



ibaHD Server

Historical Data Server

Manual
Issue 3.3

Measurement Systems for Industry and Energy
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The current version is available for download on our web site www.iba-ag.com.

Version	Date	Revision	Author	Version SW
3.3	03-2024	OPC UA server, e-mail, triggered data recording	MM, GSC, TG, st	3.3.0

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1 About this manual

This manual 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.

The latest version of this manual can be found on our website www.iba-ag.com under download.

1.1 Target group and previous knowledge

This documentation is aimed at qualified professionals, who are familiar with handling electric and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard 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 <i>Logic diagram</i>
Calling the menu command	<i>Step 1 – Step 2 – Step 3 – Step x</i> Example: Select the menu <i>Logic diagram – Add – New function block</i> .
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 Product information

2.1 Introduction

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

ibaAnalyzer can be used for more in-depth analyses of the historical data from *ibaHD-Server* by means of appropriate queries for reading, analyzing and - if required - converting into classic data files.

ibaDatCoordinator can be used for automation of post processing time-based and event-based HD data such as cyclic scheduled or event triggered reporting tasks. More information can be found in the *ibaDatCoordinator* manual.

The functions of *ibaHD-Server* and client at a glance:

- Continuous recording of measured data and events over a long time period
- 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
- Definition of any number of events from the acquired signal set
- Definition of free message texts 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 third party applications to time-based and event-based HD data using the *ibaHD-Server-API-Read* interface based on gRPC technology

2.2 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 two time periods. 128 time periods can be defined with the ibaHD-Server Ultra Time Period Store license.

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

The 2 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 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 further HD stores
30.800005	ibaHD-Server-Client	License extension by another HD client
30.800006	ibaHD-Server-Multi Client	License extension by 5 further HD client interfaces
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
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. Starting with ibaHD-Server v3.0.0, the licenses can also be stored in license containers of the company WIBU. 2 types of license containers are supported:

- CmStick: USB-dongle
- CmActLicense: Soft-container

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

The HD client licenses are neutrally distributed to any *ibaPDA* client that tries to connect to *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.

Note



If *ibaPDA* and *ibaHD-Server* are installed on the same computer, then the licenses for *ibaHD-Server* and *ibaPDA* are stored on the same soft-container dongle.

If *ibaPDA* and the *HD server* are installed on different computers, separate dongles are necessary for *ibaPDA* and *ibaHD-Server* server for the correspondent licenses.

2.3 Upgrade policy

If you want to expand the number of signals, clients, HD stores, or API interface, upgrades can be purchased as shown in the table above.

2.4 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 extent 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*
- ibaDongle-Viewer

EUP date

In these programs you'll find the "EUP date". This date is set with purchase of an applicable software license (date of purchase + 2 years) and will be adapted with each extension of the update period (maintenance contract). It determines the end of the period for free updates. All major versions of a software, which had been and still will be released prior to this EUP date can be installed, including the associated bugfix versions. Relevant for this is not the date of installation but the release date of the software version.

Hence, you can still install updates after the EUP date, as long as versions are involved which had been released before the EUP date.

Required EUP date

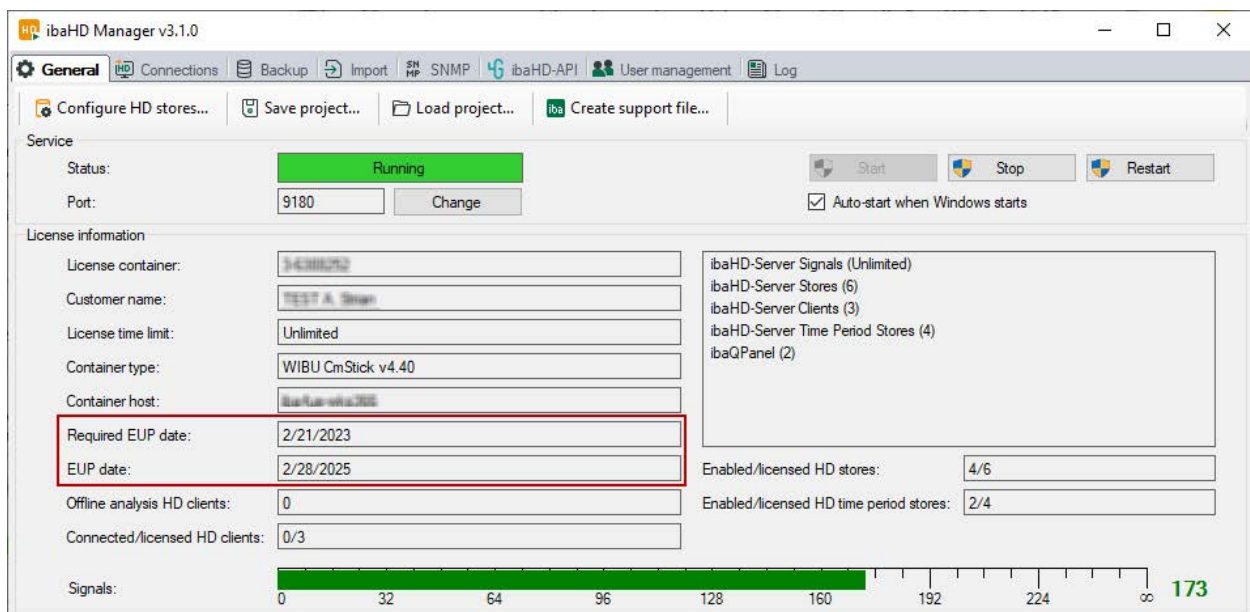
In order to control the installation procedure there is the "required EUP date" which is hard coded in the software. Practically, this date corresponds to the production or release date of a major version of the software. The "required EUP date" is only visible in the dialogs of the corresponding software (ibaPDA, ibaHD-Server, ibaCapture) but not in the dongle viewer.

During the installation, the "required EUP date" and the "EUP date" set in the dongle are compared in order to check if the installation is still permissible

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

If the "Required EUP date" is later than the "EUP date", then the software version in question had been released outside of your update period and must not be installed.

You will be notified of this in the installation wizard. In this case, abort the installation and contact iba support.



In the course of installation of *ibaHD-Server* you have the option in the installation wizard (step "EUP information") to search for available license updates. This facilitates the task in case you already have a DongleUpgrade available

2.5 Notes on updating to ibaHD-Server v2.4.x or higher

If you update from a version $<v2.4.0$ to a version $\geq v2.4.0$, 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.

3 Installation and program start

3.1 System requirements

Software for acquisition and recording

- *ibaPDA* v8.4.0 or higher
- Operating system Windows 10 (x86/x64), 11 (x64), Windows Server 2016 (x64), 2019 (x64), 2022 (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 according to the common rules of engineering and tested thoroughly. iba products will run without problems on supported hardware which fulfill requirements as specified in the official documentation.

In rare cases, third-party software products may interfere with iba product operations (e.g. service startup). Known cases had occurred with IT monitoring and security software, such as virus and network scanners.

If you face problems with starting iba products, please check the necessity for and the setup utilities of other installed software or contact iba 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 disc space requirement:

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

=> Required hard disk memory 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 table below *Recommendations for size of intermediate storage*.
- ibaHD 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

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 examples

Configuration example	Common storage size
Use case 1	
1 time-based HD store, 1000 signals	50 GB
Use case 2	
2 time-based HD stores, 15000 signals each	2× 100 GB
+ 3 time-based HD stores, together 2000 signals	3× 50 GB
+ 1 event-based HD store	50 GB
	<hr/> 400 GB

3.2 Installation

Please install the *ibaHD-Server* software on the computer on which you want to store the HD data. Please ensure 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-application 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 beginning 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 folder.
6. Select the user account
 - Local system account (default)
This account is sufficient if the server process runs only on the local computer and does not need any other special user-dependent rights.
 - Custom user
Select this option if the server process needs other user-dependent rights. The user account which you enter here has to dispose of this rights (Windows user administration).

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 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.

Use the two command line switches to perform the installation completely in 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 ibaHD server

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

	The green arrow indicates that the server service is running (" <i>ibaHD-Server</i> online"). For controlling the server, a double click on this icon starts the <i>ibaHD Manager</i> application.
	A red square indicates that the <i>ibaHD-Server</i> service is running but not ready to receive data. This state usually occurs temporarily during stopping or restarting the service.
	A gray circle indicates that the <i>ibaHD-Server</i> service is not running (" <i>ibaHD Server</i> offline").

Note

If the *ibaHD* server icon is not visible in the Windows task bar, restart the application for displaying the *ibaHD-Server* service. For this purpose, in the Windows start menu click on *Start – All Programs – iba – ibaHD-Server – ibaHD Manager*.

Start ibaPDA server

For an HD data storage or access to the current data of a running *ibaPDA* system, the *ibaPDA* server and *ibaHD-Server* must run simultaneously, because *ibaHD-Server* is supplied by *ibaPDA* server with data. Normally, the *ibaPDA* server is started together with Windows. The *ibaPDA* server icon appears in the Windows task bar. If an HD data storage is only to be shown, only a connection of the client to the HD server is required.

	<i>ibaPDA</i> server service and data acquisition are running.
	<i>ibaPDA</i> server service is running, data acquisition is stopped.
	<i>ibaPDA</i> server service is not running. A double-click on this icon opens the <i>ibaPDA</i> 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 *ibaHD-Server*. On the respective computer you only need to install the *ibaPDA* client. The *ibaPDA* server does not need to be installed nor run on this computer.

Start client

The *ibaHD* client is integrated in the *ibaPDA* client. Start the *ibaPDA* client as usual by double clicking on the *ibaPDA* client icon on the Desktop or via the Windows start menu:

Start – All Programs – iba – ibaPDA – ibaPDA client.

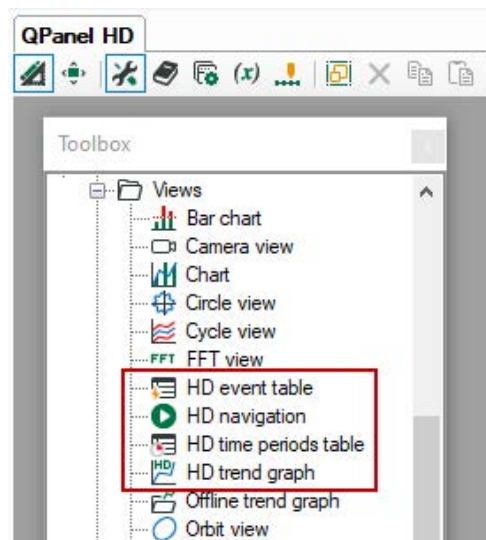
Different icons are now available in the *ibaPDA* client for connecting *ibaHD-Server* and for displaying the historical data:

	Selecting the <i>ibaHD</i> server
	Add a HD trend graph for displaying time-based historical data
	Add a 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 121.

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 HD data in *ibaQPanel* in chapter [↗ ibaHD-Server in ibaQPanel](#), page 167.

4 System overview

4.1 Architecture and functional principle

The application *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

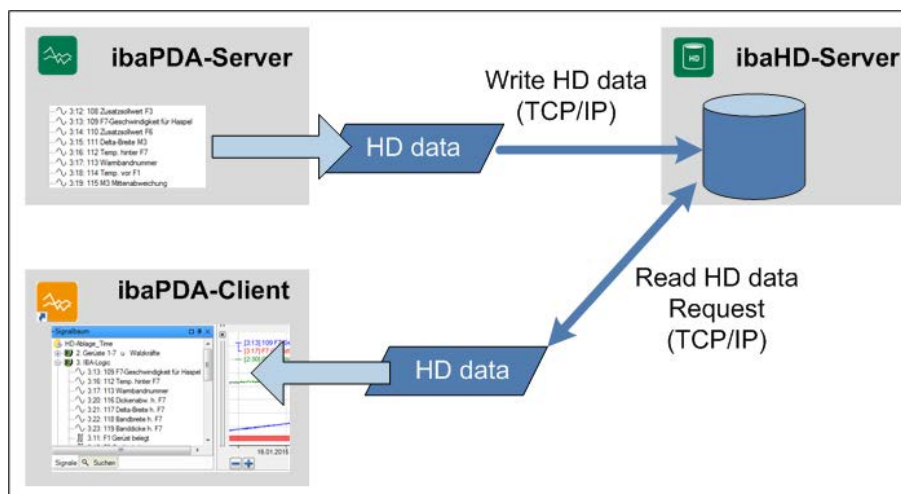


Considering the large data volume which will be stored over the years, we recommend the use of a separate computer for *ibaHD-Server* with the correspondent hard disk capacity.

ibaPDA (server) continuously provides *ibaHD-Server* with measured data which are 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.

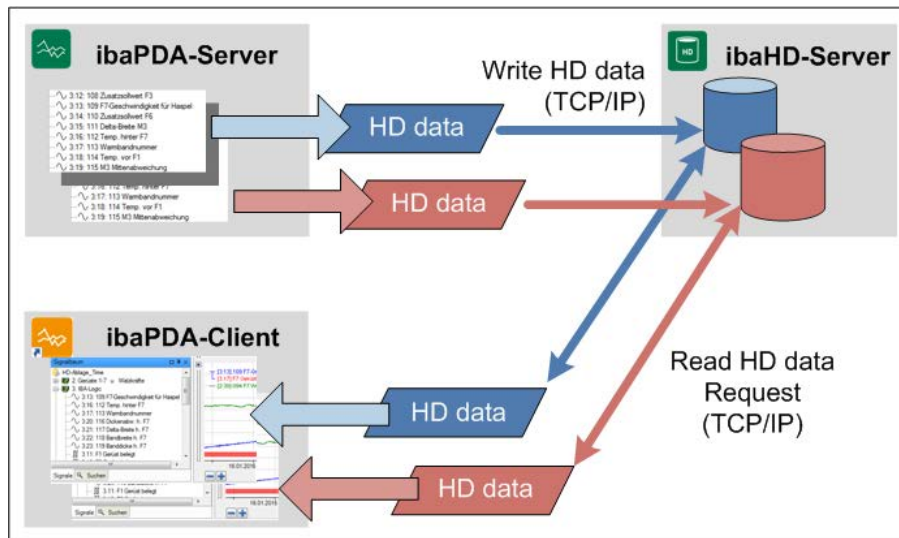
Different types of HD stores exist depending on whether signals (time- or length-based) or events shall be stored.

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).

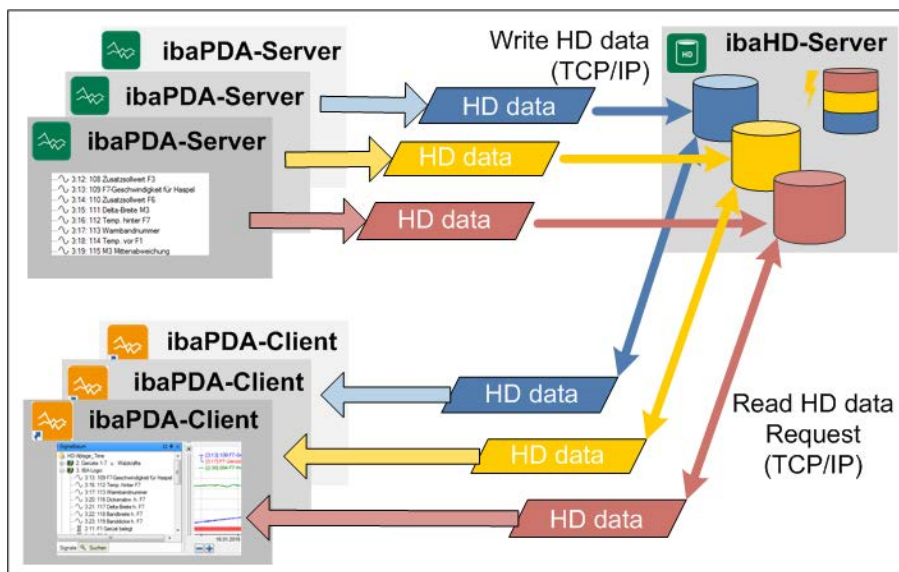


Signals or events can be assigned individually to each HD data store. So, data can be distributed, e.g. according to technological functions or subjects like production or maintenance.

