ibaHD-Server

Historical Data Server

Manual

Issue 3.6

Measurement Systems for Industry and Energy

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Version	Date	Revision	Author	Version SW
3.6	04-2026	Server access control, store migration, system information, extension HD store view, disabling of sending e-mails, user rights, option for blob storage	nm	3.6.1

Contents

1 About this documentation

This documentation describes the application of the software *ibaHD-Server*. It has to be considered as documentation being complementary to the *ibaPDA* manual. Therefore many *ibaPDA* basic functions which are also used by *ibaHD-Server*, will not be explained here. If information is required we refer to the *ibaPDA* manual or the online help.

1.1 Target group and previous knowledge

This documentation addresses qualified professionals, who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as trained specialist personnel if they are capable of assessing the work assigned to them and identifying possible risks based on their specialist training, knowledge, experience and awareness of the applicable regulations.

This documentation addresses especially persons, who deal with the capturing and storage of measuring data. For the handling of *ibaHD-Server* the following basic knowledge is required and/or useful:

- Basic knowledge of *ibaPDA*
- Basic knowledge of *ibaAnalyzer*

1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu *Logic diagram*
Calling the menu command	*Step 1 – Step 2 – Step 3 – Step x* Example: Select the menu *Logic diagram – Add – New function block*.
Keys	<Key name> Example: <Alt>; <F1>
Press the keys simultaneously	<Key name> + <Key name> Example: <Alt> + <Ctrl>
Buttons	<Key name> Example: <OK>; <Cancel>
Filenames, paths	`Filename`, `Path` Example: `Test.docx`

1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

Danger!

The non-observance of this safety information may result in an imminent risk of death or severe injury!

Observe the specified measures.

Warning!

The non-observance of this safety information may result in a potential risk of death or severe injury!

Observe the specified measures.

Caution!

The non-observance of this safety information may result in a potential risk of injury or material damage!

Observe the specified measures.

Note

A note specifies special requirements or actions to be observed.

Tip

Tip or example as a helpful note or insider tip to make the work a little bit easier.

Other documentation

Reference to additional documentation or further reading.

2 About ibaHD-Server

With the software *ibaHD-Server* (Historical Data Server), measured data and events acquired in *ibaPDA* can be recorded continuously over long periods of time and then displayed again continuously.

The HD views offer comfortable display functions of the historical data like zoom and scroll, the tabular display of events and jumping to any date or event.

For further analysis, historical data can also be read out with *ibaAnalyzer* from *ibaHD-Server* using configured queries, analyzed and - if required - converted into classic measurement files.

ibaDatCoordinator can be used to automate the post-processing of time-based and event-based HD data, e.g. for cyclically scheduled or event-driven reporting tasks. Further information can be found in the documentation for *ibaDatCoordinator*.

The functions of ibaHD-Server and HD client at a glance

- Continuous recording of measured data and events over a long period of time
- Time-based (default) as well as length-based recording of measured data
- Direct access to the historical data out of *ibaPDA* client
- Intuitive operation for visualization of historical data like scrolling or jumping to a date or event
- Quick zoom function from the annual, monthly or weekly overview down to the range of milliseconds
- Presentation of the latest together with historical data in one application
- Recording of non-equidistant signals together with equidistant signals in one file
- Definition of any number of events out of the stored signals
- Definition of free message texts together with the use of the stored signals as dynamic attributes
- Display of events in form of lists with filter function and query assistant
- Support of "offline events", which can be generated by *ibaDatCoordinator*
- Recording of measurement data along with additional information in defined time periods enables fast analysis of shifts, process steps, etc.
- Easy configuration with the usual *ibaPDA* user interface
- An *ibaHD-Server* can be used for several HD data stores via various *ibaPDA* systems
- Further analyses with *ibaAnalyzer*
- Access for one or multiple external clients to time- and event-based HD data via the *ibaHD-Server-API-Read* interface based on gRPC technology

2.1 Licenses

The basic licenses are scaled according to the number of signals, and contain an *ibaHD-Server*, two HD data stores (to be used on each existing *ibaPDA* system in the network) and two HD clients. One time period can be used with the basic license. A separate license is required for the definition of further time periods. One license allows to define 2 time periods. 128 time periods can be defined with the *ibaHD-Server Ultra Time Period Store* license.

Please note that the number of tags that can be stored per HD store is limited to 65534 tags. The number of tags equals the total number of signals and/or events for all HD data stores of an HD server. Therefore, a logged analog or digital signal is equivalent to a logged event.

The HD stores of the basic license can be used for time or length based data and events.

For a further extension, licenses are available for further HD data stores and further HD clients which allow the access from several *ibaPDA* clients to the historical data of an *ibaHD-Server*. For every workstation which has to display historical data, an HD client license and the *ibaPDA* client software are necessary.

For displaying merely HD data the *ibaPDA* client needs only to be connected with the *ibaHD-Server.* A connection with an *ibaPDA* server is not required. For access via the ibaHD-API interface, the *ibaHD-Server-API-Read* license is required.

The following licenses are available:

Order no.	Product name	Description
30.800064	ibaHD-Server-64	Basic license *ibaHD-Server* function for 64 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.800128	ibaHD-Server-128	Basic license *ibaHD-Server* function for 128 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.800256	ibaHD-Server-256	Basic license *ibaHD-Server* function for 256 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.800512	ibaHD-Server-512	Basic license *ibaHD-Server* function for 512 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.801024	ibaHD-Server-1024	Basic license *ibaHD-Server* function for 1024 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.802048	ibaHD-Server-2048	Basic license *ibaHD-Server* function for 2048 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.804096	ibaHD-Server-4096	Basic license *ibaHD-Server* function for 4096 tags, incl. 2 HD clients, 2 HD stores and 1 time period

Order no.	Product name	Description
30.808192	ibaHD-Server-8192	Basic license *ibaHD-Server* function for 8192 tags, incl. 2 HD clients, 2 HD stores and 1 time period
30.806666	ibaHD-Server-unlimited	Basic license *ibaHD-Server* function for unlimited tags, incl. 2 HD clients, 2 HD stores (limited to 65534 tags per HD store) and 1 time period
30.800003	ibaHD-Server-One-Store	License extension by another HD store (only with WIBU dongle)
30.800004	ibaHD-Server-Two-Stores	License extension by 2 additional HD data stores
30.800005	ibaHD-Server-Client	License extension by another HD client
30.800006	ibaHD-Server-Multi Client	License extension by 5 additional HD clients
30.800007	ibaHD-Server-OPC-UA-Server+	License extension for extended OPC UA server functions
30.800010	ibaHD-Server Time Period	License extension for the definition of 2 time periods
30.800011	ibaHD-Server Ultra Time Period Store	License extension for the definition of 128 time periods per HD store
30.820001	Upgrade-HD-Server-64 to 128	Increase of the number of tags from 64 to 128
30.820002	Upgrade-HD-Server-128 to 256	Increase of the number of tags from 128 to 256
30.820003	Upgrade-HD-Server-256 to 512	Increase of the number of tags from 256 to 512
30.820004	Upgrade-HD-Server-512 to 1024	Increase of the number of tags from 512 to 1024
30.820005	Upgrade-HD-Server-1024 to 2048	Increase of the number of tags from 1024 to 2048
30.820006	Upgrade-HD-Server-2048 to 4096	Increase of the number of tags from 2048 to 4096
30.820007	Upgrade-HD-Server-4096 to 8192	Increase of the number of tags from 4096 to 8192
30.820008	Upgrade-HD-Server-8192 to unlimited	Increase of the number of tags from 8192 to unlimited
30.800001	ibaHD-Server-API-Read	gRPC-API interface to query saved signals and events from existing HD stores

The licenses purchased are unlocked via a dongle which has to be plugged on the *ibaHD-Server* computer. As of ibaHD-Server v3.0.0, the licenses can also be stored in license containers from Wibu-Systems. Two types of license containers are supported:

- CmStick: USB-dongle
- CmActLicense: Soft license

To use WIBU licenses, the CodeMeter runtime environment must be installed. This is automatically installed during the installation of *ibaHD-Server.*

Other documentation

Further information on activating, updating and managing WIBU licenses can be found in the iba documentation for CodeMeter.

The HD client licenses are neutrally distributed to any *ibaPDA* client that tries to connect to the *ibaHD-Server*. If all HD client licenses are in use then the HD connection on one client should be closed before another client can obtain HD data access.

Note

The licensed HD stores can be used for time-, length- or event-based data stores. A separate license is required for a time period store.

Note

If *ibaPDA* and *ibaHD-Server* are installed on the same computer, the ibaHD licenses and the *ibaPDA* licenses are on the same Dongle or soft license.

If *ibaPDA* and the *ibaHD-Server* are installed on different computers, separate dongles or soft licenses are necessary for *ibaPDA* and *ibaHD-Server* for the corresponding licenses.

2.2 Upgrade policy

If you want to expand the number of signals, clients, HD stores, or the API interface, you can purchase upgrades. An overview of the available licenses can be found in chapter ↗ *Licenses, page 12*.

2.3 Update policy

For the software *ibaHD-Server* our conditions for software maintenance and support apply:

In the first two years after purchasing the software, you can use the software maintenance and support services free of charge. After that, a maintenance contract with an annual fee is required.

Once a licensed software has been purchased it can be used thoroughly and independently from the software maintenance and support services!

Just the update of the used software towards a newer version is unacceptable without maintenance service fee.

If and to what extend the license extensions of your system affect the maintenance service fee can be learned usually from our offers.

Alternatively, you can contact our service and support team.

You can check the validity period for free updates and support services of your license wherever the license information for your dongle is displayed:

- ibaHD Manager: *General* tab – *License* area
- ibaDongle-Viewer

EUP date
The "EUP date" is set with the purchase of an applicable software license (purchase date + 2 years) and is adjusted with each extension of the update period (maintenance contract). It determines the end of the free update period. All major versions of software that were and will be released before this EUP date can still be installed, including the associated bugfix versions. It is not the time of installation that is relevant but the release date of the software version.

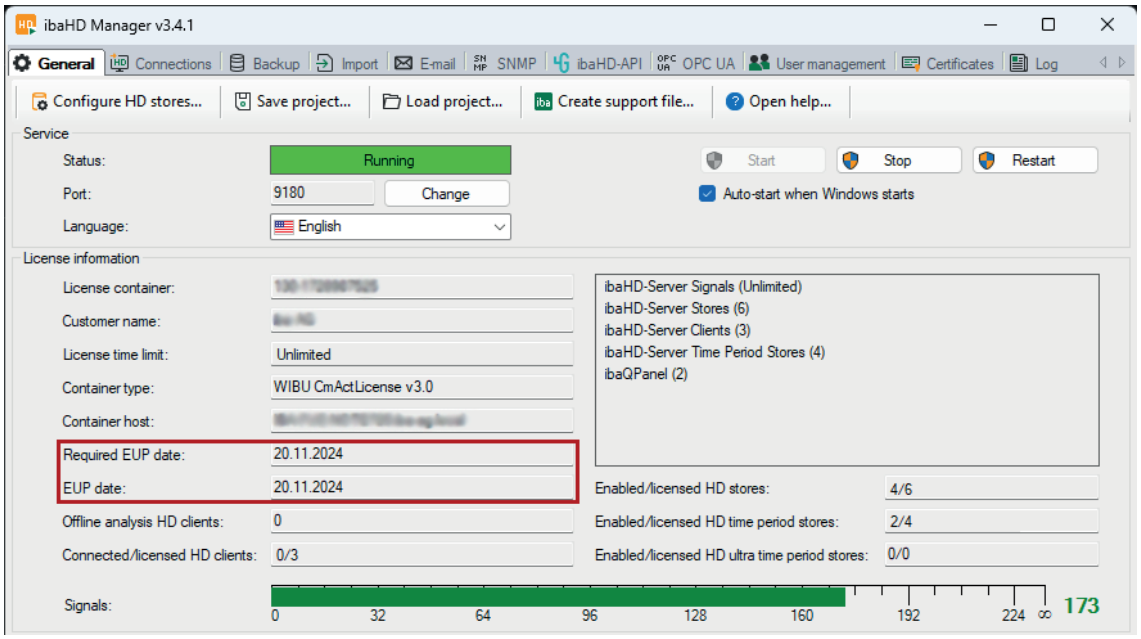
This means that you can still install updates after the EUP date, as long as they are versions that were released before the EUP date.

Required EUP date
To control the installation process, there is the "Required EUP date", which is permanently set in the software. This date practically corresponds to the production or release date of a major version of the software. The "required EUP date" is only visible in the software's own dialogs (*ibaPDA*, *ibaHD-Server*, *ibaCapture*), not in the ibaDongle-Viewer.

During installation, the "Required EUP date" is used to check whether the installation is still permitted by comparing it with the stored "EUP date".

If the "Required EUP date" is before the "EUP date", an update can be carried out and you can continue to use the support.

If the "Required EUP date" is after the "EUP date", then the software version in question has been released outside your update period and must not be installed. You will be informed of this in the installation wizard. In this case, cancel the installation and contact iba support.



During the installation of *ibaHD-Server*, you have the option to search for existing license updates in the installation wizard (step "EUP information"). This makes your work easier if you already have an upgrade.

2.4 Notes on updating to ibaHD-Server 2.4.x or higher

If you update from a version < v2.4.0 to a version ≥ v2.4.0, please note that the internal structure of the event store in *ibaHD-Server* will be converted automatically and permanently during installation.

For the purpose of a fallback you should perform a full backup of the existing event stores and the *ibaHD-Server* configuration files prior to installation. See ↗ *Backup, page 55*.

3 Installation and program start

3.1 System requirements

Please note the following requirements for the use of *ibaHD-Server*.

Software for acquisition and recording

- *ibaPDA* v8.4.0 or higher
- Operating system Windows 10 (x86/x64), Windows 11 (x64), Windows Server 2016 (x64), Windows Server 2019 (x64), Windows Server 2022 (x64) or Windows Server 2025 (x64).
- .NET-Framework 4.8 or higher

Other software components

In order to take advantage of all features of *ibaHD-Server* v2.6 or higher, particularly the feature of offline events, the following versions of other software components involved are highly recommended.

- *ibaHD-Manager* v2.6.0 or higher
- *ibaPDA* client v7.3.0 or higher
- *ibaDatCoordinator* v2.4.0 or higher
- *ibaAnalyzer* v7.3.0 or higher

Note

A combined usage of lower version software components than listed above together with the offline event feature may result in data loss in the worst case.

Note

iba software products are developed and carefully tested according to the current rules of technology. iba products generally run without problems on supported computers that fulfill the system requirements specified in the documentation.

In very rare cases, software products from other manufacturers may interfere with the operation of iba products (e.g. starting a service). Known cases were related to special IT monitoring and security software, such as virus and network scanners.

If you have problems with the start of iba products, please check the necessity and setting options of other installed programs or contact our support.

Hardware

- Computer equipment according to the requirements of the recording (number of the measuring channels, sampling cycle, volume of the archive)

Tip

The following example gives an approximate value of the memory requirements:

Recording of 64 analog signals at a time base of 1 ms in continuous operation 24/7, HD recording period 2 years

=> Hard disk memory requirement approx. 15.5 TB

Recommendations for operating ibaHD-Server on physical servers or virtual machines

General requirements

- Operating system: Windows ≥ 10 or Windows Server ≥ 2016
- Processor: 2 core + 1 core per data store; > 2 GHz
- RAM: min. 8 GB + 2 GB per data store
- Intermediate storage: Always flash on local computer; no network storage. For examples of recommended size of the intermediate storage, see the section ↗ *Size of the intermediate store, page 253*.
- HD store: Preferred flash memory, local or network drive in RAID
- Disk capacity: depends on the number of signals and storage duration[1)]

Maximum ibaHD-Server configuration

(Recommendation for one *ibaHD-Server* computer)

- HD recording: max. 32 HD stores
- Total number of signals: max 32,000 signals (all combinations of analog and digital signals, except events)
- Number of signals per time-based HD store: max 16,000 signals (all combinations of analog and digital signals)
- Number of events per event-based HD store: max 16,000 events
- Number of signals per alarm and event store: max 100,000 signals

Configuration examples

Configuration example	Common storage size
Use case 1	
1 time-based HD store, 1000 signals	50 GB

[1)] The specified sizes of the hard disk storage are net figures. The actual storage systems should have larger capacity to avoid performance loss due to internal organization processes.

Configuration example	Common storage size
Use case 2	
2 time-based HD store, 15,000 signals	2 × 100 GB
+ 3 time-based HD store, together 2000 signals	3 × 50 GB
+ 1 event-based HD store	50 GB
	Σ 400 GB

3.2 Installation

Please install the *ibaHD-Server* software on the computer on which the HD files are to be stored. Make sure that the computer has sufficient disk space. Of course, data can also be stored on a network drive, which can be accessed via the computer.

If you have a ZIP file of the new software version (e.g., after a download), unzip it into a (temporary) folder of your choice.

You find the file in the `…\01_iba_Software\ibaHD-Server` directory of the "iba Software & Manuals" data medium.

1. Close the *ibaPDA* client and other Windows programs.
2. Click on the `ibaHdSetup_vx.y.z.exe` file and follow the instructions in the installation manager.

Note

At the start of the installation process, you can open the version history with the *View version history* link. Read through the information about the changes and system requirements. Ensure that the new software version meets your project requirements, as it may not be possible to downgrade later.

3. Accept the license agreement.
4. Check your license information, if necessary.
5. Select the installation directory.
6. Select the user account (optional).
   - Local system account (default)
     This account is sufficient if the server process works only on the local computer and does not need any other special user-related rights.
   - Custom user
     Select this option if the server process requires other special user-specific rights. The user account entered here must have these rights (Windows User Management).
7. Start the installation process with <Install>.

8. Select whether you want to start the ibaHD Manager and finish the installation with <Finish>.

Note

During the installation, it is also checked whether the installation is effected within the update period specified in the dongle. If this is not the case, a message appears in which informs you about the option to purchase an extended update period (EUP) or maintenance contract.

Firewall settings
All necessary exceptions in the firewall settings are automatically carried out by the installation program. Further settings are not necessary.

3.2.1 Installation using the command line

Installation of *ibaHD-Server* can also be started using a command line. This is useful with central software administration or when using deployment systems.

You use the command line switches placed after the call for the installation program to control how the installation is to be carried out.

Notation: `ibaHdSetup_vx.y.z.exe [/SILENT /SUPPRESSMSGBOXES] [/LANG="xx"]`

Installation in silent mode
With the command line switch “/SILENT”, the installation routine runs in what is known as “silent mode”, which means that there is no user interaction, i.e. no clicking the <Next> button in the Installation Wizard.

The additional command line switch “/SUPPRESSMSGBOXES” prevents the installation window being displayed.

Installation in complete silent mode
`ibaHdSetup_vx.y.z.exe /SILENT /SUPPRESSMSGBOXES`

Installation wizard language setting
You can use the command line switch ‘/LANG=”xx”’ to change the language of the installation wizard. You can select the following languages: "en","de","es","fr","it","pt","ru","zhHans" .

Example
`ibaHdSetup_vx.y.z.exe /LANG="en"`

3.3 Start program

Start the *ibaHD-Server*, *ibaPDA* client and HD client one after the other. Proceed as follows:

Start ibaHD-Server

ibaHD-Server is installed as a service under Windows so that it is started automatically after installation or after every system start. After installation, the *ibaHD-Server* icon appears in the system tray.

	The green arrow indicates that the server service is running (*ibaHD-Server online*). Double-click on this icon to start the *ibaHD Manager* application to operate the server.
	A red square indicates that the *ibaHD-Server* service is running but is not yet ready to receive data. This state usually occurs temporarily during stopping or restarting the service.
	A gray circle indicates that the *ibaHD-Server* service is not running (*ibaHD-Server offline*).

Note

If the tray icon for *ibaHD-Server* is not visible, restart ibaHD Manager under Windows to start the *ibaHD-Server* service.

Start ibaPDA-Server

The *ibaPDA* server and the *ibaHD-Server* must be running simultaneously in order to be able to carry out HD data recording or to access the current data of a running *ibaPDA* system, as the *ibaHD-Server* is supplied with data by the *ibaPDA* server. Normally, the *ibaPDA* server is started automatically with Windows. The *ibaPDA* server icon appears in the Windows system tray. If an HD data storage is only to be shown, only a connection of the client to the HD server is required.

	*ibaPDA* server service and data acquisition are running.
	*ibaPDA* server service is running, data acquisition is stopped.
	*ibaPDA* server service is not running. A double-click on this icon opens the *ibaPDA* server status application to start the service.

Table 1: Taskbar icons

If you want to display HD signals only or if you just want to access an HD data store, you only need to connect the *ibaPDA* client with the *ibaHD-Server.* On the computer in question you only need to install the *ibaPDA* client. The *ibaPDA* server does not need to be installed or running on this computer.

Start client

The HD client is integrated in the *ibaPDA* client. Start *ibaPDA* client as usual.

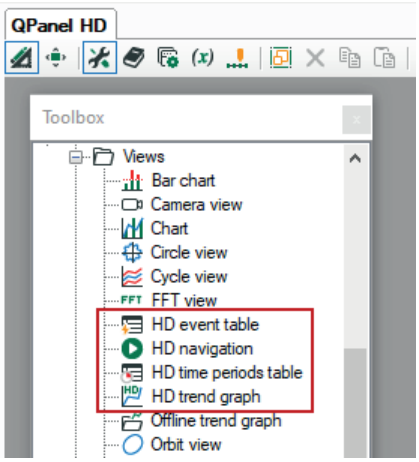
Different icons are now available in the *ibaPDA* client for connecting *ibaHD-Server* and for displaying the historical data:

	Selecting the *ibaHD-Server*
	Add a HD trend graph for displaying time-based historical data
	Add an HD event table for displaying event-based historical data
	Add a HD time periods table for displaying historical time periods

You can find additional information on how to view historical data in the *ibaPDA* client in the chapter ↗ *HD views in ibaPDA, page 161*.

Another way to display HD data in the *ibaPDA* client is offered by the add-on *ibaQPanel*.

HD trend graphs and HD event tables can be configured in a *ibaQPanel* pane, too.



You will find more information about displaying of HD data in *ibaQPanel* in the chapter ↗ *ibaHD-Server in ibaQPanel, page 206*.

4 System overview

4.1 Architecture and functional principle

The software *ibaHD-Server* is divided in a client and a server component. The server component runs as a service under Windows on an *ibaPDA* computer as well as on a separate server computer in the network.

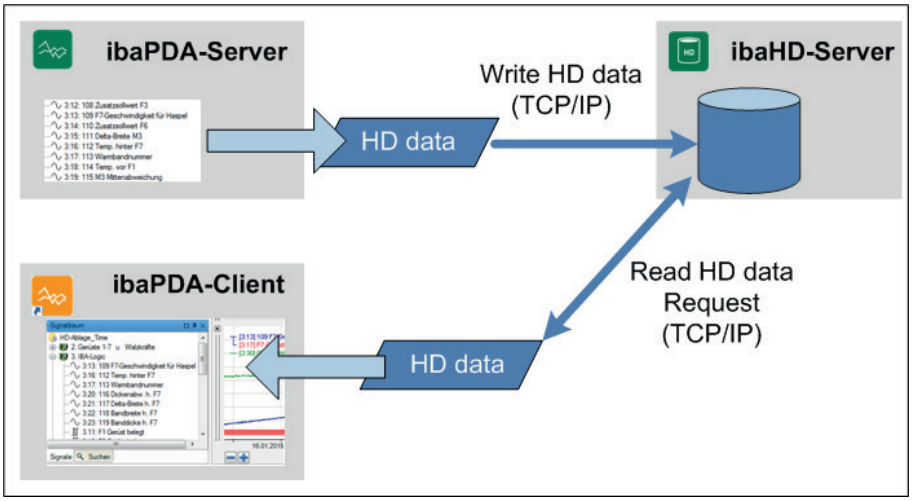
Note

Considering the large data volume which will be stored over the years, we recommend the use of a separate computer for *ibaHD-Server* with the correspondent hard disk capacity.

ibaPDA (server) continuously provides *ibaHD-Server* with measured data which is stored over weeks, months or years in a special file structure. The data is organized and stored in so-called HD stores on *ibaHD-Server*. The term HD store designates the physical (hard disk) storage area which is sized and reserved for an HD data store.

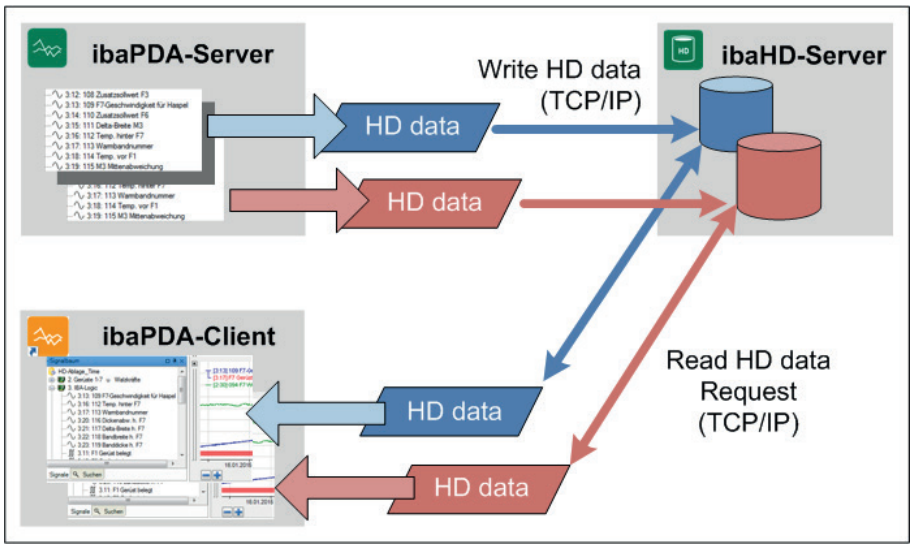
Different types of HD stores exist depending on whether signals (time- or length-based) or events shall be stored.

Together with the HD data store in *ibaPDA*, an assignment is established between the signals or events to be recorded and the HD store (file location).

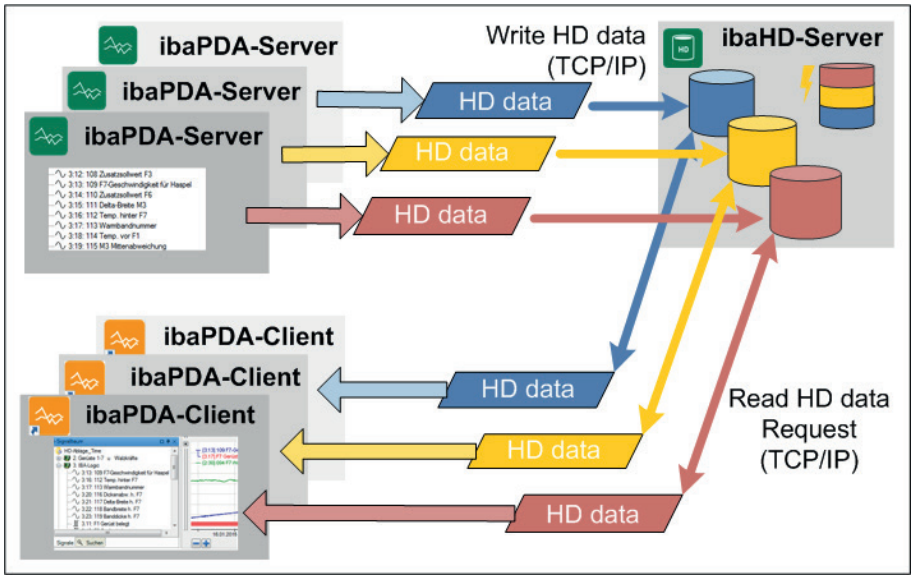


Signals or events can be assigned individually to each HD data store. So, data can be distributed, e.g. according to technological functions or subjects like production or maintenance.

An *ibaHD-Server* can manage several HD stores including HD data stores. An *ibaPDA* system can provide several HD data stores with data on one *ibaHD-Server* as shown in the next picture.



An *ibaPDA* system can write different HD data stores to different *ibaHD-Servers*, too. Also multiple *ibaPDA* systems can write their data by means of multiple HD data stores on the same *ibaHD-Server* but into different HD stores. The only exception is the event storage, because multiple *ibaPDA* systems can write on the same event store of an *ibaHD-Server*. The example shows how multiple *ibaPDA* systems write into different HD stores on one *ibaHD-Server*.



Note

This means: every HD data store needs a different HD store. It is not possible to write with several data stores into the same HD store.

The *ibaHD-Server* is operated and configured via the client component. The HD client component is completely integrated in the *ibaPDA* client. Moreover, the client component makes available the display function of the historical data in the *ibaPDA* client.

Note

An *ibaPDA* client can only connect to one *ibaHD-Server* at a time!

On the other hand, multiple *ibaPDA* clients may display the data of the same *ibaHD-Server*. Their number is limited by the number of HD client licenses.

The signals in the *ibaPDA* client are dragged and dropped out of a special HD signal tree into a special HD trend graph. Dedicated control elements, zoom and jump functions support the navigation along the time or length axis.

Events are dragged in the *ibaPDA* client out of the HD signal tree and dropped in an HD event table. It is possible to search special events via filter and a query assistant. The display mode of the relevant line in the event table can be modified dynamically. HD signal displays (trend graphs) can be coupled to an event table. In this way, the historical signal trend graph around an event can be displayed by double clicking on the event line.

Another example for a configuration can be found in the appendix.

4.2 Types of HD recording and data store

4.2.1 Time-based data store

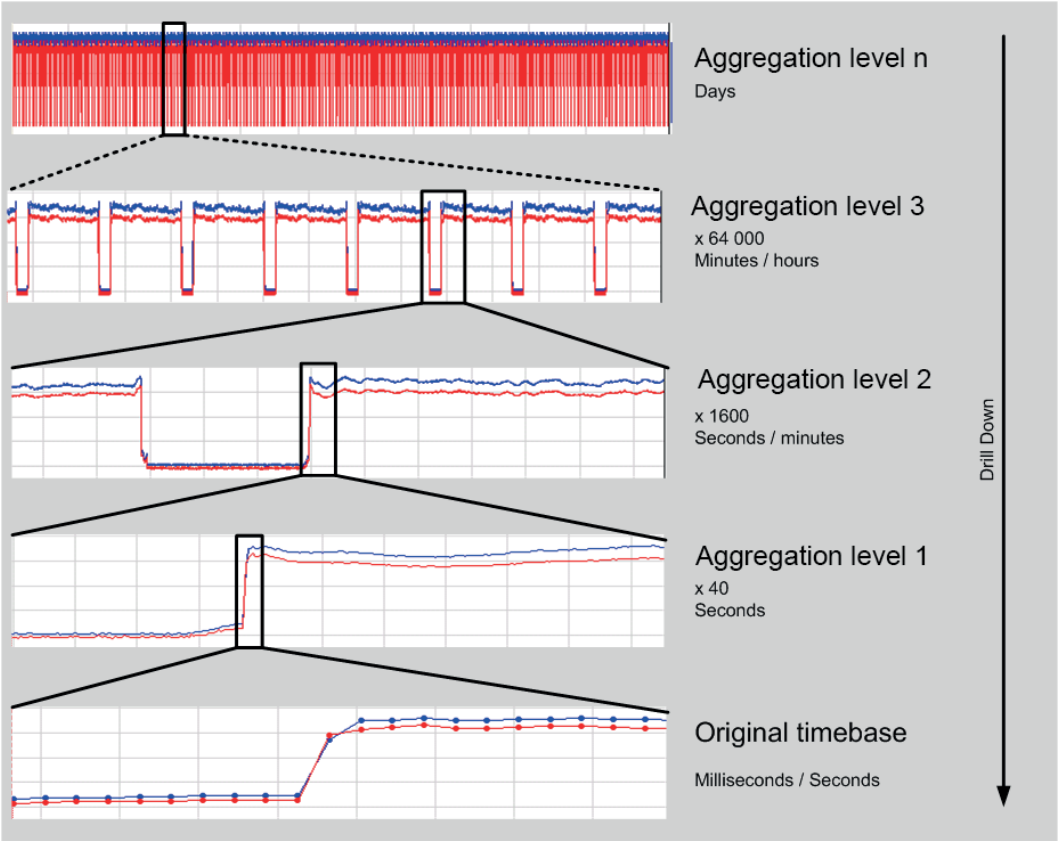
In case of a time-based HD data store, the signals are saved continuously through time in an HD store on the HD server. Similar to a usual *ibaPDA* data store, the signals to be stored have to be selected and assigned to a store profile. For the time-based data store, all signal types, including text channels, can be used.

For the display of time-based HD data, the view *HD trend graph* is available in the *ibaPDA* client and in *ibaQPanel*. Text channels can be displayed in the HD trend graph. To guarantee a quick and user-friendly display, also for large data volumes or the presentation of long periods of time in *ibaPDA*, the files are stored in a special file structure with several consolidation levels. According to the set time base for the data acquisition up to 6 aggregation levels are used. From level to level, for each signal 40 samples are combined to a sample group consisting of average, minimum and maximum value of the 40 basic values. Therefore, every new aggregation level contains only approx. 2.5 % of the samples of the last level. The creation of further aggregation levels is only continued as long as the distances between the aggregated measuring points are at least 1 day. You can customize the preset aggregation levels in the profiles in *ibaPDA*, see ↗ *Define data storage profiles, page 123*.

Text channels are saved with other aggregation levels: Original time base, 5ms, 3 min: 20 s, ca. 2 h and approx. 88 h.

The zoom in the signal curve is considerably accelerated by this scaled storage method.

The following figure shows the principle of data aggregation or, conversely, drill-down.



Examples

	Measuring point distance		
Aggregation	**Time base = 1 ms**	**Time base = 10 ms**	**Time base = 50 ms**
Level 1	40 ms	400 ms	2000 ms (2 s)
Level 2	1600 ms (1.6 s)	16,000 ms (16 s)	80,000 ms (1.3 min)
Level 3	64,000 ms (1.1 min)	640,000 ms (10.67 min)	320,0000 ms (53.3 min)
Level 4	2,560,000 ms (42.7 min)	2,560,0000 ms (7.1 h)	128000000 ms (1.5 d)
Level 5	102,400,000 ms (1.2 d)	1024000000 ms (11.9 d)	-
Level 6	-	-	-

Level 6 or higher are only used for time bases < 1 ms.

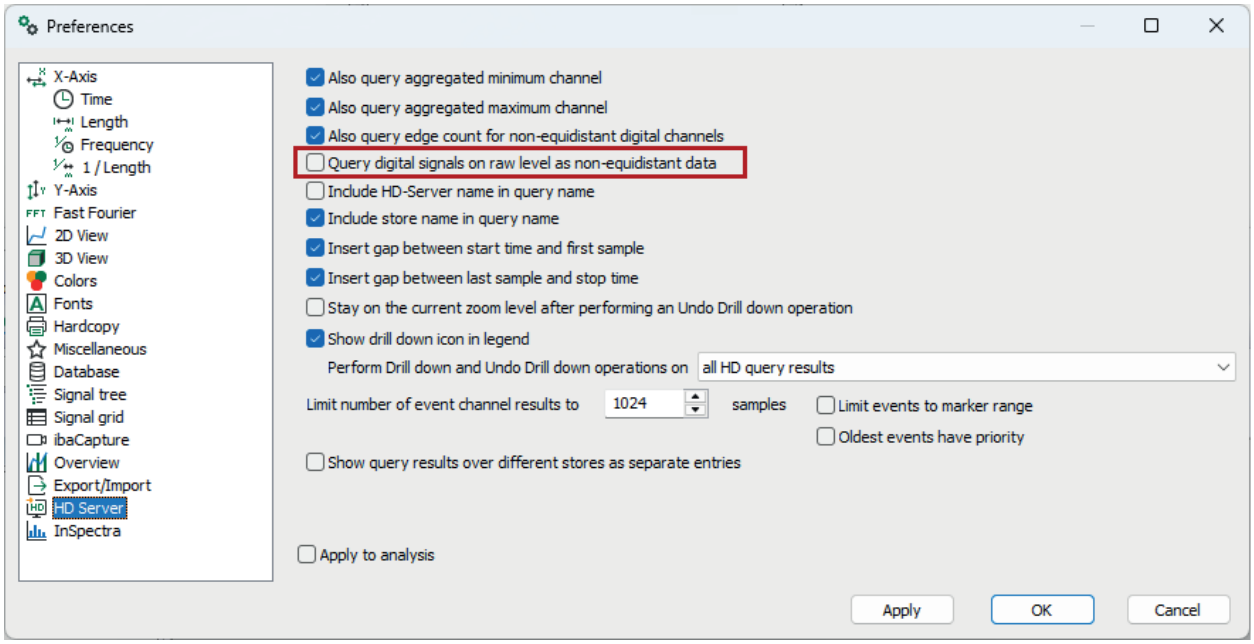
As a supplement to this type of file reduction, the usual consolidation according to the method of the run length encoding is used so that the store capacity is only insignificantly higher than for normal data files (DAT files). The zoom in the signal curve is considerably accelerated by this scaled storage method.

Note

The above mentioned time base is a time base of the storage as it is settled in the used storage profile. Therefore, the sample time is not essential for the maximum resolution of an HD store, but the time base which is used to save a signal.

The interpretation of the three aggregation values minimum, maximum and average is different for digital signals than for analog signals. The average value is an indicator of the majority of the values in the aggregated period. If the digital signal has a high value for over 50% of the time period, then a high value is stored in the aggregation level and vice versa. This is independent of the number of signal changes. The combination of the minimum and maximum values of an aggregated time period shows whether or not the digital signal was stable in the time period. If the minimum and maximum values are the same, the digital signal stayed at the same level during the period. If not, one or more signal level changes have occurred.

With version 7.3 of *ibaAnalyzer* a new option *Query digital signals on raw level as non-equidistant data* has been added to the *HD Server* query settings. Using this option, it is possible to query always digital signals as raw data independent of the aggregation level and selected query time base which is used for analog values. Especially for long-time queries this makes it possible to correctly measure duration or to evaluate time stamps of value changes without the usual errors introduced by the data aggregation on *ibaHD-Server*.



If this option is enabled, *ibaAnalyzer* uses a different mechanism to query digital signals from any *ibaHD-Server*.

For more information, see the *ibaAnalyzer* manual.

4.2.2 Time-based recording of non-equidistant data

Non-equidistant data can be generated in various ways, e.g. via modules that support an external timestamp (e.g. IEC 61850 modules) or via a data store profile that records other signals using a trigger signal.

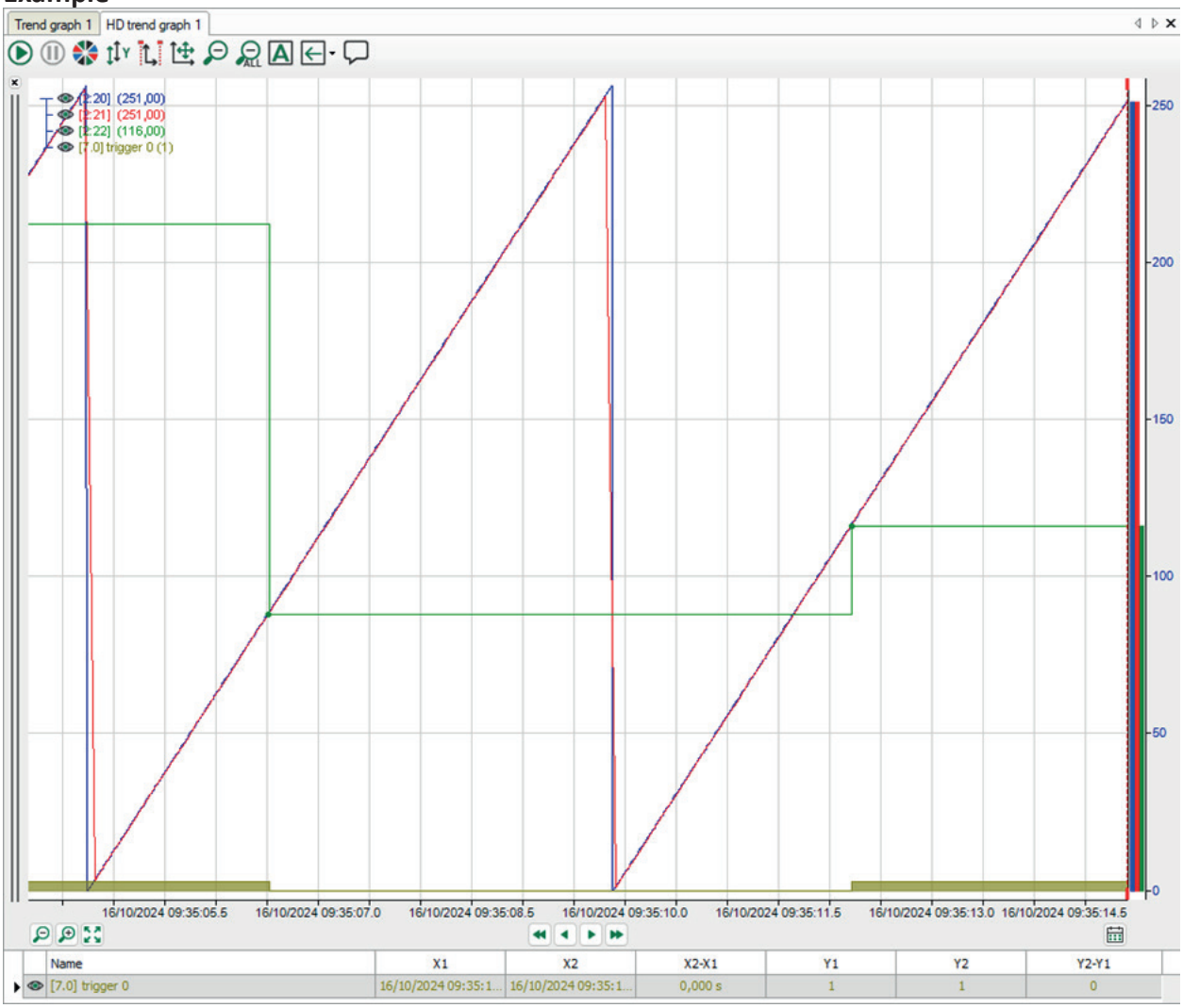
In HD store, the data is saved as raw data and in up to 5 aggregation levels. The following aggregation levels are preset:

- In the raw data level, the non-equidistant data is saved as time-value pairs.
- The aggregation levels have a time base of 200 ms, 10 s, 5 minutes, 2 hours and 1 day.

  For analog signals, the average, minimum and maximum of the aggregated measuring points are saved for each aggregation stage; for digital signals, the minimum, maximum and edge count are saved.

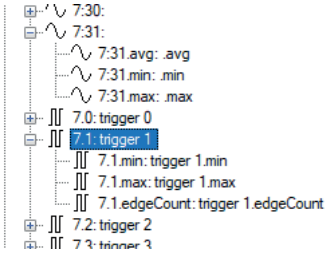
In the data store profiles in *ibaPDA*, you can use the profile type *Time, ibaHD* to customize the time base for each aggregation level, see ↗ *Define data storage profiles, page 123*.

Example



The green signal is a non-equidistant version of the blue signal: Each time the value of the yellow signal changes, a value is saved. These values are displayed as green dots. The signal is considered constant until the next value is reached. For this reason, the green signal is displayed in steps. As long as you are in the raw data level, you will see the dots. If you zoom out further until the first aggregation level is reached, no more points are drawn.

If you have activated the *Show sub-signals* option in the *ibaHD signal tree*, the values for minimum, maximum and average for analog signals and the values for minimum, maximum and number of edges for digital signals are displayed from the aggregation levels.



4.2.3 Time-based data recording with time periods

Time-based data recording with time periods is a special form of time-based data recording. Time periods mark a range of time within a time-based HD store. The start and end of the time periods can be specified using triggers or times. A time period is comparable with a triggered DAT file, but with the signal data that is present in an HD store.

Time periods can be enhanced with info fields to save additional information, e.g. text channels such as product or coil numbers.

Time periods are saved in a database table. The info fields correspond to the columns in the database table. The database can either be the internal *ibaHD-Server* database or an external database provided by the user.

4.2.4 Event-based data store

For this type of data storage, events are defined which are saved as binary information subsequently. The results will always be stored at the moment of their occurrence. If dynamic information like actual values, signal states or texts (technostrings, text signals) are configured with these results, the dynamic information at the moment of the result will also be saved.

For event based data, the aggregation will be achieved by the separation of static and dynamic parts in the data. The quantity of the dynamic data arise among other from the number of the used numeric and text fields as well as in the length of the underlying strings (when using text fields).

Examples for the storage space:

- Storage 24 h, cyclical every 1 s an ingoing event (no outgoing events) with a message text length of 141 characters: 11.5 MB
- Storage 24 h, cyclical every 0.5 s an ingoing event (no outgoing events) with a message text length of 141 characters: 23.5 MB

Compared to the time-based data, the event-based data need considerably less memory space. For the display of event-based HD data, the view "HD event table" is available in the *ibaPDA* client and in *ibaQPanel*.

The application *ibaDatCoordinator* offers the possibility to generate so called "offline events" and to store them retroactively in an existing HD event store. Different to the time and length-based recordings the events are configured and managed centrally on *ibaHD-Server*. Therefore, it is possible that multiple *ibaPDA* servers and *ibaDatCoordinator* as well write their events on the same event store.

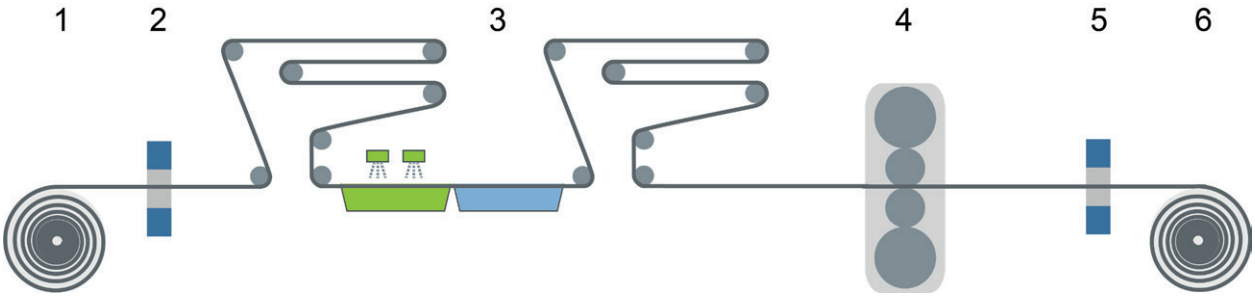
4.2.5 Length-based data store

The length-based HD data store primarily applies to plants or processes for the manufacturing of long products with limited lengths, as e.g. in rolling mills for the metal industry. The samples will not be assigned to the time axis, but to a length axis that corresponds to the length of the product. In the display (HD trend graph), the samples will be plotted over a length axis instead of the time axis. The objective of the storing and display type is to correlate samples to the product length, so that a statement about the value of a measured signal on a specific point of the product (length or distance measured from the beginning of the product) can be made.

Other applications for the length based data store are measurements of moving objects such as cranes, winches or vehicles to display the samples on the traverse distance, for example.

Measuring locations have to be defined for the data storage in order to correlate the measurement signal and the length geometrically. A measuring location is a point that is passed by the product (measurement medium) and where measuring signals are created. Depending on the required accuracy at the assignment of the signals to be measured and the length of the product (selection of the storage profile) you have to define several measuring locations, if the samples (sensors, system parts) are spatially separated.

The following figure shows an example of a simplified plant with 6 areas, where measuring data are created.



6 measuring locations with corresponding measuring signals are defined accordingly.

No.	Measuring location	Signals to be measured (example)
1	Pay-off reel	Strip tension, speed
2	Thickness gauge entry	Strip thickness entry
3	Cleaning	Temperature, concentration
4	Skin pass mill / rolling stand	Roll force, skin pass degree, strip tension entry, strip tension exit
5	Thickness gauge exit	Strip thickness exit
6	Tension reel	Strip tension, speed

The configuration of the measuring locations and the assignment of the signals will be made at the configuration of the data storage.

For more information about this, see chapter ↗ *Configuring length-based data store, page 155*

The calculation of the length will be automatically effected by a speed signal.

In an HD trend graph view only length-related signals of the same measuring location can be shown. Related to the above mentioned example, this would mean that the length-based display of rolling force and skin pass degree can be made in one HD trend graph view and the display of the strip thickness exit in another.

Unlike the time-based display, no multilevel aggregation of the measuring values for the data store will be made during the length-based storage. The raw data will only be stored according to the selected storage profile.

Therefore, 1 value of samples per meter will only be stored in the HD principle at for example a length base of 1 m.

5 Manage ibaHD-Server with ibaHD Manager

The program *ibaHD Manager* (previously ibaHD-Server status) is for the diagnostics and the operation of the *ibaHD-Server* service. It gives a general overview of the license information, active HD clients and HD stores.

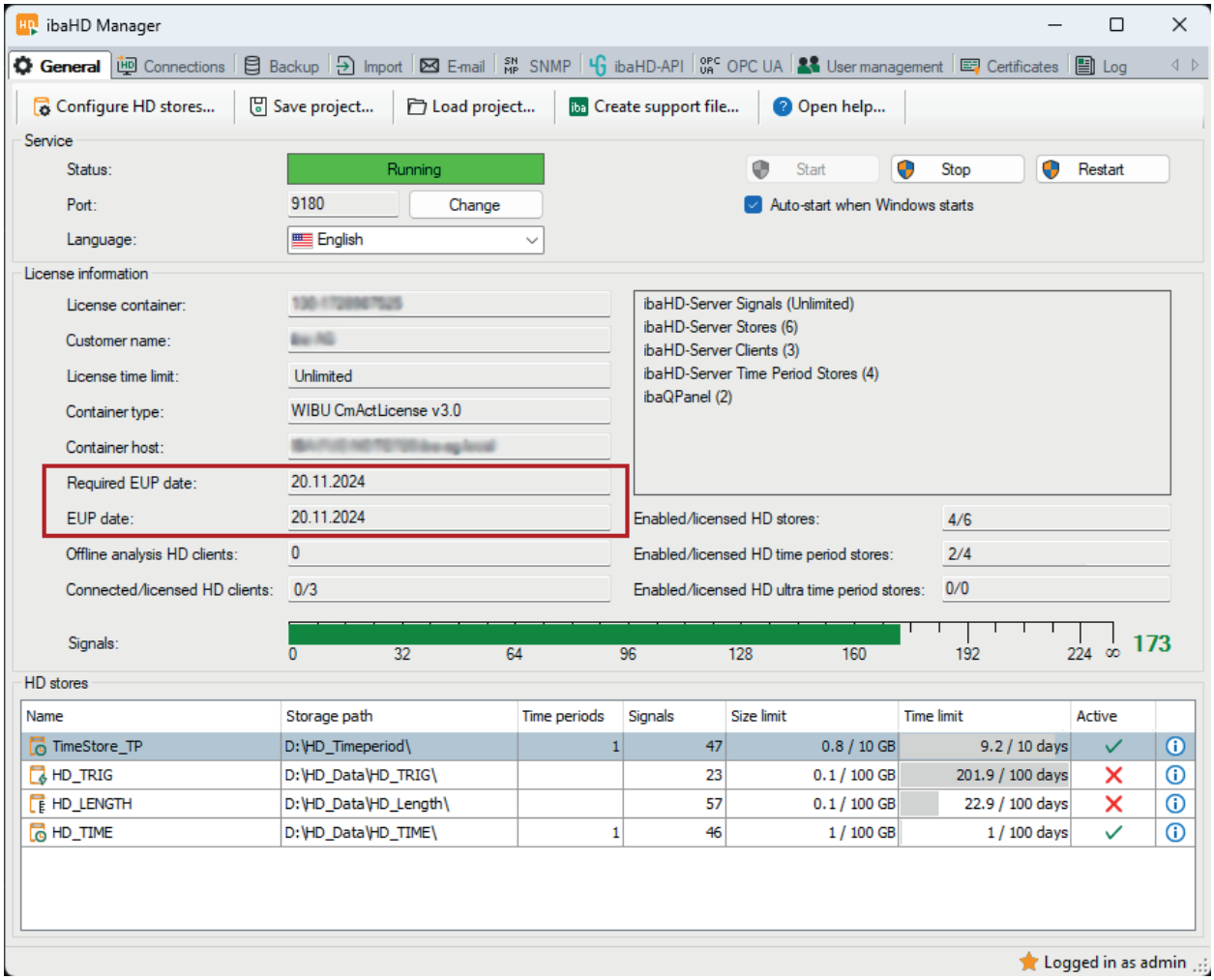
With the ibaHD-Manager you can:

- Configure HD stores
- Manage projects
- Create a support file
- Create, restore, attach and mount backups
- Import iba DAT files
- Manage users and user permissions
- Enable and configure *ibaHD-Server-API-Read*

ibaHD Manager is automatically installed with *ibaHD-Server* and can be started either via the Windows start menu or by double-clicking on the *ibaHD-Server* icon in the system tray.

5.1 General Settings

The *General* tab of ibaHD Manager contains information about the service, license information and the existing HD stores.



Service

Status

Display if the service is running or not. You can use the buttons <Start>, <Restart> and <Stop> to start or stop the service.

Port

The port no. for communication with iba programs is set automatically, but can be modified manually here.

Note

If the port number is modified manually, the firewall settings have to be adapted as well.

Auto-start when Windows starts

This option has to be activated if the service is to start automatically with every system start.

License

In the *License information* area you'll find important information about your current software license.

License container

The license container number is important for all service queries and upgrades. Please provide the license container number to our support team. It is linked to your license container, i.e. either MARX dongle, WIBU dongle or WIBU soft license and stored in our database.

Customer name

In this field, you will find the name of the customer for which this license has been approved. For projects, which were initially completed via system integrators, registration of the end user should have been requested from iba either from the outset or, at the latest, after the warranty period has expired. This makes it easier to assign the license in the case of later extensions or support cases.

License time limit

This field shows the validity time of the licenses. Depending on the container type there is either a remaining validity time given in days or hours or there is an expiration date.

Container type

This field indicates whether a MARX dongle, a WIBU dongle (WIBU CmStick) or a WIBU soft license (WIBU CmActLicense) is used.

Container host

This field shows the name of the computer where the license container is attached, which supplies the licenses obtained by the application.

Required EUP date and EUP date

The EUP date specifies the date until which the period of free software updates is valid. After the update period has expired you still can continue running the program as usual but only with the features which were already available until then.

Connected/licensed HD clients and HD stores

These fields show how many ibaHD clients and HD shelves are currently licensed and how many of them have already been activated.

For further information on licensing, see chapter ↗ *Upgrade policy*, page 14 and ↗ *Update policy*, page 15.

HD stores

In the HD stores area, HD stores are displayed that are already created. You will find the following information for each store in the table:

- Name and path of the store
- Number of configured time period stores within the HD store

  If the number in the column is marked in bold, an ultra time period license is used for store.
- Number of the contained signals
- Size limit and time limit

- Display whether data is currently being written to the store (*Active* column)

Icon	Meaning
	Data is written to the store
	Currently no data is written to the store.
	The store is deactivated, no data is written to the store.
	The necessary license is missing, no data is written to the store.

Double-clicking on a row in the table or mouse clicking on the info icon ⓘ at the end of the row opens a window with detailed information about the HD store.

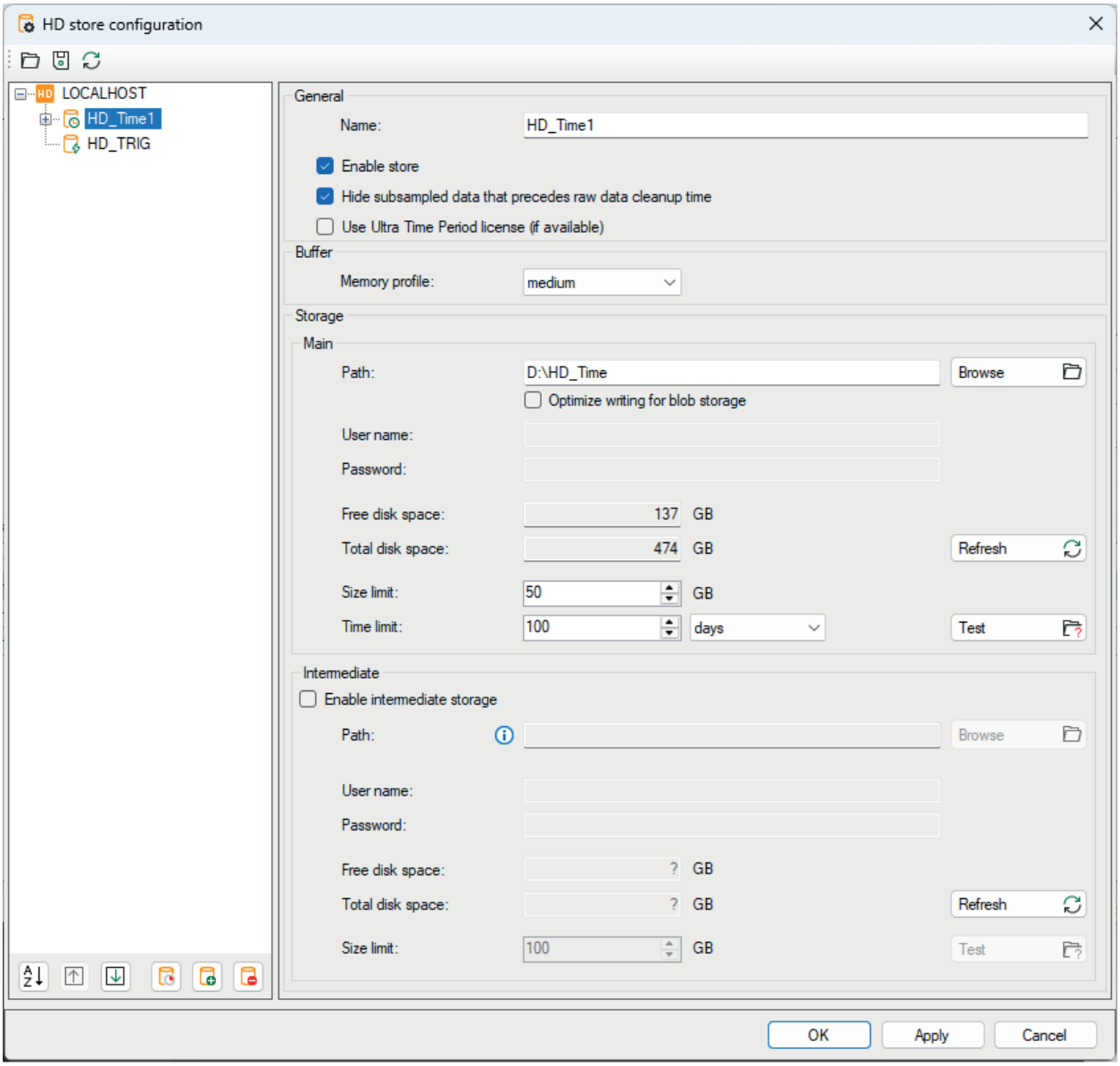
For further information, see ↗ *HD store details, page 42*.

5.1.1 Configuring HD stores

Note

Only one source can write to an HD store. When several HD data stores (from one or more *ibaPDA* systems) write on an HD server, an HD store has to be created for every HD data store.

Clicking on <Configure HD stores...> opens the configuration dialog for the stores of the *ibaHD-Server*. You get the same dialog when you click on the <Configure> button in the data storage configuration of *ibaPDA*.



The already configured HD data stores are displayed in the tree view on the left. During the first installation, the tree view is empty.

The buttons below the tree view do the following:

- A time period is added (only possible under a time store)
- An HD store is added. Use the drop-down menu to select the type of store you want to add.
- Selected HD store is removed from the tree view.
- HD stores are sorted alphanumerically.
- Selected HD store is moved up one position in the tree view.
- Selected HD store is moved down one position in the tree view.

Note

The HD data store type in ibaPDA and the HD store type on the HD server always have to match.

HD time-based data store → HD store time-based

HD time-based data store with time periods → Time period store

HD length-based store → HD store length-based

HD event-based data store → Event-based HD store

Note

A separate license is required for a time period store, see ↗ *Licenses*, page 12.

General

Name
Here you can assign a name for an HD store

Enable storage
If you want to use the storage, this option must be enabled. Enabled stores are marked in the tree structure with a yellow icon. Disabled stores are marked with a gray icon.

No read or write access is possible with a disabled store. It is also not possible to attach or restore backups.

Note

If you remove the dongle, all stores are disabled. If you reattach the dongle, all stores are automatically released again.

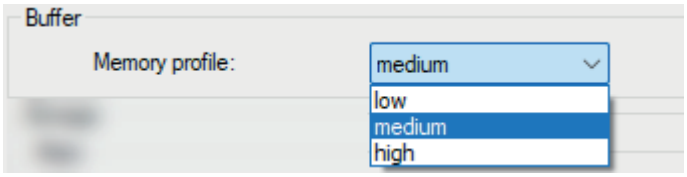
Hide summarized data whose corresponding raw data has already been deleted
This option is only available for time-based stores.
If you enable this option, then aggregated values of the higher aggregation levels will no longer be shown if the raw data that served as the basis for calculating these consolidated values was completely or partially deleted. The reason for the lack of raw data may be an automatic clean-up, for example.

If you do not enable this function, then the summarized values will also be shown if the underlying raw data is missing. A drill down in the display then shows incomplete or missing curves.

Use Ultra Time Period license (if available)
Activate this option if one of the existing Ultra Time Period licenses is to be used for the time periods in this HD store instead of a single license.

Buffer

For time and length-based HD stores, it is possible to select a memory profile for the data buffer.



The memory profile determines the size of the (main) memory which, as buffer, is reserved for the data acquisition. The buffer size is directly proportional to the number of the IO operations, which are necessary for writing data from the buffer in the HD store, i.e. on the hard disk. The performance during the reading of data from the HD store (e.g. by *ibaAnalyzer* or *ibaPDA*) will also be influenced in the process.

If the buffer gets reduced, the transmission of the data from the buffer to the hard disk will occur in smaller, but more data blocks.

If the buffer gets enlarged, the transmission of the data from the buffer to the hard disk will be carried out in larger, but less data blocks.

Some limitations apply here:

- If the *ibaHD-Server* is installed on a 32-bit operating system, the memory profile for all HD stores will automatically be set to “low.”
- The same applies to the 64-bit systems, which are equipped with less than 2 GB RAM.
- If *ibaHD-Server* is installed on a 64-bit operating system with less than 4 GB RAM. The maximum possible memory profile is “medium.”

General settings recommendations:

Select a higher memory profile if few signals with a high sample rate are acquired.

Select a lower memory profile if many signals with a low sample rate are acquired.

Exact information cannot be given here, as the performance is influenced by many factors:

- System hardware
- Number of simultaneous acquisitions

- Number of the acquired signals
- Sample rate of the acquired signals
- Data consolidation during the acquisition
- Number of the reading clients

Reference value for memory profile (depends on operating system and RAM)	
x86	low
x64: < 2 GB RAM	low
x64: < 4 GB RAM	medium
x64: ≥ 4 GB RAM	high

Storage locations

Since version 2.1 of *ibaHD-Server*, it is possible to optionally use a intermediate storage in addition to the main storage. The two areas *Main* and *Intermediate* are available for configuring both storage locations. The main storage is generally configured on hard disc drives, because this type of storage is ideal for long-term storage of large amounts of data.

The intermediate storage, on the other hand, is designed for SSD disks and is used to temporarily store newly acquired data. In this way, the data volume can be reorganized for an optimal read performance before the data is written on the hard disk of the main storage. The intermediate storage is activated by default.

Using the intermediate storage can significantly reduce the system's response time, especially if large data volumes are requested by the HD clients while acquisition is in progress or data is being imported into the store.

Also observe the notes in the appendix, ↗ *Tips for main and intermediate storage, page 252*.

Main

Path

Here you select the directory for the HD data store. If the directory is located in the network on another computer, enter the path as a UNC path (starting with \\). By means of the button <Search> you get to the directory structure of your *ibaHD-Server*.

Optimize writing for blob storage

If you store data in the cloud, such as in a blob storage, enable this option. Direct writing to the storage is minimized as much as possible, and configuration of an intermediate storage is required, see ↗ *Intermediate, page 40*.

Disable the option for standard storage (e.g., a directory in the network), as it will reduce performance during data transfer between the intermediate and main storage.

User name/password

If the directory is on an external computer, i.e. not on the *ibaHD-Server* computer and a user name is required, please enter the user name and the password.

Free / total disk memory
The totally available and free memory space referred to the partition of the entered path is displayed. In doing so, a memory space possibly already assigned to other HD stores cannot be taken into consideration.

Use the <Update> button to determine the values for free and total memory capacity.

Tip

To minimize the network load, the path for the HD data store should always refer to the local hard disk of the *ibaHD-Server* computer.

Size limit
If all signal data exceeds the memory limit set here for the HD data store, the oldest signal data is overwritten.

Time limit
If the signal data is older than the time set here, it will be deleted.

Intermediate

Use intermediate storage
Enable this option if you want to use the intermediate storage.

Path
Here you select the directory on a SSD disk for the cache. Use the <Browse> button to access the computer's directory structure.

The other settings and buttons are the same as with the primary memory.

Note

The storage capacity limit for the intermediate storage must not be larger than the size of the main storage of the respective HD store.

For time and length-based stores that are less than 500 GB, the size of the intermediate storage must be at least 10% of the main storage of the respective HD store. If the main memory of the HD store is larger than 500 GB, 50 GB are recommended for the size of intermediate storage.

For detailed information see chapter ↗ *Tips for main and intermediate storage, page 252*.

The storage system provides that the data segments that have not yet been completed are stored in the intermediate storage. If the segments are registered as completed, they are moved to the main storage of the HD store. Due to this storage method, the occupied storage space remains almost constant after a phase of growth. In exceptional cases, the size of the intermediate storage may exceed 50 GB. Then more space must be allocated on the medium for the intermediate storage.

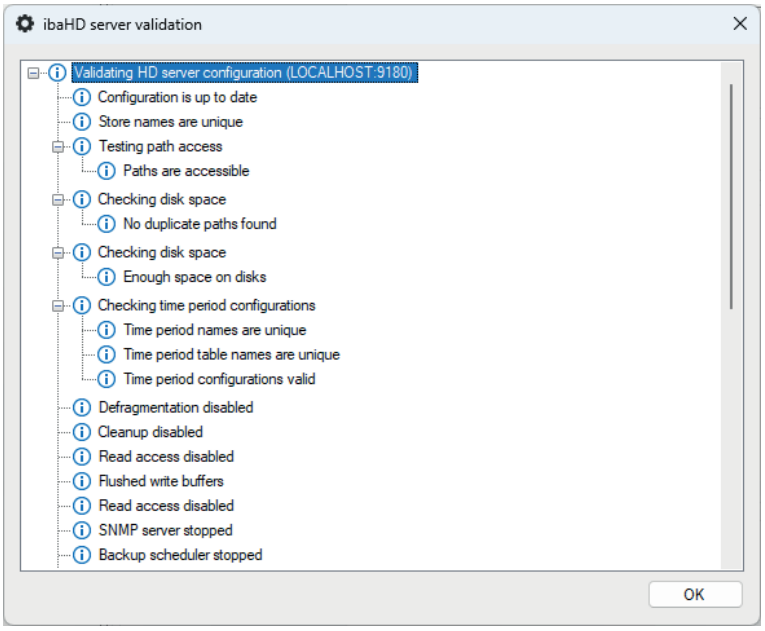
Note

In addition to the buffer in the main memory, the cache also works as a buffer when the hard disk drive is too busy to be able to execute all I/O operations. In the event that the cache overflows, the active acquisition to the HD server is interrupted and other write accesses to the store are rejected until half of the cache has been emptied into the primary memory. The writing clients receive a message with a note about the cache overflow.

See also chapter ↗ *Tips for main and intermediate storage, page 252*.

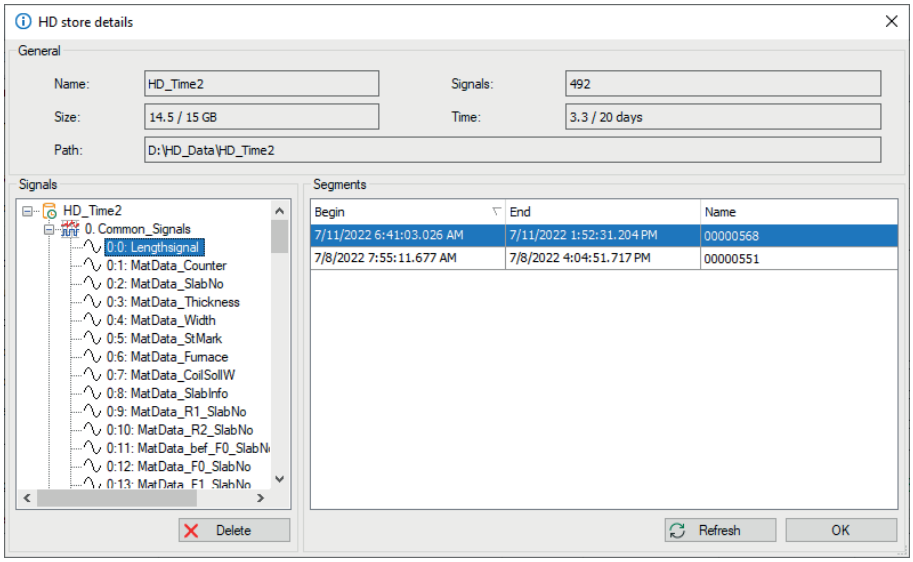
Close the configuration

Click on <OK> or <Apply> to apply the new configuration. The new configuration is to be confirmed or any error messages are displayed in a pop-up window.



5.1.1.1 HD store details

In the *General* tab in the table with the HD stores, if you double click on a row in the table or mouse click on the info icon at the end of the row, a window opens with detailed information about the HD store.



General

The name, the disc space occupied, the path, the number of recorded signals and the recording duration/limit for the clean-up strategy are shown here.

Signals

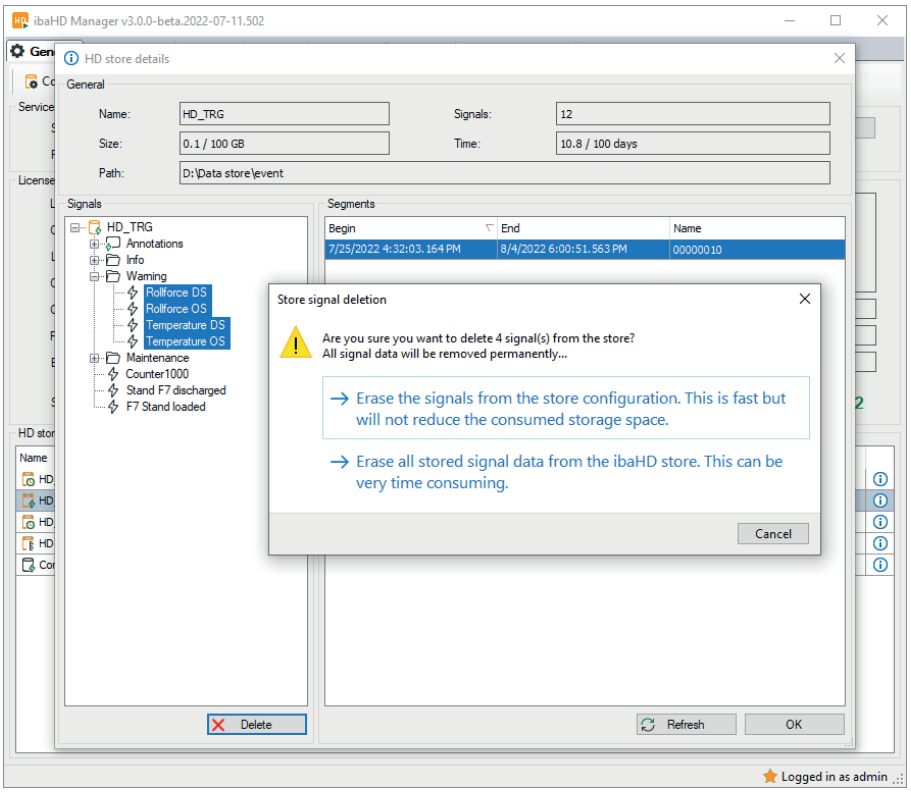
In the "Signals" area, the signal tree is displayed with the signals that were selected when configuring the corresponding HD storage in *ibaPDA*.

The <Delete> button can be used to remove individual signals or entire modules as well as groups and events from an HD store. Highlight the desired signal, event module or group in the signal tree and click on <Delete>. All data of the respective signal or event type or all signals of the module or the group are removed from the HD storage.

Always when deleting event signals, all signal data would be removed from the hard disk. This process can take a long time, especially with large, long-running configurations.

However, it is also possible to delete the signals by removing the signal from the index. Then the signal can no longer be accessed, but the data is still present in the segments. This operation is fast, but does not reduce the used disk space. The used disc space is not reduced until the data is removed from the segments by a cleanup strategy.

After clicking <Delete> you can select one of the two options in a query dialog.



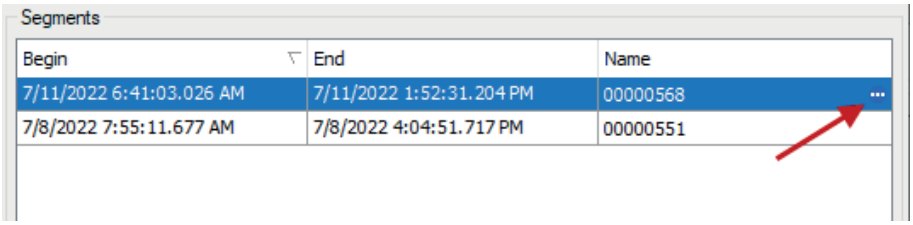
Segments

The created HD stores with the assigned signals are displayed here. The existing data per signal is listed. There, a row corresponds to a data segment in the HD server database.

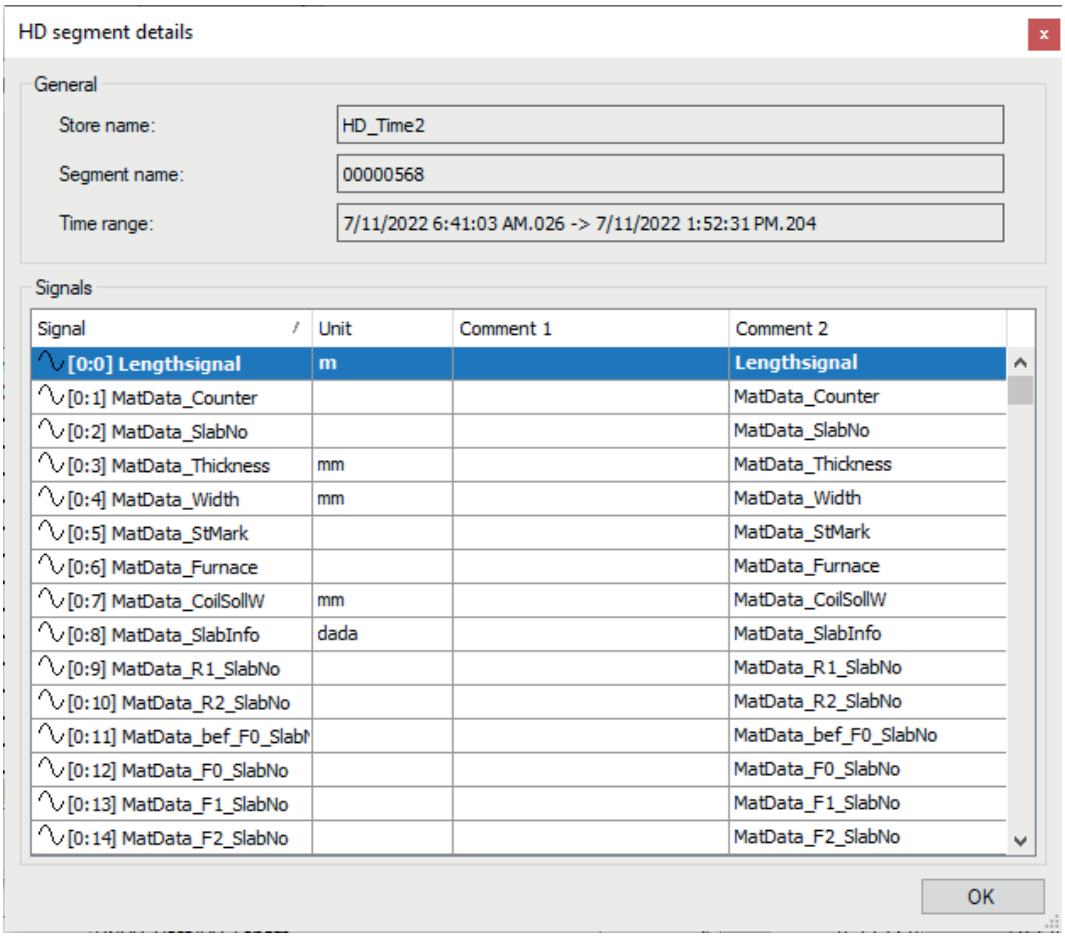
You can refresh the display with the <Refresh> button to get the latest information.

5.1.1.2 HD segment details

If you point the mouse on a segment row in the detailed view of an HD store, then a blue icon will appear on the outer right-hand side.



Double-clicking on this icon opens additional details about this segment.



This lists all signals with their units and comments once again.

The data is only displayed. No entries can be made.

5.1.2 Configuring a time period store

Proceed as follows to configure time period stores. Further Information on the setting options can be found in ↗ *Time period stores – Settings, page 45*.

1. First select the top level time-based HD store in the tree view or create a new one, see ↗ *Configuring HD stores, page 36*.
2. Click the  button.

→ A new node for the time period store is created under the selected time-based HD store.

You can add multiple time period stores to a time-based HD store.

3. Enter a name for the store and optionally a comment.
4. Establish the database connection by selecting an existing connection under *Database* or select *Create database connection…* to configure a new one.

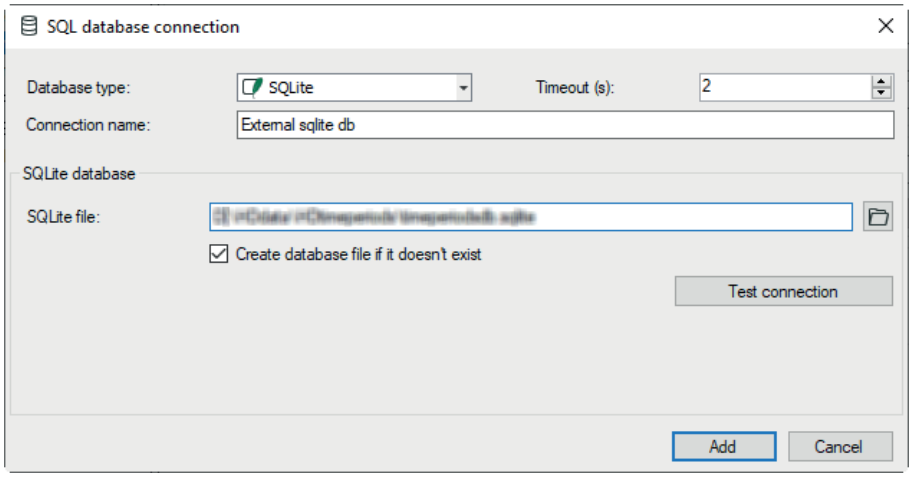
   If you select an existing database connection, you can configure it with <Edit…>. All databases that have already been configured for *ibaHD-Server* are offered.

   When you establish a new connection, the configuration window opens.

5. Select the database type and enter the necessary information depending on it. In addition to the connection name and a timeout, these are:

   - SQLite: SQLite file path

     Enter the file path to an existing file or also activate the *Create database file…* option if this is to be created first.



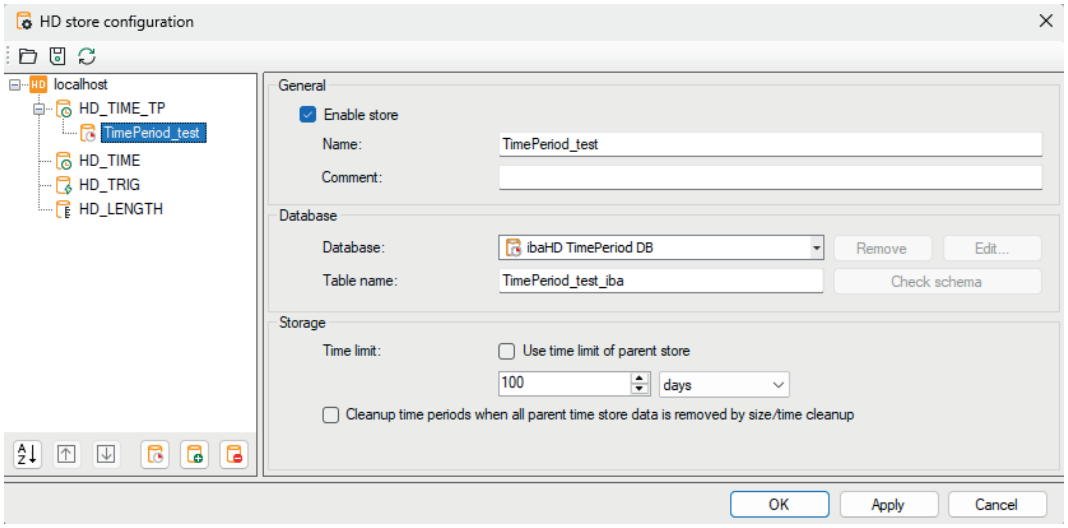
6. Use the button <Test connection> to check the configuration.
7. To be able to use the store, activate the *Enable store* option.

To remove an existing time period store, select the time period store and click on the button .

5.1.2.1 Time period stores – Settings

Time periods are saved in a time period store, which you configure as a subordinate store in a time-based HD store, see ↗ *Configuring a time period store, page 44*.

The following settings are required for the time period store:



General

Enable storage

If you want to use the storage, this option must be enabled. Stores that are not enabled are not allocated a license.

Name/Comment

Enter a unique name and a comment (optional) for the time period store here.

If you subsequently change the name, you must update references to the time period store. A corresponding message appears when the changed configuration is applied.

Note

If the time-period store is saved in an external database, first change the name of the database table and associated metadata table in the database system and then adjust the configuration in ibaHD Manager.

Database

Database

Name of the selected database containing the time period table. By default, *ibaHD-Server* creates a database for time periods as an internal SQLite database. To use the internal database, select *ibaHD TimePeriod DB*.

You can also use an external database. To do this, select the database or create a connection to a new database. Currently, only SQLite and Microsoft SQL Server databases are supported.

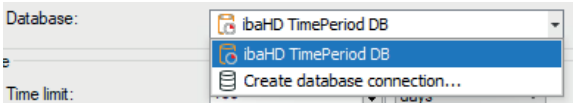
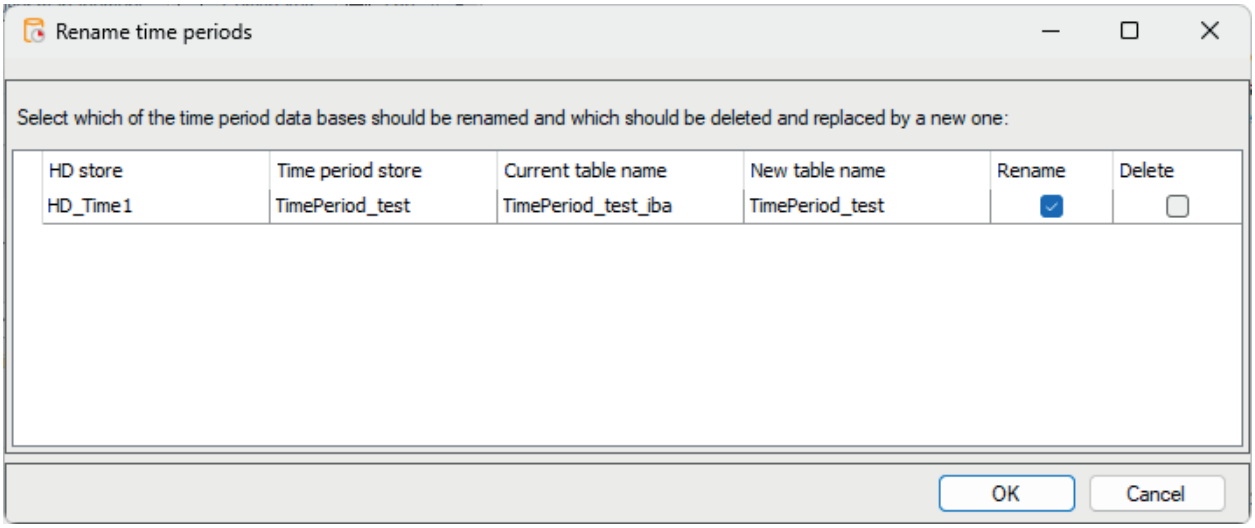


Table name

Enter a unique name for the database table here.

If you subsequently change the table name, you must update references to the tables. When applying the changed configuration, a dialog appears in which all tables are listed with the old and new table names, as well as information on the associated HD store and time period store.



Select from the following options for all listed tables:

- *Rename*: Changes the table name
- *Delete*: Deletes the old table and creates a new table with the new table name

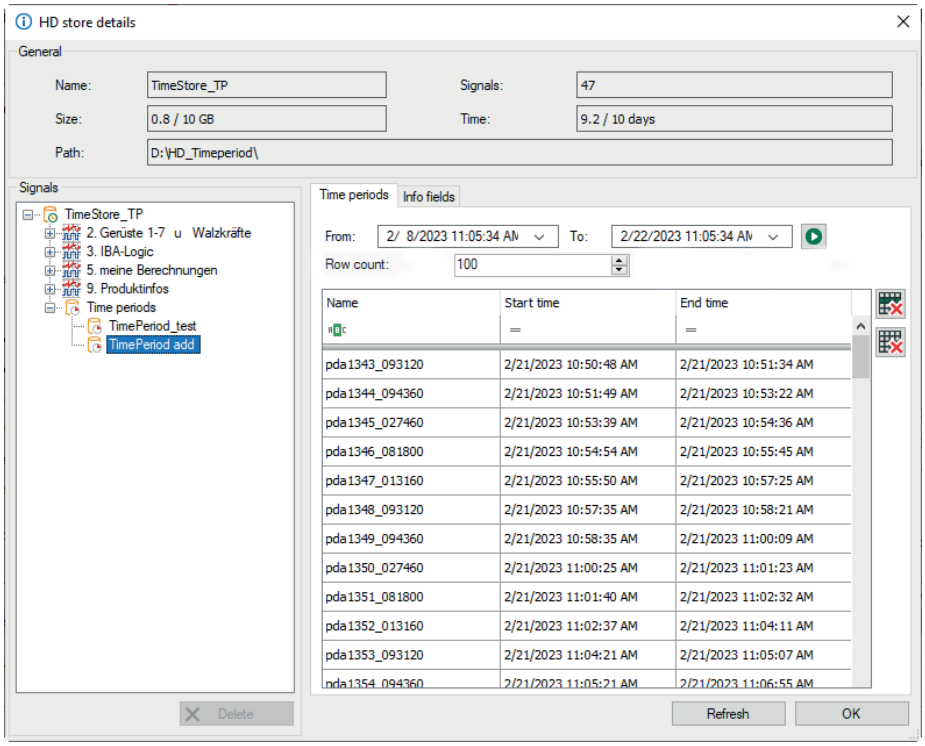
Storage

Time limit
Time periods that are older than the specified time limit are automatically cleared. By default, the time limit of the parent HD store is used. To set a different time limit for the time period, deactivate the option *Use time limit of parent store*.

Cleanup time periods if size/time cleanup removes all data within the time period store
Time periods are deleted if all data in the time period store is deleted.

5.1.2.2 HD store details for time periods

If one of the available time periods are selected in the *HD store details* dialog, the time periods that exist in the database can be viewed in a table. The calendar fields can be used to restrict the range of time periods displayed. A maximum of 100 time periods can be displayed in the table.



On the *Time periods* tab, in addition to the display individual or all time periods in an entire range can be deleted.

First select a time range that will contain the time periods in the *From, To* fields. Clicking on the button displays the 100 last time periods from that range. You can use the *Row count* field to change the number of time periods displayed. You can filter these 100 entries by name, start time, or end time.

