift register technostring



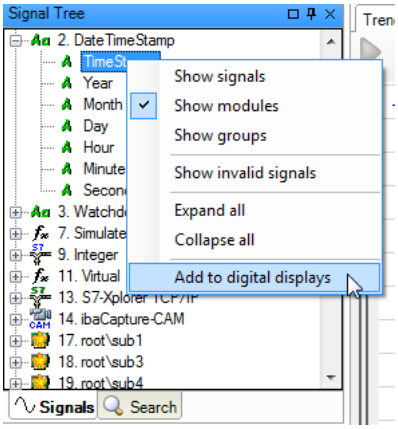
The shift register technostring works in the same way as the shift register module. The difference is that the input is now a technostring instead of a signal. For each section “s” of the source technostring new sections “s[1]”, “s[2]”, … “s[n]” (n = depth of shift register) are created in the shift register technostring. The values are shown in a table in the I/O manager. The table has a row per section of the source technostring and a column per position in the shift register.



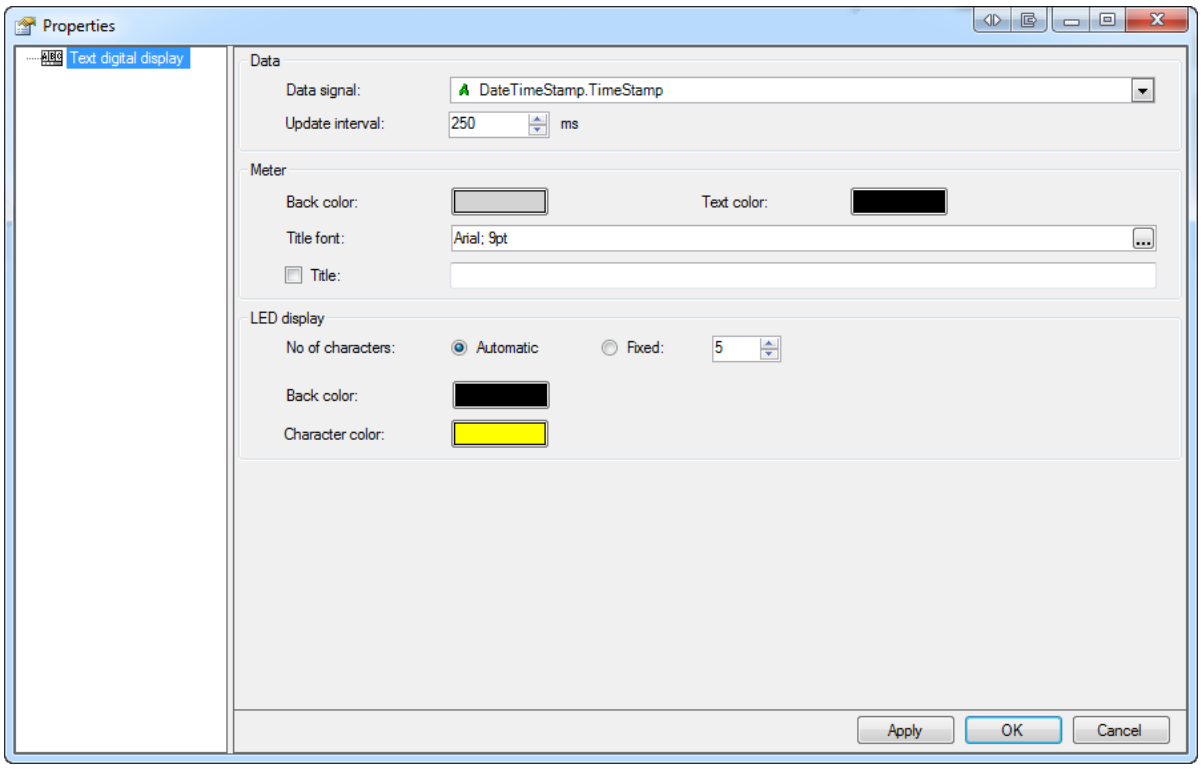
14 Text digital display



Since ibaPDA 6.34.2 you can display technostring values in a digital display. This is similar to the numeric digital displays for signals. You can add a text display by right-clicking on a technostring section in the signal tree and selecting *"Add to digital displays"*.



You can also add one by dragging a technostring section from the signal tree to the *Digital displays* dockable window.



In the properties of the text digital display you can adjust the colors and the number of characters.