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

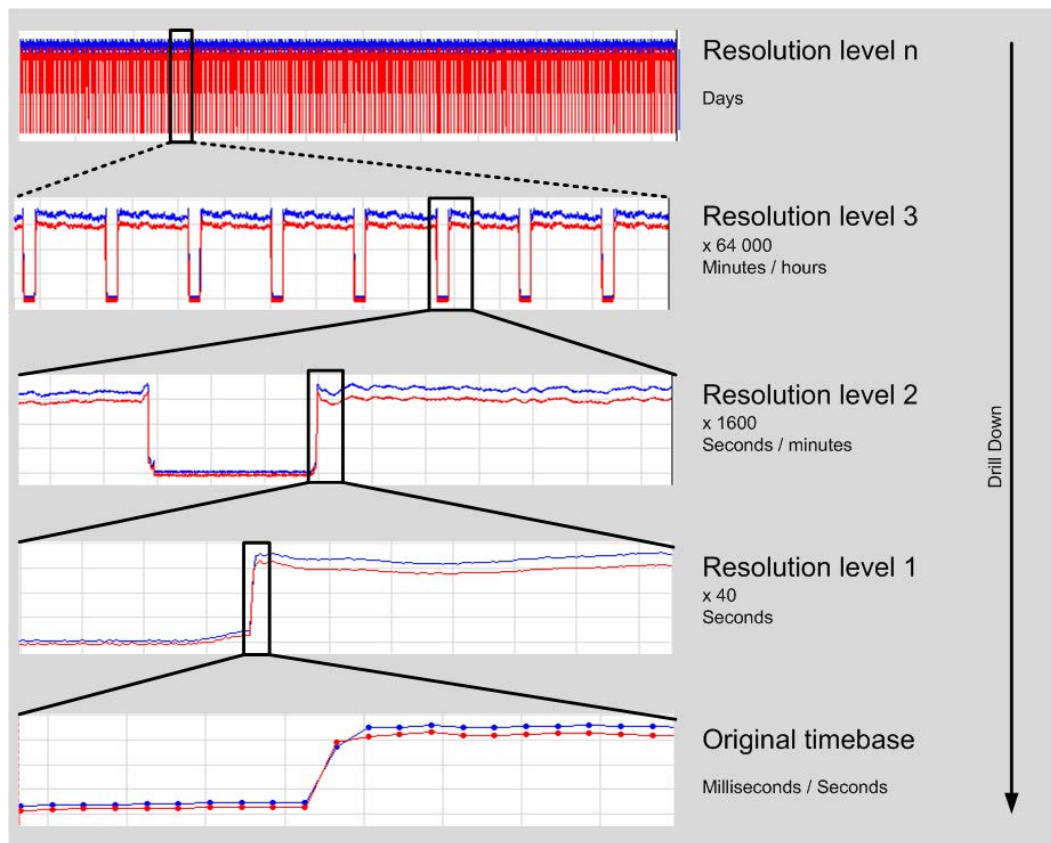
4.2.1 Time-based data store

In case of a time-based HD data storage, the signals are saved continuously through time in an HD storage on *ibaHD-Server*. Similar to a usual *ibaPDA* data storage, the signals to be stored have to be selected and assigned to a storage profile. For the time-based data storage, 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 time periods in *ibaPDA*, the files are stored in a special file structure with several aggregation 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 samples are at least 1 day.

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

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



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)	16000 ms (16 s)	80000 ms (1.3 min)
Level 3	64000 ms (1.1 min)	640000 ms (10.67 min)	3200000 ms (53.3 min)
Level 4	2560000 ms (42.7 min)	25600000 ms (7.1 h)	128000000 ms (1.5 d)
Level 5	102400000 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 method of run length encoding is used for compression so that the storage capacity is only insignificantly higher than for normal data files (dat files). The zoom in the signal curve is considerably accelerated by this storage method.

Note

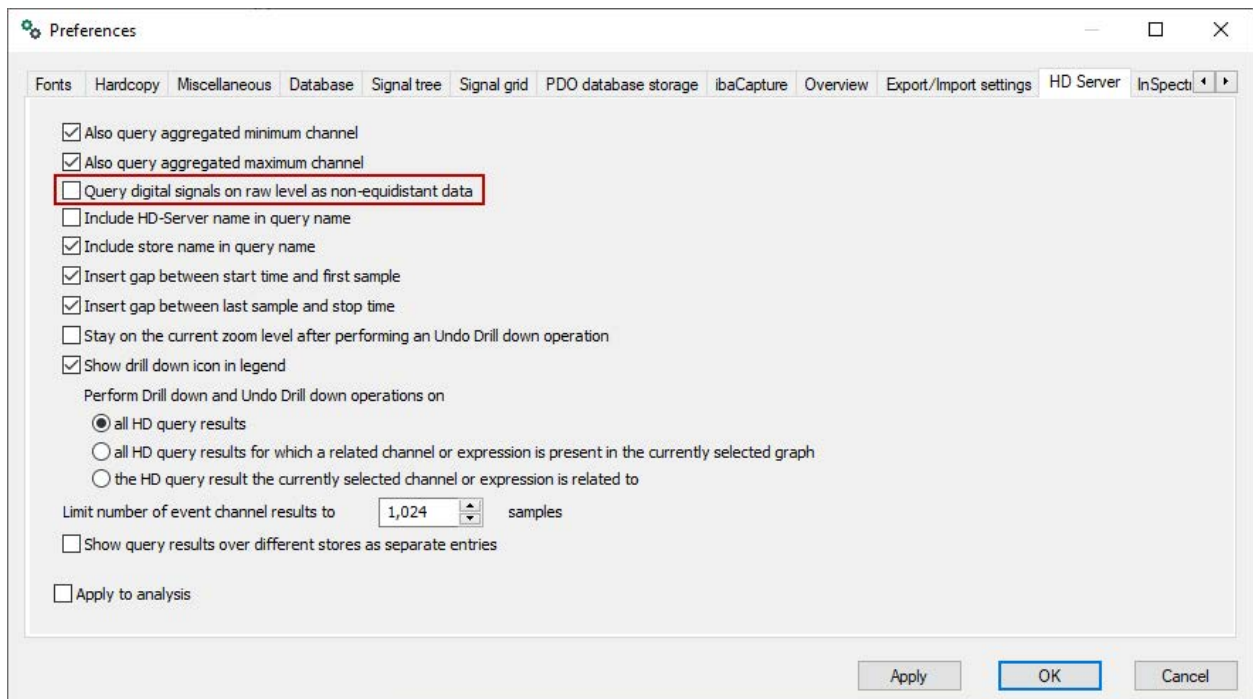


The above mentioned time base is a time base of the storage as it is settled in the used storage profile. Therefore, the sample time is not essential for the maximum resolution of an HD storage, but the time base which is used to save a signal.

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, please see *ibaAnalyzer* manual.

4.2.2 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.

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

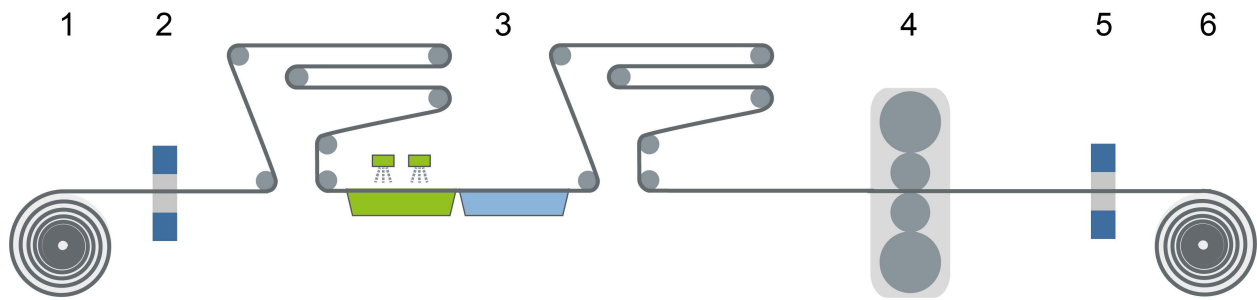
4.2.4 Length-based data store

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 115

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.

In addition, you can use this to ...

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

This program will be automatically installed together with *ibaHD-Server* and can be started

- Either via the Windows start menu (*Start – All Programs – iba – ibaHD-Server – ibaHD Manager*)
- or by double clicking on the *ibaHD server* icon in the task bar at the bottom right



5.1 General Settings

Service

Status: **Running** [Start] [Stop] [Restart]

Port: 9180 [Change] ☒ Auto-start when Windows starts

License information

License container: [34380002]
 Customer name: [TEST A. Stein]
 License time limit: [Unlimited]
 Container type: [WIBU CmStick v4.40]
 Container host: [ibaHD-Server]
 Required EUP date: [2/21/2023]
 EUP date: [2/28/2025]
 Offline analysis HD clients: [0]
 Connected/licensed HD clients: [0/3]

ibaHD-Server Signals (Unlimited)
 ibaHD-Server Stores (6)
 ibaHD-Server Clients (3)
 ibaHD-Server Time Period Stores (4)
 ibaQPanel (2)

Enabled/licensed HD stores: 4/6
 Enabled/licensed HD time period stores: 2/4

Signals: 0 32 64 96 128 160 192 224 ∞ **173**

HD stores

Name	Storage path	Signals	Size limit	Time limit	Active
TimeStore_TP	D:\HD_Timeperiod\	47	0.8 / 10 GB	9.2 / 10 days	✓
HD_TRIG	D:\HD_Data\HD_TRIG\	23	0.1 / 100 GB	201.9 / 100 days	✗
HD_LENGTH	D:\HD_Data\HD_Length\	57	0.1 / 100 GB	22.9 / 100 days	✗
HD_TIME	D:\HD_Data\HD_TIME\	46	1 / 100 GB	1 / 100 days	✓

★ Logged in as admin

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 for the 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.

For further information about the license see chapters [➤ Upgrade policy](#), page 14 and [➤ Update policy](#), page 14.

HD stores

In the HD stores range, HD stores are indicated that are already created.

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 more information, please see [➤ HD store details](#), page 41

5.1.1 Configure 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 *ibaHD-Server*, an HD store has to be created for every HD data store.

Clicking on the symbol button <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*.

In the tree view on the left the already configured HD data stores are displayed. 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 *ibaHD-Server* always have to match.



ibaHD time-based data store → Time-based HD store



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



ibaHD length-based data store → Length-based HD store



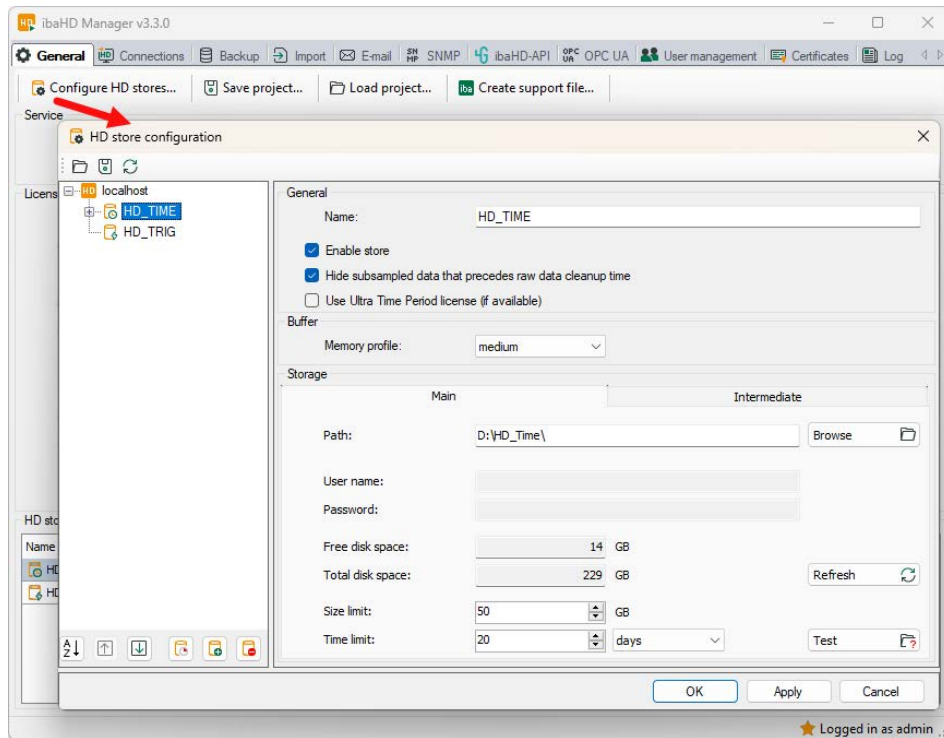
ibaHD event data store → Event-based HD store

Note



A separate license is required for a time period store.

Opening the HD store configuration in *ibaHD Manager*:



General

Name

Here you can assign a name for the HD data store

Enable store

If you want to use the store, 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 re-store backups.

Note



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

Hide subsampled data that precedes raw data cleanup time

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.

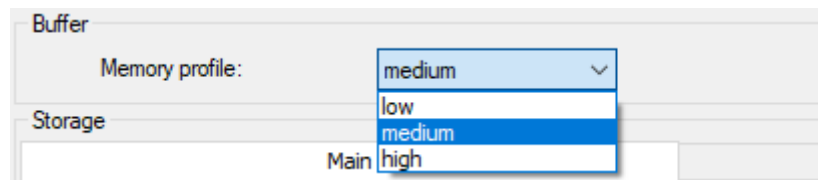
If you do not enable this function, then the consolidated values will also be shown if the underlying raw data is missing. A drill down in the display then shows incomplete or missing curves.

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 there is the possibility 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 of data from the buffer in the HD store, i.e. on the hard disk. The performance when reading data from the HD store (e.g. by *ibaAnalyzer* or *ibaPDA*) is also affected by this.

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.

Here, some limitations apply:

- If *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, that 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 sampling rate are acquired.

Select a lower memory profile, if many signals with a low sampling 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
- Sampling rate of the acquired signals
- Data aggregation at 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

Since the version 2.1 of *ibaHD-Server*, it has been possible to optionally use a cache in addition to the primary memory. The two tabs *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 main memory's hard disk.

Using the intermediate 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 229.

Main

Path

Here you select the directory for the HD data store. By means of the button <Browse> you get to the directory structure of your *ibaHD-Server*.

User name/Password

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

Free / total disc space

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

Use the <Refresh> 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 disc of the *ibaHD-Server* computer.

Size limit

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

Time limit

If the signal data are older than the time set here, they 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 intermediate storage. Use the <Browse> button to access the computer's directory structure.

The other settings and buttons are the same as with the main storage.

Note



The storage space 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 229.

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

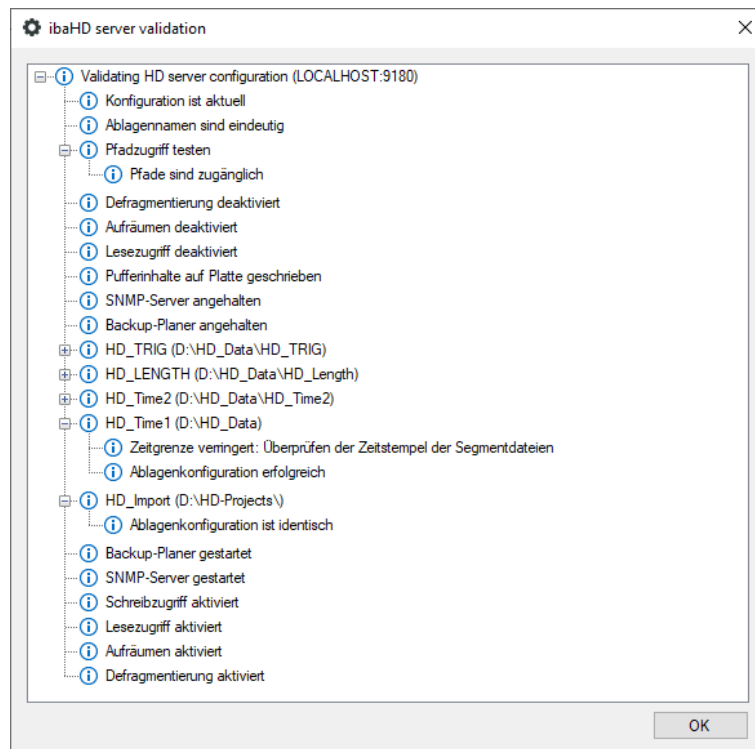


In addition to the buffer in the main memory, the intermediate storage also works as a buffer when the hard disk drive is too busy to be able to execute all I/O operations. In the event that the intermediate storage overflows, the active acquisition to *ibaHD-Server* is interrupted and other write accesses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

See also chapter [↗ Tips for main and intermediate storage](#), page 229.


Close the configuration


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

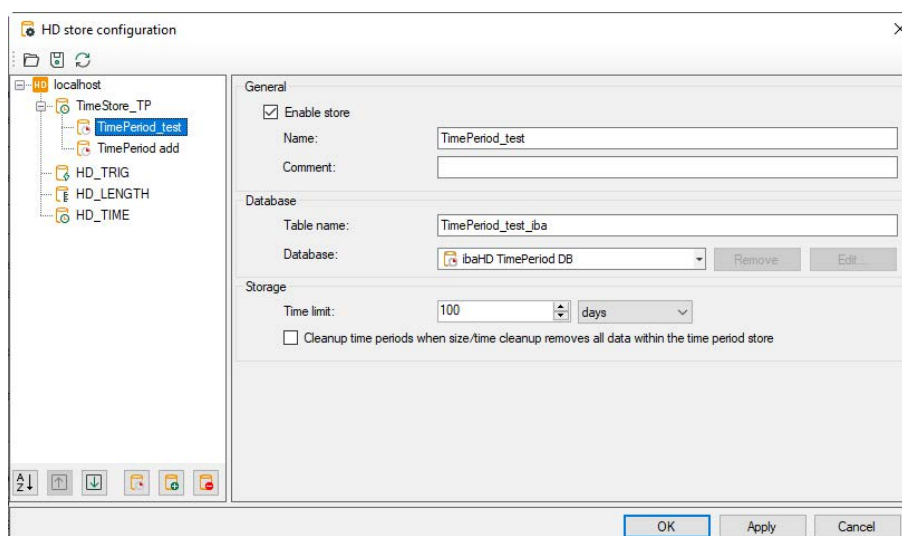


5.1.1.1 Configuring an HD store for time periods

Time periods are saved in a time period store. Time period stores are configured as subsidiary stores in a time-based HD store.