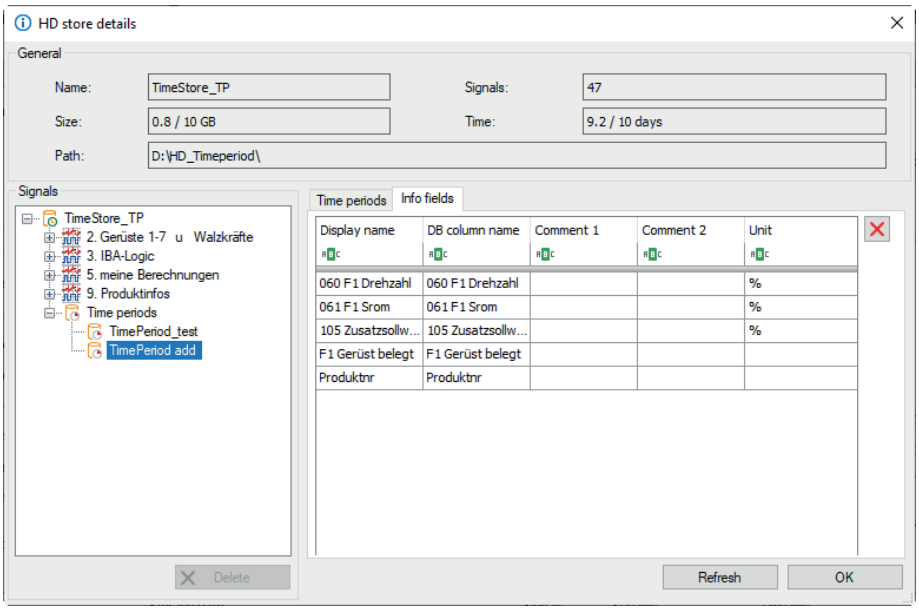
To remove time periods, the following buttons are available on the right edge:

	The selected time periods are deleted. Multiple time periods can be selected.
	All time periods from the selected time range are deleted.

Note

Deleting time periods is permanent. It is not possible to restore them later.

You can delete info fields for time periods on the *Info fields* tab.



The table shows all info fields from the selected time period store.

To remove an info field from the store, select the info fields and click on ✕.

Note

Before deleting info fields you must stop or disable writing of info fields.

Deleting an info field permanently removes the corresponding column and the values of the info field from the database table. The info field can be restored by restarting the write operation, but the old values of the info field are not restored.

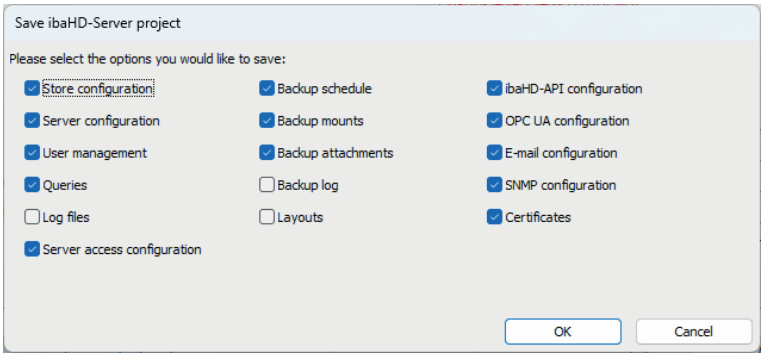
Delete operations can take several minutes.

5.1.3 Managing ibaHD-Server projects

Using the *Save project...* and *Load project...* buttons in the *General* tab of the ibaHD Manager, you can save complete *ibaHD-Server* configurations as a project file and load them again.

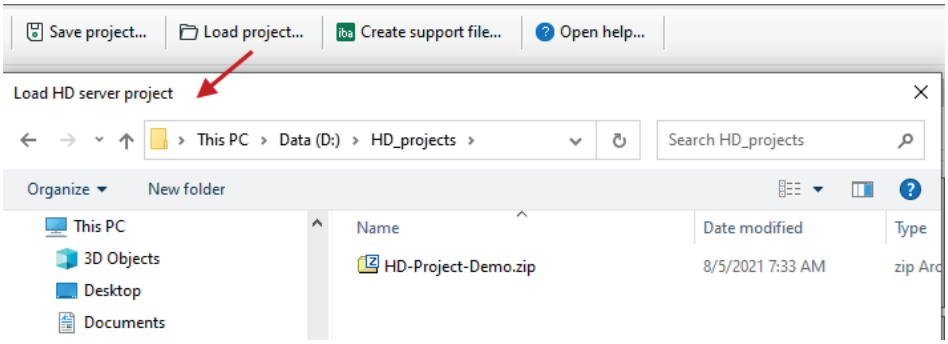
The use of project files is helpful, for example, if you need to migrate your configurations to a new computer.

Save project



To save a project, select the options to be saved and click on <OK>.

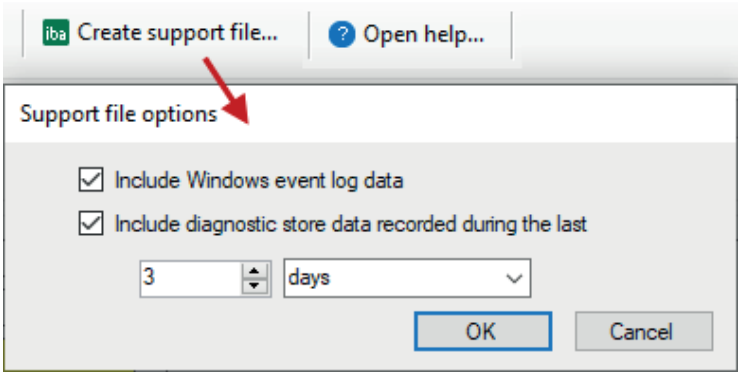
Load project



To load a project, select the desired project file in the file browser and click on <Open>.

5.1.4 Create a support file

Should you need support from iba, you can find all of the important information for support via the menu command *Create support file…* in the *General* tab of *ibaHD Manager*.



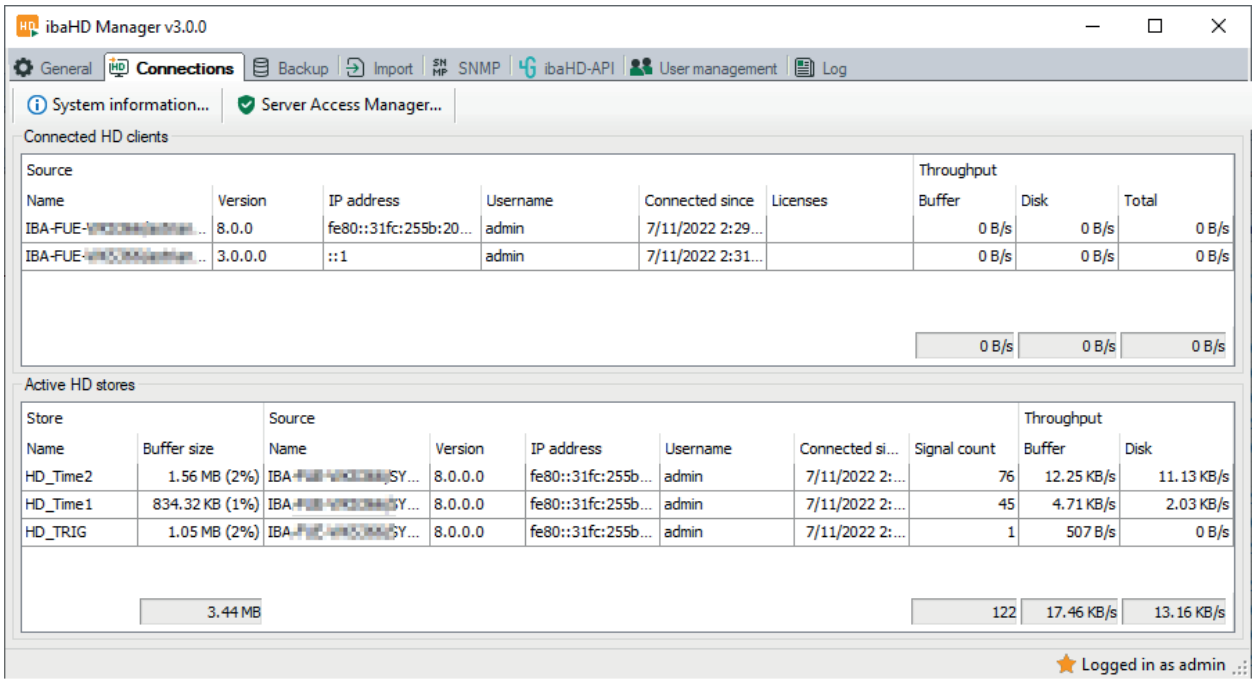
This command creates a ZIP file containing the following information:

- All store, user and backup configurations
- Event queries
- HD server log files
- Optional Windows event logs
- Optional diagnostic data of stores from the set time period

iba recommend sending a current support file to iba support if a problem occurs.

5.2 Current connections

The current connection parameters of the active HD client (with version no., IP address and user name) and the active HD stores are displayed in the *Connections* tab in the main window of ibaHD Manager.



<System information>
You can store additional information on the system here, see ↗ *System information, page 51*.

<Server Access Manager>
By setting up server access control, you have the option of reserving licenses for selected users and limiting access to the *ibaHD-Server*.

See ↗ *Server access control, page 53*.

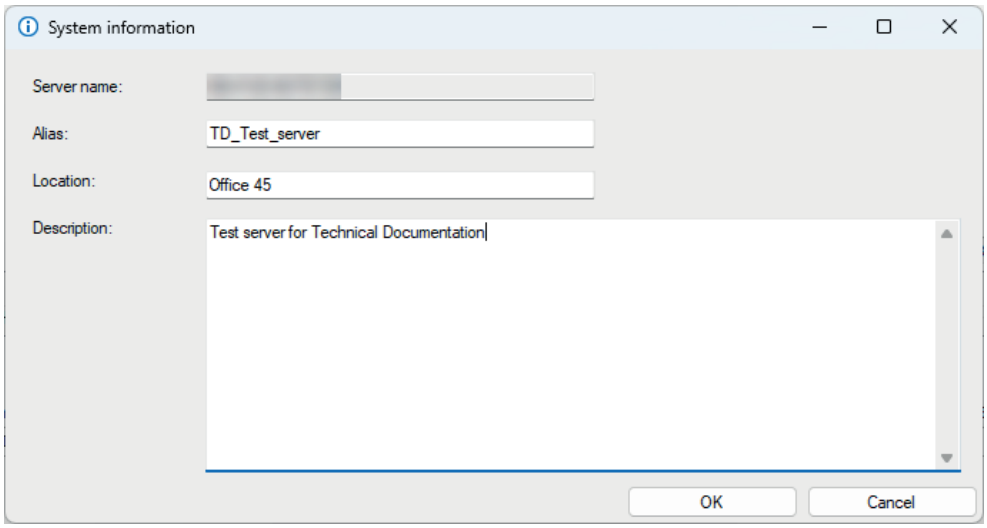
5.2.1 System information

The *System information* dialog contains information about the *ibaHD-Server* computer. The server name is automatically displayed based on the computer name under Windows.

You can add further information:

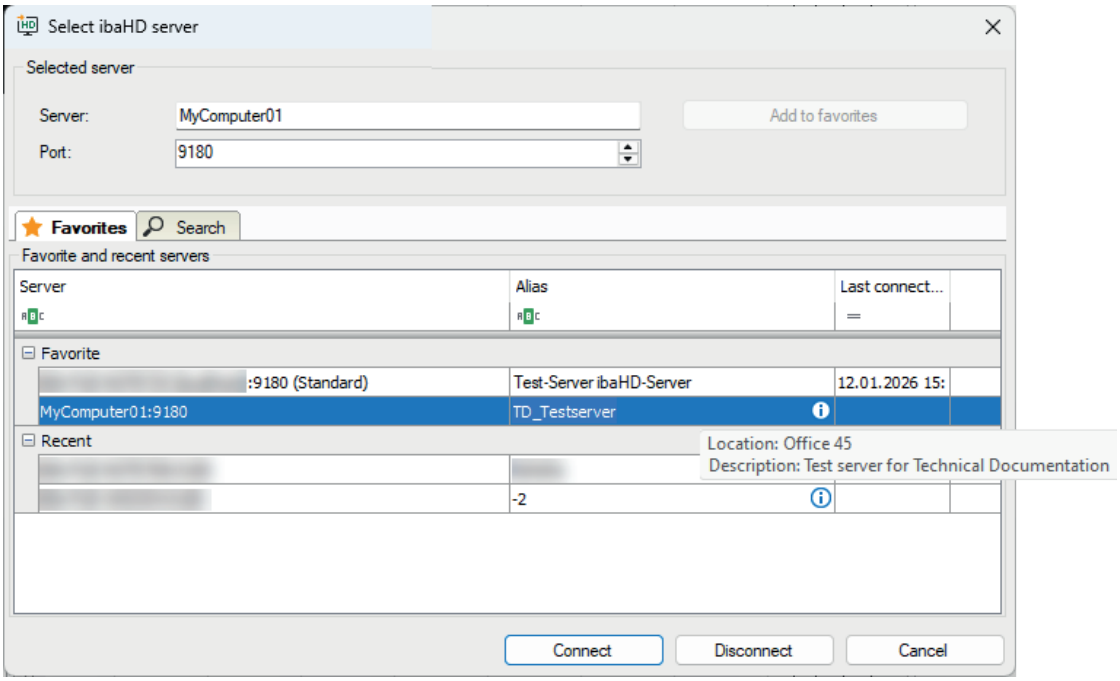
- Alias
- Location
- Description

The information is saved in the configuration.



Alias

If required, you can give the computer an alias name here that is easier to understand than the host name, for example. This alias is then also displayed in the *Select server* dialogs on the client side in the *Search* and *Favorites* tabs, making it easier to identify the desired server. The alias that you assign here is independent of the alias names of other iba products that may be installed on the same system.



The additional information *Location* and *Description* are displayed in the tooltip.

Location

Enter a unique name for the installation location of the computer, e.g. as plain text or standardized location identifier (+ ...).

Description

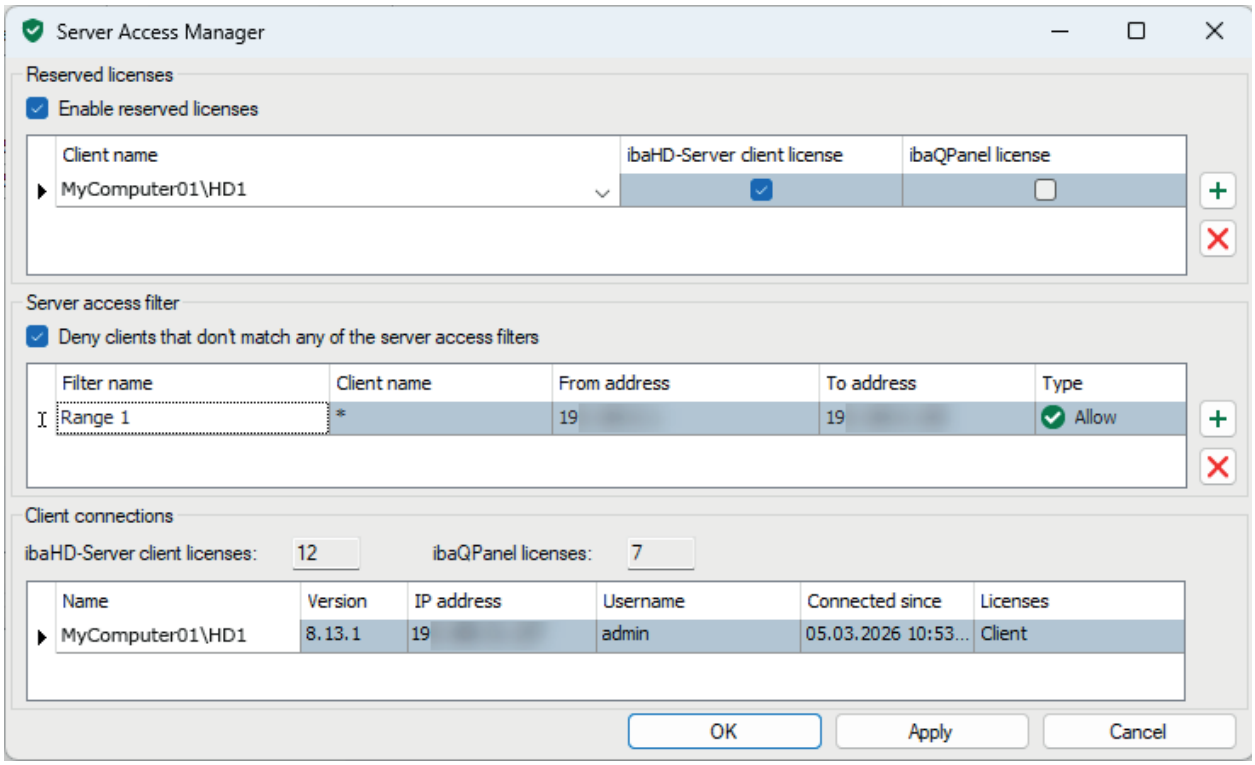
Enter further information here as descriptive text if required.

5.2.2 Server access control

By setting up server access control, you have the option of reserving licenses for selected users and limiting access to the *ibaHD-Server*.

To configure the server access control, click on <Server Access Manager> in the *Connections* tab of the ibaHD Manager.

The following dialog opens:



Reserved licenses

In the *Reserved licenses* section, you can reserve *ibaHD-Server* client licenses and *ibaQPanel* licenses for specific computers in the network. Licenses that you reserve are considered used even if the client is not connected.

Since the license model of *ibaHD-Server* works with free (floating) licenses, any client that wants to access the server can use a free license. However, this entails the risk that clients that absolutely require licensed functions will no longer find a free license if other clients were "faster" and have used all available licenses.

You can now use the reservation to guarantee that the clients that absolutely require server access for certain licenses also receive these licenses.

You must identify the computer by its name. You can also reserve several licenses for one computer if several instances of the *ibaHD-Server* client are to run on the same computer. Reserved licenses can only be used by computers that are on the list.

Clients that are not in the list can only use generally available licenses.

In the *Client connections* section, at the bottom of the dialog box, the available *ibaHD-Server* client licenses and *ibaQPanel* licenses are displayed.

For reserved licenses for clients that are not currently connected to the server, the row is marked with a grey background.

Enable reserved licenses
If you enable this option, the allocation of licenses is regulated according to the reservations. If you disable this option, all licenses of the server become available again.

Reserve license

1. Click the + button to add a new line.
   A computer name is then immediately displayed in the *Client name* column if there are active clients in the network. The first row is usually the name of the server computer itself.
2. Select the desired client from the list of available clients.
3. Then place a checkmark in the selection fields of the desired license(s).

Cancel reservation

1. Select the table row of the client for which you no longer require a reservation.
2. Click the ✕ button.

Server access filter

In the *Server access filter* area, you can specify which clients are allowed to connect to the server. To do this, enter the IP address ranges for the permitted clients.

Only allow client connections with an IP address..
If you enable this option, only connections from clients located in one of the IP address ranges in the table below are permitted. If you disable this option, the accesses are not filtered.

Note

If this option is enabled but no IP address range has been entered in the list, then access to the server is only possible via local clients running on the server computer.

Add address range for filters

1. Click the + button to add a new line.
   A default name is provided in the *Range name* column, which you can change as required.
2. Enter the start address of the permitted range in the *From address* column.
3. Enter the end address of the permitted range in the *To address* column.

Delete filter range

1. Select the table row of the range for which you no longer want to filter.
2. Click the ✕ button.

Save configuration

The configuration of the server access can be saved in an *ibaHD-Server* project, see ↗ *Managing ibaHD-Server projects, page 49*.

If a project is to be loaded that contains a server access configuration, the user is asked whether the server access configuration should also be loaded.

Client connections

ibaPDA client licenses and ibaQPanel licenses
The number of available licenses is displayed in these fields.

Connection table
The table shows one row for each currently connected client. You will find

- Name\user, client version and IP address of the connected computer
- Date and time when the connection was established
- Number of signals that are transmitted to the respective client
- Licenses used by the client.

5.3 Backup

ibaHD-Server writes the recorded measurement data continuously in one or more HD stores. There are hard disks behind these HD stores that will be fully written once or may be defective and have to be replaced.

Using the backup function, you can create backups to archive data (before it is overwritten again) or to prevent a data loss due to defective hard disks or corrupt files.

In the ibaHD Manager you will find the dialogs for the following functions:

- Create backups
- Mount backups
- Attach backups
- Restore backups

Notes on backups of time periods
A backup of time-based HD stores also includes the backup of the configured time period tables, if they are stored in the internal database of the *ibaHD-Server*. A backup of time period tables stored in external databases is not supported.

Restoring time-based HD stores also restores the associated time period stores. The time period stores are either merged or created if they do not yet exist during the restore operation.

5.3.1 Create backup

Backups are generally differentiated between two different types:

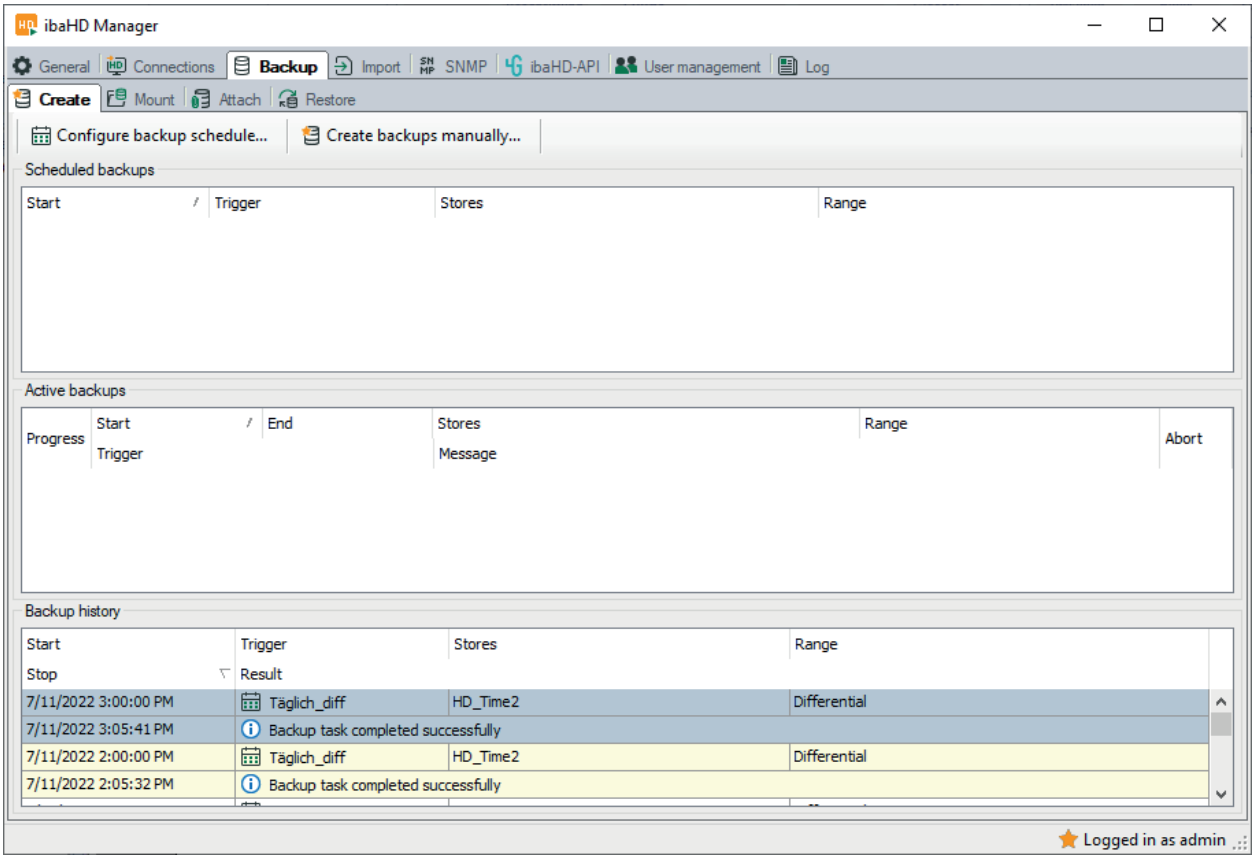
- Complete backup
- Differential backup

Complete or differential backups can be performed while the HD recording is stopped or running. The backup process runs faster when the HD recording is stopped.

Differential backup only backs up new data since HD store was last backed up.

In the *Backup* tab in the *ibaHD Manager*, there is an overview in the follow-up tab *Create* of all planned, active and completed backups.

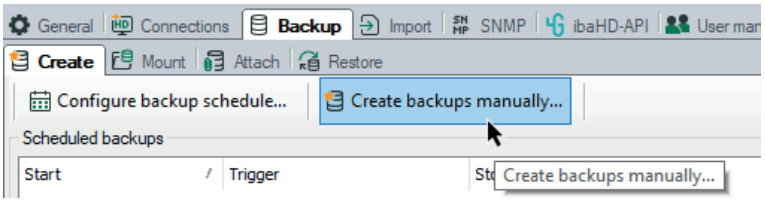
Backups can be started manually or automatically according to a schedule.



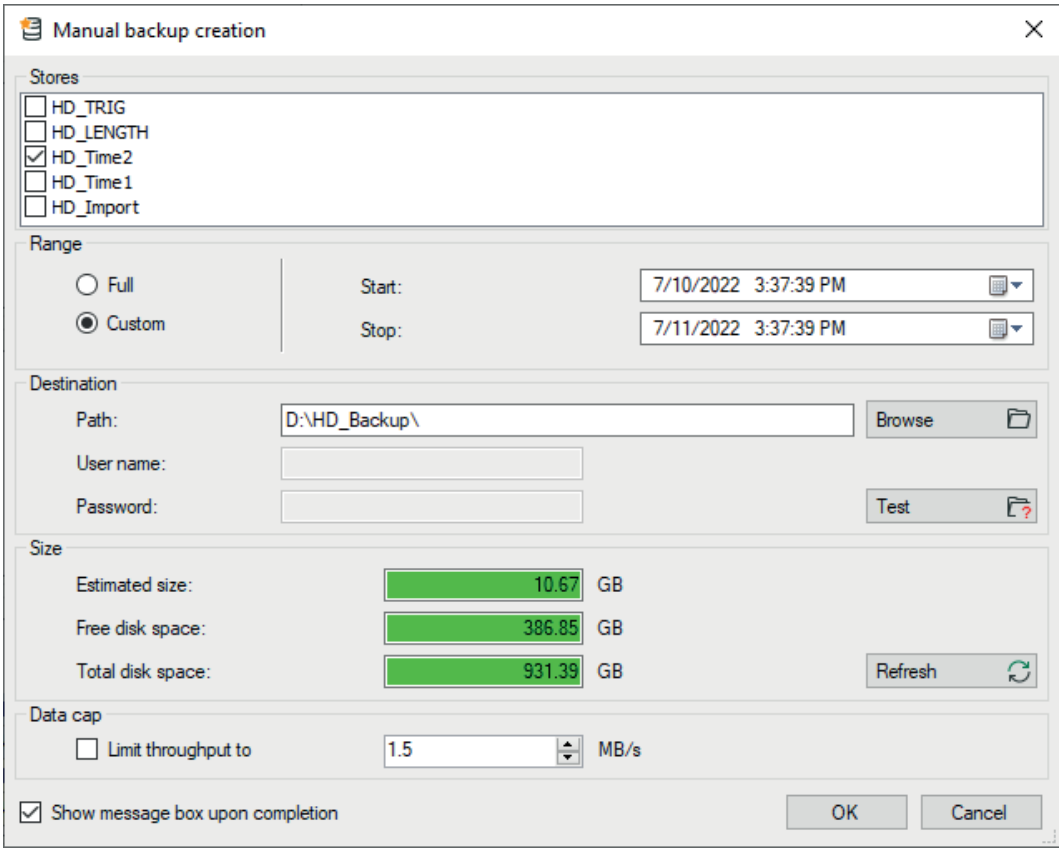
5.3.1.1 Creating a backup manually

You can create a manual backup if required. The backup then corresponds to a snapshot of the currently saved data.

In the *ibaHD Manager*, select *Backup* tab – follow-up tab *Create*, menu button <Create backups manually...>.



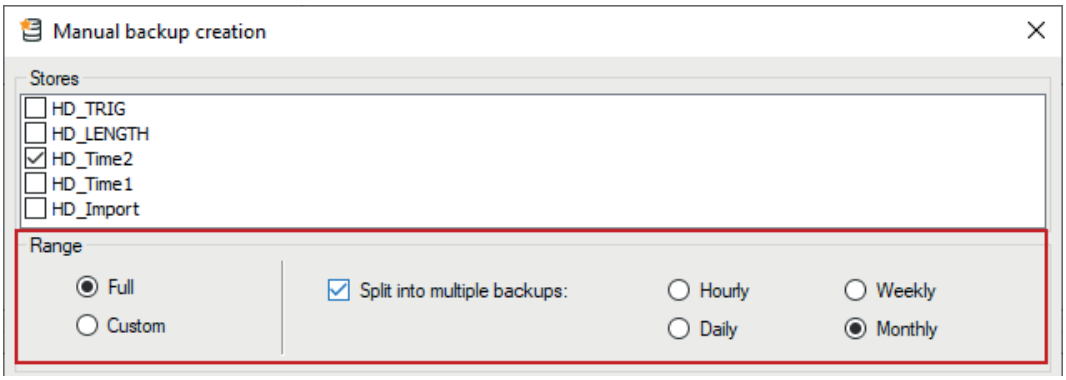
In the *Manually create backup compilation* dialog, make the necessary settings.



Stores
Select the HD stores that are to be created for the backup.

Range
Select whether the backup is to be complete or whether only a defined time range should be saved.

In the event of a complete backup, you can divided this into several backups, such as each the length of a month.



Target

Enter the destination path for the backup file or select it using the browser. If necessary (network drive), specify a user name and password.

Use the <Test> button to check whether the destination path is reachable.

Bandwidth

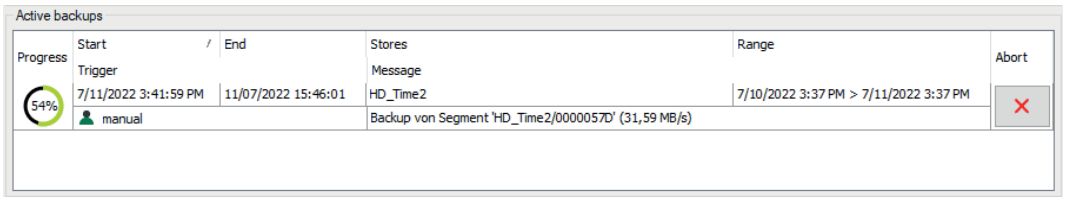
Here you can enable and adjust the upper limit for the data throughput. The standard setting is “disabled” and 1.5 MB/s. If the HD recording is running and the *ibaHD-Server* is heavily loaded by the recording or queries, you can enable the limit and reduce the value even more if necessary so that the system is not overloaded. In this case, the duration of the backup is increased.

Size

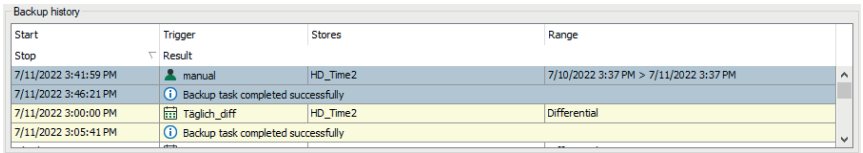
In addition to the current storage conditions on the hard disk, the estimated storage requirements of the backup are also shown to you here. If you have changed the settings for the destination path or time period, click on the <Update> button to adjust the calculated values.

Then click on <OK> to start the backup.

The progress of the backup is shown in the *Create* tab in the *Active backups* area.



Once the backup is complete, it will be shown below in the *Backup history* area.



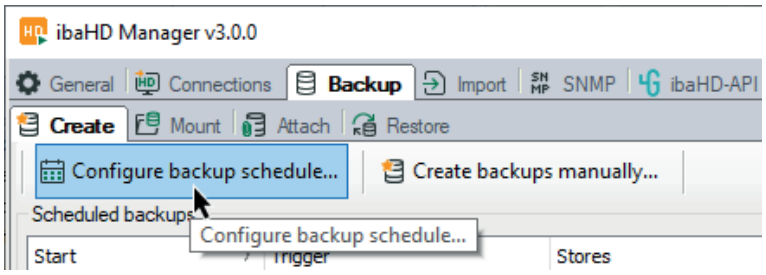
5.3.1.2 Schedule automatic backups

You can define any backup jobs or schedules for the automatic creation of backups.

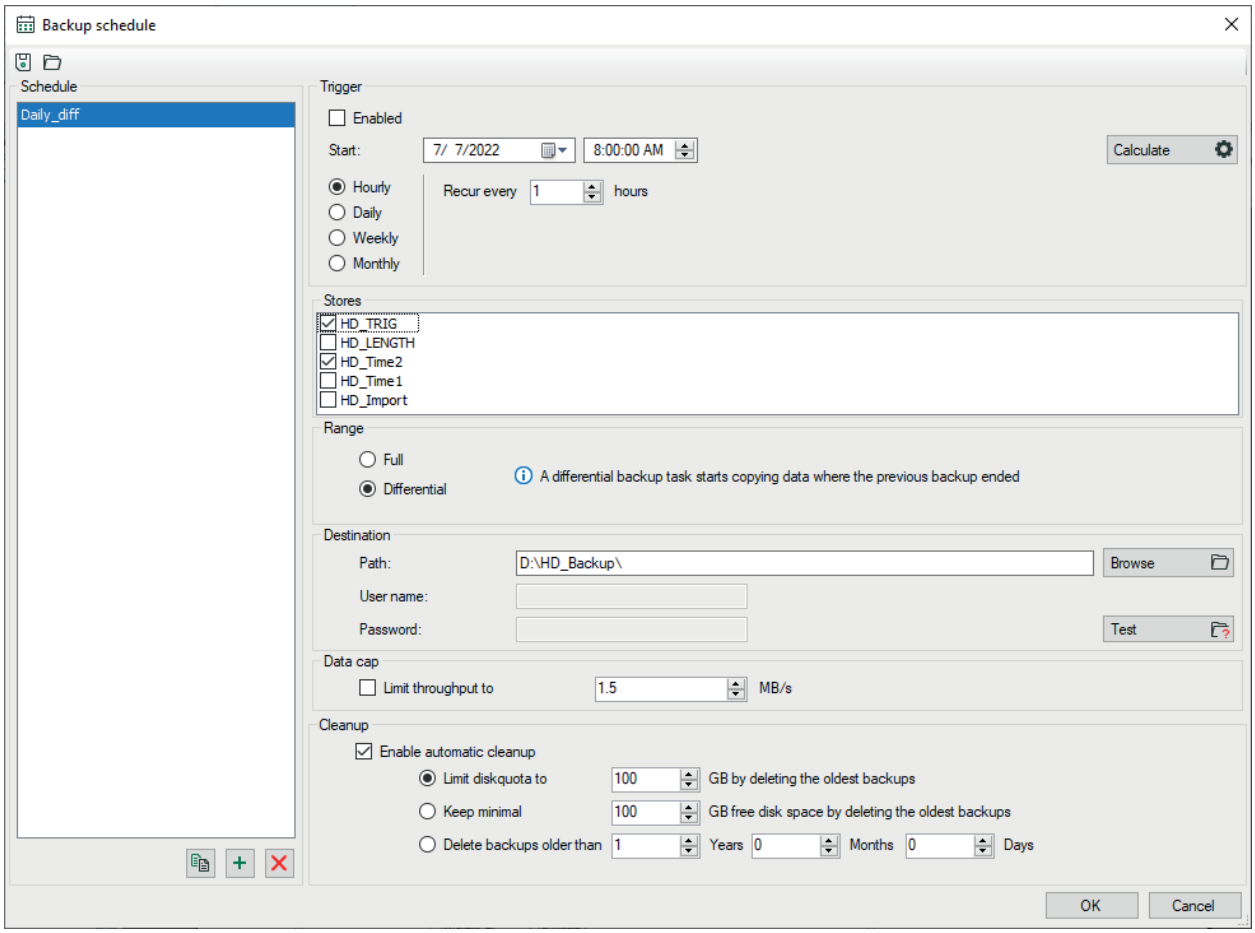
A scheduled backup is only executed if the *ibaHD-Server* service is running. The defined backup schedules are part of the *ibaHD-Server* configuration and are automatically stored internally.

In addition, the schedules can be stored in a separate XML file or imported from such a file.

In the *ibaHD Manager*, select the tab *Backup* – follow-up tab *Create*, button <Configure backup schedule…>.



In the *Backup scheduling* dialog, make the necessary settings.



Schedule

All already configured schedules are listed in this field. Click the + button to add a new backup schedule.

With the button you can copy a marked schedule in order to make work easier for schedules to be configured similarly.

With the button you can remove a marked schedule from the list.

The following settings refer to the schedule that is marked in the field on the left.

Trigger

If the schedule is to be carried out automatically, activate the option *Enabled*.

Select when the backup is to be started by setting the interval as well as the start date and start time.

You can refine the interval by setting the repetition frequency *Recur every ...*.

If the interval is set to “Daily,” for example, the backup would be started only every other day with the value “every 2 days.” Accordingly, with an interval of “weekly” you can also specify the days of the week when a backup is to be created.

For a monthly interval, the months as well as the days of the month can be selected on which the backup is to be started.

Click on the <Calculate> button to see the next trigger dates.

Stores

Select the HD stores that are to be created for the backup.

Range

Select whether the backup is to be complete or differential.

With a complete backup, all of the data in the respective HD store is saved.

A differential backup always begins at the end of the previous backup. If no previous backup is found in the target directory, then the contents of the entire HD store are stored as a backup.

Target

Enter the destination path for the backup file or select it using the browser. If necessary (network drive), specify a user name and password.

Use the <Test> button to check whether the destination path is reachable.

Bandwidth

Here you can enable and adjust the upper limit for the data throughput. The standard setting is “disabled” and 1.5 MB/s. If the HD recording is running and the *ibaHD-Server* is heavily loaded by the recording or queries, you can enable the limit and reduce the value even more if necessary so that the system is not overloaded. In this case, the duration of the backup is increased.

Clean-up

Here you can configure an automatic cleanup according to which the oldest data is overwritten if the limit is reached.

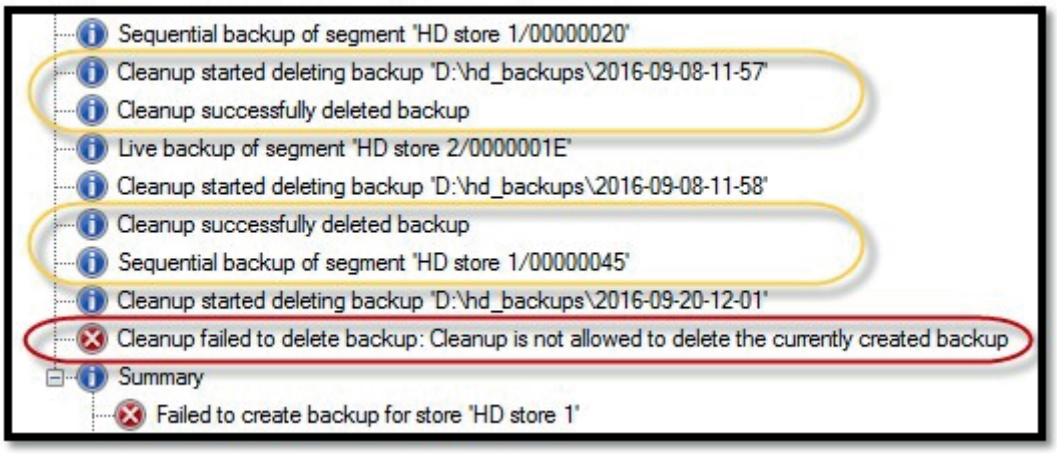
Finally, click <OK> to complete the backup planning.

The progress of the backup is shown in the *Create* tab in the *Active backups* area.

Once the backup is complete, it will be shown below in the *Backup history* area.

Save and open
You can use the toolbar to save your backup planning in a separate XML file or import a planning configuration from a suitable XML file.

Log messages
Messages are entered in the backup log about the clean-up activities



If the size of a single backup exceeds the clean-up limit, then the backup fails immediately before reaching the limit (message highlighted in red in the image above).

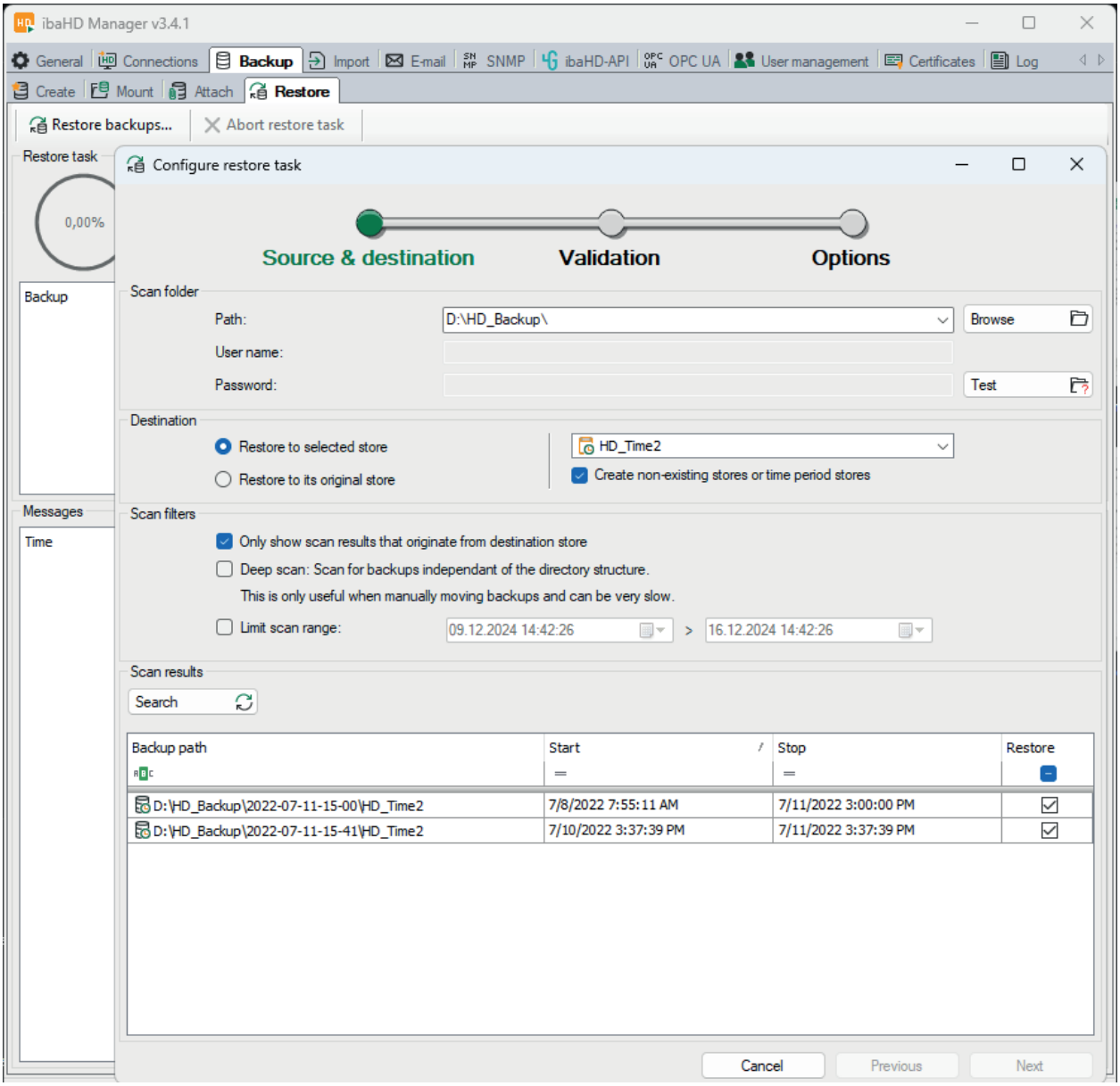
5.3.2 Restore backup

Restoring a backup means that all data in the HD store that covers the same time range as the data from the backup is overwritten by the data from the HD backup. During a backup restore, no other write accesses to the relevant store are possible. Accordingly, the data storage for the respective store is stopped in the *ibaPDA* system. The restoration process is divided into three steps:

- Setting the source & destination
- Validation
- Selecting the options

5.3.2.1 Source & destination

In the *ibaHD Manager*, select the *Backup* tab – follow-up tab *Restore*, button <Restore backups...>.



In the *Configure restore task* dialog, make the necessary settings.

Path, user name, password
Enter the path of the backup file to be restored or select it using the browser. If necessary (network drive), specify a user name and password.

Use the <Test> button to check whether the file path is reachable.

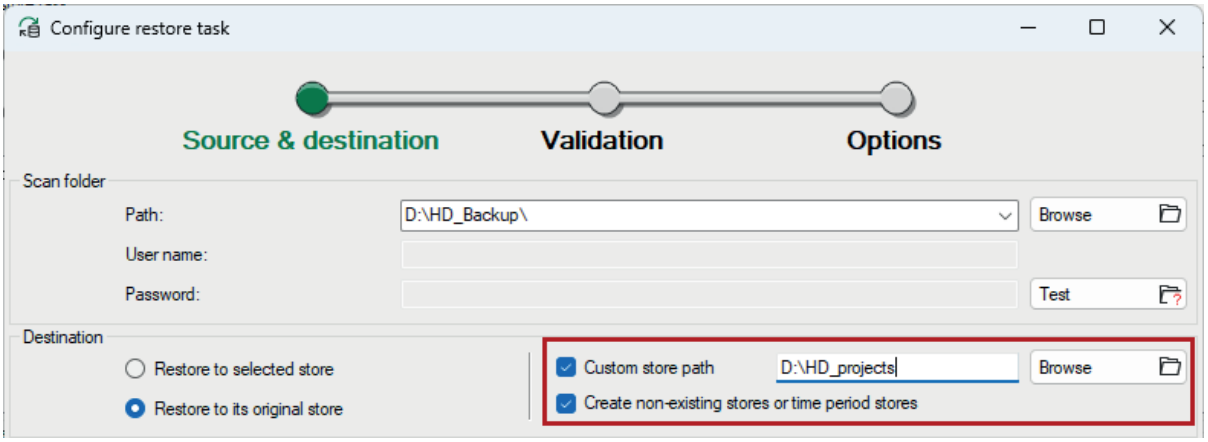
Destination
Select in which store(s) the backup is to be restored.

- Restore to the selected store

  With this selection, you can specifically select an existing store in the field to the right.

- Restore to its original store

  This option is preferred if several stores are contained in one backup. The information about the original store is included in every backup. If the folders contained in the backup do not exist on the *ibaHD-Server*, you can ensure their automatic creation during the restore by activating the option *Create non-existing stores or time period stores*. In the *Custom store path* field, you can select the path in which the store is created. The field only appears if the option *Create non-existing stores or time period stores* is activated.



Search results and search filter
Click the <Search> button to start the search for available backups.

In the *Scan results* table, the backups are listed that exist in the set file path and that correspond to the criteria set under the scan filter.

If you have selected a certain store under the destination, then you can disable the option *Only show scan that originate from destination store*. This option is enabled by default in order to list the backups matching the target.

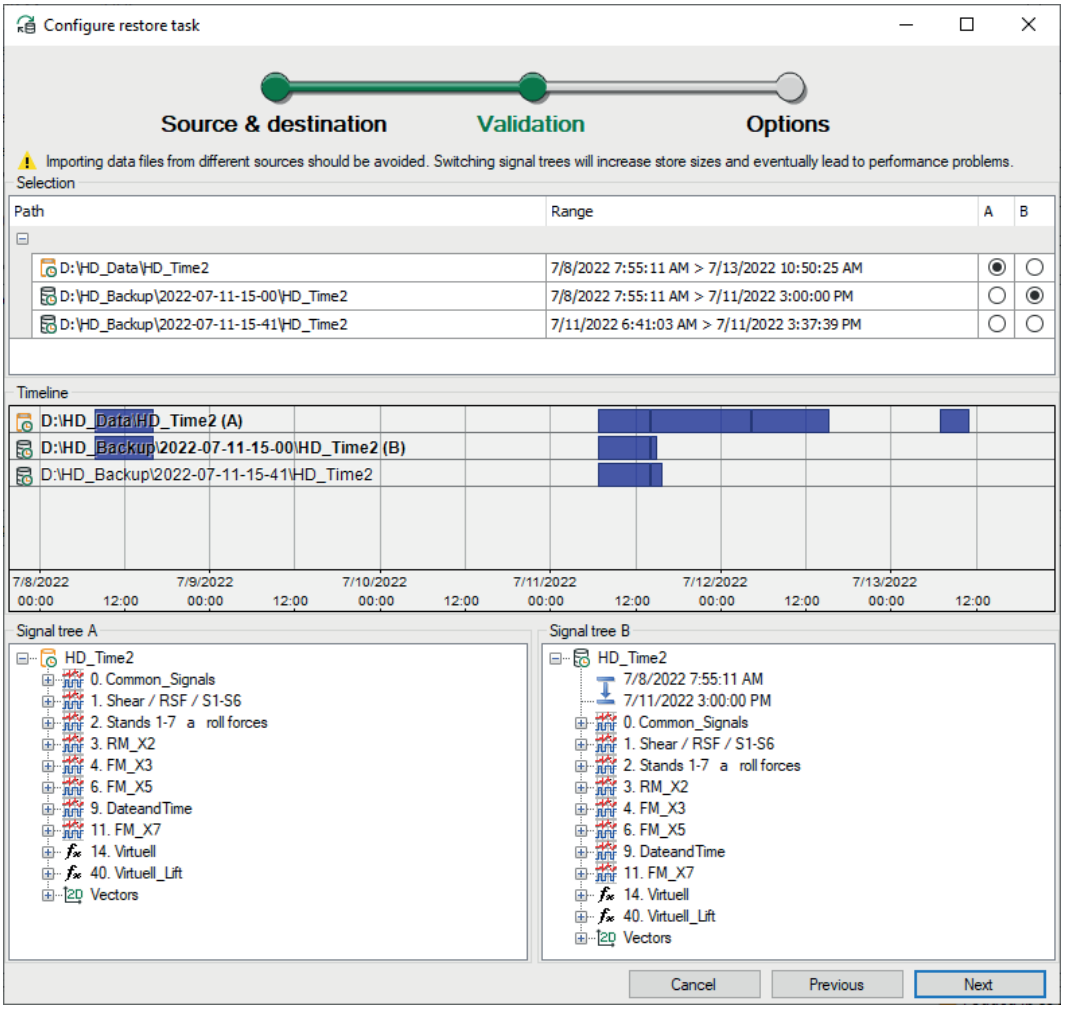
If you have selected the restoration in the original stores under *Destination*, then this option is also enabled.

If many backups are contained in the source directory, the restriction of the time period in the overview helps.

If backups in the search results are not to be restored, remove the check mark in the column *Restore*.

Click on the <Next> button to go to the next step.

5.3.2.2 Validation

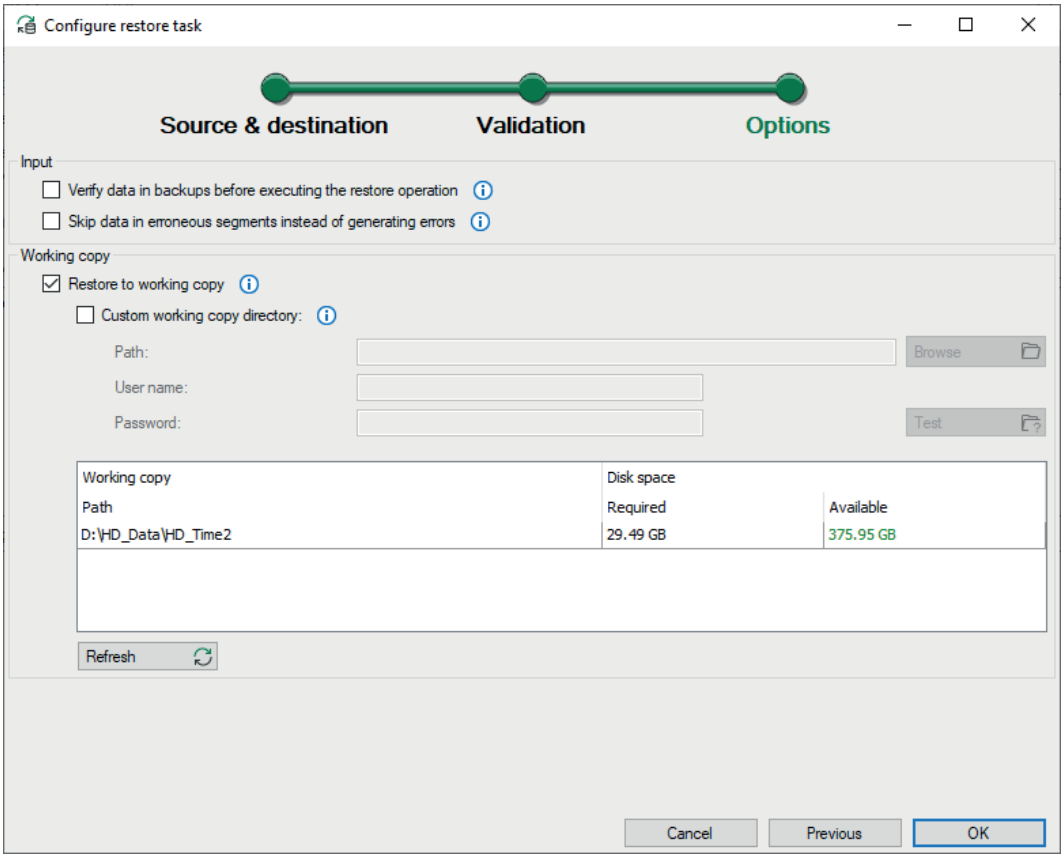


During the validation, the upper part of the dialog shows a table with the destination store and the backups selected in the previous step.

Below this, along a timeline, the databases are shown in a destination store and in the backups as bars. If you position the mouse in the timeline area, you can zoom with the mouse wheel. You can move the time axis with the mouse on the time scale (keep the left mouse button depressed).

In the lower area, there are two signal tree windows A and B. Use the option fields in the columns A and B of the table above to decide which signal tree is shown in it. You can then compare the signal trees and, for example, check whether the backup and destination store match each other.

5.3.2.3 Options



In the last step for the restore, you can only enable or disable the following options.

Input data

Verify data in backups before executing the restore operation
If you enable this option, then the backups are checked before starting the restore. Errors are shown when detected.

Skip data in erroneous segments instead of generating errors
If you enable this option, then warnings are issued instead of errors. Data in faulty segments is skipped, i.e. it is not restored.

Working copy

Restore to working copy
If you enable this option, then a working copy of the respective parts of the target store is created before executing the restore. If the restore should fail, then this option ensures that the data in the target store will be unaffected. The target store is only changed when the backups were successfully added to the working copy.

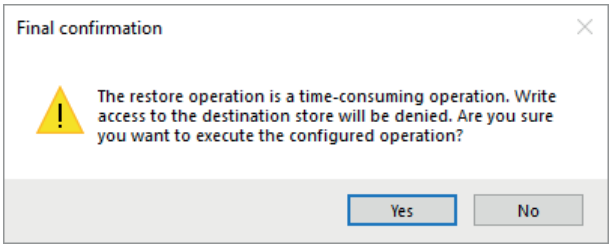
Custom working copy directory
Enable this option if there is no more sufficient memory capacity for the working copy in the destination store. You can then specify a custom directory on which the working copy is to be created. If a UNC network drive is being used, then this network drive must be accessible during the entire restore.

To check whether there is enough space in the working directory you chose, click on the <Refresh> button. The table window displays the path, required memory for the working copy and available memory capacity.

Then click on <OK>.

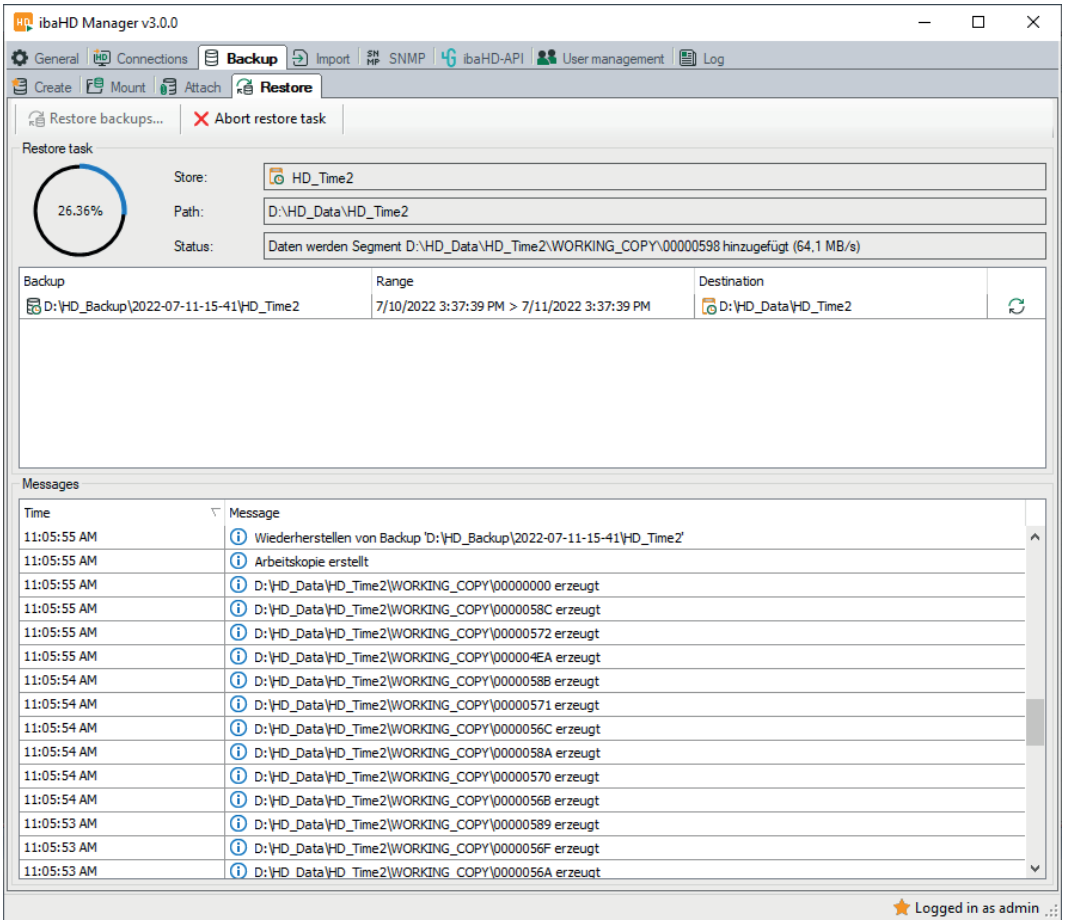
5.3.2.4 Start the restore operation

Before starting the restore operation, a final note is shown that the restore may take some time, during which no write accesses to the target store are possible.



The restore operation starts as soon as you confirm the message by clicking <Yes>.

The progress of the restore operation is logged in the dialog.



5.3.3 Mount backups

With the *Mount backups* function, you can access HD data with read rights without requiring an *ibaHD-Server* license. This allows you to carry out offline analyses of HD data on a computer that does not have a dongle or soft license.

Take the following prerequisites and properties into consideration:

- *ibaHD-Server* must be installed on the computer that you want to use to access the backup. A license is not required.
- An HD store does not need to be configured for this *ibaHD-Server*.
- No HD store with the same name must be active on the computer on which you want to mount the backup.
- If the backup has been mounted to the *ibaHD-Server* using the *ibaHD Manager*, the back-up can be accessed both locally and via the network with *ibaAnalyzer*. The backup on the *ibaHD-Server* appears in the HD query dialog as HD store with the original name of the store from which it was created.
- The mounted backup can be considered as an HD store, but no data or signals can be added. HD queries can be carried out with *ibaAnalyzer*, just like with an active HD store.
- The license counter for the number of configured HD stores in the *ibaHD Manager* is not increased.
- Only one backup of an HD store can be mounted. Additional backups can be attached to a mounted backup.
- Several backups can be mounted if they come from different HD stores.

Note

Change to ibaHD-Server v3.5.0 and higher

In earlier versions of *ibaHD-Server*, only the signal configuration was saved for automatic restoring or mounting after a restart of the *ibaHD-Server* service, not the configuration of the time periods

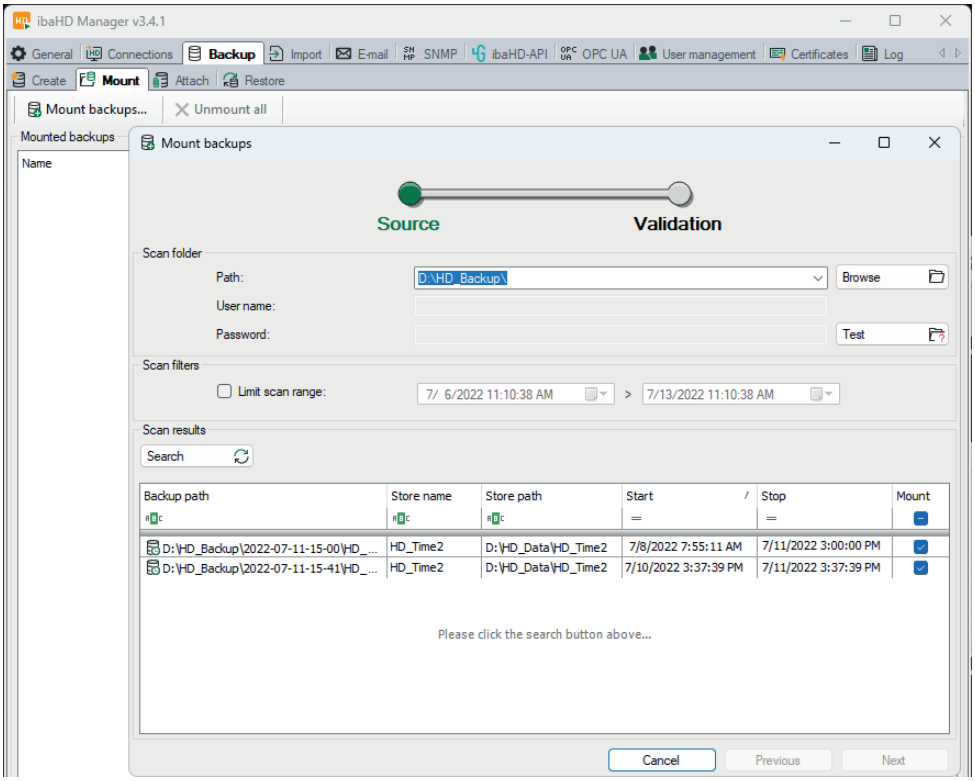
If you want to access time periods in backups that were mounted before *ibaHD-Server* v3.5.0, you must dismount the corresponding backup and then mount it again.

The process of mounting is divided into two steps:

- Setting the source
- Validation

5.3.3.1 Source

In the *ibaHD Manager*, select the *Backup* tab – follow-up tab *Mount* – button <Mount backups...>.



Make the necessary settings in the *Mount backups* dialog.

Path
Specify the path where the backup is located or select it using the browser. If necessary (network drive), specify a user name and password.

Use the <Test> button to check whether the file path is reachable.

Search results and search filter
Click the <Search> button to start the search for available backups.

In the *Scan results* table, the backups are listed that exist in the set file path and that correspond to the criteria set under the scan filter.

If many backups are contained in the source directory, the restriction of the time period in the overview helps.

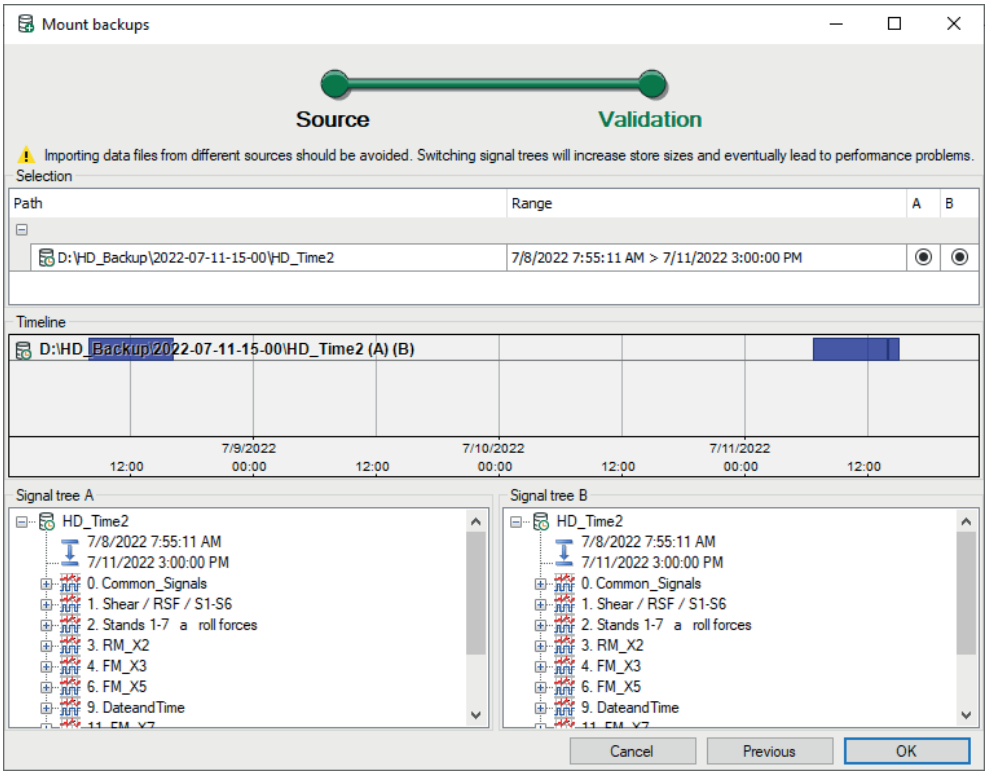
If backups in the search results are not to be mounted, remove the check mark in the column *Mount*.

Note

Only one backup of an HD store can be mounted. If you want to expand the time period of the mounted backups to include additional backups from the same HD store, you must use the “Attach backups” function.

Click on the <Next> button to go to the next step.

5.3.3.2 Validation



During the validation, the upper part of the dialog shows a table with the backups selected in the previous step.

Below this, along a timeline, the databases are shown in the backups in form of bars. If you position the mouse in the timeline area, you can zoom with the mouse wheel. You can move the time axis with the mouse on the time scale (keep the left mouse button depressed).

In the lower area, there are two signal tree windows A and B. Use the option fields in the columns A and B of the table above to decide which signal tree is shown in it. You can then compare the signal trees.

Click <OK> to complete the mounting.

5.3.4 Attach backups

Use the *Attach backups* function to expand the recording time period of an active HD store for analysis purposes.

Example
For instance, suppose the active HD store is configured for a time period of 1 month and you create a monthly backup. To be able to carry out an evaluation of the past quarter anyway, simply attach the last two backups.

During the analysis with *ibaAnalyzer*, this looks like a three-month HD recording.

Take the following prerequisites and properties into consideration:

- The backups that are to be attached may be in a different storage location than the active HD store. Therefore, you can also cover large time periods for which the active storage of the *ibaHD-Server* computer is not configured.
- Backups can be attached to an active HD store as well as to a mounted backup (offline analysis).

Note

Change to ibaHD-Server v3.5.0 and higher

In earlier versions of *ibaHD-Server*, only the signal configuration was saved for automatic restoring or mounting after a restart of the *ibaHD-Server* service, not the configuration of the time periods

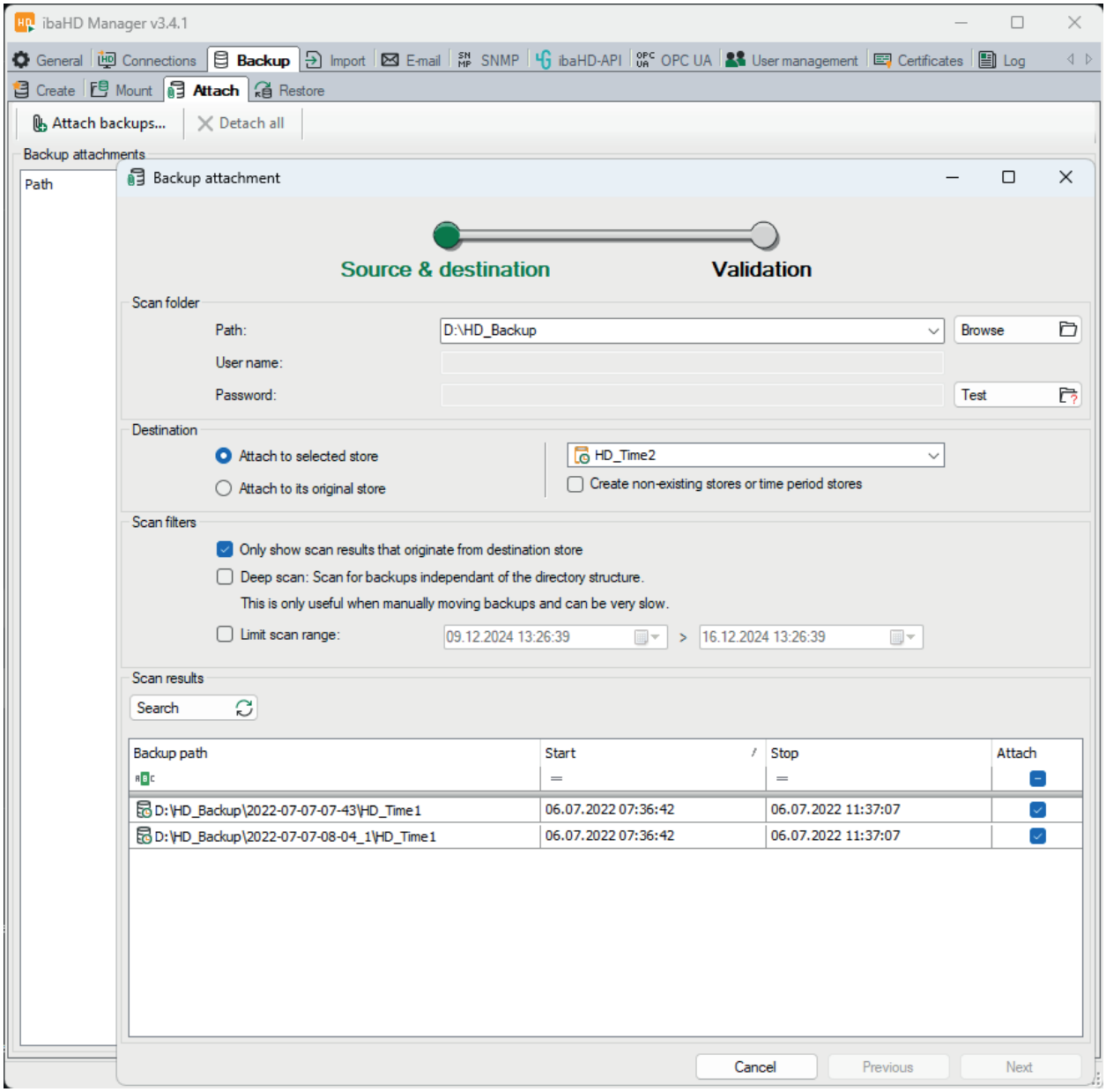
If you want to access time periods in backups that were mounted before *ibaHD-Server* v3.5.0, you must dismount the corresponding backup and then mount it again.

The process of appending is divided into two steps:

- Setting the source
- Validation

5.3.4.1 Source

In the *ibaHD Manager*, select the *Backup* tab – follow-up tab *Attach* – button <Attach backups...>.



Make the necessary settings in the *Backup attachment* dialog.

Path, user name, password
Specify the path where the backup to be appended is located or select it using the browser. If necessary (network drive), specify a user name and password.

Use the <Test> button to check whether the file path is reachable.

Destination
Select to which store(s) the backup is to be attached. The destination store can also be a mounted backup.

- Attach to selected store

  With this selection, you can specifically select an existing store in the field to the right.

- Attach to its original stores

  This option is preferred if several stores are contained in one backup. The information about the original store is included in every backup. If the folders contained in the backup do not exist on the HD server, you can activate the option *Create non-existing stores or time period stores* to ensure that they are created automatically during the attachment process.

Search results and search filter
Click the <Search> button to start the search for available backups.

In the "Scan results" table, the backups are listed that exist in the set file path and that correspond to the criteria set under the scan filter.

If you have selected a certain store under the destination, then you can disable the option *Only show scan that originate from destination store*. This option is enabled by default in order to list the backups matching the target.

If you have selected the attaching to the original stores under the destination, then this option is also enabled.

If many backups are contained in the source directory, the restriction of the time period in the overview helps.

If backups in the search results are not to be appended, remove the check mark in the column *Attach*.

Click on the <Next> button to go to the next step.

5.3.4.2 Validation

During the validation, the upper part of the dialog shows a table with the backups selected in the previous step.

Below this along a timeline the databases are shown in the backups as bars. If you position the mouse in the timeline area, you can zoom with the mouse wheel. You can move the time axis with the mouse on the time scale (keep the left mouse button depressed).

In the lower area, there are two signal tree windows A and B. Use the option fields in the columns A and B of the table above to decide which signal tree is shown in it. In this way, you can compare the signal trees and, for example, check whether the backups match each other.

5.4 Import

In the *Import* tab, you have the option of importing data files in DAT format into an HD store. In this way you can also transfer older databases that were already archived before the introduction of *ibaHD-Server* to an HD store in order to benefit from the HD functions. See ↗ *Importing data files, page 73*

Note

You can automate the import of data files using *ibaDatCoordinator* (v2.0 or higher). With an HD import task, *ibaDatCoordinator* monitors the directory to which the data files are written. After completing a data file, *ibaDatCoordinator* starts the import into the configured HD store.

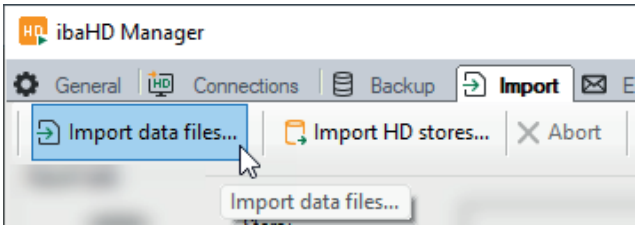
For more information on configuring HD import tasks, please refer to the *ibaDatCoordinator* documentation.

You also have the option of migrating HD stores from one HD server to another HD server. This may be necessary for technical reasons, for example. See ↗ *Migrating HD stores, page 80*.

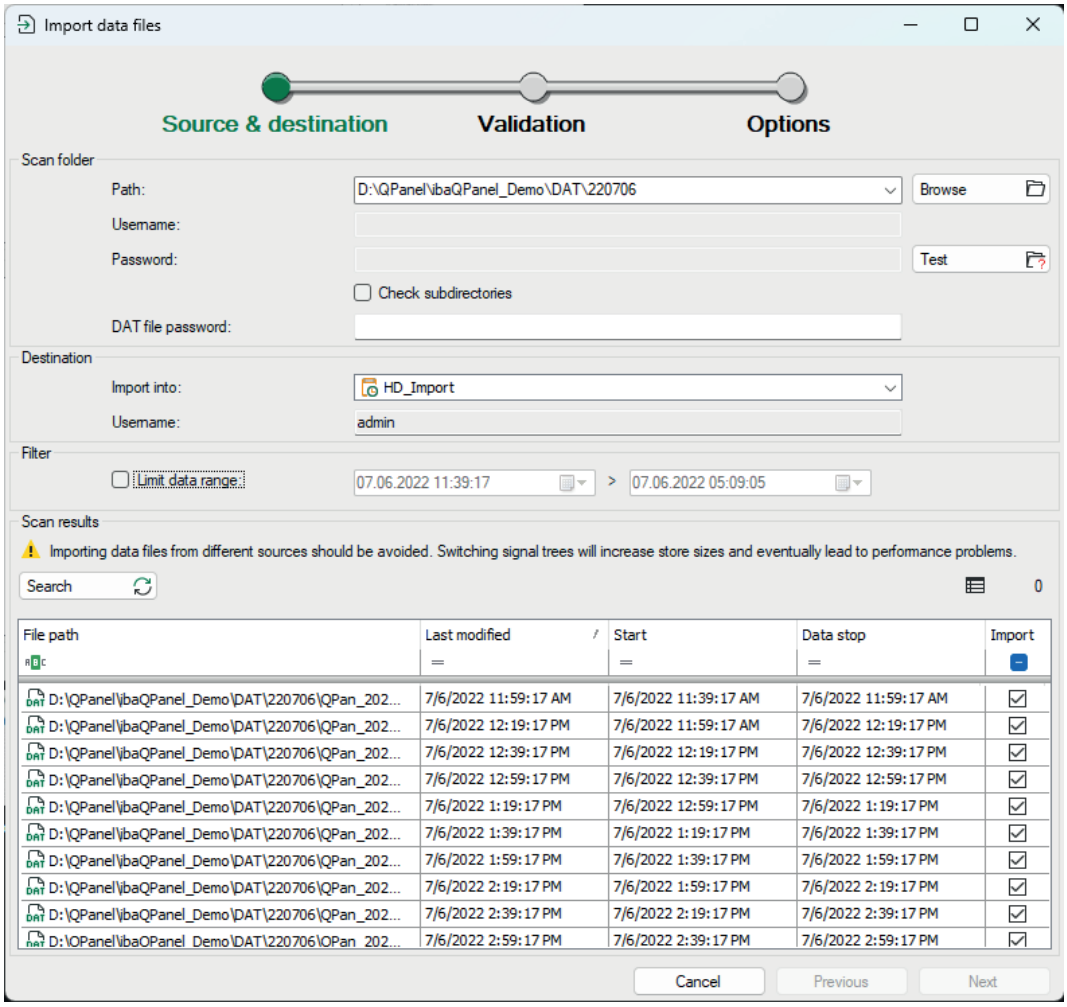
5.4.1 Importing data files

In the following, you will learn how to import data files into an HD store. You can only import data files into time-based HD stores. It is possible to import while HD data recording is running.

1. In *ibaHD Manager*, select the *Import* tab and then <Import data files>.



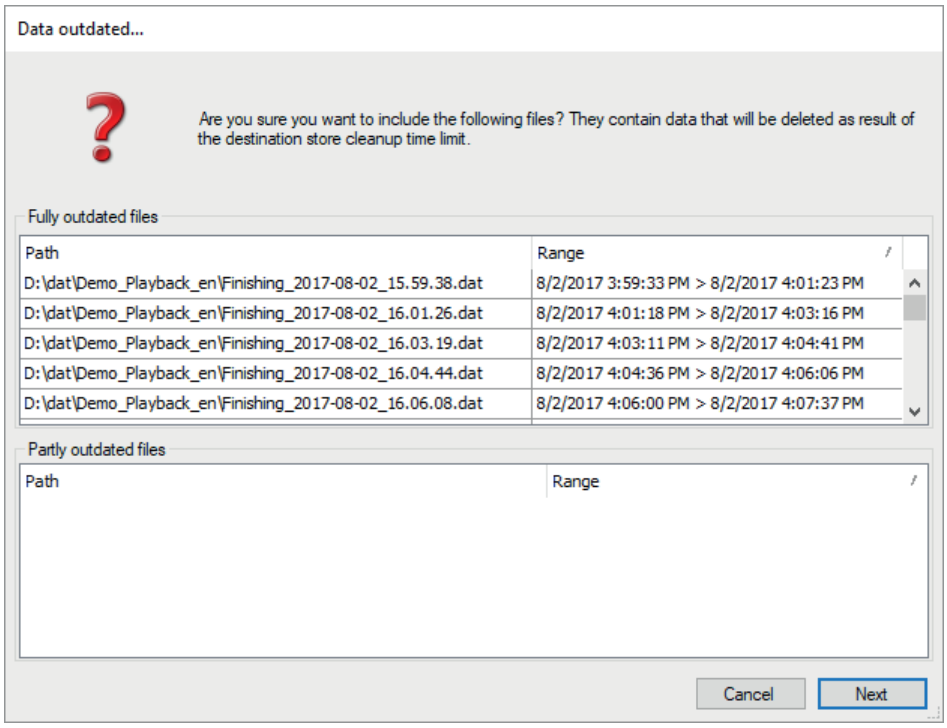
→ The import wizard opens and shows the settings for *Source & destination*.



2. Make the settings for the source and destination of the data files, see ↗ *Data file import – Set source & destination, page 77*.
3. To continue, click on <Next>.

Note

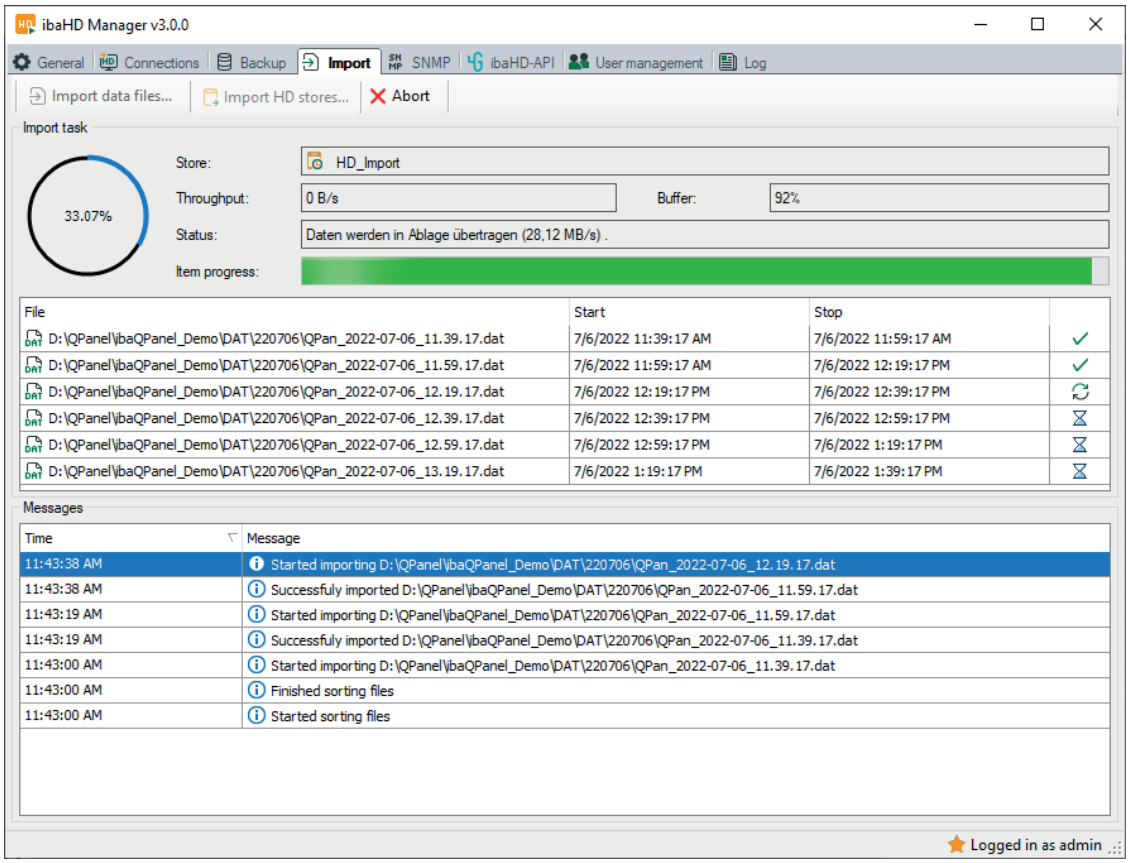
A note may already appear at this point that the selected DAT files come from one time range, which is before valid maximum time range of the HD store.



Changing the time limit in the HD store configuration may solve the problem.

4. Check the validated data, see ↗ *Data file import – Validation, page 77*.
5. To continue, click on <Next>.
6. Enable further options if required, see ↗ *Data file import - Options, page 78*.
7. To start the Import click on <OK>.

→ A dialog shows the percentage progress of the import.



During the import, you can interrupt the import process at any time with <Abort>. Partial imports that have already taken place will not be reversed.

In addition to the actual value of the data throughput in B/s, the fill level of the buffer memory is also indicated in %. If the buffer reaches a fill level of 100 %, the import pauses until the buffer fill level has fallen below 50 % again.

The table in the middle shows the data files to be imported, with the status of the import displayed in the right-hand column.

- Green check mark: Import successfully completed
- Blue arrows: File is currently being processed
- Red cross: Import failed

You will find the log messages at the bottom of the dialog.

5.4.1.1 Data file import – Set source & destination

Make the following settings in the *Source & destination* dialog for the data file import.

1. Enter the *path* of the data files to be imported and, if required (network drive), the *User-name* and *Password* .
   - If the data files are stored in a folder structured in additional subdirectories, activate the *Check subdirectories* option so that all data files are recorded.
   - If the data files are protected by a password, enter the *DAT file password* as well.

   Use the <Test> button to check whether the file path is reachable.
2. In the *Destination* area, select the HD store to which the files are to be imported.

   All active HD stores of the HD server are shown. If the HD store is protected by a password, enter the user name and password here.
3. If necessary, limit the data range under *Filter* .

   This is helpful, for example, if the source directory contains a large number of data files. Only .dat files from the set time are then shown.
4. To start the search for existing data files, click on <Search>.

→ In the "Scan results" table, the data files are listed that exist in the set file path and that correspond to the criteria set under the *Filter*.

→ You can see the number of files found above the table.

→ All data files are opened in the background and the most important information is read out, such as the start and end time. Depending on the number and storage location, the search may therefore take some time, especially if the files are located on a network drive.

5. In the *Import* column, select the data files to be imported.
6. To continue with the validation of the data, click on <Next>.

→ The *Validation* dialog opens, see ↗ *Data file import – Validation, page 77*.

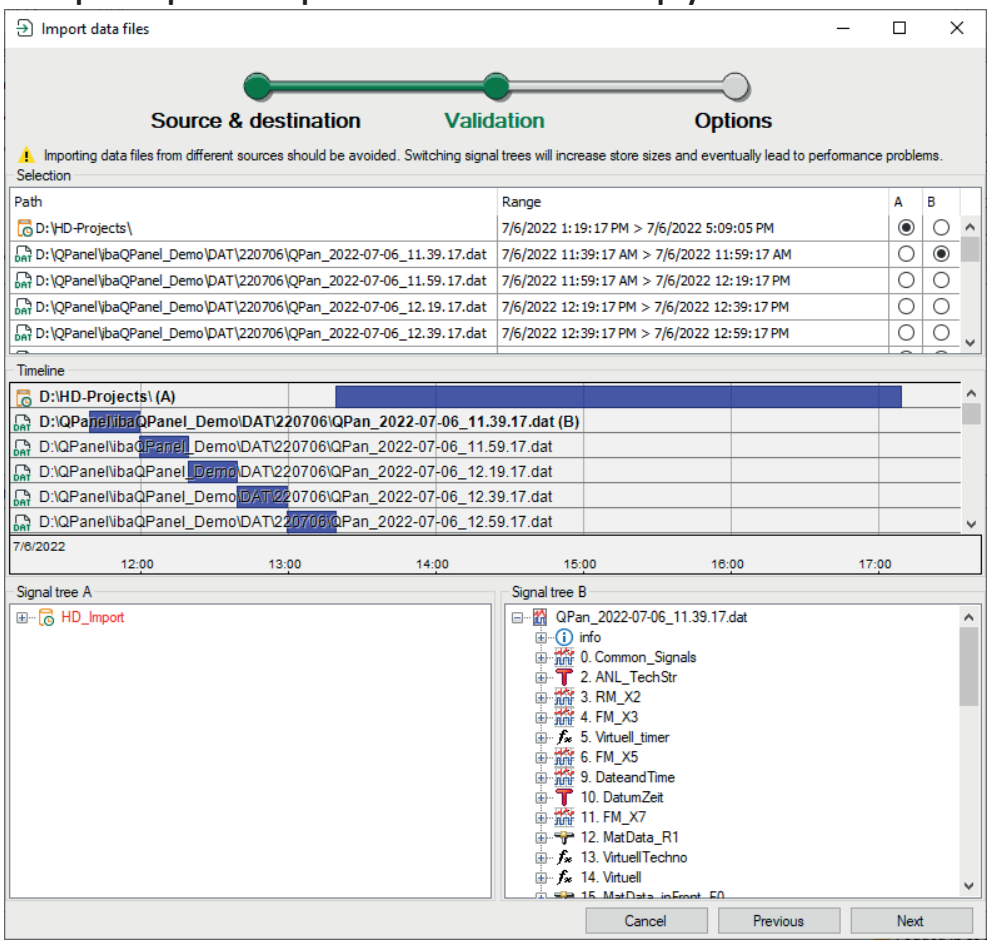
5.4.1.2 Data file import – Validation

During validation, the upper part of the dialog shows a table with the destination store and the data files selected in the previous step, see ↗ *Data file import – Set source & destination, page 77*.

