New Features in ibaPDA v8.10.0

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1 General remarks

1.1 Supported Windows Operating Systems

Windows Server 2025 (x64) was added to the list of supported operating systems.

The following operating systems are currently supported:

- Windows 10 (x86/x64)
- Windows 11 (x64)
- Windows Server 2016 (x64)
- Windows Server 2019 (x64)
- Windows Server 2022 (x64)
- Windows Server 2025 (x64)

2 SINUMERIK-Xplorer

In ibaPDA 8.10.0, the SINUMERIK-Xplorer is improved in numerous places.

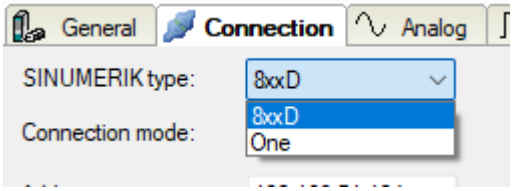
Order number and license details have not changed.

2.1 Support SINUMERIK ONE

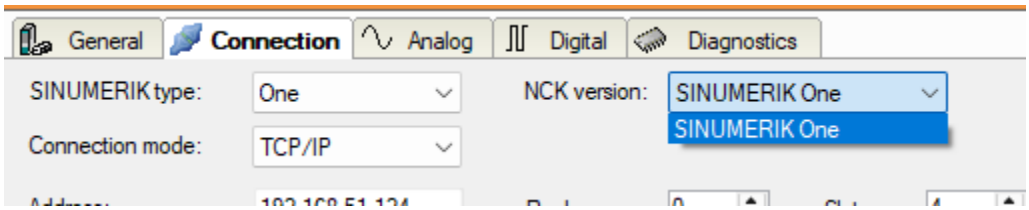
ibaPDA now supports the SINUMERIK One generation.

A dropdown is added to the SINUMERIK-Xplorer to select the SINUMERIK type. To connect to a SINUMERIK One, select “One”.

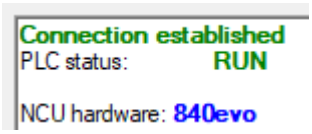
For any other device type, choose “8xxD”.



Also, a dedicated SINUMERIK One NCK version is available.

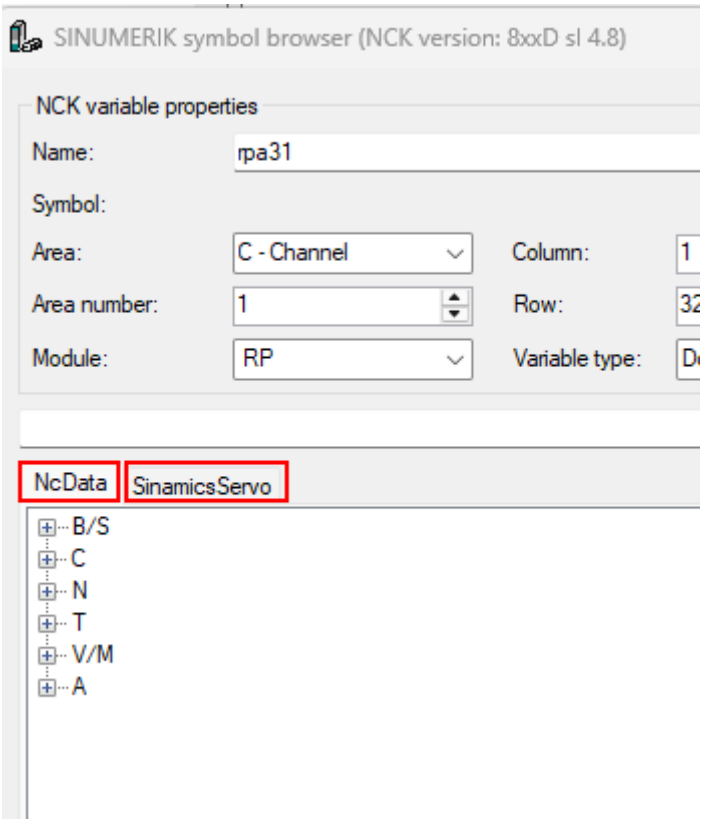


When testing the connection using the Test button, the NCU hardware type “840evo” is displayed for SINUMERIK One devices.



2.2 Mixing NC and SINAMICS symbols

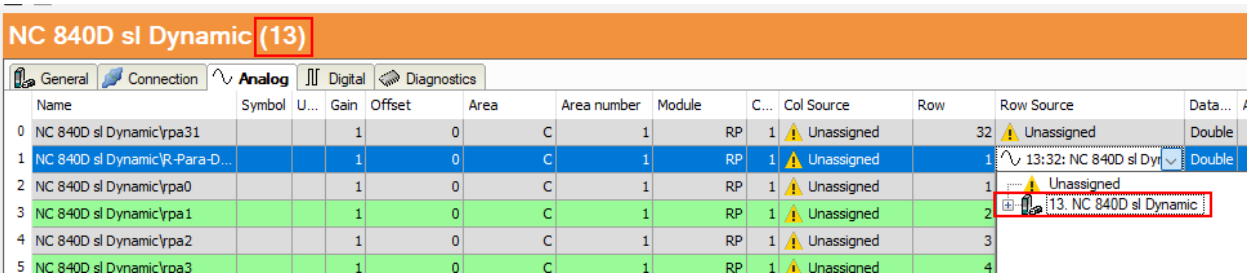
In previous versions it was not possible to acquire NC and SINAMICS servo symbols in the same SINUMERIK-Xplorer module. Additionally, it was not possible to measure symbols of different SINAMICS servo drives in the same module.



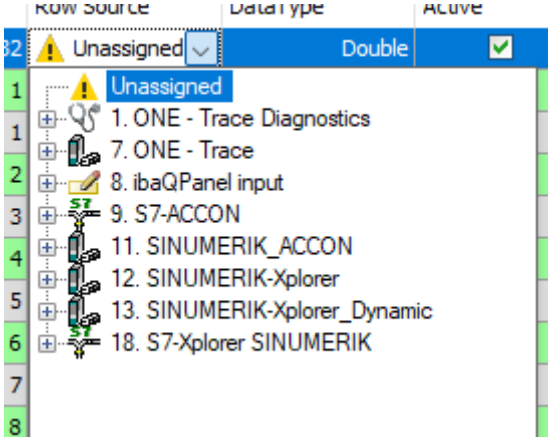
This is no longer the case. NC and SINAMICS servo symbols can be acquired in the same module, as well as symbols of multiple SINAMICS servo drives.

2.3 Dynamic addressing: Virtual signals

Up to now it was only possible to select analog signals of the same SINUMERIK-Xplorer module for the Col Source and Row Source columns.



It is now also possible to select signals of other modules.