First select the top level time-based HD store in the tree view or create a new one. Then click on the  button. A new node for the time period store is created under the selected time-based HD store. Multiple time period stores can be added to a time-based HD store.

An existing time period store can be removed by selecting it and then clicking on the  button. The following settings are required for the time period store:



General

Enable store

If you want to use the store, this option must be enabled. Stores that are not enabled do not allocate a license.

Name/Comment

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

Database

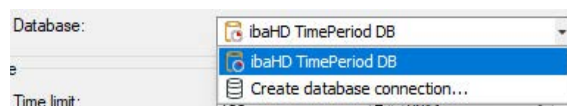
Table name

Enter a unique name for the database table here.

Database

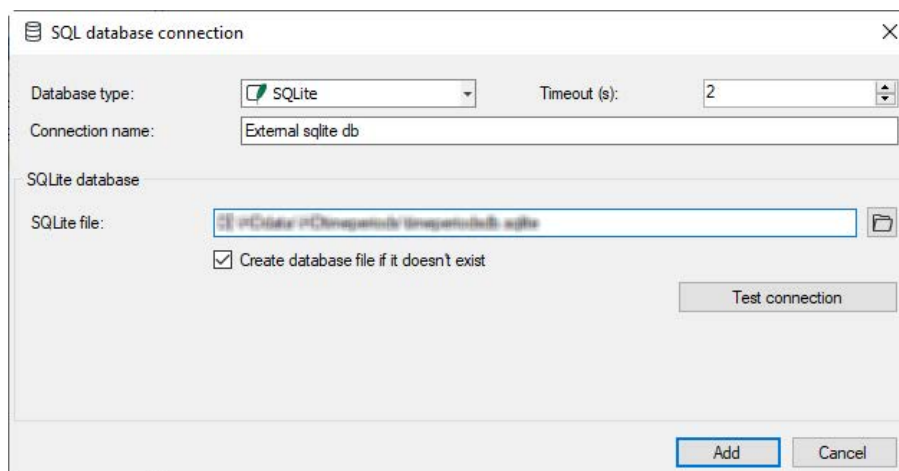
Name of the selected database containing the time period table. By default, *ibaHD-Server* creates a database for time periods as an internal SQLite database. To use the internal database, select *ibaHD TimePeriod DB*.

You can also use an external database. In the drop-down menu, you can select the database or create a connection to a database. Only SQLite type databases are currently supported.



To create a connection to the SQLite database, select *Create database connection ...*. To edit a connection, select the name.

A connection name, an SQLite file path and a timeout must be configured for the database connection. You can use the <Test connection> button to check the connection.



Storage


Time limit

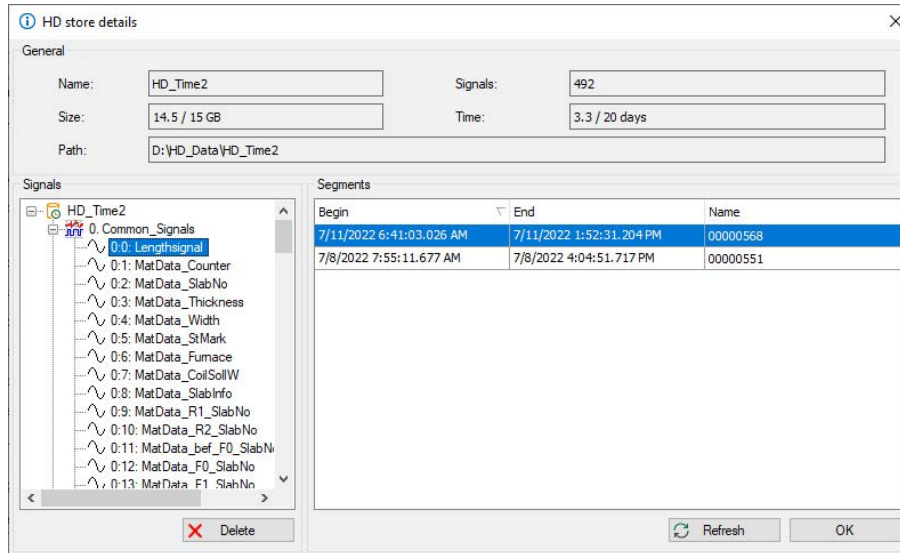
Time periods that are older than the specified time limit are automatically cleared.

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.

5.1.1.2 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

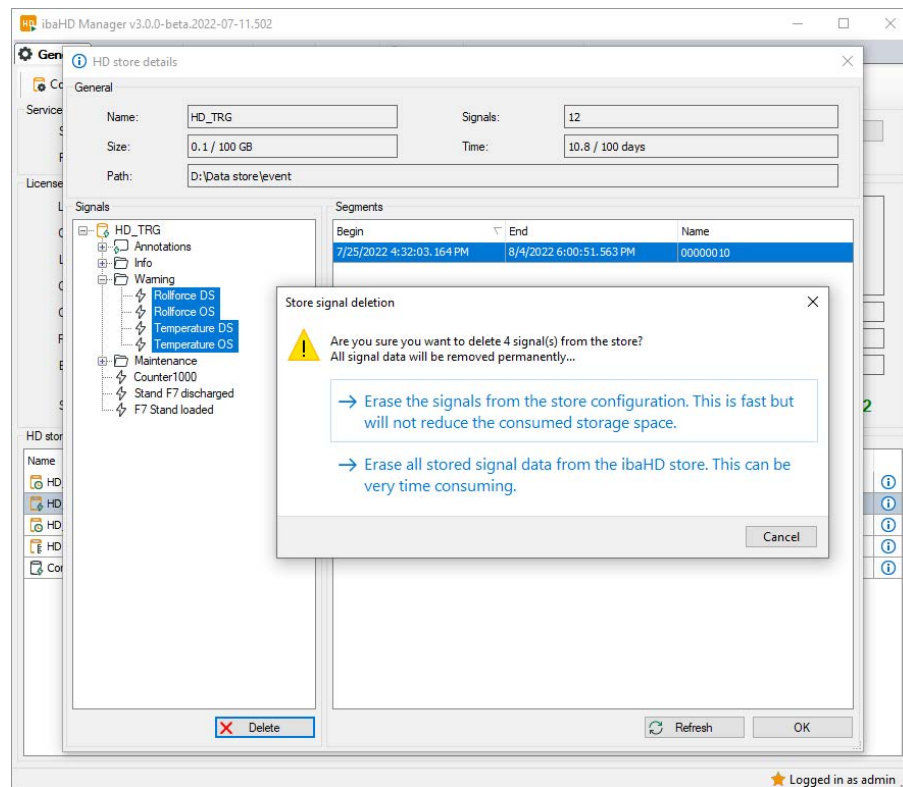
In the "Signals" area, the signal tree is displayed with the signals that were selected when configuring the corresponding HD storage in *ibaPDA*.

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.



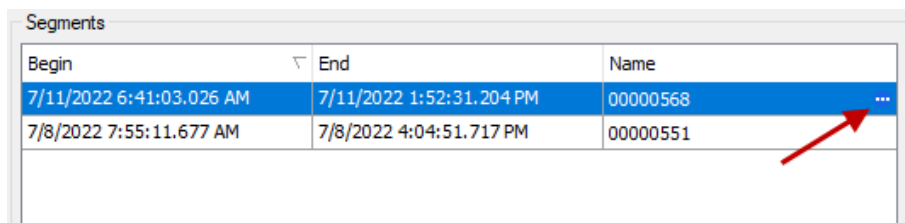
Segments

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 ibaHD server database.

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

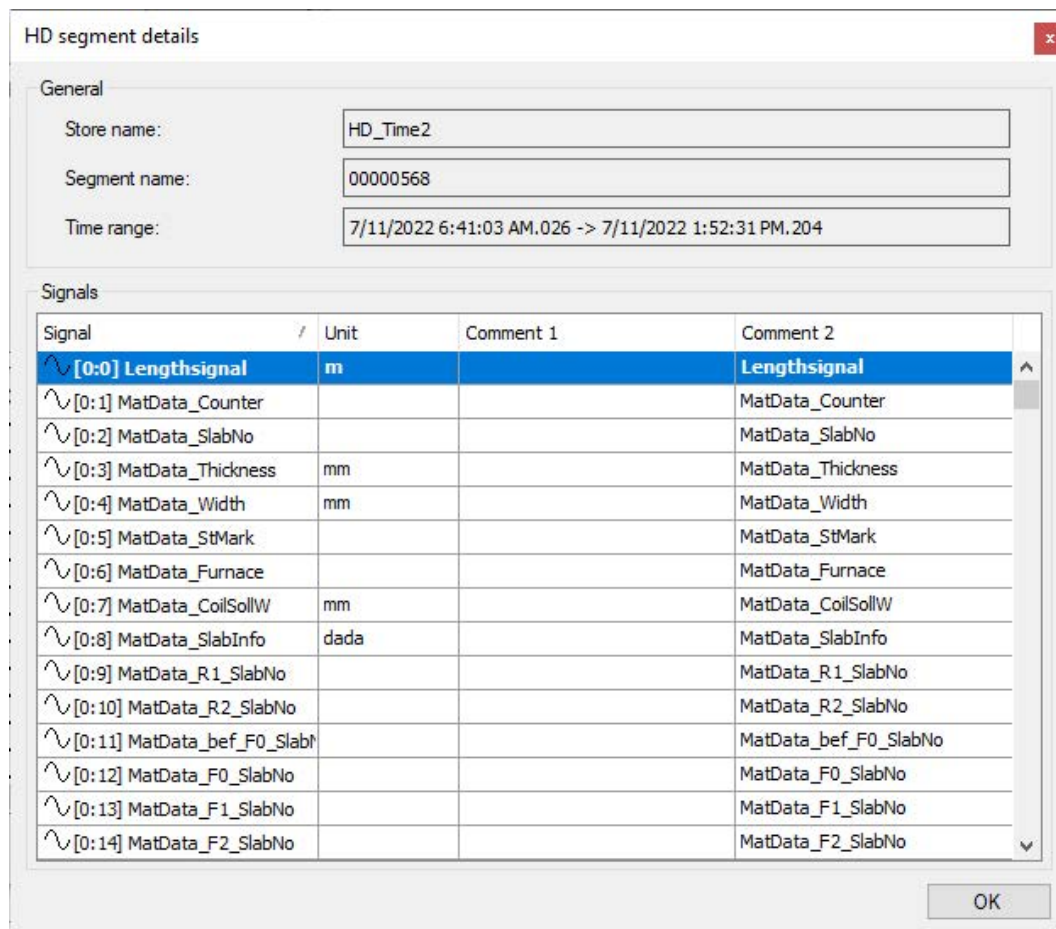
5.1.1.3 HD segment details

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.



Begin	End	Name
7/11/2022 6:41:03.026 AM	7/11/2022 1:52:31.204 PM	00000568
7/8/2022 7:55:11.677 AM	7/8/2022 4:04:51.717 PM	00000551

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



HD segment details

General

Store name: HD_Time2

Segment name: 00000568

Time range: 7/11/2022 6:41:03 AM.026 -> 7/11/2022 1:52:31 PM.204

Signals

Signal	Unit	Comment 1	Comment 2
[0:0] Lengthsignal	m		Lengthsignal
[0:1] MatData_Counter			MatData_Counter
[0:2] MatData_SlabNo			MatData_SlabNo
[0:3] MatData_Thickness	mm		MatData_Thickness
[0:4] MatData_Width	mm		MatData_Width
[0:5] MatData_StMark			MatData_StMark
[0:6] MatData_Furnace			MatData_Furnace
[0:7] MatData_CoilSollW	mm		MatData_CoilSollW
[0:8] MatData_SlabInfo	dada		MatData_SlabInfo
[0:9] MatData_R1_SlabNo			MatData_R1_SlabNo
[0:10] MatData_R2_SlabNo			MatData_R2_SlabNo
[0:11] MatData_bef_F0_SlabNo			MatData_bef_F0_SlabNo
[0:12] MatData_F0_SlabNo			MatData_F0_SlabNo
[0:13] MatData_F1_SlabNo			MatData_F1_SlabNo
[0:14] MatData_F2_SlabNo			MatData_F2_SlabNo

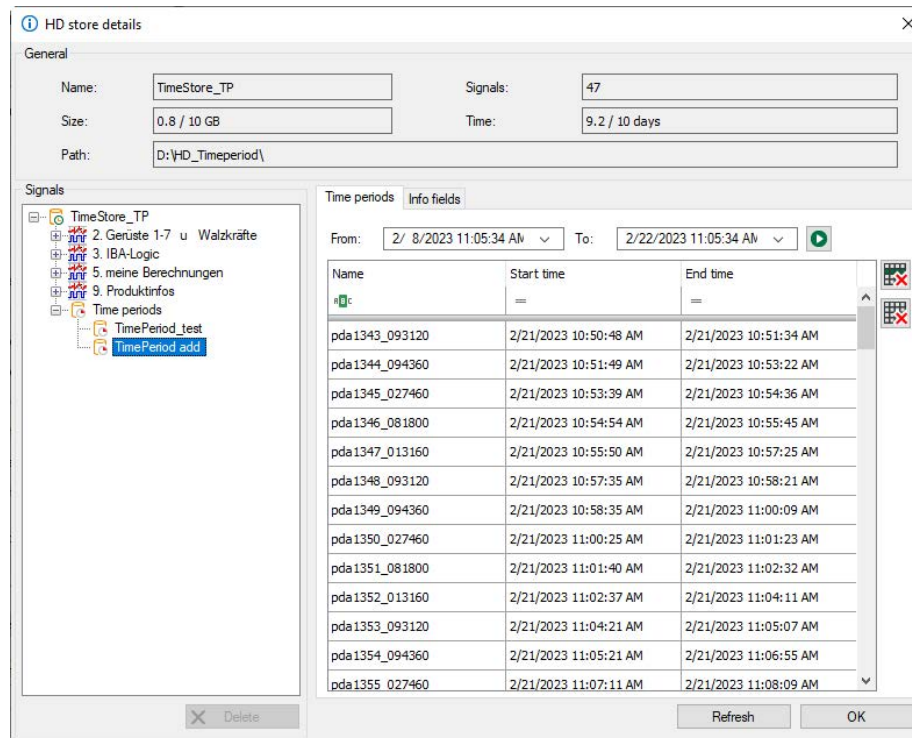
OK

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


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

5.1.1.4 HD store details for time periods



If one of the available time periods is 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, individual time periods 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 filter these 100 entries by name, start time, or end time.

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

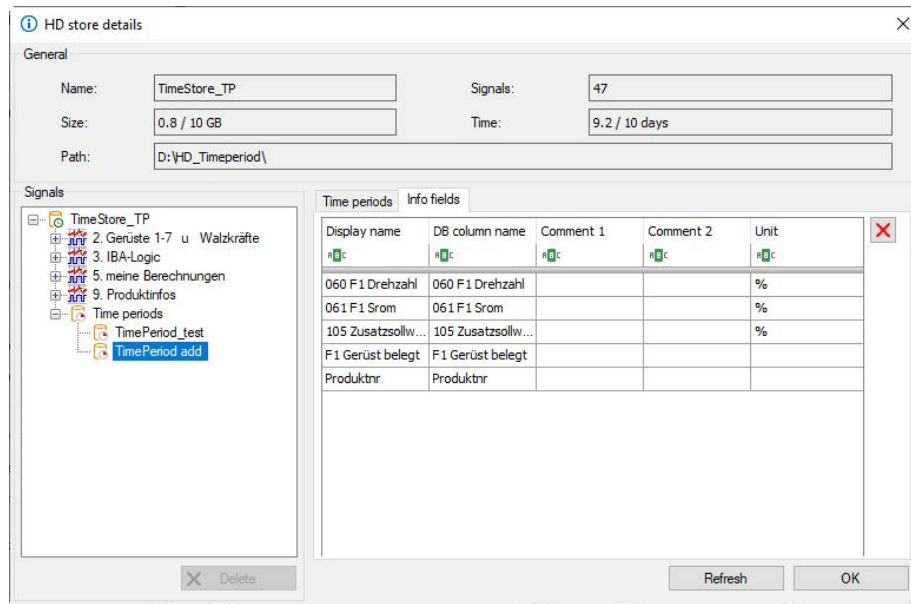
	The selected time periods are deleted. Multiple time periods can be selected.
	All time periods from the selected time range are deleted.

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 field(s) 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 recreated by restarting the writing, but the old values of the info field are not restored.

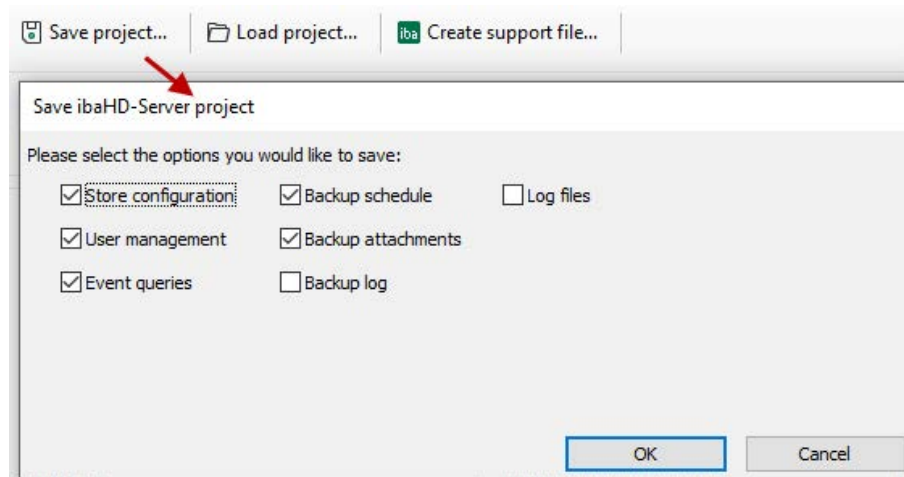
Delete operations can take several minutes.