Below, the databases in the destination store and in the backups are displayed as bars along a timeline. If you position the cursor in the timeline area, you can zoom with the mouse wheel. You can move the time axis with the cursor on the time scale by holding down the mouse button.

There are two signal tree windows A and B in the lower area. You decide which signal tree is displayed using the option fields in columns A and B of the table above. This allows you to compare the signal trees and check, for example, whether the data file and destination store match. Differences between the signal trees are highlighted with red font.

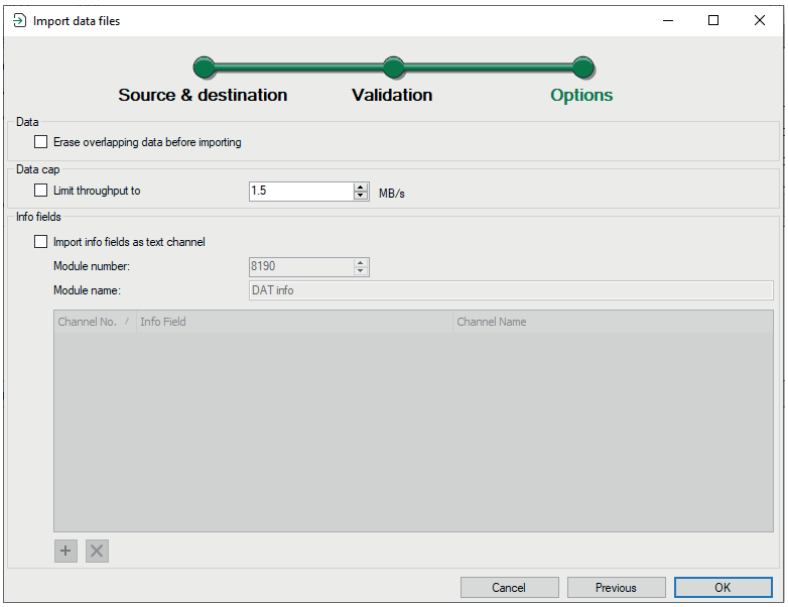
Example: Import multiple data files into a still empty HD store



To continue with the import, click on <Next>.

5.4.1.3 Data file import - Options

You can enable or disable further settings for the import of data files in the *Options* . For further information on the import see ↗ *Importing data files, page 73*.

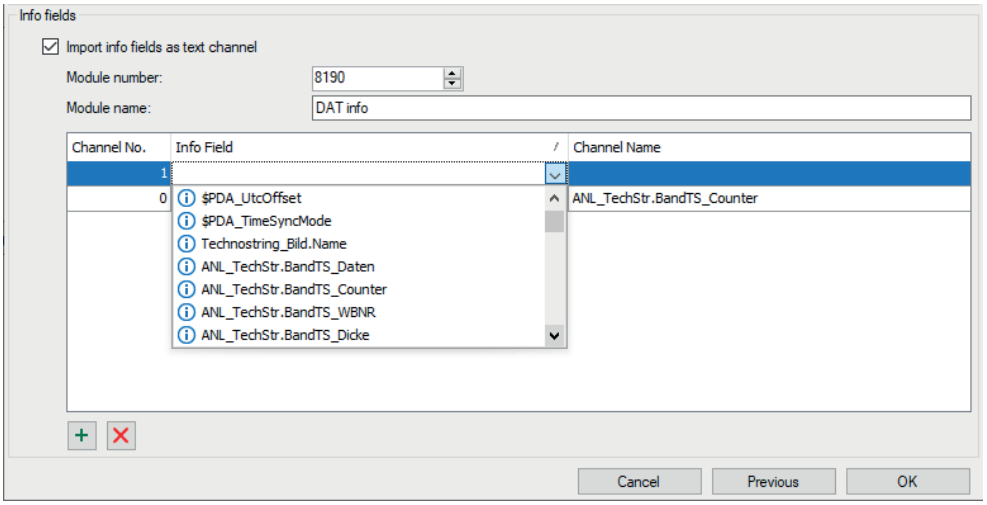


Erase overlapping data before importing
If enabled, all data in the HD store that overlaps with the data in the data file is removed before the import is executed.

If deletion is required, no write processes are possible in the HD store during this time. Therefore, only enable the option if there is no online recording by *ibaPDA* on the relevant HD store.

Limit throughput to ... MB/s
If enabled, the data throughput during import is limited to the set value. This can be useful if data from online acquisition is written to the relevant destination store at the same time.

Import info fields as text channel
If enabled, you can convert info fields from the data file into text channels and assign them to a module with the set number and name.



You can freely select the module number and module name. The module number may not already be contained in the data file.

To create a text channel, proceed as follows:

1. Click the <+> button.
2. Open the drop-down list in the *Info field* column and select the desired info field. The system's own info fields as well as all configured text channels are displayed.
3. If required, you can also give the text channel a plain text name in the *Channel name* column, under which the text channel is managed in the HD server.

5.4.2 Migrating HD stores

In the following, you will learn how to migrate HD stores from one HD server to another HD server. The migration is started and executed on the destination HD server, while the source HD server is controlled remotely.

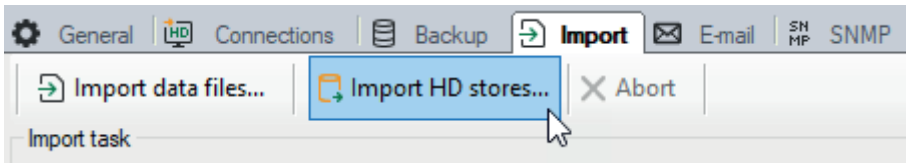
To avoid data loss during the migration, stop the *ibaPDA* data recording that writes to the store to be migrated.

Prerequisites:

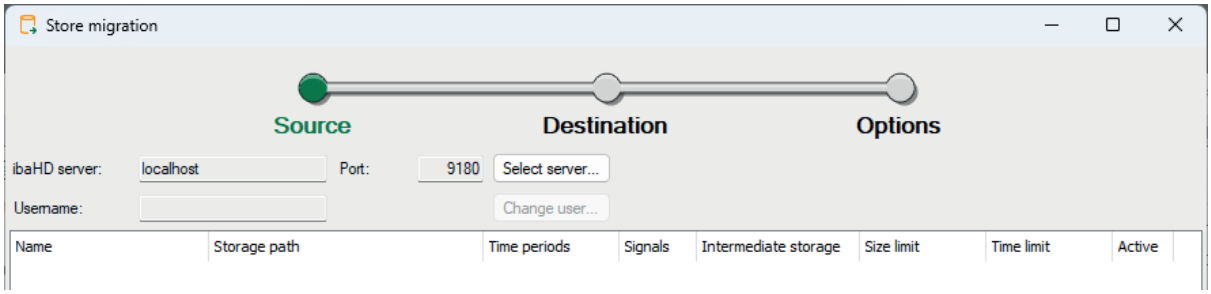
- *ibaHD-Server* has version 3.6.0 or higher on both the source computer and the destination computer.
- Sufficient storage space is available on the destination HD server for the HD stores.

Procedure:

1. Select *ibaHD Manager – Import* tab – <Import HD stores>.



→ The import wizard opens and shows the settings for the *Source*.



2. To select the source HD server, click on <Select server>.

→ The server selection dialog opens.

3. Select the desired HD server and confirm with <OK>.

→ The available time-based HD stores of the source HD server are displayed in the table.

4. Select the HD store you want to display.
5. To continue, click on <Next>.

→ The settings for the *Destination* are displayed.

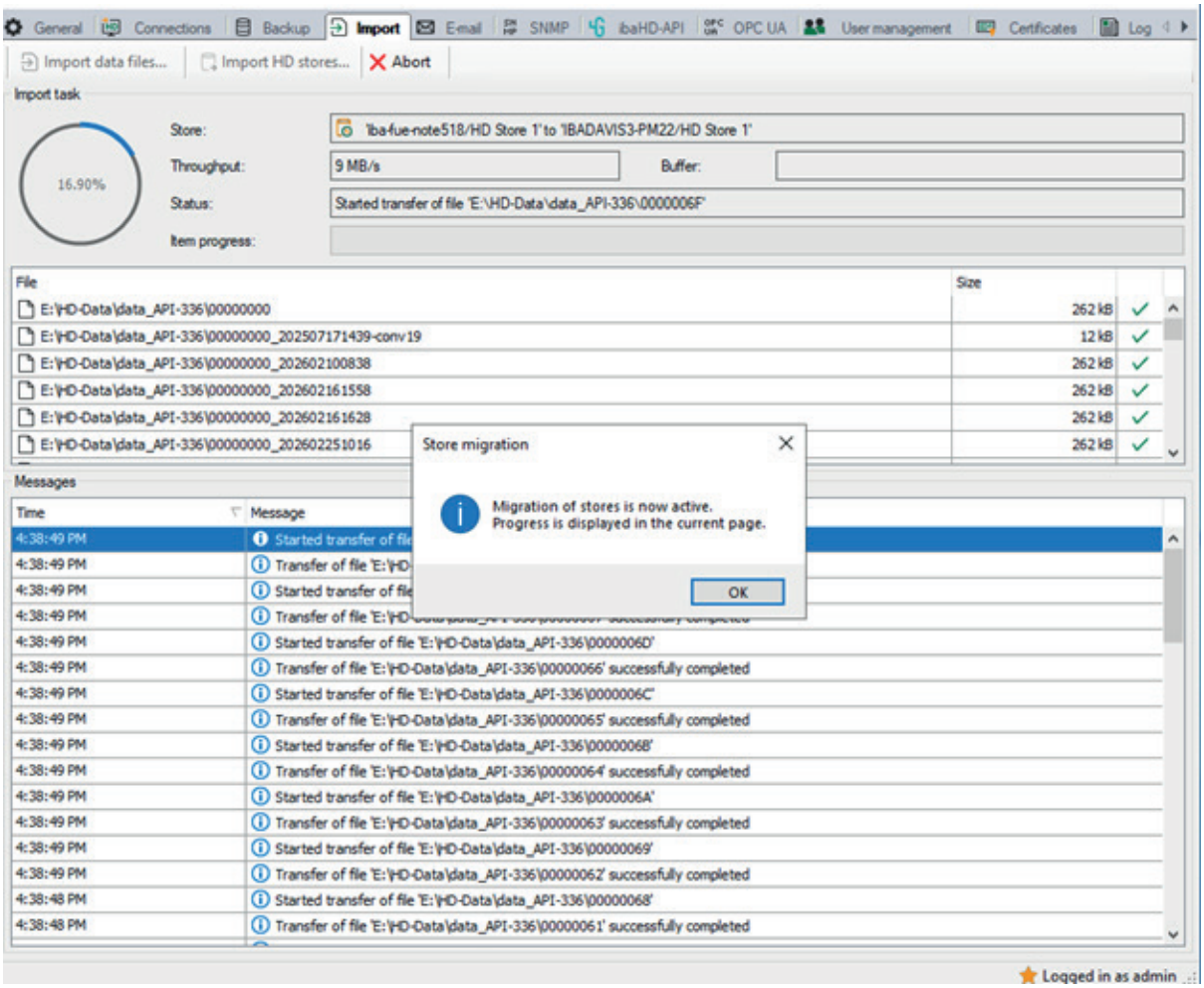
6. Make the settings for the destination HD server, see ↗ *HD store migration – Destination settings, page 82*.
7. To continue, click on <Next>.

→ The configuration is validated and the result is displayed in a window.

8. In the event that connection problems occur during the migration, optionally enter the maximum number of transfer attempts per file.

9. To start the migration, click <OK>.

→ A dialog shows the progress of the import.



During the migration, the *ibaPDA* server cannot write any data to the source HD store. The store on the source HD server is deactivated.

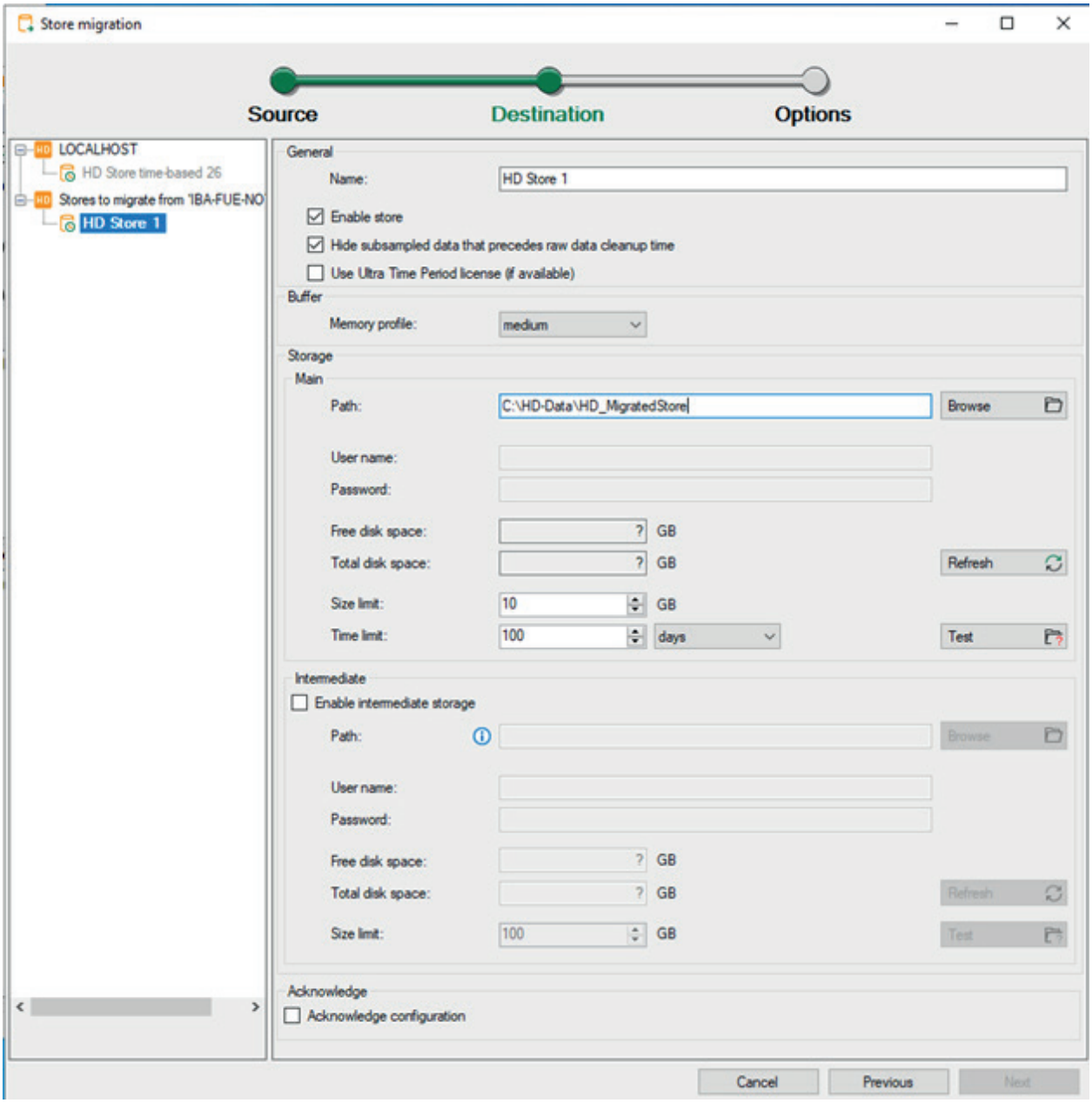
All data in the HD store is transferred during migration. An intermediate store configured on the source side is migrated to the main store before the migration.

After successful migration, you will find the HD store and associated data under the configured and available stores on your computer, see ↗ *HD stores, page 34*.

10. Finally, adjust the configuration in *ibaPDA* and establish a connection to the new HD server there, see ↗ *Select ibaHD-Server and HD store, page 127*.

5.4.2.1 HD store migration – Destination settings

If you import HD stores, you can edit and confirm the configuration of the individual HD stores in the *Destination* dialog.



Under *LOCALHOST* in the tree, you can see the HD stores currently available on the HD server, and under the *Stores to migrate from ...* node, you can see the HD stores previously selected in the *Source* dialog that are to be imported.

As soon as you select one of the stores, you will see the corresponding configuration.

1. Select the HD stores to be imported one after the other.
2. Check the configuration and confirm it with *Acknowledge configuration*.

   The settings correspond to those of the store configuration, see ↗ *Configuring HD stores, page 36*.

   Carry out this step for each of the HD stores to be imported.

3. To continue with the migration, click on <Next>, see ↗ *Migrating HD stores, page 80*.

5.5 E-mail

The e-mail function enables *ibaHD-Server* to send e-mails to defined recipients, for example to notify them of status changes. Sending e-mails is triggered by various predefined events or status changes. If you click the <E-Mail Configuration> button, you have the following options:

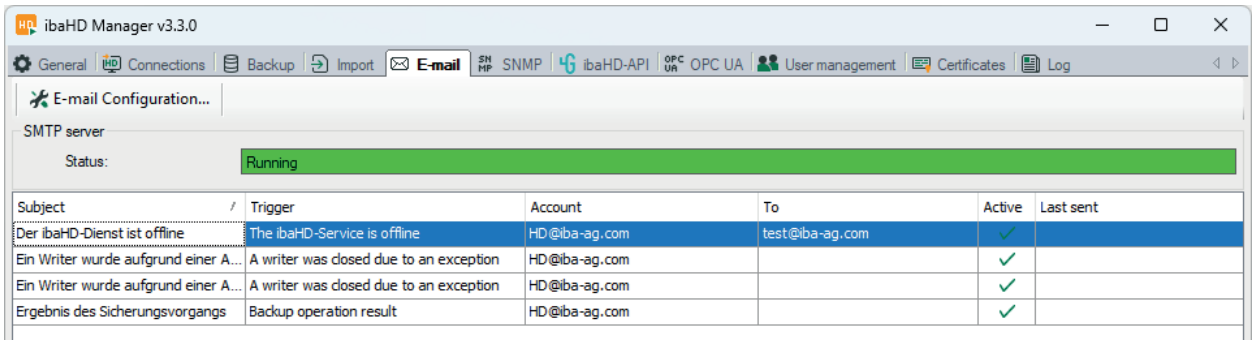
- Enable or disable the e-mail function

  To do this, activate or deactivate the *Enabled* option in the *General – SMTP server* tab.

- Set up e-mail accounts, see ↗ *E-mail accounts, page 84*.
- Configure triggering events and messages, see ↗ *Messages, page 85*.

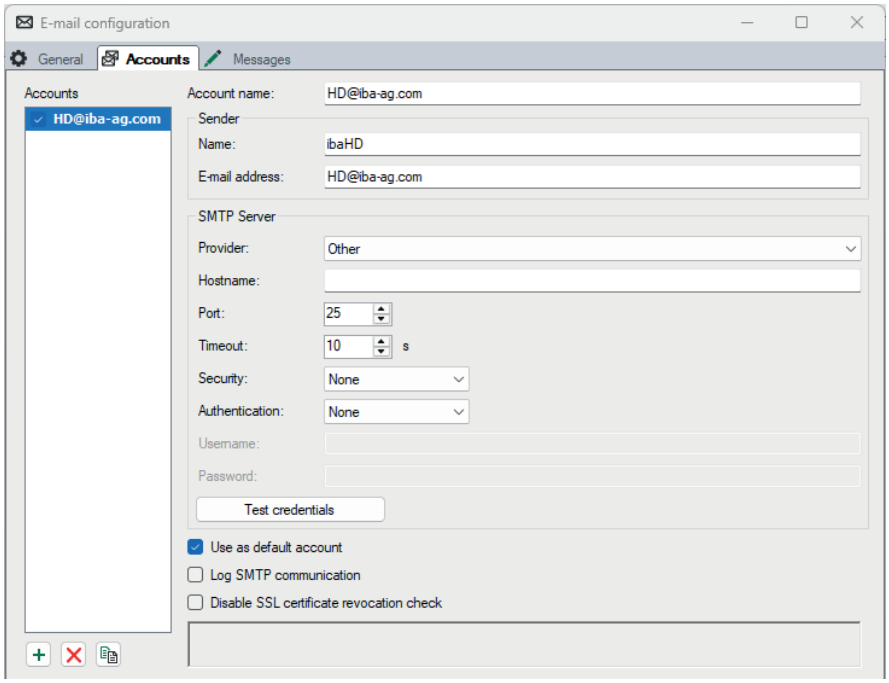
The status information indicates whether the e-mail client is enabled or not.

The table shows the configured e-mail notifications, with information about the subject, trigger, sender e-mail account, recipient address, and time last sent.



5.5.1 E-mail accounts

You can use the *Accounts* tab to configure the e-mail accounts to be used for sending e-mails.

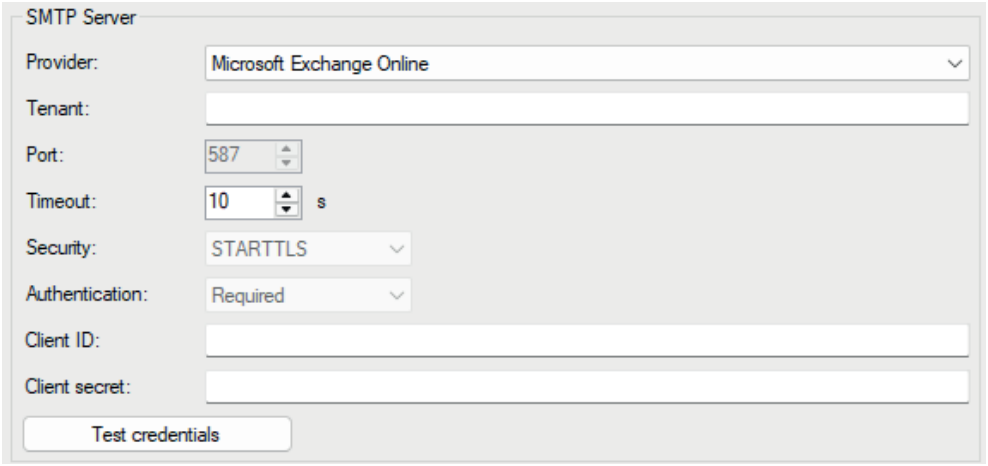


Use the <+> button to add an account and enter the required account name, sender, and SMTP server information. You can check the connection to the e-mail server with the <Test credentials> button.

If available, you can also configure and use multiple accounts.

OAuth2 for Microsoft Exchange

To use OAuth2, select the "Microsoft Exchange Online" option as the *Provider* and enter the necessary information for the *Tenant*, *Client ID* and *Client secret*.



The details must correspond to the configuration under Microsoft.

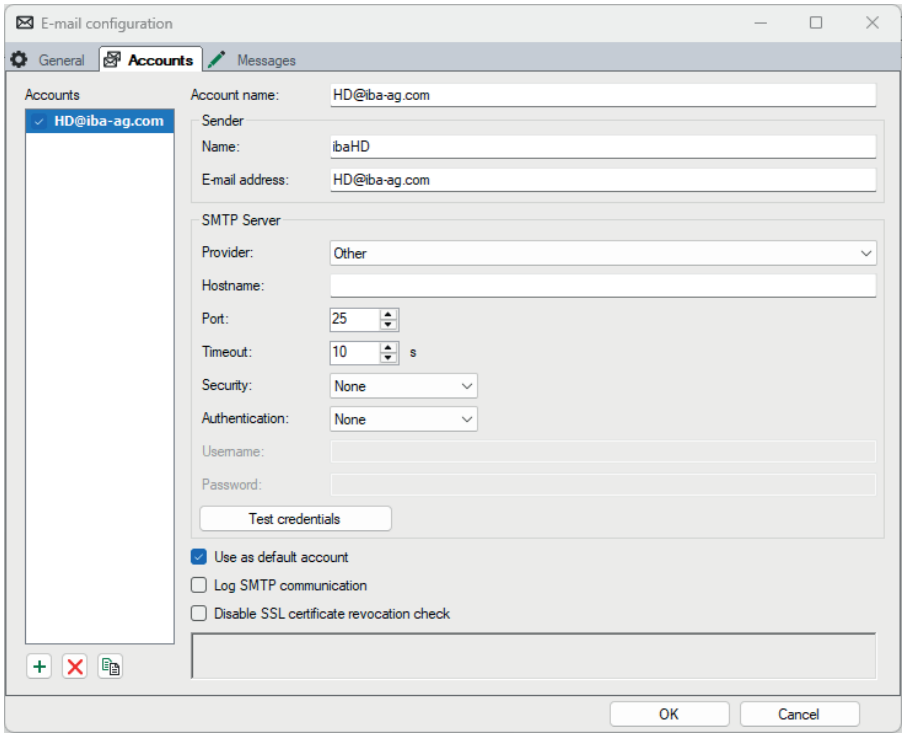
Other documentation

Detailed information on registering apps in Microsoft Entra ID can be found at https://learn.microsoft.com.

You can check the connection to the e-mail server using the <Test credentials> button.

5.5.2 Messages

You can use the *Messages* tab to configure messages to be sent, and the associated triggering events.



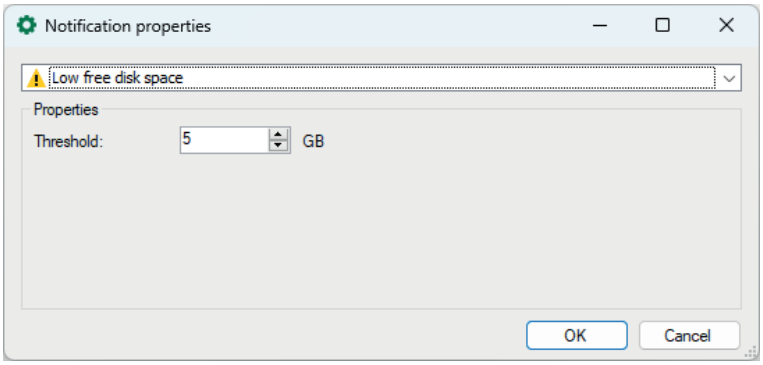
Select the sender account and enter the default information, such as recipient, CC, BCC, and subject.

Under *E-mail trigger*, select the event that will trigger sending of the e-mail. You can choose from:

- A client that is writing to the *ibaHD-Server* has been terminated due to an exception.
- 3 server exceptions in the last 60 minutes (configurable)
- 3 server warnings in the last 60 minutes (configurable)
- Low available disk space (configurable)
- License notifications
- The ibaHD service is offline
- The ibaHD service is online
- Result of backup process

- The file for a segment no longer exists.
- Files have been moved to the "UNKNOWN_DATA" folder.

Additional parameters, such as limits, can be specified for the configurable *e-mail triggers*. Clicking on the button opens the *Notification properties* dialog box.



E-mail trigger	Properties
A writer was closed due to an exception	-
3 server exceptions in the last 60 minutes	*Limit, range*: You can specify the number of server exceptions and the time range in minutes.
3 server warnings in the last 60 minutes	*Limit, range*: You can specify the number of server warnings and the time range in minutes.
Low available disk space	*Limit*: The notification is sent if the available disk space falls below the specified limit.
Segment removed from index	-
File(s) moved to 'UNKNOWN_DATA'	-

The *Text* field contains a placeholder [TRIG_MSG], which is filled automatically depending on the selected *e-mail trigger*. However, you can also enter custom text.

A dead time (default 60 s) prevents the e-mail being sent multiple times if the trigger signal occurs multiple times in a short period of time.

You can use the *Retry interval* and *Total retry time* settings to determine the intervals after which and for how long in total failed sending of an e-mail is retried.

Enabling the *Flag retries with [Delayed message...] in subject* option means that this note is automatically entered in the subject line if the e-mail could only be sent after multiple attempts.

The <Send test e-mail> button allows you to send the e-mail without the *e-mail trigger* having occurred.

5.6 SNMP

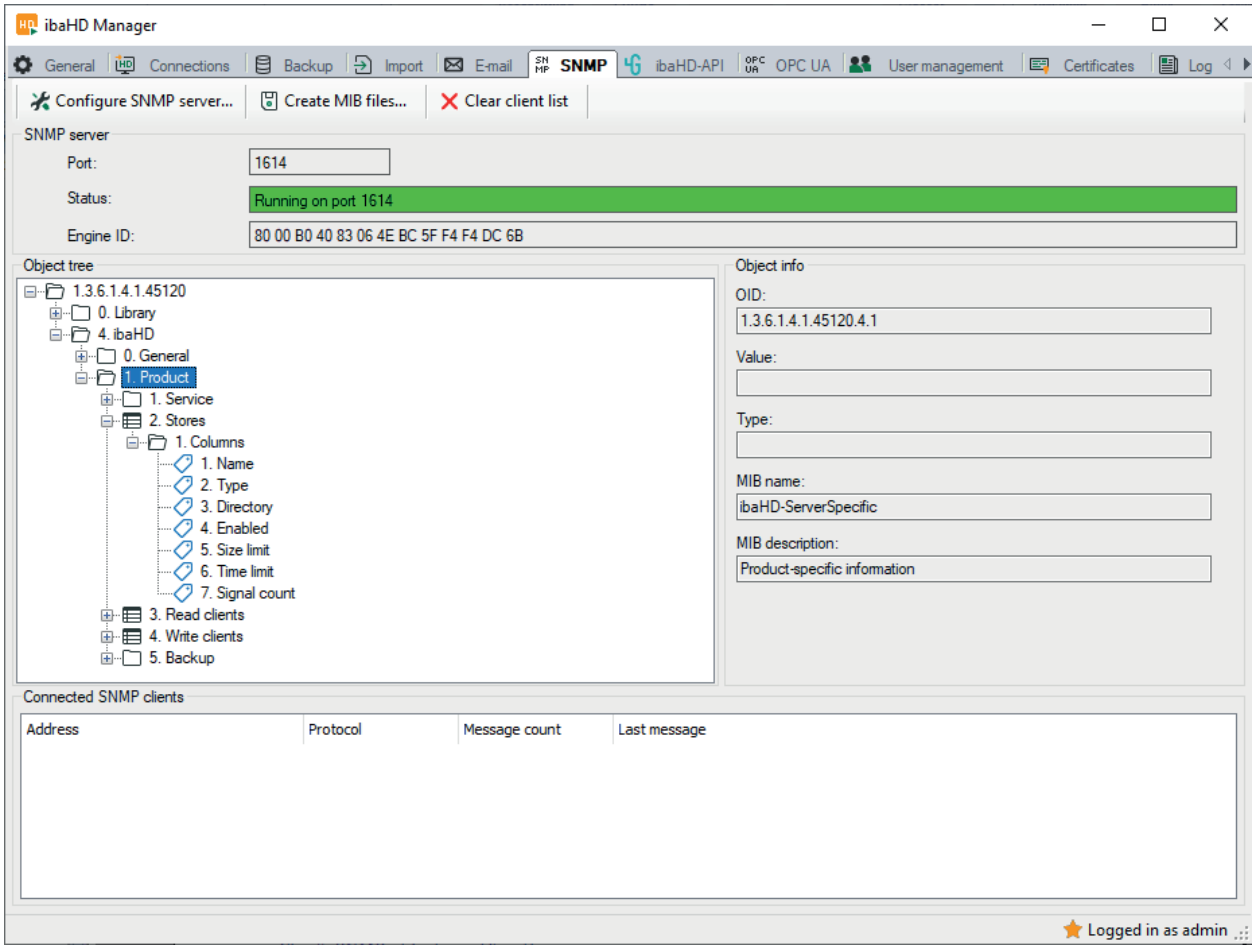
ibaHD-Server has an integrated SNMP server.

SNMP (Simple Network Management Protocol) was developed to monitor and control network elements (e.g. router, switches, printers, computers) from a central station. Using the SNMP server, the *ibaHD-Server* system can be monitored by a network monitoring tool such as the Paessler PRTG or Nagios. SNMP versions V1, V2c and V3 are supported.

The SNMP function can be enabled and disabled in the *ibaHD Manager*. In addition, the MIB files required for the SNMP clients can be created. The information provided by the SNMP server by default includes information about the following among other aspects:

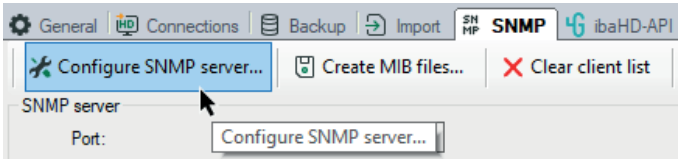
- License
- HD server service
- HD stores
- Reading clients
- Writing clients
- Backups

Which information specifically is provided can be found in the object tree in the *SNMP* tab:

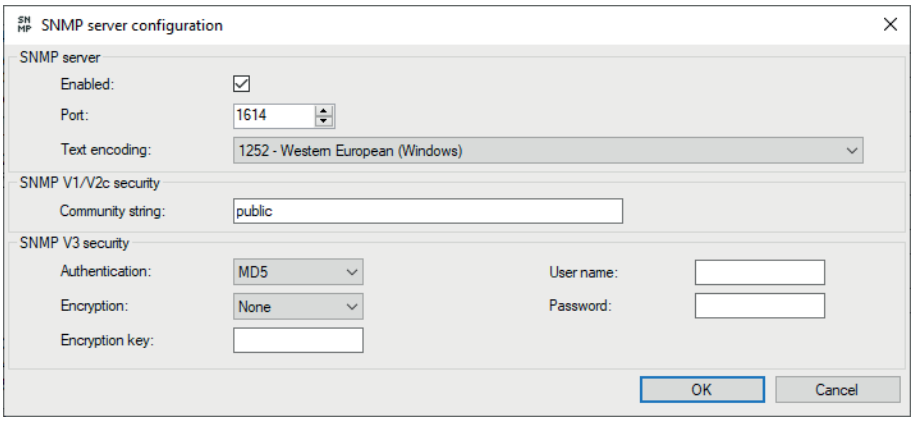


5.6.1 Enable and configure SNMP server

In the *ibaHD Manager*, *SNMP* tab, select the menu button *Configure SNMP server…*.



In the *SNMP server configuration,* make the necessary settings.



Enabled
Here you can enable and disable the SNMP server.

Port
Here you can specify the port over which the SNMP server will communicate. The default value is 1614.

Text encoding
Set the appropriate text encoding for the correct appearance of the characters here. The default setting is 1252 – Western European (Windows).

SNMP V1/V2c security

Community string
In the log versions V1 and V2c, only a community string can be submitted for authentication. This serves as a password for the data transfer between the SNMP server and SNMP client. The default value for the community string is "public."

SNMP V3 security

Authentication, user name, password
In log version V3, the security standards are more stringent whereas there are multiple methods available for authentication and encryption. Two standards are supported for user registration:

- MD5 (message digest algorithm 5, hash function, 128-bit)
- SHA (secure hash algorithm, SHA1 class, hash function, 160-bit)

In addition to selecting the registration algorithm, you must also enter a user name and password.

Encryption, encryption key
In terms of encryption, you will have the following options:

- None
- DES (Data Encryption Standard)
- AES (Advanced Encryption Standard)

In addition to selecting the authentication type, you must also enter a key.

Note

The best way is to clarify with your network administrator which settings are to be made here. Ensure that the port set is not already used by any SNMP servers running on the computer.

5.7 ibaHD-API

The ibaHD API interface allows external systems to query historical data and events from the HD stores.

The current ibaHD-API configuration is displayed in the *ibaHD-API* tab:

API version	Displays the current API version
Port	Port number for *ibaHD-API* communication
Status	Current API status
TLS certificate	Fingerprint of the currently used TLS certificate
Call history	List of connected gRPC clients since start of ibaHD-Server service

Other documentation

A detailed description of the ibaHD API interface can be found in the ibaHD-API manual.

5.8 OPC UA

ibaHD-Server has an OPC UA server module, which provides a read interface. An *ibaHD-Server OPC UA Server+* license is required to use it. This enables data from timebased HD stores to be published as OPC UA objects.

Without this license, only status information can be queried. The status information can be seen under the *HD Server Info* node on the *Tags* tab. The data nodes cannot be changed.

Connected OPC UA clients can subscribe to signal data, i.e. receive current data cyclically, and also request historical data over a particular time range.

The OPC UA server supports multiple endpoints and different security and logon policies. For example, this means that OPC UA clients can connect to a particular *ibaHD-Server* user.

OPC UA server communication is secured by certificates. The certificates are managed on the *Certificate*s tab in the ibaHD Manager.

You can configure the OPC UA server settings on the *OPC UA* tab in the ibaHD Manager. The *OPC UA* tab contains status information, connection information, and the configuration.

Signal behavior of the interface

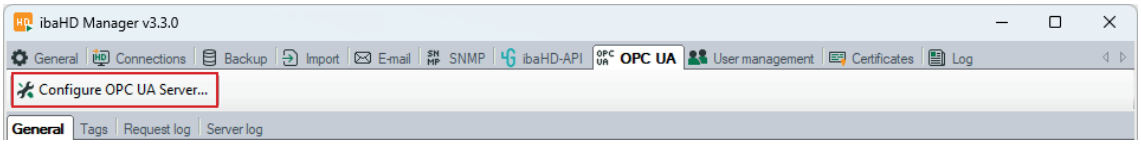
Changes to signals that originate from *ibaPDA* are carried in *ibaHD-Server* via the OPC UA interface. Changes to the signal tree such as signal name, signal number or module number are updated automatically.

Changes to the comment fields are only reinitiated when the *ibaHD-Server* service is restarted.

Signal-related units are currently not transmitted via the OPC UA interface.

5.8.1 OPC UA Server Configuration

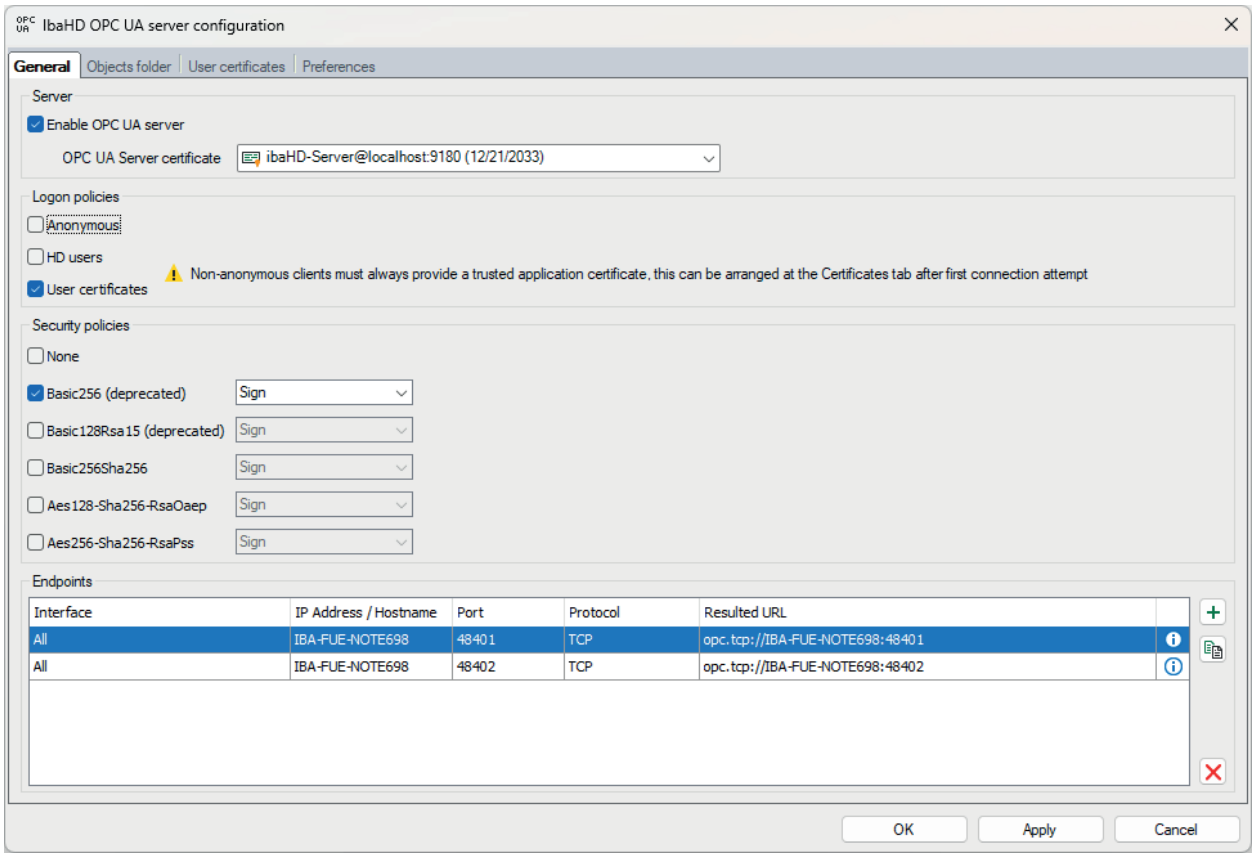
Configure the OPC UA server first. Click on the <Configure OPC UA Server...> button on the *OPC UA* tab in the ibaHD Manager.



Note

Users require the *OPC UA configuration* right to be able to configure the OPC UA server. You can set this right in the ibaHD Manager user administration.

The *ibaHD OPC UA server configuration* dialog box opens.



General tab

Enable OPC UA server

Check this box to enable the OPC UA server function.

OPC UA certificate

You require a valid certificate to use the OPC UA server. Select the certificate to be used by the OPC UA server from the drop-down list.

If you have not yet created or imported a certificate, you can do this by selecting the *Generate new certificate* or *Manage certificates* option.

You are then rerouted to the central certificate store, which you can also access from the *Certificates* tab in the ibaHD Manager. Handling of certificates is described in chapter ↗ *Certificates, page 99*.

Logon policies

At least one of the following logon policies must be set:

Anonymous

If this option is enabled, clients can log onto the OPC UA server with no logon information (user/password).

These OPC UA clients are assigned *Anonymous* user privileges. The user rights for an *Anonymous* user can be configured on the *User administration* tab in the ibaHD Manager. Access to timebased HD stores is restricted.

This option is not recommended.

HD users
If this option is enabled, clients with the valid logon information for an ibaHD server user can log on. The clients are assigned ibaHD server user access rights.

User certificate
If this option is enabled, clients can log on if a confirmed certificate for the ibaHD server user is available. The clients are assigned ibaHD server user access rights. You can assign certificates on the *User certificates* tab.

Note

If user administration is not active in *ibaHD Server*, all clients are automatically assigned full access rights and no user password is required

Security policies
At least one of the options must be enabled.

If you enable the option *None*, then connections without encryption are also supported.

For each of the other options or encryption types, you can select a security rule with signature and/or encryption:

- Sign
- Sign & encrypt
- Sign + Sign & Encrypt

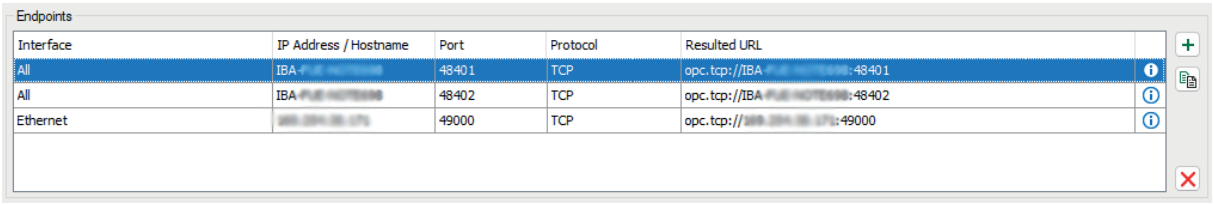
Note

Basic128Rsa15 and Basic256 encryption are now obsolete.

For security reasons, the use of Basic256Sha256, Aes128-Sha256-RsaOaep or Aes256-Sha256-RsaPss encryption is preferred.

Endpoints
In this section of the dialog box, you can configure which local endpoints the server provides.

An endpoint is a combination of IP address and port number. Instead of entering a specific IP address, it is also possible to enter the computer name of the OPC UA server. This applies to all IP addresses for all network interfaces in the system. A URI (Uniform Resource Identifier) is created from the IP address or computer name and the port number. Multiple endpoints can be configured for certain Firewall restrictions.

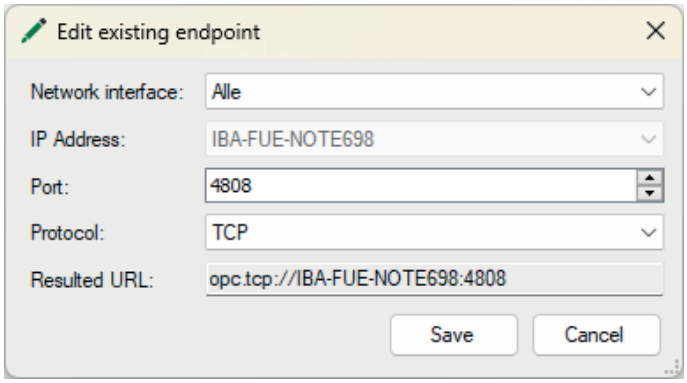


In the example shown above, OPC UA clients can connect to the OPC UA server from any network if they use port 48080 or 48081. In addition, clients can establish a connection to the IP address 169.254.38.171 using port 49000.

The list of endpoints has several control elements:

Button	Function
+	This button is used to add a new endpoint. The new endpoint initially has the same data as the local computer and then has to be edited.
	This button is used to duplicate a selected endpoint, which you can then edit.
✕	This button is used to delete the selected endpoint from the list.

You can edit an endpoint by clicking on the <i> icon on the far right.



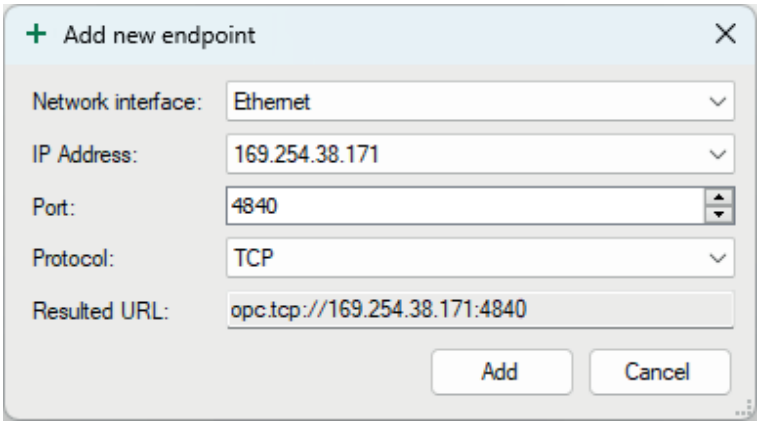
The dialog box is the same as for *Add endpoint*, see chapter ↗ *Add new endpoint, page 94*.

Note

Only IPv4 addresses are currently supported.

5.8.1.1 Add new endpoint

The following settings are required:



Network interface
Select all or a particular network interface for communication

IP address
PC name or specific IP address assigned to the network interface

Port
TCP port that handles the OPC UA communication via this endpoint. A port can only be used for one endpoint. The default registered port for OPC UA server communication is 4840.

Protocol
Supported communication protocol, TCP or HTTPS

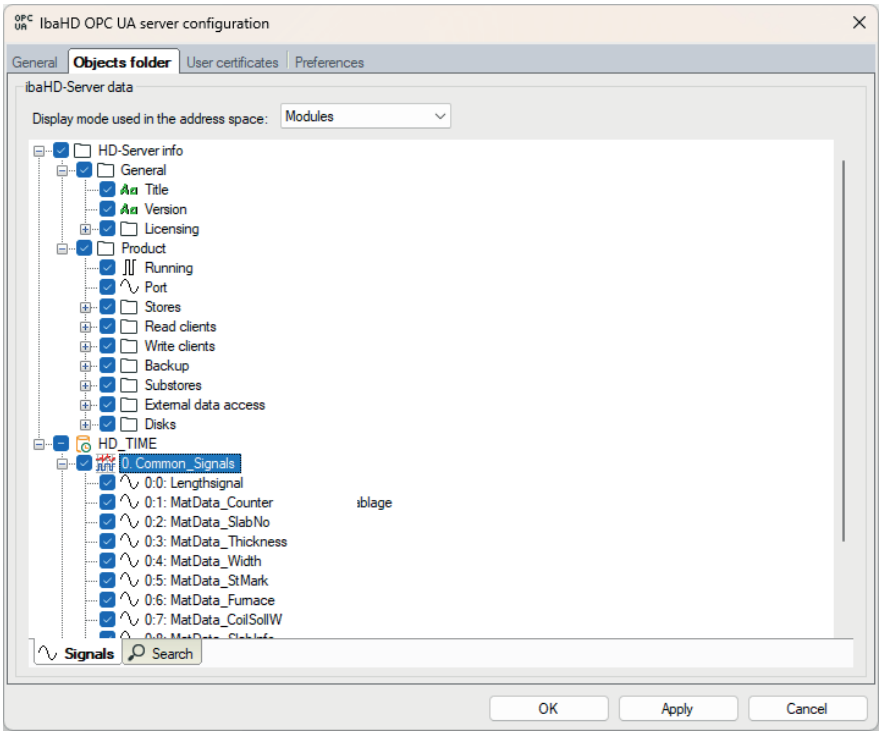
Note

To use HTTPS, at least one Sign & Encrypt security policy is required.

Resulted URL
Display of the generated endpoint

5.8.1.2 Objects folder

The objects that can be published by the OPC UA server are displayed in the tree structure.



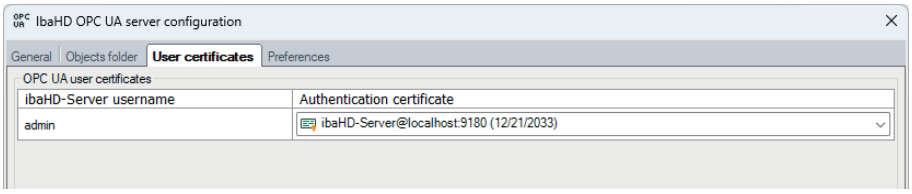
HD server data

A tree structure shows the content of the active HD stores and the attached backups. The display style of the tree structure can be changed using the context menu. The signals can be displayed in order by modules, groups, or signal numbers. The signal tree can also be filtered by particular names or parts of the comment.

To publish signals, you have to check the required signals, modules, or HD stores. You can select entire HD stores or individual signals. The selected signals are published as OPC UA data nodes and are organized in a corresponding folder structure.

By default, diagnostic data from the *ibaHD-Server* is provided via OPC UA, as listed under the HD server info node. To read historical data and signals from HD stores, an *ibaHD-Server-OPC-UA-Server+* license is required. The data nodes cannot be changed.

5.8.1.3 User certificates



The *User certificates* tab is displayed if the *User certificates* check box is selected on the *General* tab in the OPC UA server configuration.

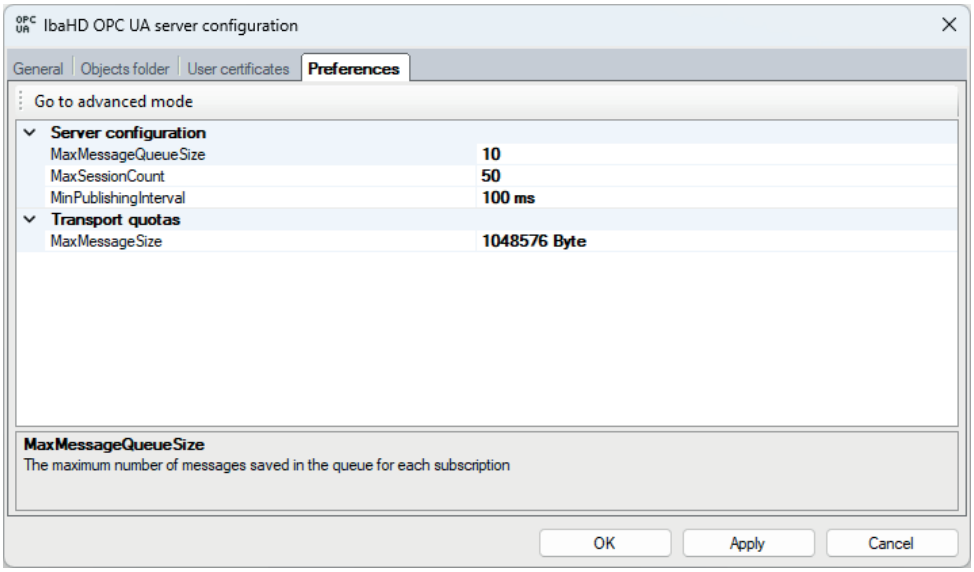
On the *User certificates* tab you can assign certificates to ibaHD users using the drop-down list, or create a new certificate.

The configured certificates are listed on the *Certificates* tab in the ibaHD Manager, and the local ibaHD users to which they are assigned are displayed.

Note

A certificate must not be assigned to multiple users.

5.8.1.4 Preferences



General connection settings for the OPC UA server interface and restrictions are displayed here.

The parameters displayed can be configured as text and are adopted when you click on <OK> or <Accept>. If the configured parameter is outside the permitted range, it is reset to the default value.

Use the *NodeIdVersion* parameter to specify the format of the *NodeId*:

- If *NodeIdVersion* = "0", then the *NodeId* corresponds to the format StoreName\SignalId.
- If *NodeIdVersion* = "1", the *NodeId* corresponds to the folder path.

  This is helpful if you are using the "Groups" display mode. Signals that are contained in several groups are no longer displayed as duplicates with the same *NodeId*.

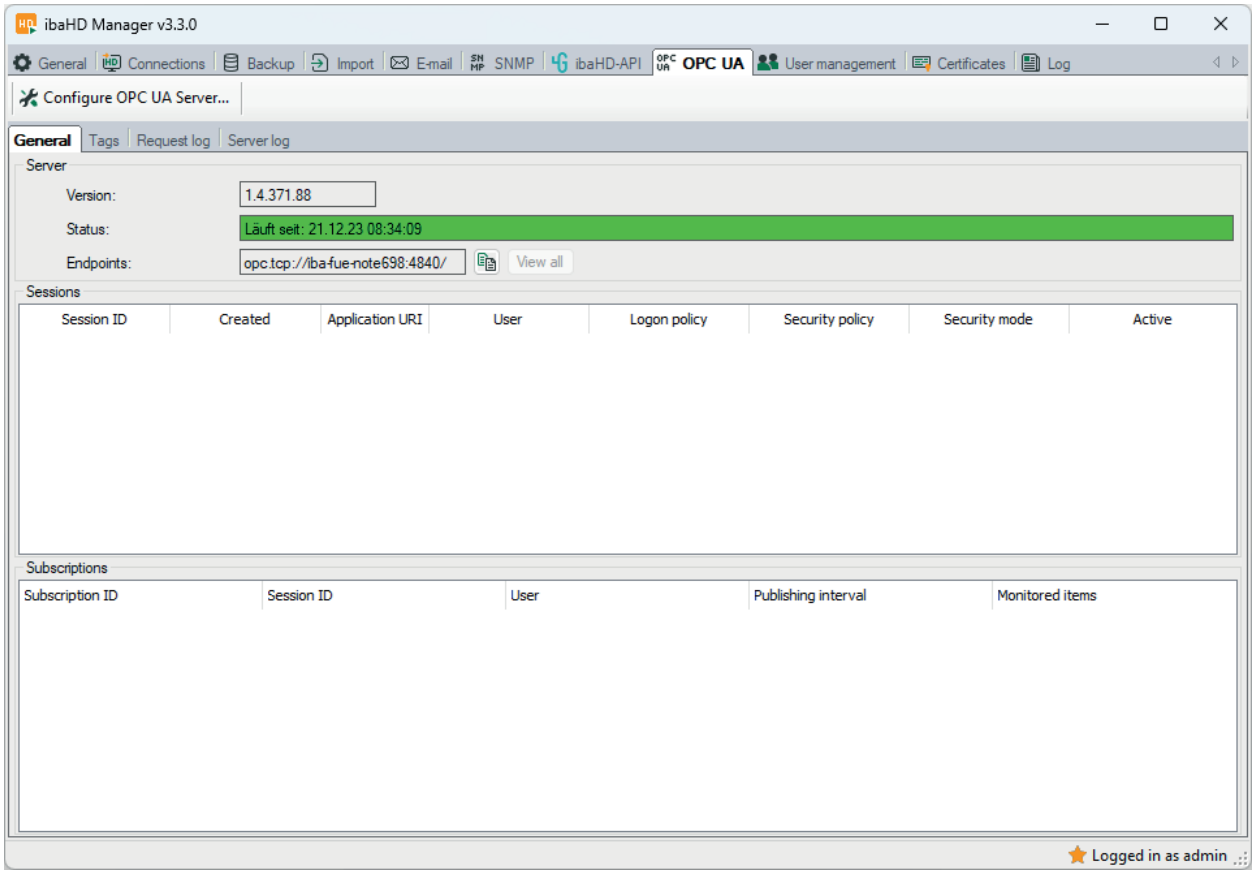
Click on <Go to advanced mode> to call up the complete list of parameters. The parameters are saved locally as XML files here:

`C:\ProgramData\iba\ibaHD-Server\hdOpcUa.cfg`

5.8.2 OPC UA in ibaHD Manager

You can use the *OPC UA* tab to configure and manage OPC UA endpoints, access and security options, the published objects, and other connection properties.

5.8.2.1 OPC UA - General



Server
The *Server* section shows the software version of the OPC UA libraries used.

In addition, the last start time of the OPC UA service is shown and the current status of the OPC UA server is indicated by the corresponding background color:

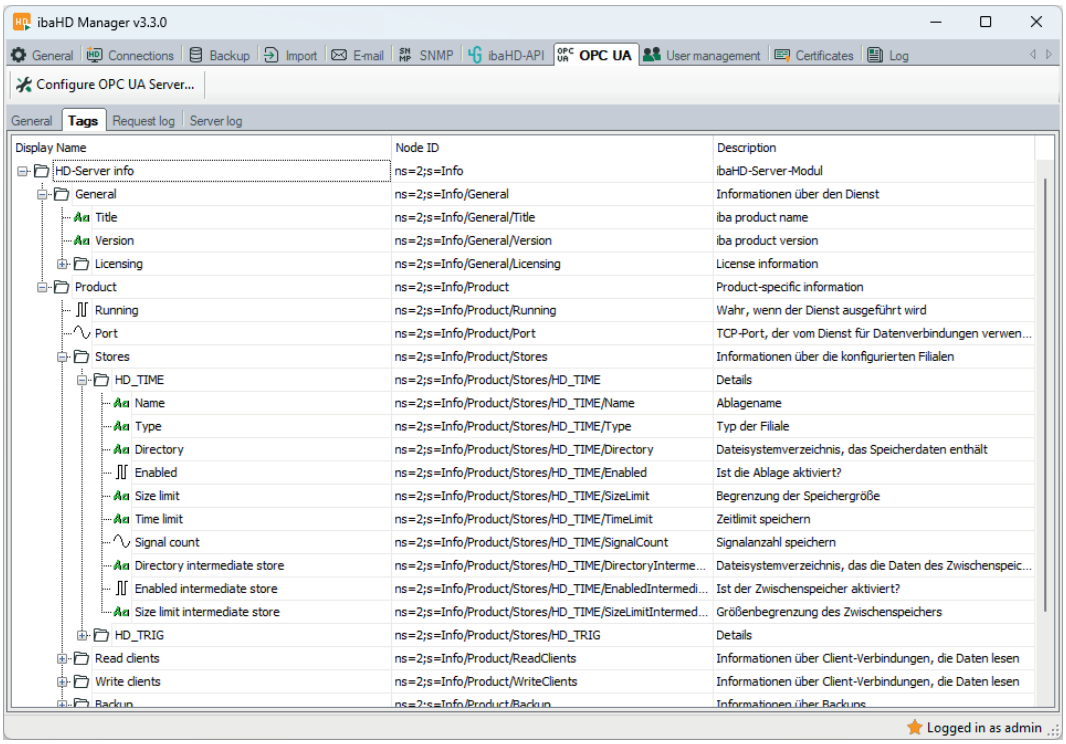
- Green - Running
- Red - Stop
- Gray - Disabled
- Yellow - Configuration change in progress

The *Endpoints* field shows the configured URLs for one or multiple endpoints. You can use the button to copy the endpoint to the clipboard. If multiple endpoints are configured, the *View all* button is enabled. This enables the available endpoints to be displayed in a separate list.

Sessions
The table shows the current sessions and properties such as user and application information.

Subscriptions
The table shows the number of subscribed variables and additional subscription properties for each session.

5.8.2.2 Tags



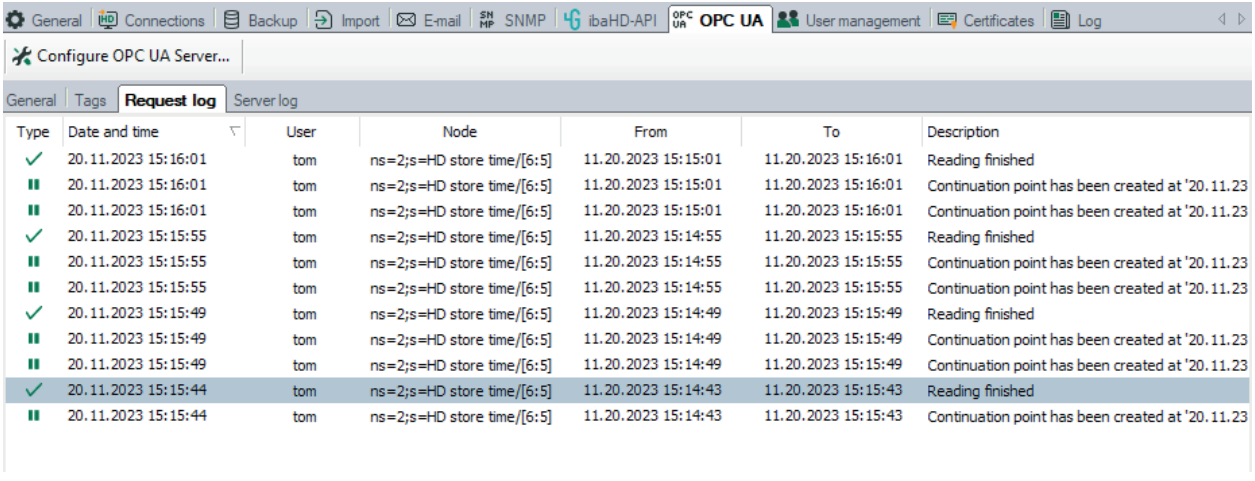
The *Tags* tab shows the list of published OPC UA nodes. The list contains the configured OPC UA objects from the *Object folder*.

The node ID can be copied so that it can be used later in an OPC UA client.

Note

Some nodes may be hidden, depending on the access rights of the current ibaHD Manager user.

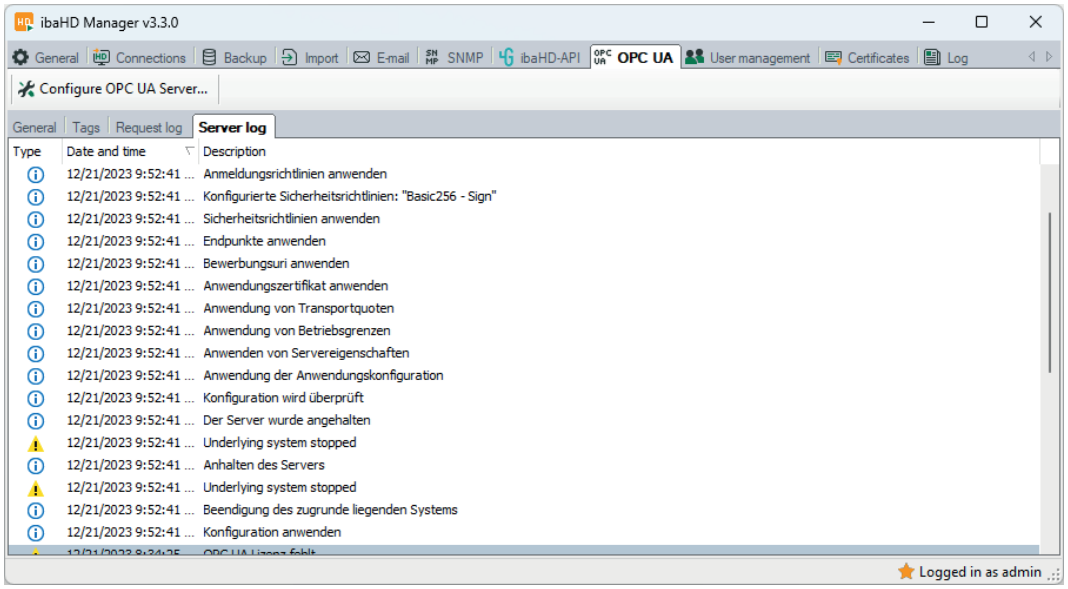
5.8.2.3 Request log



The *Request log* tab lists the requests for HD data using the OPC UA interface.

Only requests by the currently logged on ibaHD Manager user are shown. Log on as *Admin* to see the full content.

5.8.2.4 Server log



The *Server log* tab shows all server actions and OPC UA related messages in chronological order.

The messages relating to the OPC UA interface are saved in diagnostic log files. The files are located in the *ibaHD-Server* installation directory, in the \log directory. When you create support files, the OPC UA interface log files are included.

5.9 Certificates

The *Certificates* tab is used to manage the certificates for the ibaHD API interface and for use of the OPC UA server.

Certificates are used to ensure secure, encrypted TLS/SSL communication between a client and a server, as they allow secure authentication.

Before a client can connect to a server, an application certificate must first be configured. Certificates can be provided on both the server and the client side. Communication is only possible if each partner trusts the other partner's certificate.

You can also register certificates and then flag them as "not trustworthy". Communication with a partner with this kind of certificate is always rejected.

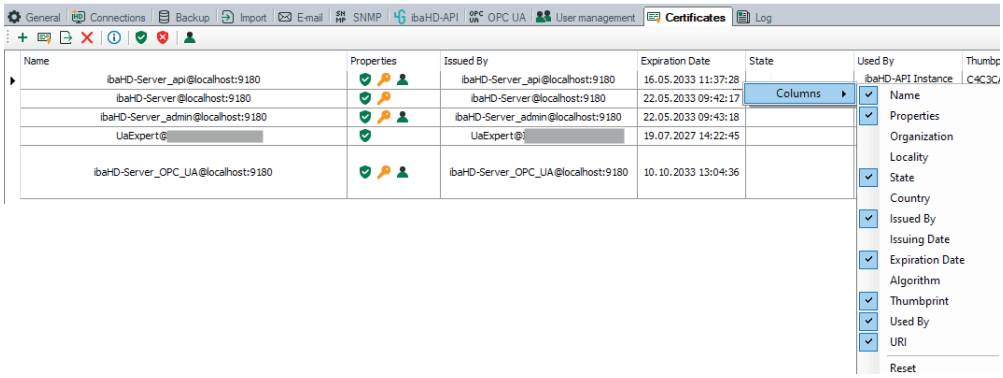
All available certificates are listed in the table. The *Name*, *Properties*, *Expiration date*, and *Used by* columns are displayed by default. If required, additional columns can be selected or deselected in the context menu of the table.

Different certificates can have the same name, i.e. they are not unique. Only a certificate's fingerprint is unique.

After the expiration date, a certificate can no longer be used. You need to renew the certificate, or replace it with another certificate that is still valid. A date highlighted in red indicates an expired certificate.

Note

Certificates added as new certificates, e.g. from OPC UA read clients, must be manually flagged as trustworthy before the application can be run using the OPC UA server read interface.



The certificate store toolbar contains a series of buttons with the following functions:

Button	Function
+	This button opens a dialog box, which you can use to load an existing certificate file. The existing certificate must contain a private key.
	This button opens a dialog box, which you can use to create a new certificate.
	This button can be used to export a certificate to a file so that it can then be registered for Windows or another application, e.g. on an API client or OPC UA client.
✕	This button is used to delete the selected certificate from the table.
ⓘ	Use this button to open a window with all detailed information about the selected certificate.
	This button is used to flag the selected certificate as “trustworthy”.
	This button is used to flag the selected certificate as “not trustworthy”. However, the certificate remains in the certificate store table.
	This button is used to activate/deactivate whether a certificate can be used for user authentication.

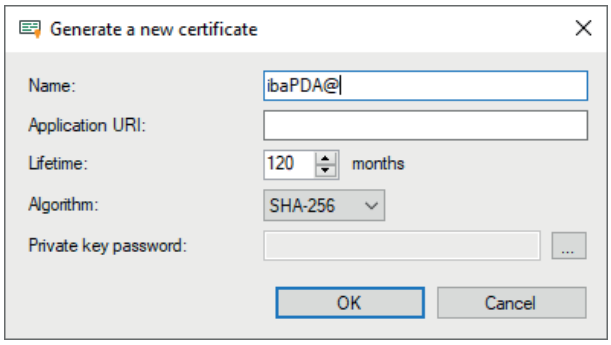
The symbols in the *Properties* column have the following meanings:

Symbol	Meaning
	The certificate is trusted as long as it has not expired.
	This certificate is not trusted.
	A private key is available for this certificate.
	This certificate can also be used for user authentication.
	This certificate is invalid. If the certificate is invalid because it has expired, the expiration date is also highlighted in red.

5.9.1 Generate a new certificate

If no certificates are available to load, it is necessary to generate one.

1. Click the button  and the following dialog box will open:



2. Enter a name of your choice for the certificate.
3. If required, enter an Application URI.
   The URI (Uniform Resource Identifier) is a global unique identifier for the application. If you do not fill in this field, a standard URI will be generated, provided that the OPC UA client verifies an Application URI. This standard URI consists of the machine name and the name of the application:
   `urn:machinename:applicationName.`
4. Define the desired validity period (lifetime) of the certificate.
5. Select the desired hash algorithm for the encryption.
   You have the choice between the algorithms SHA-256, SHA-384 and SHA-512.
   Make sure that the other communication partners support the selected algorithm too.
6. Define a password for the private key. If no password has been entered, the <OK> button remains inactive. To assign the password, click the <...> button and enter the password twice and confirm with <OK>. There are no special requirements for the password. Keep the password in a safe place so that the self-generated certificate can be exported and used for Windows or other applications.
7. Close the dialog with <OK>.

The new certificate is now entered into the list held by the certificate store and immediately assigned the properties "trusted" + private key.

You can now also export the certificate and register it with the communication partner, e.g., an OPC UA client. Afterwards, the client can then connect to *ibaPDA* (OPC UA-Server).

5.9.2 Add certificate

1. In the certificate store toolbar, click the button + .
   A dialog will open that lets you navigate to the desired certificate file and open it.
   Different file formats are supported (.der, .cer, .crt, .cert, .pem, .pfx, .p12).
   If you have a certificate with an unknown file extension, expand the file filter to "*.*" and try to open the file anyway. This works in most cases.
2. When the certificate is loaded, it appears in the certificate store list.
3. If you have not already done so, trust the certificate.

Certificates can sometimes be added without manual import.

Thus, during the first connection attempt by an OPC UA client to the OPC UA server (*ibaPDA*), the application certificate of the OPC UA client is automatically added to the certificate list and initially rejected.

Once you have selected the OPC UA client certificate in the list and confirmed it as trusted with the button the OPC UA client can subsequently connect automatically.

Use the button to reject a certificate at any time or to classify it as not trusted.

5.10 User management

In the *User management* tab of *ibaHD Manager*, you can set the user rights for *ibaHD-Server* and *ibaPDA* client, provided the two applications are connected to each other. Alternatively, you can also configure the user rights in the corresponding dialog in *ibaPDA* .

Note

Please note that you can only use the user management with one application at a time, i.e. *ibaPDA* client or *ibaHD Manager*. If the user management dialog for a server is open more than once, you will be notified with a message.

Other documentation

Detailed information on user management in *ibaPDA* can be found in the *ibaPDA* documentation.

ibaHD-Server supports two types of users:

- Local users

  The local users are created directly in *ibaHD-Server* .

- Domain users

  A description of the management of domain users using the example of *ibaPDA* can be found in chapter 5.10.2, page 110.

5.10.1 Local user management in ibaHD-Server

You can configure the user management in the *User Management* tab of *ibaHD Manager*.

In the user management, you can set up different user accounts with different rights for accessing the *ibaPDA* client, *ibaHD-Server* and individual HD stores. The following users are preset:

- *admin*: User has administrator rights

  This user can set up or remove other users and change their rights. They can also assign passwords for other users if user management is activated. You cannot change the name "admin".

- *anonymous*: Users for access from older iba software versions

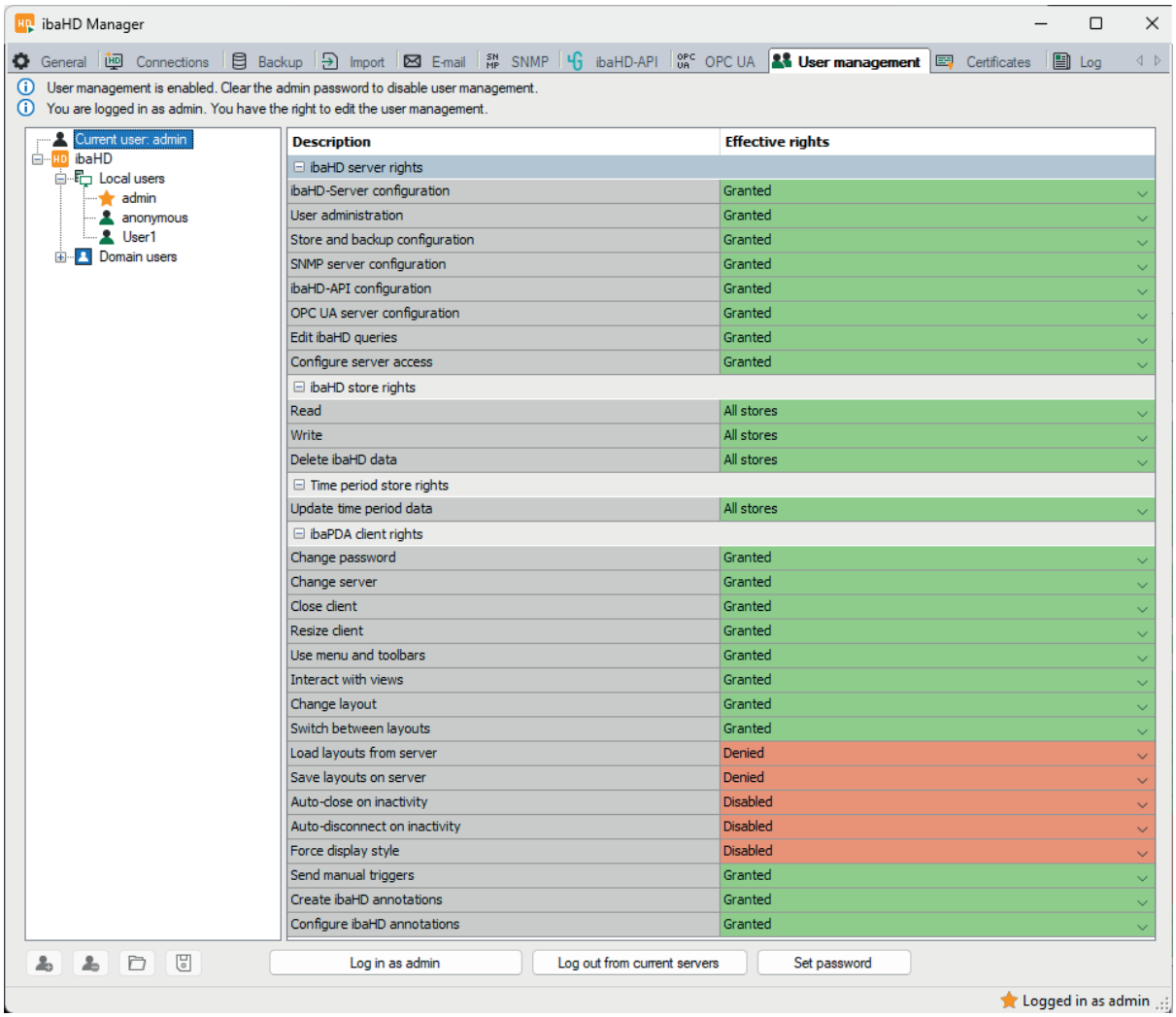
  Older software versions, such as *ibaPDA-V6*, *ibaAnalyzer* v6.x and *ibaDatCoordinator* v2.1.0 and older, do not have the option of entering a user name and password. From these software versions, access to the *ibaHD-Server* is only possible with the *anonymous* user.

You cannot delete the users *admin* and *anonymous* .

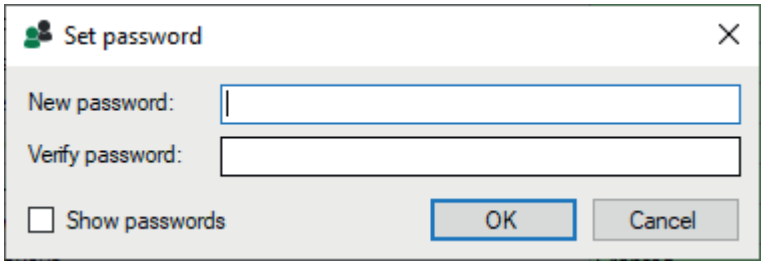
5.10.1.1 Activating user management

As long as no password has been assigned for the user *admin*, user management in *ibaHD-Server* is disabled and every *ibaPDA* client logs on to *ibaHD-Server* as *admin*. All clients therefore have all rights.

1. To enable user management, assign a password for the *admin* user. Click on the <Set password> button.



2. Enter the desired password in the following dialog.



Note

Please note, that there is a difference between Marx and WIBU license containers in terms of password length and characters.

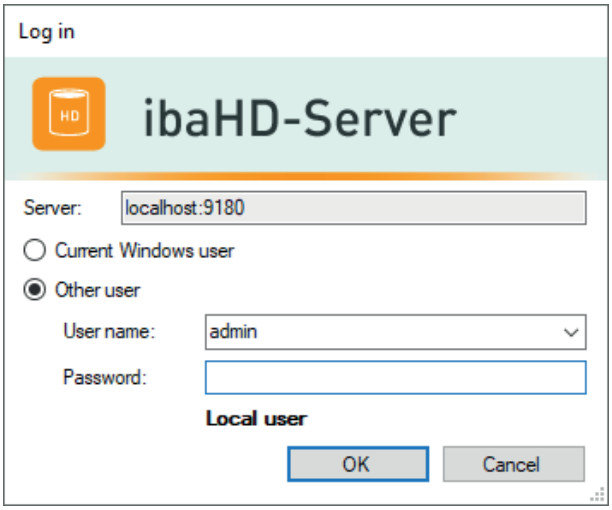
Marx dongle: max. 15 ASCII characters

WIBU dongle or soft license: no limitation in terms of length and character set

3. Confirm with <OK>.

→ User management is enabled.

→ As soon as you want to connect to ibaHD-Server, a login dialog appears.



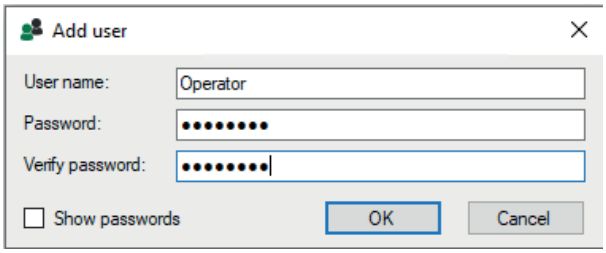
5.10.1.2 Adding or deleting a local user

To add and delete users in *ibaHD-Server*, the following buttons are available at the bottom:

	Add local user/domain user (in *ibaPDA* client, a distinction is made between *ibaPDA* users and *ibaHD-Server* users).
	Delete selected local user/domain user
	Load users from an existing user file (*.pda_users)
	Save the configured (*ibaPDA*) users in a user file (*.pda_users), incl. all permissions and passwords

Table 2: User management buttons

1. To add a new user, click on the button  .
2. Enter the user name and optionally a password.



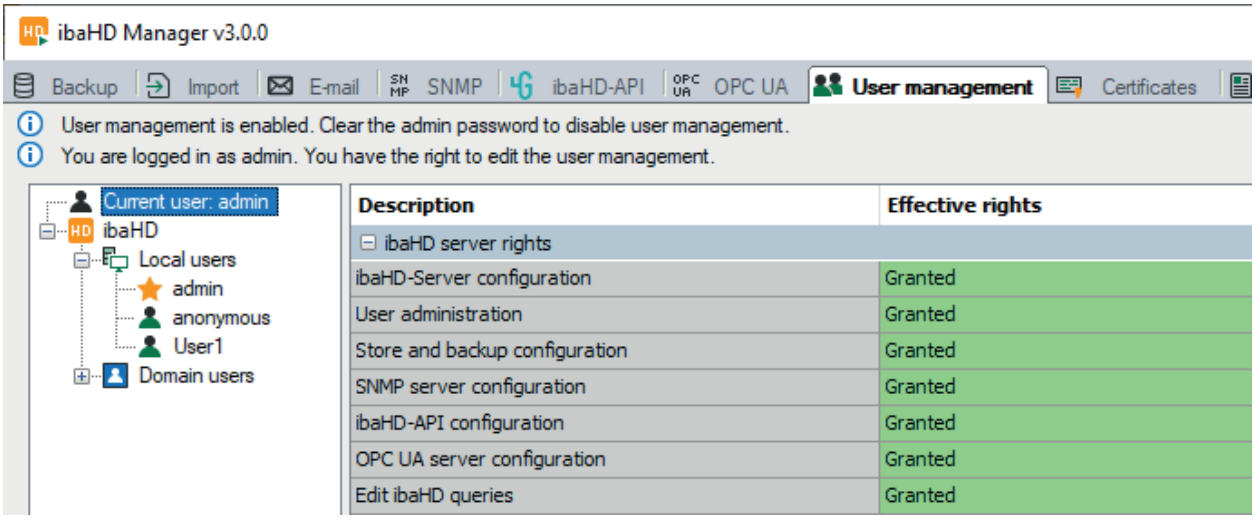
The user can also specify or change the password at a later time, see ↗ *Changing the password, page 106*.

3. Exit the dialog with <OK>.

5.10.1.3 Assigning user rights

You can change the permissions for users in *ibaHD Manager* by marking the relevant user in the tree and selecting the desired option in the table. An overview of all available rights can be found in chapter ↗ *Overview of user rights, page 106*.

You can see the user currently logged in in the tree in the *Current user* field.



The *Local users* field lists all configured users.

5.10.1.4 Changing the password

If you want to change a password or specify a password for a user later on, select the relevant user and click the <Change password> button.

If you are not logged in as **admin**, you can only change your own password in the user management dialog, unless the user administration right has been granted to you by the **admin** beforehand.

5.10.1.5 Overview of user rights

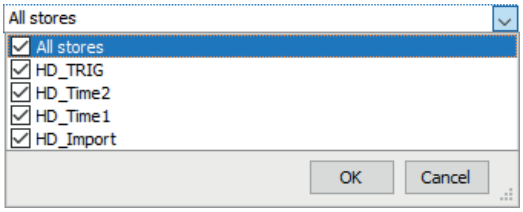
With user rights in *ibaHD-Server*, a distinction is made between store rights, *ibaPDA* client rights and server rights.

ibaHD-Server rights

Option	Description
ibaHD-Server configuration	Permission to configure *ibaHD-Server* This includes changing the system information, protocol settings and the *ibaHD-Server* port.
User administration	Permission to change the user configuration
Store and backup configuration	The permission to configure HD stores and backups
SNMP server configuration	Permission to configure the integrated SNMP server

Option	Description
ibaHD-API configuration	Permission to configure the interface ibaHD-API
OPC UA server configuration	Permission to configure the OPC UA server
Edit ibaHD queries	Permission to configure queries in HD event tables or HD time period tables. This only applies to queries stored on the *ibaHD-Server*; locally stored queries can be created and edited by all users.
Configure server access	Permission to open and configure the server access control

ibaHD store rights

Option	Description
Read	The permission to read HD stores can be granted individually for all HD stores or for selected HD stores and contained time period stores. Use the black triangle to open the selection dialog and mark *All stores* or individual HD stores from the list. 
Write	The permission to write in HD stores can be granted individually for all HD stores or for select HD stores and contained time period stores. For the selection dialog, see *Read*.
Delete ibaHD data	The permission to delete signals and events in stores by means of ibaHD Manager or when configuring in *ibaPDA*.

Time period store rights

Option	Description
Update time period data	The authorization to update existing time periods via other iba products (e.g. *ibaAnalyzer*, *ibaDatCoordinator*) can be granted individually for all time period stores or for selected time period stores. Use the arrow symbol to open the selection dialog and select *All stores* or Individual time period folders from the list.

ibaPDA client rights

Option	Description
Changing the password	The right for a user to change his own password
Change server	The right to connect to a (different) *ibaPDA* server
Close client	The right to close the *ibaPDA* client
Resize client	The right to change the size of the program window or the display style, either using the mouse or using a key combination, e.g. to enable/disable full screen mode.
Use menu and toolbars	The right to use menu commands and buttons of the toolbar. Without this right, the menus and toolbars are disabled (grayed out), except for the toolbar of the views. The user can add/remove signals to/from the current views.
Interact with views	The right to interact with views, e.g. zoom in/out, show/hide signals or change the scaling in trend graphs. If a user is not authorized to interact with views, the right “Change layout” must also be disabled. This right does not apply to FFT and oscilloscope views. Interaction with those views is always possible.
Change layout	The right to change the current layout. If you do not have this right, then you cannot move, reduce or enlarge the *ibaPDA* client window. You cannot change views. You cannot change docking windows.
Switch between layouts	The right to switch layouts. Users with this right can switch between different layouts by using the layout toolbar or function key <F11>.
Load layouts from server	The right to load layouts from the server Users with this right can manually load layouts from the server via the Layout Manager. When logging in to the server, a query appears asking if layouts should be loaded from the server. Users who do not have this right cannot manually load layouts from the server, nor is there a query when they log in. Exception user admin: ■ Denied: Layouts can be loaded manually from the server. There is no query when logging in. ■ Granted: Layouts can be loaded manually from the server. There is an additional query when logging in.

Option	Description
Save layouts on server	The right to save current or modified layouts on the server. Users with this right can manually save layouts on the server via the Layout Manager. If layouts have been changed, an additional query appears asking whether layouts should be saved on the server when the user logs out or exits *ibaPDA*. Users who do not have this right cannot manually save layouts on the server, nor is there a query when they log out. Exception user admin: ■ Denied: Layouts can be saved manually on the server. There is no query when logging out. ■ Granted: Layouts can be saved manually on the server. There is an additional query when logging out if layouts have been changed. When saving on the server, the layouts are saved in the layout file (*.layouts) in the path for the server configuration files, e.g. `C:\ProgramData\iba\ibaPDA\Layouts`
Auto-close on inactivity	Clients that are logged in under a user with this right are automatically exited after the set time if no use occurred in this time. Times from 5 min to 24 h can be selected.
Auto-disconnect on inactivity	Clients, which are logged in by a user with this right will be disconnected from the *ibaPDA* server automatically if the set time has elapsed without any operation during this time. The last layout remains loaded and the log-in dialog appears on the screen. Times from 5 min to 24 h can be selected.
Force display style	Clients that are logged in under a user with this right show the set display style during starting.
Send manual triggers	The right to send start and stop triggers using the buttons in the toolbar of the data store or the context menu on the data store status tree.
Create ibaHD annotations	The right to enter new annotations based on a pre-configured annotation type (selection from a drop-down list).
Configure ibaHD annotations	The right to configure new annotation types

5.10.2 User management in a domain with Active Directory

The iba software products *ibaPDA*, *ibaHD-Server*, *ibaCapture* and *ibaDaVIS* support user management via Active Directory. Thus, not only are local users of the programs accepted, but also domain users or groups defined by the IT admins.