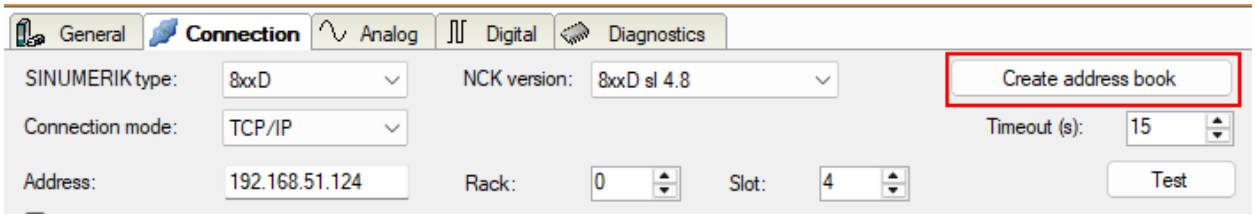
Remark:
The values of signals that are in the same module can be retrieved immediately. For external signals, reading the values is related to the time base of the acquisition and therefore slower. The delay is typically more than 100 ms.

2.4 Symbol browser: Support for GUDs

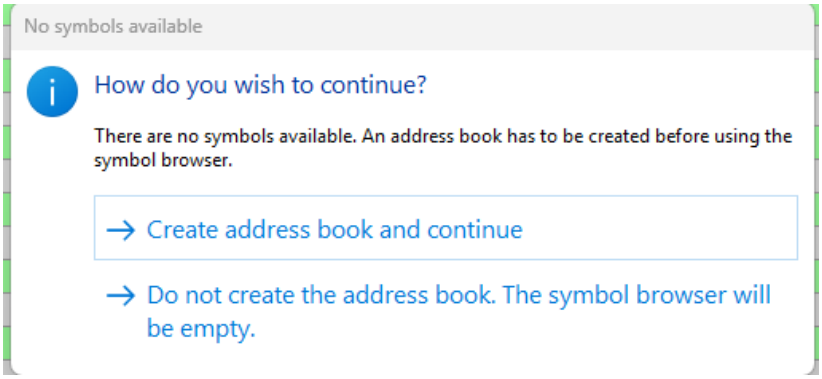
The SINUMERIK symbol browser now also supports user defined symbols (“GUD”).

GUDs can be configured on the SINUMERIK device itself but were not listed in the symbol browser in previous versions.

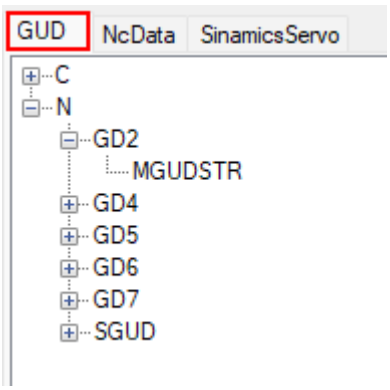
GUD and firmware symbols are stored in address books. To create an address book, the “Create address book” button in the connection tab can be used.



The address book can also be created when the symbol browser is opened and no address book is available.



GUD symbols are displayed in a dedicated tab.



2.5 New firmware versions

ibaPDA now supports SINUMERIK firmware versions up to 4.95.

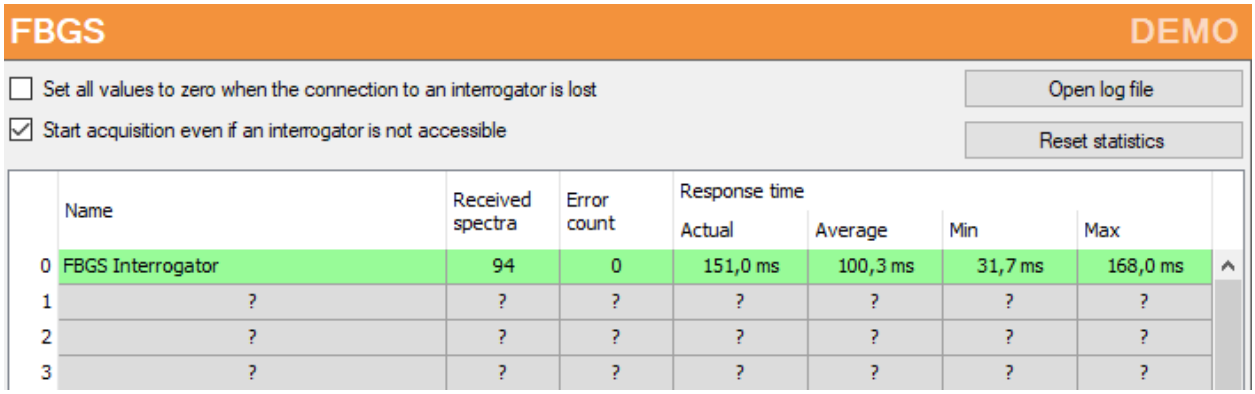
3 FBGS interface

The FBGS interface can be used to measure data from optical fibers connected to an FBGS interrogator. Each optical fiber contains several sensors where each sensor corresponds to a wavelength peak in the optical spectrum. The position of this peak can be influenced by strain, stress or the temperature acting on this fiber. Thus, the sensors can be used to quantifiably measure these properties.

Using a TCP/IP connection, the FBGS interrogator periodically sends the peak positions and corresponding intensities to ibaPDA where the data can be interpreted further. ibaPDA contains a module that automatically converts the peak data to a temperature value.

Order Information	
Order no.	31.001017
Name	ibaPDA-Interface-FBGS
License	4 channels, max. 256, no matter at which interrogator
Order no.	31.101017
Name	one-step-up-Interface-FBGS
License	+4 channels

3.1 Interface



The interface shows a table of all currently configured connections to FBGS interrogators where each connection corresponds to one row in the table. The color of a row has the following meaning:

- Green: The connection is active and data is being read
- Orange: The connection is active but data is being read at a slower rate than configured
- Red: The connection is not active
- Grey: No connection is configured

The **Received spectra** counter indicates how many datasets have been received from the FBGS interrogator. One dataset is a collection of peak wavelength and intensity pairs of all configured sensors of all configured channels/fibers of the FBGS interrogator. The **Error count** refers to the number of times a connection error (or failed connection attempt) has occurred or

ibaPDA was unable to synchronize the data of several channels. The **Response time** is how fast data is being received by ibaPDA through the TCP/IP data connection; actual, average, minimum and maximum values are displayed.