5.1.2 Manage ibaHD-Server projects

Use the menu buttons *Save project...* and *Load project...* in the *General* tab of *ibaHD Manager* to save and reload complete *ibaHD-Server* configurations as a project file.

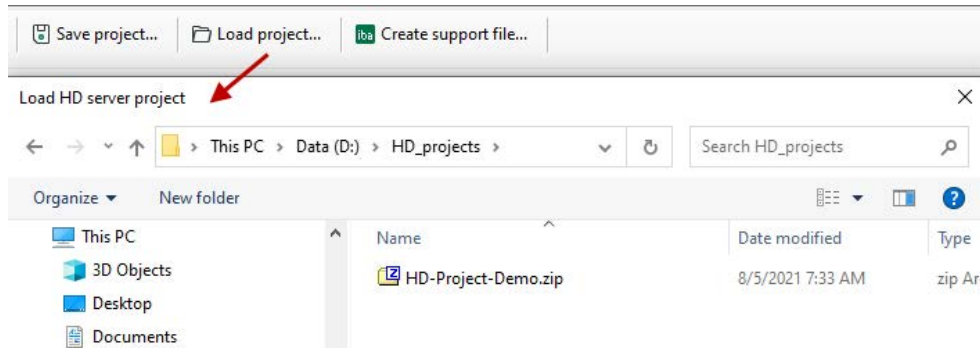
For example, it is helpful to use project files if you need to migrate your configurations to a new computer.

Save project



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

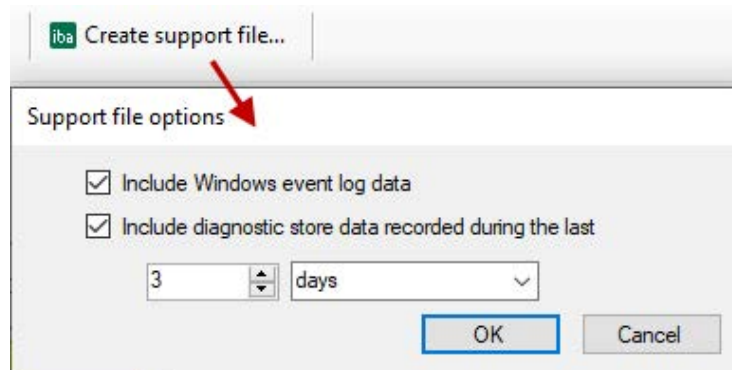
Load project



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

5.1.3 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

In general, we recommend sending a current support file to our support desk if a problem occurs.

5.2 Current connections

The current connection parameters of the active HD client (incl. version, IP address and user name) and the active HD stores are displayed in the *Connections* tab in the main window of the *ibaHD Manager*.

Connected HD clients

Source	Version	IP address	Username	Connected since	Licenses	Throughput
Name						Buffer Disk Total
IBA-FUE-...	8.0.0	fe80::31fc:255b:20...	admin	7/11/2022 2:29...		0 B/s 0 B/s 0 B/s
IBA-FUE-...	3.0.0.0	::1	admin	7/11/2022 2:31...		0 B/s 0 B/s 0 B/s

Active HD stores

Store	Buffer size	Source	Version	IP address	Username	Connected si...	Signal count	Throughput
Name		Name						Buffer Disk
HD_Time2	1.56 MB (2%)	IBA-FUE-...	8.0.0.0	fe80::31fc:255b...	admin	7/11/2022 2:...	76	12.25 KB/s 11.13 KB/s
HD_Time1	834.32 KB (1%)	IBA-FUE-...	8.0.0.0	fe80::31fc:255b...	admin	7/11/2022 2:...	45	4.71 KB/s 2.03 KB/s
HD_TRIG	1.05 MB (2%)	IBA-FUE-...	8.0.0.0	fe80::31fc:255b...	admin	7/11/2022 2:...	1	507 B/s 0 B/s

3.44 MB 122 17.46 KB/s 13.16 KB/s

★ Logged in as admin

5.3 Backup

Regarding the topic of “backup,” please read [Creating and managing backups](#), page 203

5.4 Import

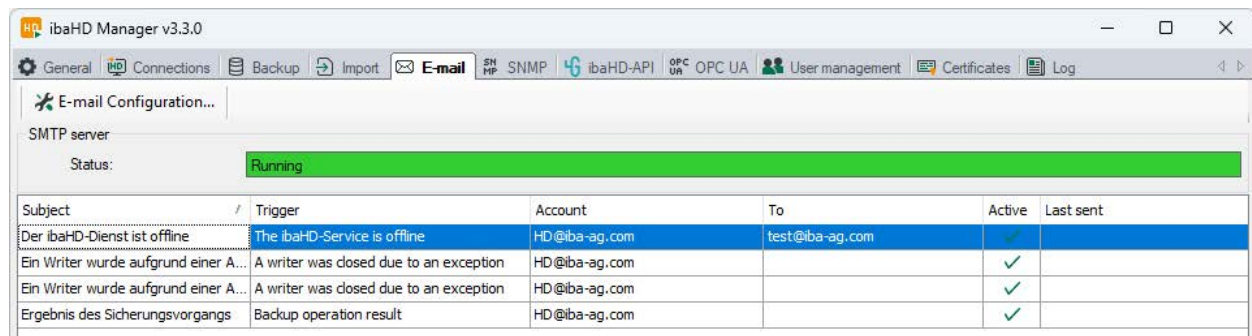
Regarding the “importing” topic, please read [Importing data files](#), page 220

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 of e-mails is triggered by various predefined events or status changes. Click on <E-mail configuration> to configure the e-mail accounts, the triggering events, and the messages.

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

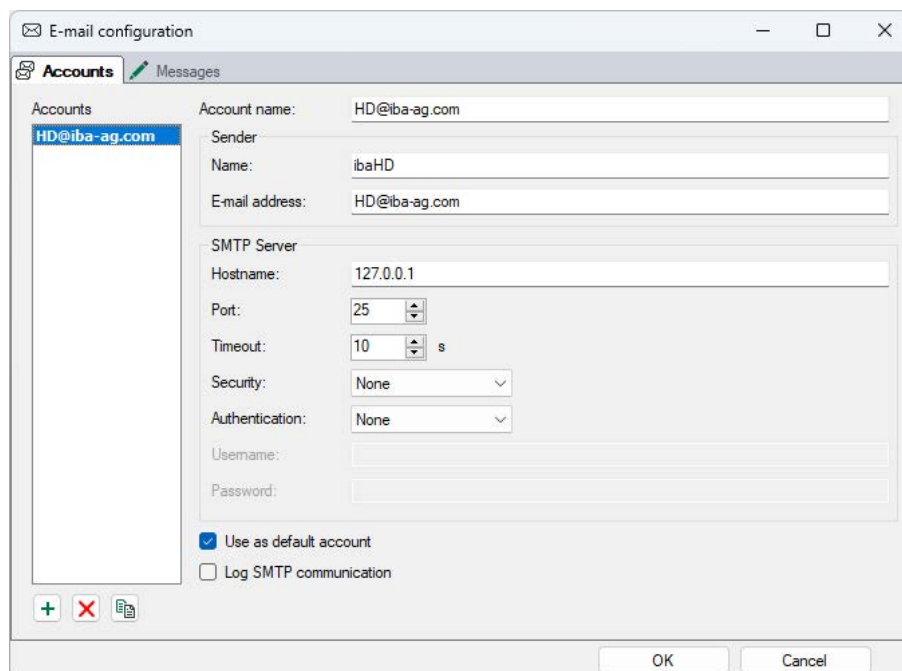
The table shows the configured e-mail notifications, with information about the subject, trigger, sender e-mail account, recipient address, and time last sent.



Subject	Trigger	Account	To	Active	Last sent
Der ibaHD-Dienst ist offline	The ibaHD-Service is offline	HD@iba-ag.com	test@iba-ag.com	✓	
Ein Writer wurde aufgrund einer A...	A writer was closed due to an exception	HD@iba-ag.com		✓	
Ein Writer wurde aufgrund einer A...	A writer was closed due to an exception	HD@iba-ag.com		✓	
Ergebnis des Sicherungsvorgangs	Backup operation result	HD@iba-ag.com		✓	

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.



E-mail configuration

Accounts Messages

Accounts

Account name: HD@iba-ag.com

Sender

Name: ibaHD

E-mail address: HD@iba-ag.com

SMTP Server

Hostname: 127.0.0.1

Port: 25

Timeout: 10 s

Security: None

Authentication: None

Username:

Password:

☒ Use as default account

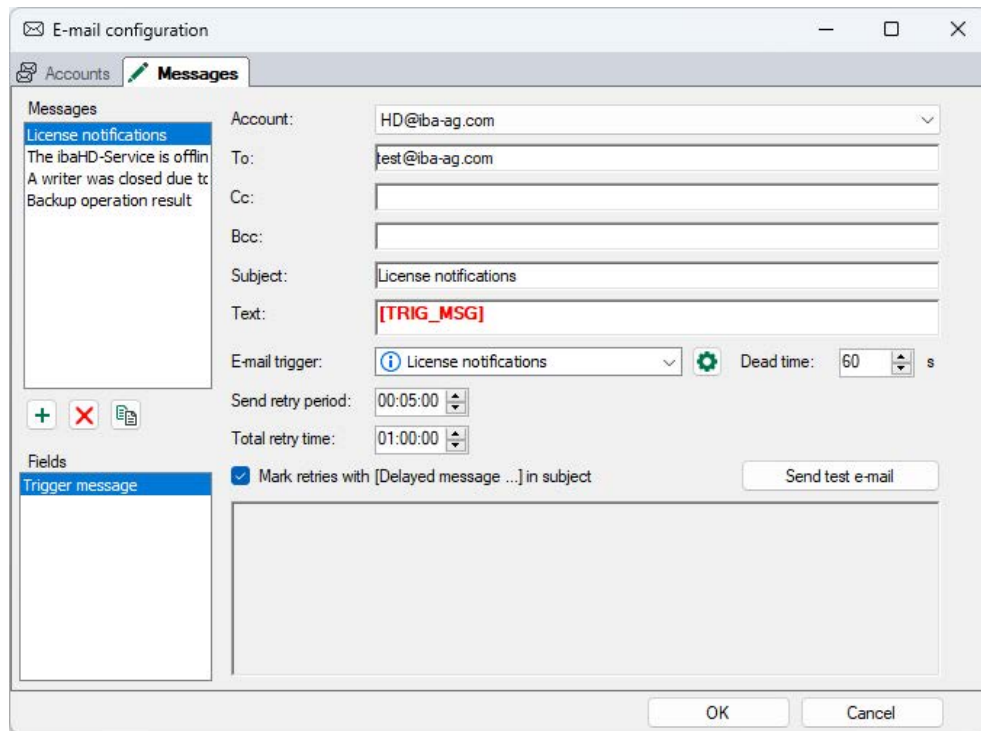
☐ Log SMTP communication

OK Cancel

Use the <+> button to add an account and enter the required account name, sender, and SMTP server information. If available, multiple accounts can be configured and used.

5.5.2 Messages


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

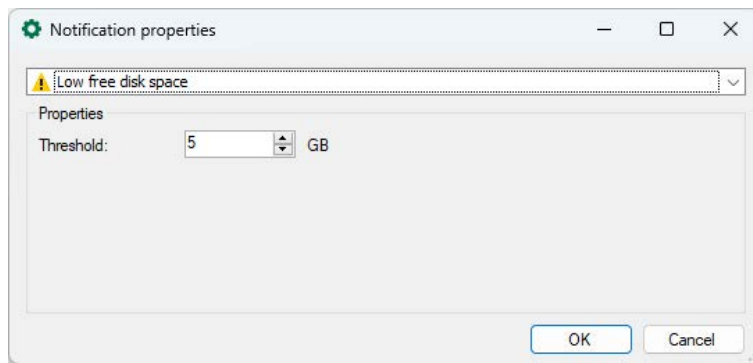


Select the sender account and enter the default information, such as recipient, CC, BCC, and subject.

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

- A client writing to the ibaHD server was closed due to an exception.
- 3 server exceptions in the last 60 minutes (configurable)
- 3 server warnings in the last 60 minutes (configurable)
- Low free disk space (configurable)
- License messages
- The ibaHD service is offline
- The ibaHD service is online
- Backup result

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
Low free disk space	<i>Threshold:</i> The notification is sent if the free disk space falls below the specified limit.
3 server exceptions in the last 60 minutes	<i>Threshold, range:</i> You can specify the number of server exceptions and the time range in minutes.
3 server warnings in the last 60 minutes	<i>Threshold, range:</i> You can specify the number of server warnings and the time range in minutes.

The *Text* field contains a placeholder [TRIG_MSG], which is filled automatically depending on the selected *e-mail trigger*. However, you can also enter individual 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 *Repeat sending period* and *Repeat sending total time* settings to determine the intervals after which and for how long in total failed sending of an e-mail is repeated.

Enabling the *Mark 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:

The screenshot displays the **ibaHD Manager v3.0.0** interface, specifically the **SNMP** configuration tab. The top menu bar includes options like **General**, **Connections**, **Backup**, **Import**, **SNMP**, **ibaHD-API**, **User management**, and **Log**. Below the menu, there are three buttons: **Configure SNMP server...**, **Create MIB files...**, and **Clear client list**.

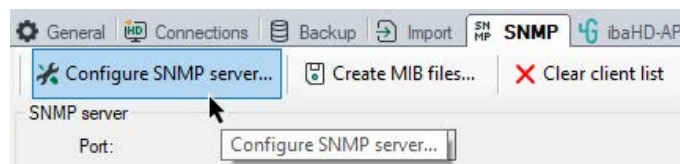
The main configuration area is divided into three sections:

- SNMP server:**
 - Port:** 1614
 - Status:** Running on port 1614 (indicated by a green bar)
 - Engine ID:** 80 00 B0 40 83 06 4E BC 5F F4 F4 DC 6B
- Object tree:** A hierarchical tree structure showing the MIB tree. The root is **1.3.6.1.4.1.45120**, which branches into **0. Library**, **4. ibaHD**, **0. General**, **1. Product**, **1. Service**, **2. Stores**, **1. Columns**, **3. Read clients**, **4. Write clients**, and **5. Backup**. The **1. Product** node is currently selected.
- Object info:** A panel on the right showing details for the selected object. It includes fields for:
 - OID:** 1.3.6.1.4.1.45120.4.1
 - Value:** (empty field)
 - Type:** (empty field)
 - MIB name:** ibaHD-ServerSpecific
 - MIB description:** Product-specific information

At the bottom of the interface, there is a section for **Connected SNMP clients** with a table that has columns for **Address**, **Protocol**, **Message count**, and **Last message**. The status bar at the bottom right indicates **Logged in as admin**.

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:

Port	Port number for <i>ibaHD-API</i> 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 *Certificates* 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.

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.

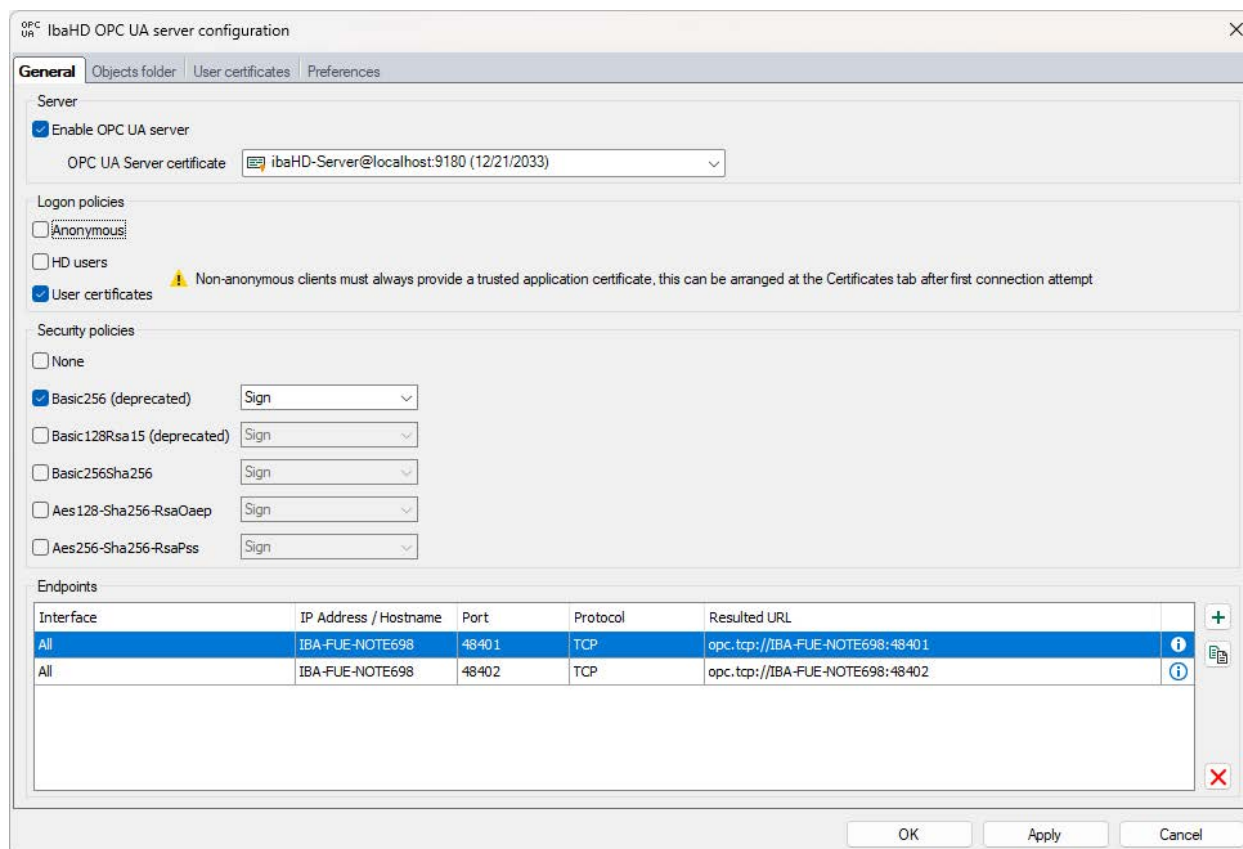


Note



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 65.