Note

ibaHD-Server only supports Active Directory security groups for user management. Distribution groups are not supported.

Further information on security groups and distribution groups can be found in the Microsoft documentation.

5.10.2.1 Advantages of the Active Directory method

For the IT administration, Active Directory offers the advantage of central user management for applications such as *ibaPDA*, *ibaHD-Server*, *ibaCapture* or *ibaDaVIS* in one domain. This simplifies the maintenance of user accounts and their authorizations within the applications.

Active Directory users, or *domain users* as they are called in the softwares, are users or groups defined in an Active Directory.

The individual users inherit the permissions from the group to which they belong. Therefore, it is not necessary to create all users individually in the software's user management system. If the group is created as a domain user, any user belonging to this group can log in with their domain credentials and use the software with the permissions assigned to the group. This means that adjustments can be made very easily by the IT administration, e.g., in the case of staff changes or new employees.

Individual users can still be created locally in the software's user management system if required, e.g., to obtain rights that differ from those of the group.

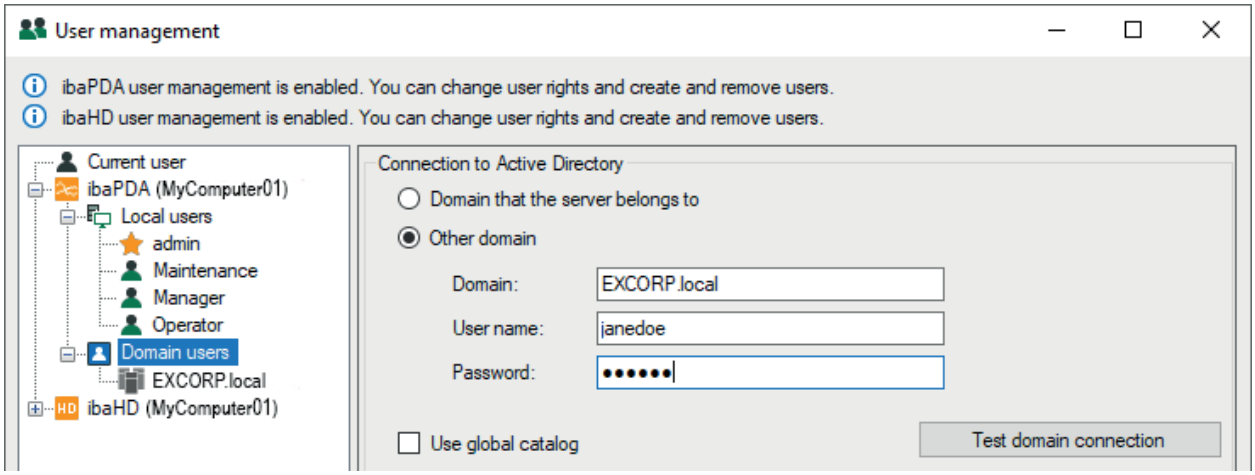
The software-specific rights are granted or denied to the individual users via the software's user management interfaces (*ibaPDA* or *ibaHD-Server*). This can be done by all users who have the *User administration* right.

5.10.2.2 Establish a connection to a domain

To add a domain user, you must first establish a connection to a domain. Under the *domain user* node in the user management dialog, you can set which Active Directory domain *ibaPDA* or *ibaHD-Server* you should connect to.

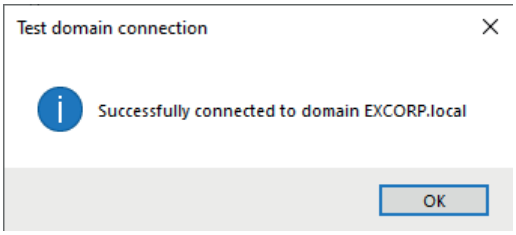
If the *ibaPDA*/*ibaHD-Server* computer is a member of a domain, you can decide to use this domain. It is also possible to use another domain by entering the domain name and the credentials of a user from that domain. Thus, it is possible to use the users of an Active Directory on an *ibaPDA* computer that is not integrated in a domain (e.g., only part of a workgroup). The prerequisite is, of course, that the domain is accessible so that *ibaPDA* can query the corresponding information.

ibaPDA or *ibaHD-Server* will then search for domain users and groups in the set domain and its sub-domains.



Proceed as follows:

1. If you have not already done so, log on as a user with the "User administration" right.
2. In the user tree, select the *Domain users* node. The *Connection to Active Directory* section appears in the right-hand dialog box.
3. If the computer is already in a domain and you want to access the users of this domain, select *Domain that the server belongs to*.
4. If you want to access the users or groups of another domain, select *Other domain* and specify the credentials of a valid domain user. It is recommended to use the full domain name (FQDN: Fully Qualified Domain Name) with all name components (e.g., including the suffix *.local*).
5. Click on <Test domain connection> to check that the information is correct. If the connection is successful, you will receive a message.



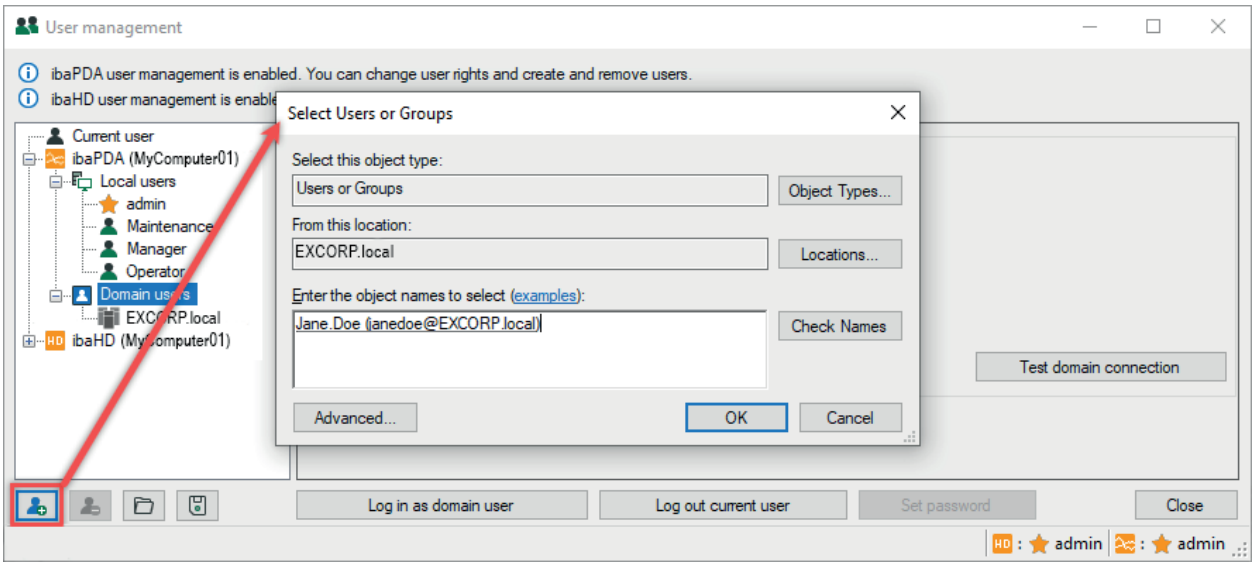
6. If you enable the *Use global catalog* option, then parent domains and trusted domains are also included when searching for users and groups.

At the bottom of the user tree there are four buttons (blue icons for domain users) with the following functions:

	Add local user/domain user (in *ibaPDA* client, a distinction is made between *ibaPDA* users and *ibaHD-Server* users).
	Delete selected local user/domain user
	Load users from an existing user file (*.pda_users)
	Save the configured (*ibaPDA*) users in a user file (*.pda_users), incl. all permissions and passwords

Table 3: User management buttons

5.10.2.3 Add domain user



Proceed as follows:

1. Make sure that any node in the *Domain users* section of the user tree is selected.
2. Click the "Add user" button at the bottom of the tree. The tooltip for the button shows the program and computer name for which the user is created, e.g., "ibaPDA (*computer name*)". The "Select users or groups" dialog opens (Windows standard dialog). The default domain is set as configured in the domain settings (see figure in 5.10.2.2, page 110).
3. Enter a user or group name in the empty field if you know it. If not, you can use the search function via <Advanced...>. Then select the desired user or group from the search results. If necessary, you can select several users or groups here, separated by semicolons.
4. Close the dialog with <OK>. The new user or group now appears in the user tree under a domain node.
5. If you want to add additional users, make sure that the *Domain users* node or the child domain node is selected.

5.10.2.4 Manage user rights

If a user or group is selected in the user tree, the corresponding permissions are displayed to the right of it. Select the top node *Current user* if you want to see the granted permissions for the currently logged-in user.

You can assign or revoke rights to users or groups if you are logged in to the *ibaPDA* server or *ibaHD-Server* as a user with the "User administration" right (e.g., admin).

Rights that are not available or cannot be changed are grayed out. For example, the "Change password" right is not available for domain users or groups.

By right-clicking in the table you can copy the user rights and transfer them to another user.

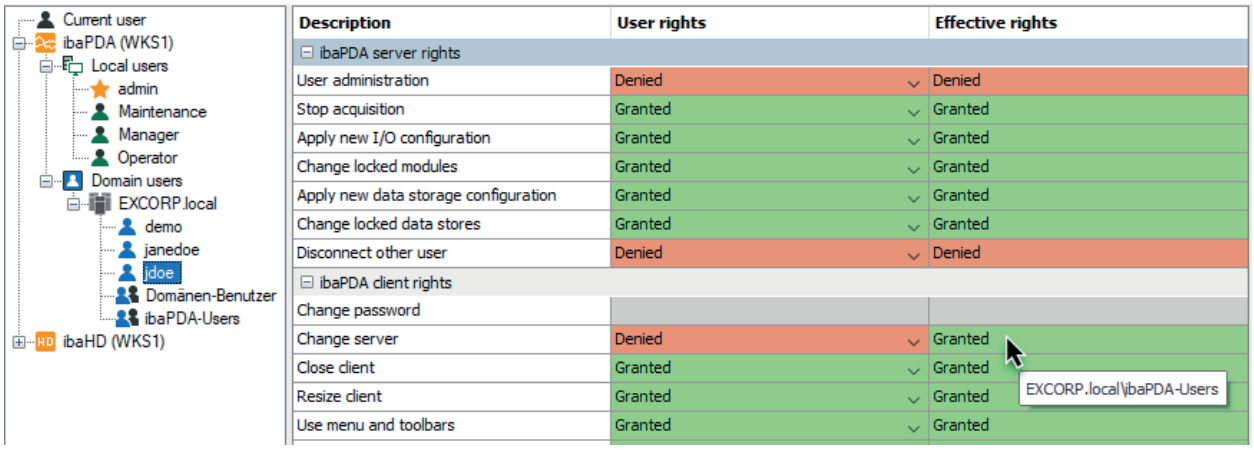
5.10.2.5 Effective rights

One domain user can belong to several groups. Permissions can be assigned both directly to the user or inherited from the groups to which they belong.

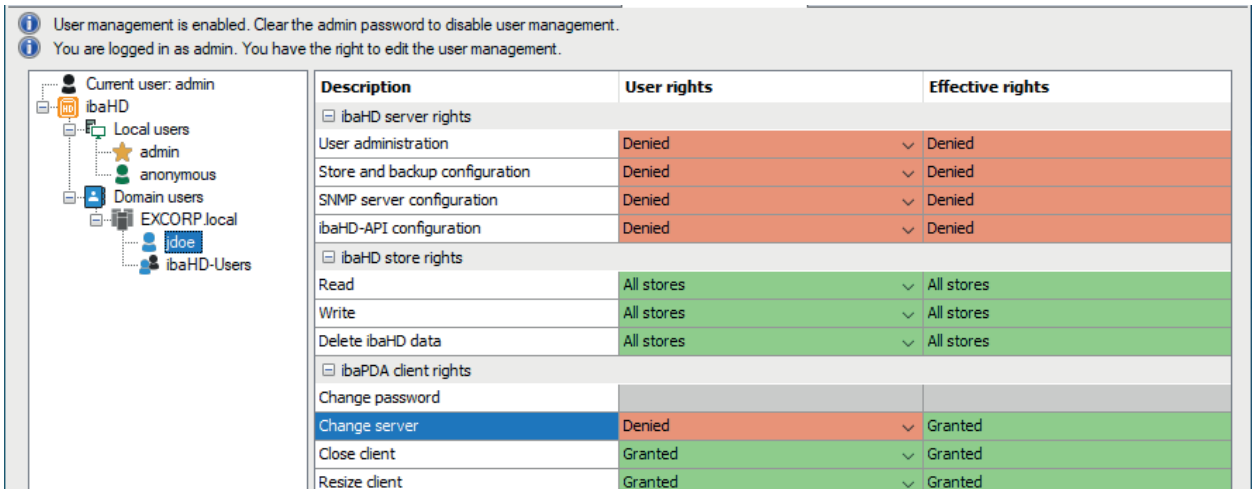
The "Effective rights" column shows the result of this mechanism and is only displayed for domain users, not for groups or local users.

If both a domain user and the user group to which it belongs are entered in the user management, there may be different settings for group and user.

In such a case, the **granted** rights always prevail over the denied ones. Example *ibaPDA:*



Example *ibaHD-Server*:



The figures show that the user “jdoe” has been denied the “Switch server” right. However, this user still gets the right granted because it is also a member of the “ibaPDA-users” or “ibaHD-users” group, which has this permission.

If a right has been granted, the tooltip on the mouse cursor shows the source(s) that inherited the right.

In this context, similar cases are also possible:

The configured domain user is a member of a group

User	Group	Effective
✓	✓	✓
✓	x	✓
x	✓	✓
x	x	x

✓ = Granted, x = Denied

The configured domain user is a member of more than one group

User	Group 1	Group 2	Effective
✓	✓	✓	✓
✓	✓	x	✓
✓	x	✓	✓
✓	x	x	✓
x	✓	✓	✓
x	✓	x	✓
x	x	✓	✓
x	x	x	x

✓ = Granted, x = Denied

In the case of users who are members of several groups, *ibaPDA* successively verifies the group based rights in their listed order in the list of SIDs received from the Active Directory controller (AD controller). This list is requested by ibaPDA from the AD controller whenever a domain user logs on. The group rights are combined with one another according to fixed rules. If the domain user is entered individually in the *ibaPDA* user management system, its rights are used as the basis for the additional combinations. If the user is not entered in the user management system, only the group rights are taken into account.

The order of the groups in the SID list is important for certain rights.

1. They are determined as granted/denied via a Boolean "OR" function, whereby "Granted" is dominant.
2. For the rights "Auto-close on inactivity" and "Auto-disconnect on inactivity", the lowest value is always applied. For example, if one group has a value of 10 minutes and the other group has a value of 1 minute, 1 minute is applied.
3. The "Force display style" right is applied from the user or the first group with a preselected display style.

4. For the rights "Load layouts from server" and "Save layouts on server", the layout directory is applied from the user or the first group for whom one of these rights is set.

The domain user is not entered in the user management system but is a member of multiple groups

Group 1	Group 2	Effective (current user)
✓	✓	✓
✓	x	✓
x	✓	✓
x	x	x

✓ = Granted, x = Denied

5.10.2.6 Logging in as a domain user

You can log in as a domain user in the user management dialog. To do this, click the button <Log in as domain user> at the bottom of the dialog. The button is only available if the *Domain user* node or one of its child nodes is selected in the user tree.

In the subsequent login dialog, you have various options for logging in.

Current Windows user

Logging in with the current Windows user is only possible for domain user accounts. Local Windows users are not supported.

The *ibaPDA server* or *ibaHD-Server* uses the SID (Security IDentifier) of the logged-in user to determine whether this user is present in the configured Active Directory (setting is configured via user management – *Domain users* node). If the search is successful, the user's group memberships in the Active Directory are determined. Based on these, the user's rights within *ibaPDA/ibaHD-Server* are configured via the *ibaPDA*/*ibaHD* user management dialog. It is not necessary to enter a password for the current Windows user, because their credentials have already been verified during Windows logon.

Other user

You can also log in under "Other user" with the full credentials of a user. The drop-down list in the *Users* field shows all configured local users and domain users that are available for selection.

To log in as a domain user, enter the user name in the user field using the syntax `Domain\User name`. It is recommended to use the full domain name (FQDN: Fully Qualified Domain Name) with all name components (e.g., including the suffix *.local*). Additionally, you must enter the password of the domain user.

The *ibaPDA*/*ibaHD-Server* logs on to the desired domain with the entered credentials, thereby verifies the user and queries the SID.

The rest of the procedure is identical to that for the "Current Windows user":

The *ibaPDA server* or *ibaHD-Server* uses the SID to determine whether the user exists in the configured Active Directory. If the search is successful, the user's group memberships in the Active Directory are determined. Based on these, the user's rights within *ibaPDA*/*ibaHD-Server* are configured via the *ibaPDA*/*ibaHD* user management dialog.

5.10.2.7 Access to an ibaHD-Server from 2 domains

It can happen that several iba products distributed throughout the company need to access the data of an *ibaHD-Server*, but are located in different domains. The following describes how you can enable cross-domain access using the two domains **business-domain** and **automation-domain**. In the example, there is an *ibaHD-Server* and an *ibaPDA* in the **business-domain**, and an *ibaAnalyzer* client is integrated in the **automation-domain**.

Note

The *ibaHD-Server* can be connected to only one domain. There is no way to bind the *ibaHD-Server* service to two independent domains at the same time.

Prerequisites:

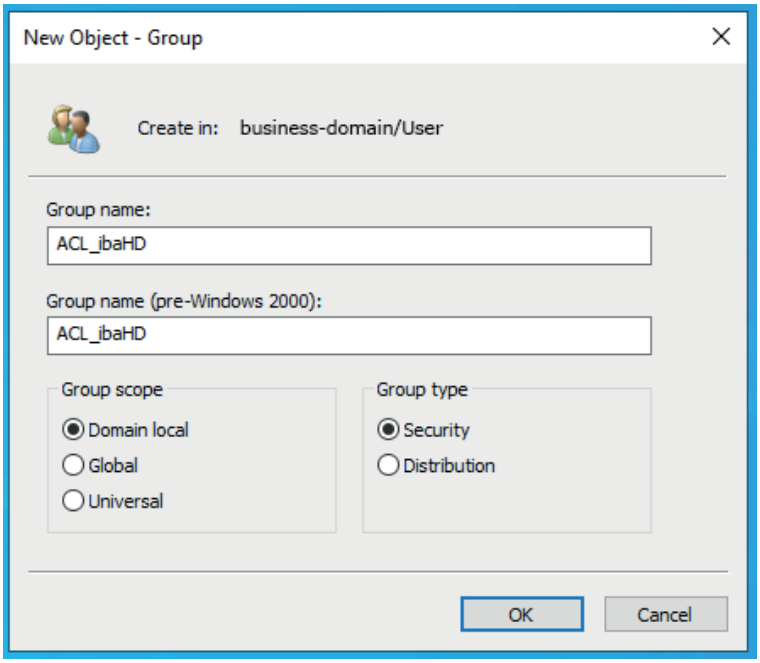
- A so-called domain trust must exist between the domains.
- DNS resolution must work on both sides, i.e. both domains must be able to resolve each other.

Create a group in the domain of the ibaHD-Server

First create a group in the Active Directory user and group management in the **business-domain** in which the *ibaHD-Server* is located, e.g. ACL_ibaHD.

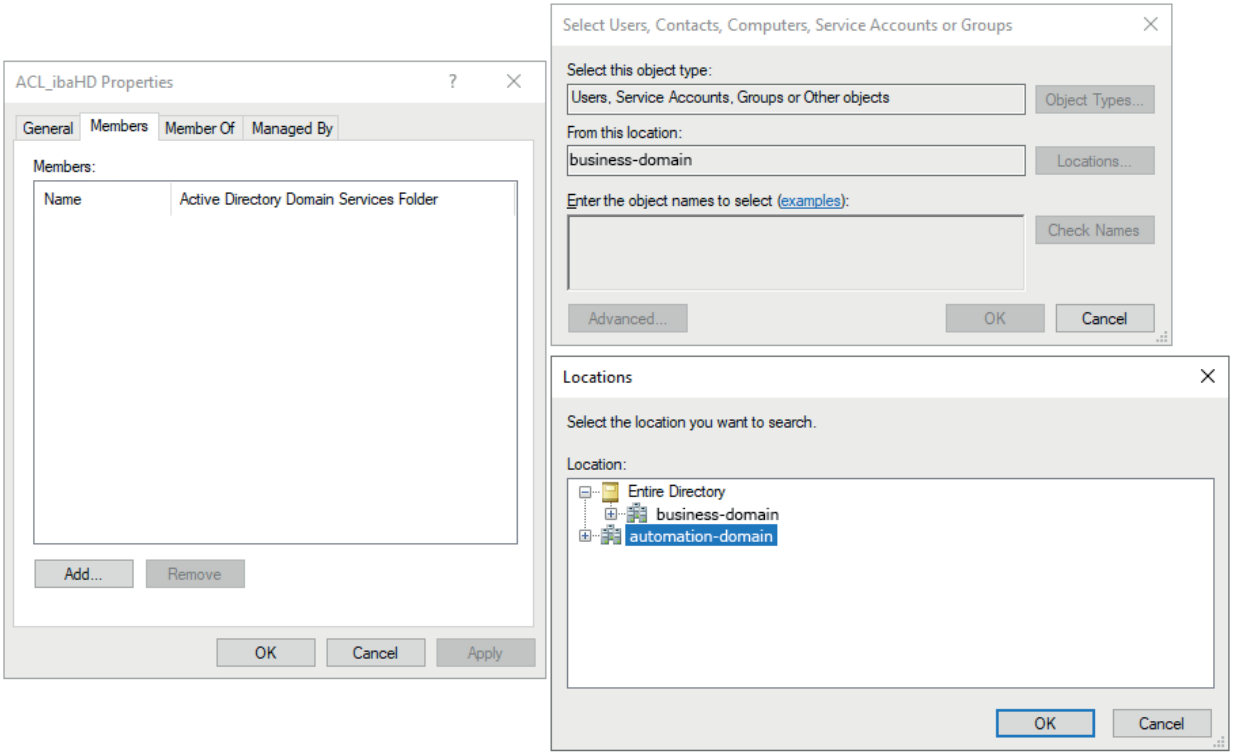
The group must have the following characteristics:

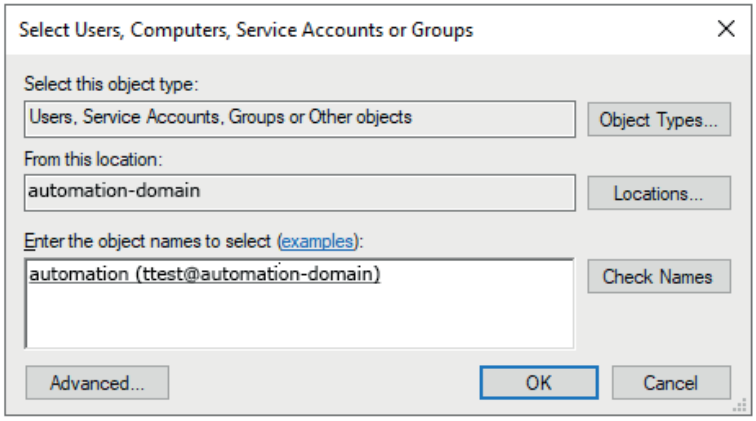
- *Group area*: Local (in domain)
- *Group type*: Security

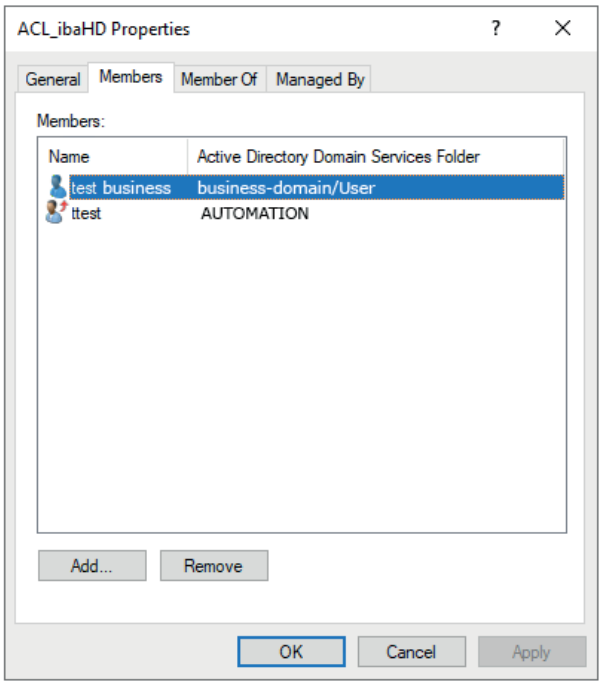


Add users from the second domain

Add the users from the second domain **automation-domain** who are to be granted access to the ACL_ibHD group you have just created. Make sure that you have selected the correct domain in the user search.

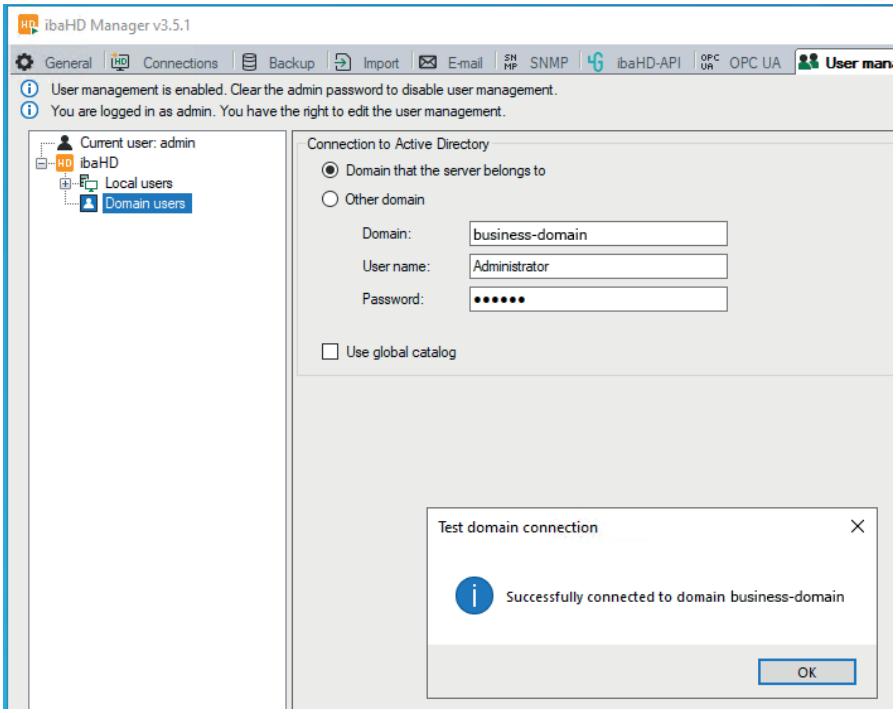




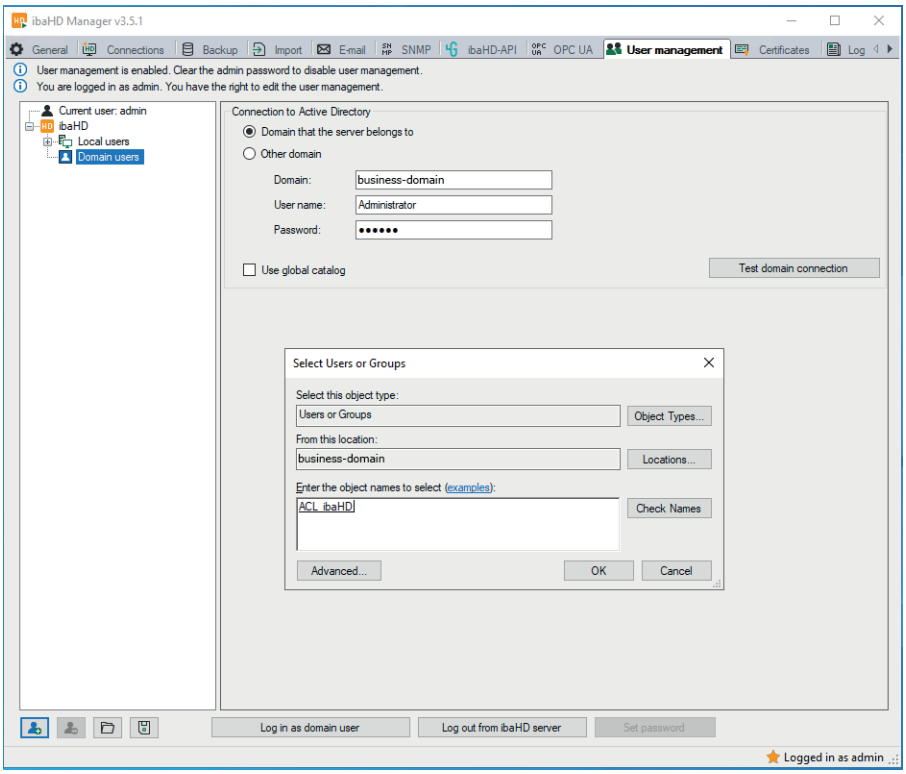


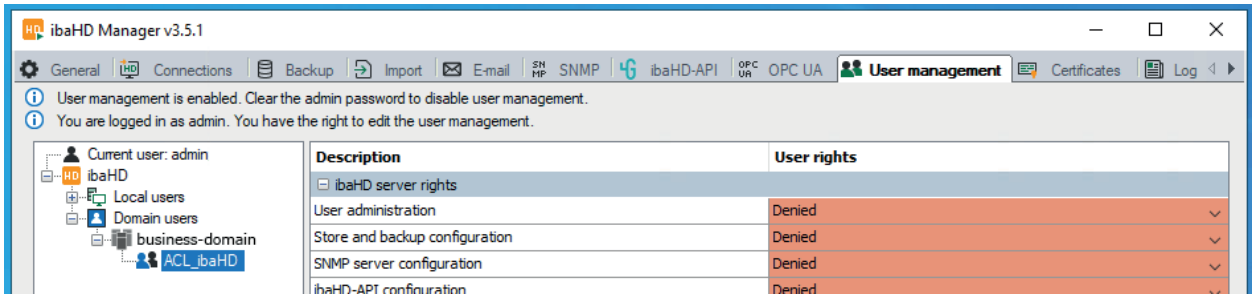
Store group on the ibaHD-Server

Store the ACL_ibaHD group in the user administration of *ibaHD-Server*. To do this, first link the **business-domain** to the system.



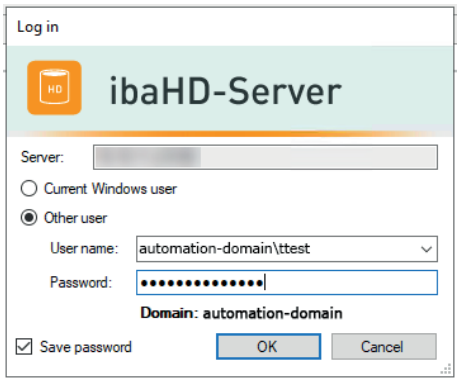
Then add the group using the corresponding option.





Test access

Finally, test the access by successfully logging in from both systems (*ibaAnalyzer* client and *ibaHD-Server*) and accessing the *ibaHD-Server*.



5.11 Protocol

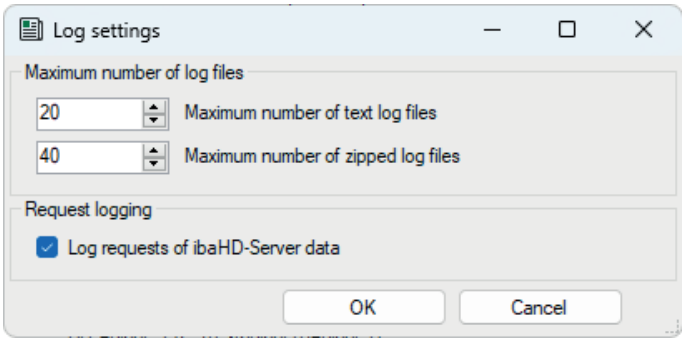
All system events of *ibaHD-Server*, such as configuration changes, are recorded in tabular form in the *Log* tab.

<Open log file...>
The button is used to load and open the current log file, which is also displayed in the log window, in the standard text editor of the computer.

<Open log directory...>
The button opens Windows Explorer on the default log directory. You can also find log files here from the past.

<Configure log settings...>
Here you can change the number of saved log files and specify whether all data requests to the HD server should be logged.

Log settings



In the example, up to 20 log files are saved in text format. When the maximum number of text files is reached, the oldest files are zipped in order to save storage space. Once the maximum number of zipped files has been reached, the oldest log files are deleted.

If the option *Log requests of ibaHD-Server data* is activated, the requests are written to a separate file. These can be found in the `Request` subfolder in the standard log directory. If the option is deactivated, the requests are not logged. This change is applied without restarting.

6 Configuring ibaHD-Server in ibaPDA

As usual,*ibaPDA* continuously acquires data from the automation environment. The stored signals (digital and analog signals, as well as text signals) result from the configuration in the I/O Manager of *ibaPDA*.

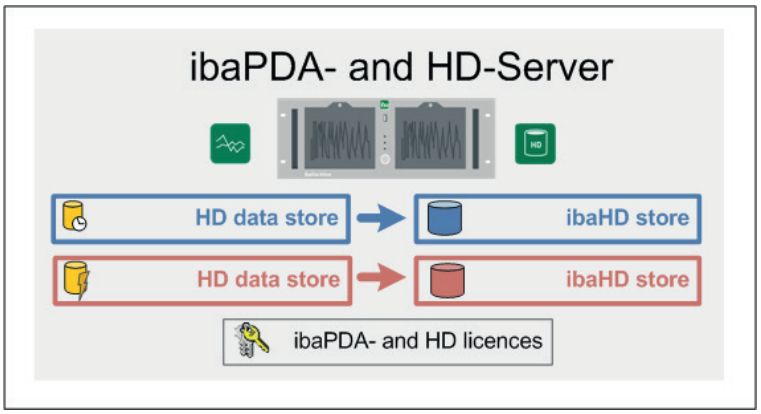
- With a **time-based** HD data store configured in *ibaPDA*, the acquired digital and analog signals are transferred to the desired *ibaHD-Server*, where they are stored in a **time-based** HD store.
- With a **time-based HD data store with time periods** configured in *ibaPDA*, the acquired digital and analog signals are transferred to the desired *ibaHD-Server*, where they are stored in a **time period store**.
- With an **event-based** HD data store configured in *ibaPDA*, events are created from the defined triggers, transferred to the desired *ibaHD-Server* and stored there in an **event-based** HD store.
- With a **length-based** HD data store configured in *ibaPDA*, the acquired digital and analog signals are transferred to the desired *ibaHD-Server*, where they are stored in a **length-based** HD store.

In contrast to normal data stores, the HD data store does not create data files in iba format (*.dat), but sends the stored data to the *ibaHD-Server*, which takes the data and writes it to the corresponding HD store.

ibaAnalyzer offers functions for converting HD data into a standard iba data file.

6.1 Organization of functions and licenses

6.1.1 ibaPDA and ibaHD-Server running on the same computer

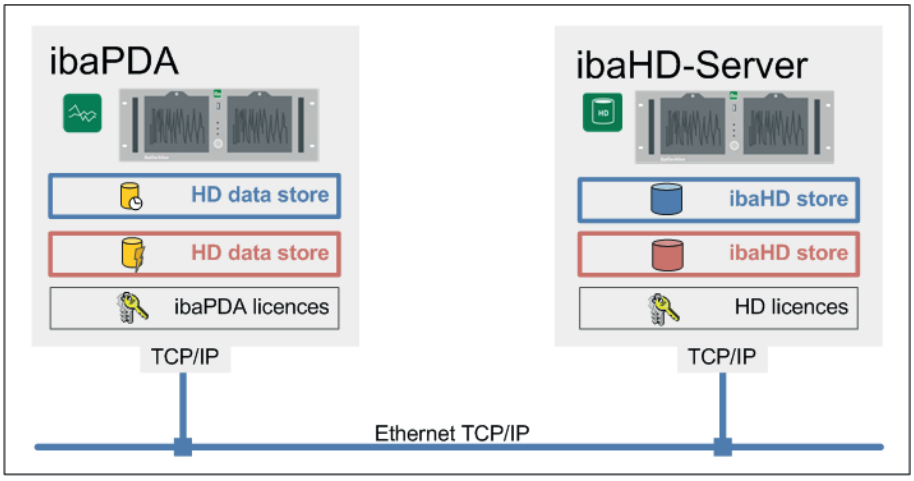


Note

If *ibaPDA* and *ibaHD-Server* are installed on the same computer, the HD licenses and the *ibaPDA* licenses are on the same license container(dongle or soft license).

For the installation of the HD data store in *ibaPDA* select the same computer as the *ibaHD-Server* (localhost). The HD stores are also configured on the same computer. Every HD store can only store data from one source, i.e. a HD data store of an *ibaPDA* system. The number of HD data stores which may write to a *ibaHD-Server* simultaneously depends on the license. By means of the different HD data stores and the corresponding stores, you have the possibility to combine signals as required, e.g. production and maintenance data.

6.1.2 ibaPDA and ibaHD-Server running on separate computers



Note

If *ibaPDA* and *ibaHD-Server* are installed on separate computers, the respective licenses for *ibaPDA* and *ibaHD-Server* are required in separate license containers (dongles or soft licenses).

This application corresponds mainly to the previous example. The difference is that you have to select the remote computer as *ibaHD-Server*. All *ibaHD-Servers* recognized in the network are automatically displayed in the *ibaHD-Server* selection menu of the *ibaPDA* client.

For more information about accessing a central *ibaHD-Server* by multiple *ibaPDA* systems, see the appendix, chapter ↗ *Example for large scale plant configuration, page 251*.

6.2 Set up HD data store

In the HD data store, you specify which signals or events are sent to which *ibaHD-Server* and which signals are written in which HD store.

You define the following parameters:

- Selection of the *ibaHD-Server* (local or separate computer)
- Selection and/or configuration of the HD data store on *ibaHD-Server*
- For time and length-based data stores: assignment of the signals which are written in a time or length-based HD store.
  Along with the signal assignment you also determine the profile which is associated with the signal to be stored. It therefore makes sense to set up the desired profiles before configuring the data store.

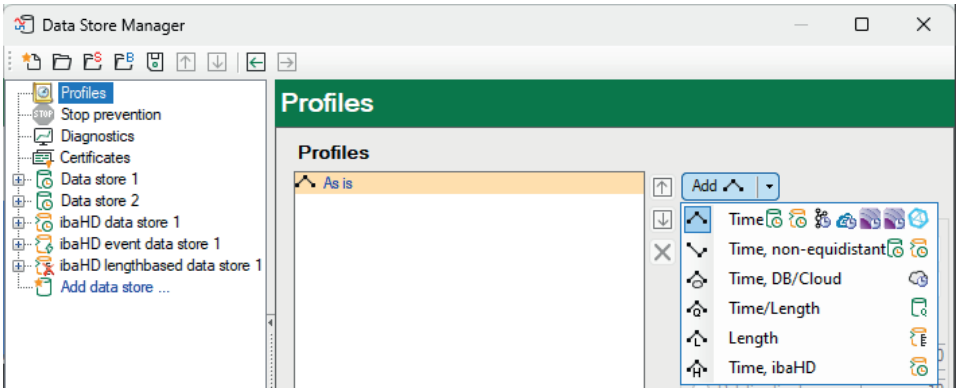
- For event data stores: Definition of events that are written in an event HD store

In order to set up an HD data store and/or to define storage profiles, open the dialog *Data Store Manager* via the menu *Configure Data Store Manager* or by clicking on the icon.

6.2.1 Define data storage profiles

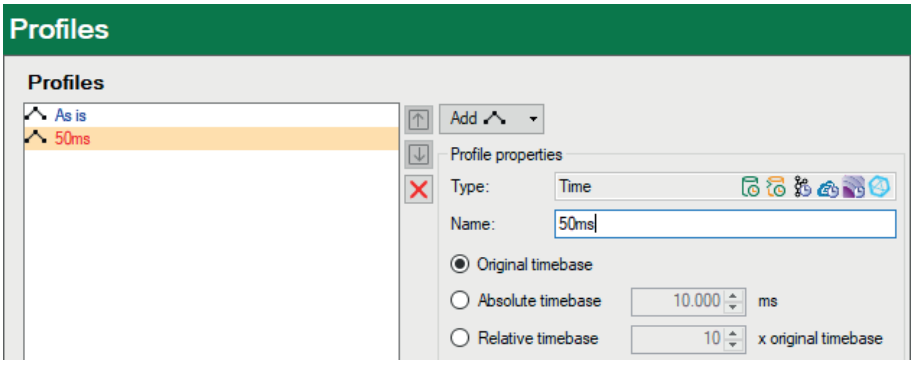
If not happened yet, please define at first the storage profiles, that you want to use for the HD data store. If appropriate profiles for normal *ibaPDA* data stores are already designed, you can also use them for time-based HD stores. You can create as many profiles as you want.

1. Click on the node *Profiles* in the left part of the dialog.
2. Select a profile type in the drop-down list from the button <Add>.



Usually you will use the type "Normal profile" for time-based HD data stores and the type "Length" for length-based stores. Use the "Time, ibaHD" profile for the acquisition of non-equidistant data.

3. Give the profile a unique name, e.g. “50ms” if the data should be stored in the 50 ms grid.

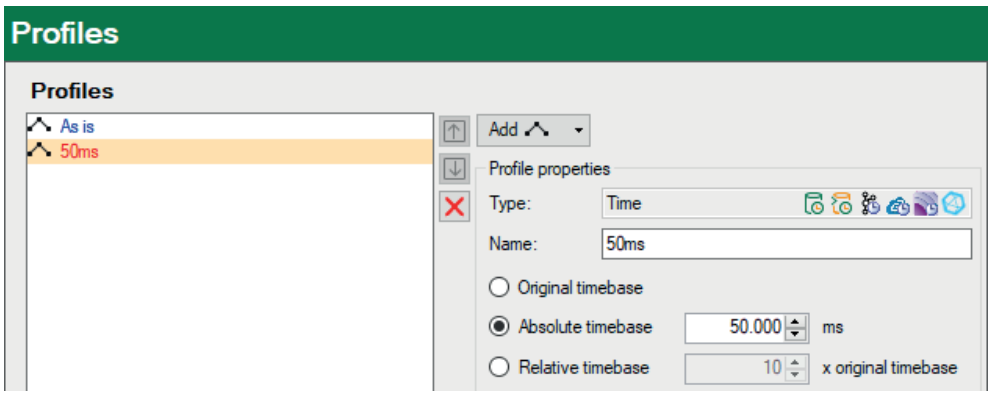


4. If you have set the "Time, ibaHD" profile type, select the *Mode*:
   - As is: The signals are stored as they are. This means that equidistant signals are stored equidistantly, non-equidistant signals are stored non-equidistantly.
   - Equidistant: The signals are resampled. The new time base can be configured as an absolute time base or as a multiple of the original time base. Filters can be used to determine which value is to be saved. This profile has the same options as the standard "Time" profile.

- Non equidistant: Each time the value of the trigger signal changes, a value is saved. In the case of a digital trigger signal, a value is therefore saved for both the rising and falling edge. The sampling time stamp can be taken from the source signal or from the trigger signal. This is only important if the time base of the source and trigger signal is different. This profile has the same options as the standard "Time, non-equidistant" profile.

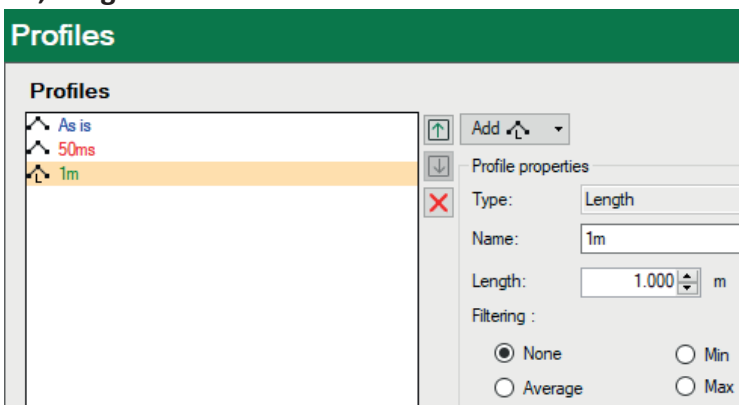
5. Set now the required timebase (here: 50 ms) or length base (in m) and activate a filter option, if necessary.
   You can set length values from 1 mm to several meters.

Profile type “Time”, Absolute timebase “50 ms”



In this example, the average value of all values recorded in the recording interval of 50 ms is saved.

Profile type “Length”, Length base “1 m”



Signals which are recorded with this profile will later only show one sample per meter in the *ibaPDA* trend graph.

6. If you want to customize the time base of the aggregation levels, select the *Aggregation mode* "Custom aggregation timebases".

Note

Note the following restrictions for the time base of each aggregation level:

- You can define a maximum of 5 aggregation levels.
- At least one aggregation level must have a timebase > 1 minute.
- The largest timebase must be < 7 days.
- Each level must be a multiplication of the level below. For example, level 1 with a timebase of 500 ms and level 2 with a timebase of 20.35 seconds are not permitted. iba AG recommends that the factor between the timebases of successive aggregation levels is between 10 and 100.
- The configuration of the user-defined aggregation levels is independent of the profile mode.

Note

Please note that the resolution of the length data has an influence on the possible zoom factor for the zoom out of the HD trend graph. A length-based HD trend graph can display maximum 50,000 samples per signal. The smaller the length base, the shorter is the total length that can be displayed in the trend graph.

If, for example, a length base of 1 mm has been selected, then it is not possible to zoom out further than 50 m. The measurement for a very long product, e.g. a rolled steel strip with a length of several hundred meters, cannot be displayed completely in a single trend graph.

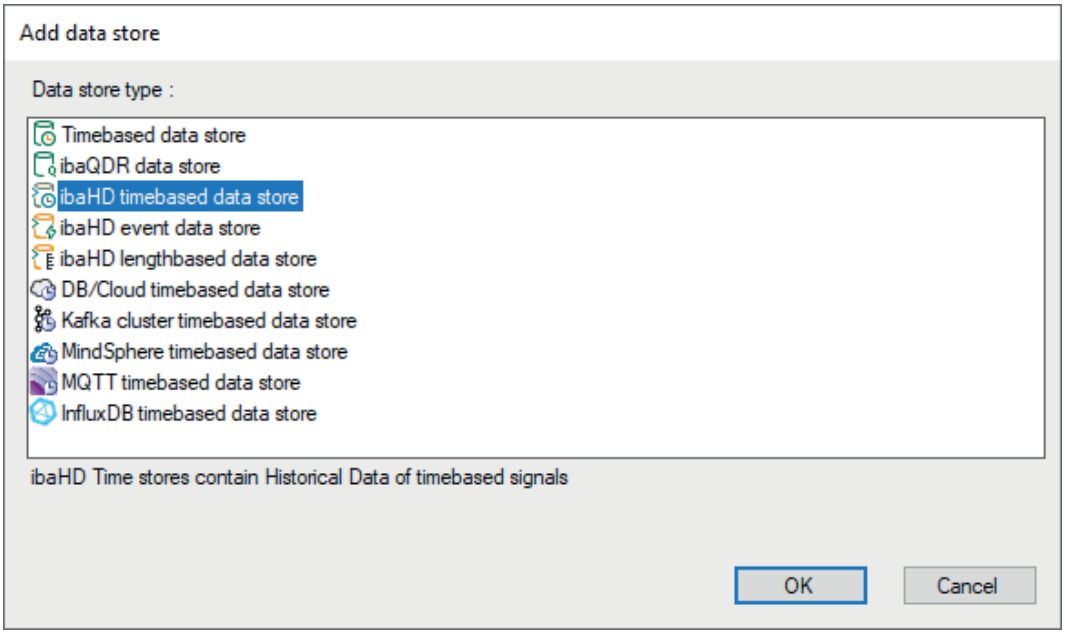
If you rather select a storage profile with a length base of 0.5 m, up to 25 km can be displayed in a trend graph.

Other documentation

For further information on the storage profiles see the *ibaPDA* manual.

6.2.2 Add an HD data store

Having selected the command "Add data store..." highlighted in blue in the tree structure on the left side, a window opens where you can select the data store type.



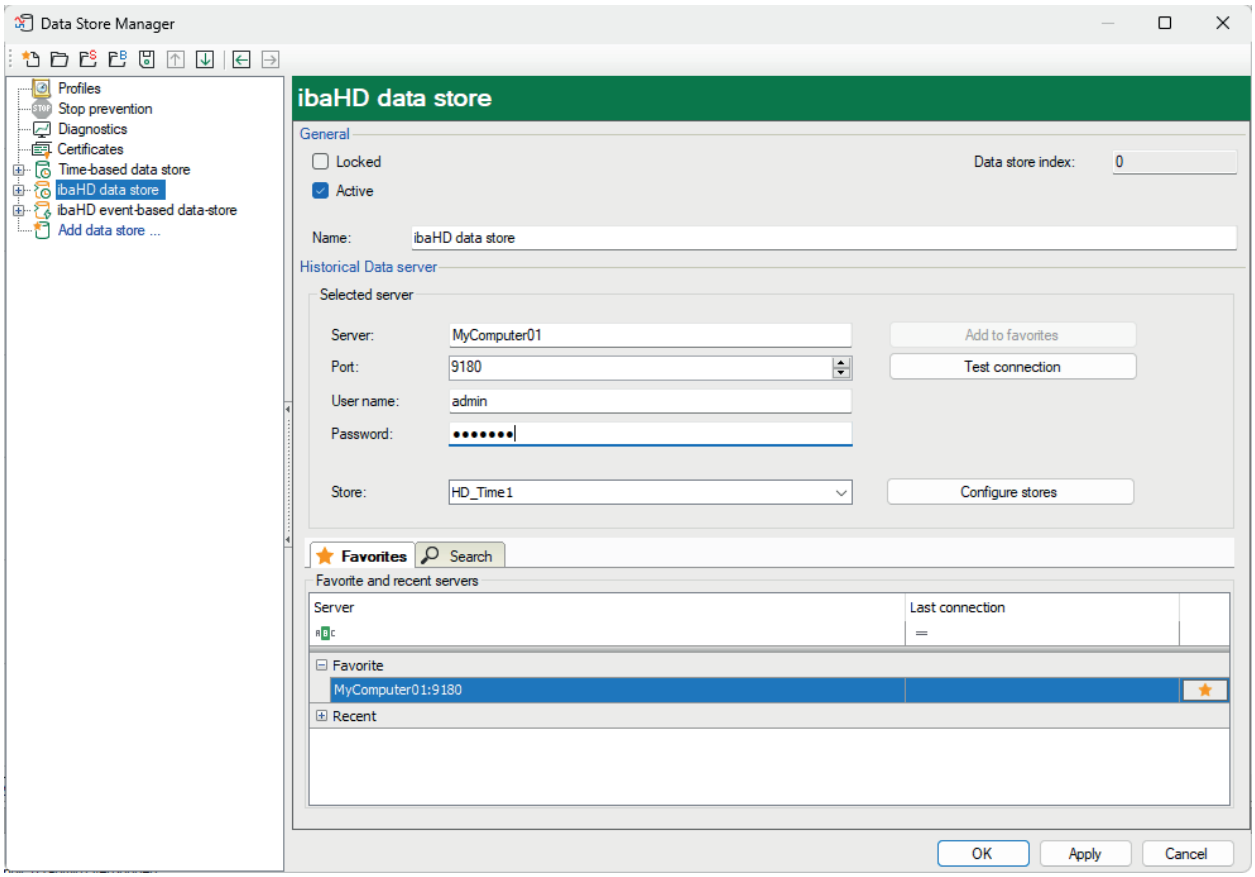
These types can be selected for HD stores:

- HD timebased data store
- HD event data store
- HD lengthbased data store

The selected HD data store is added to the tree structure and can now be configured in the further steps.

6.2.3 Select ibaHD-Server and HD store

The general settings are identical for time-, length- and event-based HD data store.



General

Locked
If this option is selected, a modification of the data storage is not possible any more. Locked data storage can only be unlocked by authorized users.

Active
Here you can select if the HD data storage is active or not.

Data storage name
Here you can assign a name for the HD data storage; Default setting: HD data storage n

HD Server

All *HD-Servers* recognized in the network are displayed in the *Search* tab. Click the <Search> button to update the list. Alternatively, you can also select from servers that have been marked as favorites or recently used in the *Favorites* tab.

Note

While using network routers or hubs, the search function may fail. In this case you have to manually enter the HD server name and the HD store name.

In case of not connected network cables, an *ibaHD-Server* locally installed on the *ibaPDA* computer will eventually not be displayed, too.

Select an *ibaHD-Server* where the HD data storage of your data shall be sent. If you select an *ibaHD-Server* with activated user administration, you still need to enter your user name and password. To check the settings, click <Test connection>.

If an *ibaHD-Server* is selected, it appears in the *Server* field and you can select one of the HD stores already created there from the selection list in the *Store* field.

Configuring stores

If no HD stores should be available, for example during the first commissioning, you must configure HD stores first.

The configuration dialog for the HD stores can be reached either here in the *ibaPDA* data recording configuration via the button <Configure stores> or via the ibaHD Manager, in the *General* tab.

For more detailed information about configuring HD stores, see ↗ *Configuring HD stores*, page 36.

6.2.4 Configuring time-based HD data store

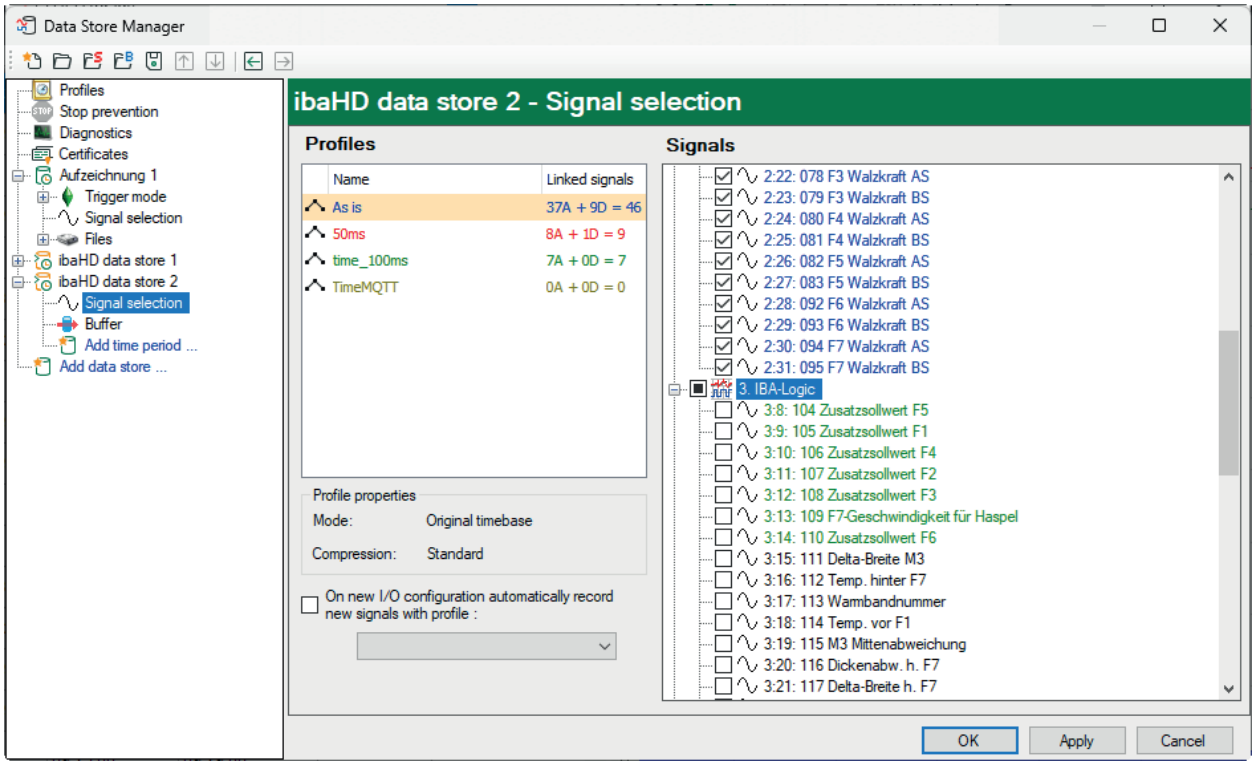
After the time-based HD data store was configured, the signals which shall be recorded there, must be selected. The signal selection is carried out in the same way as for normal data store with *ibaPDA*. Select the "Signal selection" link in the tree beneath your established data store.

Now, at the latest, you should have defined the needed storage profiles for the time-based HD data store, as described in chapter ↗ *Set up HD data store, page 122*.

As for usual data stores, you can assign signals to profiles.

Note

Text channels which you can also configure for the use in time-based data stores, are sampled on a minimal timebase and must be recorded with storage profile "As is".



Tip

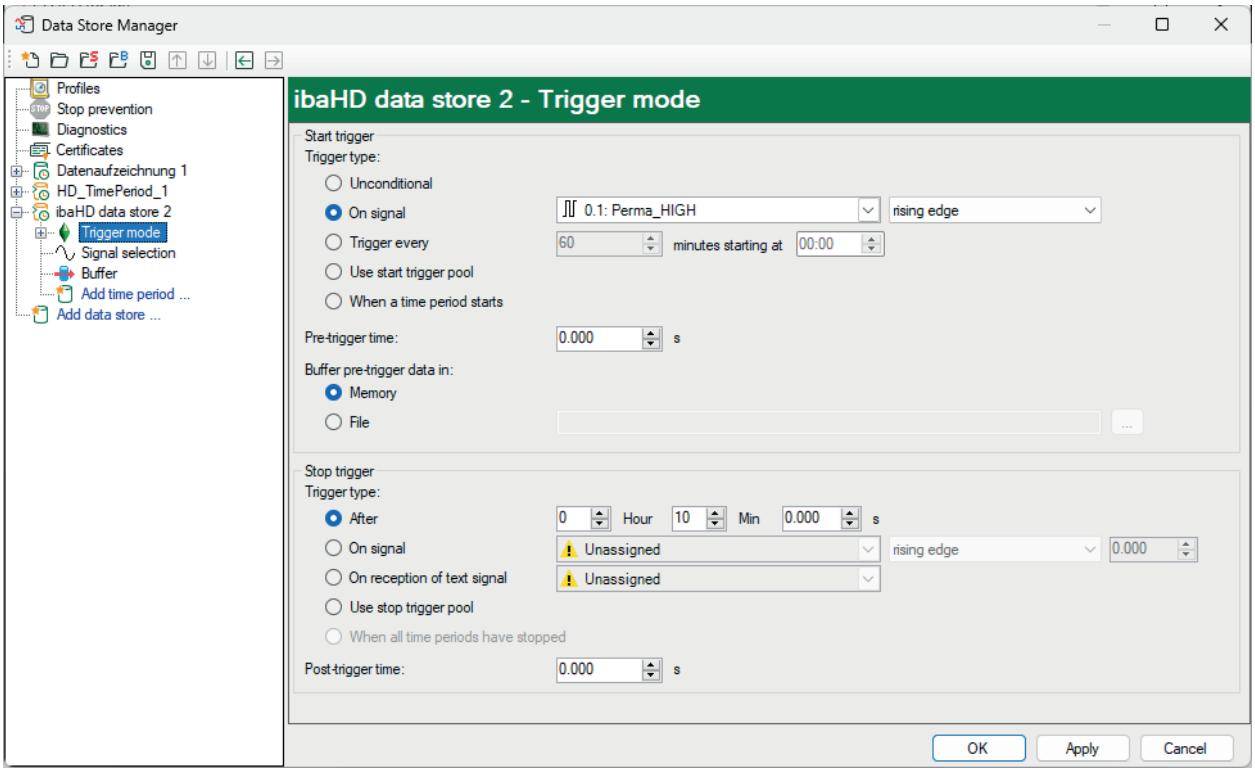
To apply the already existing signal selection, e.g. from *ibaPDA* data storage for *ibaHD-Server*, you can use the export and import function. For this purpose, please click with the right mouse button in the right "Signals" field and select the commands "Import" / "Export" in the appearing context menu.

If signal conflicts are detected during the check, the new configuration is appended (see ↗ *Select ibaHD-Server and HD store, page 127*, keyword *Default conflict action*).

6.2.4.1 Trigger mode

The prerequisite for triggered timebased HD data recording is *ibaHD-Server* v3.2.0 or higher.

In the *Trigger Mode* node, you can make settings for the start and stop trigger for triggered data recording.



Start trigger

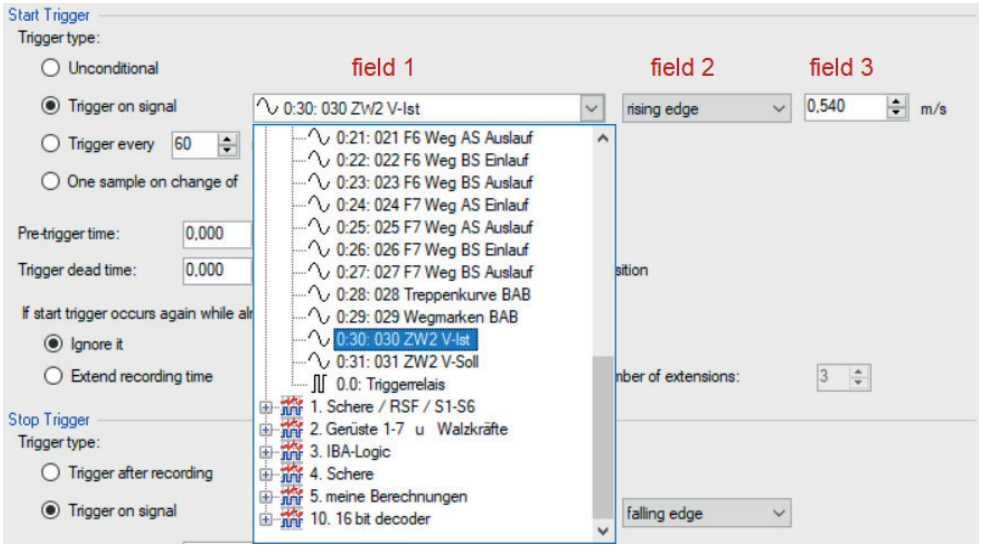
Unconditional

If this option is selected, no trigger is enabled. The data is recorded continuously.

Trigger on signal

If you want the trigger to fire on a measured signal or a virtual signal, you need to check *Trigger on signal* in the option field. In the fields next to this, define the properties of the trigger signal.

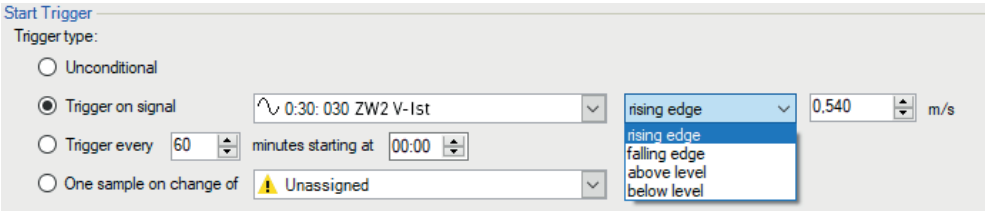
- Field 1: Drop-down list for signal selection (available analog and digital signals)
- Field 2: Drop-down list for selecting edges or levels
- Field 3: Drop-down list for selecting the trigger level value given in the specific physical unit (field 3 is only enabled in case of analog trigger signals)



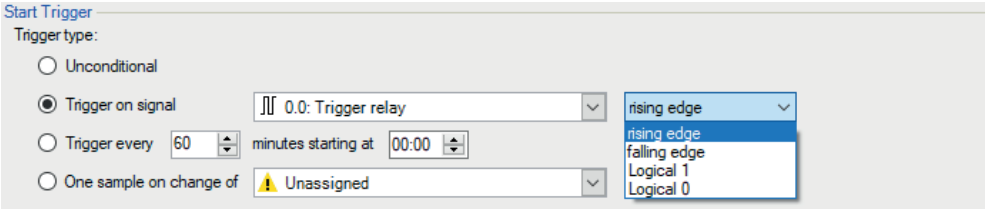
Both analog and digital signals can serve as triggers. Select the signal to be triggered via the signal tree in the selection list in field 1.

In fields 2 and 3 you can define the trigger event more specifically. These fields vary depending on whether the selected trigger signal is analog or digitalt.

- For analog signals, you can choose between level or edge triggers including a predefined level (field 3).



- For digital signals, you can choose between level or edge triggers including the 2 levels logical 0 (FALSE) and logical 1 (TRUE).



Trigger every ...

If you want to use a start trigger always at a certain time regularly, you can check the *Trigger every ... minutes starting at ...* option. Enter the period given in minutes, or select it from the input field. Value range is from 0 to 1440, which equals one day. Then enter or select the start time for the first trigger. Value range is from 00:00 to 23:59, which equals one day.

Use start trigger pool

Enable this option if you want to use trigger signals from the start trigger pool. You can find further information about the trigger pool in the *ibaPDA* manual, part 5, *Data storage.*

When time period starts
Enable this option if you want recording to start as soon as any period in the same HD store receives a start trigger.

Pre-trigger time
If this function is selected by entering a time, *ibaPDA* precedes the live data with the buffered data from the pre-trigger buffer. The saved pre-trigger buffer is continuously overwritten and always contains the latest data. The buffer can either be saved in the computer memory or in a file.

- Memory:
  If Memory is selected, the pre-trigger data is buffered in the RAM. The data volume that can be saved in the pre-trigger memory is limited to approx. 500 MB. If the set pre-trigger time combined with the number of selected signals causes this limit to be exceeded, the File option must be selected instead. If this occurs, a warning is displayed when applying the data recording configuration.
- File
  The pre-trigger data is saved in a file. Enter the path for the required directory or select a directory using the browser button. The directory is created if it does not already exist. The file name begins with the name of the HD store.

Stop trigger
For the stop trigger, a trigger type and the trigger lag time can be set. If “Unconditional” is set, all options for the stop trigger are disabled and no stop trigger is defined. This corresponds to continuous HD recording.

Trigger type
You use the trigger type to specify the circumstances under which recording is to be stopped.

After
The recording is stopped as soon as the specified time after the start of recording is exceeded.

On signal
See explanations for start trigger

On reception of text signal
If this option is enabled, recording stops when the selected signal receives a new text value. The content of the text signal is not relevant for the trigger function.

Use stop trigger pool
This option enables every signal in the stop trigger pool to stop recording if it is triggered. You can find further information about the trigger pool in the *ibaPDA* manual, Section 5, *Data recording*.

When all time periods have stopped
Recording stops as soon as all time periods have been completed.

Trigger lag time
If this function is selected by entering a time, recording is only ended when this lag time has elapsed.

6.2.4.2 Buffer

The data storage uses a memory buffer and additionally a file buffer that can be enabled optionally.

The description applies to all types of data stores that transfer data to external systems and where temporary accessibility and available bandwidth issues may occur, such as:

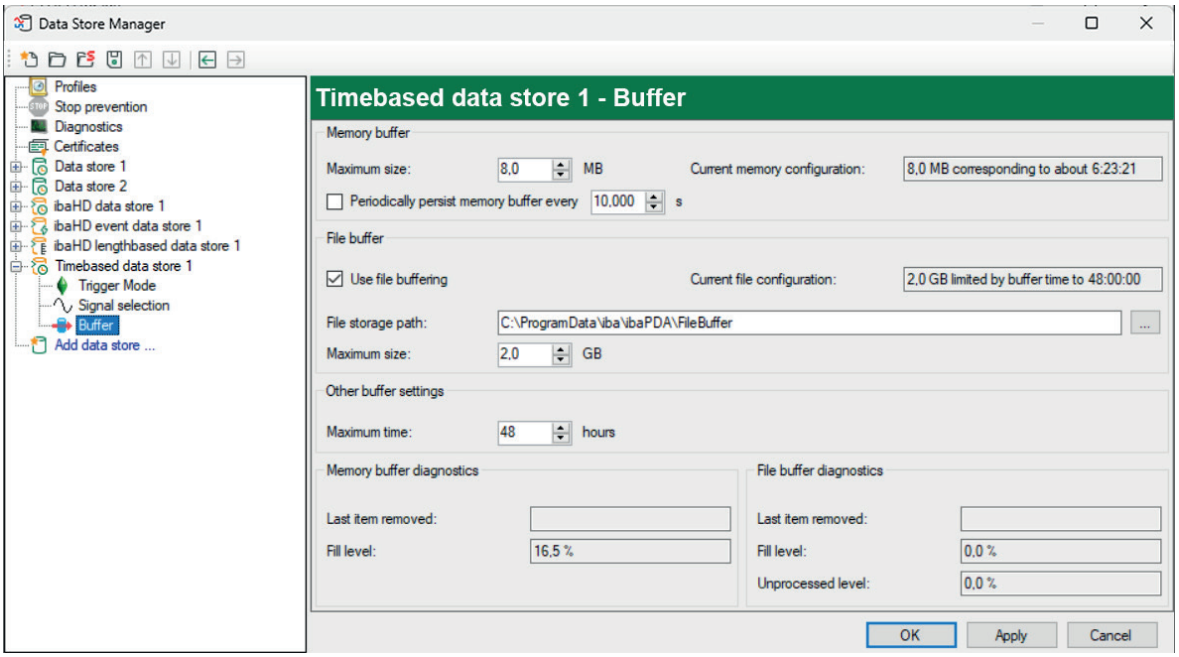
- ibaHD timebased/eventbased/lengthbased
- DB/Cloud timebased
- Kafka cluster timebased
- MQTT timebased
- MindSphere timebased
- InfluxDB timebased

Data to be sent to the target system always passes through the internal *ibaPDA* memory buffer. If the connection to the target system exists, the data is sent there from the memory buffer immediately. If the connection is lost, or the data cannot be sent out fast enough, the data remain in the memory buffer. The memory buffer is located in the RAM of the *ibaPDA* computer and is therefore limited and volatile. If, for example, the acquisition is restarted, the buffered data is lost. If the memory buffer grows beyond the configured size during ongoing acquisition, the oldest values are deleted and thus lost.

To improve this, a file buffer can additionally be enabled, which can buffer much larger amounts of data. The data is stored in files in a directory in a local drive of the *ibaPDA* server. When the file buffer is enabled, data is transferred from the overflowing memory buffer to the file buffer. If the acquisition is finished or restarted (e.g. by applying a modified IO configuration), data that may be in the memory buffer at this time is also transferred to the file buffer.

After reconnecting to the target system, the oldest data is always transferred first. Newer values are added to the buffer in the meantime. If there is still buffered data in the file buffer when the acquisition is started, it is handled and processed in the same way. The data is saved in the format that was configured in the data store at the time of buffering and it is also sent in this format when the connection is established again.

You configure the buffering in the *Buffer* node of the respective data store. The figure below shows the buffer configuration using the example timebased data store.



Memory buffer

The memory buffer is always enabled. You cannot deactivate it because data to be transmitted always passes through the buffer before being forwarded to the target system.

Maximum size

Enter here the maximum total size for items buffered in memory. If the maximum size is exceeded, there are 2 options:

- When file buffering is disabled, the oldest item in memory is deleted (and is lost forever).
- When file buffering is enabled, the oldest part of the buffer memory is moved to a buffer file.

Periodically persist memory buffer every … s

You can only enable this option if file buffering is enabled. If the option is enabled, the entire memory buffer is periodically swapped to a buffer file.

Enter a duration after which the memory buffer is periodically stored. It must be between 10 s and 600 s.

With this option you can ensure that as little data as possible is lost in case of a system failure.

Current memory configuration

Display of the approximate time period that can be temporarily stored in the memory buffer with the configured settings. Specified in d.hh:mm:ss.

File buffer

Use file buffering

By default, the file buffer is not used. Here you can enable file buffering.

Current file configuration
Display of the approximate time period that can be temporarily stored in the file buffer with the configured settings. Specified in d.hh:mm:ss.

File storage path
In the *File storage path* field, you can select a location for the files. You can enter the directory directly into the text field, or select it via the browse button <...>. The configured file directory must be located on a local hard disk of the *ibaPDA* server computer.

You can use the same file directory for several data stores because the buffer files of a data store have a unique name. Files from different data stores can thus be distinguished by their name.

Maximum size
You can configure the maximum total size of the buffer files of a data store. The buffer files themselves have the file extension .buf, the index file for managing the buffer files has the extension .info. The maximum size is the total size of all these files. If the maximum buffer size is exceeded, the oldest buffer file is deleted.

Other buffer settings

Maximum time
Stored data older than the maximum time is not transferred to the target system. Files older than the maximum time can be deleted. You can enter a value between 1 and 1000 hours.

Memory buffer diagnostics/File buffer diagnostics

Last item removed
Indicates when the last item was taken from this part of the buffer.

Fill level
The fill level indicates what percentage of the buffer size is currently filled with buffered data.

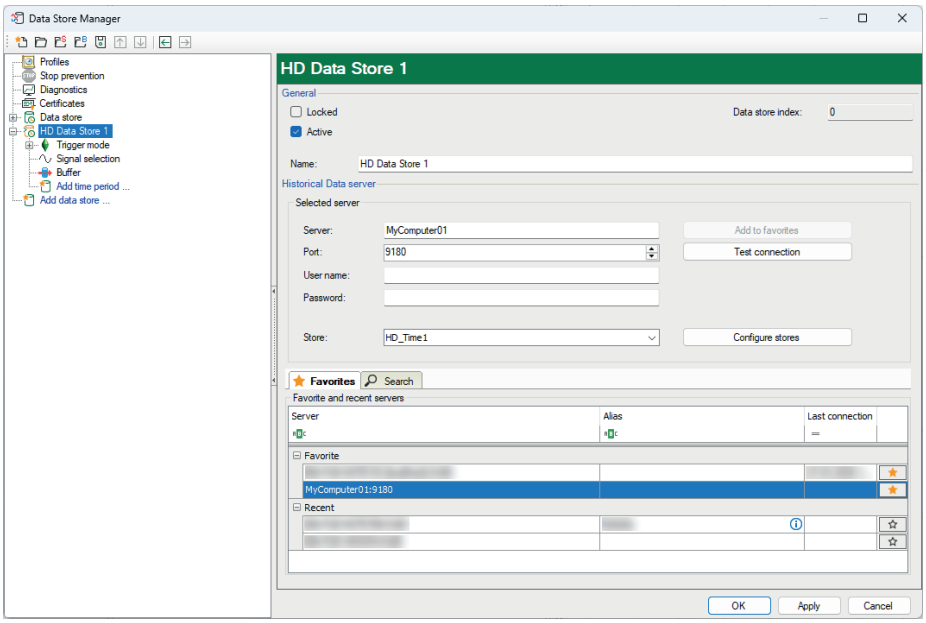
Unprocessed level
Items transferred to the target system are not deleted immediately in the file buffer. Only when a buffer file is completely read, it is deleted. Therefore, it is possible that only a part of a buffer file contains data that has not yet been transferred. The fill level refers to the existing buffer files, while the "unprocessed level" indicates the percentage of data in the file buffer that has not yet been transferred.

6.2.5 Adding a time period

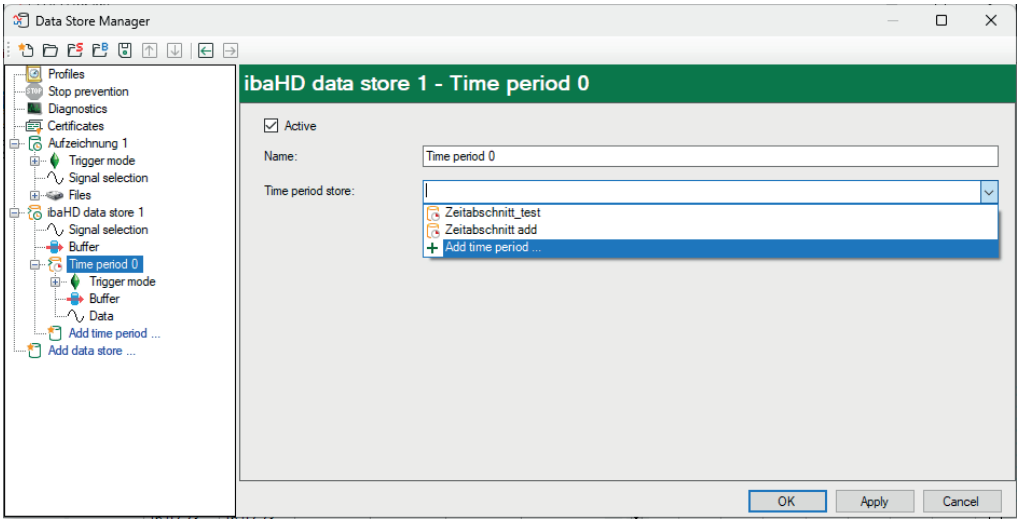
Proceed as follows to configure time periods in a time-based data store in *ibaPDA* .

Prerequisite: Time period stores are already configured, see ↗ *Time period stores – Settings*, page 45.

1. Click on the *Add time period* link under the HD data store.



→ The following dialog box appears:



2. Enter a name for the time period and select the time period store to which you want to write the data.

   Only time periods that are not yet being written/used by a HD store are displayed. If no time period store has been configured yet, you can open the configuration of the HD store via the *Add time period* entry.

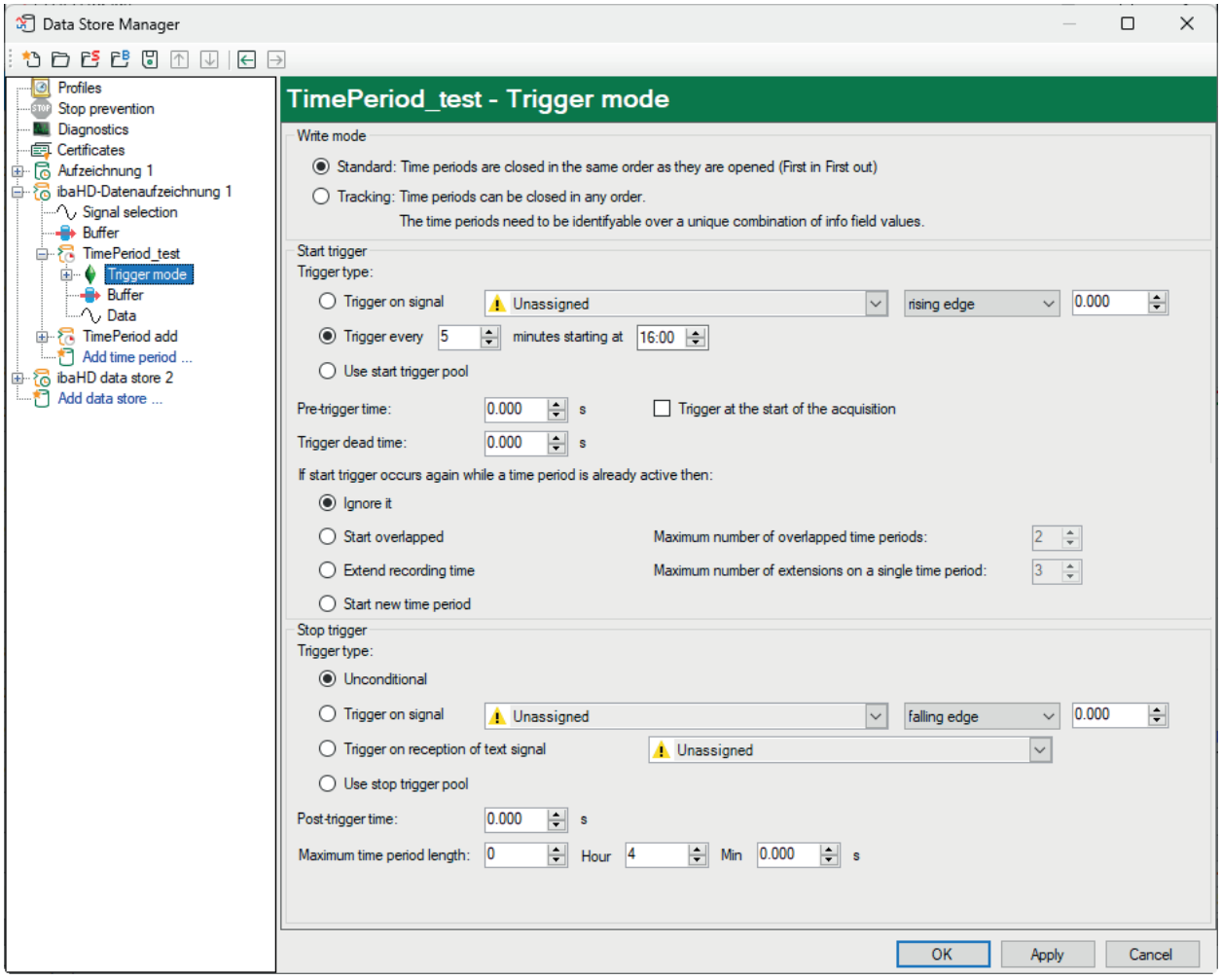
Note

The time period data is saved by default as a subfolder to the configured store data. All data contained in this time period folder is managed autonomously by *ibaHD-Server*.

Changes or file access violations to the folder data can have an impact on *ibaHD-Server* processes.

6.2.5.1 Trigger mode

In the “Trigger mode” node, you can configure the triggers that create the time period.



Two write modes are possible: Standard and tracking mode

- Standard: Time periods are closed in the same order as they were opened (first in, first out)
- Tracking: Time periods can be closed in any order. The time periods must be identifiable by a unique combination of info field values. Tracking mode is used when time periods must be assigned to specific product items. If there are several items in the production system, the stop trigger is not unique when an item leaves the production system. Tracking mode allows assignment of stop triggers to product IDs and thus ensures that the correct time period is closed.

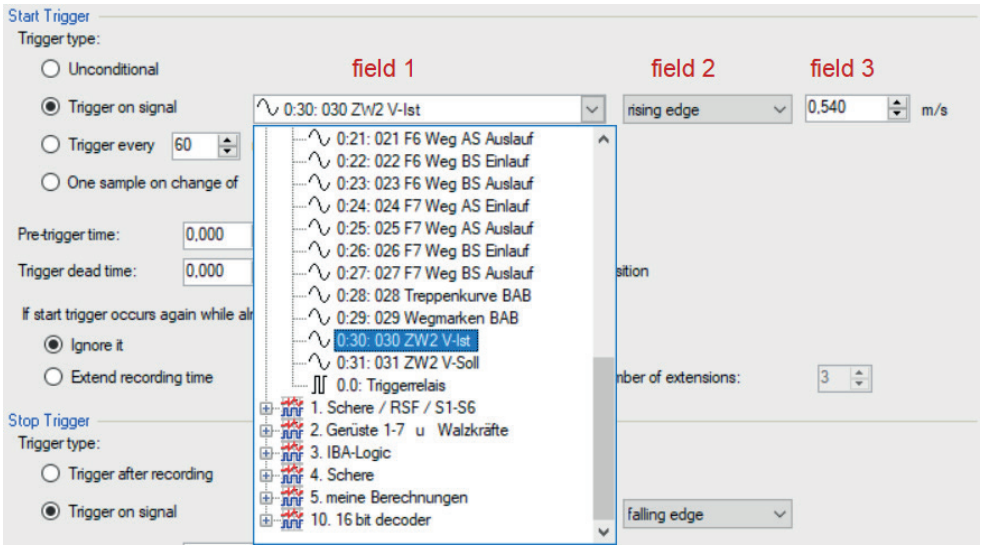
Trigger settings in standard mode

Start trigger

Trigger on signal

If you want the trigger to fire on a measured signal or a virtual signal, you need to check *Trigger on signal* in the option field. In the fields next to this, define the properties of the trigger signal.

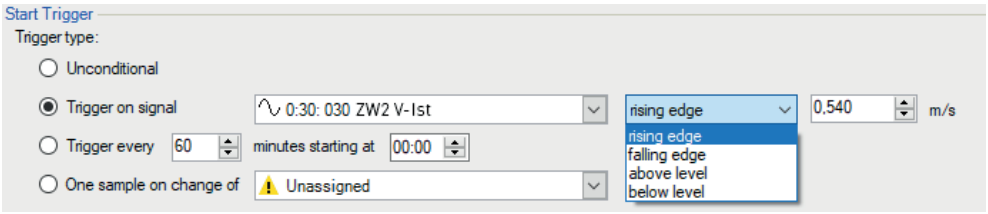
- Field 1: Drop-down list for signal selection (available analog and digital signals)
- Field 2: Drop-down list for selecting edges or levels
- Field 3: Drop-down list for selecting the trigger level value given in the specific physical unit (field 3 is only enabled in case of analog trigger signals)



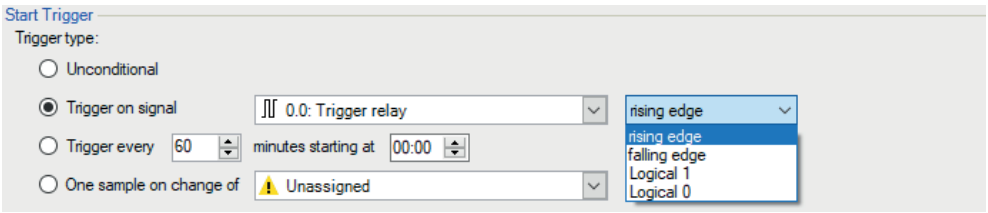
Both analog and digital signals can serve as triggers. Select the signal to be triggered via the signal tree in the selection list in field 1.

In fields 2 and 3 you can define the trigger event more specifically. These fields vary depending on whether the selected trigger signal is analog or digitalt.

- For analog signals, you can choose between level or edge triggers including a predefined level (field 3).



- For digital signals, you can choose between level or edge triggers including the 2 levels logical 0 (FALSE) and logical 1 (TRUE).



Trigger every …

If you want to use a start trigger always at a certain time regularly, you can check the *Trigger every ... minutes starting at …* option. Enter the period given in minutes, or select it from the input field. Value range is from 0 to 1440, which equals one day. Then enter or select the start time for the first trigger. Value range is from 00:00 to 23:59, which equals one day.

Use start trigger pool
Enable this option if you want to use trigger signals from the start trigger pool. You can find further information about the trigger pool in the *ibaPDA* manual, part 5, *Data storage.*

Pre-trigger time
You can configure a pre-trigger time, which means that the time period begins before the trigger event by the pre-trigger time. The start time is then the trigger time minus the pre-trigger time. If the trigger condition is met, the incoming data is added to the data buffered during the pre-trigger time.

Trigger dead time
This property is available for the *Trigger on signal* and *Trigger every...* start triggers. The trigger dead time specifies the time of suppressing subsequent triggers after a trigger occurred. For example, if the dead time is set to 5 seconds, all other triggers are ignored for the duration of 5 seconds after the first trigger occurrence.

Trigger at the start of the acquisition
If you want the time period to start immediately at the start of the acquisition, or as soon as a new data storage configuration has been applied, the *Trigger at the start of the acquisition* option must also be enabled. If you do not enable this option, the time period does not start until the trigger fires.

If a start trigger occurs again while a time period is already active, then:
You can specify what you want to happen if a new start trigger occurs while a time period is already active:

- Ignore it:
  If this option is enabled, the system ignores every new start trigger. The current time period is continued.
- Start overlapped:
  If this option is enabled, a further time period is started and the current one is not closed. In the *Maximum number of overlapped time periods* field, you can set how many time periods can be opened at the same time.
- Extend recording time:
  If this option is enabled, the maximum length of the current time period is increased. It is increased by the configured *Maximum time period length* in the stop trigger section. In the *Maximum number of extensions on a single time period* field, you can configure how often the maximum length can be increased.
- Start new time period:
  If this option is enabled, the current time period is closed and a new time period is started.

Stop trigger

In standard mode, a stop trigger always relates to the oldest open time period. If acquisition is stopped or a new data acquisition configuration is applied, all open time periods are automatically closed.