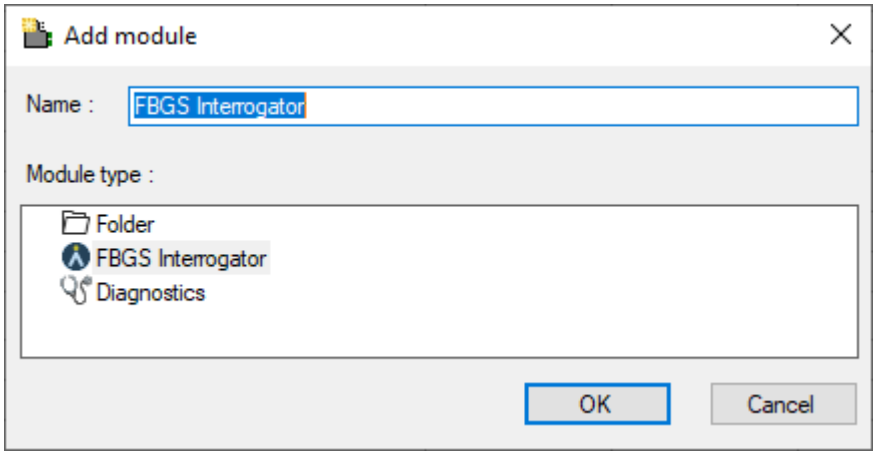
When enabling the option **Set all values to zero when the connection to an interrogator is lost**, the data of FBGS modules with no active connection will be set to zero. When this option is not enabled, the measured data will remain the same.

When the option **Start acquisition even if an interrogator is not accessible** is enabled, ibaPDA can proceed to start the acquisition even though a connection to the interrogator could not be established (or a non-critical configuration error occurred) while trying to start the acquisition. In that case, ibaPDA will periodically try to connect to the FBGS interrogator. If the connection attempt succeeds, ibaPDA will start measuring data from the previously unreachable FBGS interrogator, without restarting the entire ibaPDA acquisition.

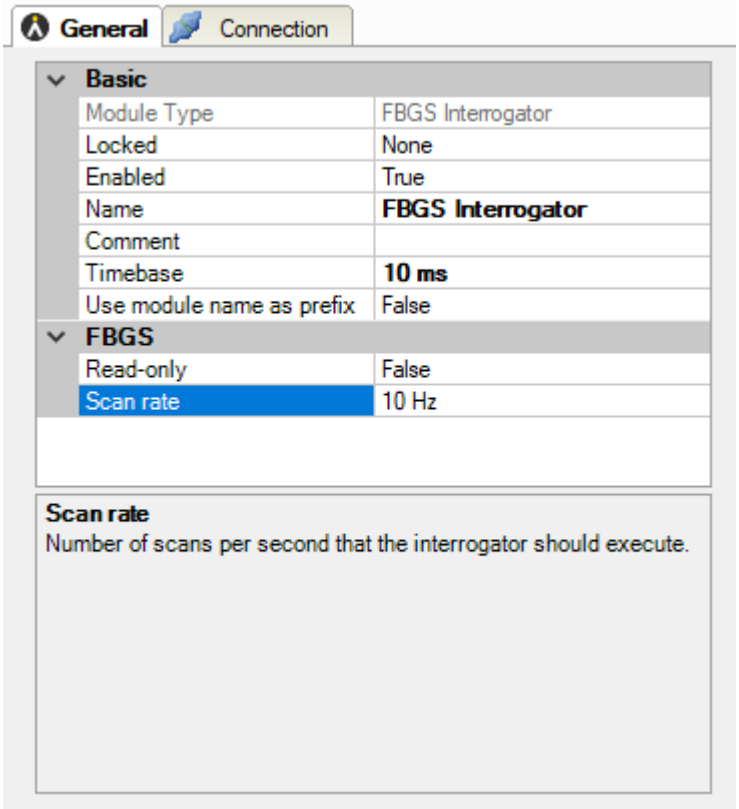
Clicking the **Open log file** button opens a log file with information related to the FBGS interface and its modules.

The **Reset statistics** button can be used to reset the diagnostic counters in the connection table.

3.2 Device modules

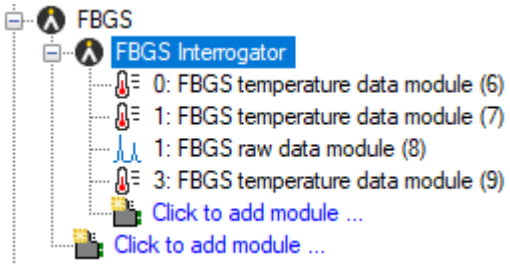


Under the interface node, you can add an FBGS Interrogator module.

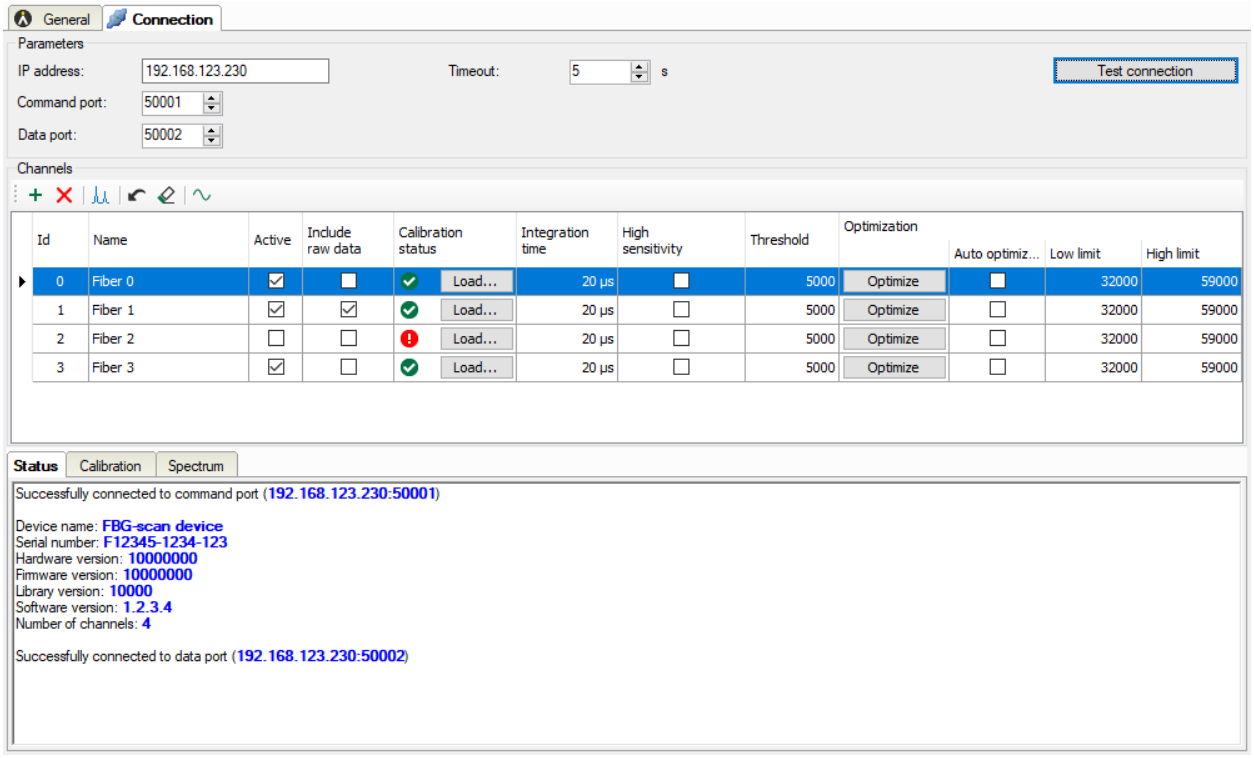


In the **General** tab of an FBGS Interrogator module, the basic module properties can be found alongside some FBGS-specific properties:

- **Read-only**: when enabled, ibaPDA will not overwrite any configuration parameters in the FBGS interrogator. It is the user's responsibility to configure the FBGS interrogator using another tool (e.g. the FBGS standard software) and to make sure the parameters in ibaPDA are up to date. By default, this option is disabled.
- **Scan rate**: the number of times per second the FBGS interrogator should sample the spectrum for each channel. The allowed range for this parameter is 1 Hz – 500 Hz. The default value is 10 Hz.