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.

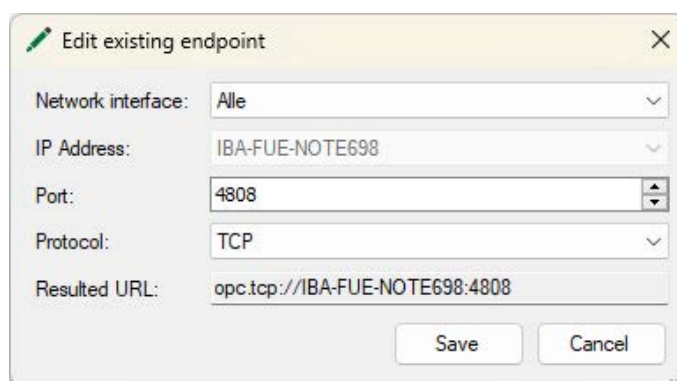
Endpoints				
Interface	IP Address / Hostname	Port	Protocol	Resulted URL
All	IBA-FUE-NOTE698	48080	TCP	opc.tcp://IBA-FUE-NOTE698:48080
All	IBA-FUE-NOTE698	48081	TCP	opc.tcp://IBA-FUE-NOTE698:48081
Ethernet	169.254.38.171	49000	TCP	opc.tcp://169.254.38.171:49000

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 titled "Edit existing endpoint" contains the following fields:

- Network interface: Alle
- IP Address: IBA-FUE-NOTE698
- Port: 4808
- Protocol: TCP
- Resulted URL: opc.tcp://IBA-FUE-NOTE698:4808

Buttons: Save, Cancel

The dialog box is the same as for *Add endpoint*, see chapter [Add new endpoint](#), page 59.

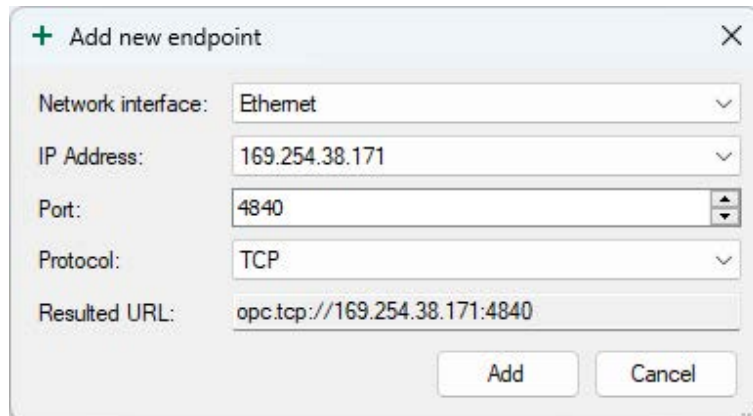
Note



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

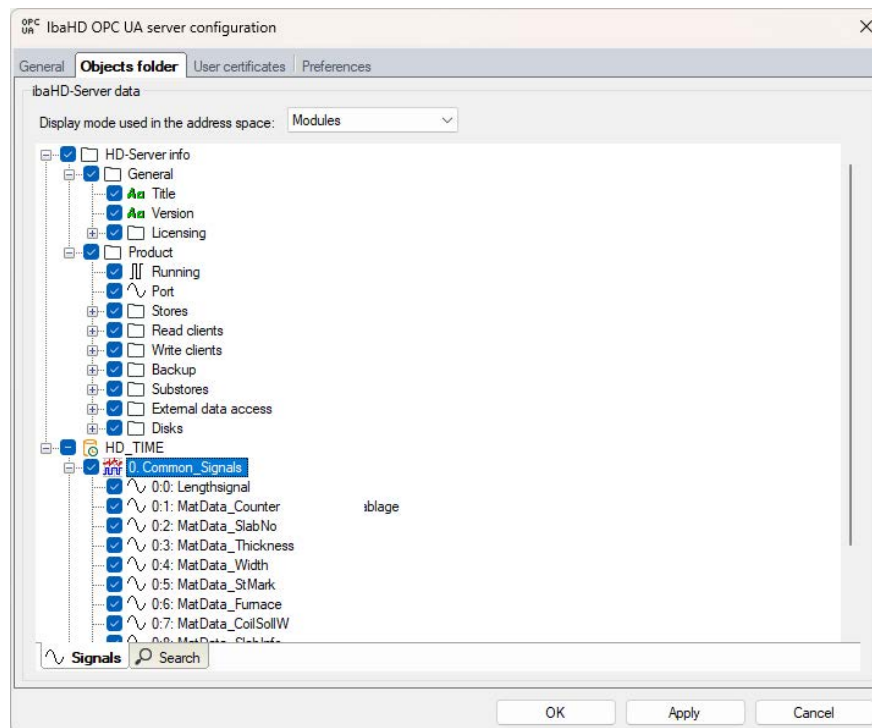
To use HTTPS, at least one Sign & Encrypt security policy is required.

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.



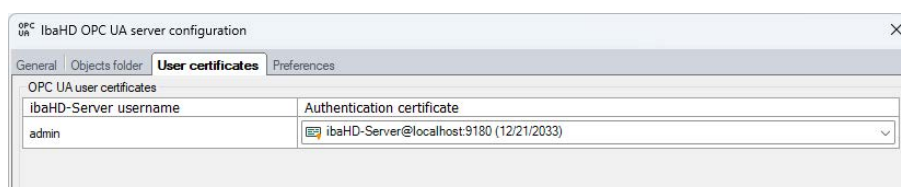
ibaHD server data

A tree structure shows the content of the active ibaHD 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 ibaHD stores. You can select entire ibaHD 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 ibaHD 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.

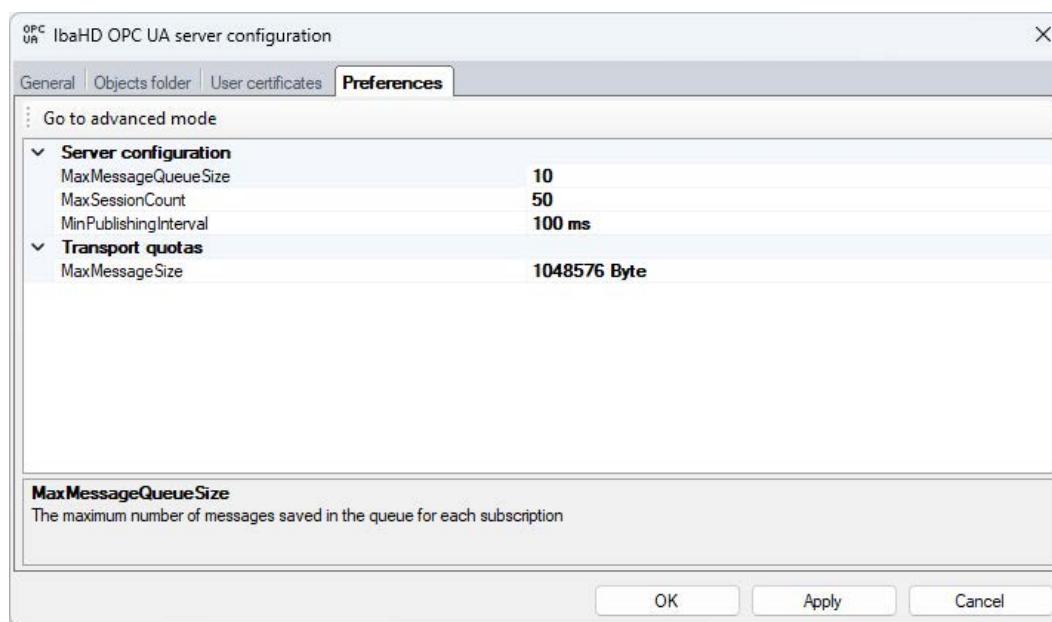
On the *User certificates* tab you can assign certificates to ibaHD users using the drop-down list, or create a new certificate.

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.

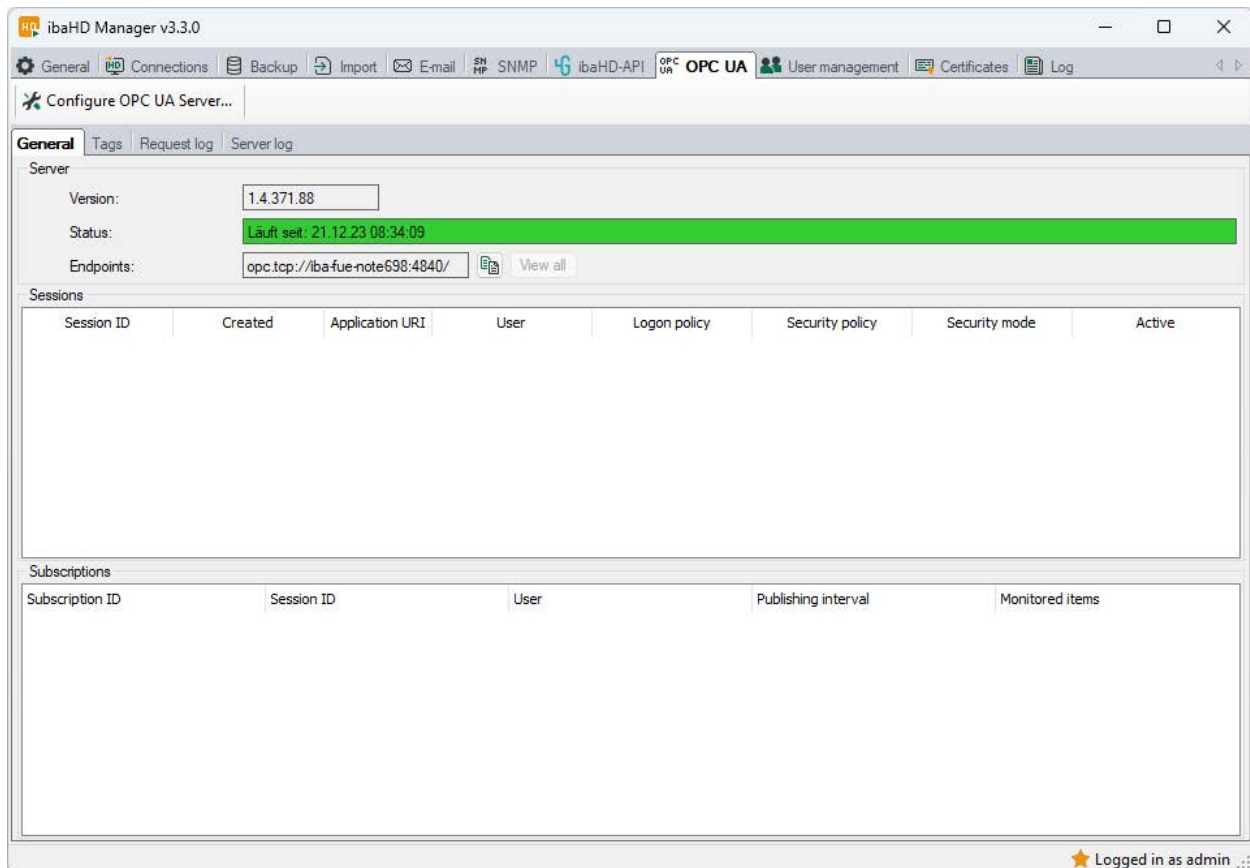
The parameters displayed can be configured as text and are adopted when you click on <OK> or <Apply>. If the configured parameter is outside the permitted range, it is reset to the default value.

Clicking on <Advanced mode> calls up the full 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.

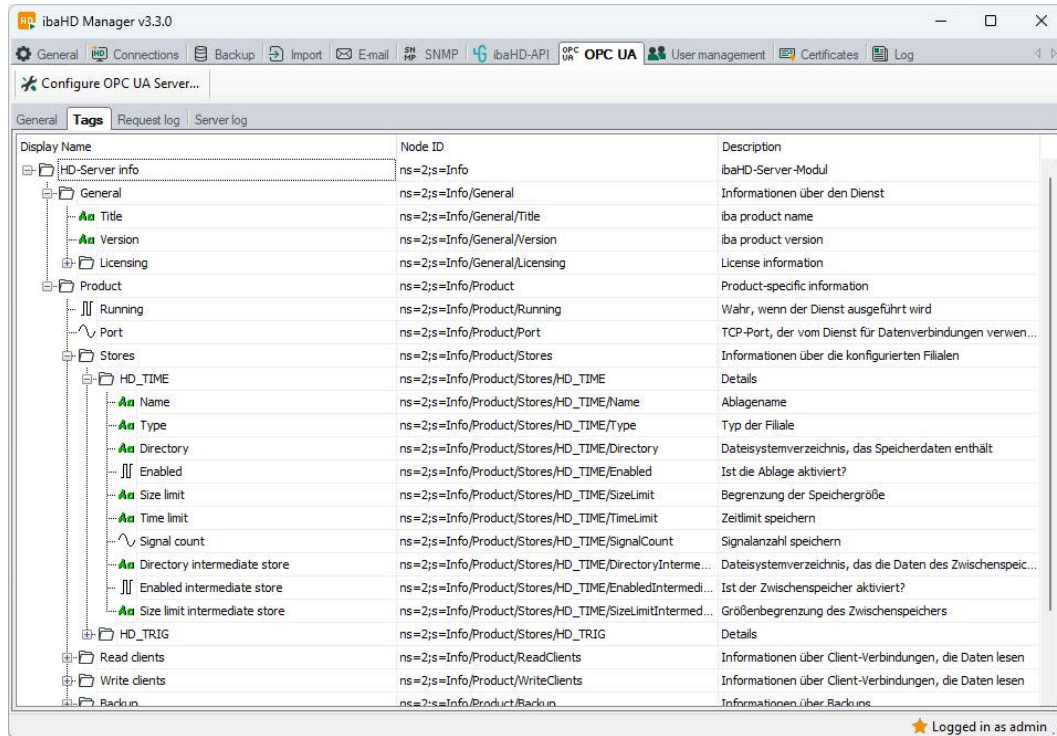
Sessions

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



Display Name	Node ID	Description
HD-Server info	ns=2;s=Info	ibaHD-Server-Modul
General	ns=2;s=Info/General	Informationen über den Dienst
Title	ns=2;s=Info/General/Title	iba product name
Version	ns=2;s=Info/General/Version	iba product version
Licensing	ns=2;s=Info/General/Licensing	License information
Product	ns=2;s=Info/Product	Product-specific information
Running	ns=2;s=Info/Product/Running	Wahr, wenn der Dienst ausgeführt wird
Port	ns=2;s=Info/Product/Port	TCP-Port, der vom Dienst für Datenverbindungen verwenden...
Stores	ns=2;s=Info/Product/Stores	Informationen über die konfigurierten Filialen
HD_TIME	ns=2;s=Info/Product/Stores/HD_TIME	Details
Name	ns=2;s=Info/Product/Stores/HD_TIME/Name	Ablagenname
Type	ns=2;s=Info/Product/Stores/HD_TIME/Type	Typ der Filiale
Directory	ns=2;s=Info/Product/Stores/HD_TIME/Directory	Dateisystemverzeichnis, das Speicherdaten enthält
Enabled	ns=2;s=Info/Product/Stores/HD_TIME/Enabled	Ist die Ablage aktiviert?
Size limit	ns=2;s=Info/Product/Stores/HD_TIME/SizeLimit	Begrenzung der Speichergröße
Time limit	ns=2;s=Info/Product/Stores/HD_TIME/TimeLimit	Zeitlimit speichern
Signal count	ns=2;s=Info/Product/Stores/HD_TIME/SignalCount	Signalanzahl speichern
Directory intermediate store	ns=2;s=Info/Product/Stores/HD_TIME/DirectoryInterme...	Dateisystemverzeichnis, das die Daten des Zwischenspeic...
Enabled intermediate store	ns=2;s=Info/Product/Stores/HD_TIME/EnabledIntermedi...	Ist der Zwischenspeicher aktiviert?
Size limit intermediate store	ns=2;s=Info/Product/Stores/HD_TIME/SizeLimitIntermed...	Größenbegrenzung des Zwischenspeichers
HD_TRIG	ns=2;s=Info/Product/Stores/HD_TRIG	Details
Read clients	ns=2;s=Info/Product/ReadClients	Informationen über Client-Verbindungen, die Daten lesen
Write clients	ns=2;s=Info/Product/WriteClients	Informationen über Client-Verbindungen, die Daten lesen
Backup	ns=2;s=Info/Product/Backup	Informationen über Backups

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

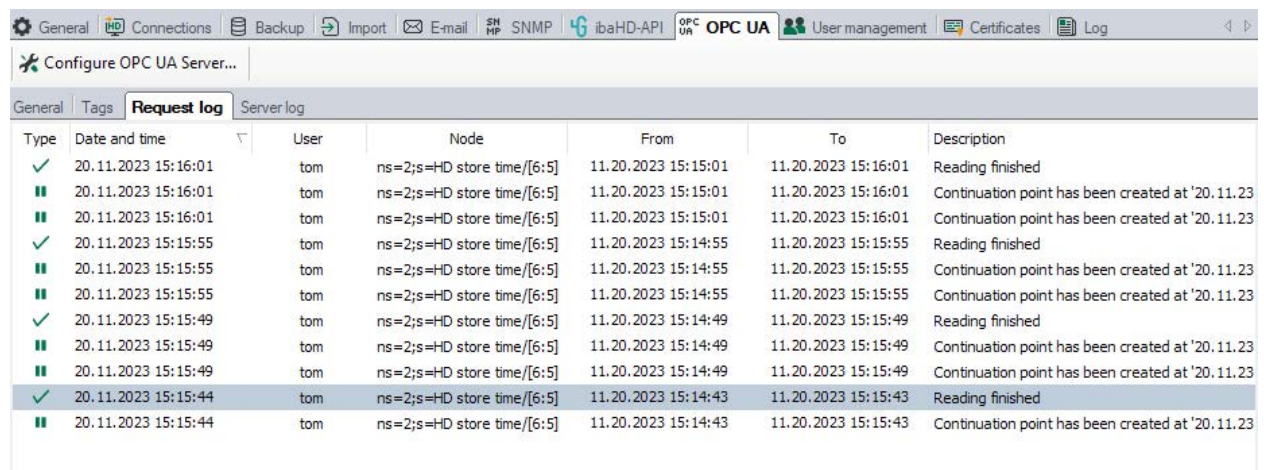
The node ID can be copied so that it can be used later in an OPC UA client.