The settings for the stop trigger are made in the same way as for the start trigger. As before, both analog and digital signals can be used as the trigger.

Trigger on reception of text signal

The stop trigger is initiated by reception of the text signal selected in the field nearby. The content of the text signal is not relevant for the trigger function.

Post-trigger time

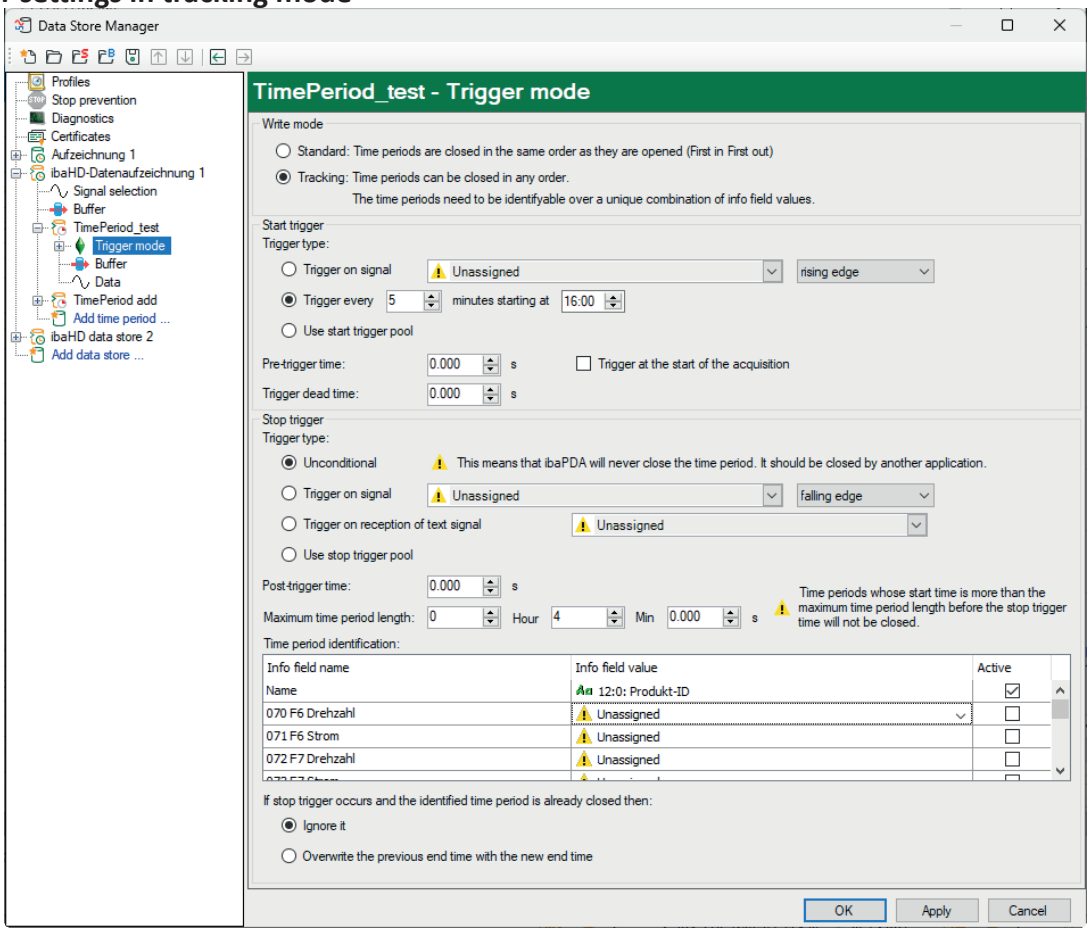
You can configure a post-trigger time, which means that the time period ends after the trigger event by the post-trigger time.

Maximum time period length

If no stop trigger is fired, the time period is automatically closed when it reaches the maximum length.

If *Unconditional* is selected for the stop trigger, the time period always has the maximum length.

Trigger settings in tracking mode



Start trigger

The settings for the start trigger are the same as those in standard mode.

Stop trigger

The settings for trigger type, post-trigger time and maximum time period length correspond to those in standard mode.

However, in tracking mode the stop trigger relates not to the oldest time period but to the time period that corresponds to the current ID.

The ID of a time period is defined by one or more info fields. You can configure which info fields define the ID in the table for identification of the time period. To add the info field to the ID, assign a signal and enable it by checking it. The signals are acquired at the time of the stop trigger and *ibaPDA* then queries the time period store to identify the times whose ID info fields correspond to the signal values.

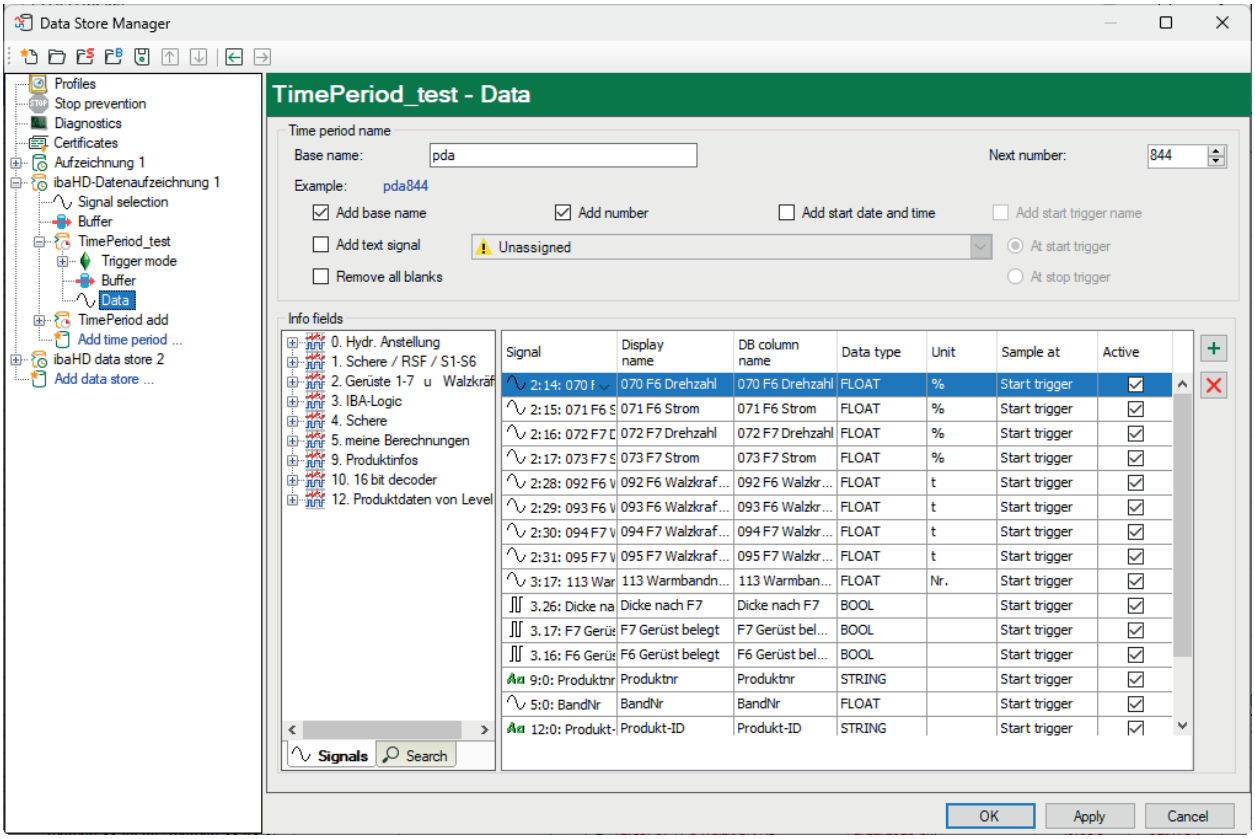
The query only includes time periods whose start time is less than the maximum length of the time period before the stop trigger. If *ibaPDA* finds several matching time periods, none of them are closed. A warning is created in the event log.

You can configure how *ibaPDA* behaves if a stop trigger occurs and the matching time period is already closed. You can choose between

- Ignore it: The end time of the corresponding time period is not changed
- Overwrite the previous end time with the new end time: The end time of the corresponding time period is changed

In tracking mode, open time periods are not automatically closed if acquisition is stopped or a new data storage configuration is applied. Time periods are only closed by a stop trigger. If *Unconditional* is selected, another application must close the time period.

6.2.5.2 Data



In the *Data* node you can configure how time periods are named and which info fields will be written. You can define a basic name and select which parameters are to be added to the time period name: a (consecutive) number, start date and start time, start trigger name, value of a text signal.

In the *Info fields* table, you can add info fields by dragging signals from the signal tree into the table. You can also use the plus button to add a row. For each info field you must define the following:

- Signal: Signal whose value is to be written to the info field
- Display name: The display name for the info field. By default, the signal name is used. The same name may not be used twice for the display name.
- DB column name: The name of the database column that will contain this info field. Depending on the database type that the period uses, there may be restrictions on the length and the characters that can be used in the column name. By default, a normalized version of the signal name is used.
- Data type: The data type used for the database column. By default, the data type of the signal is used.
- Unit: This is the unit for the info field (read only). It is always the same as the unit of the signal.
- Sample at: You can specify when the value is acquired - at the start or at the stop trigger.
- Active: If an info field is active, *ibaPDA* writes a value to the field. If it is not active, *ibaPDA* does not change the database column corresponding to the info field.

The table shows the full list of info fields that are available in the database. It is not necessary for *ibaPDA* to write all info fields.

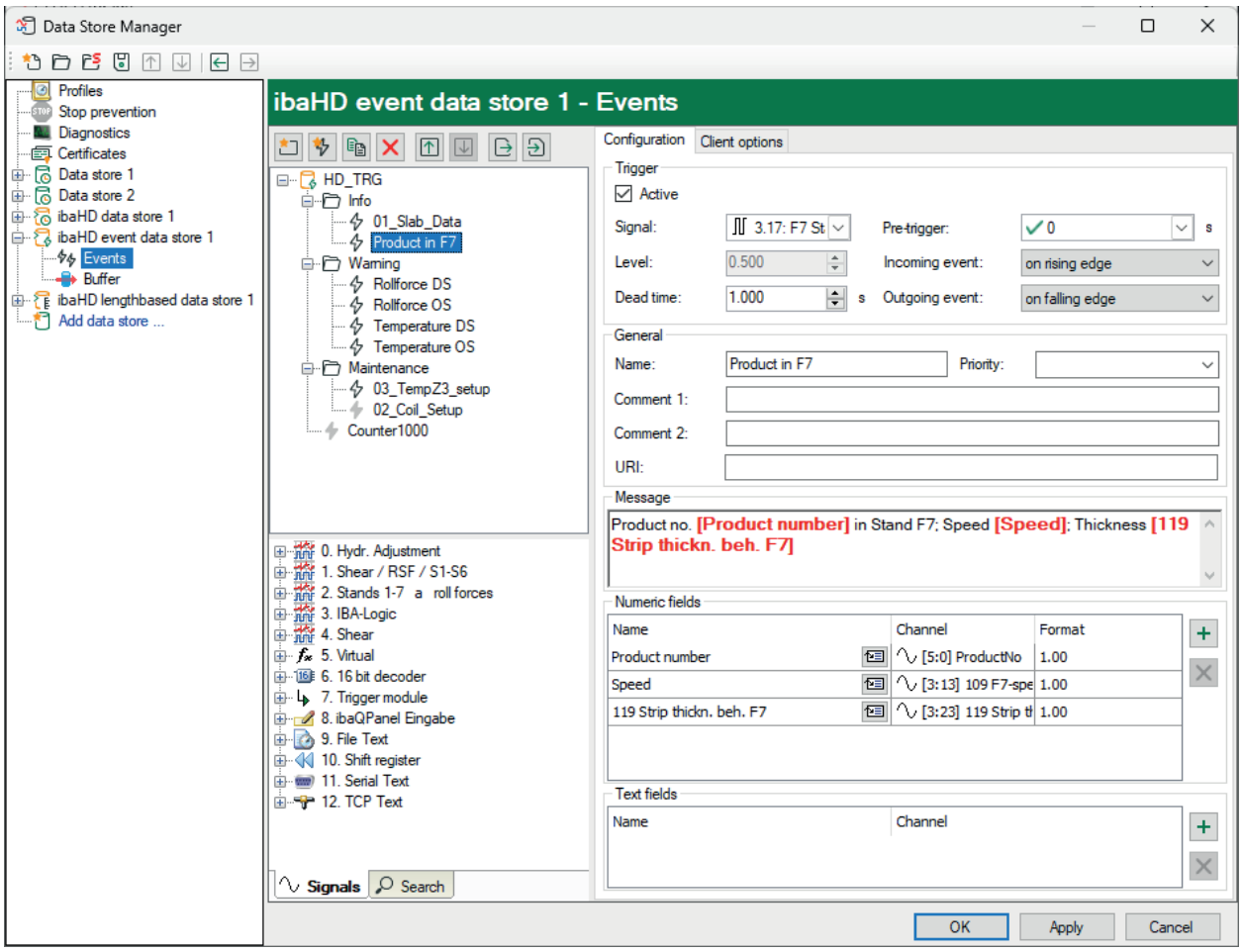
6.2.5.3 Buffer for time periods

You configure the buffering in the *Buffer* node of the respective time period. Information on the setting options can be found in chapter ↗ *Buffer, page 133*.

6.2.6 Configuring event-based HD data store

When the event-based HD data store is established, each event that is to be created and stored must be defined.

Select the node "Events" of your event-based data store in the tree structure on the left side. On the right side, the dialog box is now displayed where you can configure your events.



Events

The configured events are displayed here as a tree. You can establish a directory structure for a better classification (e.g. in system parts, technological groups etc.).

The following buttons are available for editing the event tree:

 Adds a new folder to the tree

 Adds a new event to the tree

The following buttons are available if you have already configured events and they refer always to the marked nodes (event or folder)

 Copies the selected nodes in the tree

 Removes the selected nodes in the tree

 Moves the selected node inside the hierarchy level up.

 Moves the selected node inside the hierarchy level down.

 Importing an event configuration from a compatible text file

 Exporting the configured events into a text file

Tip

With keeping the <Shift> key depressed, you can mark a whole range of nodes (inside a hierarchy level).

With keeping the <Ctrl> key depressed, you can mark a selection of several nodes (inside a hierarchy level).

Two tabs are available for the further configuration:

- Configuration
  In this tab, you configure the events, i.e. the name, the firing trigger signal and the message text.
- Client options
  In this tab, you configure whether a generally applicable row style should apply in the event display for all events and whether certain commands should be sent to the trend displays if an event occurs.

Note

Please note the opportunity to define events by means of trigger modules. See also ↗ *Generating events by trigger modules, page 159*.

6.2.6.1 Configuration tab

Trigger

Active
Here you can select if the event is active or not.

Signal
Here you select the signal that is to trigger the event.

Pre-trigger time
Enter a lead time for the tigger to move the timestamp.

A positive value shifts the time stamp into the past, a negative value shifts it into the future.

Level
This value is only relevant for analog trigger signals. Enter the value whose exceeding or falling below shall trigger the event.

Incoming event
You can store an event as an incoming and outgoing event.

Here you set how the incoming event is to be triggered.

- In case of an analog signal as a trigger, the setting *on rising edge* means that the value of the trigger signal must exceed the level value in order to trigger the incoming event.
- In case of an analog signal as a trigger, the setting *on falling edge* means that the value of the trigger signal must fall below the level value in order to trigger the incoming event.

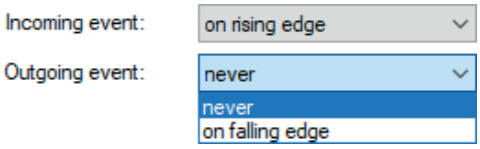
Outgoing event
Here you set how the outgoing event is to be triggered.

If the incoming event is triggered *on rising edge*, the outgoing event can only be triggered *on falling edge* and vice versa.

Dead time
The dead time describes the period of time for which an incoming event cannot be triggered again after it has been triggered. This can be used to suppress showers of events with fluttering signals.

Tip

If you only want to store incoming events, set the value *never* for *Outgoing event* .



Tip

Use virtual modules in the I/O Manager of *ibaPDA* to create more complex triggers from the stored analog and digital signals. You can then select these signals as triggers for the events.

General

Name
Here you enter the name of the event. The event is displayed under this name in the left tree.

Priority
Here, you can select a priority for the event. The three priority groups *High*, *Normal* and *Low* are predefined in the drop-down list.

However, you can also add your own priority classes to the list by simply writing the desired plain text (e.g. "error", "warning", "information" into the field. After accepting the configuration, this priority class is also available in the drop-down list. There is no need to assign a priority to an event.

Comment 1 or comment 2
Just like for an analog or digital signal in the I/O Manager of the *ibaPDA*, you can enter every additional information in the fields *Comment 1* and *Comment 2*.

URI

Here you can specify a URI that opens in the default browser as soon as the *ibaPDA* user clicks on the corresponding field in the event table.

Tip

You can also set or reset the property *Active* for a folder. Hereby, all events which are in the folder are activated or deactivated.

Message

Here you can enter a message which will be put out while triggering the event.

The entered text can contain placeholders for numbers and texts which refer to analog/ digital signals and text signals of the I/O manager. When configuring offline events with *ibaDatCoordinator* the placeholders can be used for numeric values or texts from a data file or HD query and from a PDO file. While triggering, these placeholders in the text of the message are filled dynamically with the current value of the signal or technostring.

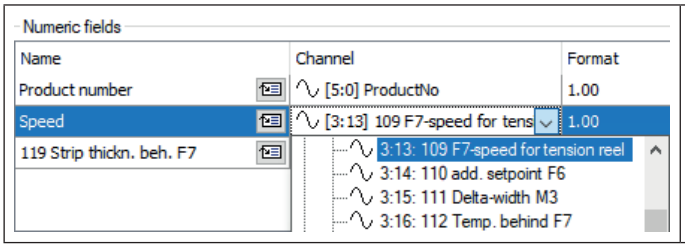
How to define the placeholders is described under "Numeric fields" and "Text fields".

Numeric fields

In the table, you can define up to eight placeholders for numbers which can be used in the message.

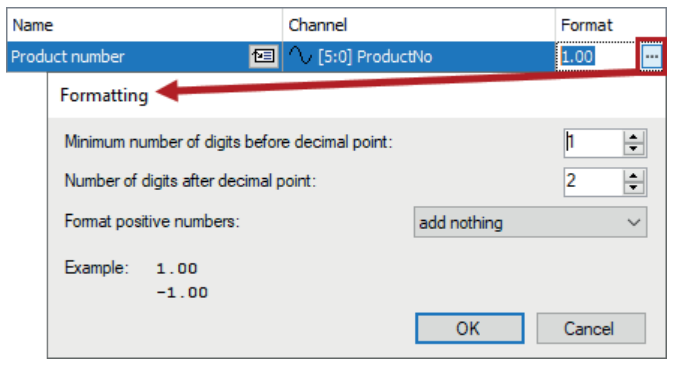
Column Name
Here, you enter an arbitrary name for the numeric field.

Column Channel



Here, you select the signal whose current value has to be entered into the message while triggering the event.

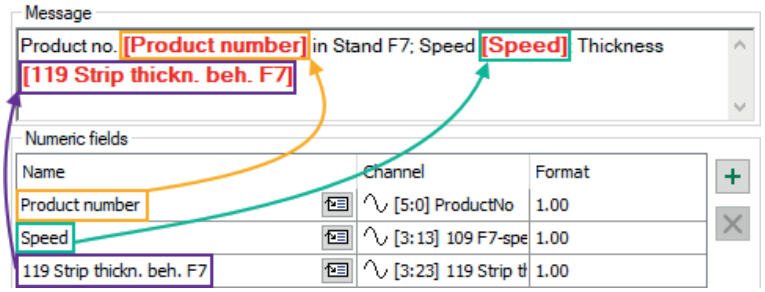
Column Format



Clicking on the <...> button opens the window for entering the number format.

Define the format which will be used to display the current value in the message here.

You enter a placeholder for a numeric field in the message text by placing the cursor on the right place in the message and by clicking on the icon at the desired numeric field. The placeholder is automatically entered at the cursor position (marked by square brackets and red bold printed text).



Text fields

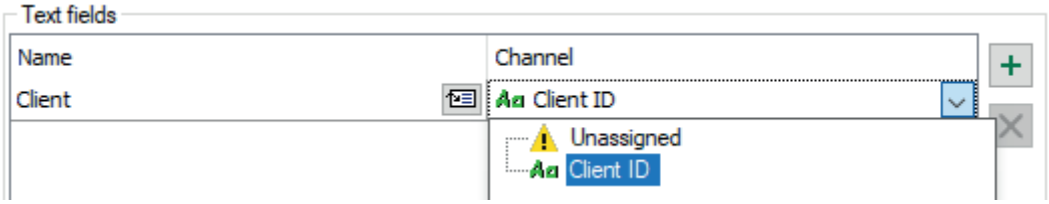
In the table, you can define up to eight placeholders for texts which can be used in the message.

Column Name

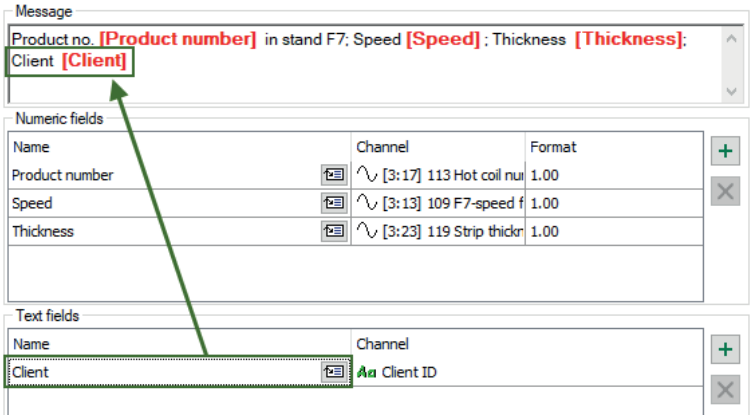
Here, you enter a random name for the text field.

Column Channel

Here, you select the text signal whose current value has to be entered into the message at the triggering of the event.



You enter a placeholder for a numeric field in the message text by placing the cursor on the right place in the message and by clicking on the icon at the desired numeric field. The placeholder is automatically entered at the cursor position (marked by square brackets and red bold printed text).



Note

The signals for channels in the table for number or text fields can be selected via the drop-down menu and also via drag &drop from the signal tree displayed in the left-hand area of the configuration window. Thereby only the correct signal types in the correct tables are accepted (analog or digital signals for number fields, text signals for text fields).

Note

The names of the number and text fields for an event have to be unique!

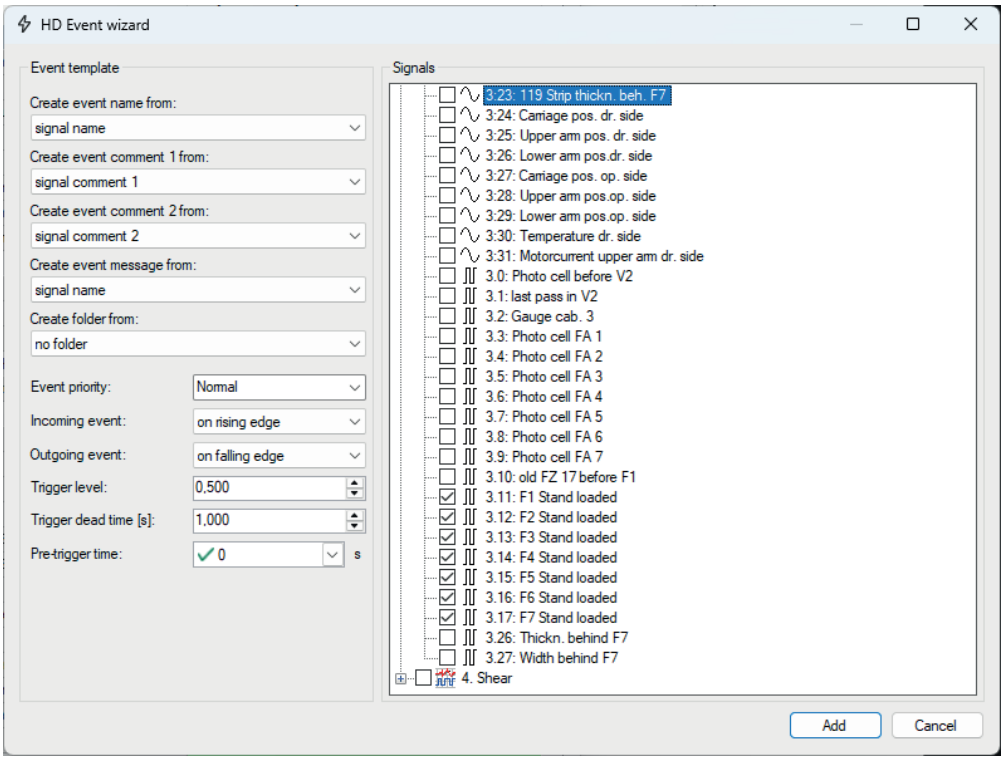
Note

All used expressions need to be timebased! Lengthbased signals can be converted to timebased signals using the function *ConvertBase ([lengthbased_expression],1,0).*

6.2.6.2 Event wizard

The event wizard opens by clicking on the button in the configuration of event-based data stores. It also opens automatically when you drag a signal or an entire module from the window with the signal tree into the event tree window above it. If you have set up a folder structure for the events, drag the desired signal directly to the correct folder.

Use the wizard to create events directly from signals that you have configured in the I/O Manager. You can select one or multiple signals to be configured as an event. Therefore, the properties of the signals (signal name, comment 1 and 2) can be automatically transferred to the properties of the events.



Event template

Create event name from

Select from the drop-down list how the "Event name" should be assigned. The "signal name", "signal comment 1" and "signal comment 2" are available for selection.

The default setting is "signal name".

Create event comment 1 from

Select from the drop-down list how the "event comment 1" should be assigned. The "signal name", "signal comment 1" and "signal comment 2" are available for selection.

The default setting is "signal comment 1".

Create event comment 2 from

Select from the drop-down list how the "event comment 2" should be assigned. The "signal name", "signal comment 1" and "signal comment 2" are available for selection.

The default setting is "signal comment 2".

Create event message from

Select from the drop-down list how the "event message" should be assigned. The "signal name", "signal comment 1" and "signal comment 2" are available for selection.

The default setting is "signal name".

Event priority

Here you select the priority of the events that are created with the wizard.

Incoming event

Here you set how the incoming event shall be triggered.

- In case of an analog signal as a trigger, the setting "on rising edge" means that the value of the trigger signal must exceed the trigger value in order to trigger the incoming event.
- In case of an analog signal as a trigger, the setting "on falling edge" means that the value of the trigger signal must fall below the trigger value in order to trigger the incoming event.

Outgoing event
Here you set how the outgoing event is to be triggered.

- If the incoming event is triggered on "Rising edge", the outgoing event can only be triggered on "Falling edge" and vice versa.
- If only incoming events are to be recorded, select the "Never" setting here.

Trigger value
This value is only relevant for analog signals. Here you enter the value above or below which the event should be triggered.

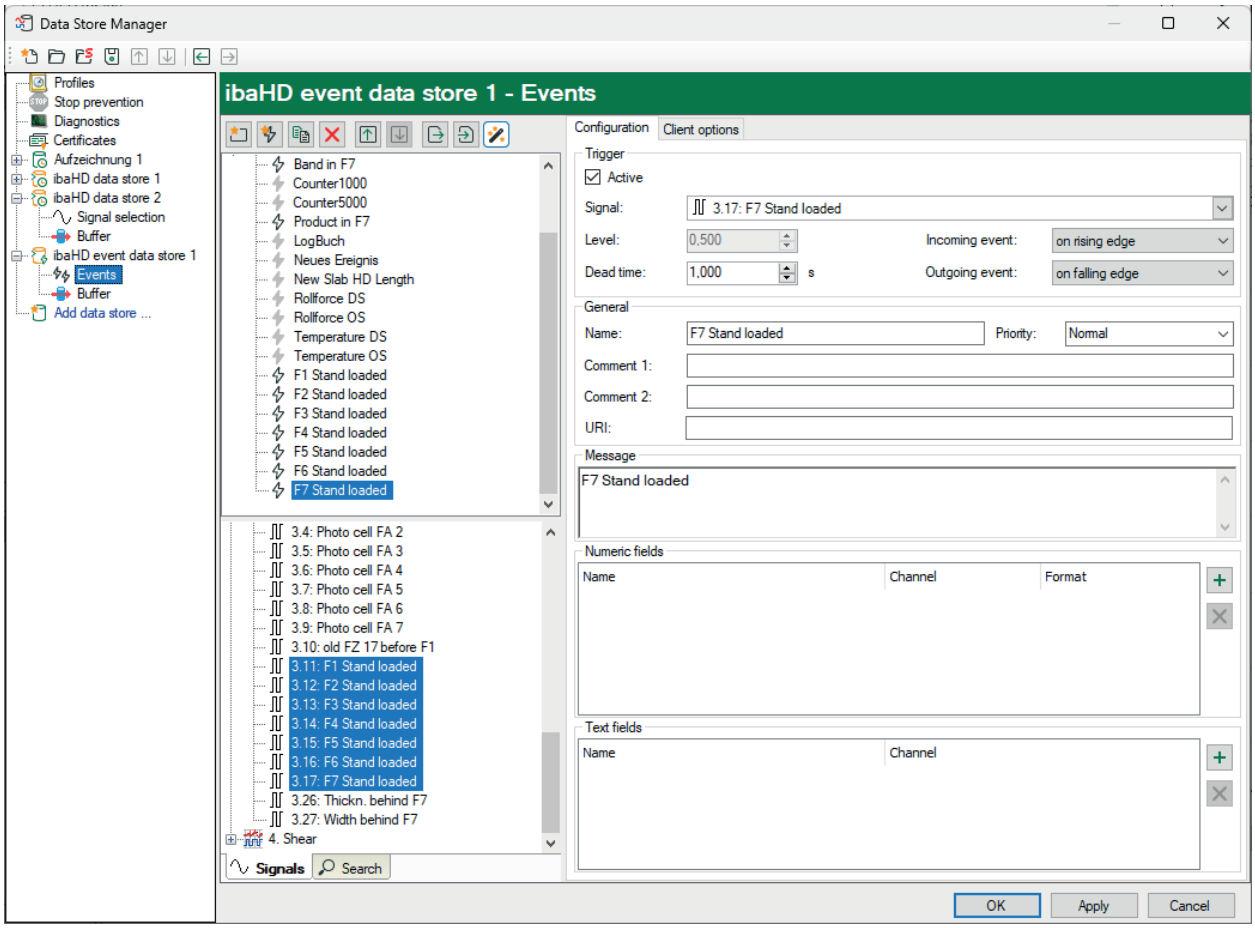
Trigger dead time
The dead time describes the period of time for which an incoming event cannot be triggered again after it has been triggered. This can be used to suppress showers of events with fluttering signals.

Pre-trigger time
Moves the timestamp of the event into the past (positive value) or future (negative value).

Signals

Here you select the signals from which events are to be created using the settings in the "Event template".

Click on the <Add> button to create the events. After adding the selected events from the example at the beginning of this chapter, the following events are available in the event tree.



6.2.6.3 Client options tab

By setting the client options, you can determine how events are show on the connected client computers in the event display and which commands are sent to the trend displays when the event occurs.

These settings are generally applicable preferences. If the corresponding settings, such as color settings for events, were changed locally on a client computer, then these are dominant over the values specified in the client options.

These settings also always refer to the event(s) marked on the left in the event tree.

Event table

Set the row style
Select the font style as well as the background and text color here. Every event message is then shown exactly that way, unless other settings were locally set on a client.

Trend graph commands

Set displayed time span around event
Here you can set how big the time period before and after an event should be, which should be shown in the trend view after the occurrence of the event time.

Set displayed signals

If you enable this option and have specified signals for display, then only the curves of the specified signals are shown in the trend view when the event occurs.

Signals that could be seen in the trend view before the event occurred are removed and replaced by the signals from this setting.

This process cannot be automatically undone in order to restore the old state. The previous signals could only be reloaded into the trend display with another event.

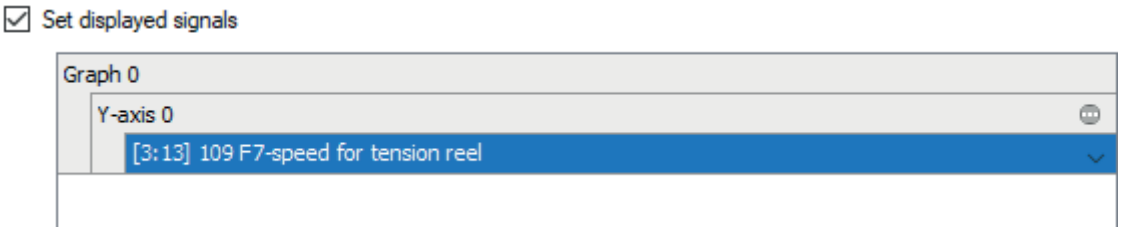
When determining the signals, in addition to the signal selection you also have the ability to decide whether the signals should be shown on one or on different Y-axes or whether a new trend graph should appear in the trend view.

The buttons have the following meaning:

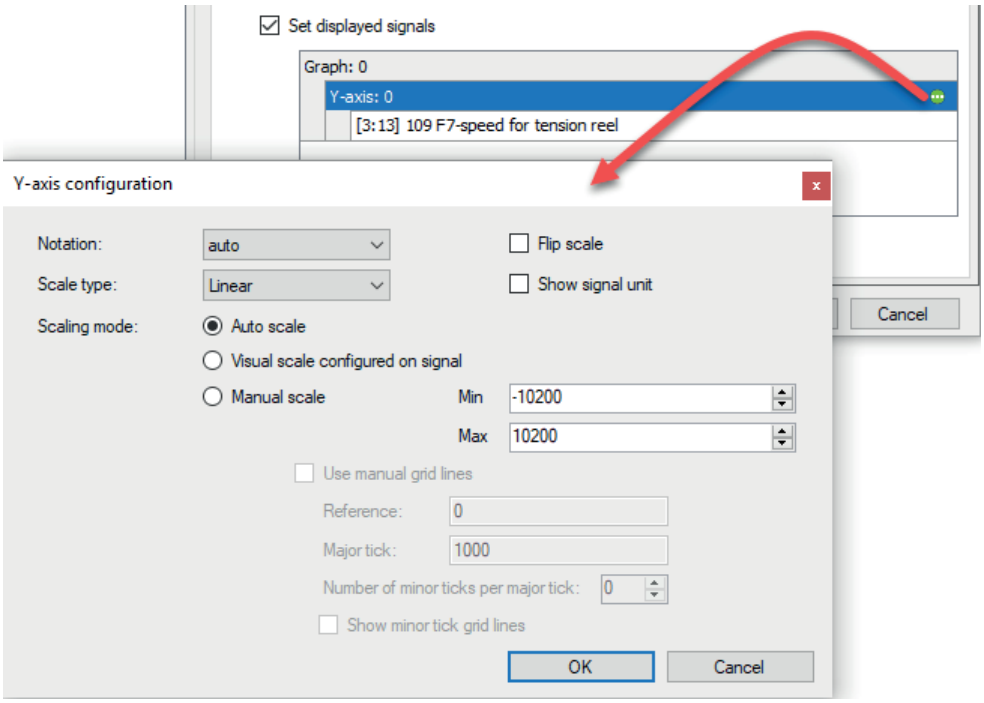
	Add signal
	Add signal on new Y-axis
	Add signal in new graph
	Remove signal

Proceed as follows:

1. Enable the option *Set displayed signals*.
2. If the list field is still empty, click on the <Add signal> button.
   A curve plane and a Y-axis will be created in the list field. Under the Y-axis the signal tree opens from which you can now select the desired signal.

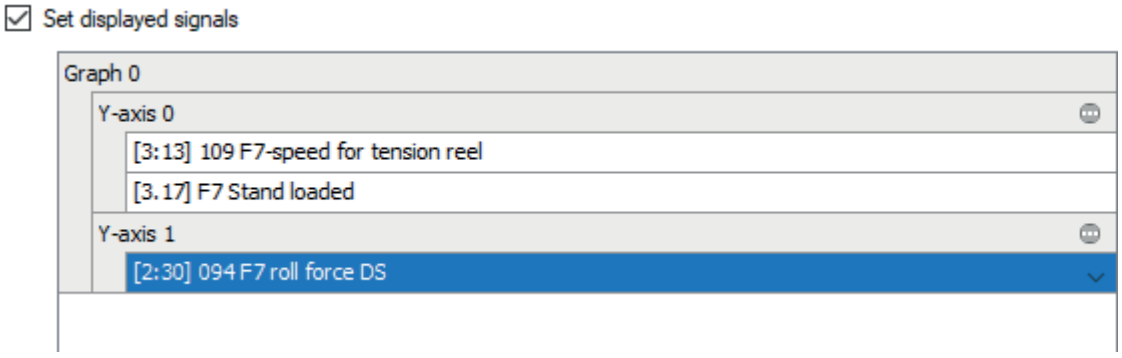


3. If you click on the icon on the Y-axis plane  , you can specify additional settings of the Y-axis, such as the scaling.

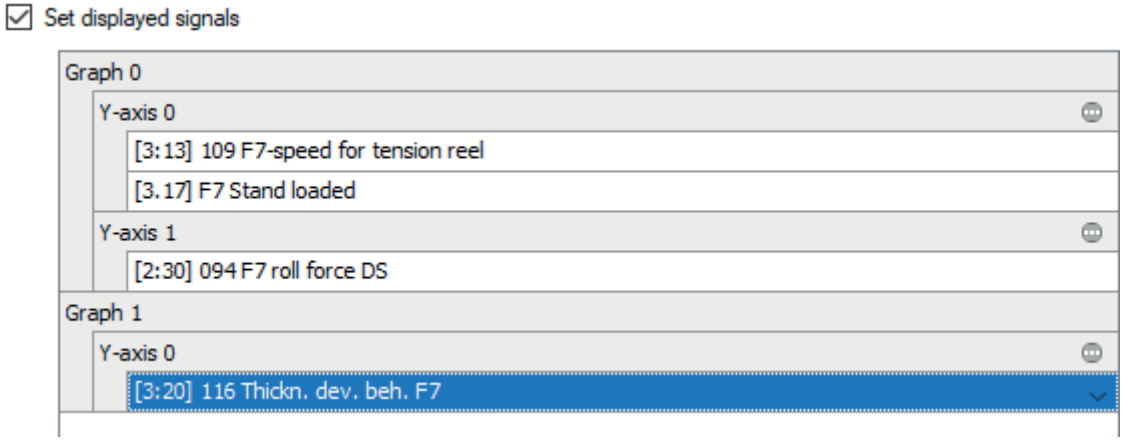


4. If you want to add additional signals that are to be displayed on the same Y-axis and in the same trend graph, simply click on <Add signal.>

5. If you want to display a signal in the same trend graph with a different Y-axis, for example due to a different physical unit or a different scaling, then click on the button *Add signal or new axis* .
   Another Y-axis plane is added in the list field under which you can select signals again.

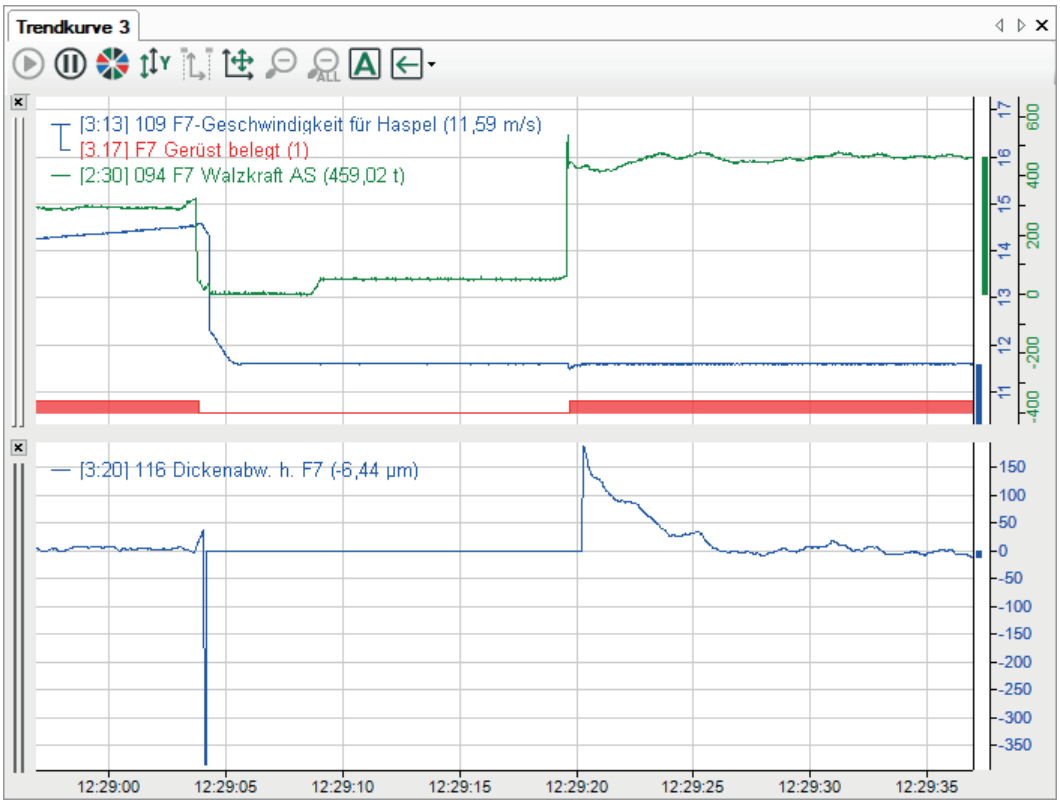


6. If you want to add a new trend graph in the trend view, then click on the button *Add signal on new graph* . A new curve plane with a new Y-axis is created in the list field under which you can add signals again.



7. If you want to delete a signal, a Y-axis or a curve, select the respective plane and click on the button ✕.
8. Exit the dialog with <OK>.

If an event occurs as described in this example, the trend display would look like this:



6.2.7 Configuring length-based data store

After configuring the HD data store, measuring locations have to be defined. The associated signals can then be assigned to the measuring locations with the appropriate recording profile.

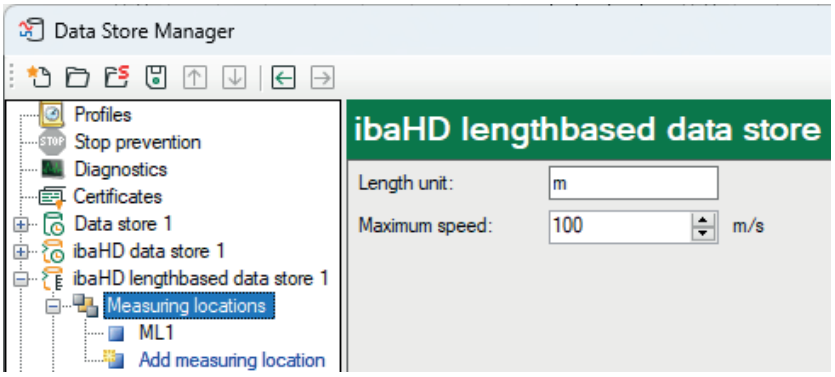
For a length-based data store, multiple measuring locations (ML Measuring Location) can be defined. At least one measuring location has to be defined. Measuring locations serve for the grouping of measuring signals that are created in the plant/in the process at the same place and which have a product reference.

Refer also to the introducing example in chapter ↗ *Length-based data store*, page 30.

The general rule is:

All signals of a measuring location have to use the same length unit and the same maximum speed in the plant. Therefore, those values will only be set once per data store.

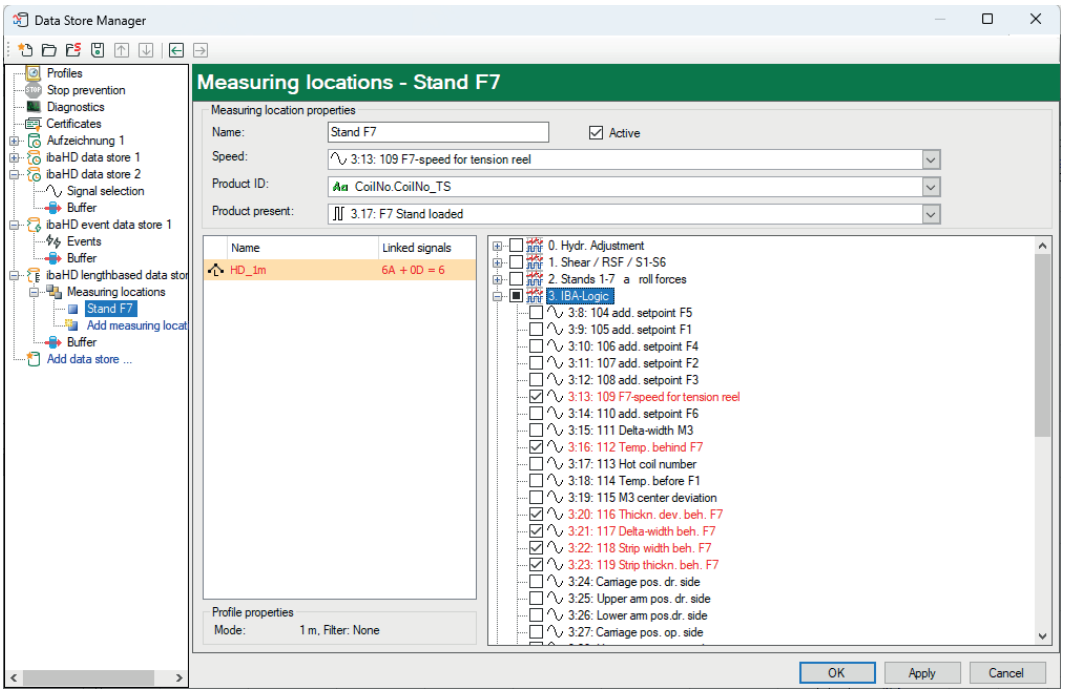
Mark the branch “Measuring Locations" with the mouse and enter the length unit and maximum speed here. The length unit only serves for a correct labeling, e.g. of the axes. The maximum speed is used for a reasonable limitation of the actual speed, to limit the speed, that is used to calculate the length data, to the maximum value in case of a malfunction.



A first measuring location (ML1) exists by default. Mark the measuring location with the mouse and continue the configuration of the measuring location.

In this dialog, make the following settings:

- Name the measuring location
- Select control signals for the measuring location
- Select the signals to be measured and their recording profile



Name

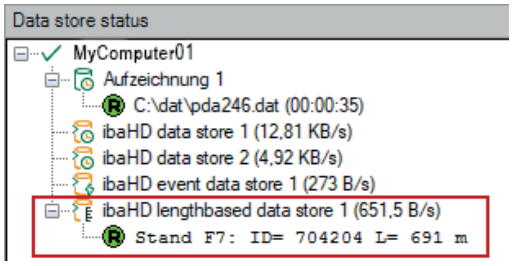
Enter a unique name for this measuring location to be able to identify it. The name of the measuring location is a part of the signal ID for the signal references in the *ibaPDA* client. A later renaming of a measuring location could lead to invalid signal references in the *ibaPDA* client.

Speed

Select the speed signal that transfers the speed measured at this measuring location.

Product ID

For the product ID you need a text signal. With this text signal the product is denominated, which is currently located at this measuring location.
During the measurement, the ID is shown in the window “Data storage status”:



Product present

Select a digital signal here, that is exactly TRUE at the moment the product is located at the measuring location (e.g. of photoelectric cell, proximity sensor, material tracking etc.) With the edges of this signal, the length calculation is also triggered.

With the rising edge, the initialization of a new product is started, i.e. the text signal selected under product ID is read. Furthermore, the speed signal for the length calculation, starting from length 0, is integrated from this moment on. With the falling edge of the signal, the length calculation and the data storage are terminated. A gap (fixed width) is inserted in the HD trend graph display.

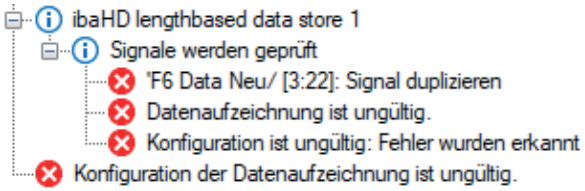
If the signal is FALSE, the *ibaHD-Server* does not store data for the concerned measuring location.

Selecting signals

First, mark the required recording profile in the left field, which should be used to store the samples. Thereafter, select the signals from the signal tree on the right that you want to store and that belong to this measuring location.

Note

A signal can always be assigned to only one measuring location. If you assigned one signal to several measuring locations, an error message will appear at the verification of the data store configuration.



Tip

If you need a signal at several measuring locations, duplicate the signal with the help of the virtual signals and then assign them to the measuring locations.

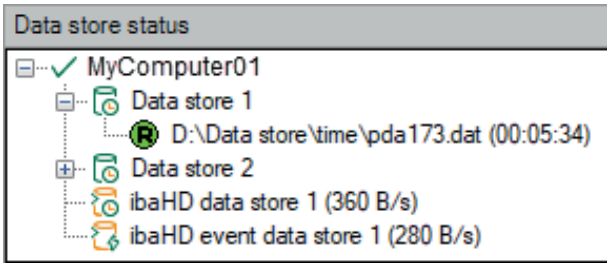
6.2.8 Start / stop recording

By clicking on the icons <Go> and <Stop> in the *ibaPDA* client, respectively, the recording is started and stopped.

6.2.9 Data storage status

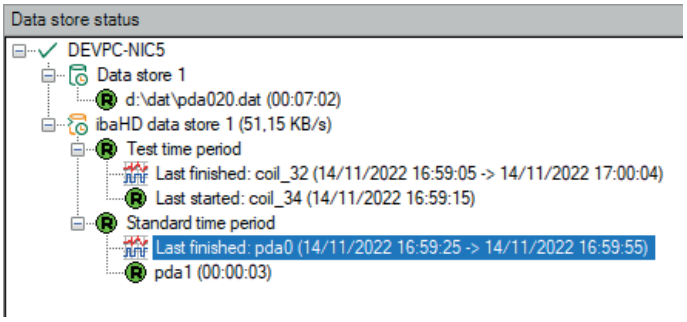
On the *Data storage status* range, the status of the HD data stores is displayed and which data volume is currently being written on the *ibaHD-Server*.

Example with a time based dat file, currently recording:

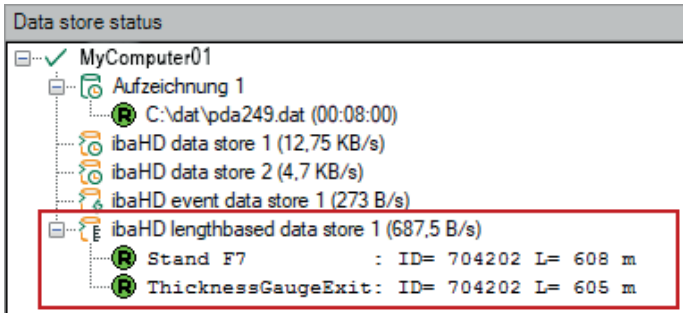


For time-based HD data stores with time periods, the current status of the time periods is shown. When recording in standard mode, the last finished time period and the currently recorded time period are displayed (in the example Standard time period).

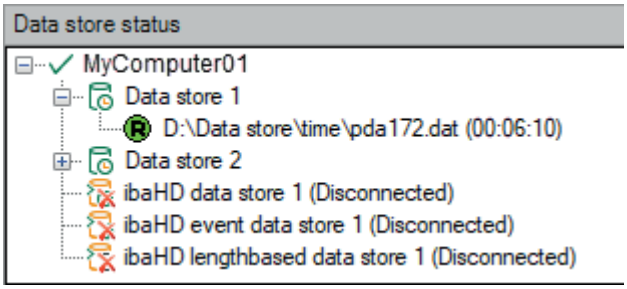
The last finished time period and the start time of the currently recorded time period are displayed in the tracking mode (in the example Test time period).



In case of a length-based data recording additional information about the current product ID and the calculated product length for each measuring location is displayed.



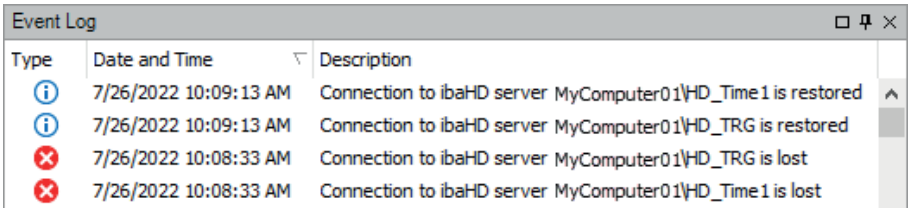
If the connection between the HD data store and the *ibaHD-Server* is interrupted, this will be displayed by a status accordingly modified.



For example, an interruption can occur by modifying the configuration of the HD data store or of the signals/events. When the HD data store of *ibaPDA* writes on the *ibaHD-Server* via a network (separated installation of *ibaPDA* and *ibaHD-Server* on different computers) faults in the network can lead to interruptions.

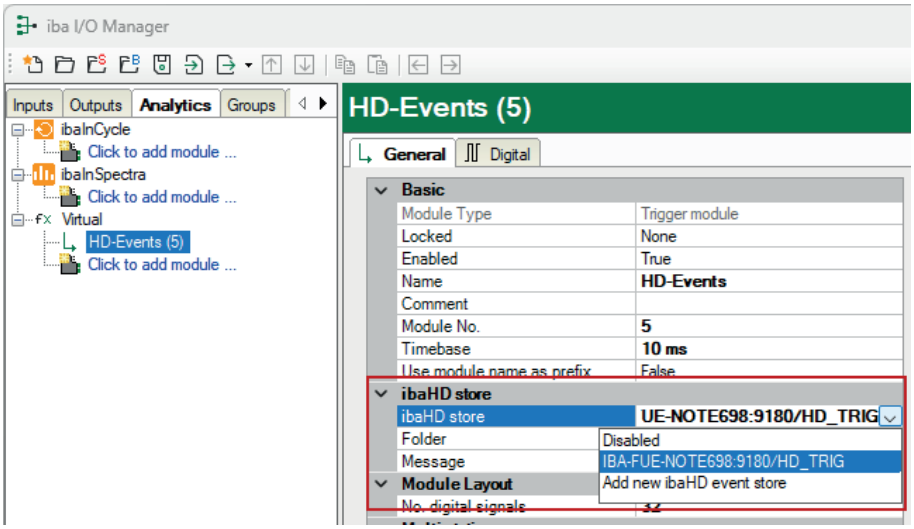
Note

ibaPDA periodically tries to restore an interrupted connection to the *ibaHD-Server*. When a connection of an HD data store has been interrupted or restored, this will be compiled in the event log of the *ibaPDA*.



6.2.10 Generating events by trigger modules

When configuring trigger modules in the *ibaPDA* I/O Manager, you can define in the module settings in which HD event store the trigger firings are written as events.



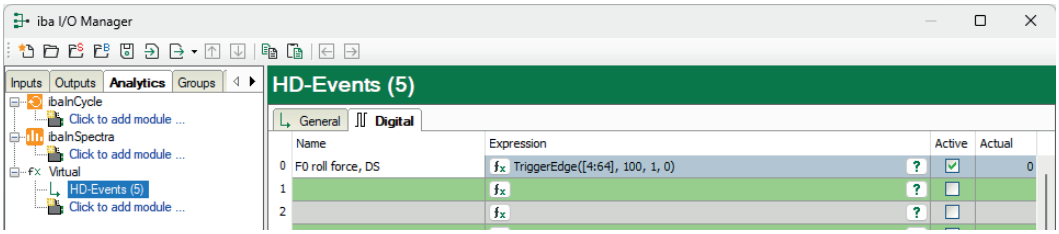
You can also select a folder in the ibaHD store in which the trigger events of this module are to be stored. If there is no folder yet, you can create a new folder.

Note

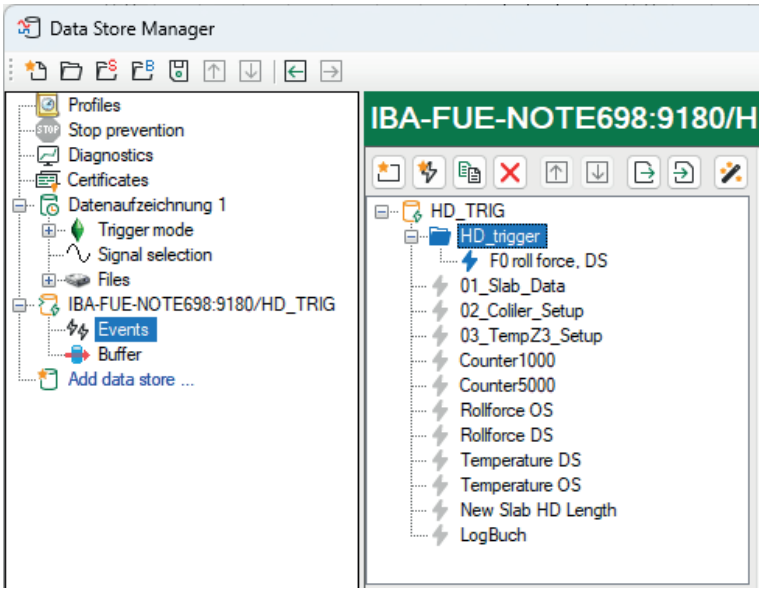
Please note that only one trigger module may write the events to the specified folder and that no additional events may be written to this folder.

Otherwise, the order of existing events may be changed when new events are added.

All triggers which are configured in the module generate an event in the selected HD event store when firing. Definition of the trigger in the I/O Manager in *ibaPDA*:



Events, which have been created by trigger modules have a blue icon in the event tree. It indicates that these events cannot be edited in the configuration dialog of the event-based data store.



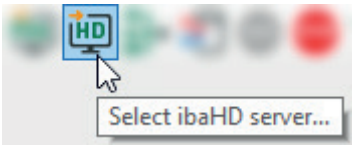
7 HD views in ibaPDA

In a special HD view, the data from the established HD stores can be displayed in a trend graph. Meanwhile, the recording can continue. The handling of this trend graph is identical with the regular trend graph in *ibaPDA*. In the following only the specific functions for HD trend graphs are described.

7.1 To connect to the ibaHD-Server

At first, select the *ibaHD server* whose data shall be displayed:

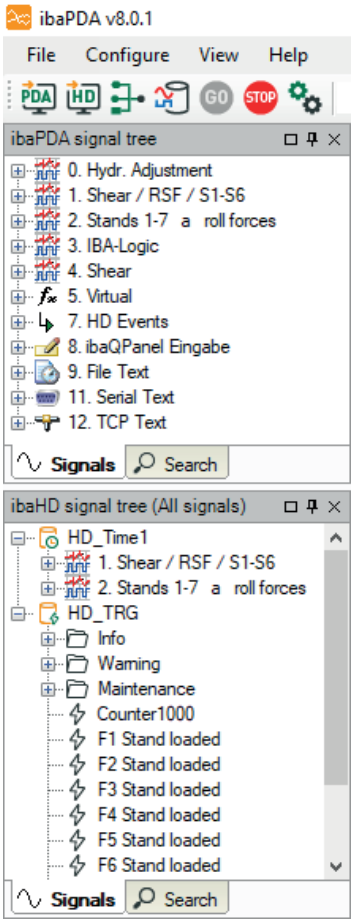
Click on the button in the toolbar



Or go to the menu *Configure – Select ibaHD server …*

The *ibaHD server selection* window will be opened. Select an *ibaHD server* from the list or enter the IP address or the computer name in the address line. Accept the selection with <OK>. The HD stores with the created signals configured on the *ibaHD server* are displayed as additional HD signal tree.

Login information will be requested in case the HD user management is enabled.

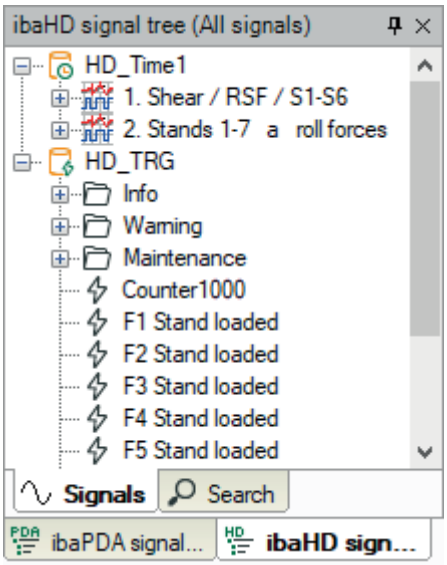


You can display and hide the HD signal tree via the menu *View – ibaHD signal tree*.

Tip

You can also drag and drop the HD signal tree on other positions in the *ibaPDA* client.

For example, you can arrange the standard signal tree and the HD signal tree over two tabs in the same window.



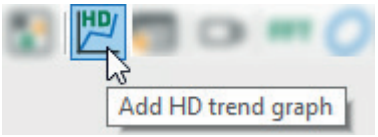
7.2 HD trend graph

In an HD trend graph view, time- or length-based HD data can be displayed. Both signal types cannot be shown together in one view. Furthermore, separated displays must also be used for every measuring location at length-based HD data.

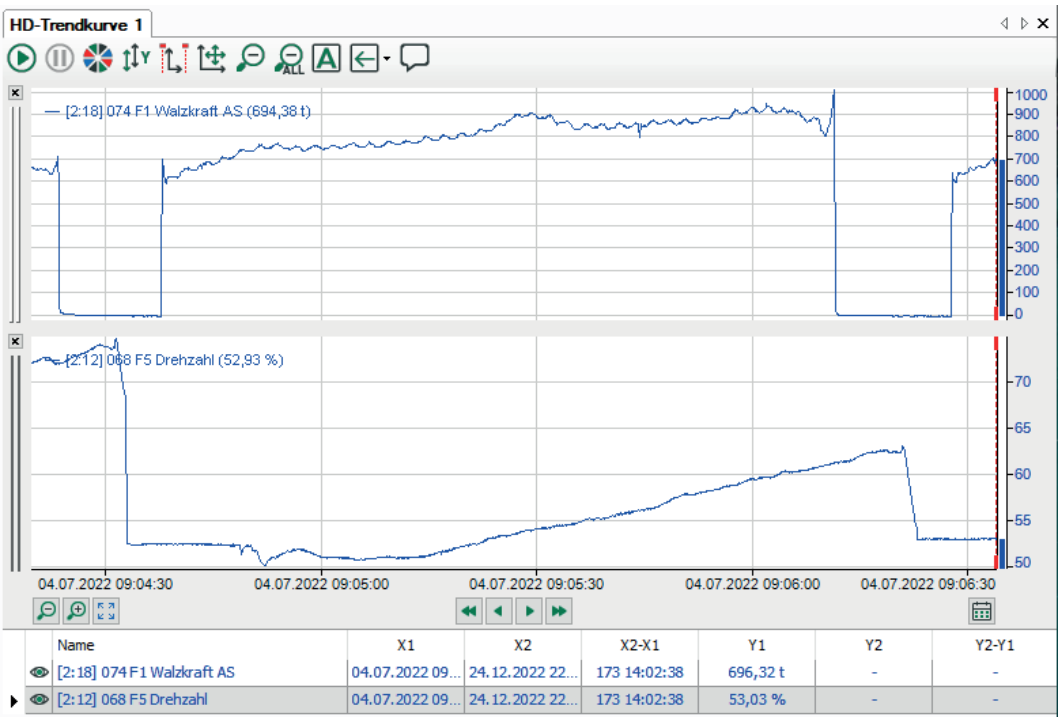
The signals of different measuring locations cannot be displayed together in one HD trend view.

An HD trend graph will be opened when you click in the *ibaPDA* client

- on the icon in the toolbar and then drag signals with the mouse out of the HD signal tree (time- or length based) and drop them into the trend graph via Drag & Drop.



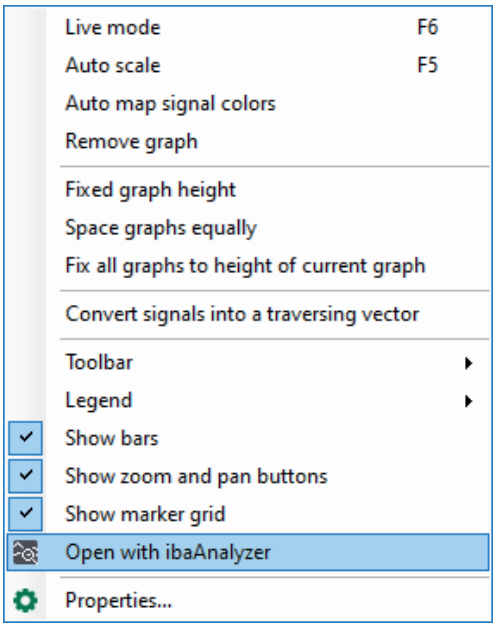
- double click on a signal in a HD signal tree (time- or length-based).
- or drag an event from the HD signal tree (time- or length based) and drop it on the empty work space of the *ibaPDA* client.



The display of the historical trend graph is the same as that of the normal trend graph with the difference that the data comes from the *ibaHD-Server* and not from the *ibaPDA* server. In case of time based storage, the signal can be displayed during the whole recording period.

Open HD trend graph in ibaAnalyzer

If the HD trend graph is paused, you can open the displayed time range in *ibaAnalyzer*. To do this, open the context menu and select *Open with ibaAnalyzer*.



7.2.1 Operation and setup of time-based HD trend graphs

On the X axis there are various buttons for the navigation:

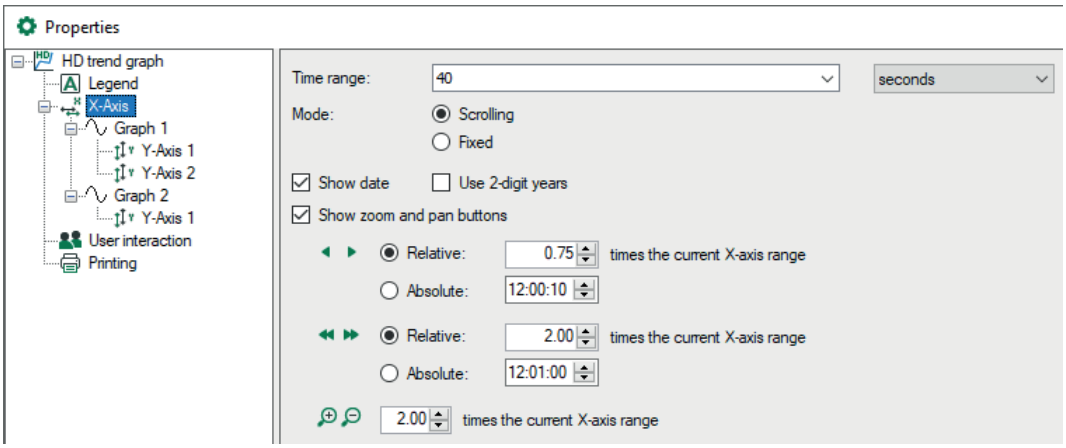
	Zoom function
	Scroll
	Jump to a date

If the HD trend graph is used in *ibaQPanel*, the events can be displayed as text channels together with both time- and length-based HD trend graphs.

For further information, see chapter ↗ *ibaHD-Server in ibaQPanel, page 206*.

Zoom function

In the pause mode, the <+>-button enlarges the center of the X axis and in the live mode the last part of the X axis. The <-> button reduces accordingly. The default value of the zoom factor is 2. This means if the section of the X axis is enlarged, it is half as large as the original section, if it is reduced, the section of the X axis is twice as large as the original section. The zoom factor can be modified via the X axis properties.



Scroll

	Scrolls in large steps to the left, starting from the current position
	Scrolls in small steps to the left, starting from the current position
	Scrolls in small steps to the right, starting from the current position
	Scrolls in large steps to the right, starting from the current position

The step can be set via the X axis properties. The default setting for little steps is relative 0.75 and for large steps relative 2. Alternatively, the step can be set as absolute value in hh:mm:ss time units for time-based values and in meter for length-based values.

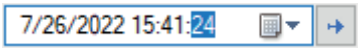
Example: If the X axis indicates a range of 100 s and if the time stamp goes to 10:00:00, a small step jumps to the left by 75 s on 09:58:45 and a large step to the left by 200 s on 09:56:40.

The functions zoom and scroll can be carried out with the help of the keyboard:

Button	Key	Description
	<+>	enlarging
	<–>	reducing
	Page up	small step to the right (only in pause mode)
	No key function	large step to the right (only in pause mode)
	Page down	small step to the left
	No key function	large step to the left

Jump to a date

Clicking the button  opens a calendar where you can enter a date and time on second basis.



With a click on the arrow to the right, the display of the trend graph jumps to this time point.

This function is also available on length-based HD trend graphs because the time stamp is always stored along with the length-based data.

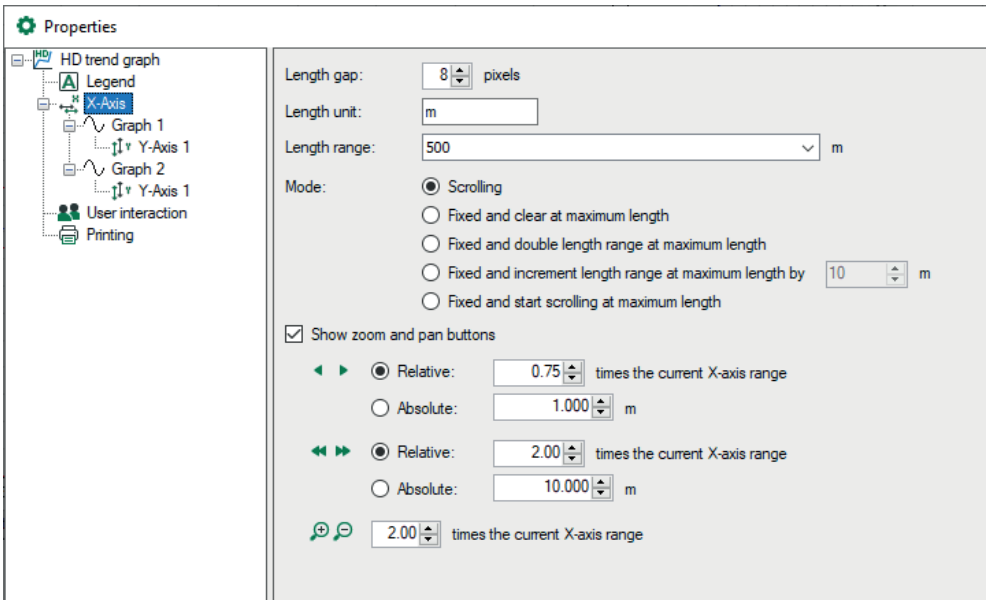
Other documentation

Please take further information about the settings of the display e. g. scaling the Y axis, using the markers etc. from the manual or the online help of *ibaPDA*.

7.2.2 Operation and setup for length-based HD trend graph

Basically the buttons for the time- and length-based HD trend graphs are similar to each other.

In principle, the difference is that the x-axis is labeled with length units at the length-based display and the buttons for scrolling work with length steps. However, there is no “endless” x-scale but consecutive sections where the length scale always increases from 0 to a maximum value. Between these sections no storage takes place and a gap, that always remains the same, will be entered to get an optical separation. Therefore you will find according settings in the properties dialog.



Length gap
Set the size of the required gap between two curve sections in pixels here.

Length unit
Enter the length unit to label the x-axis here.

Length range
The length range can be entered as a fixed value. You can also select an analog signal that specifies the length range dynamically. The value has to be considered as a maximum value for the length scale on the x-axis.

In practical applications, however, the current value can differ from that as the length of the length axis also depends on the length base for the storage. A length-based HD trend graph can display maximum 50,000 samples per signal. If a length base of 1 mm was selected in the storage profile, for example, the length range will automatically be limited to 50 m - no matter which value you set here.

Mode

Mode	Behavior
Scrolling	The length value determines the visible range of the base axis. The base axis starts at 0 and scrolls in the specified direction until length value is reset. Then a gap follows which indicates the length reset and the scrolling starts again as soon as the length value increases.
Fixed and clear at maximum length	The fixed base axis shows a scale from 0 to length range value. The graph shifts in the specified direction. The graph is cleared when the length signal is reset. If the graph reaches end of scale before length reset (length range is smaller than the actual length), the base axis shifts for another length range.

Mode	Behavior
Fixed and double length range at maximum length	The fixed base axis shows a scale from 0 to length range value. The graph shifts in the specified direction. The graph is cleared when the length signal is reset. If the graph reaches end of scale before length reset (length range is smaller than the actual length) the base axis is rescaled to double the length range. The graph moves further by the specified amount. If the end of the scale is reached before the length reset, the scale is extended again by the specified amount.
Fixed and increment length range at maximum length by...	The fixed base axis shows a scale from 0 to length range value. The graph shifts in the specified direction. The graph is cleared when the length signal is reset. If the graph reaches end of scale before length reset (length range is less than the actual length) the base axis is extended by the specified amount. The graph continues shifting to the middle of the base axis. When the end of scale is reached again before length reset, the scale is doubled again (4 times the original length range).
Fixed and start scrolling at maximum length	The fixed base axis shows a scale from 0 to length range value. The graph shifts in the specified direction. The graph is cleared when the length signal is reset. If the graph reaches end of scale before length reset (length range is smaller than the actual length), the base axis moves with scrolling speed.

Buttons for zooming and scrollling

Functions and properties correspond to those of the time-based HD trend graph.

Signal/marker table

Compared to the time-based HD trend graph, there are 3 more columns in the signal table of the length-based HD trend graph.

Signal/marker table

Signal table with marker values, positions and distances:

Column	Live mode	Pause mode
X1	Current position/product length	Position/product length at marker 1
X2	-	Position/product length at marker 2
X2-X1	-	Length difference between marker 1 and 2
T1	Current time stamp	Time stamp at marker 1
T2-T1	-	Time span between T1 and T2, including the gaps
T2	-	Timestamp at marker 2
Y1	-	Sample at marker 1
Y2	-	Sample at marker 2
Y2-Y1	-	Sample difference between marker 1 and 2

Tip

If you place a marker on the gap between the graphs, the maximum value of the previous measurement will be displayed as x-value. This is, for example, how the total product length can be determined very easily.

7.2.3 Notes and attachments

In any HD trend representation, you can always add one or more notes. Notes are saved in an event-based HD store as manually added events and are shown in the event table.

Notes are intended to document an observation or a remark in due time and to save them in the HD record.

In addition, each note can be linked with an attachment. An attachment can be any file, such as an image file (screenshot) or a document (Word, PDF, etc.).

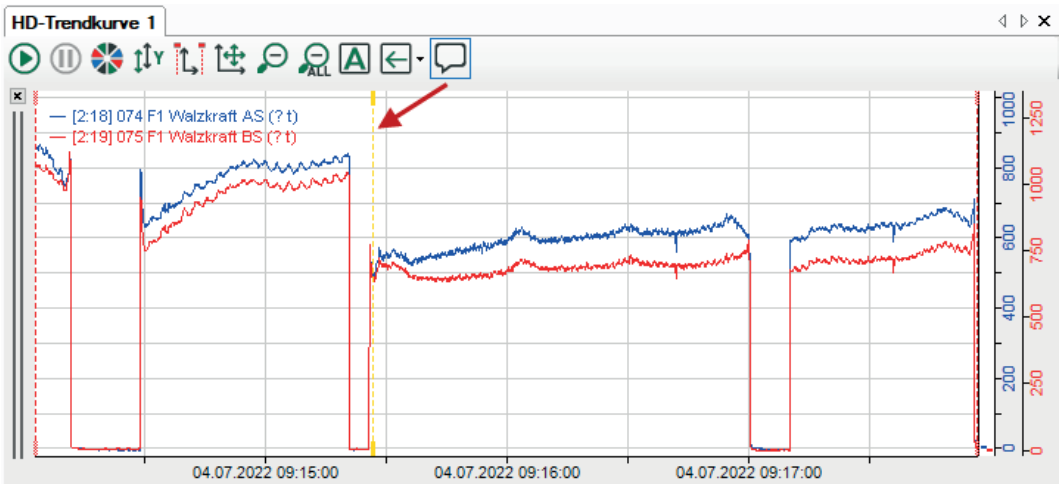
To facilitate use on the one hand and to optimize the management of notes in the HD server on the other, notes (once created) can be saved in a tree structure. This allows you to build a library of types or categories of notes that you can then always reuse. You can configure the notes by topic, for example (“failure,” “quality,” “mechanics,” “production,” etc.).
To enter a note in the event table, you then have to select the appropriate configured notes (“topic”) from the drop-down list and complete them with a current message that you enter by hand.

To create a note, proceed as follows.

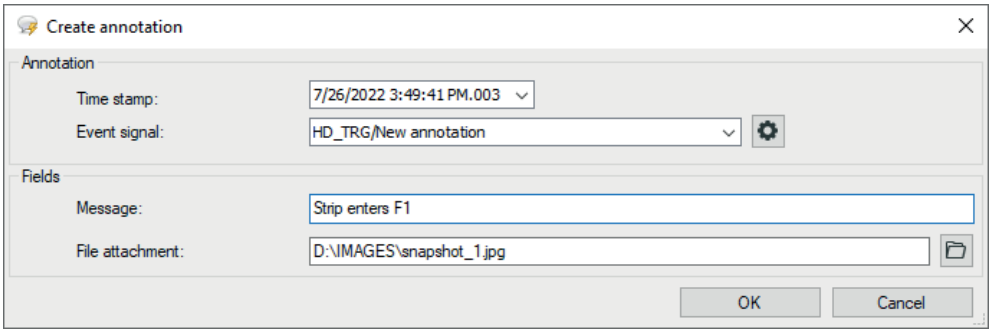
1. During the ongoing acquisition, click on the note icon in the toolbar of the HD trend view.

Clicking switches the trend display to pause mode and a yellow marker appears that is attached to the cross-hair cursor.

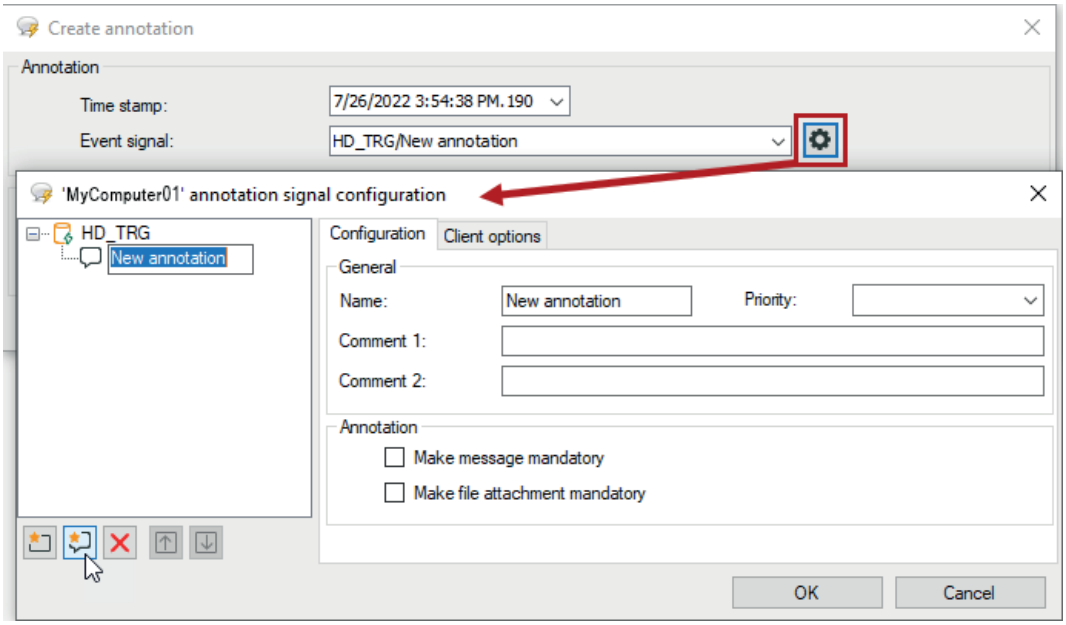
2. Use the mouse to navigate to the time in the trend graph where you want to paste the note and click.



The "Create annotation" dialog opens.



3. If necessary, correct the time stamp of the note.
4. The last chosen note is displayed in the *event signal* field. If annotations have already been configured, you can select an appropriate annotation from the drop-down list in order to adopt event names and comments for the current annotation.
   If you have not yet configured any annotations, you see "Events/ New annotation". In this case, please read on in step 8 first.
5. If you have selected a note, insert plaint text as a message first. This text will appear later in the event table both in the *message* column as well as in the *note* column.
6. If you want to add an additional document (image file, report file, text file or Office file) to the note, you can enter the complete path to the respective file or select it by browser in the *file attachment* field.
   This path will be shown later in the *Attachment* column in the event table.
7. Exit the dialog with <OK>.
   The new annotation will be sorted into the event table with the right time.
8. If you have not configured any notes before, click on the gear icon in the “Create note” dialog.
   The dialog "'*HD-Server computer*' annotation signal configuration" opens up.



The tree structure shows all of the HD stores for events that exist on the respective HD server.

9. In this tree structure, you can now create any type of note and arrange these in a folder structure. To do this, use the following symbol keys;

   New folder

   New note

   Remove

   Move up

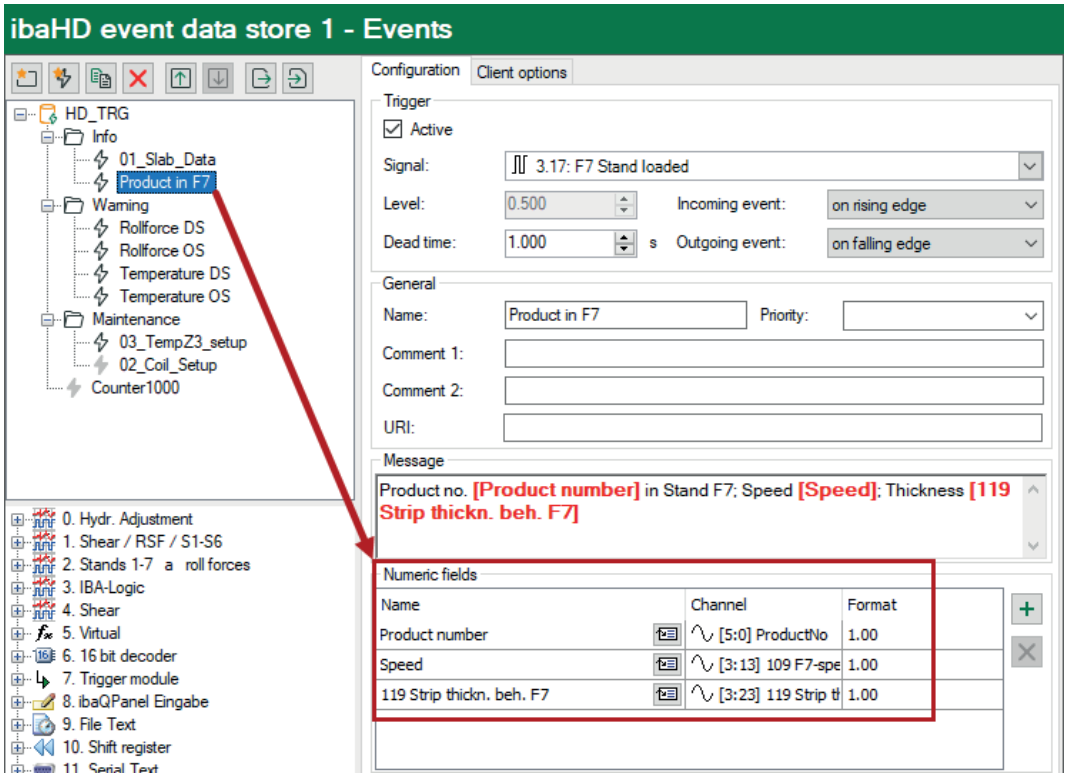
   Move down

10. If you configure a new note, give it a meaningful understandable name.
11. If necessary, select a degree of priority. In the event table, the note, like other events, will be handled with the same degree of priority, such as when filtering.
12. IF necessary, enter up to two comments. The comments are visible in the event table if the columns*comment 1* and *comment 2* are enabled.
13. If you want to make sure that when entering a note in the trend graph the entry of a message is not forgotten, enable the option *Message required*. The dialog for creating a note then cannot be closed if the message field is empty.
14. If you want to make sure that when entering a note in the trend graph the entry or selection of an attachment is not forgotten, enable the option 'File attachment required.' The dialog for creating a note then cannot be closed if the *file attachment* field is empty.
15. Exit the dialog with <OK>. You will return to the "Create annotation" dialog and can now select the appropriate note from the "Event signal" drop-down list. Continue with step 5.

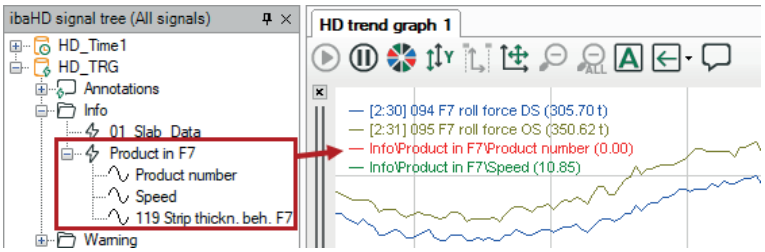
7.2.4 Displaying event-related numeric and text fields

You can drag the numeric fields with (dynamic) signal values or text fields with text signals which are configured in the event into the HD trend graph for display. If you do so, the actual values at the time of event occurrence are displayed.

Three numeric values are assigned to the event "Product in F7".



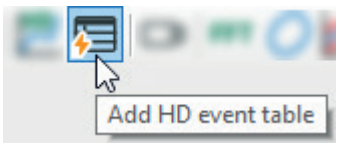
The numeric fields are available in the HD signal tree under the event node.



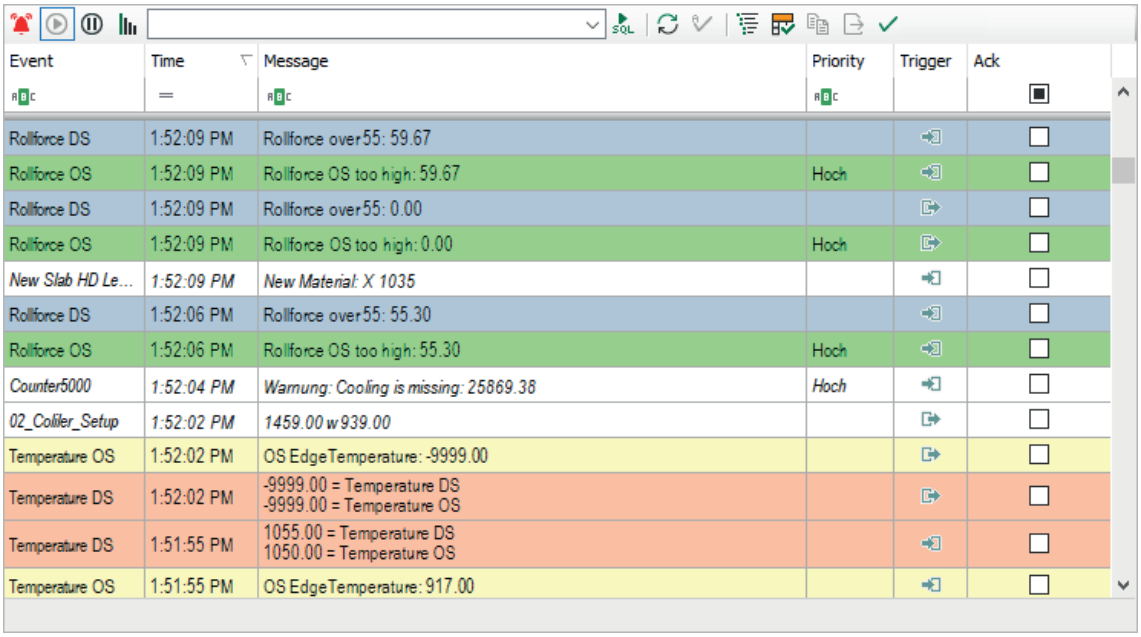
7.3 Event table

An event table will be opened if you click in the *ibaPDA* client

- on the icon in the toolbar

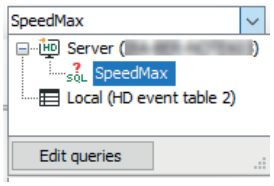


- or make a double click on an event in the HD signal tree.