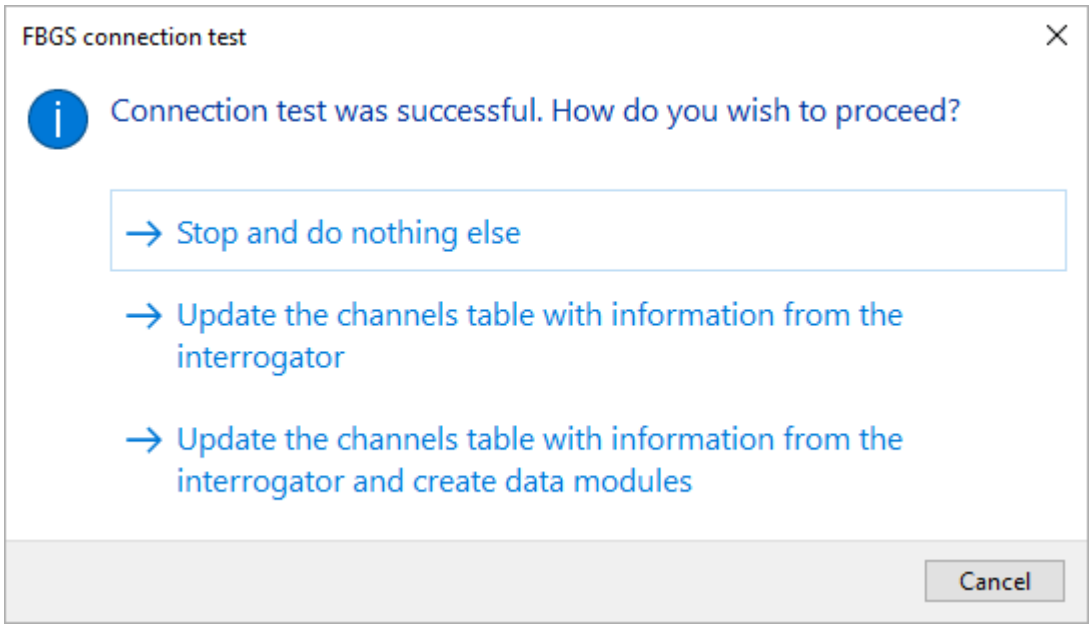
An FBGS Interrogator module by itself does not have any analog or digital signals; these are defined in the interrogator module's submodules or data modules. There are currently two types of FBGS data modules: raw data modules and temperature data modules (these will be explained further on in detail).



The bulk of the configuration parameters can be found under the **Connection** tab. The Connection tab is divided in three sections: a Parameters section, a Channels section, and a section to display the results of configuration operations.

In the **Parameters** section, the **IP address** (or hostname) of the FBGS interrogator should be configured. Should they differ from the default values, you can change the values for the **Command port** (default: 50001) and **Data port** (default: 50002) as well. The TCP/IP connection **Timeout** (default: 5 s) can be changed here as well.

When clicking the button **Test connection**, ibaPDA will attempt to establish a connection to the FBGS interrogator and display the results in the **Status** tab in the bottom section of the Connection tab. In case of a successful connection test, some information retrieved from the FBGS interrogator will be displayed (e.g. device name, serial number, …). A dialog will appear with the following options:



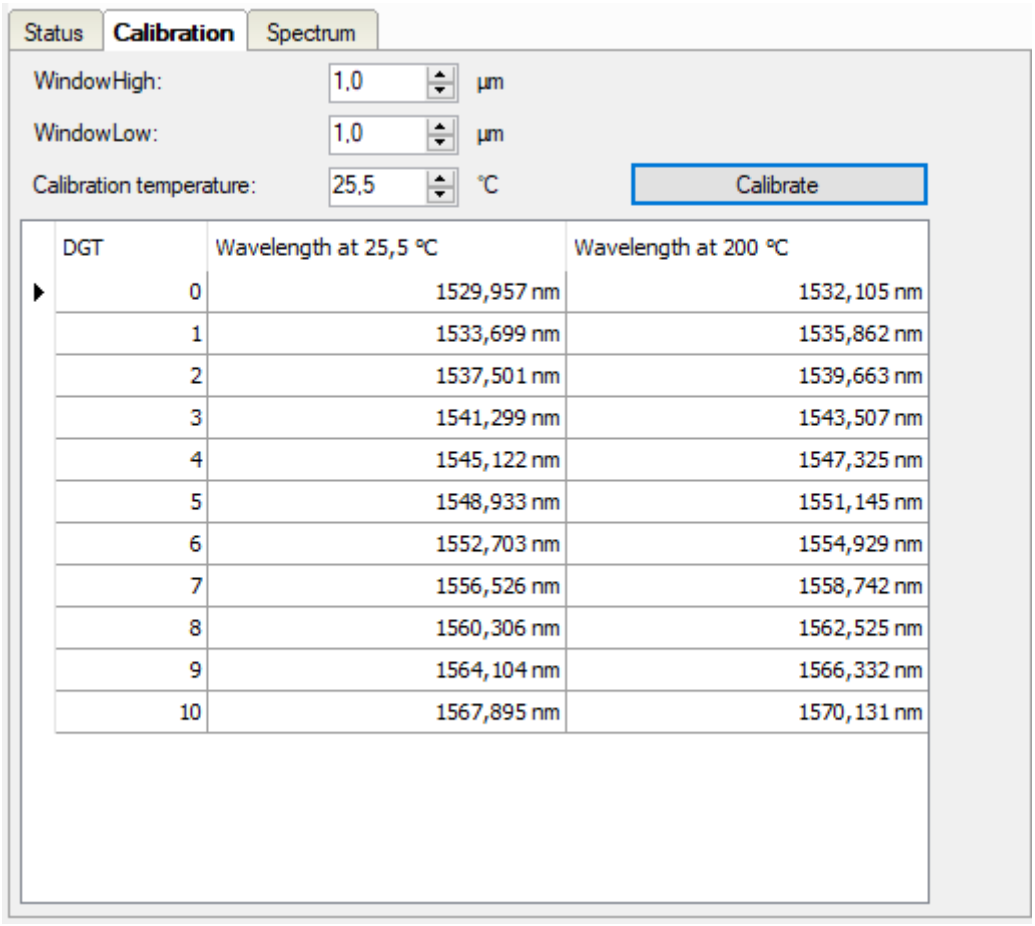
When selecting options 2 or 3, the table in the Channels section will be automatically updated using the information present in the FBGS interrogator. When selecting option 3, ibaPDA will, additionally, create data modules for the active channels.