Note



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

5.8.2.3 Request log

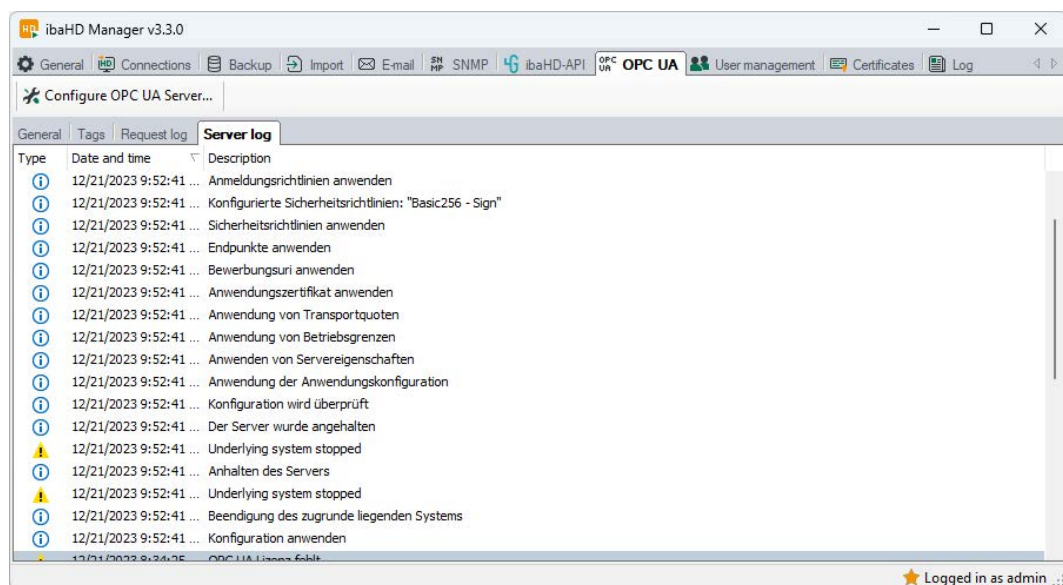


Type	Date and time	User	Node	From	To	Description
✓	20.11.2023 15:16:01	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:15:01	11.20.2023 15:16:01	Reading finished
II	20.11.2023 15:16:01	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:15:01	11.20.2023 15:16:01	Continuation point has been created at '20.11.23
II	20.11.2023 15:16:01	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:15:01	11.20.2023 15:16:01	Continuation point has been created at '20.11.23
✓	20.11.2023 15:15:55	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:55	11.20.2023 15:15:55	Reading finished
II	20.11.2023 15:15:55	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:55	11.20.2023 15:15:55	Continuation point has been created at '20.11.23
II	20.11.2023 15:15:55	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:55	11.20.2023 15:15:55	Continuation point has been created at '20.11.23
✓	20.11.2023 15:15:49	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:49	11.20.2023 15:15:49	Reading finished
II	20.11.2023 15:15:49	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:49	11.20.2023 15:15:49	Continuation point has been created at '20.11.23
II	20.11.2023 15:15:49	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:49	11.20.2023 15:15:49	Continuation point has been created at '20.11.23
✓	20.11.2023 15:15:44	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:43	11.20.2023 15:15:43	Reading finished
II	20.11.2023 15:15:44	tom	ns=2;s=HD store time/[6:5]	11.20.2023 15:14:43	11.20.2023 15:15:43	Continuation point has been created at '20.11.23

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



Type	Date and time	Description
i	12/21/2023 9:52:41 ...	Anmeldungsrichtlinien anwenden
i	12/21/2023 9:52:41 ...	Konfigurierte Sicherheitsrichtlinien: "Basic256 - Sign"
i	12/21/2023 9:52:41 ...	Sicherheitsrichtlinien anwenden
i	12/21/2023 9:52:41 ...	Endpunkte anwenden
i	12/21/2023 9:52:41 ...	Bewerbungsuri anwenden
i	12/21/2023 9:52:41 ...	Anwendungszertifikat anwenden
i	12/21/2023 9:52:41 ...	Anwendung von Transportquoten
i	12/21/2023 9:52:41 ...	Anwendung von Betriebsgrenzen
i	12/21/2023 9:52:41 ...	Anwenden von Servereigenschaften
i	12/21/2023 9:52:41 ...	Anwendung der Anwendungsconfiguration
i	12/21/2023 9:52:41 ...	Konfiguration wird überprüft
i	12/21/2023 9:52:41 ...	Der Server wurde angehalten
!	12/21/2023 9:52:41 ...	Underlying system stopped
i	12/21/2023 9:52:41 ...	Anhalten des Servers
!	12/21/2023 9:52:41 ...	Underlying system stopped
i	12/21/2023 9:52:41 ...	Beendigung des zugrunde liegenden Systems
i	12/21/2023 9:52:41 ...	Konfiguration anwenden
!	12/21/2023 9:52:41 ...	OPC UA Lizenz fehlt

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.







Name	Properties	Issued By	Expiration Date	State	Used By	Thumbprint	URI
ibaHD-Server_api@localhost:9180		ibaHD-Server_api@localhost:9180	16.05.2033 11:37:28		ibaHD-API Instance	C4C3CA8CA001279...	urn:IBA-FUE-NOTES18:ibaH...
ibaHD-Server@localhost:9180		ibaHD-Server@localhost:9180	22.05.2033 09:42:17			D02D052E73...	urn:IBA-FUE-NOTES18:ibaH...
ibaHD-Server_admin@localhost:9180		ibaHD-Server_admin@localhost:9180	22.05.2033 09:43:18			FD38A72659...	urn:IBA-FUE-NOTES18:ibaH...
UaExpert\$		UaExpert\$	19.07.2027 14:22:45			B1C530F1D4...	urn:IBA-FUE-NOTES18:Unfr...
ibaHD-Server_OPC_UA@localhost:9180		ibaHD-Server_OPC_UA@localhost:9180	10.10.2033 13:04:36			32CC1D710A...	urn:IBA-FUE-NOTES18:ibaH...

Columns
<input checked="" type="checkbox"/> Name
<input checked="" type="checkbox"/> Properties
<input checked="" type="checkbox"/> Organization
<input checked="" type="checkbox"/> Locality
<input checked="" type="checkbox"/> State
<input checked="" type="checkbox"/> Country
<input checked="" type="checkbox"/> Issued By
<input checked="" type="checkbox"/> Issuing Date
<input checked="" type="checkbox"/> Expiration Date
<input checked="" type="checkbox"/> Algorithm
<input checked="" type="checkbox"/> Thumbprint
<input checked="" type="checkbox"/> Used By
<input checked="" type="checkbox"/> URI
<input type="checkbox"/> Reset

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.
	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 select the certificate to be used for the API communication.

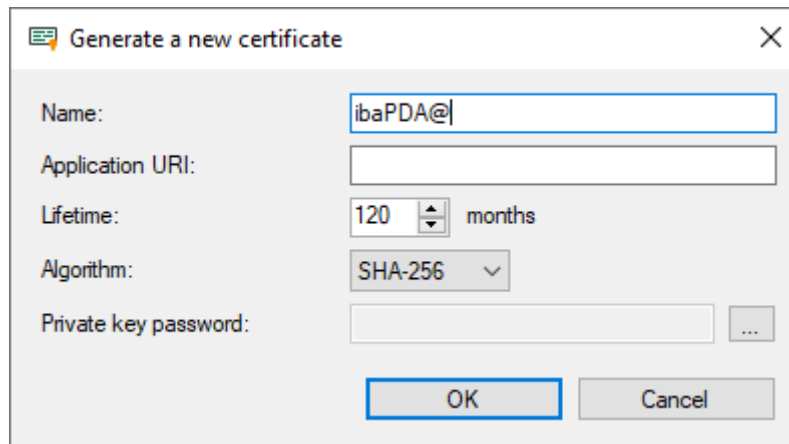
The symbols in the *Properties* column have the following meanings:

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.
	This certificate is used for API communication.

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:



The dialog box titled "Generate a new certificate" contains the following fields and controls:


- Name:** A text input field containing "ibaPDA@".
- Application URI:** An empty text input field.
- Lifetime:** A numeric input field set to "120" with a "months" unit label.
- Algorithm:** A dropdown menu currently showing "SHA-256".
- Private key password:** A text input field with an adjacent "..." button for password selection.
- Buttons:** "OK" and "Cancel" buttons at the bottom right.

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

ibaHD-Server specific user management

For *ibaHD-Server*, permissions regarding *ibaHD-Server* and *ibaPDA* client can be assigned to the users in the *User Management* tab of *ibaHD Manager*. You manage the permissions regarding *ibaHD-Server* in the *ibaHD Manager* program

For managing the permissions regarding *ibaPDA* client, you can use the program *ibaHD Manager* as well as the corresponding dialog in *ibaPDA* client, if this program is connected to an *ibaHD-Server*.

ibaHD-Server supports two types of users:

- Local users
- Domain users

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

The management of domain users is described in chapter 5.10.2, page 75 using the example of *ibaPDA*. It applies accordingly for *ibaHD-Server*, both in *ibaPDA* client and *ibaHD Manager*.

Note



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

5.10.1 Local user management in ibaHD-Server

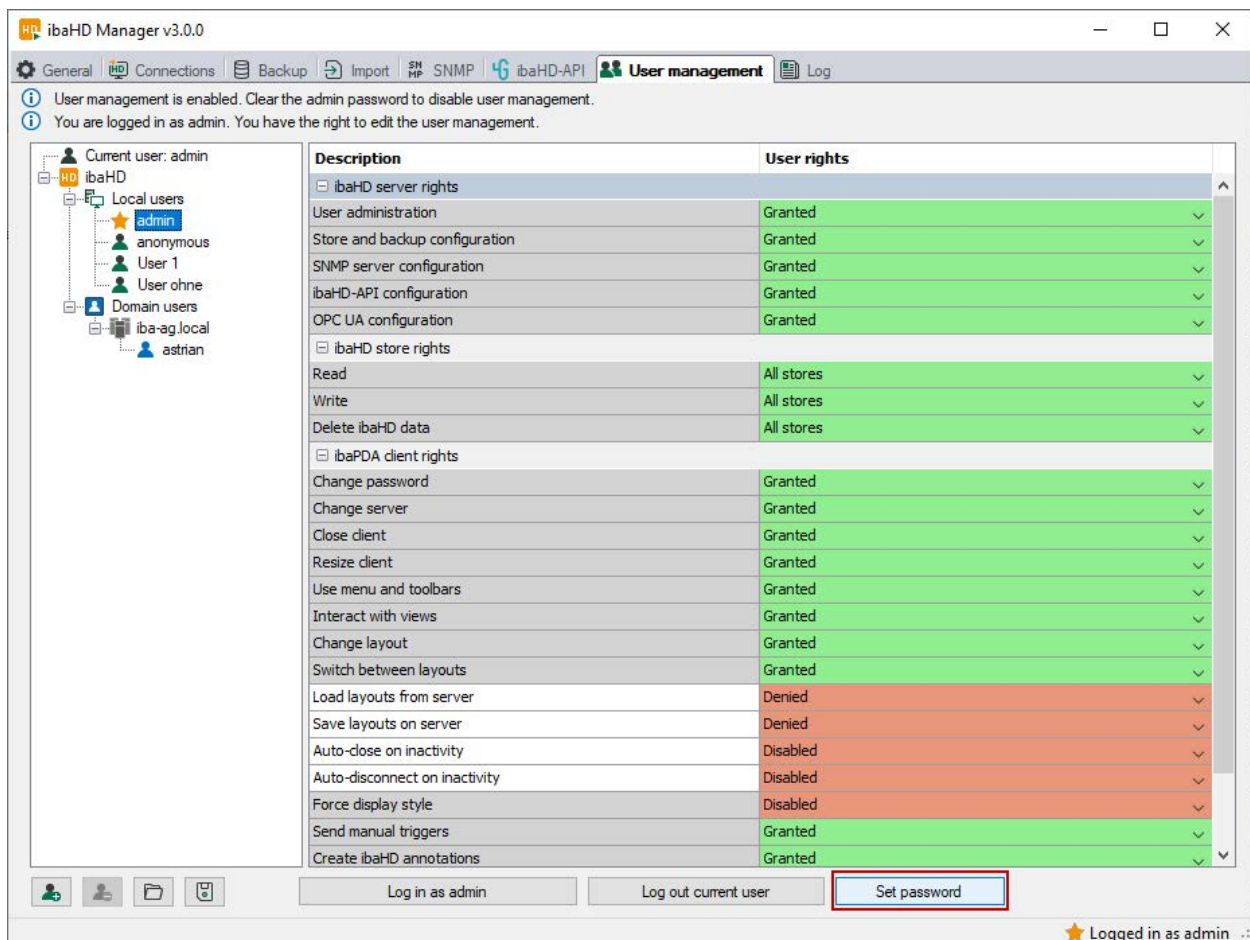
The user management allows the creation of different user accounts. Each user account can be provided with various rights with respect to *ibaPDA* client, *ibaHD-Server* and HD stores. The users *admin* and *anonymous* are the default.

The administrator user, called **admin**, can set up or remove other users and change their rights. The name **admin** cannot be changed.

The user **anonymous** serves for accessing older program versions which do not offer the possibility to enter user name and password, such as *ibaPDA-V6*, *ibaAnalyzer v6.x* and *ibaDatCoordinator v2.1.0* and older. These program versions connect to the *ibaHD-Server* with the user **anonymous**.

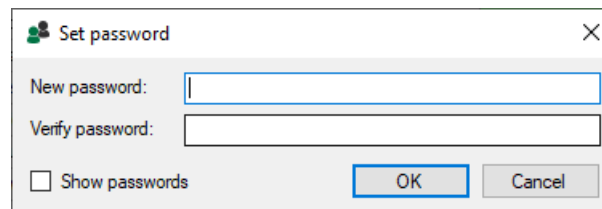
Via the configuration of the HD store permissions for the user **anonymous**, you can individually grant or deny the right to read and/or write for each HD store if you are working with older program versions.

Perform the user configuration in the *User administration* tab in the main window of the *ibaHD Manager*.



As long as the user **admin** does not have a password, the user administration is disabled. If the user administration is disabled, every *ibaPDA* client logs into the *ibaHD-Server* as **admin**. All clients therefore have all rights.

To enable the user management system, you have to set a password for the **admin** user. For this purpose, click the <Set password> button.



A dialog box titled "Set password" with a close button (X) in the top right corner. It contains two text input fields: "New password:" and "Verify password:". Below these fields is a checkbox labeled "Show passwords". At the bottom right are two buttons: "OK" and "Cancel".

If the user administration is disabled, then a login dialog appears as soon as you want to connect to the *ibaHD-Server*.