Toolbar

The toolbar of the event table contains the following control elements:

	Starts live alarm stream.
	Starts the live display of the event table. All triggered live events are immediately displayed in the event table.
	Stops the live display of the event table. It is now possible to mark individual signals in the event table.
	Displays the number of events in a time range. Select the events of the event table and the time range in the dialog window. The table that appears contains a list with the number of events.
	Selection list for selecting the desired event query. If you expand the list field, you can see all existing event queries and select the one you want. If you click on the <Edit queries> button, the configuration dialog for queries opens. You can then edit existing queries or create new ones.
SQL	Executes the event query that was selected in the selection list.
	Updates the display according to the query executed.
	Automatic acknowledgement of all incoming events
	Display/hide signal tree
	Automatically marks the last line added.
	Copies the line(s) selected in the event list to the clipboard. Only possible in pause mode.

	Exports the line(s) selected in the event list to an Excel or text file. Only possible in pause mode.
✓	Acknowledges all events displayed in the event table.

Status bar

The status row is on the lower border of the event table. It gives information about the event queries carried out (e.g. status of the running query, number of the events, error messages) and if a filter is currently active.

Sorting

The event table can be sorted ascending or descending in every column. Click on the header of the column which you want to use as sorting criterion. The displayed downwards pointing arrow symbolizes the descending sorting order. The arrow pointing upwards symbolizes the ascending sorting order.

In an event table, the "Time" column in descending order is selected as default setting. Hence, the most recent event is always on top.

Acknowledgment

Every single event can be acknowledged via the control box in the "Ack" column. Clicking on the button ✓ will acknowledge all of the events displayed at once.

Note

The acknowledgment of an event cannot be reversed.

Filter line

The upper row in the event table is for filtering the table. In all columns except for *Trigger* and *Priority* you filter according to the entered string. It is not possible to use placeholders. In the *Time* column, filtering is possible with the operators <, >, <= and >=. Select a search operation using the <ABC> or <=> button. Then enter the search term or a value.

In the *Trigger* column, the following filter allocations are possible:

No filtering active.

Incoming Only incoming events are displayed.

Outgoing Only outgoing events are displayed.

In the *Ack* column, the following filter allocations are possible:

▣	No filtering active.
☐	Only not acknowledged events are displayed.
☑	Only acknowledged events are displayed.

Note

As soon as a filter is set, a filter symbol is displayed in the column header and the filter row is highlighted in green. The set filter is displayed below the table.

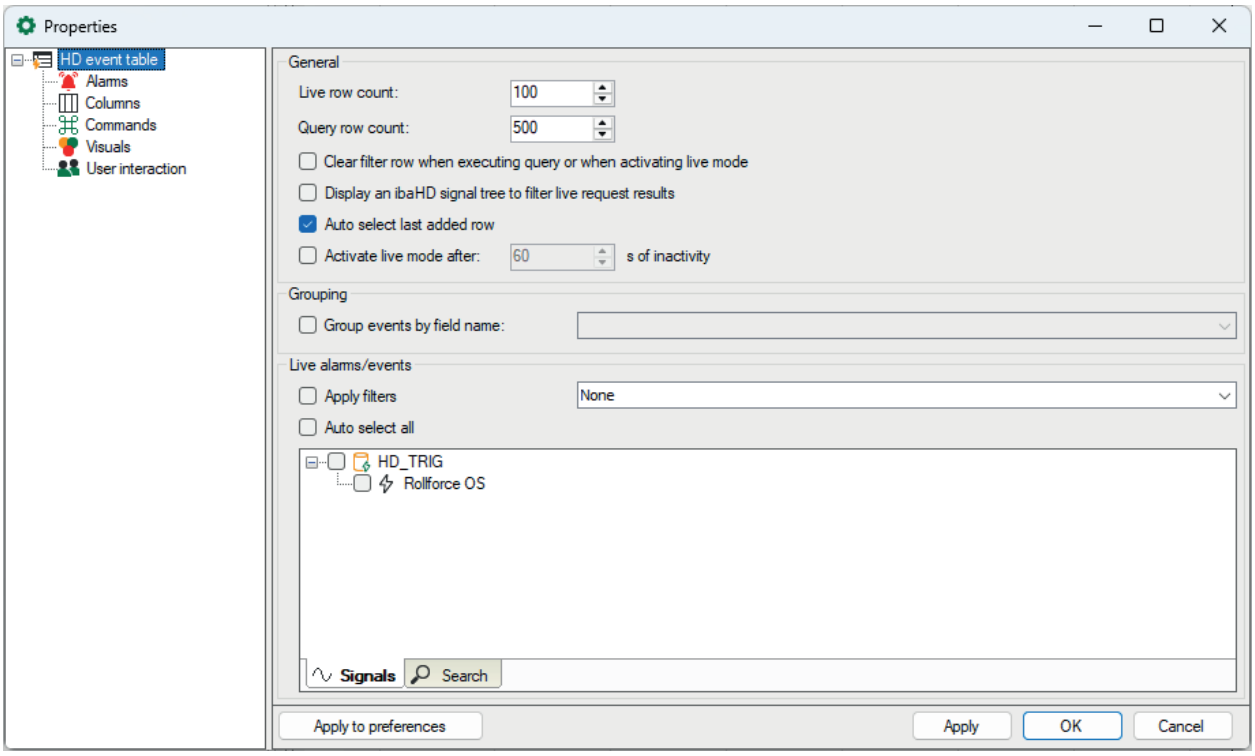
It is also possible to enter a filter in a field of the filter line and to hide the associated column. So you can, for example, display only incoming messages without displaying the *Trigger* column.

The filter for the respective column can be edited and deleted by clicking on the filter symbol.

A detailed description of the filter functions can be found in the appendix, chapter ↗ *Advanced filter in tables, page 257*.

7.3.1 Properties of the event table

You open the properties dialog by clicking the right mouse button on the event table and selecting the menu item *Properties*.



7.3.1.1 Basic settings

General

Live row count
Here, you can set the number of lines to be displayed in the event table with actual (live) events. A maximum of 1000 rows can be displayed.

Query row count
Here, you set the number of lines shall be displayed in the event table after a query had been performed. A maximum of 1000 lines can be displayed.

Clear filter row when executing query or when activating live mode
When you enable this option, then the search patterns that you may have entered in the filter row are automatically deleted as soon as you execute a query or switch to the live mode of the event table. You therefore do not have to remember to manually remove the filter terms again.

Display an HD signal tree to filter live request results
Enabling this option displays the tree structure for the ibaHD time periods.

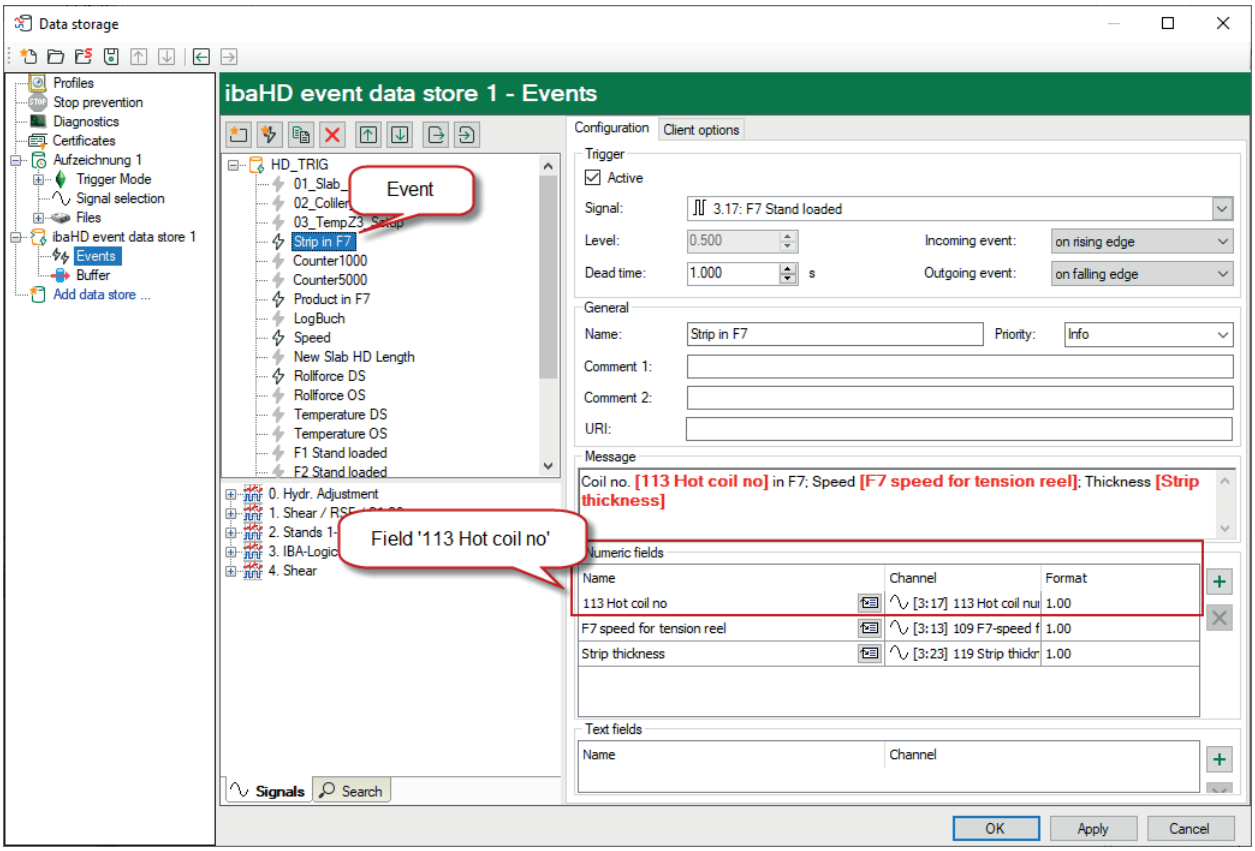
Auto select last added row
Enabling this option will cause the newest row being selected automatically. Thus, the most recent event will always have the focus.

Activate live mode after ... s of inactivity
Enabling this option will cause the view to return automatically from pause mode to live mode if no mouse or keyboard operation occurred over the set time span (given in seconds).

Grouping

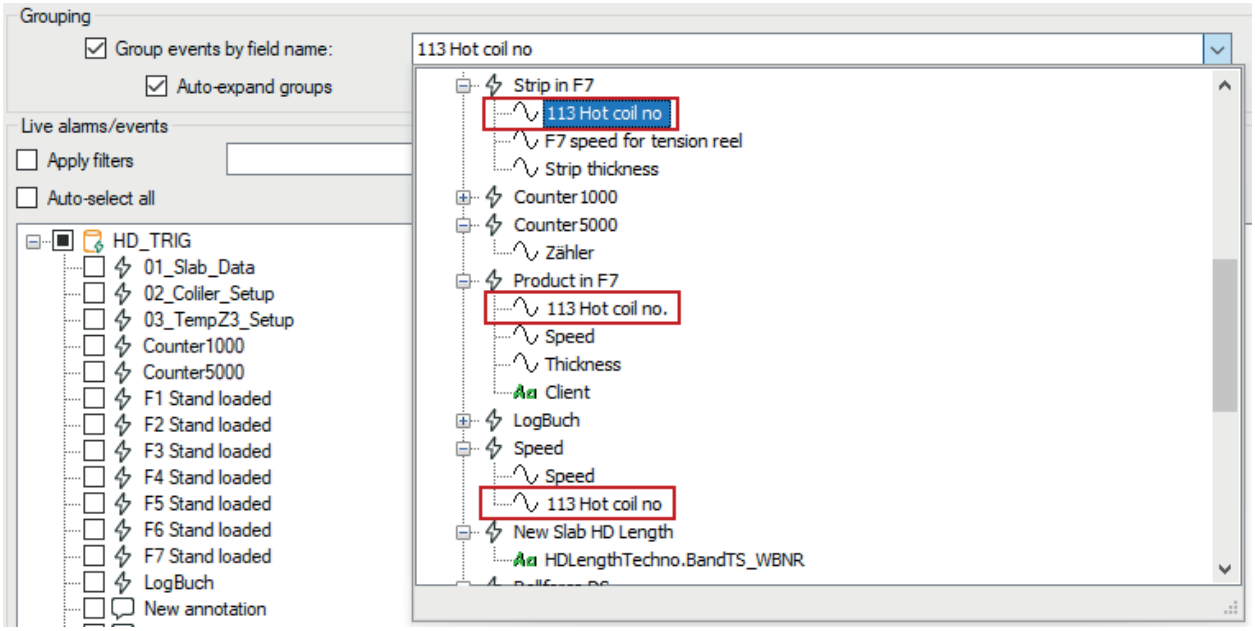
By activating this option you can group events in the table. The grouping is made with a (dynamic) field which is used in the events (see event configuration).

Example for the use of a field during the event configuration:



A grouping can only be carried out reasonably if the field has the same name in all events.

To select a field for the grouping, open the drop-down list in the settings of the event table.



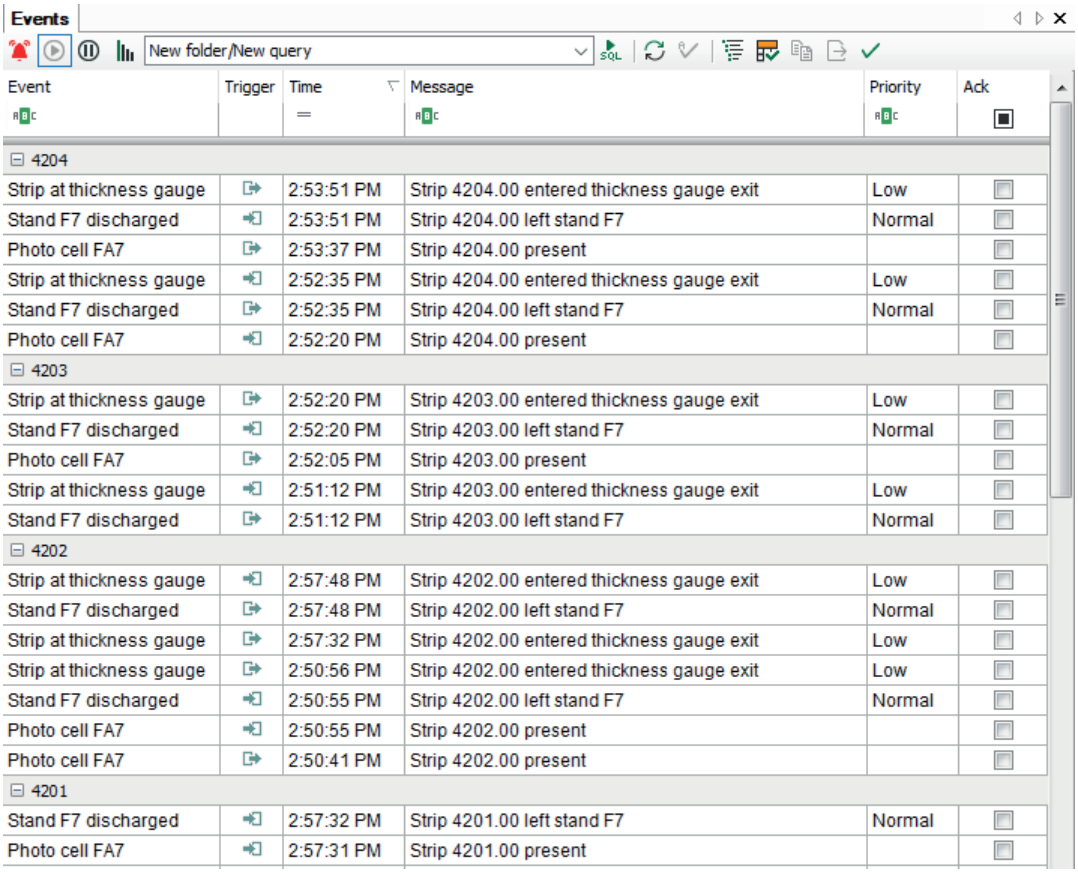
All configured events with their fields are listed there. Select the required field for the grouping and click on <Apply> or <OK>.

All events contained in this field are displayed in groupings now.

In this example this is the field “Coil number”.

In the table, a grouping header is set for every value of the field “113 Hot coil number” and the corresponding events will be listed below.

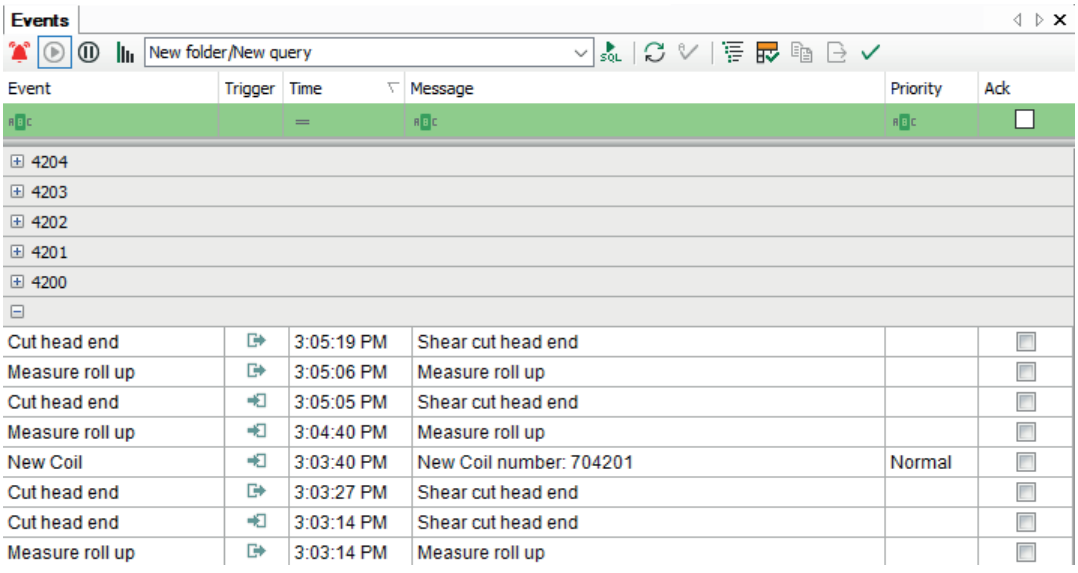
Events grouped according to coil numbers:



Event	Trigger	Time	Message	Priority	Ack
4204					
Strip at thickness gauge		2:53:51 PM	Strip 4204.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:53:51 PM	Strip 4204.00 left stand F7	Normal	
Photo cell FA7		2:53:37 PM	Strip 4204.00 present		
Strip at thickness gauge		2:52:35 PM	Strip 4204.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:52:35 PM	Strip 4204.00 left stand F7	Normal	
Photo cell FA7		2:52:20 PM	Strip 4204.00 present		
4203					
Strip at thickness gauge		2:52:20 PM	Strip 4203.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:52:20 PM	Strip 4203.00 left stand F7	Normal	
Photo cell FA7		2:52:05 PM	Strip 4203.00 present		
Strip at thickness gauge		2:51:12 PM	Strip 4203.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:51:12 PM	Strip 4203.00 left stand F7	Normal	
4202					
Strip at thickness gauge		2:57:48 PM	Strip 4202.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:57:48 PM	Strip 4202.00 left stand F7	Normal	
Strip at thickness gauge		2:57:32 PM	Strip 4202.00 entered thickness gauge exit	Low	
Strip at thickness gauge		2:50:56 PM	Strip 4202.00 entered thickness gauge exit	Low	
Stand F7 discharged		2:50:55 PM	Strip 4202.00 left stand F7	Normal	
Photo cell FA7		2:50:55 PM	Strip 4202.00 present		
Photo cell FA7		2:50:41 PM	Strip 4202.00 present		
4201					
Stand F7 discharged		2:57:32 PM	Strip 4201.00 left stand F7	Normal	
Photo cell FA7		2:57:31 PM	Strip 4201.00 present		

You can minimize or extend the groups separately, if required. In the context menu of the event table you can minimize or extend all groups. In the properties dialog you can configure if the group should be extended automatically or not.

Any other events which do not contain the field for grouping are listed under an empty header.



Event	Trigger	Time	Message	Priority	Ack
4204					
4203					
4202					
4201					
4200					
Cut head end		3:05:19 PM	Shear cut head end		
Measure roll up		3:05:06 PM	Measure roll up		
Cut head end		3:05:05 PM	Shear cut head end		
Measure roll up		3:04:40 PM	Measure roll up		
New Coil		3:03:40 PM	New Coil number: 704201	Normal	
Cut head end		3:03:27 PM	Shear cut head end		
Cut head end		3:03:14 PM	Shear cut head end		
Measure roll up		3:03:14 PM	Measure roll up		

As expected, the sorting of the lines in the groups is made according to the selected sorting column (e.g. column "Time", descending). The sorting of the groups will be made after the comparison of values in the sorting column in every first line of the groups.

The first line of a group always contains the maximum or minimum value of the sorting column at ascending or descending sorting.

Live events

Here, you can see a tree structure of all event-based HD stores of the associated *ibaHD-Server* with the events stored there.

Select here the events which have to be displayed in live mode in the event table.

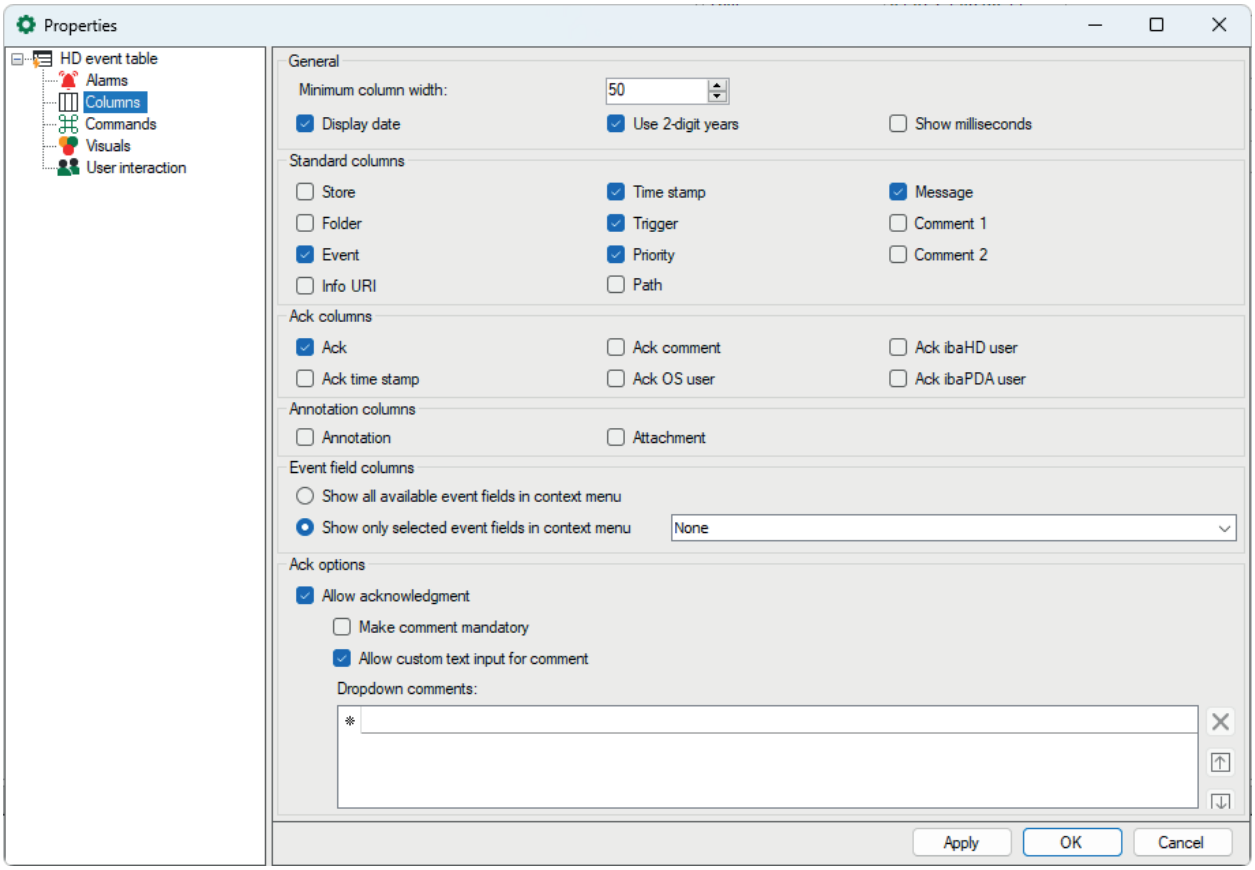
Selecting the setting "Auto-select all," all events of all HD stores of the associated *ibaHD-Server* are always displayed in the event table.

Note

Events which you select by drag and drop from the HD signal tree are automatically addressed in the tree structure of the live events.

7.3.1.2 Columns

In the *Columns* node, you define the display and behavior of the columns in the event list.



General

Here you can specify the values for the *Minimum column width* in pixels and define the date display.

Standard, acknowledge and note columns

Here you can select which columns should be shown in the event table and which should not. In addition to the standard columns, you can enable or disable special columns for acknowledgment and notes.

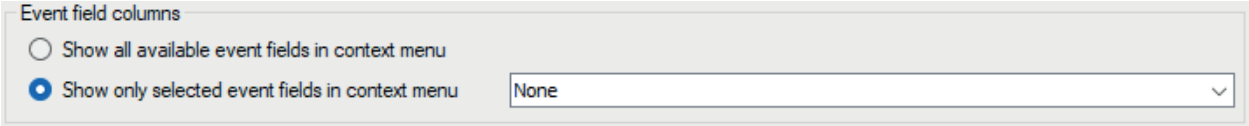
Column Info URI

If you click on the URI displayed in this column, the URI will be opened in the computer's default browser.
If this column is not displayed, you can also open the URI by <Alt>+mouse-clicking on any area of the event entry.

Tip

In the event table, you can always enable and disable columns via the context menu.

Event fields



Show all available event fields in context menu

You can show and hide all fields defined in the various events as columns via the context menu of the event table.

Show only selected event fields in context menu

From the selection list, select the event fields that are to be available as additional columns in the event table. You can show and hide these via the table's context menu.

Meaning of the acknowledgment columns

Acknowledgment

This column is enabled by default and is used to acknowledge an event message. The acknowledgment occurs by clicking on the box. Once the message has been acknowledged, a check mark is shown in the box. If the column in the event table is not enabled, then an acknowledgment is not possible.

Acknowledgment of the time stamp

The time of the acknowledgment is shown in this column.

Acknowledgment of a comment

This column shows the comment that was entered or selected during the acknowledgment (see *acknowledgment options*, further below).

Acknowledgment system user, ibaHD-User and ibaPDA-User
In these columns, the respective user name of the user is shown who actuated the acknowledgment.

- *System-User* is the user name who is registered under Windows on the computer or the user account under which the *ibaPDA* client is running.
- *ibaHD-User* is the user name under which the client is registered on the *ibaHD-Server* according to the user management.
- *ibaPDA-User* is the user name under which the client is registered on the *ibaPDA* server according to the user management.

Acknowledgment options
You can adjust the display and handling of the acknowledgment of event messages to your needs in the acknowledgment options settings.

Allow acknowledgment
Enable this option to be able to acknowledge messages in the event table. If you disable this option, then a mouse click in the column *Acknowledgment* does nothing.

Comment required
If you enable this option, then a dialog for entering or selecting a comment opens automatically as soon as a message has been acknowledged. If you disable this option, then an acknowledgment is completed without comment. An acknowledgment comment can also be added or changed later in the event list.
The comment is displayed in the *Ack comment* column in the event list.

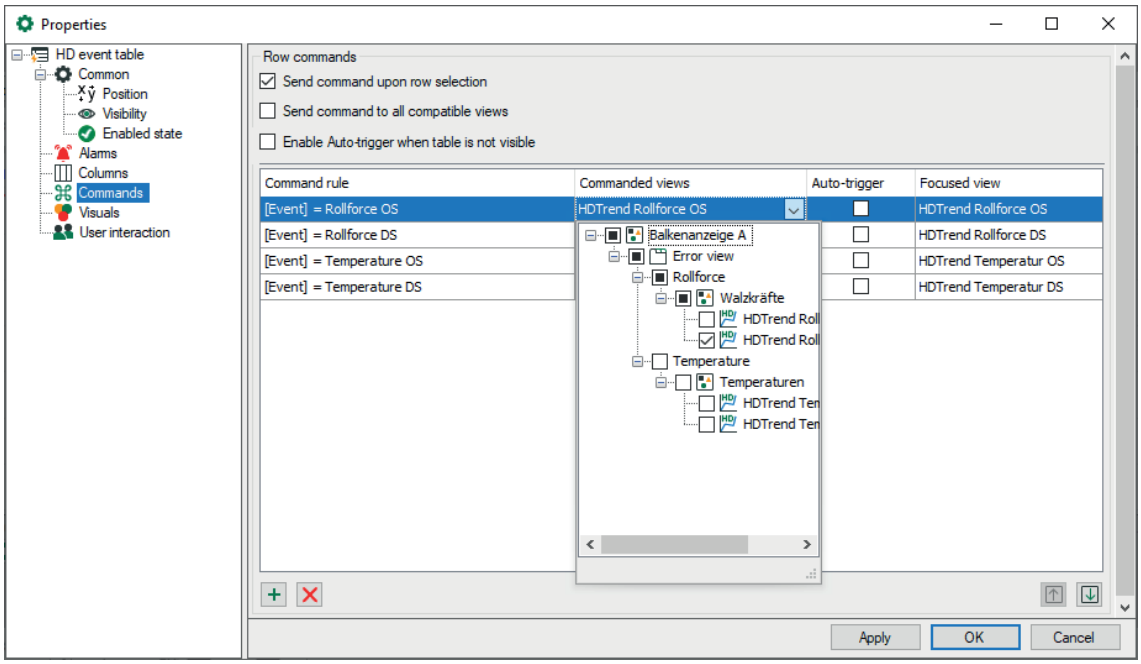
Allow user text input for comments
If you enable this option, then any plaint text can be entered as a comment during the acknowledgment. This is possible as an alternative to selecting prepared comments in the drop-down list. If you disable this option, only the entries from the drop-down list can be used as an acknowledgment comment.

Drop-down comments
In this list, you can enter acknowledgment comments that are then available to choose from in the drop-down list during acknowledgment. Use the arrow symbols to the right of the list to change the sequence of the comments. Use the delete icon to remove the comment in which the cursor is located.

7.3.1.3 Commands

Event tables can be coupled with HD trend graphs so that when double-clicking on an event line the desired trend graph stops and is placed on the right position of the time or length axis.

In the branch "Commands" in the properties of the event table you can set such line commands.



If you do not enable both options for row commands, then double clicking on an event in the event table does nothing.

Row commands

If you want all HD trend graphs to jump to the time of the event that you have double clicked, then enable the option *Send command to all compatible views*. The command rules will be disabled in this case.

If you want only certain trend graphs to jump to the time of an event and others to continue to run as normal, then only enable the option *Send command during row selection* and configure the appropriate command rules.

The third option determines whether a configured auto-trigger executes a jump or not, if the event table is not visible. This option is disabled by default, i.e. an auto-trigger executes the jump only if the event table is visible.

Command rules

Using the command rules, you can specify exactly for which event and under which conditions which trend views jump to the time of the event.

In the column *Relevant views,* you select the trend graphs which have to be stopped and positioned when the conditions are fulfilled.

If you make a check mark for a command rule in the 'auto-trigger' column, then the view is automatically switched when the configured condition occurs.

You can define as many command rules as you want.

Note

The list of command rules will be checked from the top down when double clicking on a row in the event table. At the first applied rule, the check will be finished and the command is forwarded to the assigned views.

You can modify the sequence of the rules: Use the button ↑ to move the marked rule up and the button ↓ to move it down.

Note

When using the command rules, double clicking in the event table is only successful for the events that are included in the command rules.

Configure command rule

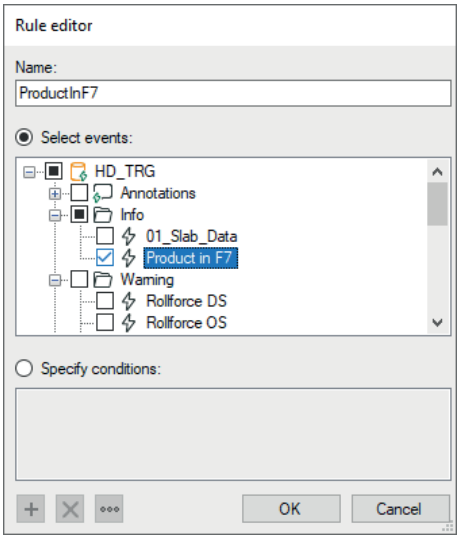
+ Adds a new rule.

✕ Deletes the marked rule.

... Opens the editor for editing the rule

Add a new command rule.

The dialog *Edit rule* opens.



First give the rule a meaningful name.

A rule offers two mutually exclusive methods.

If you enable the “Select events” option, then you can mark one or more events in the tree below that trigger a switching of the trend view, either by the status change "incoming" and/or "outgoing" (auto-trigger) or by double clicking on an event row. For events that are not marked here, the trend view will continue to run.

Tip

This method is suitable if you only want to switch certain trend views when double clicking on any event. To do this, mark all events in the tree.

If you enable the"Specify conditions” option, then you can formulate check conditions in the field below that are executed when double clicking on an event row. In the auto-trigger mode, the conditions are checked constantly.

If a condition is met, the trend view is switched.

Configure conditions

A condition can consist of one or more expressions that are linked with each other.

+ Adds a new expression.

✕ Deletes the marked expression.

... Opens the editor for editing the expression.

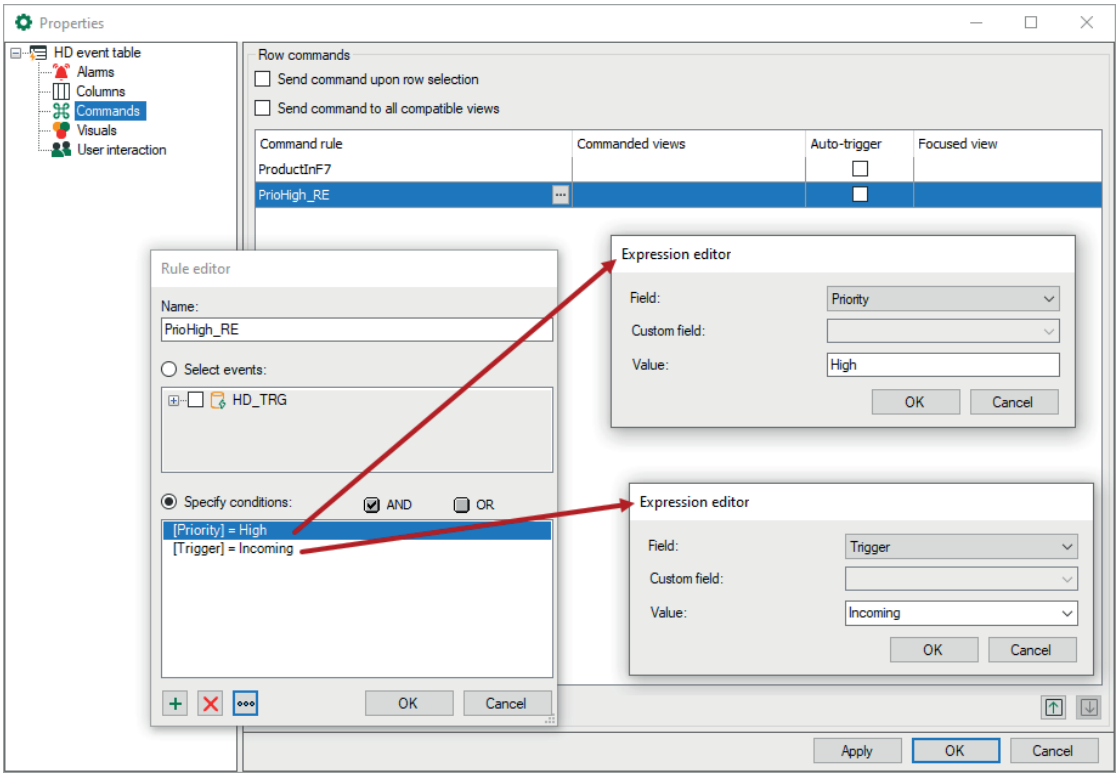
If a condition contains several expressions, then these will be linked with a logical AND or OR.

Click the button + in order to add an expression or the button ... to edit an existing expression. In the *Edit expression* dialog, first select a field (e.g. event, comment, trigger, etc.) and then the value (e.g. event name, plaint text incoming/outgoing, etc.)

In the following example, double-clicking on events stops the HD trend graph named "Rolling forces" and sets it to the time stamp of the clicked event. The events meet the following requirements:

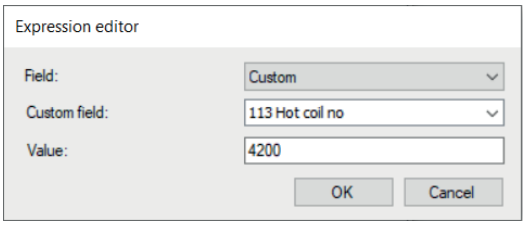
- Priority = "High"
- Trigger = "Incoming"

Command rule with two conditions that must be simultaneously met:

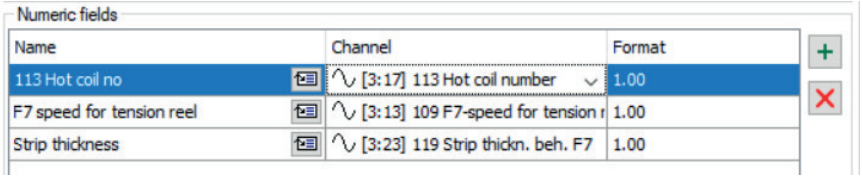


Note

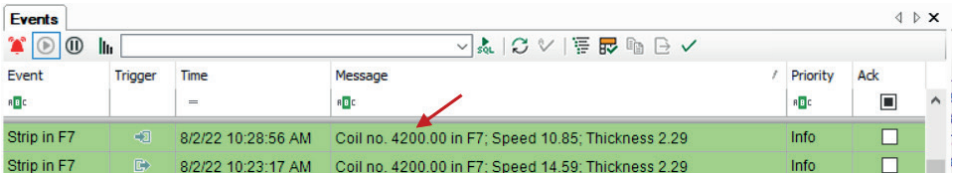
In an expression you can select the field type "Custom". Therefore commands can be written in order to request number and text fields from the event definition.



With this expression, for example, you could check by double clicking on the event whether it has a number field or label called "coil number" and if it is equal to the value "4200".

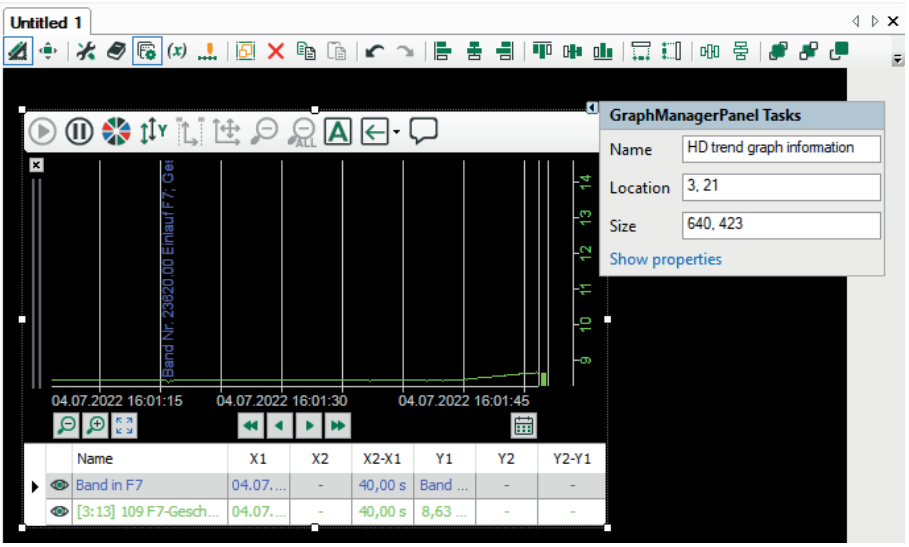


This argument would be met, for example, for the following event:



Note

You can also send commands to HD trend graphs which are placed in *ibaQPanel*. To name an HD trend graph in *ibaQPanel*, in the design mode click on the triangle icon in the upper right corner of the HD trend graph. Enter the desired designation in the text field "Name".



7.3.1.4 Visuals

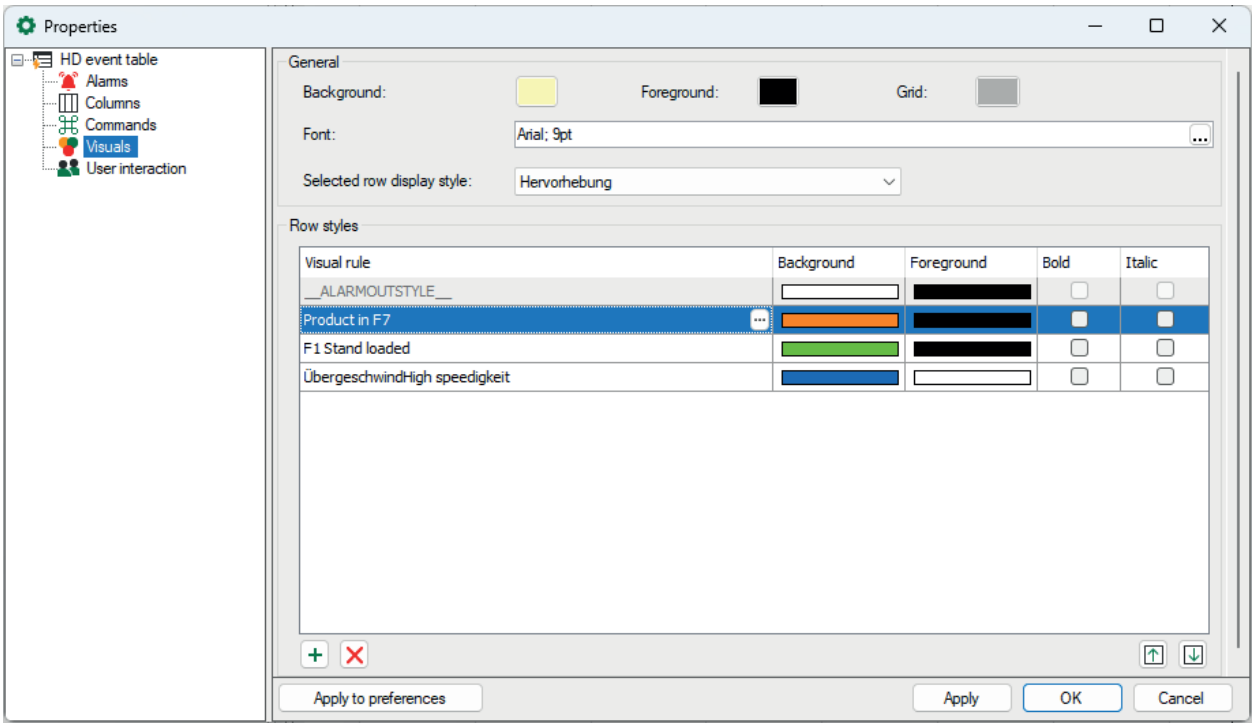
Similar to the commands (see above), the style of the rows in the event table can be controlled, depending on the properties of the occurred event.

In the "Pane" heading in the properties of the event table, you can set such row styles locally on the *ibaPDA* client.

Note

For every event, you can specify the row style globally already during the event definition (configuration of the HD record, tab *Client options*).

These global row styles are overwritten by the local settings that you make in the properties of the event table.



General

Here, you set the overall performance of the event table, background and foreground color, the color of the grid and the font.

Row styles

In the "Row styles" list, you create rules and corresponding style modifications (background and foreground color, bold and italic print of the font).

+ Adds a new rule at the end of the list.

✕ Deletes the marked rule.

Opens the editor for editing the rule

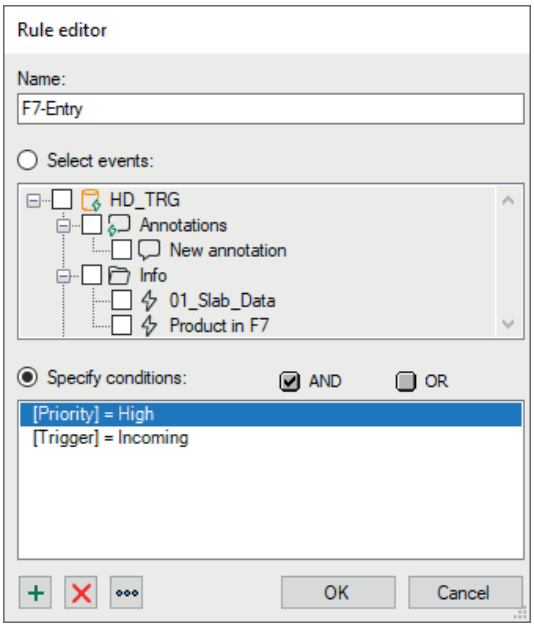
Note

By double-clicking, the list of rules is checked from the top to the bottom. At the first applied rule, the check will be finished and the style modification will be made.

You can modify the sequence of the rules: Use the button to move the marked rule up and the button to move it down.

Add a new command rule.

The dialog *Rule editor* opens.



First give the rule a meaningful name.

A rule offers two mutually exclusive methods.

If you enable the "Select events" option, then you can mark one or more events in the tree below that are shown with the row style corresponding to the rule.

Tip

This method is suitable if you want to assign a row style to certain events.

If you enable the "Specify conditions" option, then you can formulate check conditions in the field below that are checked constantly during acquisition.

If a condition is met, the corresponding event is provided with the row style.

A condition can consist of one or more expressions that are linked with each other.

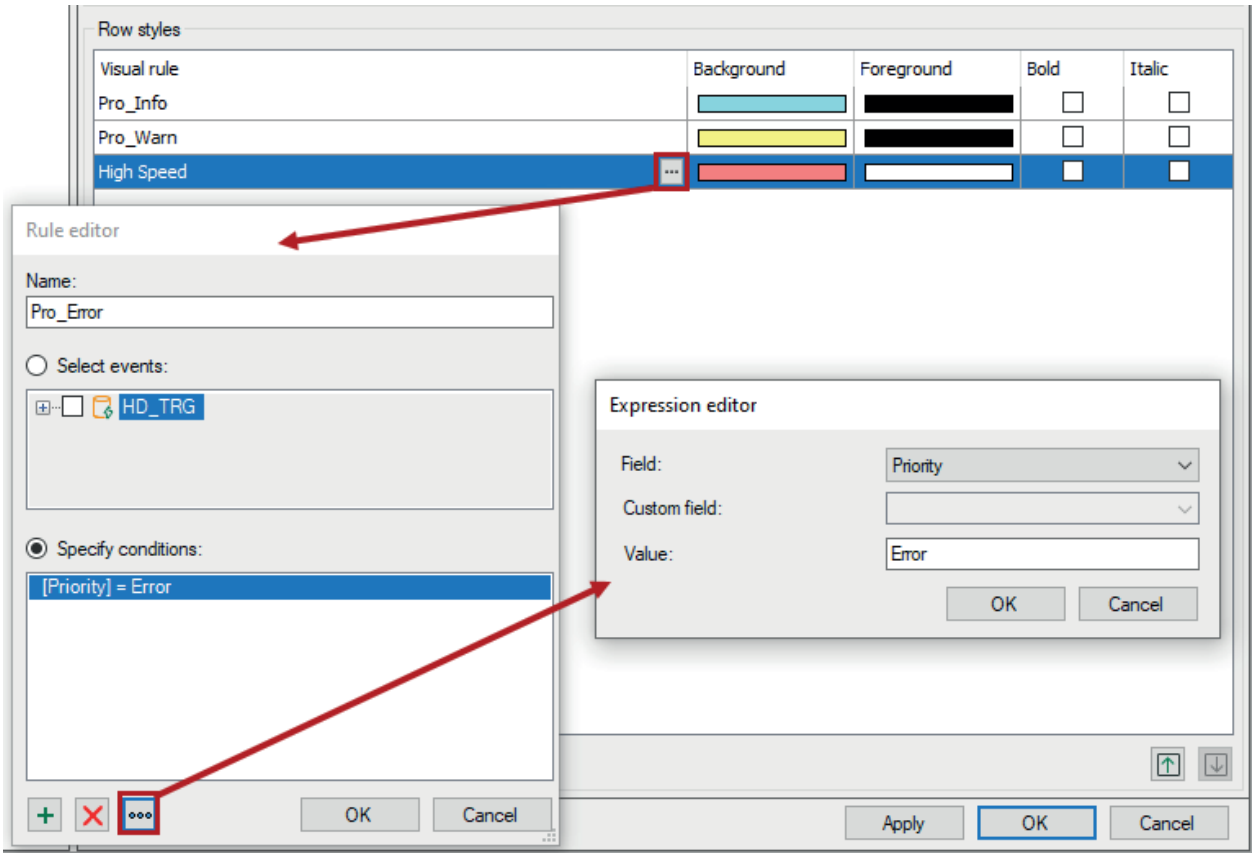
+ Adds a new expression.

✕ Deletes the marked expression.

... Opens the editor for editing the expression.

If a condition contains several expressions, then these will be linked with a logical AND or OR. In the *Edit expression* dialog, first select a field (e.g. event, comment, trigger, etc.) and then a value (e.g. event name, plaint text incoming/outgoing, etc.)

In the example below, for all events the background is colored red and the font is shown in bold. The events meet the requirement priority = "Error".

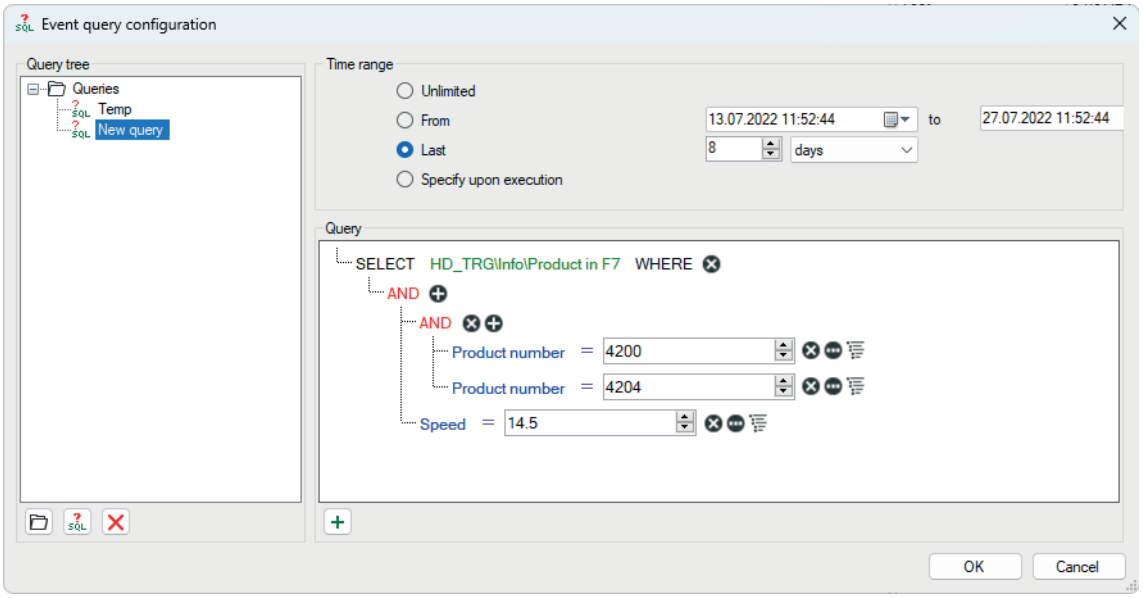


The row styles shown above as an example change the appearance of an event table as follows:

Event	Tri...	Time	Message	Priority	Ack
Tension Uncoiler 1		**25.04.12 12:00:46**	**Tension Uncoiler #1 50% above SP level (SP: 35.0 [kN], AV: 35.8 [kN]**	**Error**	
Tension Uncoiler 1		25.04.12 12:00:46	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 35.8 [kN]	Warning	
Tension Uncoiler 1		**25.04.12 12:00:39**	**Tension Uncoiler #1 50% above SP level (SP: 35.0 [kN], AV: 62.1 [kN]**	**Error**	
Tension Uncoiler 1		25.04.12 12:00:39	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 62.1 [kN]	Warning	
Coil on Uncoiler 2		*25.04.12 12:00:25*	*New Coil '4AB12346 ' on Uncoiler #2 (Diam.: 1675 mm, Thickn.: 1.01 mm)*	*Information*	
Tension Uncoiler 1		25.04.12 12:00:14	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 37.0 [kN]	Warning	☑
Tension Uncoiler 1		25.04.12 12:00:09	Tension Uncoiler #1 30% above SP level (SP: 35.0 [kN], AV: 47.8 [kN]	Warning	☑
New Coil welded		*25.04.12 11:59:17*	*Coil '4AB12345 ' welded (Diam.: 1870 mm, Thickn.: 1.02 mm)*	*Information*	
Coil on Uncoiler 1		*25.04.12 11:58:24*	*New Coil '4AB12345 ' on Uncoiler #1 (Diam.: 1870 mm, Thickn.: 1.02 mm)*	*Information*	☑

7.3.2 Configuration of event queries

To configure event queries, open the selection list of event queries and click on the <Edit queries> button.



Note

The event queries are stored on the *ibaHD server*. This means that the queries are available to all ibaHD clients (*ibaPDA*, *ibaAnalyzer*) if they are connected to the *ibaHD-Server*.

Query tree

All existing queries are shown here. There are two types of queries:

- *Server queries* are stored on the *ibaHD-Server* so that all connected clients can use the same server queries.
  Note: Only users who have the right *Edit ibaHD queries* can save or edit server queries.
- *Local* queries are stored in the layout. Other connected clients cannot see these.

You can arrange queries by using a directory structure.

Adds a new folder at the marked position of the tree structure.

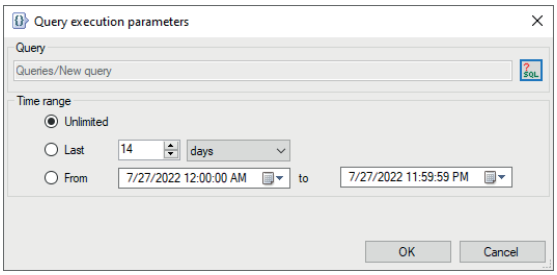
Adds a new query at the marked position of the tree structure.

Deletes the marked node and eventually secondary nodes in the tree structure

Query range

Every query is executed over a defined time range. There are several options for restricting the query range.

- Unrestricted: The query covers the entire HD recording
- Specify upon execution: After clicking on the start button for the query, a dialog appears in which you have to specify the query range



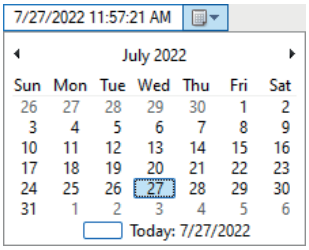
  Clicking on <OK> executes the query.

- The last xx minutes/hours/days/weeks/months: The query only covers a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- From *Date* to *Date*: The query covers the time period between the set days (inclusive).

Tip

To set the current date, open the Date & Time Picker by clicking on the down arrow.

Here you can select the entry under “Today...”.

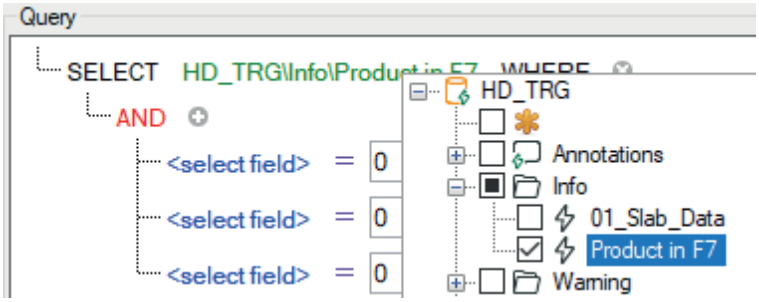


Query details

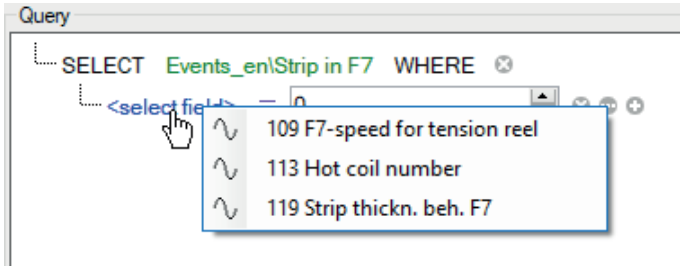
Here, you create the actual query using notation similar to SQL.

- Clicking on the icon + adds a SELECT instruction to the query marked in the tree.

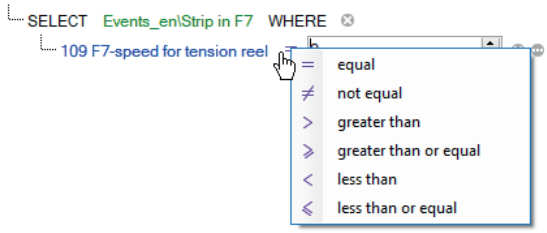
- By clicking on the green text, you open the event tree of the ibaHD server. Select here the event you are searching for.

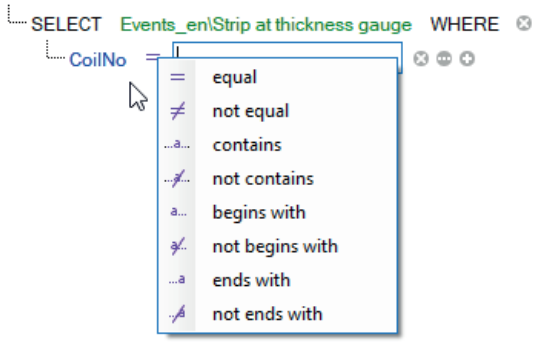


- Click on the blue text to select eventually existing numeric and labels.



- Depending on the selected field (numeric or label) a list of operators is displayed by clicking on the violet equal sign. Select the requested operator.





- Behind the elements in the query, there are different buttons which you can use to extend or modify the query:

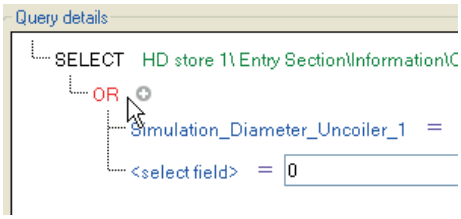
  Adds the instruction for a new expression

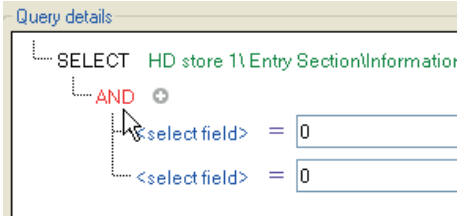
  Creates a new group of expressions

  Deletes an instruction or an expression

  Switches the right side of an expression between a fixed value and a field

- You can change the logical operator which is linked with a group of expressions by clicking on the operator.

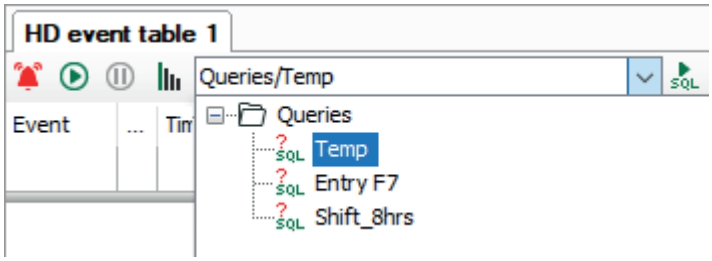




Clicking on <OK> closes the editor and saves the created queries.

Executing event queries

1. Select the desired query from the list.

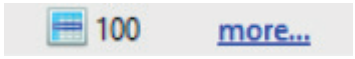


2. To start the query, click on SQL.

→ Depending on the complexity of the query and the number of events found, execution may take some time. You can see the current progress of the running query in the status line of the event table.

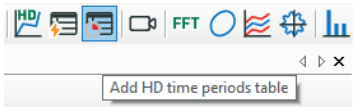
→ After completion of the query, the number of the found events is displayed in the status row. A query can return more events than line exist in the event table.

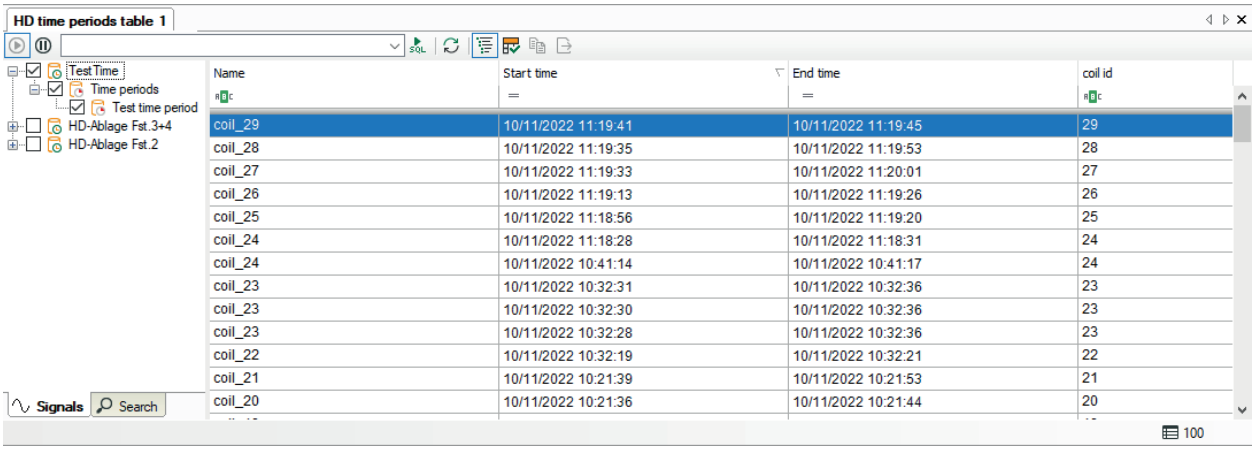
3. To display any additional events, click on the blue “more...” link in the status bar.



7.4 HD time period table

The time period table can be used to display different time periods from multiple time period stores in an *ibaHD Server*. A time period table is opened in the *ibaPDA* client by clicking on the  icon in the toolbar.

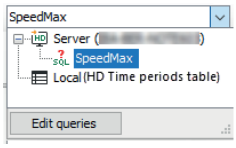




Select the time period store you want to display. There are various options for doing this:

- Open the tree structure using the button in the toolbar. Select the time period store you want to display.
- Use drag & drop to drag a time period store from the HD signal tree to the table.
- Select the time period store in the context menu of the time period table.

The toolbar for the time periods table contains the following controls:

	Starts the live display of the time periods.
	Stops the live display of the time periods (pause). It is now possible to mark individual lines in the table.
	Drop-down list for selection of time period query. If you open the drop-down list you can see all available queries and select the one you want. A mouse click on the button <Edit queries> opens the editor for creating time period queries.
SQL	Carries out the SQL-query which has been selected in the drop-down list. If the query takes some time, a progress bar will be displayed in the status bar at the bottom of the table. Furthermore, there will be a link which you can use to abort the query in case it takes too long.
	Refreshes the display according to the executed query.
	Show/hide signal tree
	Highlights automatically the most recently added line.
	Copy the time periods which are selected in the table to the clipboard. Only possible in pause mode.
	Exports the time periods which are selected in the table to an Excel or text file. Only possible in pause mode.

In live mode, new rows are added when new time periods are created. The rows are updated when the end time or other info fields are updated.

Status bar

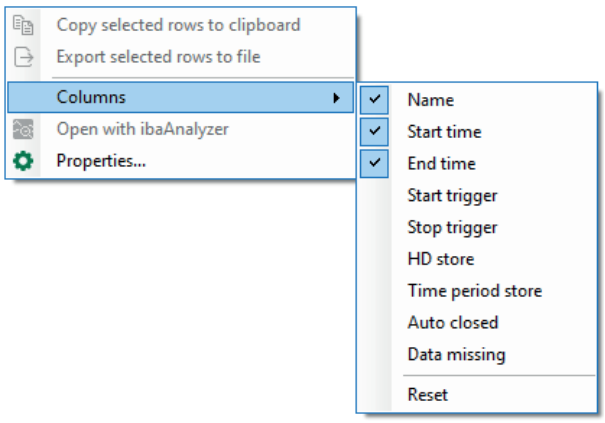
The status bar is at the lower edge of the table. It provides information about SQL queries carried out (e.g. status of the running query, number of results, error messages) and whether a filter is currently active.

Sorting

The table can be sorted in ascending or descending order of any column. Click on the header of the column which you want to use as the sorting criterion. The arrow shown (down or up) indicates the sort order (descending or ascending). The default setting is descending order of the *Start time* column, which means that the most recent time period is at the top.

Show/hide columns

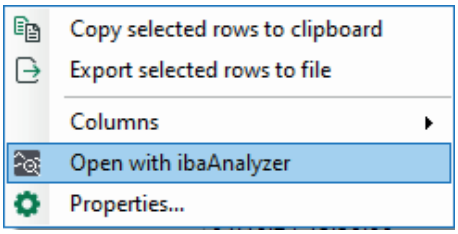
If you right-click on the table, you can select the visible columns or hide columns in the pop-up menu.



In the upper section of the pop-up menu, you can select the standard columns, and in the lower section the columns for the info fields. The info field columns that appear in the pop-up menu can be configured in the properties of the time periods table, see next section.

Filter line
The upper row in the time period table is for filtering the table. A detailed description of the filter functions can be found in the appendix, chapter ↗ *Advanced filter in tables, page 257*

Open time periods ibaAnalyzer
Selected time periods can be opened directly in *ibaAnalyzer* . To do this, select a row in the time period table and select the *Open in ibaAnalyzer* command from the context menu. The info fields of the time period are displayed and the name of the time period is used as the file name.



Prerequisite is *ibaAnalyzer* version 8.1 or higher. If an older version of *ibaAnalyzer* is installed, the time period is opened but no info fields are displayed. The name of the file only contains the start and end time, but not the name of the time period. If a time period without an end time is opened in *ibaAnalyzer*, the current time is used as the end time.

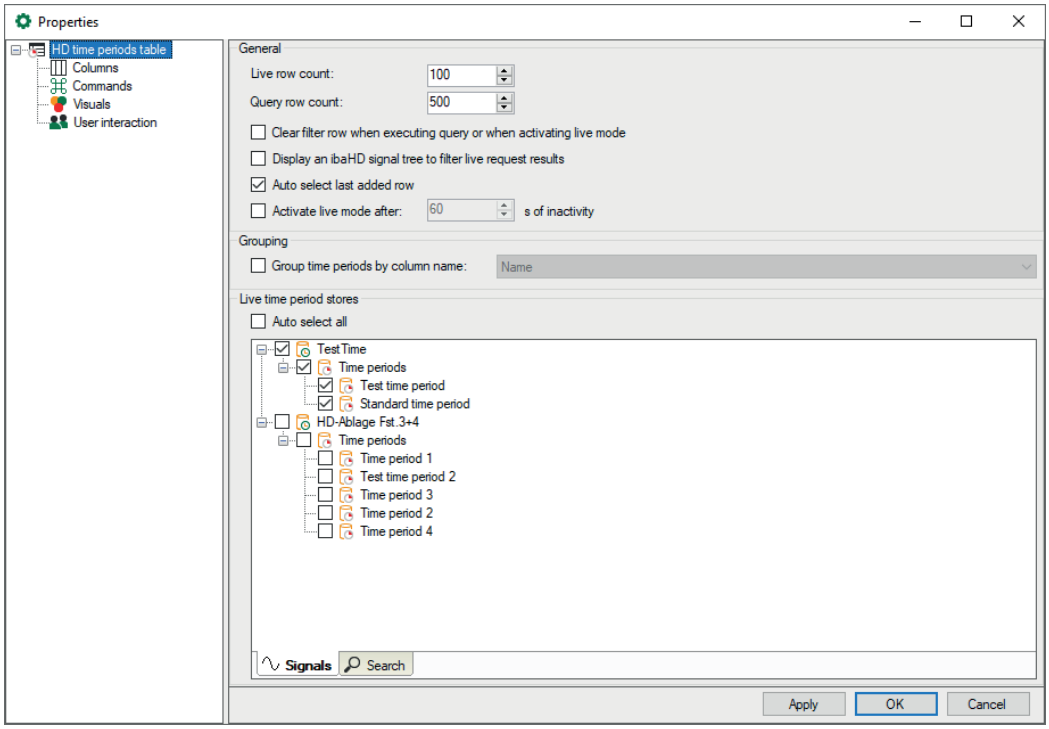
If the time-period table is in pause mode, you can select several rows. Each line is then opened as a separate file in *ibaAnalyzer* .

7.4.1 Properties of the HD time periods table

To open the properties dialog, right-click in the HD time periods table and select *Properties* from the context menu.

7.4.1.1 General Settings

In the *Properties* dialog, determine the display of the HD time period table and select the time periods to be displayed.



General

Live row count / Query row count
Here, you can set how many rows are to be displayed in the HD time periods table with current time periods and/or how many rows are to be displayed after a query. A maximum of 1000 rows can be displayed.

Clear filter row when executing a query or when activating live mode
Enabling this option automatically deletes any search patterns you have entered in the filter row as soon as you execute a query or switch to live mode in the table. This means that you do not have to remember to manually remove the filter terms.

Display an HD signal tree to filter live request results
Enabling this option displays the tree structure for the ibaHD time periods.

Auto select last added row
Enabling this option will cause the newest row being selected automatically. Thus, the most recent event will always have the focus.

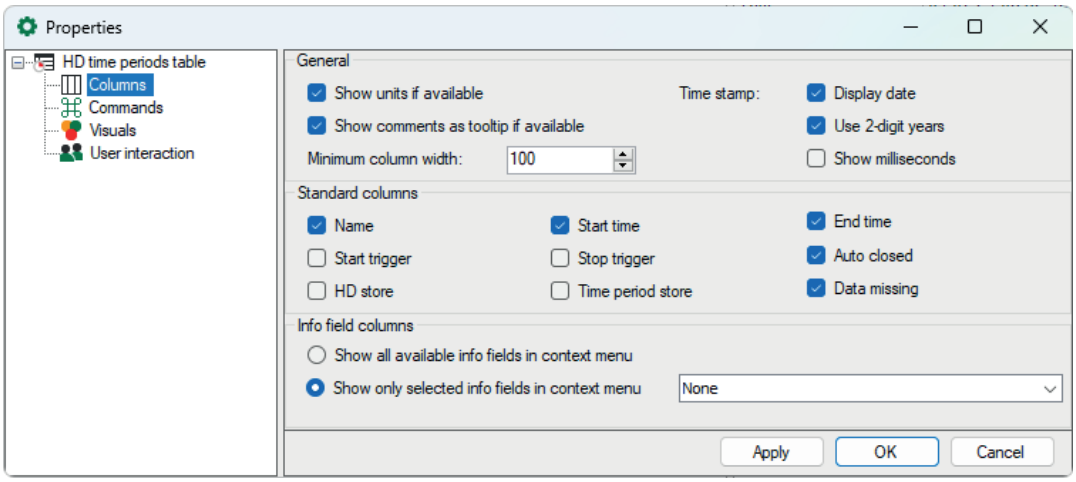
Activate live mode after ... s of inactivity
Enabling this option will cause the view to return automatically from pause mode to live mode if no mouse or keyboard operation occurred over the set time span (given in seconds).

Grouping
Enabling this option allows you to group time periods in the table using columns. Select a column in the adjacent field.

Live time periods
In the tree structure, you can select the time period store from which the time periods are to be displayed. Select the corresponding stores and the time periods. If you enable the option *Auto select all*, then all stores and time periods will be selected for live display.

7.4.1.2 Columns

In the *Columns* dialog, you define the formatting of the columns and the info fields.



General
Use the options to choose how the data will be formatted in the columns.

Standard columns
The selected columns are displayed in the HD time periods table.

In addition to the *Name* of the time period, you can choose from the following columns:

- *Start time* and *End time*
- *Start trigger* and *Stop trigger*
- *HD store* und *Time period store*
- *Auto closed*:
  This value is "0" if the time period was closed by a stop trigger and "1" if *ibaPDA* has closed it automatically. *ibaPDA* closes a time period automatically if the maximum time period duration is exceeded. *ibaPDA* also automatically closes all open time periods if the acquisition is stopped in standard mode.
- *Data missing*:
  This value is "0" if the signal data is available in the HD store for the entire duration of the time period and "1" if some data is missing. *ibaPDA* sets the value for all open time periods in tracking mode to "1" when the acquisition is stopped.

Info field columns
You can choose from the following options:

- Show all available info fields in context menu

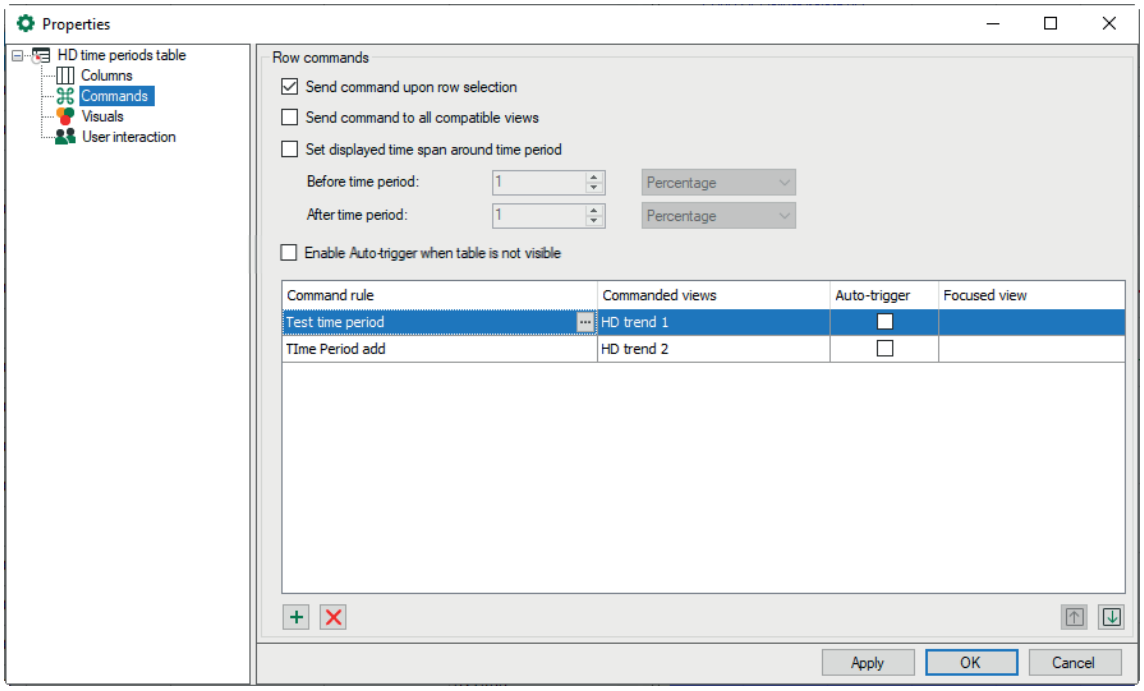
  If enabled, you can show and hide all info fields defined in the various events as columns via the context menu of the HD time segment table.

- Show only selected info fields in the context menu

  In the list, select the info fields that are to be available as additional columns in the HD time period table. You can show and hide these via the context menu.

7.4.1.3 Commands

Time period tables can be linked to HD trend graphs, which means that when you double-click on a row in the table the HD trend graphs show the time period selected in the row from start to end.



The *Send command to all compatible views* option is enabled by default. This means that when you double-click on a row in the table, all HD trend graphs show the selected time period. In this case, the command rules are disabled.

If you enable *Send command upon row selection*, you only have to select a row to execute the command, instead of double-clicking on the row.

The *Set displayed time span around time period* option enables you to add an additional time span before and/or after the period in which the signals are shown in an HD trend graph.

If you only want certain HD trend graphs to show the selected time period, disable the *Send command to all compatible views* option and configure appropriate command rules.

A command has the following properties

- Command rule: The rule defines the time period to which the command applies. You can select time period stores or define conditions for columns.
- Commanded views: Here, you can select the views that you want to switch to the selected time period.

- Auto-trigger: If Auto-trigger is enabled, the command is triggered when a row that meets the rule is added to the table. If Auto-trigger is not enabled, you have to select or double-click on the row, depending on the *Send command upon row selection* option, to trigger the command.
  You can configure an auto-trigger for three different situations:
  - Start time: The related trends jump to the start time of a new time period.
  - End time: The related trends jump to the end time of a new time period.
  - start time/end time: The related trends show the complete time span from start time to end time after a time period has ended.
- Focused view: Here, you can select whether you want to enable a different view after the command has been triggered.

Note

The list of command rules is checked from the top down when you double-click on a row in the table. When the first applicable rule is found, the check is finished and the command is forwarded to the assigned views.

You can change the order using the arrow buttons to move the selected row up or down.

Configure command rule

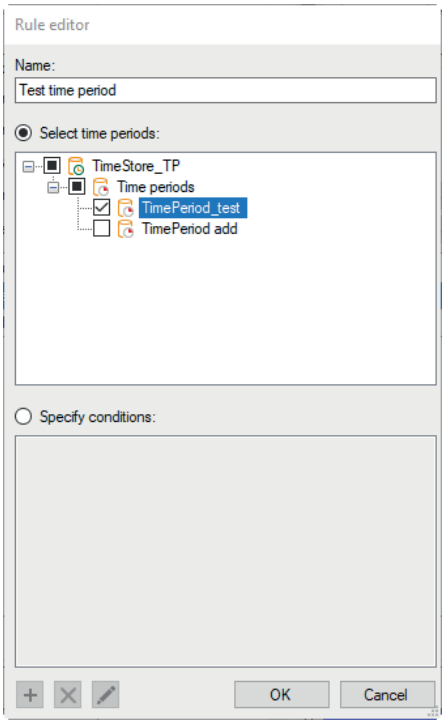
You can change the order using the arrow buttons to move the selected row up or down.

+ Adds a new rule.

✕ Deletes the selected rule.

Opens the editor for editing the rule

Add a new command rule. The *Rule editor* dialog opens.



First give the rule a meaningful name. A rule provides two mutually exclusive methods.

If you enable the *Select time periods* option, you can select one or more time periods in the tree below that trigger a switching of the HD trend view when a row is either selected or double-clicked.

If you enable the *Specify conditions* option, then you can enter check conditions in the field below that are executed when double clicking on a row. In auto-trigger mode, the conditions are checked continuously.

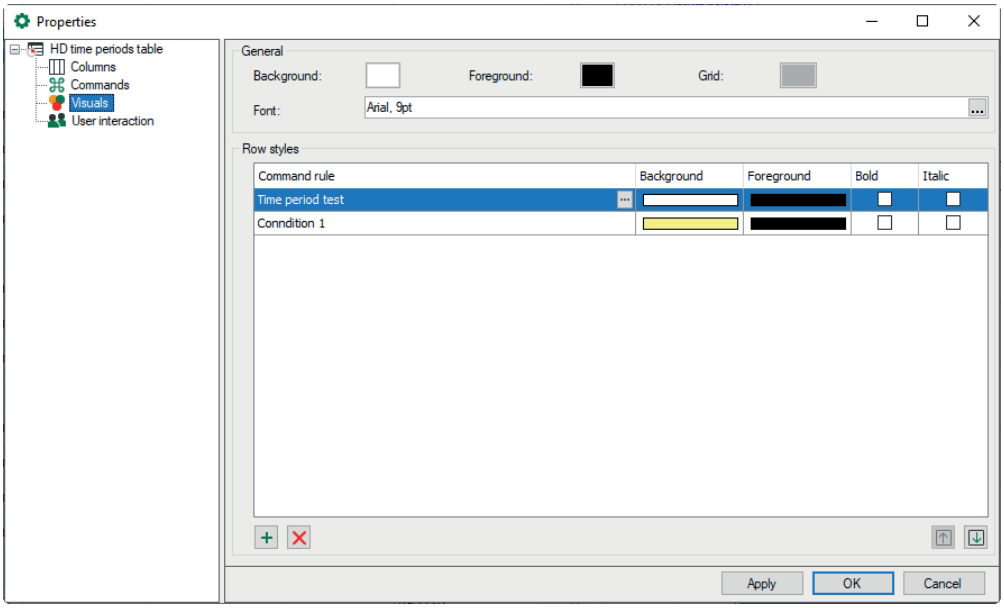
If a condition is met, the trend view is switched.

Configuring conditions

The procedure for configuring a condition is the same as that for event tables. See chapter ↗ *Commands, page 181*.

7.4.1.4 Visuals

Set up the appearance of the time periods table here.



General

Here, you can set the overall appearance of the table, i.e. the background and foreground color, the color of the grid and the font.

Row styles

The row style can be controlled depending on the properties of the time periods. In the *Row styles* list, you can create rules and associated style modifications.

+ Adds a new rule at the end of the list.

✕ Deletes the selected rule.

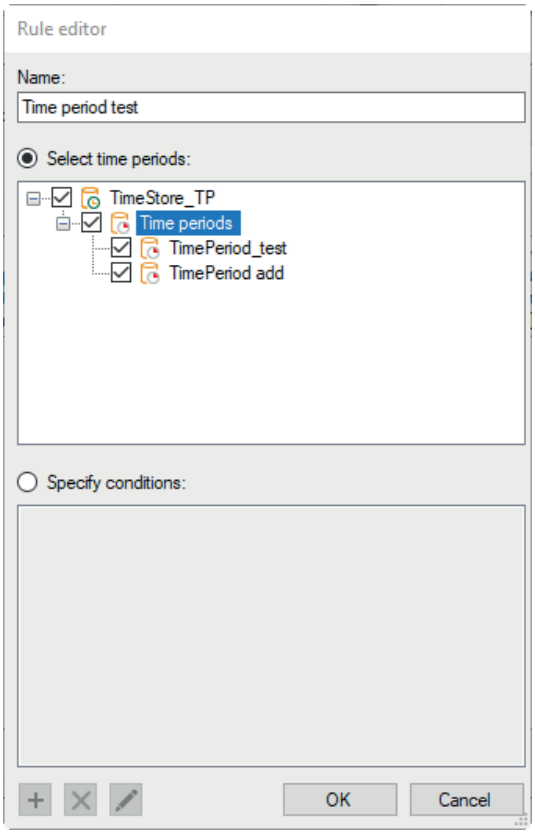
... Opens the editor for editing the rule

Note

Double-clicking checks the list of rules from top to bottom. When the first applicable rule is found, the check is finished and the style modification is made to the row.

You can modify the sequence of the rules: Use the button to move the selected rule up and the button to move it down.

Add a new command rule. The *Rule editor* dialog opens.



First give the rule a meaningful name. A rule provides two mutually exclusive methods.

If you enable the “Select time periods” option, you can select one or more time periods in the tree below that will be displayed using the row style corresponding to the rule.

Tip

This method is suitable if you want to assign a row style to certain time periods.

If you enable the *Specify conditions* option, then you can enter check conditions in the field below that are checked continuously during acquisition. If a condition is met, the corresponding time period is assigned the relevant row style. A condition can consist of one or more expressions that are linked with each other.

Adds a new expression.

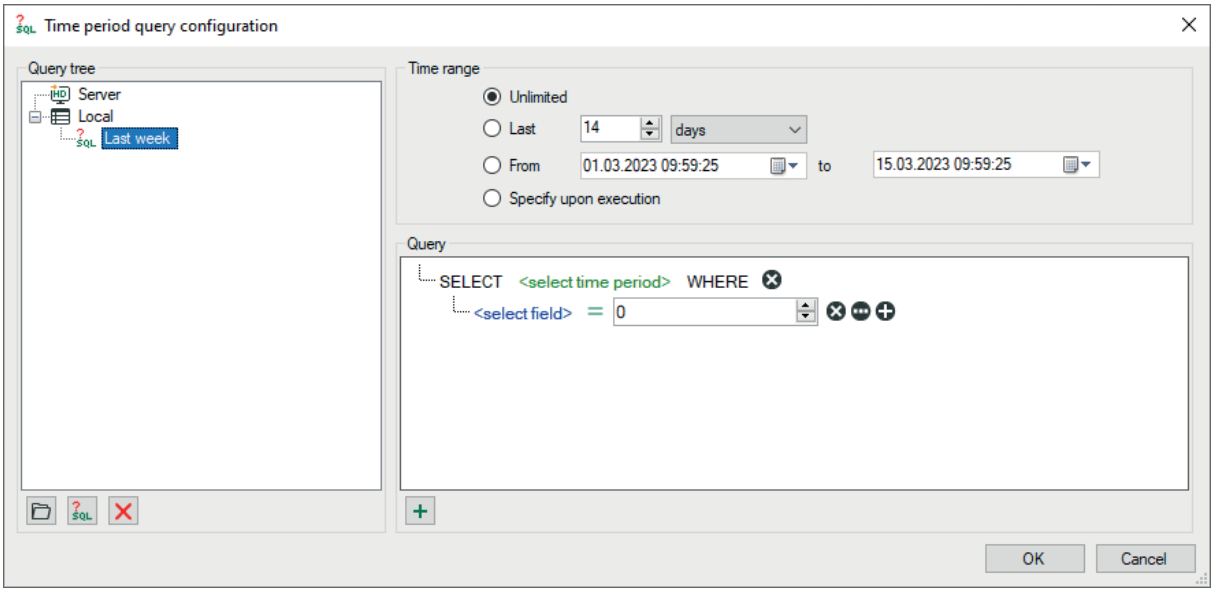
Deletes the selected expression.

Opens the editor for editing the expression.

7.4.2 Configuration of time period queries

In the HD time periods table toolbar, you can filter the rows displayed by particular criteria. Enter a value or configure a query by clicking on the icon. If you remove a value, the filter is deleted.

To configure time period queries, open the query drop-down menu and click on the <Edit queries> button.



Note

The event queries are stored on the *ibaHD server*. This means that the queries are available to all ibaHD clients (*ibaPDA*, *ibaAnalyzer*) if they are connected to the *ibaHD-Server*.

Configuring queries

All existing queries are shown in the query tree. You can arrange queries by using a directory structure.

	Adds a new folder at the selected position
SQL	Adds a new query at the selected position
	Deletes the selected node and any secondary nodes

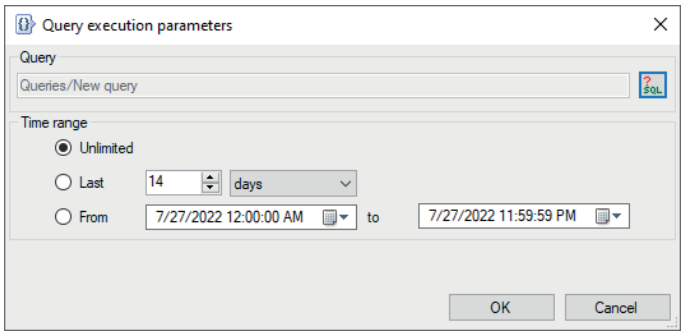
There are two types of queries:

- *Server queries* are saved on the *ibaHD-Server*, which means that all connected clients can use the same server queries.
  Note: Only users who have the right *Edit ibaHD queries* can save or edit server queries.
- *Local queries* are saved in the layout. Other connected clients cannot see these.

Query range

Every query is executed over a defined time range. There are several options for restricting the query range.

- Unrestricted: The query covers the entire HD recording
- Specify upon execution: After clicking on the start button for the query, a dialog appears in which you have to specify the query range

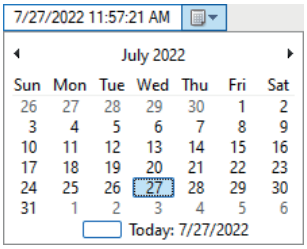


  Clicking on <OK> executes the query.