In the **Channels** section, you can configure the different fibers/channels attached to the FBGS interrogator in the table. For each channel, the following parameters or actions are available:

- **Id**: a read-only index used to reference a channel in the FBGS interrogator module's data modules.
- **Name**: a human readable name used to identify the channel.
- **Active**: indicates whether data should be measured for this channel. When disabled, the FBGS interrogator will not send data for this channel and the corresponding data modules in ibaPDA will be disabled during I/O configuration validation or when generating the data modules manually.
- **Include raw data**: when enabled, ibaPDA will generate raw data modules during I/O configuration validation or when generating the data modules manually.
- **Calibration status**: ✅ indicates that calibration data has been loaded for this channel; ❗ indicates that no calibration data is currently available. By clicking the **Load…** button, you can load a calibration file for the selected channel.
- **Integration time***: the channel's integration time in µs.
- **High sensitivity***: when activated, the channel's high sensitivity mode will be enabled.
- **Threshold***: the channel's noise threshold level.
- **Optimize**: when clicking this button, the FBGS interrogator will optimize the **Integration time** and **Threshold** values and decide whether **High sensitivity** mode should be enabled or not. The resulting values are displayed in the channels table.
- **Auto optimization***: when enabled, the FBGS interrogator will automatically optimize its parameters during acquisition.

- **Low limit***: the low limit for the FBGS interrogator's optimization process
- **High limit***: the high limit for the FBGS interrogator's optimization process

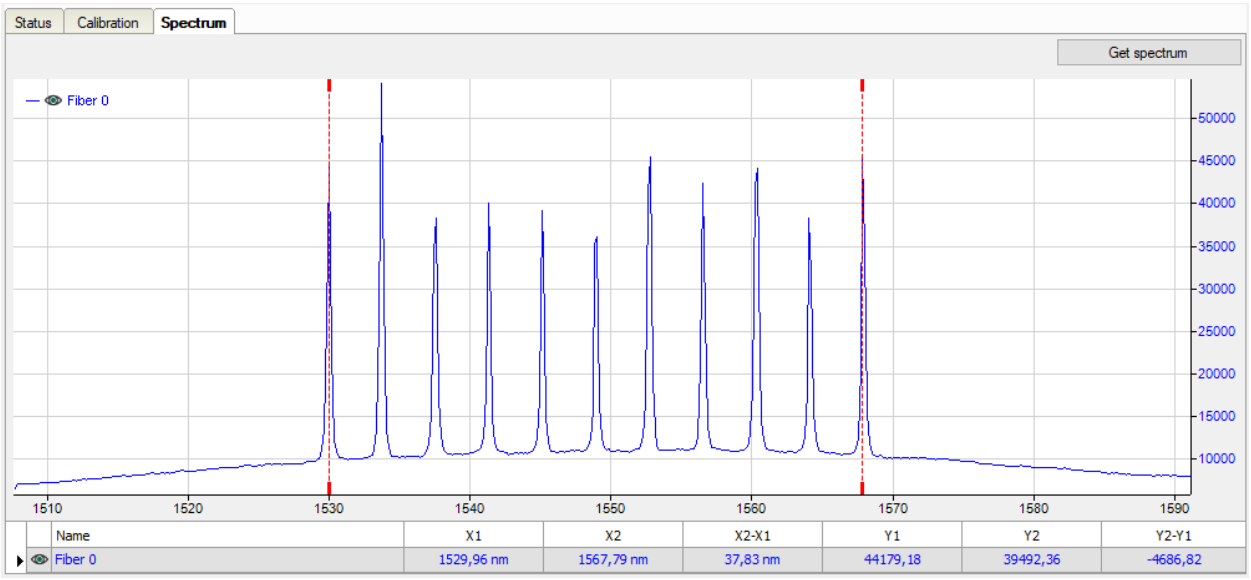
***** For more information, we refer to the FBGS interrogator's manual.



DGT	Wavelength at 25,5 °C	Wavelength at 200 °C
0	1529,957 nm	1532,105 nm
1	1533,699 nm	1535,862 nm
2	1537,501 nm	1539,663 nm
3	1541,299 nm	1543,507 nm
4	1545,122 nm	1547,325 nm
5	1548,933 nm	1551,145 nm
6	1552,703 nm	1554,929 nm
7	1556,526 nm	1558,742 nm
8	1560,306 nm	1562,525 nm
9	1564,104 nm	1566,332 nm
10	1567,895 nm	1570,131 nm

In case calibration data has been loaded for a channel, it can be viewed in the **Calibration** tab of the bottom section of the connection tab. The **WindowHigh** and **WindowLow** parameters used for the peak windowing process are displayed and can be adjusted here. You can also recalibrate the fiber at its low temperature point (the calibration data at the high temperature cannot be changed in ibaPDA). To do so, enter a new calibration temperature (if applicable) and click the **Calibrate** button. ibaPDA will retrieve the current peak wavelengths and use these new values when calculating the temperature values of temperature data modules.

Though the most convenient option is to let ibaPDA automatically add the channels after a connection test, there is also the possibility to manually add or remove channels using the + and ✕ buttons respectively.



For diagnostic purposes it is possible to retrieve the complete spectrum for each channel by clicking the button. The spectrum will be displayed in the **Spectrum** tab of the lower section of the Connection tab. It is possible to zoom in/out and move the markers (similar to a paused trend graph in ibaPDA). In the Spectrum tab it is also possible to refresh the spectrum using the **Get spectrum** button (which does the same as clicking the button in the toolbar).

By clicking the button, you can revert a channel's calibration data at its low temperature (which could have been updated by recalibrating the fiber in ibaPDA) to the calibration data loaded from the original calibration file. The button can be used to clear all calibration data for a channel; the channel will go to an uncalibrated state.

You can generate the FBGS interrogator module's data modules by clicking the button. This will add new or update existing modules and set their enabled state based on the channel's Active property.

3.2.1 Raw data module

General | Analog

	Name	Unit	Gain	Offset	Active
0	Raw wavelength 0	nm	1	0	☑
1	Raw wavelength 1	nm	1	0	☑
2	Raw wavelength 2	nm	1	0	☑
3	Raw wavelength 3	nm	1	0	☑
4	Raw wavelength 4	nm	1	0	☑
5	Raw wavelength 5	nm	1	0	☑
6	Raw wavelength 6	nm	1	0	☑
7	Raw wavelength 7	nm	1	0	☑
8	Raw peak power 0		1	0	☑
9	Raw peak power 1		1	0	☑
10	Raw peak power 2		1	0	☑
11	Raw peak power 3		1	0	☑
12	Raw peak power 4		1	0	☑
13	Raw peak power 5		1	0	☑
14	Raw peak power 6		1	0	☑
15	Raw peak power 7		1	0	☑

A raw data module simply lists all peak wavelengths and all corresponding peak powers. The analog signal list is automatically generated based on the **Channel index**, which is configured in the data module's **General** tab. In the category **Basic** there is also the option **Prefix channel index to module name**. This makes it easier to distinguish between the data modules of different channels.