A dialog box titled "Log in" for the "ibaHD-Server". It features the ibaHD logo (an orange square with "HD" inside) and the text "ibaHD-Server". Below this is a "Server:" field containing "localhost:9180". There are two radio buttons: "Current Windows user" (unselected) and "Other user" (selected). Under "Other user", there is a "User name:" dropdown menu showing "admin" and a "Password:" text input field. At the bottom, it says "Local user" and has "OK" and "Cancel" buttons.

If the user administration is enabled and you are logged in as **admin**, then you can set up, remove and change the rights of additional users. You can also assign passwords for each user account.

To add and delete users, the following buttons are available at the bottom:





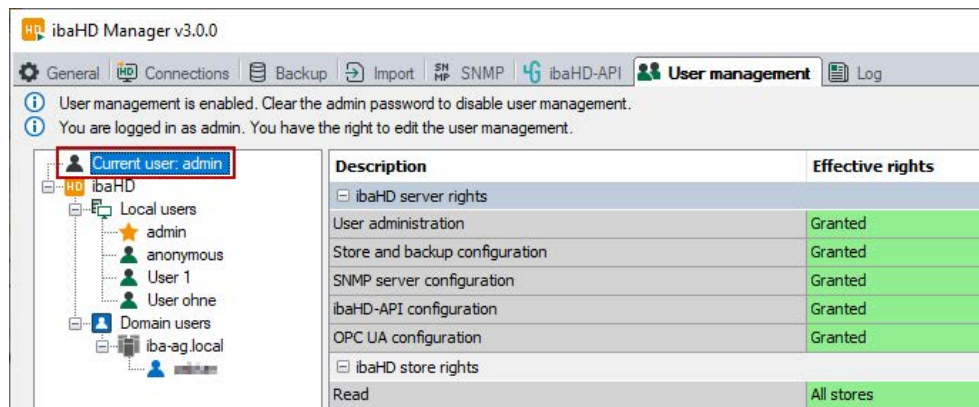
	Add local user/domain user (in <i>ibaPDA</i> client, a distinction is made between <i>ibaPDA</i> users and <i>ibaHD-Server</i> users).
	Delete selected local user/domain user
	Load users from an existing user file (*.pda_users)
	Save the configured (<i>ibaPDA</i>) users in a user file (*.pda_users),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

Table 2: User management buttons


You can change the permissions by selecting the relevant user in the tree and choosing the desired option in the table to the right using the fields' drop-down menu.

The current user is shown in the field *Active user*.



The *User* field lists all configured users.

Add users

Use the button  to add a new user. Enter a username. Setting a password is optional. The user can also specify or change the password at a later time. Close the dialog with <OK>.

Add user

User name:

Password:

Verify password:

☐ Show passwords

Remove users

Select the relevant user in the list and click on the button .

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 passwords...> 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.

5.10.1.1 User rights

User rights are differentiated between store rights, *ibaPDA* client rights and server rights.

In order to assign permissions to a user, mark the corresponding user, select the desired options in the *User rights* table and save the settings by clicking the button <Apply changes>.

Store rights

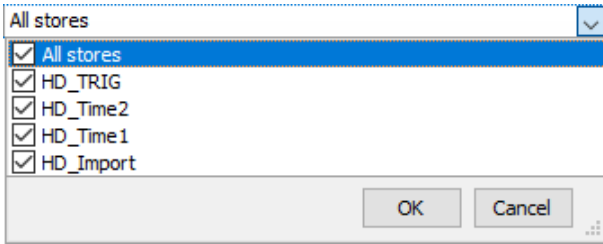
Option	Description
Read	<p>The permission to read HD stores can be individually granted for all HD stores or for select HD stores.</p> <p>Use the black triangle to open the selection dialog and mark <i>all stores</i> or individual HD stores from the list.</p> 
Write	<p>The permission to write in HD stores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

Table 3: User rights for HD stores

ibaPDA client rights

Option	Description
Changing the password	The permission to a user to change his own password.
Change server	The permission to connect to a (different) <i>ibaPDA</i> server.
Close client	The permission to close the <i>ibaPDA</i> client.
Resize client	The permission 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 permission to use menu commands and buttons of the toolbar. Without this permission, the menus and toolbars are disabled (grayed out), except for the toolbar of the signal views. The user can add/remove signals to/from the current signal monitors.

Option	Description
Interact with views	<p>The permission to interact with signal views, e.g. zoom in/out, show/hide signals or change the scaling in trend graphs.</p> <p>If a user is not authorized to interact with views, the permission “Change layout” must also be disabled.</p> <p>This option does not apply to FFT and oscilloscope views. Interaction with those views is always possible.</p>
Change layout	<p>The permission to change the current layout.</p> <p>If you do not have this permission, then you cannot move, reduce or enlarge the <i>ibaPDA</i> client window. You cannot change views. You cannot change docking windows.</p>
Switch between layouts	<p>The permission to switch layouts.</p> <p>With this permission, you can switch between different layouts by using the layout toolbar or function key <F11>.</p>
Load layouts from server	<p>The permission to load layouts from the server.</p> <p>Users with this permission 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 permission cannot manually load layouts from the server, nor is there a query when they log in.</p> <p>Exception user admin:</p> <ul style="list-style-type: none"> ■ 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.
Save layouts on server	<p>The permission to save current or modified layouts on the server.</p> <p>Users with this permission 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 <i>ibaPDA</i>. Users who do not have this permission cannot manually save layouts on the server, nor is there a query when they log out.</p> <p>Exception user admin:</p> <ul style="list-style-type: none"> ■ 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. <p>When saving on the server, the layouts are saved in the layout file (*.layouts) in the path for the server configuration files, e.g.</p> <p>C:\ProgramData\iba\ibaPDA\Layouts</p>

Option	Description
Auto-close on inactivity	Clients that are logged in under a user with this option 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 option will be disconnected from the <i>ibaPDA</i> 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 option show the set display style during starting.
Send manual triggers	The permission to operate the start and stop trigger buttons in the toolbar of the data store.
Create ibaHD annotations	The permission to enter new annotations based on a pre-configured annotation type (selection from a drop-down list).
Configure ibaHD annotations	The permission to configure new annotations/types of annotations.

Table 4: User management, ibaPDA client permissions

Server rights

Option	Description
User administration	The permission to change the user configuration.
Store and backup configuration	The permission to configure HD stores and backups.
SNMP server configuration	The permission to configure the integrated SNMP server.
ibaHD-API configuration	The permission to configure the ibaHD-API server.
OPC UA configuration	The permission to configure the OPC UA server.
Edit ibaHD queries	The 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.

5.10.1.2 Compatibility with other iba programs

The iba programs *ibaPDA-V6*, *ibaAnalyzer v6.x* and *ibaDatCoordinator v2.1.0* and older do not allow the input of username and password when accessing HD data. That is why the user **anonymous** is set up in advance in the *ibaHD-Server* from v2.3.0. All aforementioned programs always connect to the *ibaHD-Server* with the user **anonymous**.

Via the configuration of the HD store permissions for the user **anonymous**, you can individually grant or deny the right to read and/or write for each HD store for the aforementioned programs.

For the iba programs *ibaPDA-V7*, *ibaAnalyzer v7.x* and *ibaDatCoordinator v2.2.0* or higher, the user login information is queried when accessing HD data.

5.10.2 User management in a domain with Active Directory

The programs *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.

5.10.2.1 Advantages of the Active Directory method

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

Active Directory users, or *domain users* as they are called in the programs, 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 program'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 program 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 program's user management system if required, e.g., to obtain rights that differ from those of the group.

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

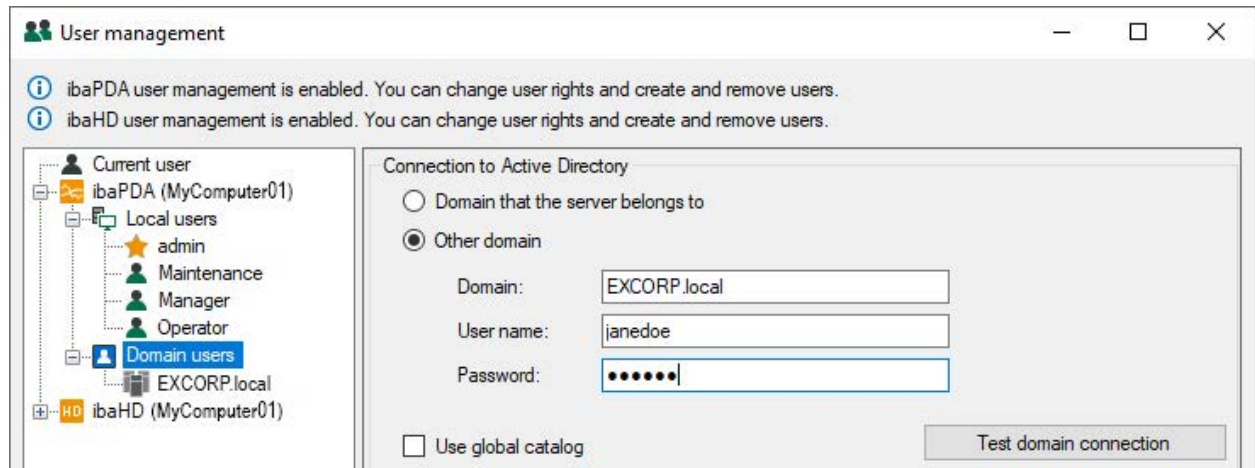
5.10.2.2 Establish a connection to a domain

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 creden-

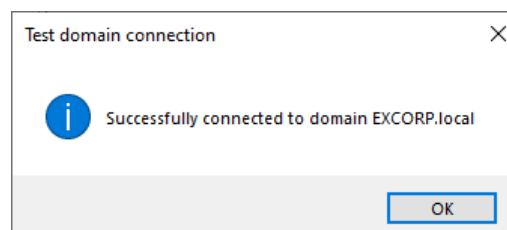
tials of a user from that domain. Thus, it is possible to use the users of an Active Directory on an *ibaPDA* computer that is not integrated in a domain (e.g., only part of a workgroup). The prerequisite is, of course, that the domain is accessible so that *ibaPDA* can query the corresponding information.

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:





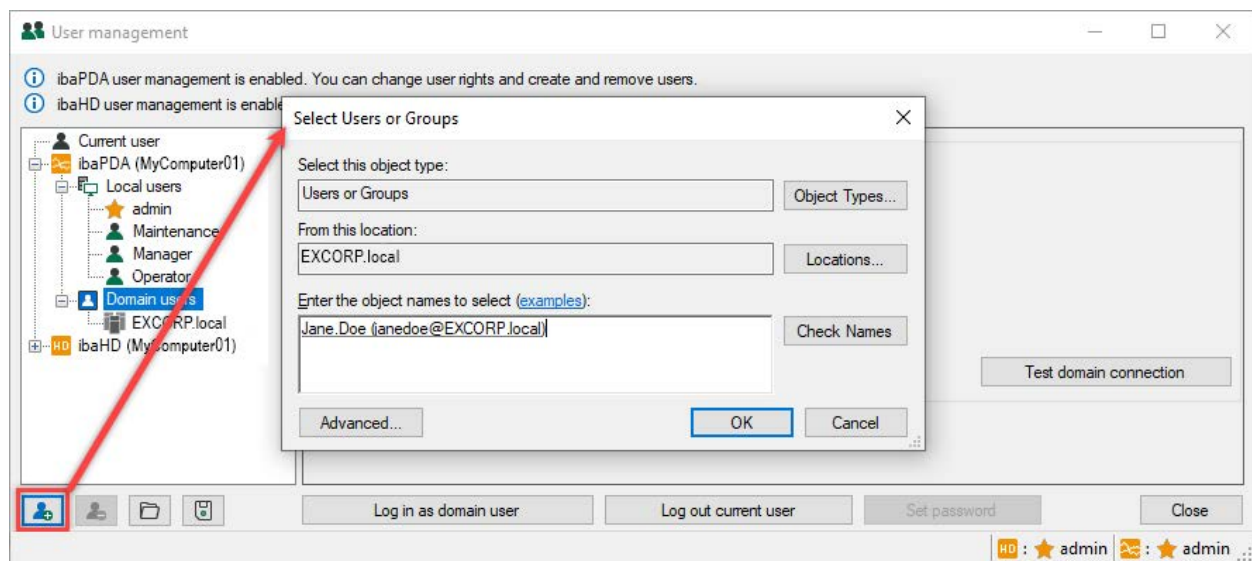
	Add local user/domain user (in <i>ibaPDA</i> client, a distinction is made between <i>ibaPDA</i> users and <i>ibaHD-Server</i> users).
	Delete selected local user/domain user
	Load users from an existing user file (*.pda_users)
	Save the configured (<i>ibaPDA</i>) users in a user file (*.pda_users),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

Table 6: 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 75).
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.

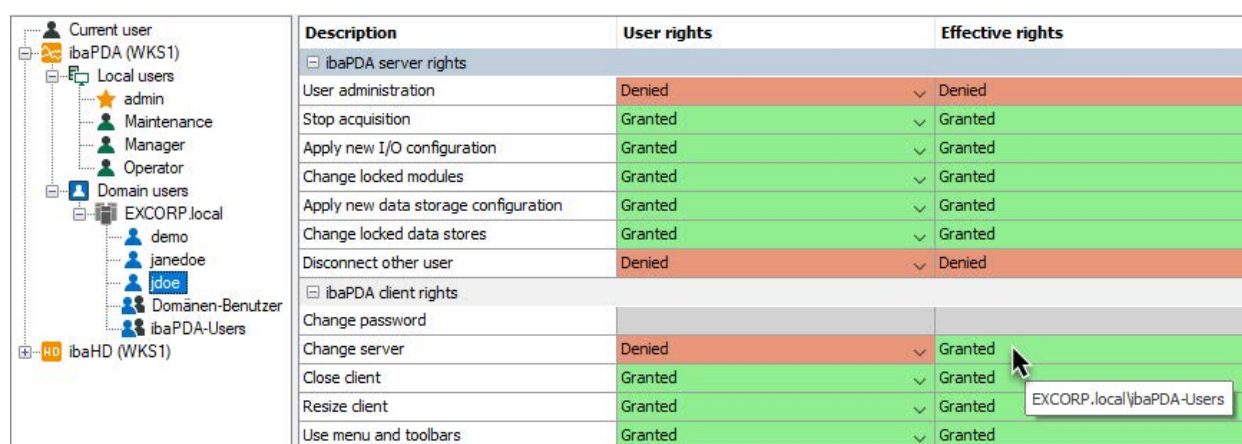
5.10.2.5 Effective rights

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 local users.

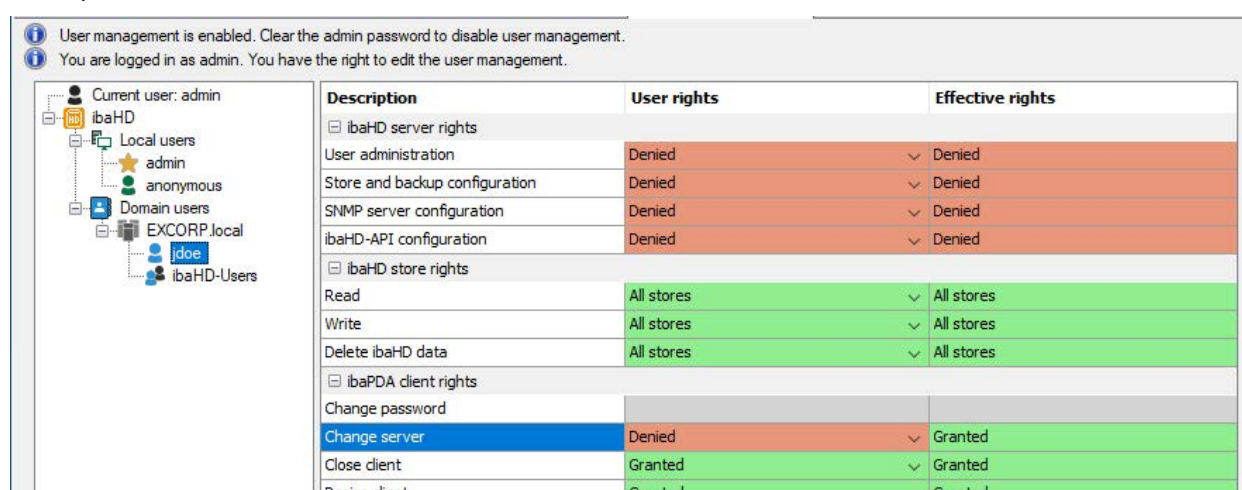
If both a domain user and the user group to which it belongs are entered in the user management, there may be different settings for group and user.

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



Description	User rights	Effective rights
ibaPDA server rights		
User administration	Denied	Denied
Stop acquisition	Granted	Granted
Apply new I/O configuration	Granted	Granted
Change locked modules	Granted	Granted
Apply new data storage configuration	Granted	Granted
Change locked data stores	Granted	Granted
Disconnect other user	Denied	Denied
ibaPDA client rights		
Change password		
Change server	Denied	Granted
Close client	Granted	Granted
Resize client	Granted	Granted
Use menu and toolbars	Granted	Granted

Example *ibaHD-Server*:



Description	User rights	Effective rights
ibaHD server rights		
User administration	Denied	Denied
Store and backup configuration	Denied	Denied
SNMP server configuration	Denied	Denied
ibaHD-API configuration	Denied	Denied
ibaHD store rights		
Read	All stores	All stores
Write	All stores	All stores
Delete ibaHD data	All stores	All stores
ibaPDA client rights		
Change password		
Change server	Denied	Granted
Close client	Granted	Granted
Resize client	Granted	Granted

The figure shows 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 right.