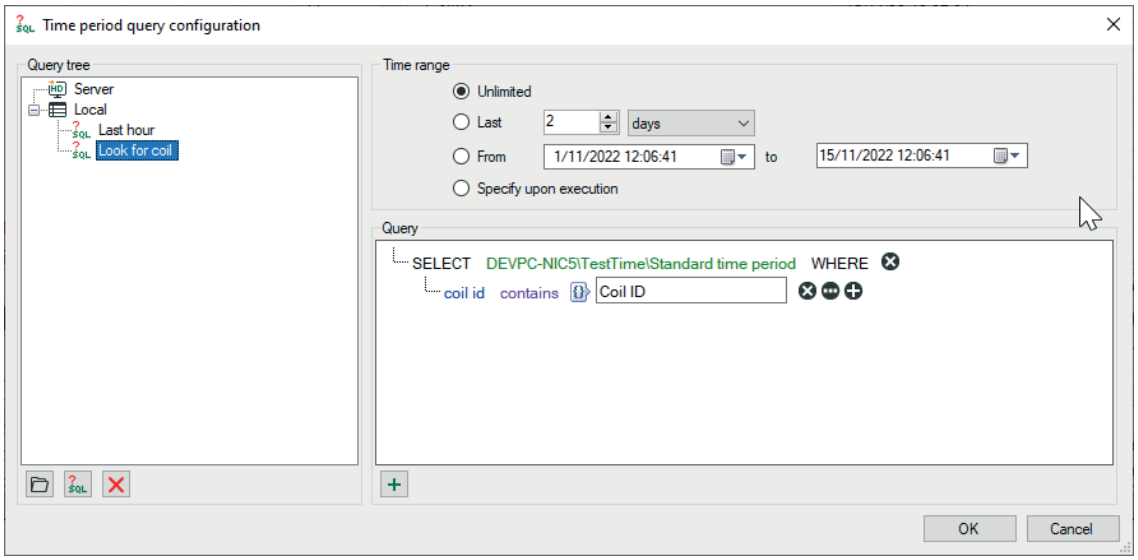
- The last xx minutes/hours/days/weeks/months: The query only covers a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- From *Date* to *Date*: The query covers the time range between the set days (inclusive).

Tip

To set the current date, open the Date & Time Picker by clicking on the down arrow. Here, you can select the entry under *Today…*.



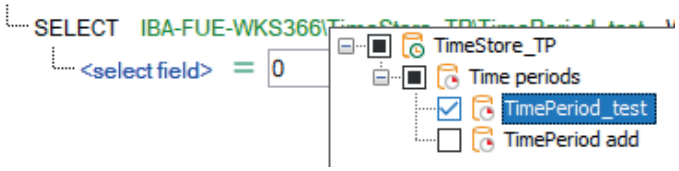
Query details



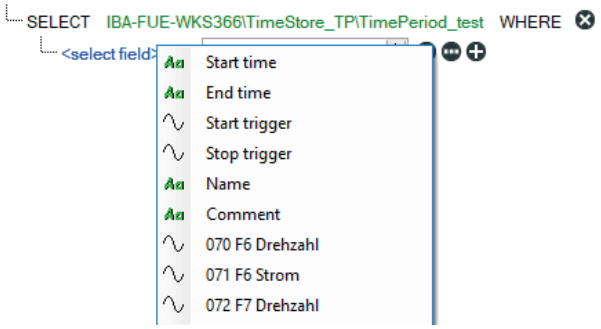
Here, you create the actual query using notation similar to SQL.

The query begins with a SELECT statement.

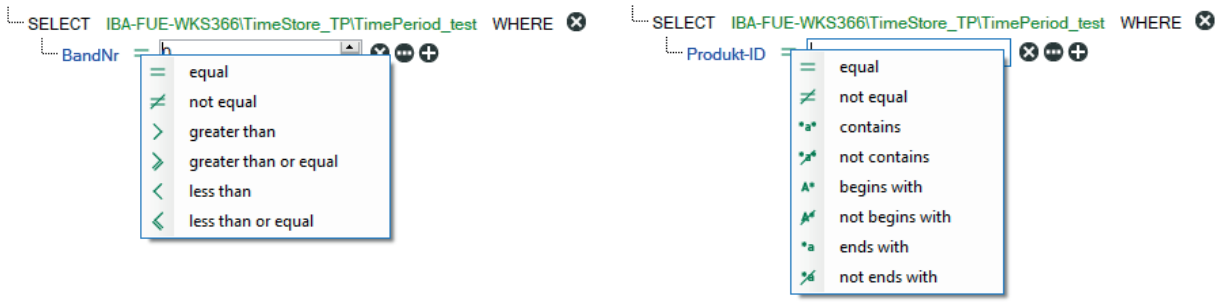
Clicking on the green text opens the tree structure for the configured time periods. Select the time period you want to search for.



Click on the blue text to select a column in the table or any existing information fields.



Depending on the selected field (numeric or text field), clicking on the green equals symbol displays a list of operators. Select the required operator.



Behind the elements in the query, there are different buttons which you can use to extend or modify the query:

Deletes the expression

Switches the right side of an expression between a fixed value and a field

Adds a new expression to the instruction

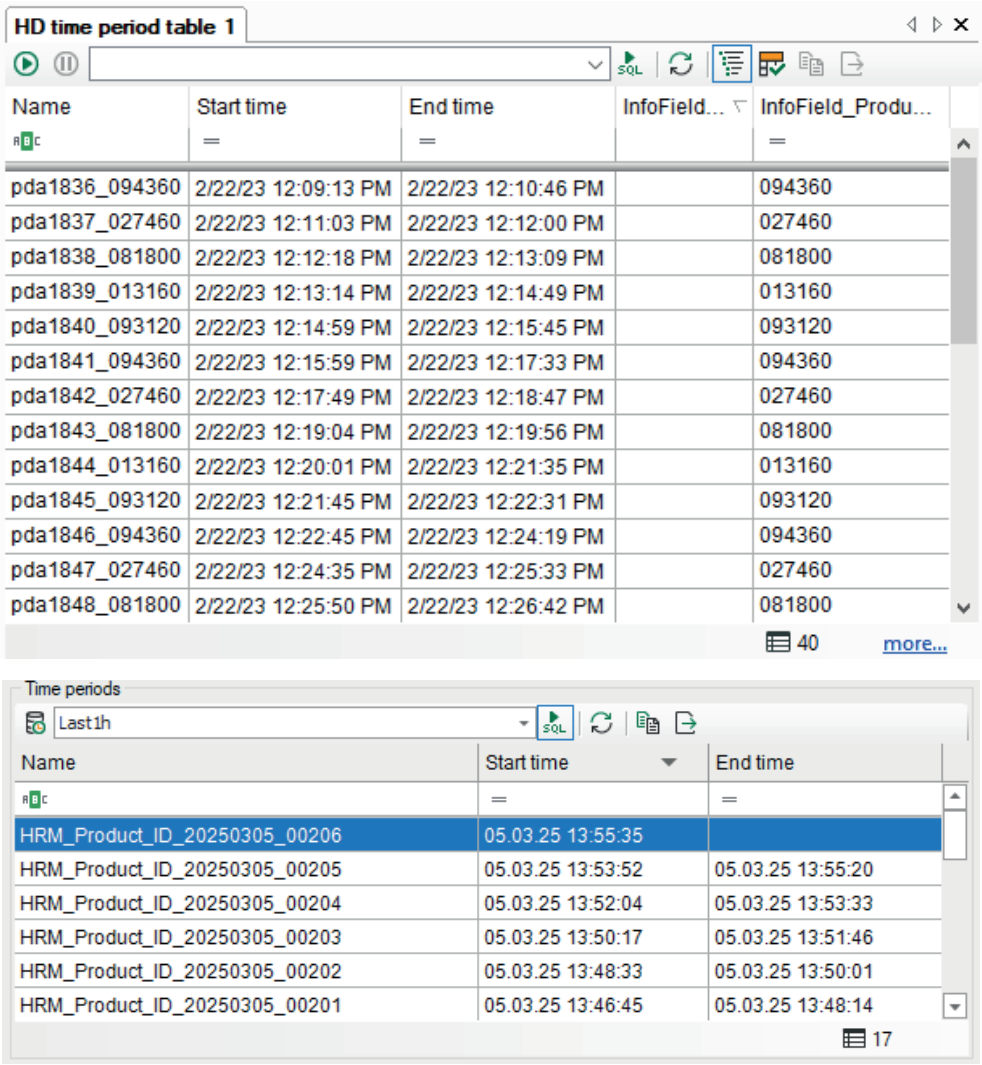
You can change the logical operator that is linked with a group of expressions by clicking on the operator.

Clicking on <OK> closes the editor and saves the created queries.

Executing the query

First select the relevant query from the list in the toolbar and then click on the button to the right.

When the query has been completed, the number of results found is displayed in the status bar on the right.



A query can return more results than the number of rows configured in the table. To display any other results, click on the blue "more..." link.

You can return to live mode by clicking on the button.

7.5 ibaHD-Server in ibaQPanel

ibaQPanel is a software add-on for *ibaPDA*, which allows to use, among others, extended freely configurable visualization objects.

Note

You need an additional license to use *ibaQPanel*. If required, please contact the support of iba AG.

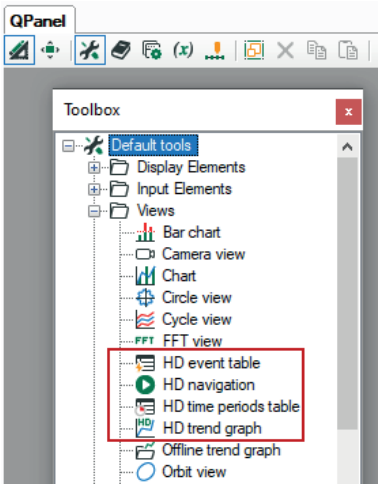
Other documentation

Here, it is only responded to the characteristics of *ibaQPanel* in connection with *ibaHD-Server*.

For the precise description of the handling of *ibaQPanel*, please observe the *ibaQPanel* manual.

Tools

The list of the tools contains also the display elements "HD event table," "HD trend graph" and "HD navigation" which are used for the visualization of data from *ibaHD-Server*.



The other tools mostly support as well HD signals for display and control purposes.

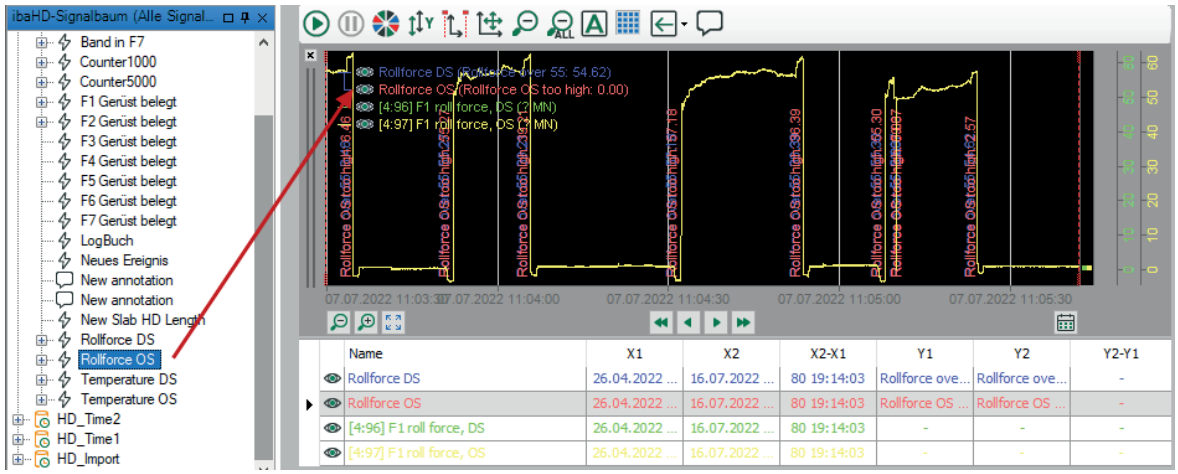
7.5.1 HD trend graph – extended functions

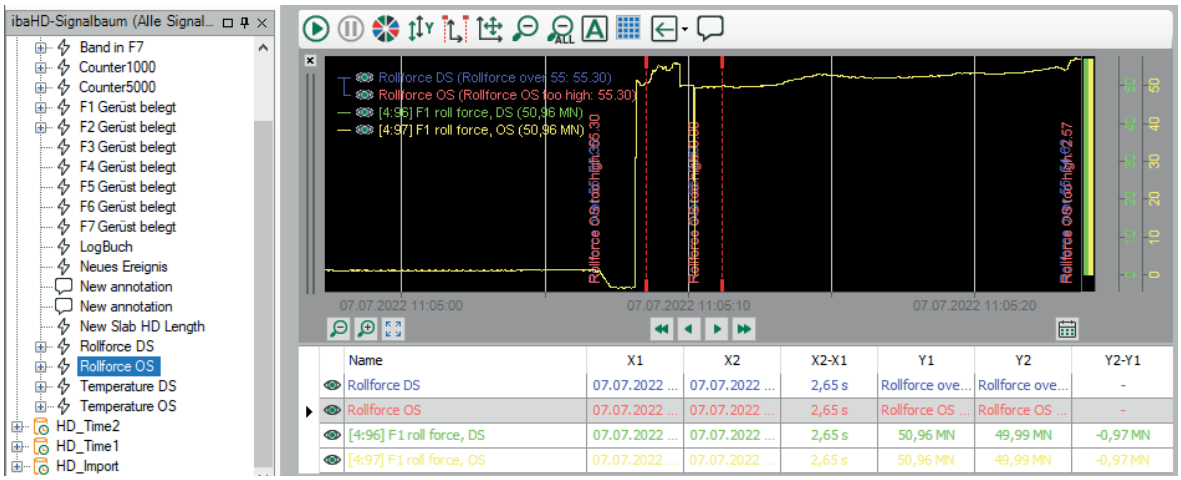
Events as text channels

Using the "HD trend graph" in *ibaQPanel*, it is possible to display in the trend graph events as text channels.

Simply drag the event from the HD signal tree and drop it on the trend graph in *ibaQPanel*. The event is displayed in the legend with its event name. If the event occurs, an event message is displayed dynamically on the right time or length position.

The following two figures show as an example the event "Tension Uncoiler 1" in a time-based trend graph. The second figure shows a zoomed presentation of the triggering.





Tip

When you only want to compile the incoming events, set the value "never" when you define the event for the "Outgoing event" (see chapter ↗ *Configuring event-based HD data store*, page 143*)*.

Tip

In order to avoid overlapping text in the display when zooming out, just disable the option "Allow text channel overlap" in the graph's properties.

Note

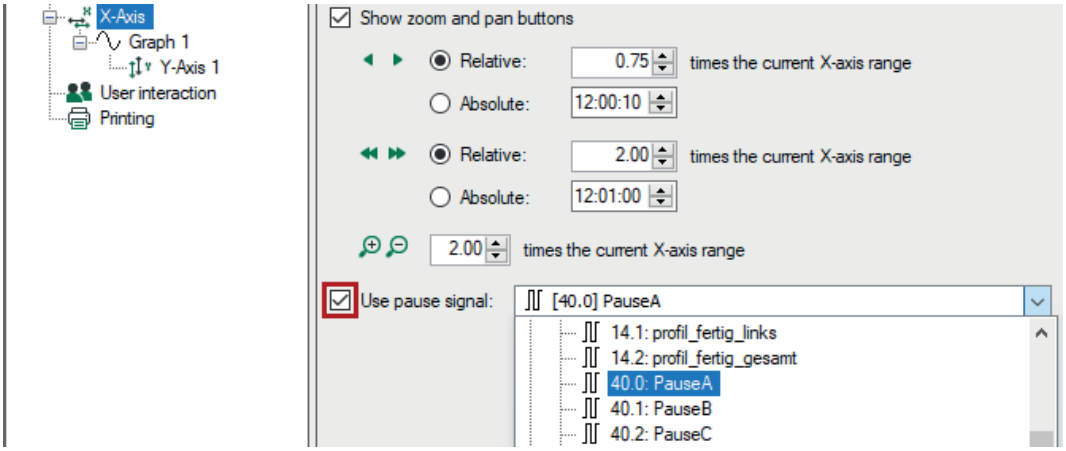
If you run the HD trend graph in live mode in *ibaQPanel* and you want to display an event as text channel, it is currently urgently necessary that at least another time-or length-based analog or digital signal is displayed simultaneously. This is necessary to run the scrolling of the X-axis.

Note

All events occurring while the "Product present" signal is FALSE are displayed in the gap between the graphs.

Pause signal

The option "Use the pause signal" exists for the time-based as well as for the length-base HD trend graph.



ibaQPanel offers the possibility to control the scrolling of the trend curves with a digital signal. If the option is enabled and a suitable profile is selected, the scrolling is stopped when the signal is TRUE. If the signal is FALSE, the scrolling continues.

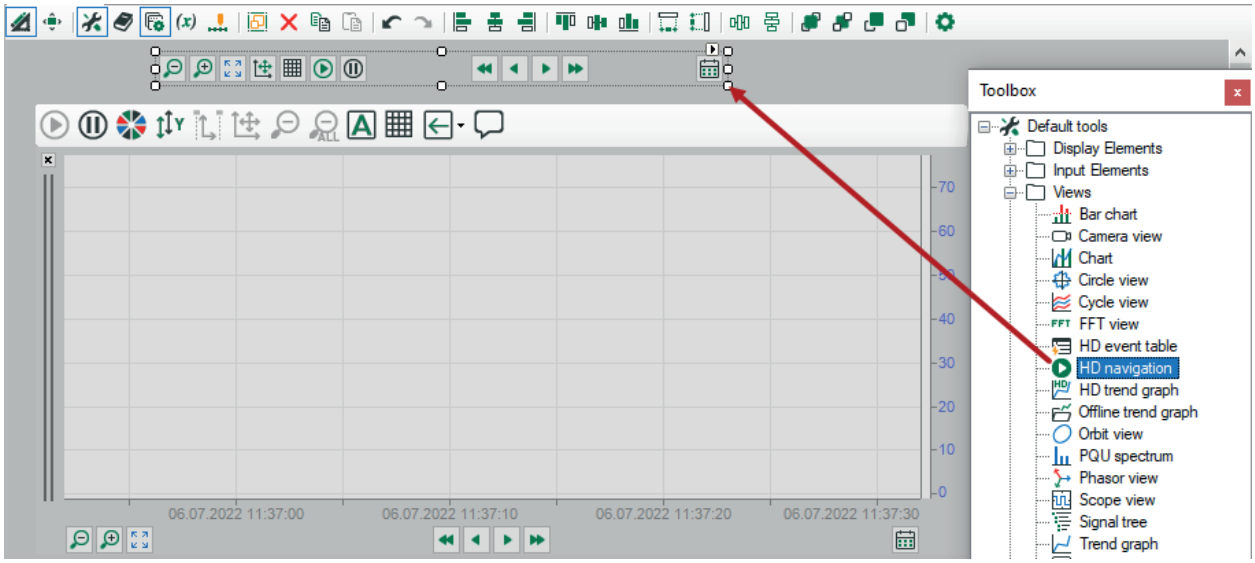
For the use of a pause signal with a time-based HD trend graph, this pause signal has to be included in the HD signal tree of a time-based HD store.

For the use of a pause signal with a length-based HD trend graph, this pause signal has to be included in the HD signal tree of a length-based HD storage.

Only suitable signals are offered in the signal tree of the selection field.

7.5.2 HD navigation

With the *HD navigation* element, several HD trend graphs can be controlled simultaneously.



During the configuration of the HD navigation bar, you can decide which buttons are visible and which HD trend graph should be connected with them. The time-based as well as the length-based HD trend graph can be assigned to the same HD navigation bar. During the navigation with the scroll buttons, the steps in the according unit will be made, as described in chapter ↗ *Operation and setup of time-based HD trend graphs, page 164*.

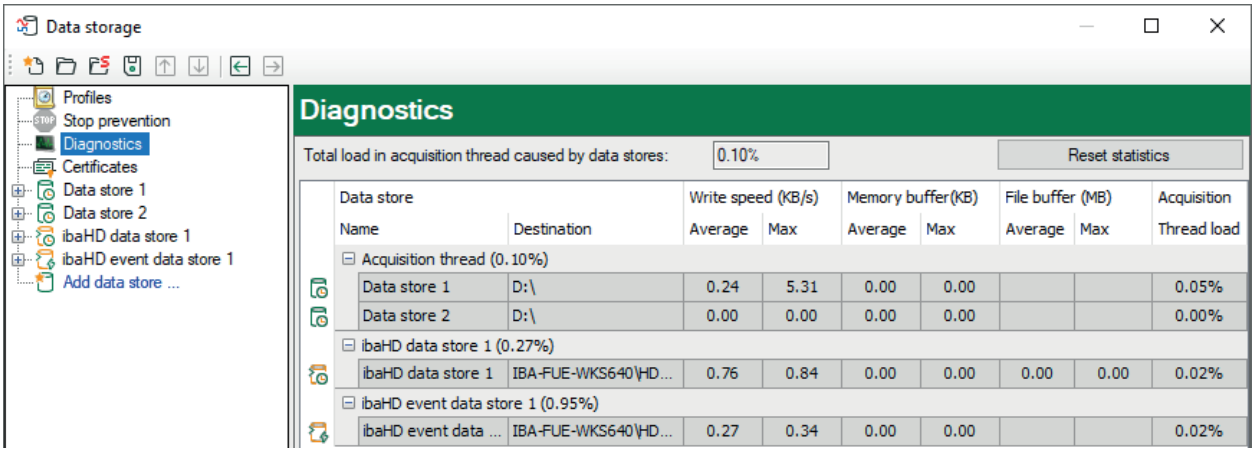
	Zoom function
	Zoom reset
	Display/hide the marker table [1)]
	Play, pause
	Scroll (big and small steps)
	Jump to a date

[1)] For this function, the visibility of the marker table has to be set to “manual” in the properties of the HD trend graph.

7.6 Diagnostics

7.6.1 General data store diagnosis

In the configuration dialog for the data store a sub-tree “Diagnostics” is available. In this overview you can find information about the performance of any configured data store.



The lines with the HD data stores (time-, length- and event-based) show the writing speed that is used to write the data on ibaHD-Server.

The columns *Memory buffer* (MB) show how much data is buffered in the memory buffer in ibaPDA. The columns *File buffer* (MB) show how much data is buffered in the file buffer. These values should usually be around zero. If this connection to the *ibaHD-Server* is interrupted, the values for the buffered data will ascend.

In the column “Thread Load” the partial processing time will be displayed, that is used for the creation of the data to be written on the HD server. These values already contain the run length encoding for time-based stores, event trigger calculation for event-based stores and the calculation of the length-based data for length-based stores.

Other documentation

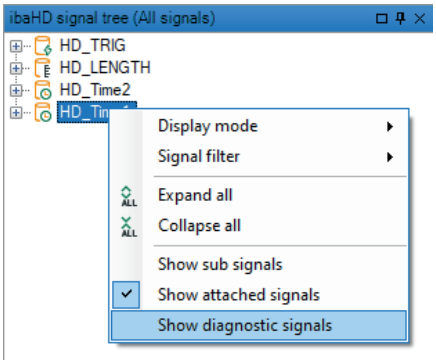
You can find information regarding the store types that are no HD stores in the *ibaPDA* manual.

7.6.2 Display diagnostic signals

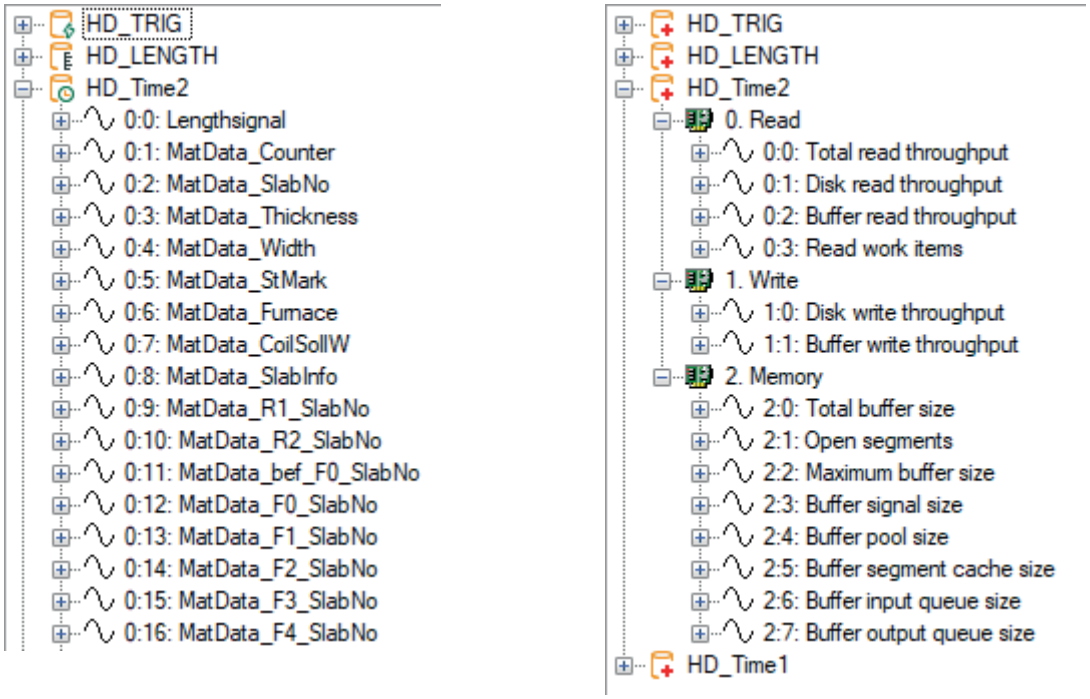
In addition to the configured measuring data, *ibaHD-Server* records a series of specific diagnosis data for every HD store in a special diagnosis memory. The data provide information about the performance of the system during writing and reading access as well as about the use of the memory and the buffer.

These data can be viewed with the *ibaPDA* client (starting from *ibaHD-Server* version 1.4.1). Principally, in case of problems, they should supply the support with specific information about the activity of *ibaHD-Server* at the moment of the failure. These are constant date sets that are always stored time-based.

To enable the display of the diagnosis data, perform a right mouse click with depressed <Shift> key in the HD signal tree window. The context menu now contains (contrary to the simple right mouse click) the options “Show diagnostic signals” and “Show attached signals”, see also chapter ↗ *Show appended signals, page 212*.



If you enable this option, the measured signals in HD signal tree will be replaced by diagnostic signals. Example in the following figure :HD signal tree with measured signals (left side) or diagnostic signals (right side).



You can now drag the diagnosis signals and drop them into a (time-based) HD trend graph curve as usual for display purposes.

The following limitations apply to the diagnostic signals:

- Diagnostic signals are sampled and stored with a rate of 1 Hz
- The max. limit of the memory for the cleanup strategy is 512 MB
- The max. recording time for the cleanup strategy is 6 months

7.6.3 Show appended signals

As described in the chapter ↗ *Backup*, page 55, you have the option to create backups of your HD records. You can attach these backups to the HD store in order to virtually extend the time period that is stored in the HD store.

If a backup has been attached to an HD store, the function *Show appended signals* is available.

This function may be useful if the backup also contains signals that are not included in the active HD store (e.g. because they were deleted after the backup). If you enable the function, these signals are shown. If you do not enable the function, then only the signals from the HD store are shown.

To enable the display of the appended signals, perform a right mouse click with depressed <SHIFT> key in the HD signal tree window. The context menu now contains (contrary to the simple right mouse click) the option *Appended signals*.

8 Offline events

General

Offline events are events that are not written into an HD store during data acquisition with *ibaPDA*, but are inserted into an existing HD store afterwards. With this function, events can be generated on the basis of measurement files or HD queries and linked with calculated values. These events can be written into the HD store.

Using *ibaAnalyzer* and the analysis files (*.pdo), new application possibilities arise such as:

- Calculation of Key Performance Indicators (KPI) over a defined time range (day, week, shift etc.)
- Calculation of quality data for single products or process cycles

These functions can be configured with *ibaAnalyzer* even without offline events. However, the storage of the calculated values in *ibaHD-Server*, assigned correctly to the time of their occurrence, is only possible with the help of offline events.

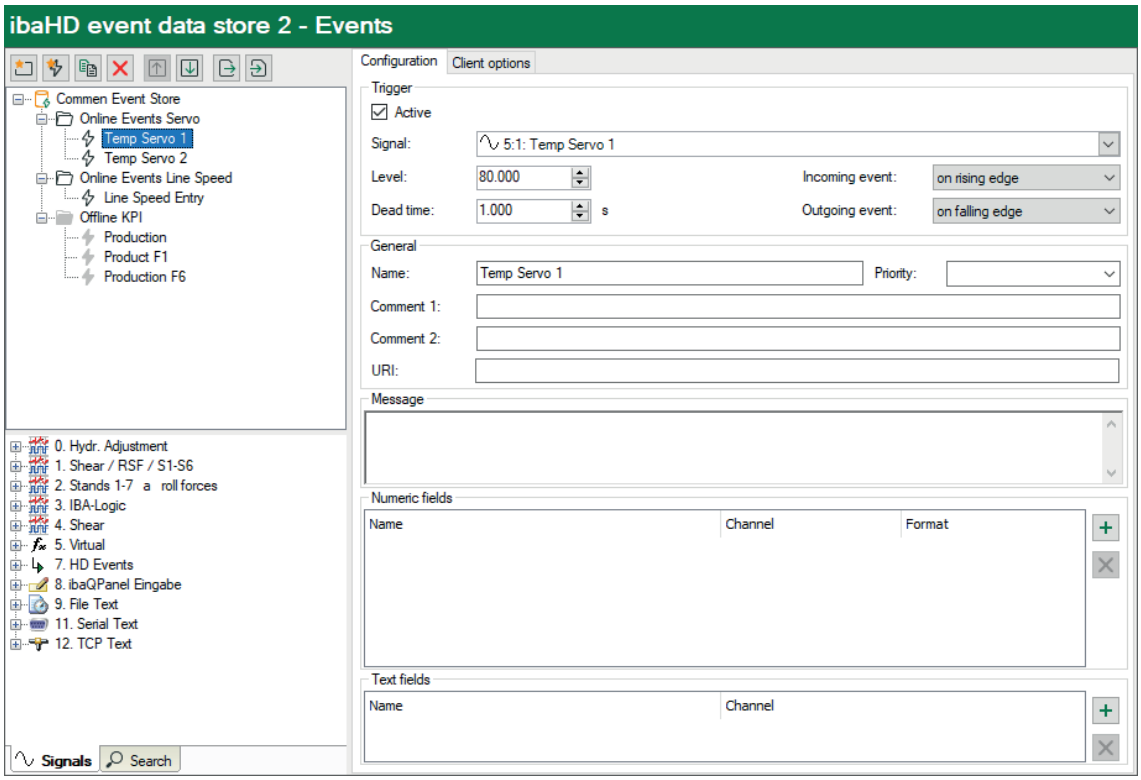
These calculations can be made not only for live data, but also for data that lie in the past.

With offline events, any process or signal states can be subsequently indexed as events.

Configuration

Unlike normal HD events, offline events are not defined in the data storage configuration of *ibaPDA*, but in *ibaDatCoordinator* with the HD offline event task.

HD events from *ibaPDA* server and offline events from *ibaDatCoordinator* can be stored in the same HD event store, the configuration is very similar. One part of the configuration is stored in *ibaHD-Server*, the other part on the system where the event was configured, i.e. either in *ibaPDA* or in *ibaDatCoordinator*.



In the configuration dialogs of *ibaPDA* and *ibaDatCoordinator*, all events are displayed, i.e. in the configuration of event-based data storage in *ibaPDA*, the offline events are also displayed in the event tree and vice versa.

Offline events are displayed with a gray icon in the event tree. If an HD event is disabled in the data storage, it is also displayed in gray.

Tip

If events are marked with a gray icon in the event tree of the event store, it is not easy to distinguish whether they are offline events (configured with *ibaDatCoordinator*) or only disabled events.

To avoid confusion, you should either indicate the event type in the event name or create a separate folder in the event tree for the offline events, for example.

Note

The access to the event configuration of an *ibaHD-Server* is restricted. At a point in time, a HD event store can be accessed either only with *ibaPDA* (in order to configure events for HD event store) or only with *ibaDatCoordinator* (in order to configure offline events for an offline event task).

This also applies to the simultaneous access of different instances of the same application (e.g. *ibaPDA* clients) to an event store.

Should it still be attempted, a message will appear.

Defining offline events

Offline events are created in *ibaDatCoordinator* using the HD offline event task. One or more events can be generated per HD offline event task. However, an offline event can only be generated by one task at a time. These tasks can be assigned to any job in *ibaDatCoordinator*, no matter whether it is a DAT file job, a scheduled or an event job.

Note

An offline event is always generated whenever the corresponding offline event task is executed.

Display

Offline events can be displayed just like normal events in the event table of the *ibaPDA* client. All functions of the event table that are available for HD events are also applicable for the offline events, e.g. jumping to the time of occurrence of an event in the HD trend graph by double-clicking on the message line in the event table.

Other documentation

You can find a detailed description of the offline event configuration in the manual of the product *ibaDatCoordinator*.

9 Access to HD data with ibaAnalyzer

With *ibaAnalyzer* you can access data recorded with *ibaHD-Server*. This requires a connection to the *ibaHD-Server* and the HD store. The HD query dialog is available in *ibaAnalyzer* for the configuration of HD queries. Here you can define which data is to be queried, e.g. via a time selection or signal-based query conditions. You can also use this query dialog to query time periods from the HD data. For further information see ↗ *Configuration of ibaHD-Server connection and HD queries, page 217*.

The result of an HD query is structured in a similar way to a normal measurement file. This allows you to perform basically the same operations in *ibaAnalyzer* (e.g. display signals, perform calculations, create reports, perform extractions).

Note

With *ibaAnalyzer* v8.1, the numbering of HD events has been changed. If you use analyses with queries from older versions, you may have to reconfigure the query.

9.1 Opening the HD query dialog

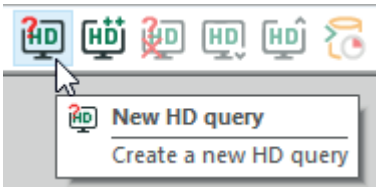
Functions for accessing HD data are available in the *Historical Data* menu. Some commands can also be found in the context menu of the signal tree.

Other documentation

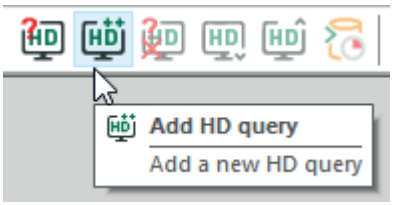
Detailed information on the functions in the *Historical Data* menu can be found in the *ibaAnalyzer* documentation, part 1, in the chapter *The Historical Data menu*.

1. To start a new HD query, click on *Historical Data – New HD query* in the menu or click on the corresponding icon in the menu bar.

→ The new query replaces existing files or HD queries in the signal tree.

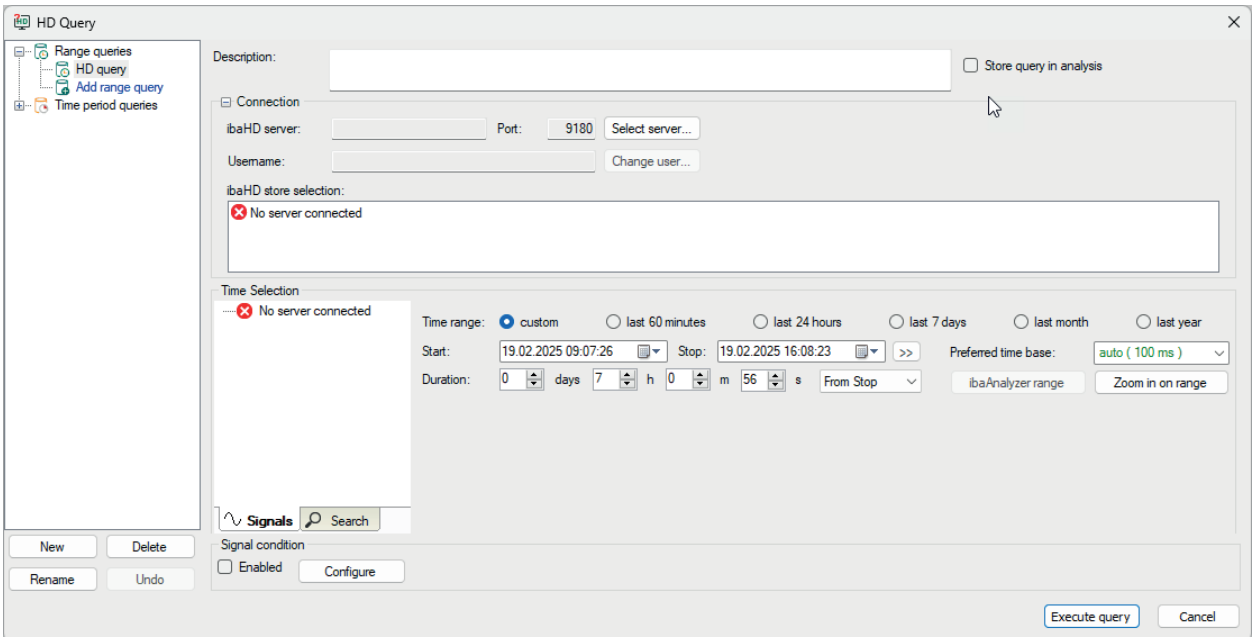


2. If there is already an HD query or a measurement file in the signal tree and you want to add an HD query, click on the menu *Historical Data – Add HD query* or click on the corresponding icon in the menu bar.



9.2 Configuration of ibaHD-Server connection and HD queries

If you add, append or replace an HD query, the HD query dialog opens.



If you are using the HD query function for the first time, you must first establish a connection to the *ibaHD-Server* and the desired HD storage. You can then configure and execute the query.

You can configure several different HD queries and time period queries and assign them a unique name. The queries are listed on the left-hand side of the dialog. You can enter a description for each HD query and specify whether the query should be saved in the analysis.

To configure a HD query, perform the following steps:

1. Set up the connection to the *ibaHD-Server* from which you want to retrieve data, see ↗ *Setting up a connection to the ibaHD server, page 218*.
2. Specify the time range for which the query is to be made.

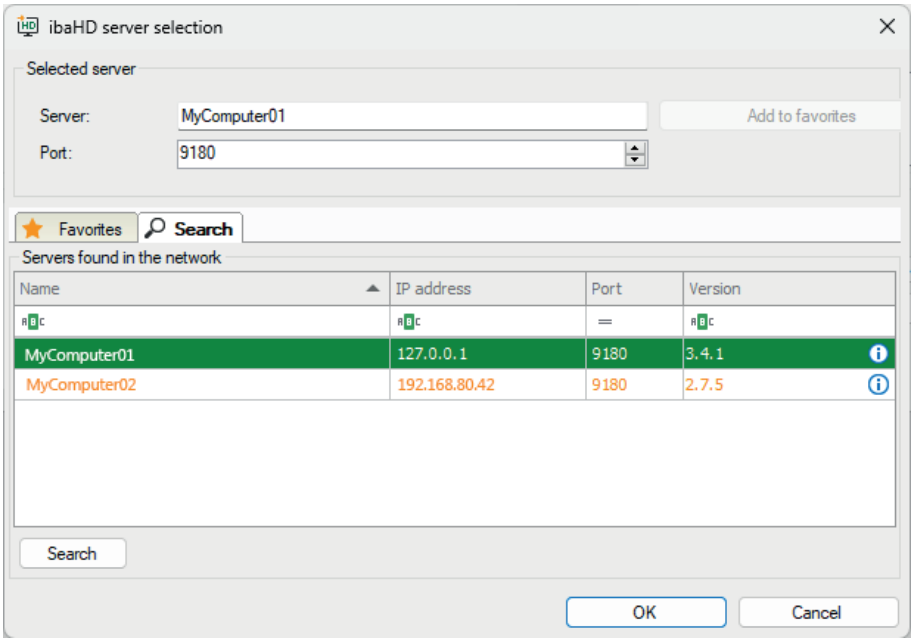
   For HD queries, see ↗ *Time selection for the HD query, page 219*.

   For time period queries, see ↗ *Time period queries, page 230*.
3. Optionally limit the query with conditions to certain events or signal states, see ↗ *Formulating signal conditions, page 225*.

9.2.1 Setting up a connection to the ibaHD server

To be able to execute HD queries, first set up the connection to the *ibaHD-Server*. You can change the connection settings at any time later if required.

1. Click on the <Select server> button in the HD query dialog.



→ The *ibaHD server selection* dialog shows a table with the computers detected in the network on which an ibaHD-Server service is running. If required, you can update the table by clicking on <Search>.

Color	Meaning
Green	*ibaHD-Server* contains stores and data
Orange	*ibaHD-Server* with non-compatible version, some functions are not available
Red	*ibaHD-Server* not compatible

Tip

If you move the mouse over the "i" icon, a tooltip opens with further information. For example, you can see whether time periods are available or which functions are not available (connection marked in orange).

2. Select the desired *ibaHD-Server* in the table.

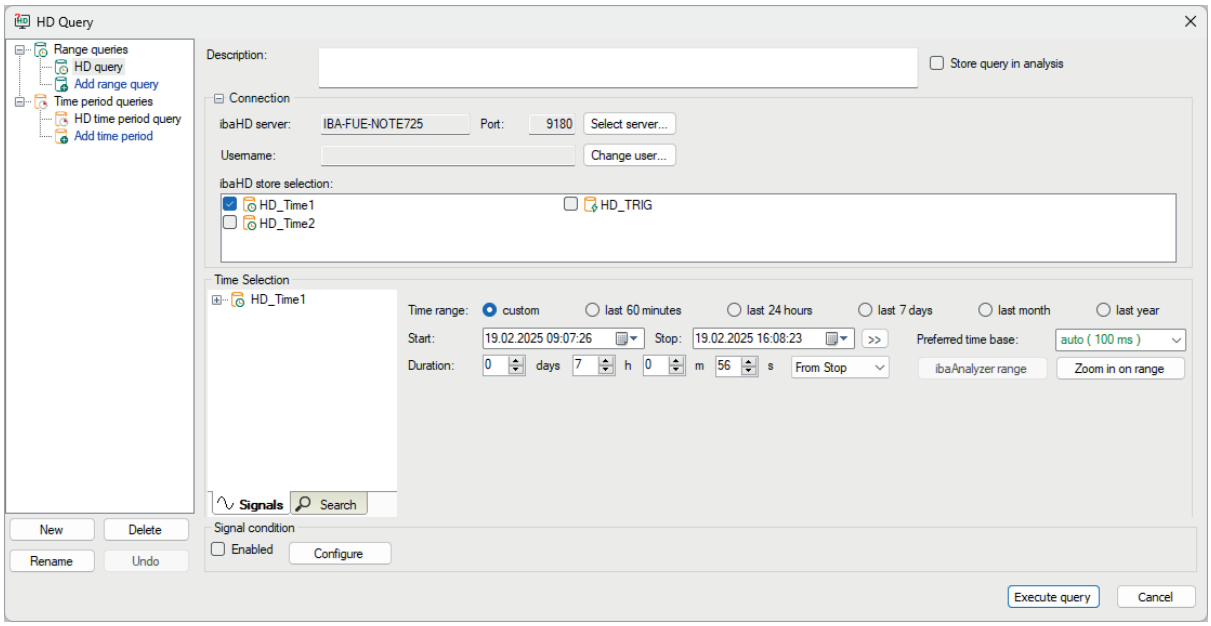
→ The name is displayed at the top of the *Address* field.

Alternatively, you can enter the computer name or IP address manually in the field.

3. Make sure that the port number matches the setting for the selected *ibaHD-Server* service.
4. Confirm the selection with <OK>.
5. If you have selected an *ibaHD-Server* with activated user administration, you still need to enter your username and password.

6. In the *ibaHD store selection* area, select one or more HD stores of the server to be included in the query.

   You can choose between time-based and event-based HD stores.

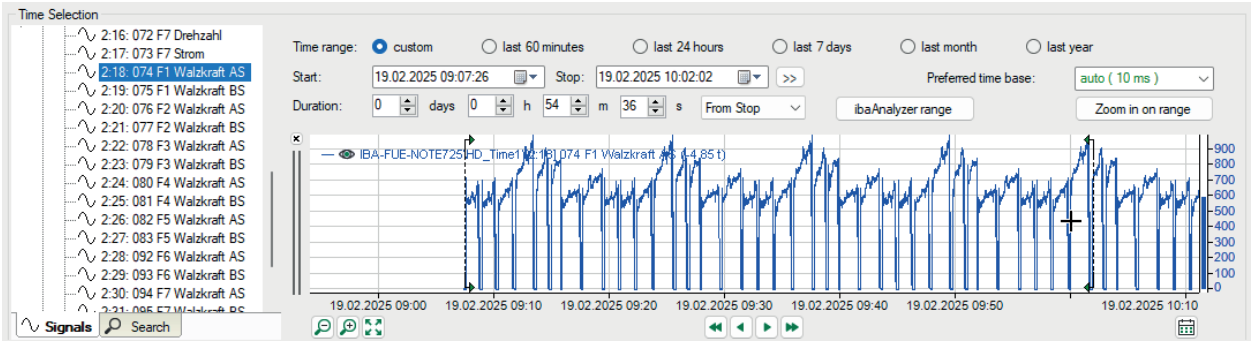


→ A separate data file is displayed in the signal tree for each of the selected stores as a query result.

7. Once you have completed these settings, select the time range, see ↗ *Time selection for the HD query, page 219*.

9.2.2 Time selection for the HD query

In the *Time selection* area of the HD query dialog, set the time range for which you want to execute the query.



Signal tree

In the signal tree, select the signals for which you want to execute the time selection.

For further information on using the signal tree, see ↗ *Time selection – signal tree, page 221*.

Option fields

Option fields make it easier to select the time range.

For all options except *Custom*, the time range is re-evaluated at the time the query is executed.

The toolbar is hidden in the signal view by default. To show the toolbar, click on *Show toolbar* in the context menu of the preview.

Custom

Select this option if you want to select the time range manually with markers in the preview or with the time control elements.

See ↗ *Time selection – preview of the HD trend graph, page 222*.

Last 60 minutes

The queried time range starts one hour before the current time and lasts until the current time.

Last 24 hours

The queried time range starts one day before the current time and lasts until the current time.

Last 7 days

The queried time range starts one week before the current time and lasts until the current time.

Last month

The queried time range starts on the same day and at the same time as one month before the current time and lasts until the current time. The length of the time range corresponds to the number of days in the month before the current month.

Last year

The queried time range starts on the same day and at the same time as one year ago from the current time and lasts until the current time. The length of the time range corresponds to the number of days in the year before the current year.

Start/Stop

Input fields or calendar function for date and time of start and stop time. The fields are only visible if you have selected the *Custom* option.

If you maintain these fields, the markers are positioned accordingly in the HD trend graph.

If you click on the [>>] button to the right of the date field of the stop marker, the stop marker is automatically positioned at the current time and the signal values currently available in the HD store are loaded.

Preferred time base

Selection of the time base with which to load the data.

For information on the time bases offered and how they are formed, see ↗ *Selection of the preferred time base, page 223*.

Duration

Duration of the time range between start and stop time

The values adjust when you move the markers in the HD trend graph or change the values in the *Start* and *Stop* fields, and vice versa fields. You can also enter the duration directly in days, hours, minutes and seconds. In this case, define how the time range is positioned:

- *From Stop*: Stop marker remains in place, start marker is moved.
- *From Start*: Start marker remains in place, stop marker is moved.
- *Centered*: The center of the selected area is stationary, both markers are moved symmetrically to it.

To change a value and set the other values to zero, hold down the <Ctrl> key. For example, you can change the minutes and set the values in the fields for days, hours and seconds to zero.

<ibaAnalyzer range>
Use the button to adopt the time range of the data currently loaded in *ibaAnalyzer* for the query. The button is only active if you have already loaded data before opening the HD query dialog.

<Zoom in on range>
The markers remain in place when zooming in or out or when moving the X-axis. On the other hand, moving the markers or changing the values for the start and stop times does not automatically adjust the zoom factor. The markers can therefore be very close together or outside the window. This button sets the zoom range so that the selected time range is displayed in the middle of the graph. Start and stop markers are positioned at ¼ and ¾ of the visible X-axis section.

HD trend graph

You can also define the time range in the HD trend graph with markers.

For further information on using the HD trend graph, see ↗ *Time selection – preview of the HD trend graph, page 222*.

9.2.2.1 Time selection – signal tree

The signal tree is located on the left-hand side of the *Time selection* dialog. There you will find the HD stores that you selected before under *Connection*. You will find the signals that *ibaHD-Server* has saved there under each HD store.

Commands for the display mode and filtering of signals are available in the context menu of the signal tree.

Display mode

Specify how the signals are displayed in the tree.

Note

The setting you select here for the display mode is applied to the normal signal tree in *ibaAnalyzer* and vice versa.

Filter settings

The selection under *Signal filter* determines which signals are displayed in the signal tree. *Active signals* are signals that are currently also written in the HD store. *Inactive signals* are signals which are recorded but not currently written.

Search

You can search for specific signals in the *Search* tab. The function is similar to the search function in the normal *ibaAnalyzer* search window.

9.2.2.2 Time selection – preview of the HD trend graph

You can display signals from the signal tree in the HD trend graph in the *Time selection* area on the right. Select the desired signals as usual using drag & drop or double-click.

The controls for navigating the HD trend graph are similar to those in *ibaPDA*:

- Zooming the time axis in and out with the mouse wheel
- Move the time axis towards the past or future with the mouse
- Zoom in and out by adjustable factors with plus/minus buttons
- Navigate towards the past or future with configurable step buttons
- Navigate to a specific date using the calendar function

A live mode is not available.

You can also limit the desired section. Once you have found the time or time range you want to query using the navigation tools, you can set the start and end of the time range in various ways.

Set start and stop markers

As soon as a signal is displayed, there are two markers on the signal trend. You can move the markers with the mouse to set the start and end of the period.

The values for the date and time of the set start and stop time are displayed in the corresponding option fields above the graph.

The cursor changes when you move over the markers at the top or bottom end of the signal trend:

	The mouse is on the start marker
	The mouse is on the stop marker.

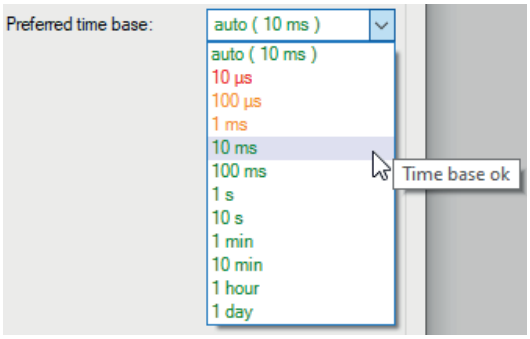
To move the markers at a constant distance, hold down the <Shift> key while moving them.

Enter start and stop time

Instead of using markers, you can also define the start and stop times manually using the corresponding fields and options and thus limit the time range more precisely, see ↗ *Time selection for the HD query, page 219*.

9.2.2.3 Selection of the preferred time base

The time base with which the loaded signal values are to be displayed later is set in the HD query dialog in the *Time Selection* area via the *Preferred time base* drop-down list.



Depending on the requirements for the time resolution of the queried data, select a small time base (high resolution) or a larger time base (lower resolution).

The values offered in the list are standard values and are only approximate. The actual time base with which the data can be loaded is determined by the store in the *ibaHD-Server*. Only the original time base (highest resolution) and the automatically determined time bases of the various aggregation levels are available.

The following cases may occur when selecting the preferred time base:

- The preferred time base is the same as an existing time base in the HD store:

  The data is loaded with this time base.

- The preferred time base is smaller than any time base in the HD store:

  The data is loaded with the smallest available time base.

- The preferred time base is between a smaller and a larger time base in the HD store:

  The decision as to which existing time base is loaded is made by *ibaHD-Server* using the following formula:

  - The larger time base is loaded when

    $$\frac{sample\ period\ of\ coarser\ level}{preferred\ time\ base} < \frac{preferred\ timebase}{sample\ period\ of\ finer\ level}$$

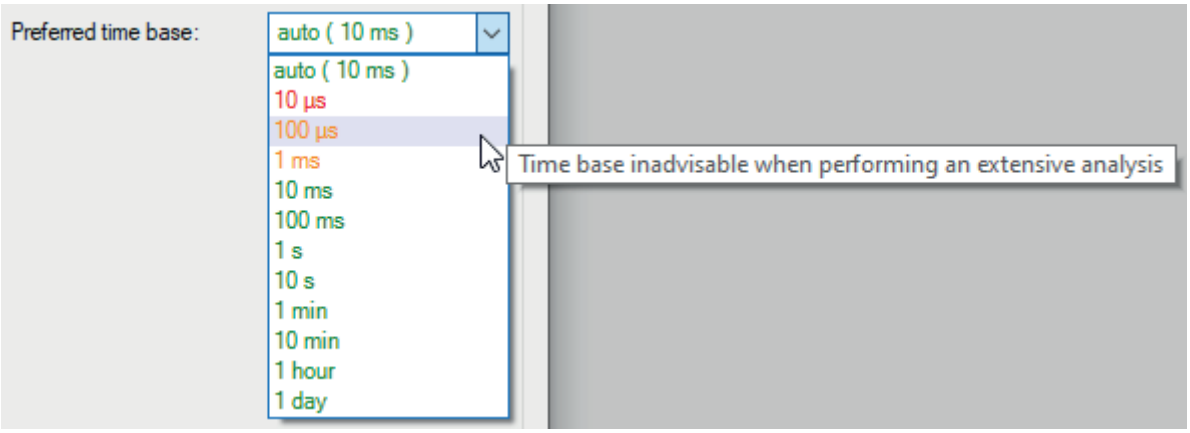
  - Otherwise, the smaller time base is loaded.

Depending on how large the set time range is, the choice of time base has a considerable effect on the amount of data.

In the HD query dialog, you can only select the time range for the query, not for specific signals. During an HD query, *ibaAnalyzer* always loads all signals contained in the HD store in question for the set time range.

If the set time base is very small and the time range is very large, the amount of data to be loaded may exceed the memory capacity. This means that further processing or analysis of the data is only possible to a limited extent or not at all. *ibaHD-Server* therefore calculates the amount of data to be expected depending on the set time range and marks the limits in color for the time base values in the drop-down list. If you select *Auto* as the preferred time base, the optimum time base is selected automatically.

In addition, a tooltip indicates possible difficulties if you select the relevant time base anyway.

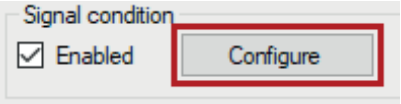


Color	Meaning
Red	The set time range and this time base require more memory than *ibaAnalyzer* can provide. If you select this time base without reducing the time range and execute the query, an error message appears. The query cannot be executed. Set a different time range or a different time base in the HD query dialog.
Orange	With the set time range and this time base, *ibaAnalyzer* can provide sufficient memory. However, only limited analysis functions are possible or only a few signals can be displayed. If you select this time base without reducing the time range and execute the query, a message appears. You can execute or cancel the query and select a different time range.
Green	With the set time range and this time base, extensive analyses are also possible without any problems. If you close the HD query dialog with <Execute query>, the query is executed.

9.2.3 Formulating signal conditions

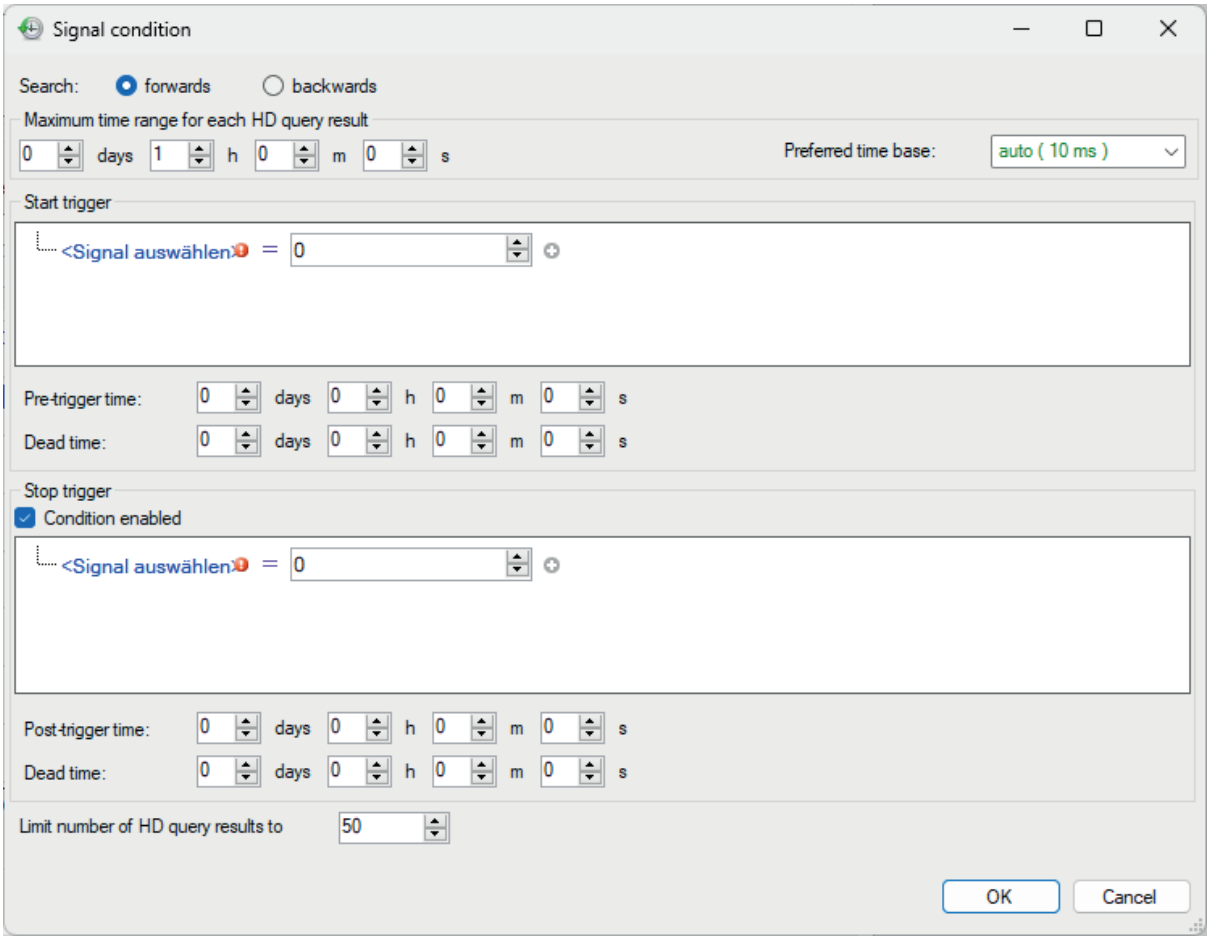
You can use signal conditions to configure conditional queries and limit the query to certain events or signal states within the set time range.

1. Activate the *Enabled* option.



2. To configure the signal conditions, click on the <Configure> button.

→ The *Signal condition* dialog opens.



Search
Select whether you want to search for conditions forwards or backwards in time. If *forwards* is selected, *ibaAnalyzer* starts searching for events of the specified condition, starting from the start time to the end time. If *backwards* is selected, *ibaAnalyzer* starts searching from the end time to the start time (i.e. backwards in time).

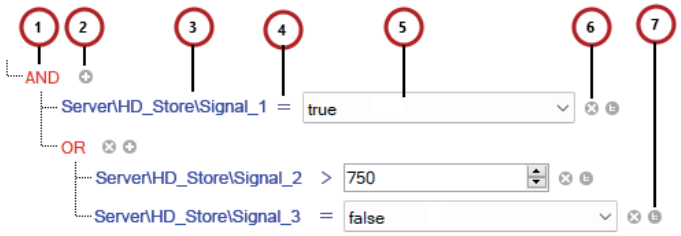
Maximum time range for each HD query result
The query with reference to a specific signal condition can return several results because a measurement file is generated for each time the condition is met. You can set the maximum length of these query results here.

If you use a stop trigger and it fails, this setting limits the length of the query result.

Start trigger
Use the *Start trigger* to configure the condition that defines the event or signal status to be searched for. The time at which the event occurs is the start of the query result or the measurement file. You determine the end of the query result either by a *Stop trigger* or the setting for the maximum time range.

Various editor functions are available in the *Start trigger* field for defining the signal condition.

The start trigger triggers when the overall result of the condition is fulfilled.



1	Logical link	By default AND Click on the link to switch between AND and OR.
2	Add expression	
3	Blue font	Signal tree for signal selection
4	Operator	Comparison operators for selection
5	Comparison value	Digital signals: True/False Analog signals: Value input
6	Remove expression	Complete expression or group is removed.
7	Add expression group	Indented, with a separate logical link, you can add further expressions that are initially linked within the group. The group result then leads to the result with the superordinate link.

Pre-trigger time
Specify how much time should be included in the query before the start trigger.

Dead time
Specify how long the time range is after a start trigger before a new start trigger is detected.

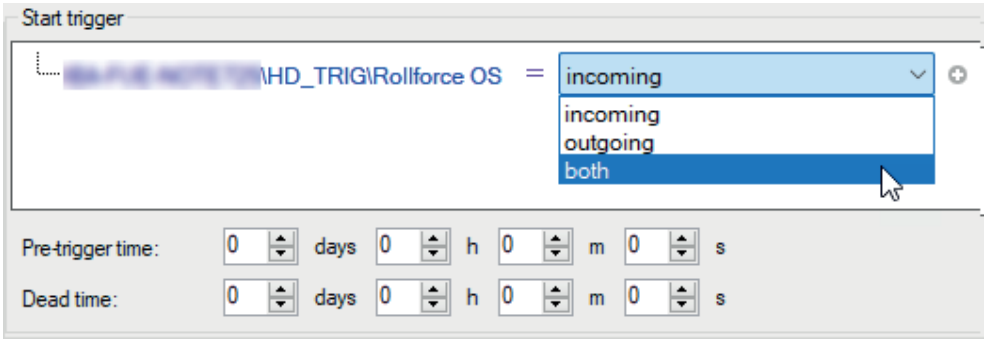
Stop trigger
Optionally define the end of a query range. The settings for the formulating the condition, the post-trigger and the dead time correspond to the start trigger.

Limit number of HD query results to …
Here you can limit the number of query results for a file group.

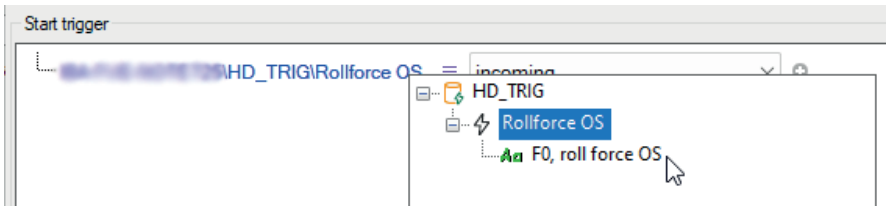
9.2.3.1 Formulating conditions for events

Queries based on a condition can also contain events. The following options are available:

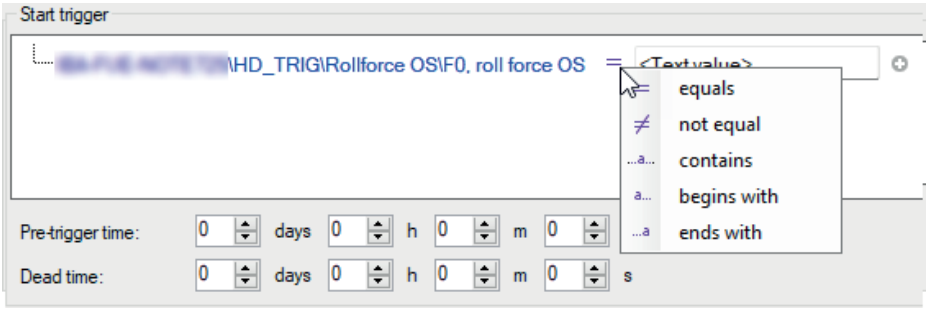
- Specify the event and also whether the condition is fulfilled when the trigger is received, goes out or both.



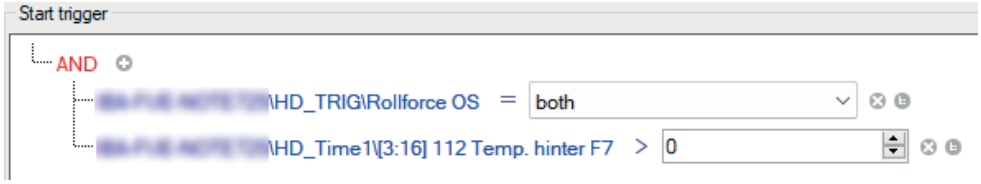
- Use a numeric field of the event and check it for a limit value. This is comparable to applying a condition to an analog signal.



- Check whether the text fields of an event are identical or partially identical to a specific text.



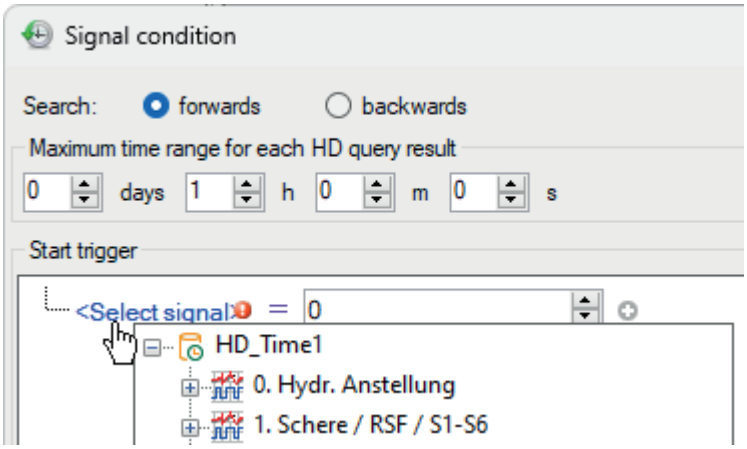
- Link the conditions for events with other event conditions or with conditions for normal HD signals using the Boolean operators AND or OR.



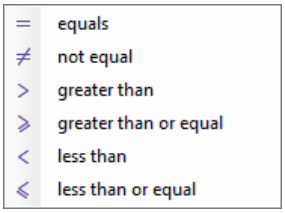
9.2.3.2 Example: Formulating signal condition

The following example shows the procedure for creating a condition.

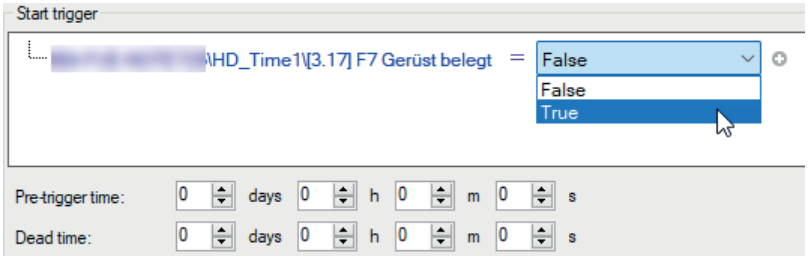
1. Click on the blue text *Select signal* and select the desired signal in the signal tree, e.g. a digital signal.



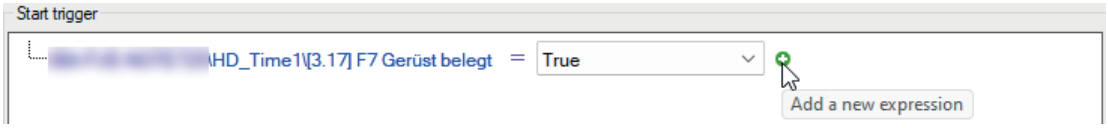
2. Click on the operator symbol and select the operation, e.g. equal or unequal for a digital signal.



3. Select a comparison value, e.g. "True" for a digital signal.

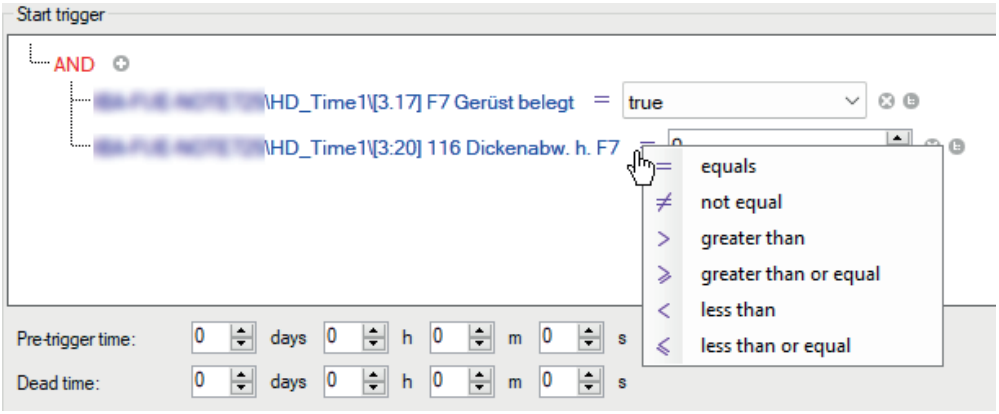


4. If you want to add another condition, click on the icon.



→ A new expression is created and logically linked to the previous expression with AND.

5. Formulate the second expression, e.g. with an analog signal that you compare with a limit value.

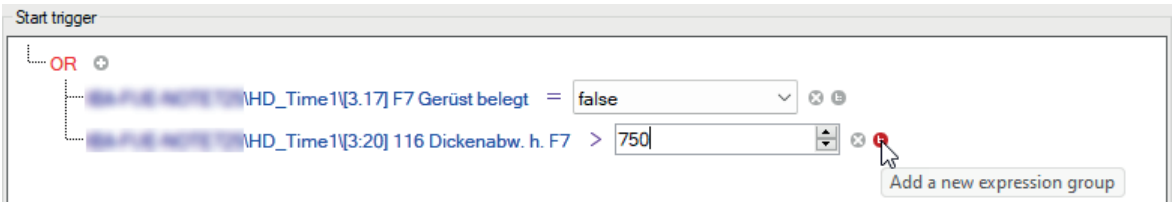


6. Enter the desired limit value above which the trigger should be activated by the selected analog signal.

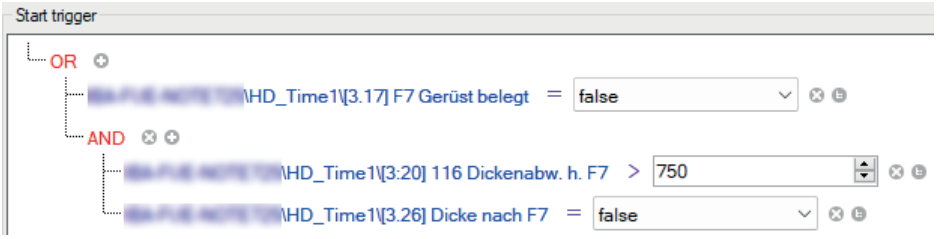
   Here in the example 750 µm.

7. With the AND link, both expressions must be "True" for the trigger to fire. If you want the trigger to fire when only one condition is met, click on the red AND to switch to the OR link.

8. You can also cascade conditions by combining expressions into groups. To create a group, click on the icon for the expression that is to be the first member of the group.



9. The expressions in the group are combined with their own logical link (AND by default).



   To add further expressions to the group, use the icon at group level.

9.2.4 Time period queries

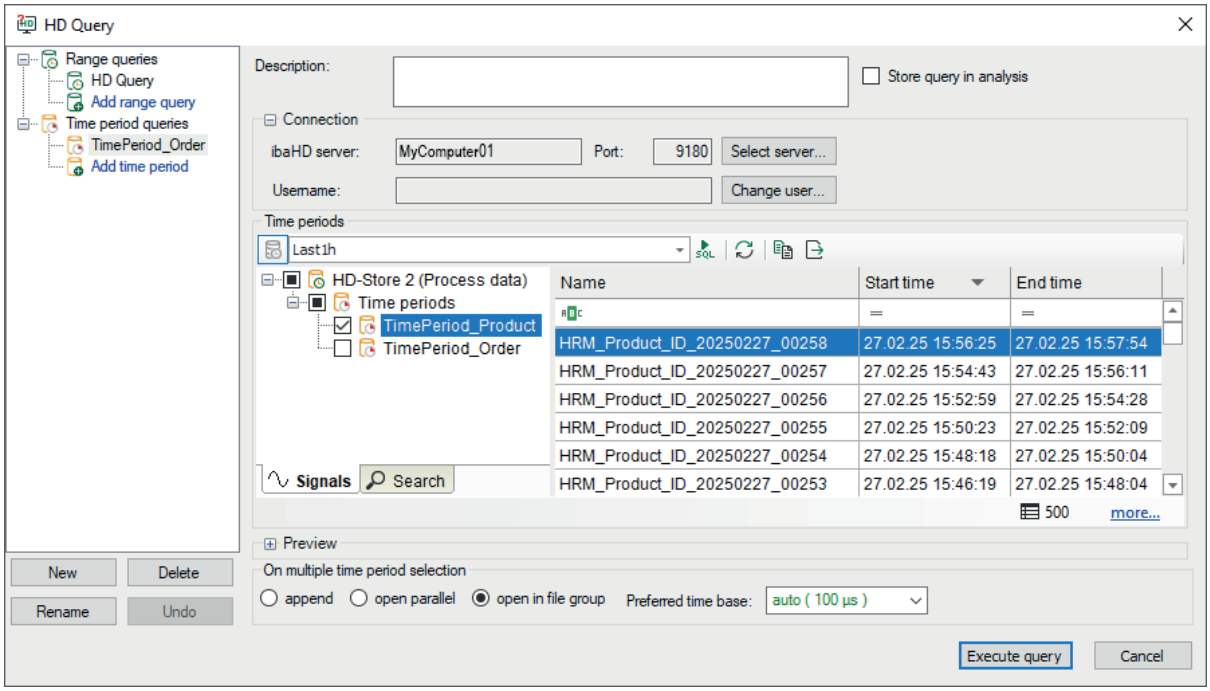
To query time periods, *ibaAnalyzer* must be connected to a time-based HD store in which time period stores are configured. As with an range query, the result of the query is displayed in the signal tree of *ibaAnalyzer*. You can treat the query result like a data file.

Create time period queries

On the left-hand side of the dialog you will find the time period queries under the range queries.

1. Click on *Add time period* in the left-hand tree or select an existing query.
2. In the *Time periods* section of the store tree, select the time period stores that you want to display.

→ The table shows the time periods of the store. The functions of the table are similar to the time period table in *ibaPDA*, see ↗ *HD time period table*, page 192.



3. Select the relevant time periods from the table.

   If required, you can also filter the time periods in the table using the columns or with conditions, see ↗ *Configuration of time period queries Configuration of time period queries*, page 201.

4. If you have selected multiple time periods, use *On multiple time period selection* to determine how *ibaAnalyzer* should handle the query result of the time periods.

   For further information see ↗ *Query results of the time periods, page 239*.

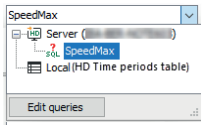
5. Click on <Execute query>.

→ The query result is displayed in the *ibaAnalyzer* signal tree.

9.2.4.1 Operation of the time period table

The time period table shows the time periods from the selected time period file.

The toolbar for the time periods table contains the following controls:

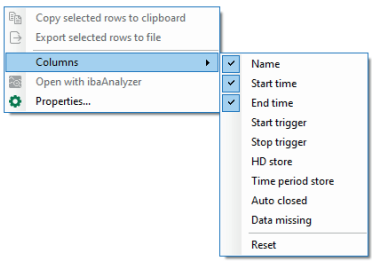
	Switches back to the display of the latest available time periods after a condition query.
	Drop-down list for selecting the time period query. If you expand the list field, you can see all existing time period queries and select the one you want. The <Edit queries> button opens the configuration dialog for conditional queries within the table. You can then edit existing queries or create new ones.
	Executes the condition query selected in the drop-down list. If the query takes longer, a progress bar is displayed in the footer of the table. A link will also appear that you can use to cancel the query if it takes too long.
	Updates the display according to the query executed.
	Copies the time periods marked in the table to the clipboard.
	Exports the time periods marked in the table to an Excel or text file.

Status bar

The status bar is at the lower edge of the table. It provides information about SQL queries carried out (e.g. status of the running query, number of results, error messages) and whether a filter is currently active.

Show/hide columns

You can show and hide columns in the table's context menu. The upper columns are the standard columns. The lower columns refer to the info fields. You can configure the info field columns in the properties of the time period table.



Filter line

A filter line is located directly below the column headings. This allows you to filter using text input or other options. Press <Enter> after the entry and the table will be sorted. To return to the unfiltered view, delete the entries from the filter line. The filter options are determined by the data type of the info fields.

A detailed description of the filter functions can be found in the documentation for *ibaPDA*.

Open time periods ibaAnalyzer
You can use the context menu to open the selected time period in a new *ibaAnalyzer* window. If you have selected an *ibaHD-Server* with activated user administration, you still need to enter your user name and password.

Sorting and filtering

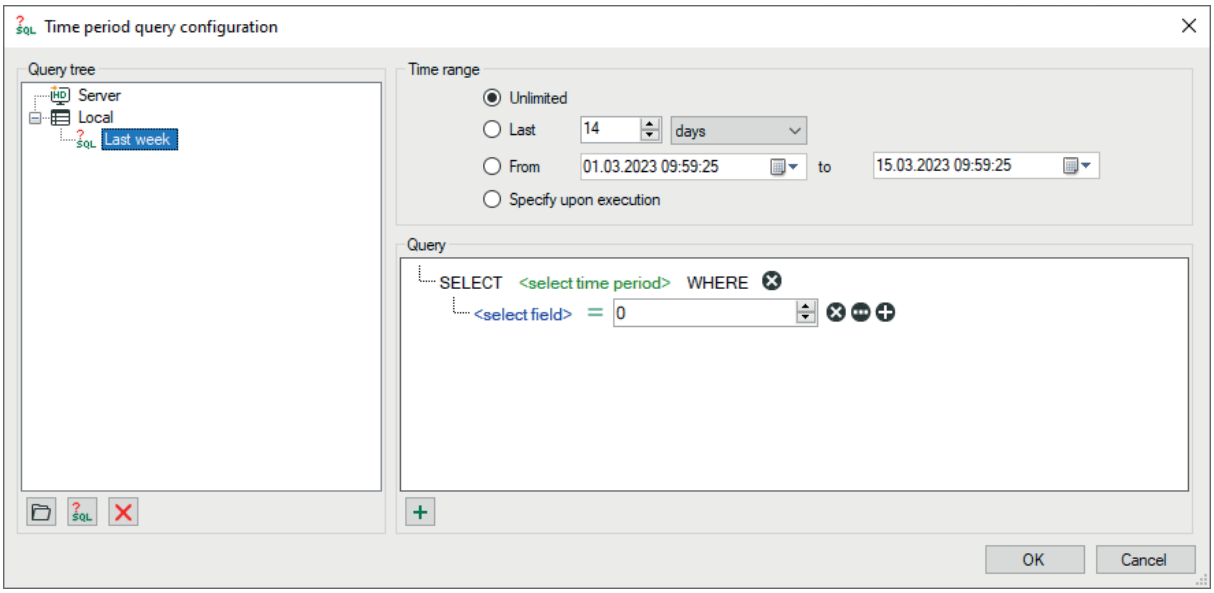
Sorting
You can sort the table by each column in ascending or descending order. Click on the header of the column which you want to use as sorting criterion. The arrow shown (down or up) indicates the sort order (descending or ascending). By default, the table is sorted by the *Start time* column so that the most recent time period is at the top.

Filter line
A filter line is located directly below the column headings. This allows you to filter using text input or other options. Press <Enter> after the entry and the table will be sorted. To return to the unfiltered view, delete the entries from the filter line. The filter options are determined by the data type of the info fields.

9.2.4.2 Configuration of time period queries

In the HD time periods table toolbar, you can filter the rows displayed by particular criteria. Enter a value or configure a query by clicking on the icon. If you remove a value, the filter is deleted.

To configure time period queries, open the query drop-down menu and click on the <Edit queries> button.



Note

The event queries are stored on the *ibaHD server*. This means that the queries are available to all ibaHD clients (*ibaPDA*, *ibaAnalyzer*) if they are connected to the *ibaHD-Server*.

Configuring queries

All existing queries are shown in the query tree. You can arrange queries by using a directory structure.

	Adds a new folder at the selected position
	Adds a new query at the selected position
	Deletes the selected node and any secondary nodes

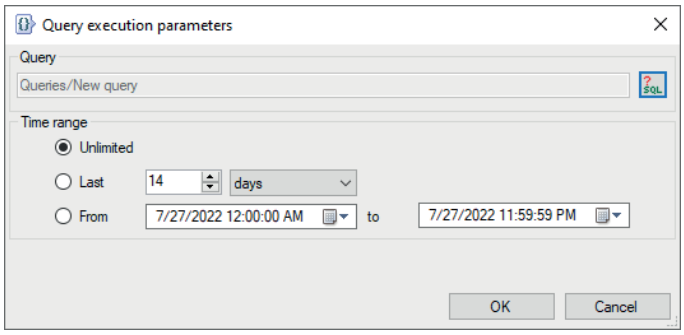
There are two types of queries:

- *Server queries* are saved on the *ibaHD-Server*, which means that all connected clients can use the same server queries.
  Note: Only users who have the right *Edit ibaHD queries* can save or edit server queries.
- *Local queries* are saved in the layout. Other connected clients cannot see these.

Query range

Every query is executed over a defined time range. There are several options for restricting the query range.

- Unrestricted: The query covers the entire HD recording
- Specify upon execution: After clicking on the start button for the query, a dialog appears in which you have to specify the query range

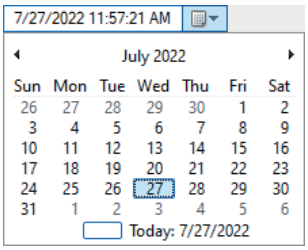


  Clicking on <OK> executes the query.

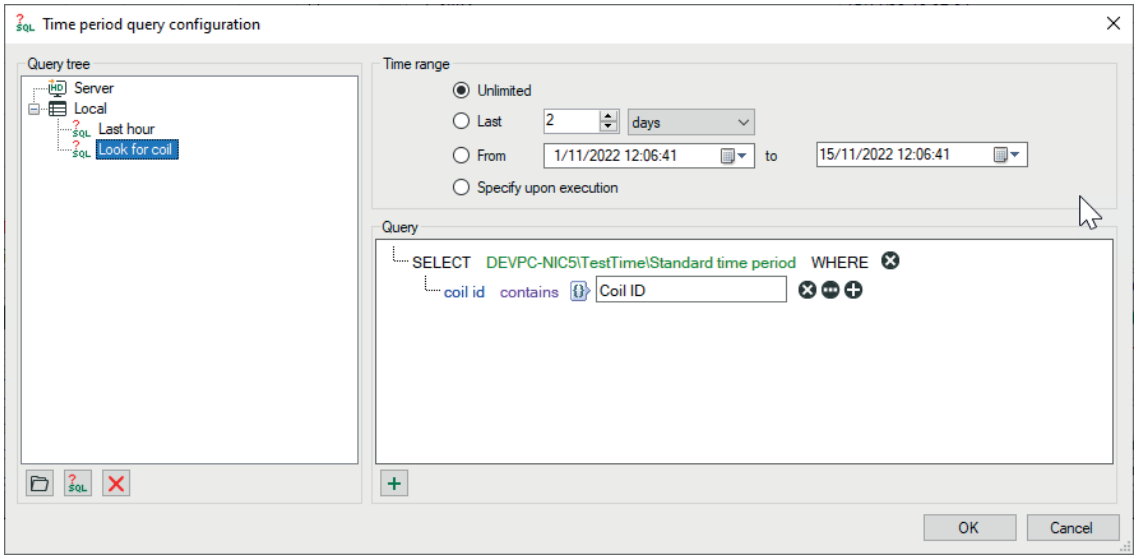
- The last xx minutes/hours/days/weeks/months: The query only covers a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- From *Date* to *Date*: The query covers the time range between the set days (inclusive).

Tip

To set the current date, open the Date & Time Picker by clicking on the down arrow. Here, you can select the entry under *Today…*.



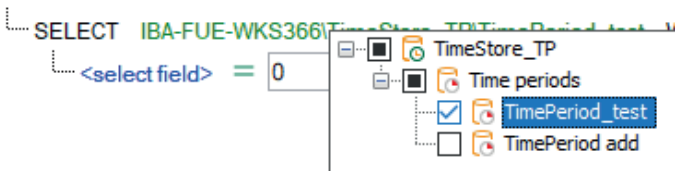
Query details



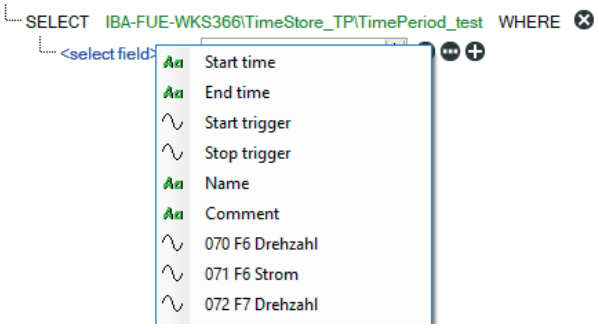
Here, you create the actual query using notation similar to SQL.

The query begins with a SELECT statement.

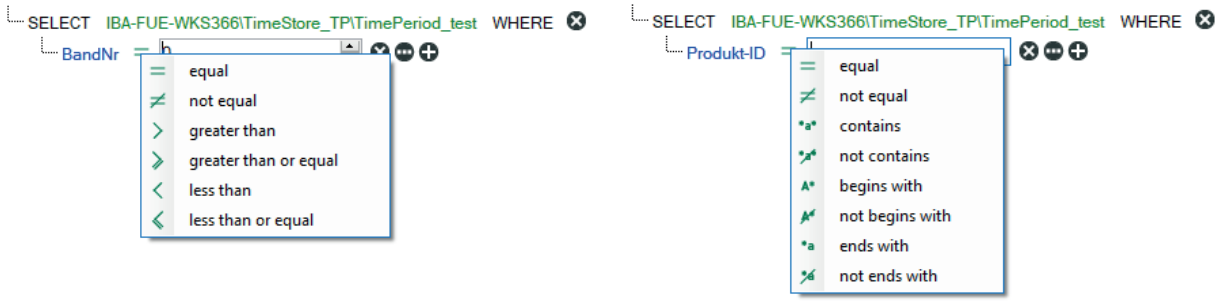
Clicking on the green text opens the tree structure for the configured time periods. Select the time period you want to search for.



Click on the blue text to select a column in the table or any existing information fields.



Depending on the selected field (numeric or text field), clicking on the green equals symbol displays a list of operators. Select the required operator.



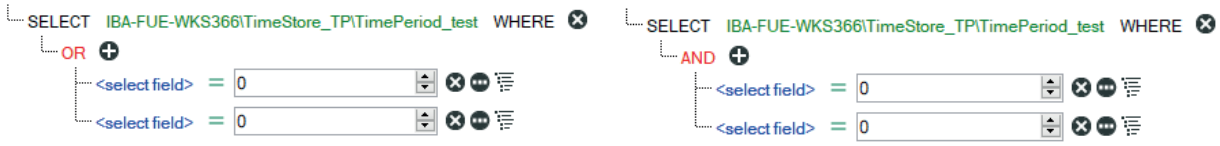
Behind the elements in the query, there are different buttons which you can use to extend or modify the query:

Deletes the expression

Switches the right side of an expression between a fixed value and a field

Adds a new expression to the instruction

You can change the logical operator that is linked with a group of expressions by clicking on the operator.