If calibration data has been loaded for the specified channel index, ibaPDA will generate a list of 4 x the number of peaks in the calibration file. The first half of signals corresponds to the peak wavelength values, while the second half of signal corresponds to the peak power values. Signals are generated for double the number of peaks in the calibration file to allow for monitoring peak splitting. In the highly unlikely case, where each peak is split in two, all peaks can still be tracked. Under normal operation, half of the signals will show no valid value (i.e. the number of measured peaks equals the number of peaks in the calibration file).

3.2.2 Temperature data module

General | Analog | Digital

	Name	Unit	Gain	Offset	Active
0	Wavelength 0	nm	1	0	☑
1	Wavelength 1	nm	1	0	☑
2	Wavelength 2	nm	1	0	☑
3	Wavelength 3	nm	1	0	☑
4	Peak power 0		1	0	☑
5	Peak power 1		1	0	☑
6	Peak power 2		1	0	☑
7	Peak power 3		1	0	☑
8	Temperature 0	°C	1	0	☑
9	Temperature 1	°C	1	0	☑
10	Temperature 2	°C	1	0	☑
11	Temperature 3	°C	1	0	☑

As is the case for the raw data module, the analog signal list is also automatically generated based on the **Channel index** (again to be configured in the data module's **General** tab). The option **Prefix channel index to module name** is available here as well.

ibaPDA will create the following list of signals: n x peak wavelength, n x peak power, n x temperature; where n is the number of peaks in the calibration file. In the **General** tab, you can also configure the **Temperature unit** (°C or °F) of the temperature signals.

General | Analog | Digital

	Name	Active
0	Connected	☑
1	Number of peaks conflict	☑
2	Max peak intensity > 90%	☑
3	Min peak intensity < 4/3 noise threshold	☑
4	Peak separation < 0.8 nm	☑

The temperature data module also contains some digital signals:

- **Connected**: indicates whether the connection to the FBGS interrogator is active
- **Number of peaks conflict**: when 1, the number of measured peaks does not match the number of peaks in the calibration file
- **Max peak intensity > 90%**: indicates whether there is at least one peak for which the intensity is 90% of the saturation intensity. If this is the case, the integration time needs to be lowered or high sensitivity mode should be disabled.
- **Min peak intensity < 4/3 noise threshold**: when 1, there is at least one peak with an intensity smaller than 4/3 of the noise threshold. If cleaning the fiber(s) does not resolve the issue, try increasing the integration time or lowering the noise threshold
- **Peak separation < 0.8 nm**: indicates whether the separation between two adjacent peaks is smaller than 0.8 nm. In this case, faulty measurements can occur.

3.3 Diagnostics modules

General | Analog | Digital

	Name	Unit	Gain	Offset	Active	Actual
0	Received spectra		1	0	☑	105
1	Invalid data points		1	0	☑	0
2	Error counter		1	0	☑	0
3	Update time (configured)	ms	1	0	☑	100 ms
4	Response time (actual)	ms	1	0	☑	110,741 ms
5	Response time (average)	ms	1	0	☑	100,246 ms
6	Response time (min)	ms	1	0	☑	40,5514 ms
7	Response time (max)	ms	1	0	☑	156,23 ms

All data displayed in the interface's connection table can also be measured as signals by adding a diagnostics module linked to an FBGS interrogator module. Two extra signals which are not shown in the connection table are available:

- **Invalid data points**: this is the number of received data points for which no channel is configured. This signal should normally be 0.
- **Update time (configured)**: the period corresponding to the configured scan rate of the FBGS interrogator. The signal value is set once and remains fixed throughout the acquisition.

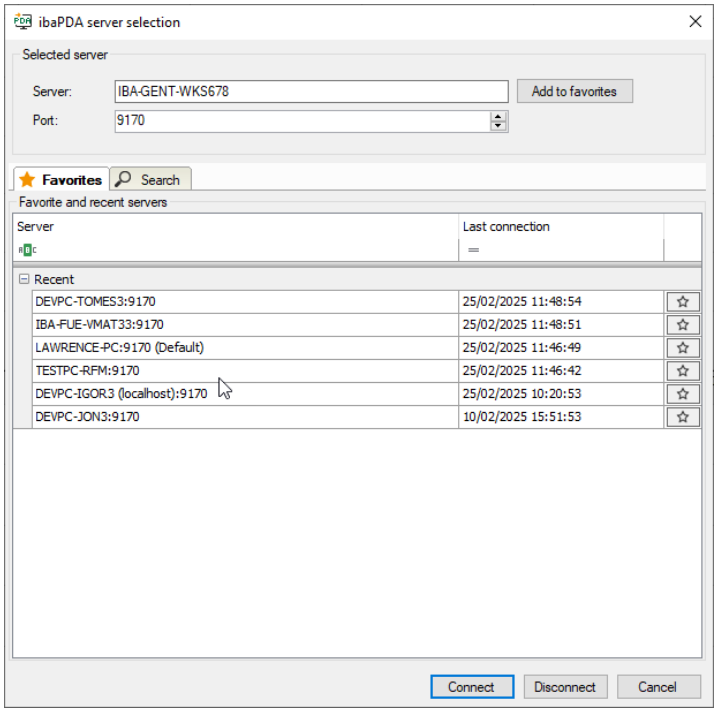
4 Server connection and store selection

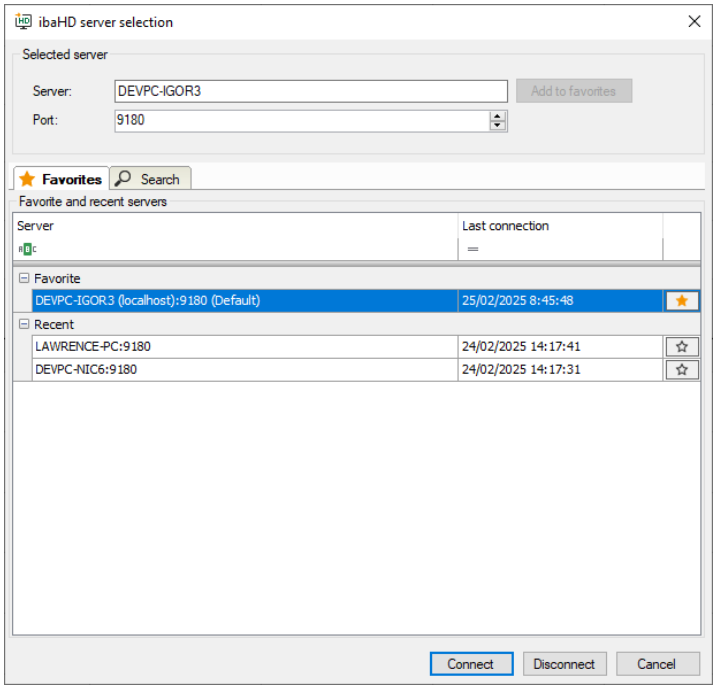
4.1 Server connection dialogs

The ibaPDA and ibaHD server selection dialogs have been updated. Both dialogs now look the same and have the same functionalities. The concept of **favorites** was introduced. That means that certain servers can be marked as favorite, making it very easy to connect to them.

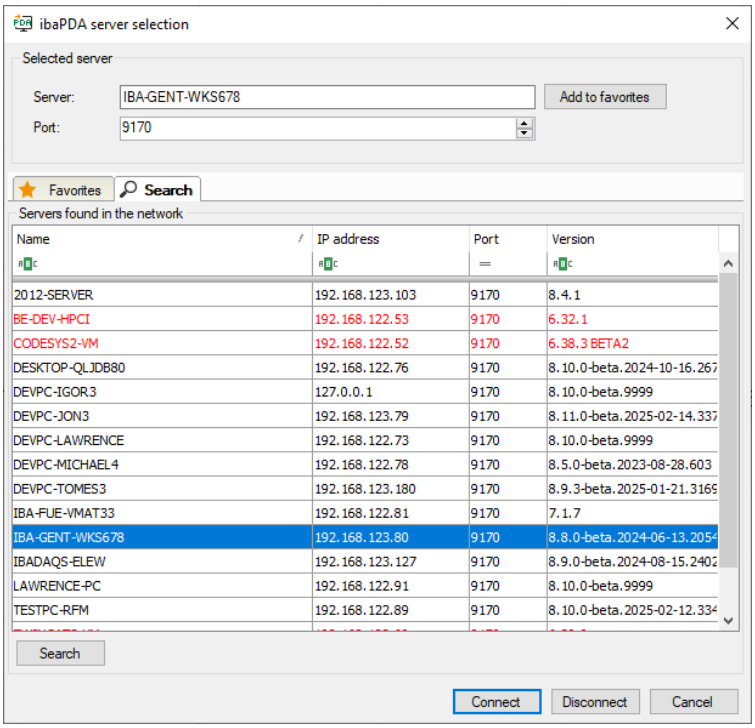
The dialog consists of two tabs:

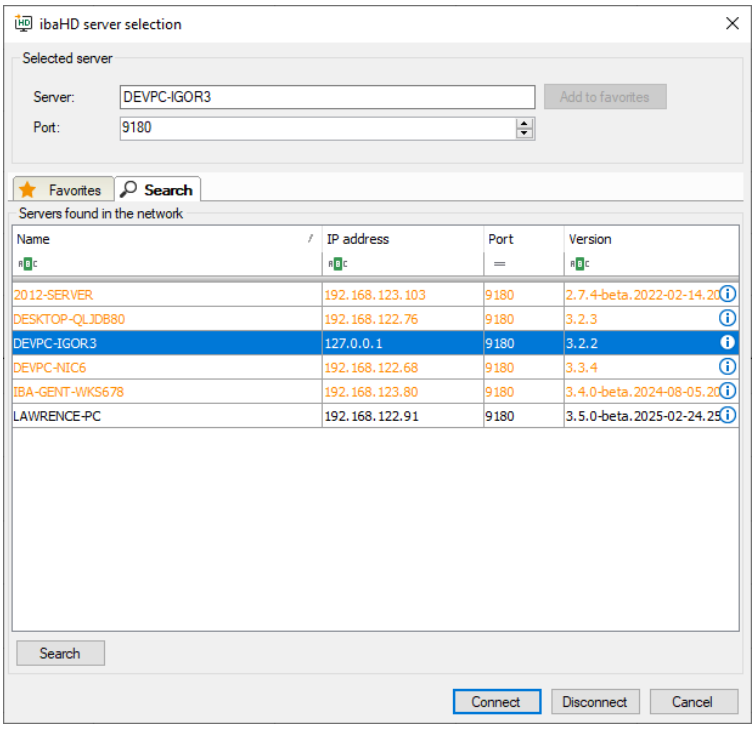
- In the first tab named “Favorites”, not only the favorite servers are visible, but also the servers the client was connected to in the past. The **10 most recent servers** are remembered.





- In the second tab named “Search”, all servers that are discovered in the network are displayed. The search is triggered automatically if you open the dialog and can be retriggered by pressing the “Search” button. The search takes 3 seconds.





There are several ways to mark a server as favorite:

- Click on the yellow star on the right, in the table on the favorites tab.
- Click the “Add to favorites” button in the search tab, to add the selected server.
- Use the context menu, in the table on the search tab.

You can only mark a server as favorite, if it is not marked as favorite yet. The favorites are remembered even if you close the dialog with cancel.

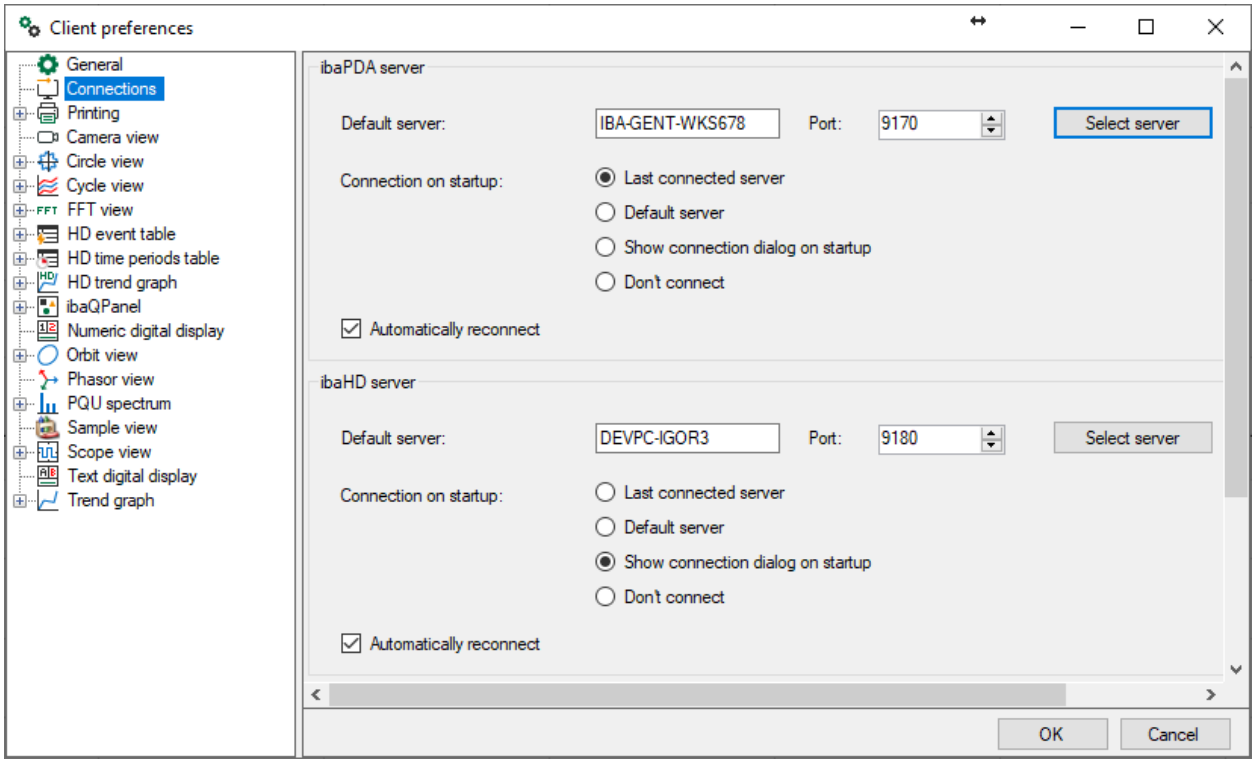
You can select a server by clicking the “Connect” button, but also by double clicking a server in one of the tables. You can also disconnect by pressing the “Disconnect” button. This will disconnect, set the last connected server to an empty server and the system will not try to reconnect automatically.