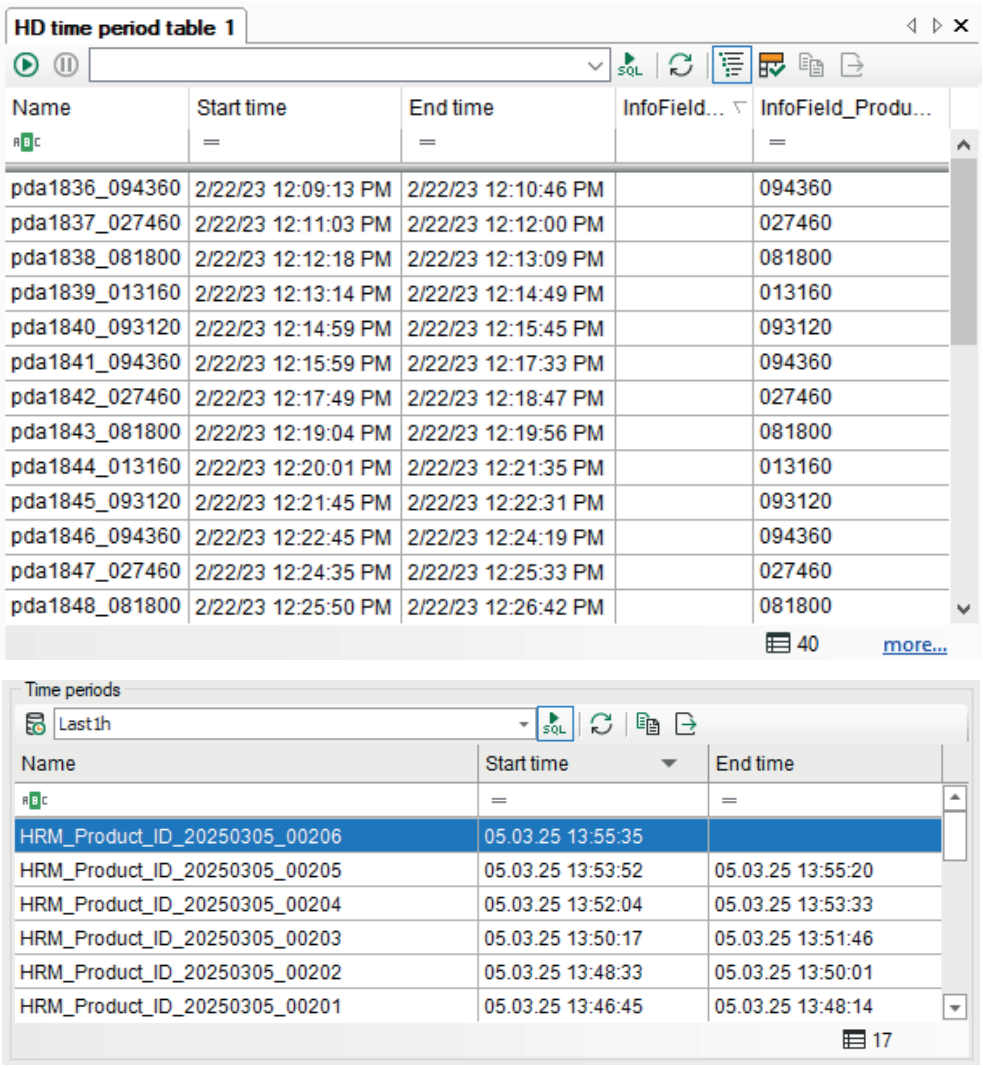


Clicking on <OK> closes the editor and saves the created queries.

Executing the query

First select the relevant query from the list in the toolbar and then click on the button to the right.

When the query has been completed, the number of results found is displayed in the status bar on the right.



A query can return more results than the number of rows configured in the table. To display any other results, click on the blue "more..." link.

You can return to live mode by clicking on the button.

9.3 HD query results

The *ibaAnalyzer* signal tree displays the result of an HD query for a period of time like a data file.

The signals in the query result are treated in the same way as the signals from a normal data file.

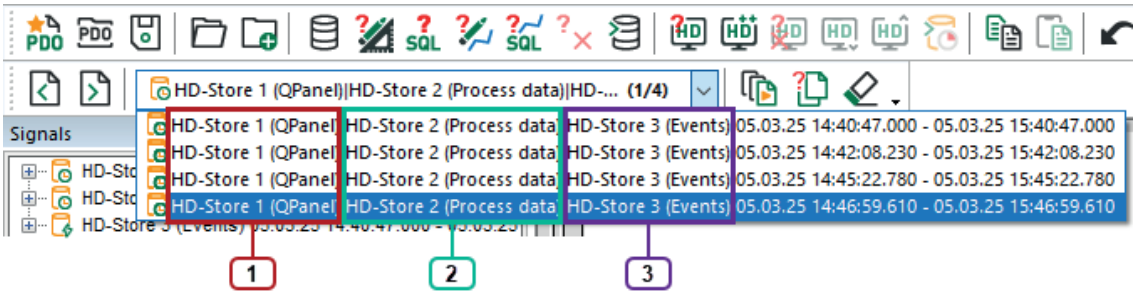
You can also apply analyses that were created using a data file to HD query results and vice versa. You also have the option of exporting query results as a DAT file.

Other documentation

Further information can be found in the *ibaAnalyzer* documentation part 2, chapter *Opening data files*.

Depending on the options selected under *HD Server* in the graph setup or preferences, you can query the maxima and minima of the aggregated values of a signal as subchannels, see ↗ *Subchannels min/max, page 243*. This can be particularly interesting when selecting a large timebase or data from a higher aggregation level. So-called outliers are then easier to recognize.

Results of a query with a signal condition are displayed as a file group, as there are usually several results. By default, one line is displayed for each search result in the drop-down list, even if several HD stores are involved.



1	Time-based store 1
2	Time-based store 2
3	Event-based HD store

If you want the results being listed separated by HD stores in the file group field, you have to enable the option *Show query results over different stores as separate entries* in the preferences, *HD Server* tab.

9.4 HD query results of an event-based HD store

In *ibaAnalyzer*, events are available as text signals. If numerical fields are defined for the event, these events are available as analog, non-equidistant subchannels of the event text signal. All text fields of the events are also available as subchannels of the event text signal.

Three additional signals are available for each event:

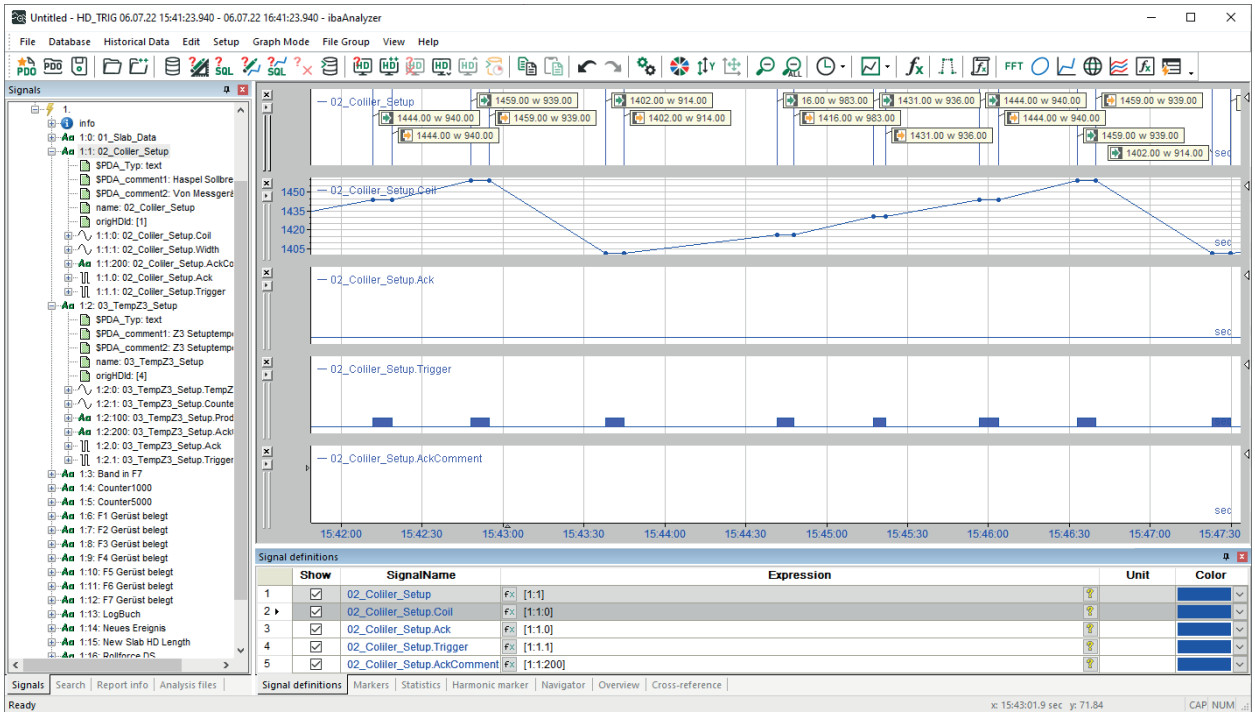
- **.Ack*: Non-equidistant digital signal

  The signal is true for every confirmed event and false for every unconfirmed event.

- **.Trigger*: Non-equidistant digital signal

  For an event that can be both incoming and outgoing, this signal is true if the event is incoming and false if the event is outgoing. This signal is always true for a signal that is never outgoing.

- **:AckComment*: A text signal containing the confirmation comments.



The events are marked by icons as incoming or outgoing events in the graph.

Similarly to *ibaPDA*, you can also use the event table for HD data in *ibaAnalyzer*.

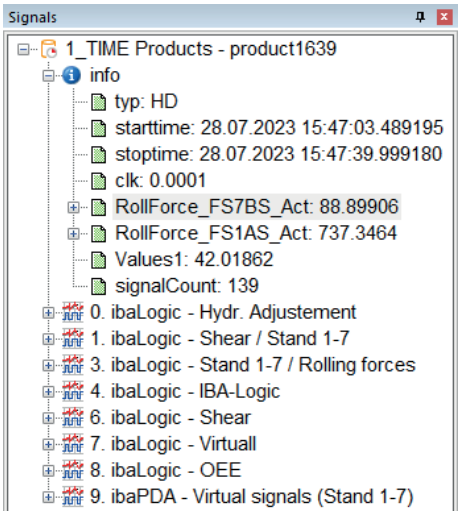
Display options in the signal tree

If you select the display option *Show groups per file* or *Show groups across all* files in the context menu of the signal tree, the displayed groups correspond to the folders in which the events are organized on the *ibaHD-Server*.

9.5 Query results of the time periods

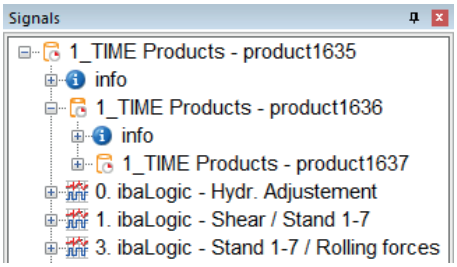
ibaAnalyzer displays the result of a time period query like a data file in the signal tree. The options you have for HD query results also apply to time periods, see ↗ *HD query results, page 236*.

The signals and info fields come from the HD store.



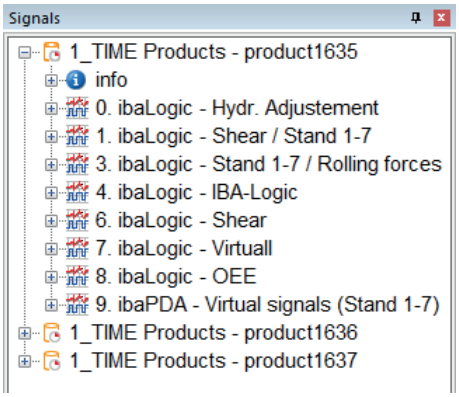
If you have queried several time periods, *ibaAnalyzer* can handle the query result of the time periods in different ways. You determine this in the query under *On multiple time period selection*.

- *Appended*: The time periods are displayed one after the other as if the data files were appended to each other.

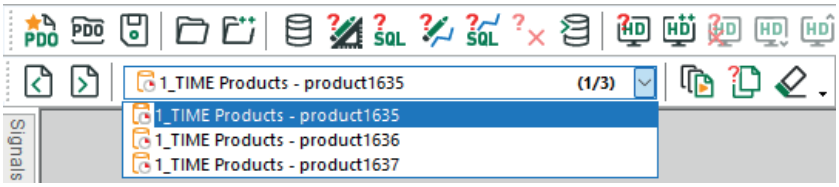
  

  You can also display the info fields as a graph by double-clicking on them. For further information, see *ibaAnalyzer* manual part 3, *InfoField*, *InfoFieldText* and *InfoFieldTime* functions.

- *Parallel*: The time periods are opened side by side.

- *File group*: The time periods are available in the file group field and are treated like a data file group. You can also perform a file group query.



Other documentation

Further information on the behavior of data files can be found in the *ibaAnalyzer* manual part 2, *The data file*.

9.6 Drill-down function

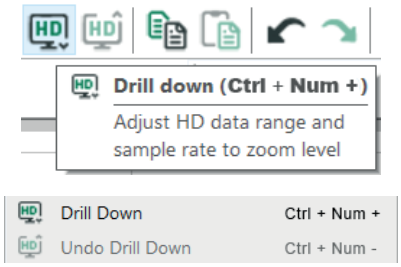
If you use the zoom function in *ibaAnalyzer*, the data is not reloaded, unlike with the HD trend graph in *ibaPDA*. The number of samples and therefore the resolution of the signal curve remains unchanged.

If you have executed an HD query with a timebase of 1 min, for example, because the time range was correspondingly large, then the distance of 1 min is also kept when zooming in. Zooming in therefore does not create any new information.

For a better data resolution, you can therefore perform a so-called drill-down in the zoomed-in display.

During a drill-down, the time range and timebase are recalculated according to the set zoom level and the data is requested from the HD server accordingly.

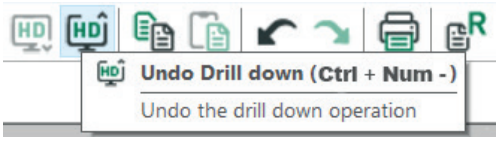
To perform a drill-down, click on the corresponding icon in the menu bar or the command in the *View* menu:



The command is only available in the menu bar and menu bar if you have previously zoomed in. If you want to perform another drill-down, you must zoom in further.

Undo drill-down

You can undo the drill-down operations step by step. The icon in the menu bar and the *Undo drill-down* command are only available if you have performed at least one drill-down.



You can only apply drill-down operations to HD queries whose signals are displayed in the currently selected graph or are used in an expression that is displayed in the currently selected graph.

Accordingly, you can only undo a drill-down for HD queries to which the displayed signals or expressions are related.

Behavior in the signal tree

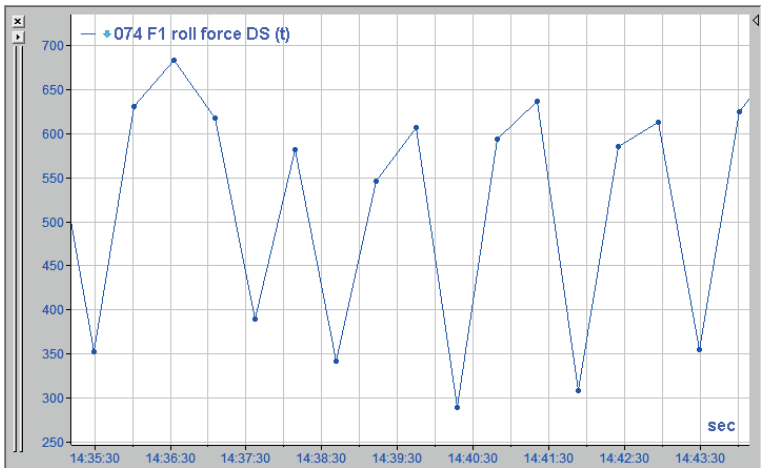
If you perform a drill-down, a modified HD query is executed and the original HD query in the signal tree is overwritten. The HD query generated by a drill-down has the following properties:

- Same HD server and same HD store
- Time range corresponding to the zoomed X-axis range
- A preferred timebase, calculated according to the following formula:

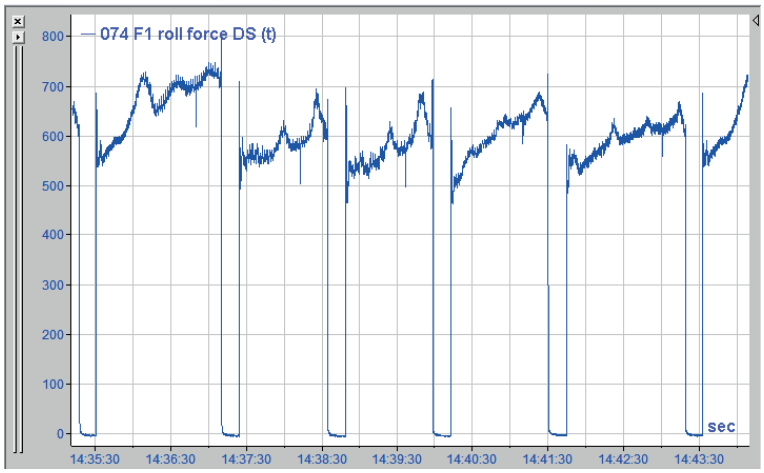
$$new\ preferred\ time\ base = \frac{zoomed\ time\ range\ length}{old\ queried\ time\ range\ length} \times old\ preferred\ time\ base$$

Example

An HD query over a time range of 2 days and 8 hours with a timebase of 30 s provides the following image after zooming in to a time range of only 8 min:



Only the execution of a drill-down provides sufficient information for a meaningful curve. The zoom factor remains unchanged.



9.7 Subchannels min/max

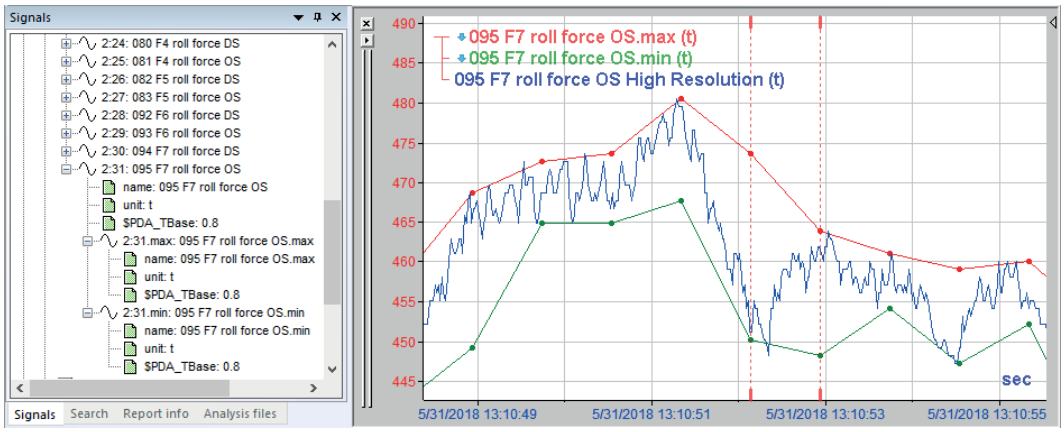
For each HD query, the *min* and *max* subchannels are automatically loaded for each analog signal if the following options are activated in the *ibaAnalyzer* default settings under *HD Server*:

- *Also query aggregated minimum channel*
- *Also query aggregated maximum channel*

Other documentation

Further information on the settings for HD servers can be found in the *ibaAnalyzer* documentation, part 2 in the *HD Server* chapter.

In the following image, you can see the measured value and the subsignals for *max* and *min* in the signal tree. The graph shows the corresponding curves in red and green. The blue curve shows the high resolution data for comparison.

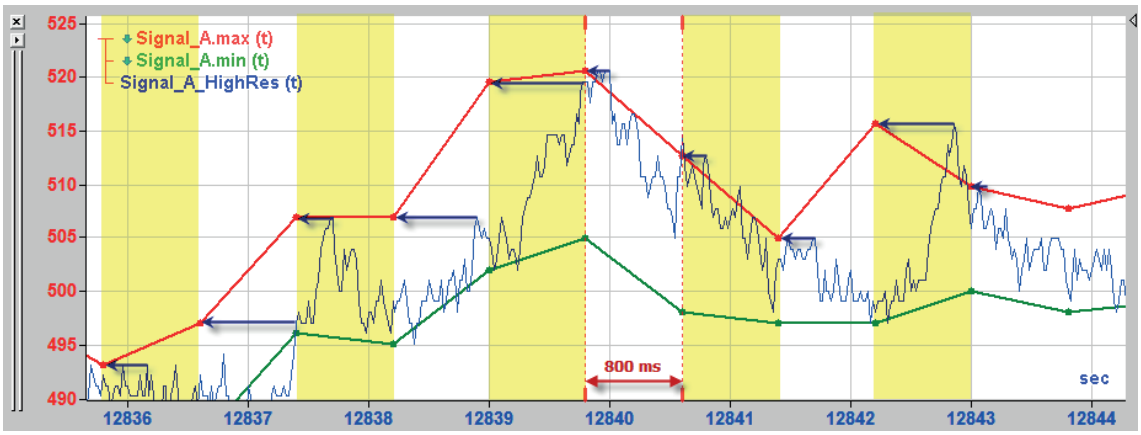


The calculation of the maximum and minimum values always relates to the determined time basis of the query.

This provides you with information about the maximum and minimum values that occurred in the time base intervals for the aggregation. Measured value outliers are therefore not lost.

Determination of minimum and maximum values

The following figure illustrates how the maximum values are determined, for example.



In this example, the preferred time base for the HD query is 800 ms. The aggregated values for the measured value (not shown here) as well as the maxima and minima are entered in this time grid.

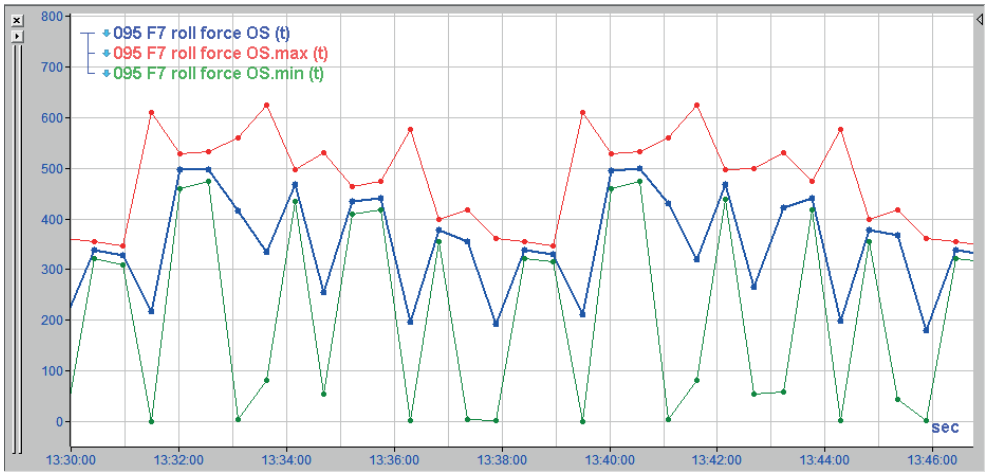
The blue curve in the background shows the measured values in the highest resolution as they would look after a drill-down. The maximum value of the blue curve from each 800 ms interval is drawn on the red curve.

Minimum and maximum in drill-down

If you perform a drill-down in a display with maximum and minimum signals, the curves get closer to each other until they are congruent at the smallest time base offered by HD recording.

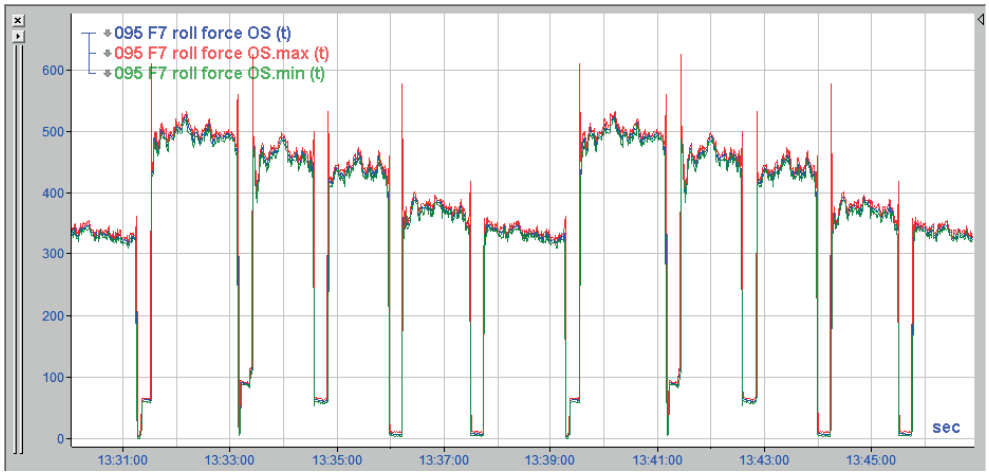
Example 1

Curves after zooming into an HD query with a timebase of about 30 s:

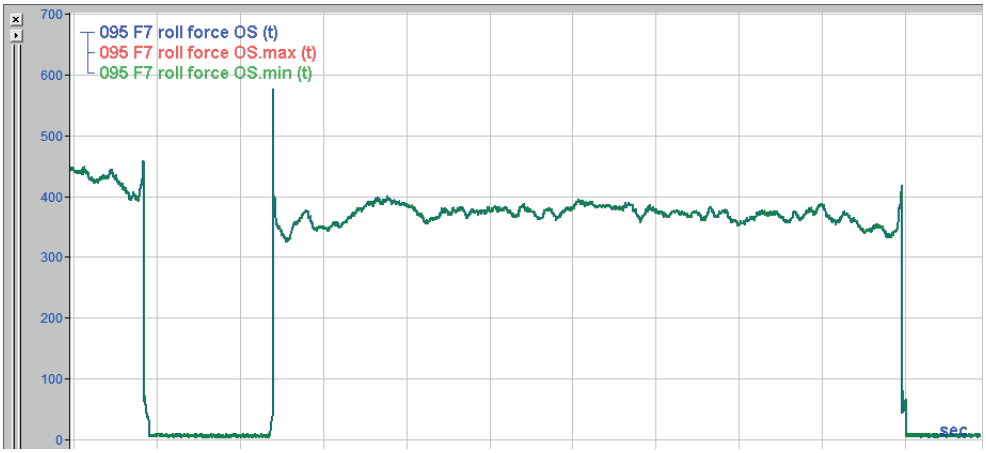


Example 2

Curves for the same time range after an initial drill-down.



Example 3
Curves after zooming in and drilling down again (highest resolution); In this example, only the green curve is visible because it is in the foreground and covers the others:

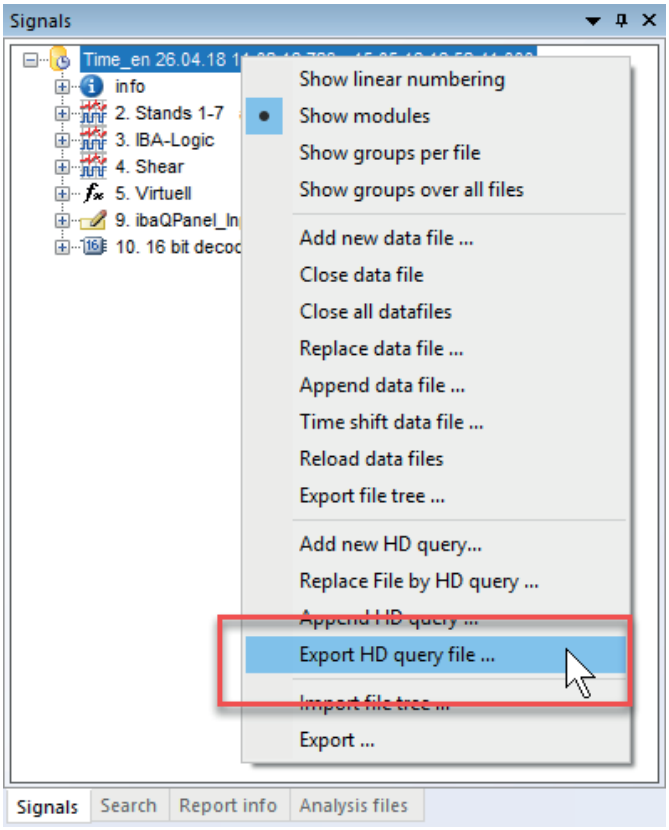


9.8 Export and import of HD queries and time periods

You can export and import the result of an HD query or time period query in file form. The procedure is identical for both types of queries.

Exporting an HD query or time period query

1. Once you have executed a query, click on *Export HD query file* in the context menu of the signal tree.



→ The *Save datafile* dialog opens.

2. Select the destination path.
3. Enter a file name.
4. Save the file with <OK>.

   The file is given the extension .hdq. You can open it like a data file.

Other documentation

Further information can be found in the *ibaAnalyzer* documentation part 2, chapter *Opening data files*.

Opening an HDQ file

Because the file only contains the query parameters and no measured values, a connection to the corresponding HD server needs to exist in order to open the HDQ file.

You can edit the exported query (HDQ file) with a text editor.

Example of an exported HD query:

Content	Description
`[HDQ file]`	Identification HD query
`port number=9180`	Port number
`server=HD-Computer`	HD server name
`starttime=31.10.2013 10:15:50.336000`	Start of the time period that is to be read out
`stoptime=31.10.2013 10:19:25.758000`	End of the time period that is to be read out
`store=HD store_Time`	HD store where the data is stored
`timebase=0.001`	Time base of the measured data
`type=time`	Time-based or length-based data

Instead of `starttime` or `stoptime`, you can also specify a `duration` in seconds. You can also specify the value "now" as the `stoptime`.

In this way, you can formulate queries for a consistent time range, e.g. for the last 7 days, always from the time range when the query is executed or the HDQ file is opened. Example of HD query for the last 7 days from "now":

HD-Abfrage letzte KW.hdq

```
1 [HDQ file]
2 portnumber=9180
3 server= HD-Computer
4 duration=604800
5 stoptime=now
6 store=HD-Ablage 1
7 timebase=60
8 type=time
```

Example of an exported time period query:

Content	Description
`[HDQ file]`	Identification time period query
`port number=9180`	Port number
`server=HD-Computer`	HD server name
`store=HD-Store 2 (Process data)`	HD store
`timebase=0.01`	Set timebase
`timePeriodId=116268`	Identification of the time period
`timePeriodName=HRM_Product_ID_20250303_00231`	Time period name
`timePeriodStoreName=TimePeriod_Product`	Name of the time period store
`type=time`	Time-based data

Exporting HD query to a standard data

If an HD query is loaded in *ibaAnalyzer*, you can use the usual export function (*File* menu – *Export…*) to generate a normal iba data with the extension .dat. This allows you to make an HD query available to users who do not have a connection to the HD server.

Other documentation

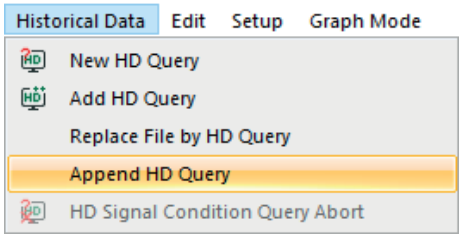
Further information can be found in the *ibaAnalyzer* documentation part 2, chapter *Exporting data*.

9.9 Appending an HD Query

Just like normal DAT files, you can also append HD queries or time period queries to HD queries, time period queries or DAT files that are already open in order to display longer periods of time.

It only makes sense to append to a DAT file if the signal structure of the DAT file and the HD record is the same.

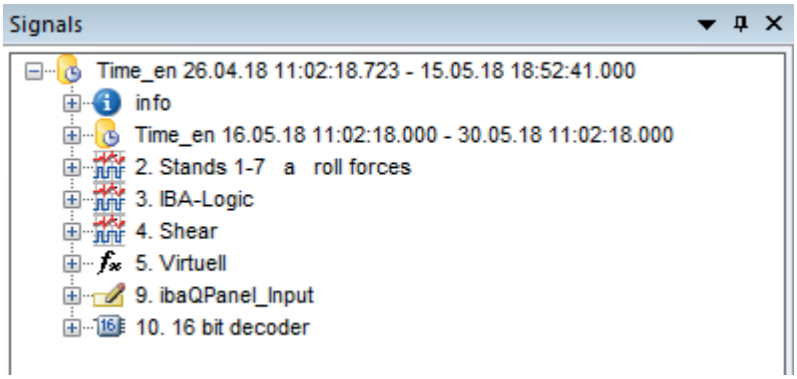
1. To append a query, select *Append HD Query* in the *Historical Data* menu or in the context menu of the signal tree.



→ The configuration dialog for the HD query opens.

2. Optionally, set a different query period and execute the query.

→ The new query result is nested in the signal tree.

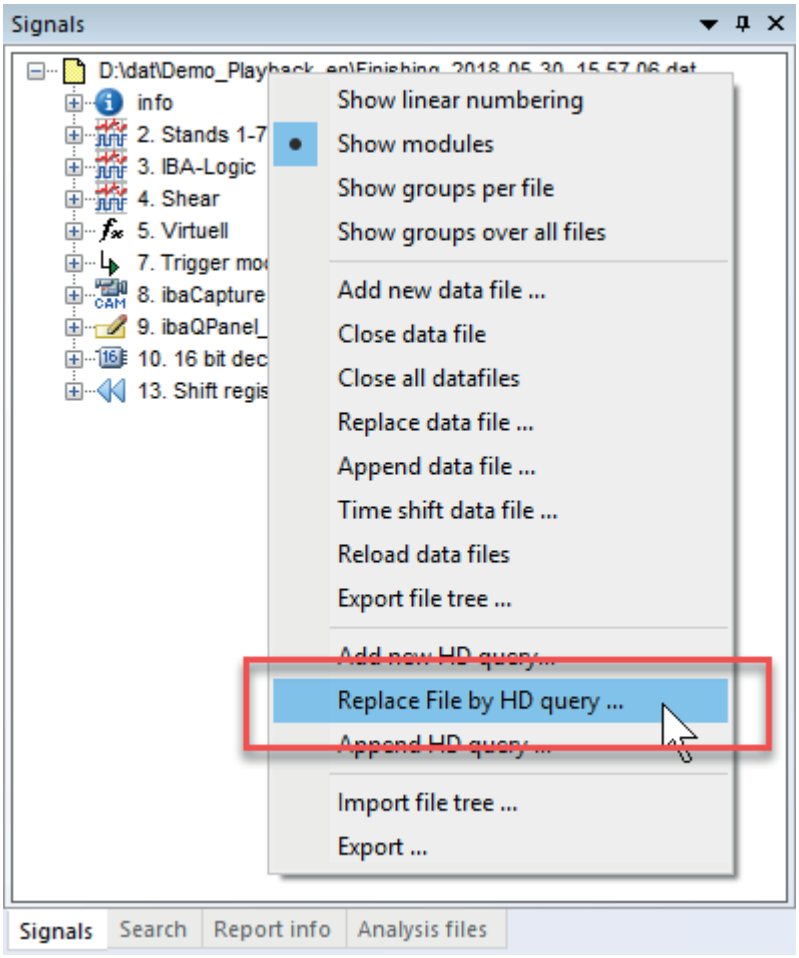


Note

To ensure a timely appearance in the graphs, make sure that the option *Synchronize files on recording time* is enabled in the X-axis settings.

9.10 Replacing a file by HD query

The *Replace File by HD query* command can be found both in the *Historical Data* menu and in the context menu of the signal tree.



When you execute this command, the configuration dialog for the HD query opens, where you can set a new time range and a new condition. After executing the query, the existing data file or HD query is overwritten by the new HD query result.

If there are several data files or HD queries in the signal tree (next to each other or appended), the replace command affects the selected file or query.

9.11 Automation of HD analyses

For regularly recurring analyses of HD data, e.g. to create day or shift reports, an automation of the HD query using *ibaDatCoordinator* is suitable.

In contrast to *ibaPDA* data recordings, where the execution of the *ibaDatCoordinator* jobs is triggered with the creation of new data files, this option is not available for the "endless" HD recordings. However, you have the option of defining planned jobs and tasks. This makes it possible to execute analyses independently of the creation of new data files.

You can use *ibaDatCoordinator* to define a scheduled job, i.e. a time-controlled job that executes an HD query cyclically. With the appropriate configuration of HD query and analysis (*.pdo), any evaluations and further steps such as report creation or database extraction can be automated.

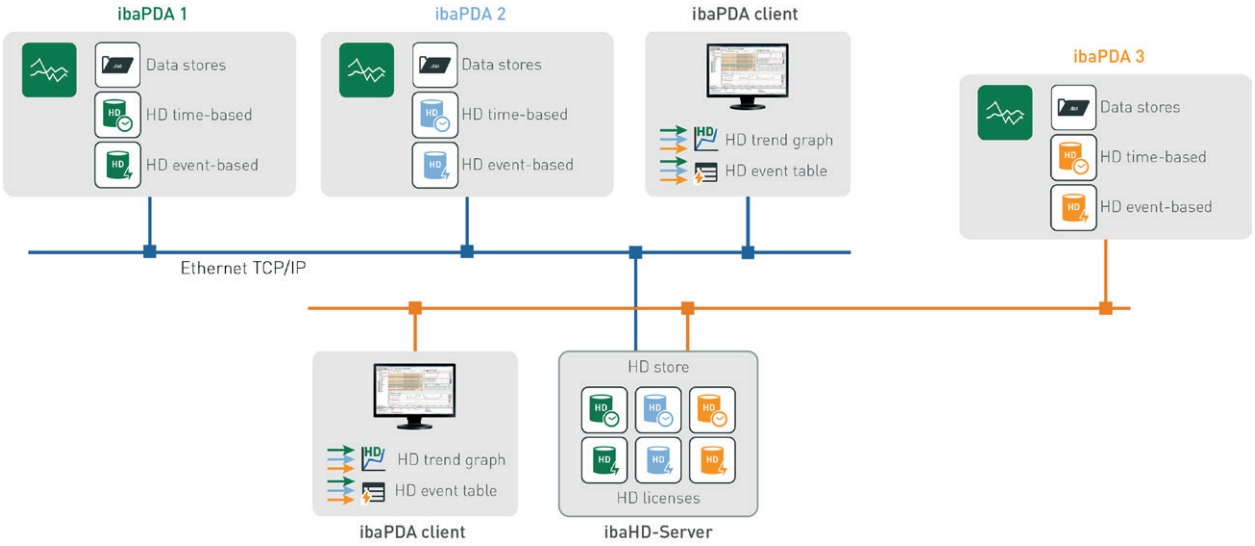
Other documentation

Further information on configuring scheduled jobs can be found in the documentation for *ibaDatCoordinator*.

10 Appendix

10.1 Example for large scale plant configuration

The following example shows three *ibaPDA* systems distributed on two networks. Each *ibaPDA* system sends signal or event data to the *ibaHD-Server* via a time and event based data store. An HD store is assigned to every *ibaPDA* side data store on the *ibaHD-Server*. The historical data of the whole *ibaHD-Server* can be displayed on any *ibaPDA* client in the networks. The HD signal display and the event table are used for this purpose.



Every HD store can only store data from one source (HD data store of an *ibaPDA* system). If several *ibaPDA* systems write on one *ibaHD-Server* each HD data store has to write in an own HD store. For the installation of each HD data store you configure one HD store on the *ibaHD-Server*.

Thus you can write, e.g., data from different plants with separate *ibaPDA* systems in an *ibaHD-Server*.

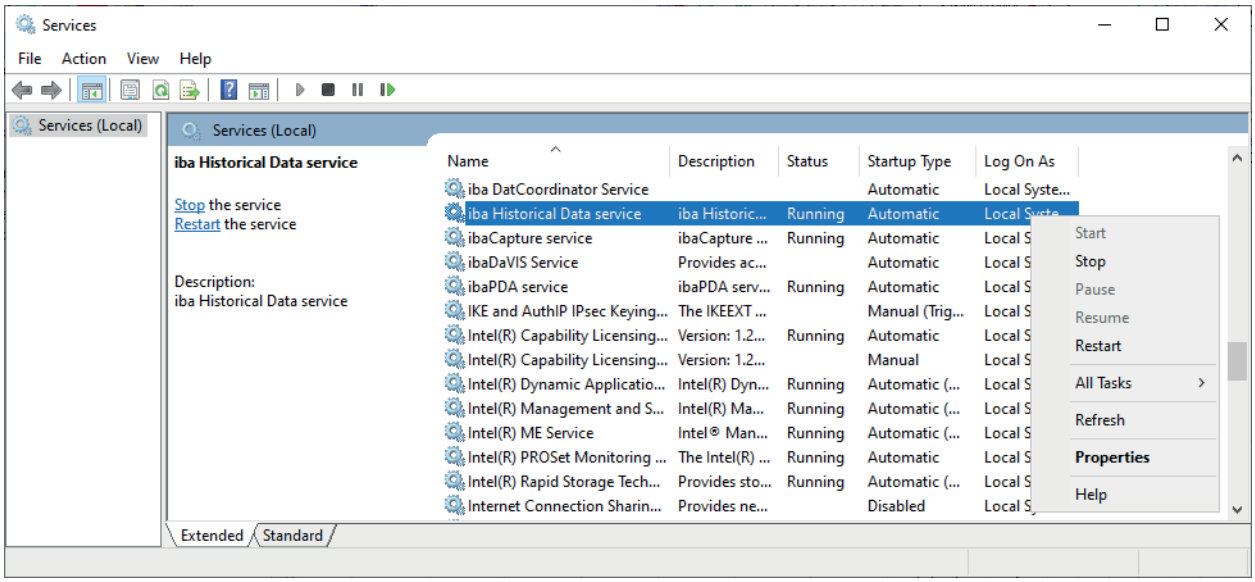
10.2 ibaHD-Server service

ibaHD-Server is a service under Windows. A Windows service runs under a user name, that means that a certain user account, provided during installation, has been assigned to it. The user account must have administrator rights. The default setting is the local system account which has administrator rights for the local computer.

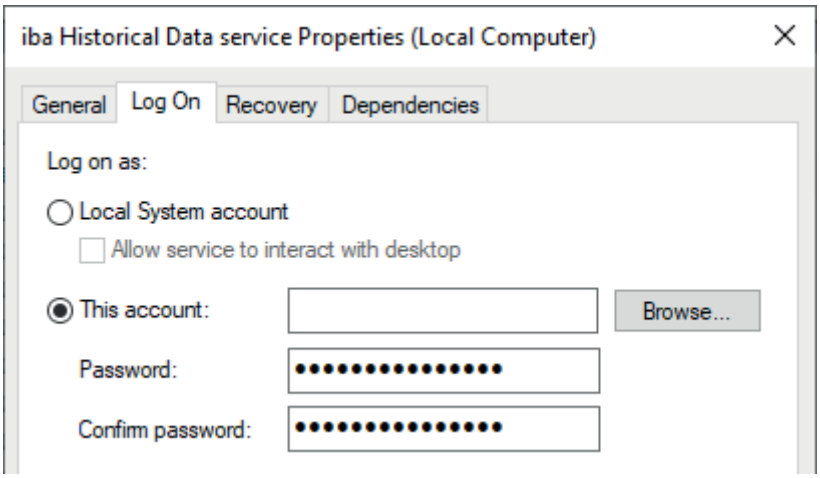
To view or to modify the current applicable user account for the *ibaHD-Server*, open the Windows service administration.

Go to *Start – Windows Administrative Tools – Services*.

To have a look at the settings of the services, right-click on the service "iba Historical Data service" and select "Properties".



Select the tab "Log On" in the properties.



Here, you can verify if the service is currently running under the local system account or if another user account is logged on. If you want to change a user account, please click on "This account", fill in the registration information and leave the dialog by clicking <OK>.

10.3 Tips for main and intermediate storage

Recommendations for setting up primary memory and cache

- Primary memory
  - Create a partition for each HD store
  - The drive should only be written by the *ibaHD-Server*
  - Do not use the HD partition(s) as memory for .dat files or other purposes
- Cache
  - Use an SSD disk with a balanced ratio of read and write performance
  - You can use the SSD disk as an intermediate storage for several HD stores, depending on the data throughput of the HD stores

- Depending on the performance class and generation of the used SSD, availability and performance may decrease over the operating time. A method of ensuring the performance of the SSD for longer is to leave up to 20% of the SSD disk unpartitioned. If you have any questions, please contact iba support.
- SSD hard disk with NVMe interface is advantageous

Size of the intermediate store

The size of the buffer used depends on the number of signals, regardless of whether they are analog or digital signals. The signals are saved in segment files. At least one segment file exists in the *ibaHD-Server* for each aggregation level.

ibaHD-Server has a limit regarding the size of the segment file and also the number of signals per segment file. The number of signals per segment file depends on the aggregation level.

Maximum segment file size: 512 MB

Maximum number of signals per segment per aggregation level:

Level 0 (raw) 256

Level 1 512

Level 2 1024

Level 3 2048

Level 4 4096

Level 5 8192

The number of configured signals determines the number of segment files per level and the size of the store.

Example:

Signal count total 5000, segment size max. 512 MB

	Max. signal count/seg	#Segments	Max. size
Segments Count L0	256	20	10240
Segments Count L1	512	10	5120
Segments Count L2	1024	5	2560
Segments Count L3	2048	3	1536
Segments Count L4	4096	2	1024
Segments Count L5	8192	1	512
Store size			20992 MB
Store size opt. configured (3* Level0)			30720 MB

At the time of configuration, the size of the intermediate storage used cannot be determined due to the unknown number of data to be stored, but also because the number of signals can change again and again due to reconfiguration in *ibaPDA*. Therefore, *ibaHD-Server* expects the minimum size described in chapter ↗ *Configuring HD stores*, page 36.

If the intermediate storage is smaller than the calculated memory size to be used, *ibaHD-Server* internally reduces the size of the segment files so that all Level 0 segment files only occupy 1/3 of the intermediate storage. This leads to more file transfers between intermediate and main storage.

Therefore, after adding signals in *ibaHD-Server*, the configuration of the intermediate storage should be compared with the required space.

10.4 Moving main storage to a new store location

If, for example, the disk space of your current main storage is no longer sufficient for one or more HD stores, you can set up the main storage at a new location. In doing so, you can take your existing HD data with you. To move a main storage with intermediate storage, you need to follow special steps.

Moving main storage without intermediate storage

1. Stop the data acquisition in *ibaPDA*.
2. Create a backup of the desired HD store in *ibaHDManager*. This way, you have a backup copy of the data.

   See also ↗ *Creating a backup manually*, page 57.
3. When the backup is ready, stop the *ibaHD-Server* service, e.g. via *ibaHD Manager*.
4. Now copy the entire directory of the main storage to the new location.
5. When the copying process is finished, start the *ibaHD-Server* service again, e.g. via *ibaHD Manager*.
6. In the *ibaHD Manager*, select the new location of the main storage for each copied HD store in the *General* tab via the <Configure HD stores> button.
7. If you apply the configuration, keep the data still in the old directory as a backup copy and reject the final deletion.
8. Now check whether all the data was copied. If all data was copied, you can delete the old directory of the HD store.

Moving the main storage with intermediate storage

1. Stop the data acquisition in *ibaPDA*.
2. Create a backup of the desired HD store in *ibaHDManager*. This way, you have a backup copy of the data.

   See also ↗ *Creating a backup manually*, page 57.
3. Make sure that there is enough free space in the directory of the main storage before you deactivate the intermediate storage.

   Disable the option Use intermediate storage in ibaHD Manager in the General tab via <Configure HD stores> in the subtab Intermediate storage.

→ All data of the intermediate storage is transferred to the main storage.

4. Stop the *ibaHD-Server* service, e.g. via *ibaHD Manager*.

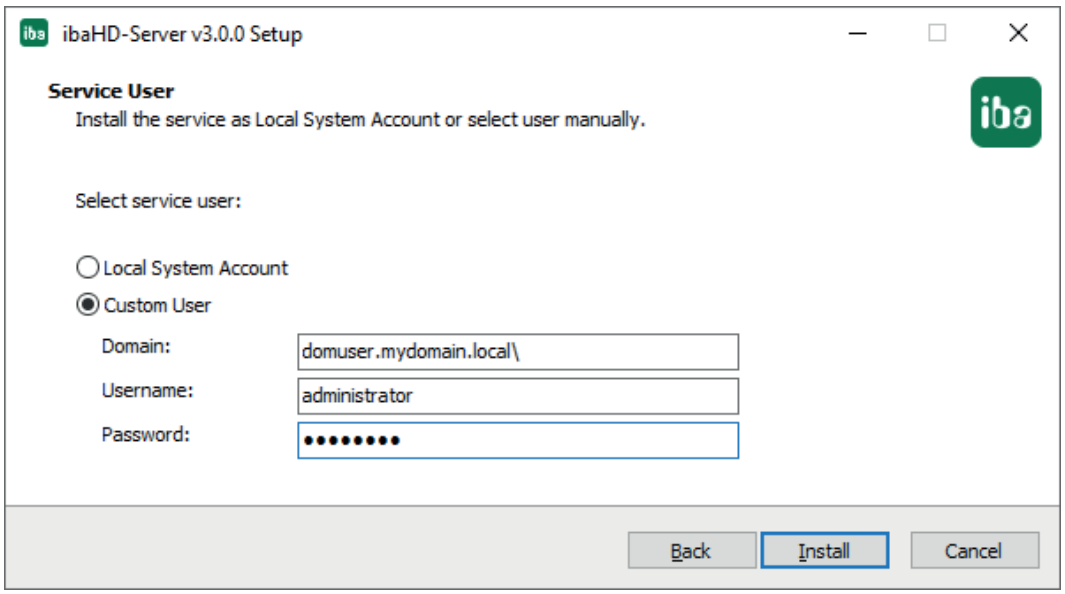
5. Now copy the entire directory of the main storage to the new location.
6. When the copying process is finished, start the *ibaHD-Server* service again, e.g. via *ibaHD Manager*.
7. In the *ibaHD Manager*, select the new location of the main storage for each copied HD store in the *General* tab via the <Configure HD stores> button.
8. Enable the option *Use intermediate storage* in the subtab *Intermediate storage*.
9. If you apply the configuration, keep the data still in the old directory as a backup copy and reject the final deletion.
10. Now check whether all the data was copied. If all data was copied, you can delete the old directory of the HD store.

10.5 DFS Namespace

The use of DFS namespaces in *ibaHD-Server* can occur in two different ways. In each case, an operating system user (OS user) must be created that is used exclusively by the *ibaHD-Server* service. Neither individual users nor processes should be able to impair the UNC connections of the *ibaHD-Server* service.

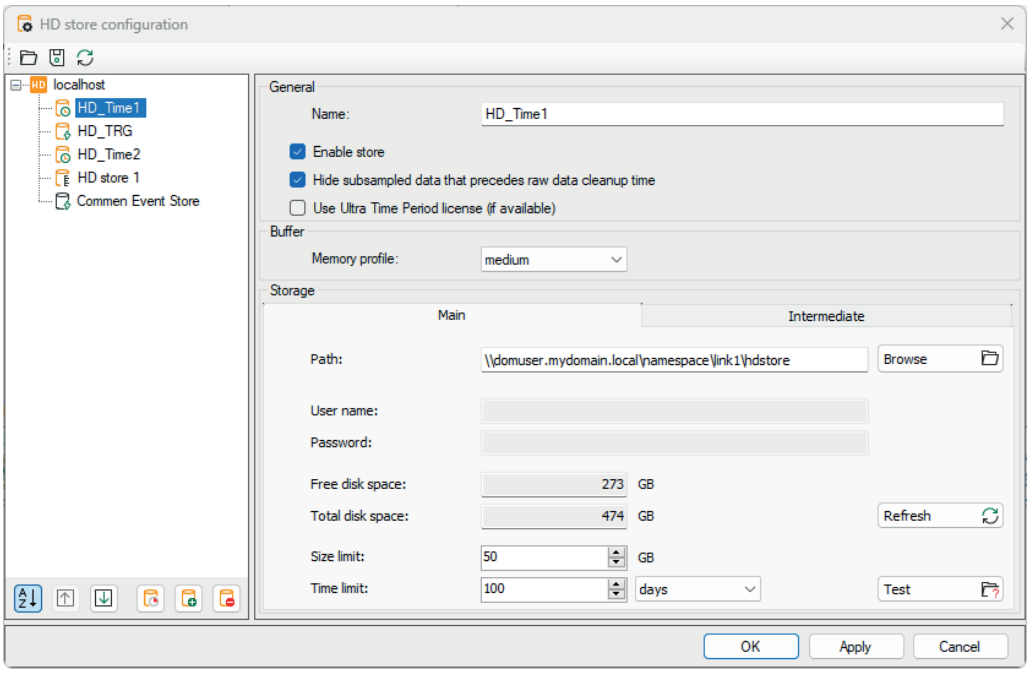
User of a domain

The easiest way to use DFS namespaces is to run the ibaHD-Server service under a domain user account. You can already specify this during the installation.



The prerequisite for this is of course that the computer is part of the domain and the user has sufficient rights.

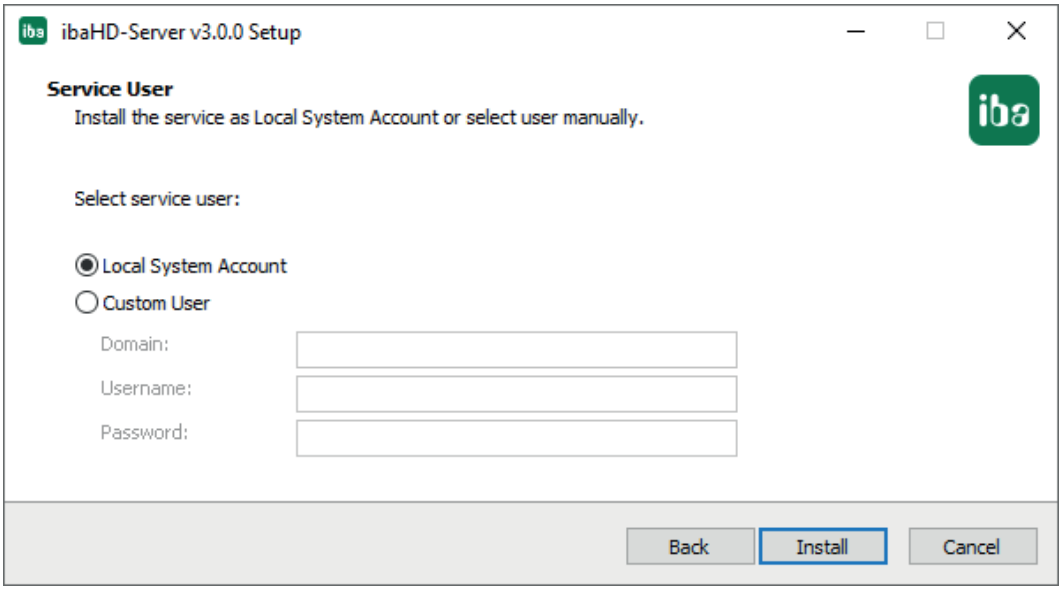
When configuring the HD store, the fields for user and password must then be left empty. Windows tries to automatically apply the session registration for the connection to other systems. If you want to make a connection to UNC paths outside the domain, you can still enter the necessary login credentials.



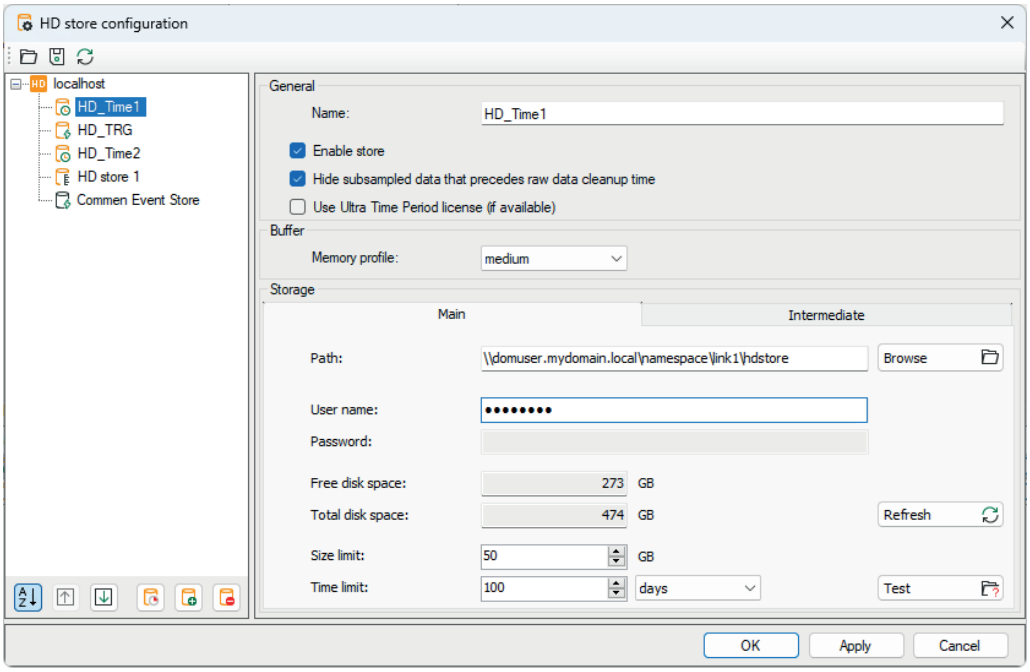
Local user

If the ibaHD-Server service is running under a local user or a different user outside the domain, you can still establish connections to DFS namespaces.

This is the case, for instance, if you have selected the local system account when installing the service.



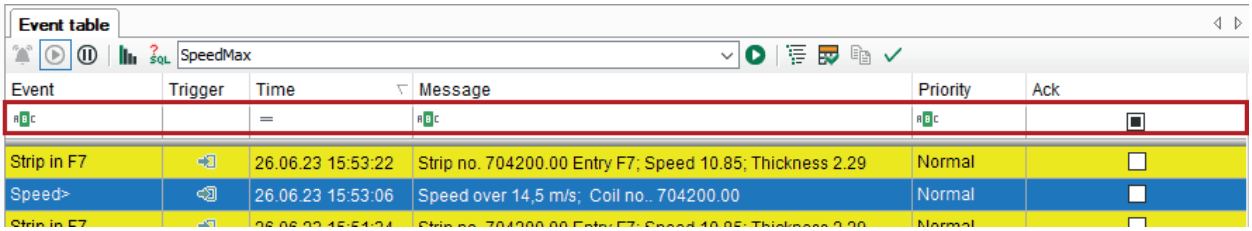
When configuring the HD store, you must then specify a domain user with sufficient rights. This user must have read access to the DFS namespaces and write/read access to the DFS link targets.

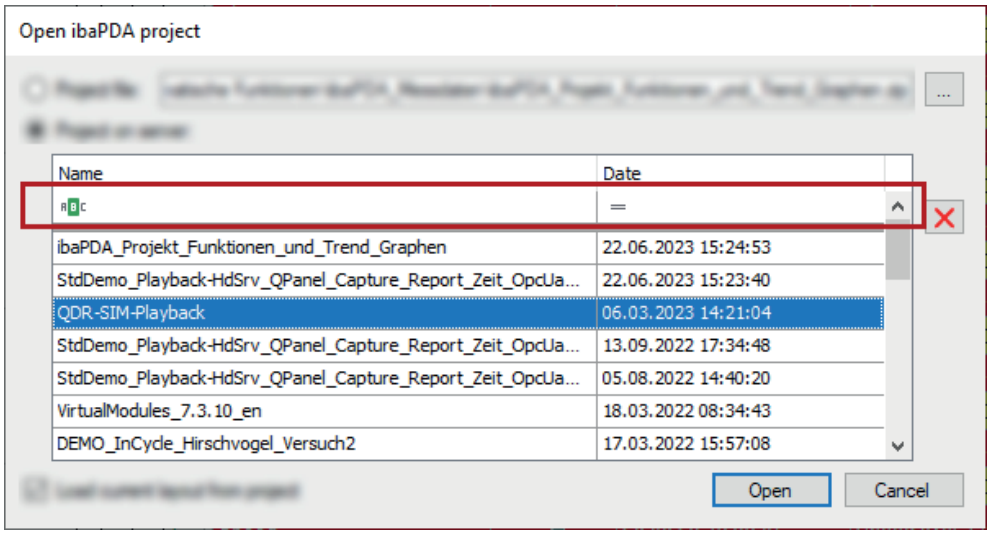


10.6 Advanced filter in tables

Many tables used in *ibaPDA* provide a filter function. Right below the column headers there is a filter row.

Tables providing such a filter function are for example the HD Event table or the table listing the *ibaPDA* projects in the *Open ibaPDA project* dialog.

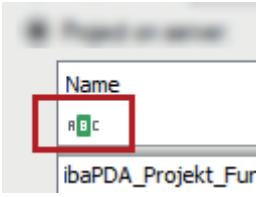




In some of the tables you may immediately see the filter icons, in others you first have to click in the filter row, in order to see the filter icons. Both simple and advanced filter functions are provided.

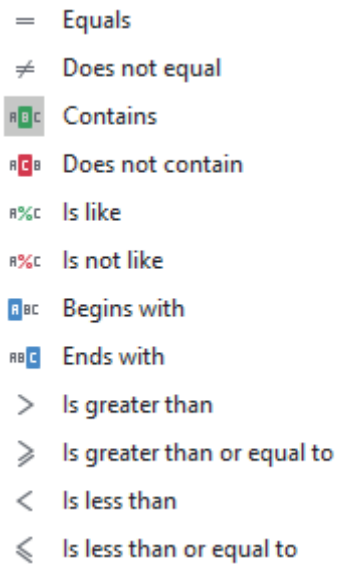
10.6.1 Simple filter function

Click in a column of the filter row and you will see the icon of the current filter method.



The default method is *Contains* on columns with text as content and *Equals* on columns with numerical content. If the method has already been altered by a user, the latest selected method is shown.

Clicking on the icon displays a list of the available methods for this column.

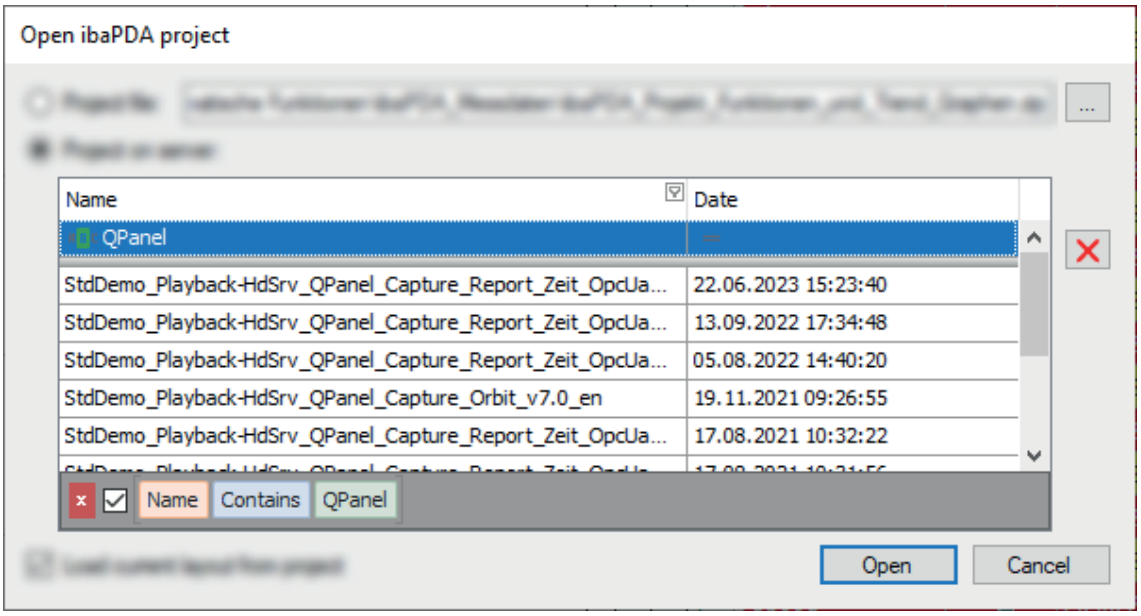


Each method leads to a different filter behavior.

If another filter method suits more your needs, just select it here and enter the filter pattern right into the filter row.

After you have entered a filter pattern the filter is also visualized on the bottom of the table in a human-readable way, showing three fields:

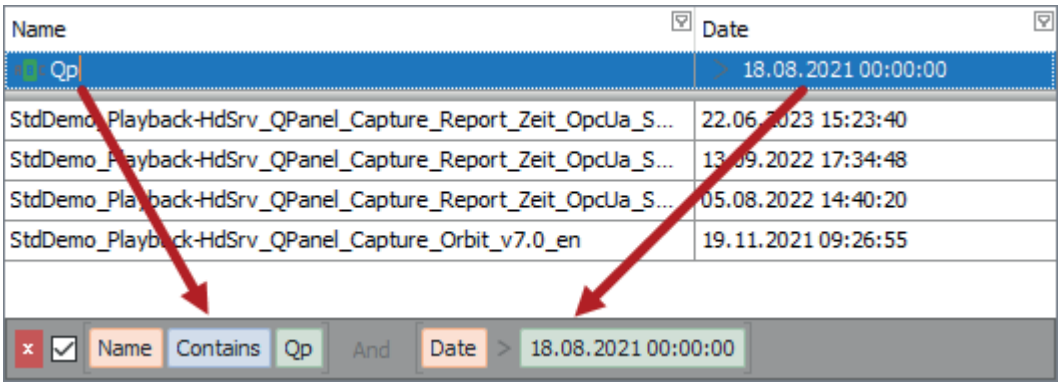
Column name (here *Name*) – filter method (here *Contains*) – filter pattern (here *QPanel*)



The table then only shows the rows which match the filter pattern.

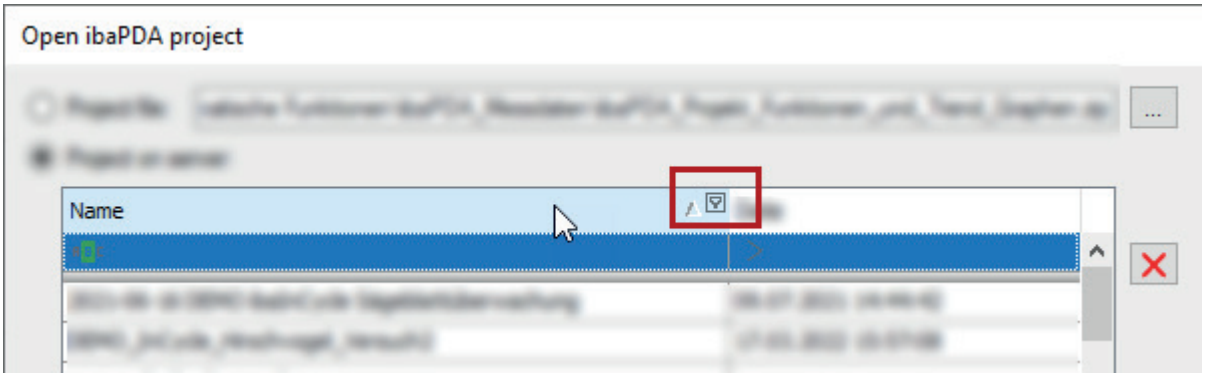
By using the little checkbox you can disable and enable the filter. With the red delete button you remove the filter finally.

If you filter on multiple columns at the same time, the filters are shown as a logical AND combination.



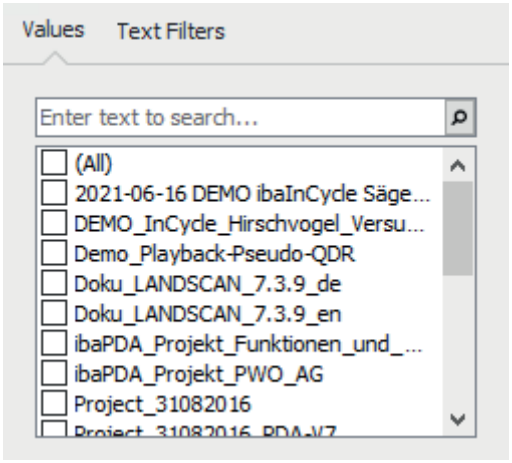
10.6.2 Advanced filter functions

If you move the mouse cursor over a column header a little filter icon appears at the right end of the column header.



This filter icon, by the way, is always displayed as soon as a filter is enabled.

Clicking on the filter icon opens the advanced filter dialog.

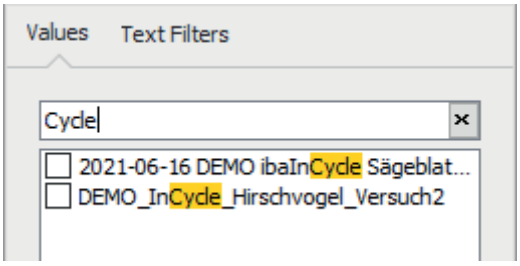


The advanced filter has two tabs:

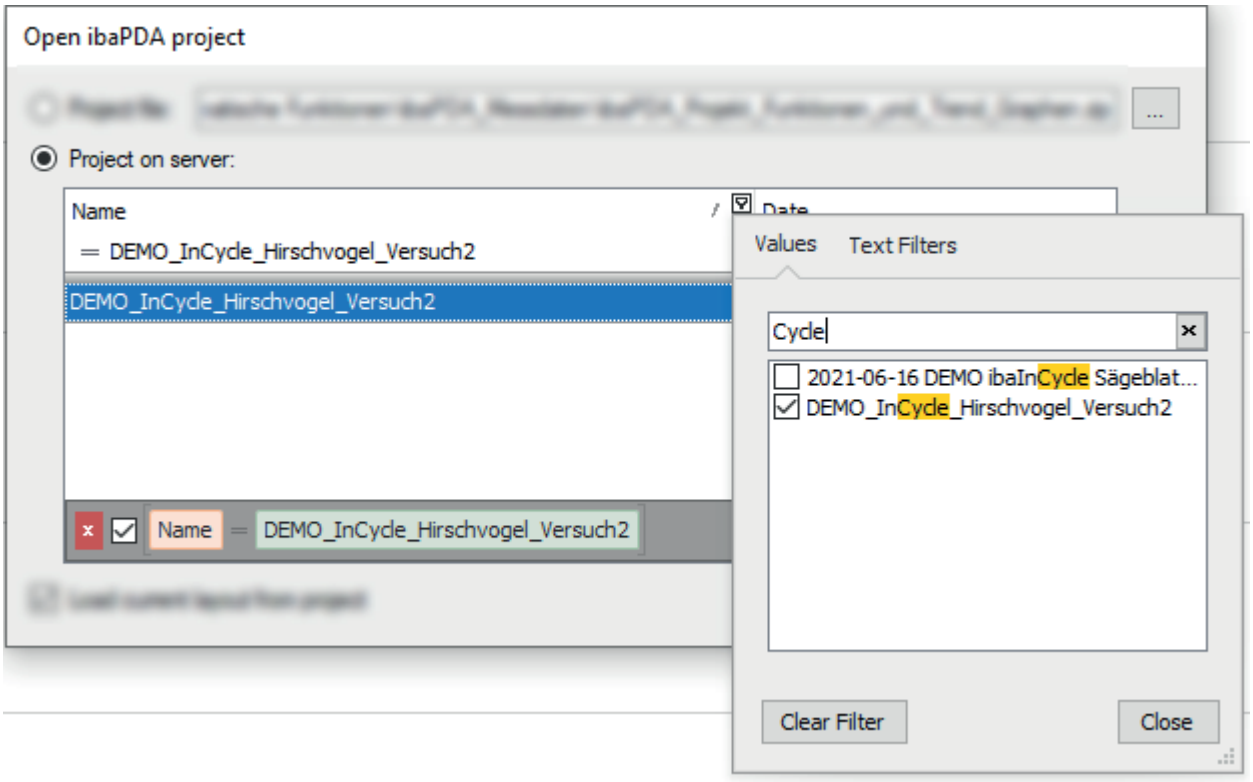
- *Values*, to search for a value or to select one or more values (similar to MS Excel)
- *Advanced filters*, to create a filter based on the value type
  In the example above, the value in the column *Name*, is a text and therefore the second tab is *Text Filters*. There would be a *Date Filters* tab if the value is a date and a *Numeric Filters* tab if the value is a number.

Values

The *Values* tab contains a list of all values in the selected column. Above the list, there is a field where you can enter a search pattern. Rows which don't match the pattern are removed from the table. The search pattern is highlighted yellow in every matching row.



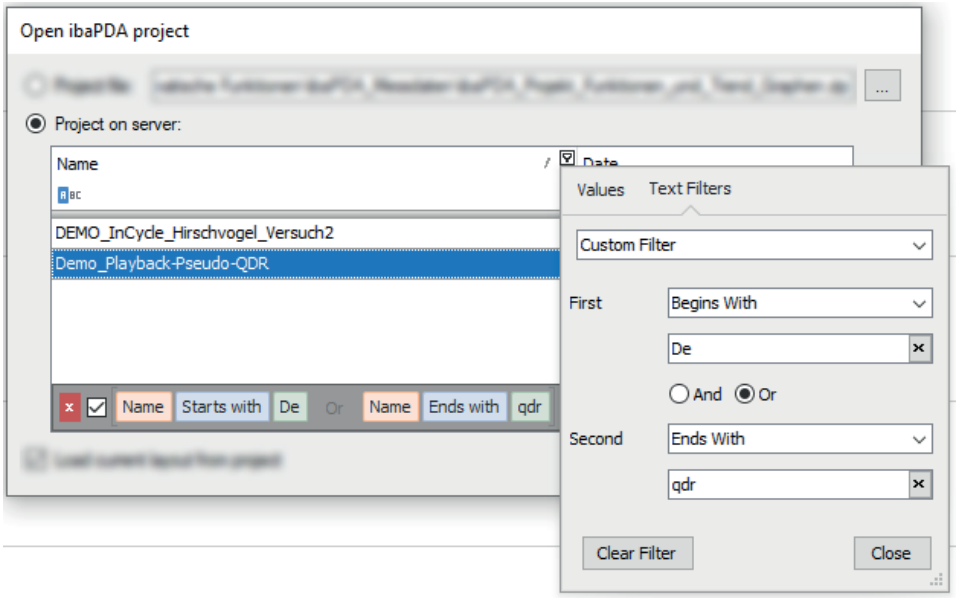
If you select one or multiple search results by a checkmark, only these rows will be displayed in the table.



Advanced filters

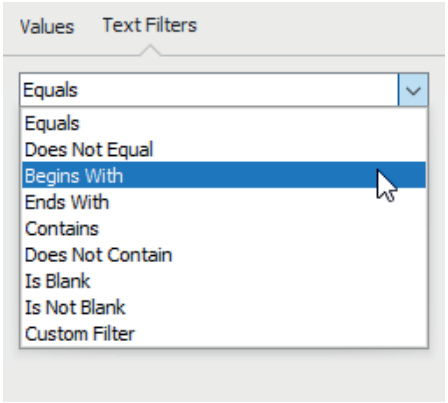
The filter options of the advanced filters depend on the column's value type. A column with numeric value, for example, has different filter options than a column with date values.

Moreover, each filter type provides a custom filter option. In case the standard filters are not suffcient for your needs you can use the custom filter option to create additional filters.



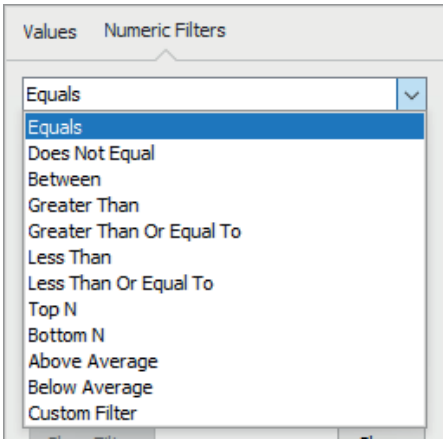
Text filters

Special text filters can be used in columns with text values.



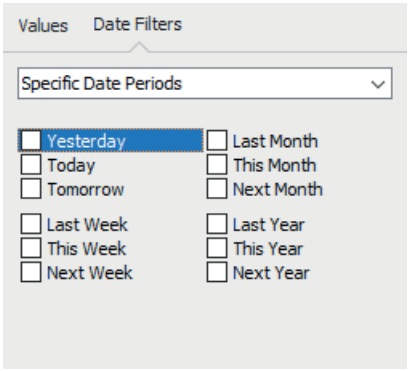
Numeric filters

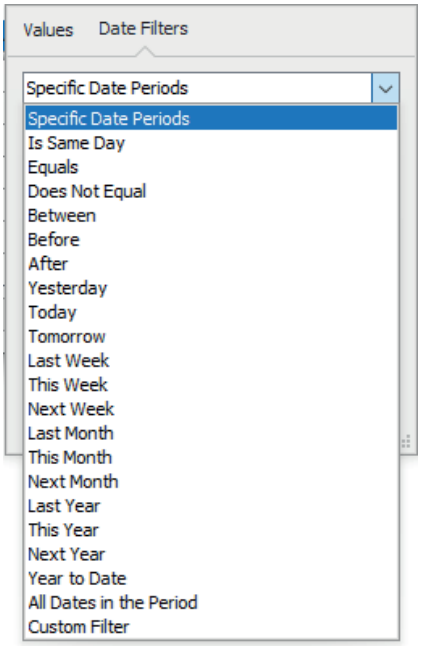
Numeric filters are only available in columns with numbers.



Date filters

Plenty of filters for time ranges and days are available in columns with date values.



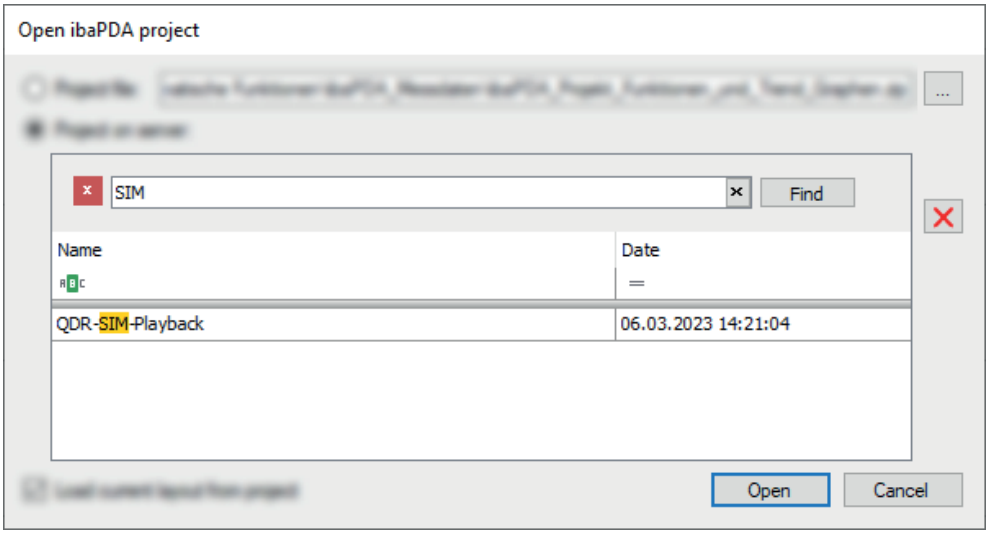


10.6.3 Search function

Beside the filters you can also use a general search function.

Click into the table and then press <CTRL>+<F>.

A search row will open on top of the table where you can enter a search pattern.



10.7 UNKNOWN_DATA' folder

When the server starts, *ibaHD-Server* checks and cleans up all the stores contained. Files or segments that cannot be assigned are moved to the `UNKNOWN_DATA` folder. You will find the folder in the respective directory of the filing system.

You can set *ibaHD-Server* to automatically send an e-mail when data has been moved to the directory. For information on the configuration, see ↗ *Messages*, page 85.

Note

Files that have been moved to the `UNKNOWN_DATA` will be deleted automatically and permanently after 28 days.

10.8 Display of summer and winter time

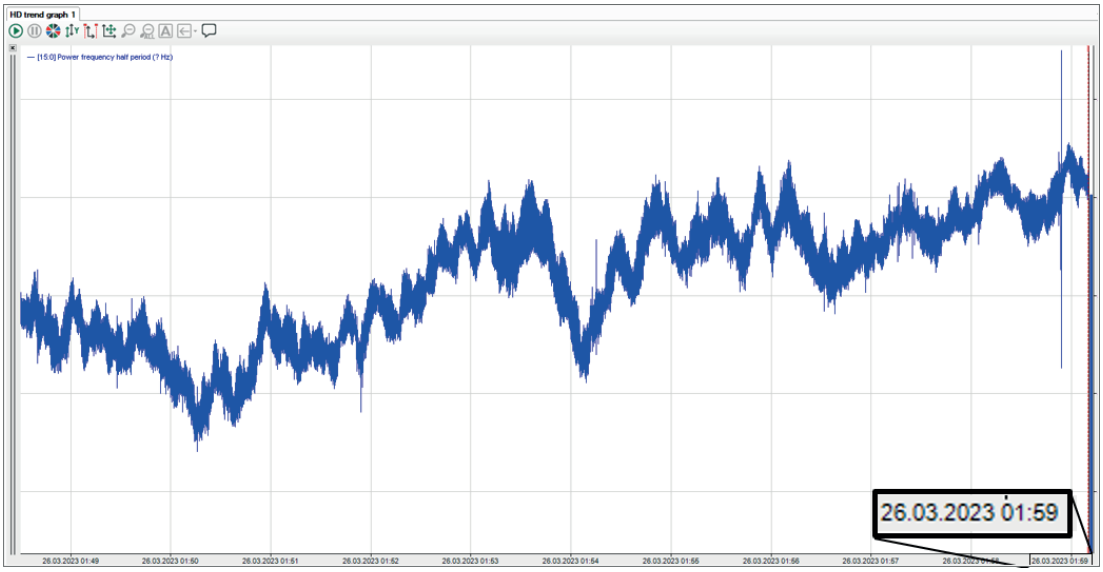
While data in *ibaHD-Server* is always saved with the UTC time, the display differs when changing from summer to winter time or winter to summer time, depending on whether you display the signal trends in *ibaPDA* or *ibaAnalyzer*.

Display in ibaPDA

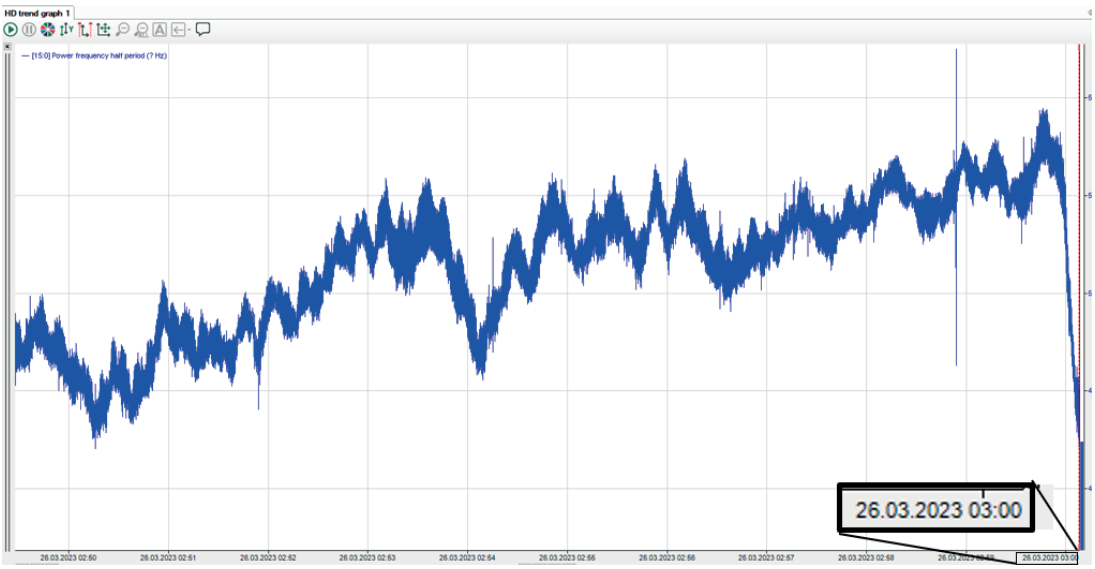
The trend in *ibaPDA* shows a continuous trend, whereby the time stamp is based on the last time displayed.

Change from winter to summer time (ibaPDA)

The image figure shows the trend for the signal shortly before the time change at 01:59:



After the change to summer time, i.e. one minute later, the timeline adjusts to the new time and continues the trend retroactively so that there is no gap. The signal trend that was displayed between 1:00 a.m. and 2:00 a.m. on winter time now corresponds to the time period from 2:00 a.m. to 3:00 a.m. on summer time:

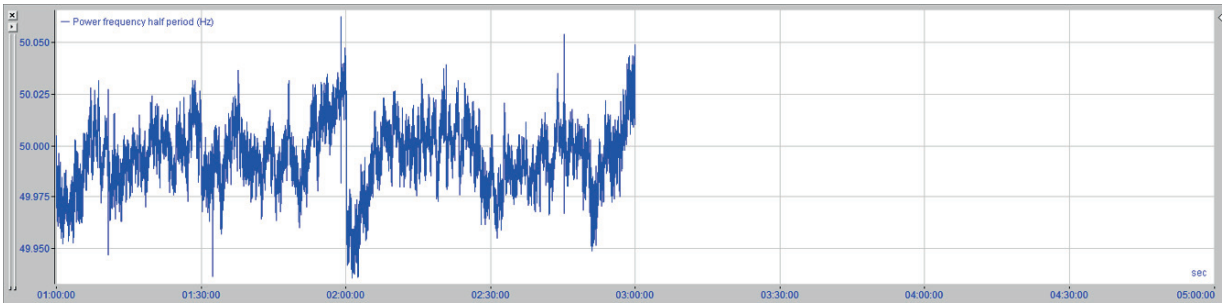


Display in ibaAnalyzer

The trend display in *ibaAnalyzer* shows a continuous trend, whereby the time stamp is based on the time queried. Start and end times are converted to UTC time.

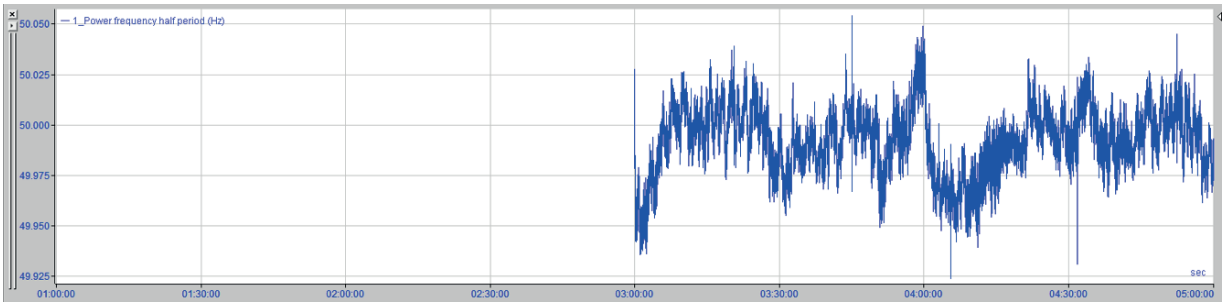
Change from winter to summer time (ibaAnalyzer)

The following figure shows the period from 01:00 to 04:00 before the time change:



No data is displayed for the period from 03:00 to 04:00.

After the change to summer time, the query shows the following trend for the period 02:00 to 05:00:



No data is displayed for the period from 02:00 to 03:00.

10.9 Recommendation and tips for using OPC UA

To move the server load for subscription-based reading from CPU to RAM usage, make the following settings:

- Increase the publishing interval of the subscription and the maximum number of messages stored in the queue for the monitored item on the OPC UA client side

  or

- Reduce the corresponding values on the *ibaHD-Server* side in the *MaxMessageSize*, *MaxMessageQueueSize* and *MinPublishingInterval* fields for all clients, see ↗ *Preferences*, page 96.

Data is lost

If data or values are lost during subscription-based reading, try reducing the **subscription**'s publishing interval or increasing the number of messages stored in the queue. Note that the OPC UA Server module moves all queried values in a publishing interval to the queue.

Problems when requesting large amounts of raw data

If you request large amounts of raw data via historical functions, problems may occur due to the default limitation of 1 megabyte per message on the OPC UA side. You can adjust the limit to up to 10 megabytes in the preferences in intelligent mode and to any value in extended mode. Please note the possible effects on the network.

11 Support and contact

Support

Phone: +49 911 97282-14

Email: support@iba-ag.com

Note

If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

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