The **text color of the servers** in the table on the search tab has a specific meaning:

- Black: Connecting to this server is possible.
- Orange: The server version does not support all the features required by the client. However, connecting to it is still possible.
- Red: Connecting to this server is not possible, e.g. when the server version is too old. For instance, it is not possible to connect to ibaPDA servers prior to version 7.0.1.
- Blue: The client version is incompatible with this server, but it is possible to update the client to the same version as the server. So, connecting is possible, at least if you allow the system to install the corresponding version of the client.

4.2 Server connection settings

You can open the client preferences via the Configure menu. In the client preferences there is a node named “Connections”.



In this node you can configure:

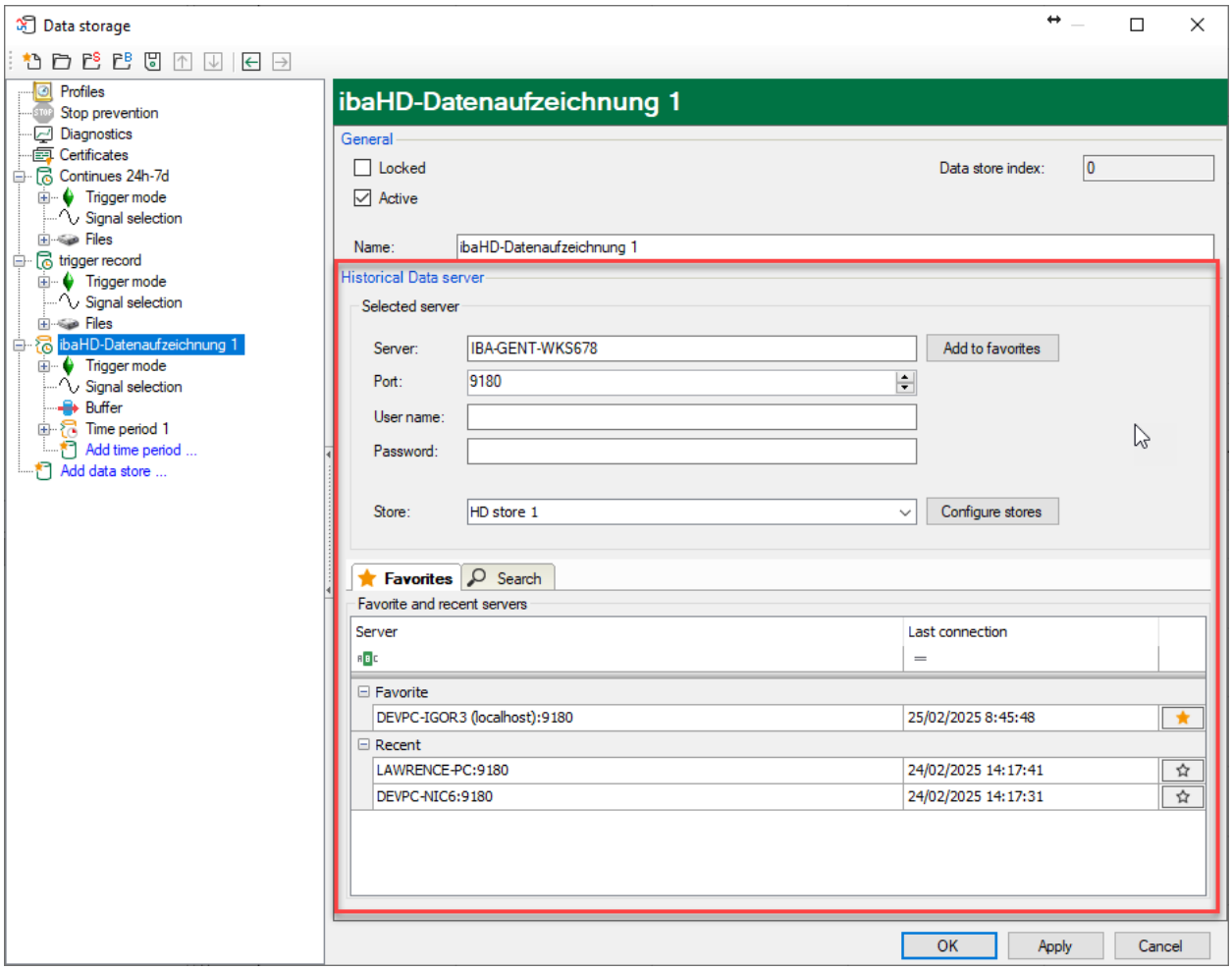
- The default server: For ibaPDA, by default, this is the name of the local machine.
- The behavior when ibaPDA started. There are 4 options:
  - Last connected server: The server ibaPDA was connected to the last time the client was closed.
  - Default server

  - Show connection dialog on startup
  - Don’t connect
- The behavior when ibaPDA cannot establish the configured connection or when the connection is lost. If “Automatically reconnect” is enabled, it will try to (re)connect periodically in the background.

These settings can be configured independently for the connection with the ibaPDA server and the ibaHD server.

4.3 Store selection

The control to select a store from an ibaHD server was also updated and has the same look and feel as the server connection dialogs. The content of the favorites tab and the search tab are identical to that of the server connection dialogs.



The workflow is as follows:

- Firstly, you must select a server and, if user management is active, enter the username and password so the system can login onto the server.
- Secondly, you can choose the store from the store dropdown.

You can also configure the stores of the server by clicking the “Configure stores” button once the server is chosen/entered.