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
Granted	Granted	Granted
Granted	Denied	Granted
Denied	Granted	Granted
Denied	Denied	Denied

Table 7: Determining the effective rights for a domain user in one user group

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

User	Group 1	Group 2	Effective
Granted	Granted	Granted	Granted
Granted	Granted	Denied	Granted
Granted	Denied	Granted	Granted
Granted	Denied	Denied	Granted
Denied	Granted	Granted	Granted
Denied	Granted	Denied	Granted
Denied	Denied	Granted	Granted
Denied	Denied	Denied	Denied

Table 8: Determining the effective rights for a domain user in two user group

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)
Granted	Granted	Granted
Granted	Denied	Granted
Denied	Granted	Granted
Denied	Denied	Denied

Table 9: Determining the effective rights for domain users who have not been assigned their own rights

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.

5.11 Log files

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

The *Open log file...* menu button is used to load and open the log file (that is also shown in the log window) in the standard text editor of the computer.

The *Open log directory...* menu button is used to open Windows Explorer on the standard log directory. You can also find log files here from the past.

6 Configure 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) are signals resulting from the configuration in the *ibaPDA* I/O manager.

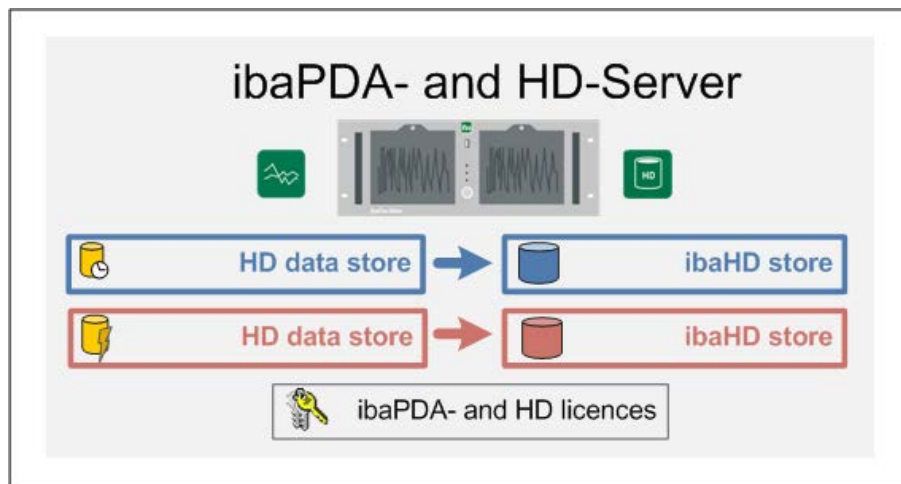
- With a **time-based** HD data store configured in *ibaPDA*, the acquired digital/analog signals are transferred to the desired *ibaHD-Server* and are stored there in a **time-based** HD store.
- With a **time-based HD data store with time periods** configured in *ibaPDA*, the acquired digital/analog signals are transferred to the desired *ibaHD-Server* and are stored there 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/analog signals are transferred to the desired *ibaHD-Server* and are stored there in a **length-based** HD store.

In contrast to the normal data store, the HD data store creates no measured data in the iba format (dat), but sends the stored data to *ibaHD-Server* which takes the data and writes them in the correspondent HD store.

ibaAnalyzer allows the conversion of HD data into standard iba data files.

6.1 Organization of functions and licenses

6.1.1 ibaPDA and ibaHD-Server running on the same computer



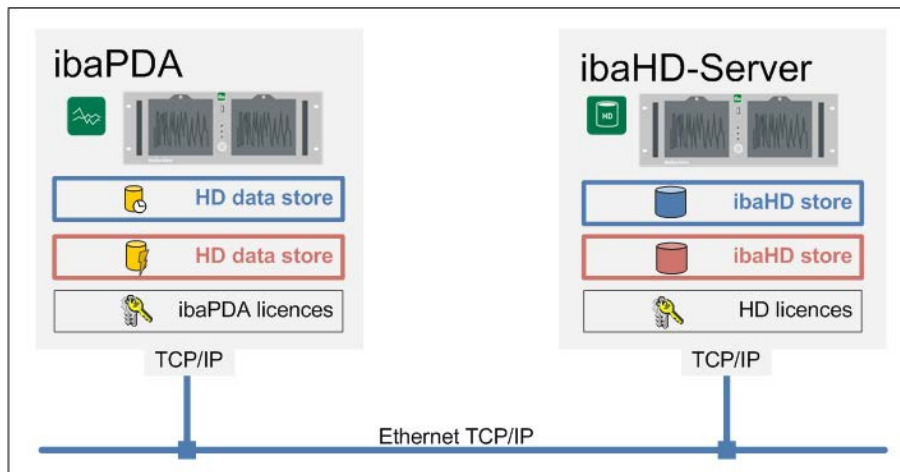
Note



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

For the installation of the HD data store in *ibaPDA* select the same computer as *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 an *ibaHD-Server* simultaneously depends on the license. With 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 the *ibaHD-Server* are installed on different computers, separate license containers (dongles or soft licenses) are necessary for *ibaPDA* and *ibaHD-Server* for the correspondent 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* detected in the network are displayed automatically in the *ibaHD-Server* drop-down menu of the *ibaPDA* client.


For more information about accessing a central *ibaHD-Server* by multiple *ibaPDA* systems, see chapter [➤ Example for large scale plant configuration](#), page 227.

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:

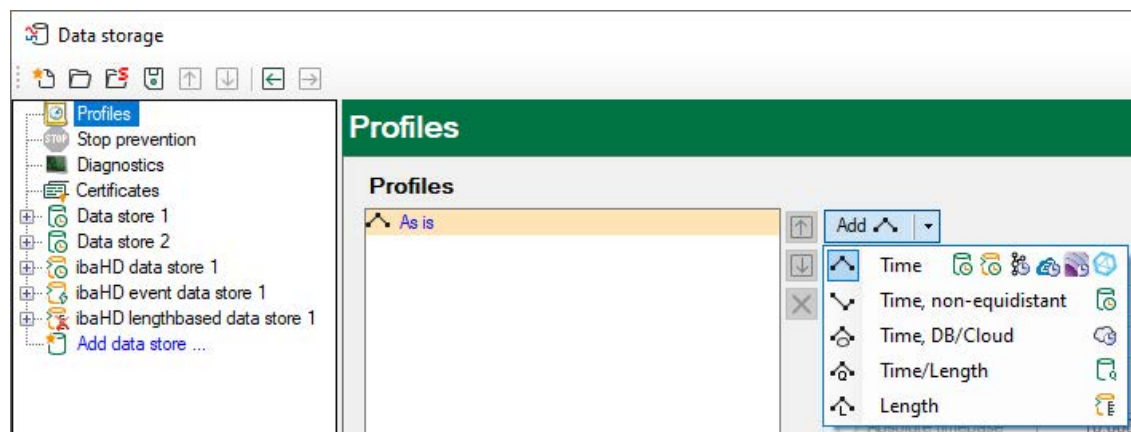
- Selection of the *ibaHD-Server* (local or separate computer)
- Selection and/or configuration of the HD data store on *ibaHD-Server*
- For time and length-based data stores: assignment of the signals which are written in a time or length-based HD store.
Along with the signal assignment you also determine 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 storage" via the menu *Configure - Data storage* or by clicking on the icon .

6.2.1 Define data storage profiles

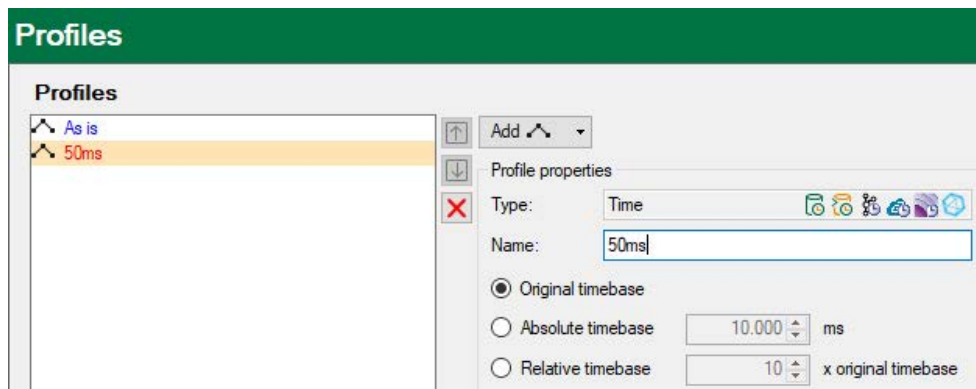
If not done yet, please define at first the storage profiles, that you want to use for the HD data store. If appropriate profiles for normal *ibaPDA* data stores are already designed, you can also use them for time-based HD stores. You can create as many profiles as you want.

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

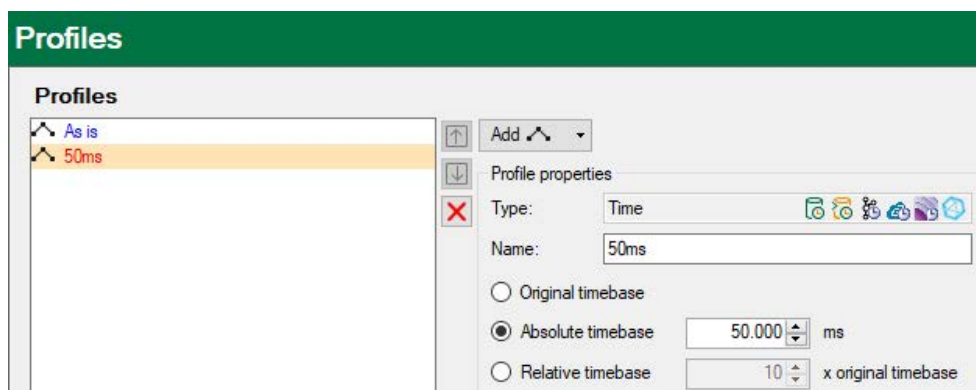


Usually you will use the type "Normal profile" for time-based HD data stores and the type "Length profile" for length-based stores.

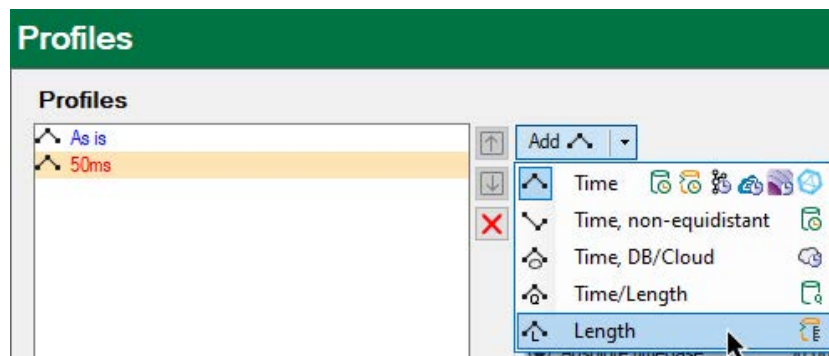
3. If necessary, give the profile a unique name, e.g. "50ms" if the data should be stored in the 50 ms grid.



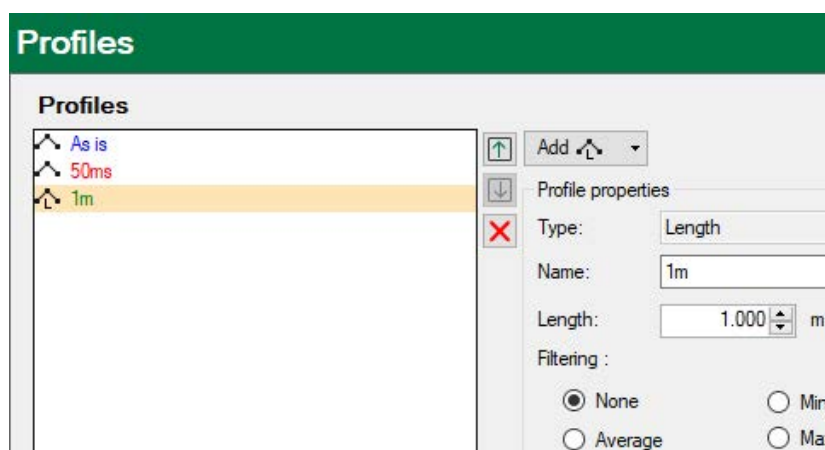
4. Set now the required time base (here: 50 ms) and activate a filter option, if necessary. In this example the average value of any values measured in the storage interval of 50 ms will be saved.



5. If you also want to configure a length-based HD store, proceed accordingly, but select the profile type "Length profile".



6. Thereafter, set the required length base in meters (1m in this example) and activate one of the filter options, if necessary.
You can set length values from 1 mm to several meters.



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

Note



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

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

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

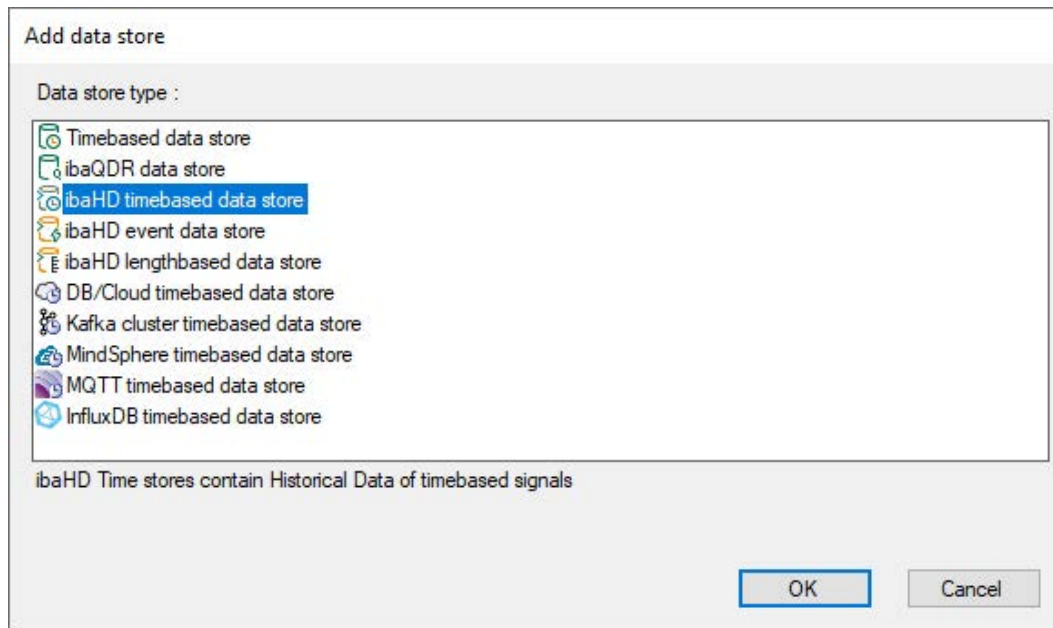
Other documentation



For more information about 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 storage.

Data storage

ibaHD data store 1

General

☐ Locked Data store index: 0

☒ Active

Name: ibaHD data store 1

Default conflict action: Append

Conflict dialog time-out: 180 sec

Historical Data server

Server: MyComputer01 Port: 9180 Configure

Store: HD_Time1

Username: admin Password:

Server list:

Server	IP address	Port	Version
MyComputer01	127.0.0.1	9180	3.0.0
MyComputer02	192.168.80.23	9180	3.0.0
MyComputer03	192.168.80.42	9180	3.0.0

Search

OK Apply Cancel

"General" range

Locked

If this option is selected a modification of the data store is not possible any more. A locked data store can only be unlocked by authorized users.

Active

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

Data store name

Here you can assign a name for the HD data store, default setting: ibaHD data store n

Default conflict action

If you modify properties of signals that already have been sent to the *ibaHD-Server* (for example the name or the unit of the signal) in the I/O manager of *ibaPDA*, the system will detect a conflict. In this case, old signal trends and attributes (e.g. name, unit, ...) remain in the *ibaHD-Server*, new attributes are adopted for the new signal data.

The other actions offered in the drop-down menu are currently not supported. For each setting, the "Append" action is executed as described above.

Conflict dialog time-out

As soon as you modify the configuration of the signals, you will be asked for the conflict dialog of each signal. Then it will be possible to indicate one of the three conflict resolutions for each

signal. If you do not indicate any setting, the action applies which you have defined as default according to the timeout set here.

"Historical Data server" range

In the field "Server list" all *ibaHD-Servers* detected in the network are displayed. With a click on <Search> the list is updated.

Note



While using network routers or hubs the search function may fail. In this case you have to enter manually the HD server name and the HD data 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 an *ibaHD-Server* with enabled user administration is selected, the username and password must still be entered.

If an *ibaHD-Server* is selected, it is shown in the field "Server" and in the field "Store" you can select in the drop-down menu one of the HD stores, that have already been set.

Configure HD store

If no HD stores are 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 storage configuration via the button <Configure> or via the *ibaHD Manager*, in the *General* tab.

For more detailed information about configuring HD stores, see [Configure HD stores](#), page 34.

6.2.4 Configuring time-based HD data store

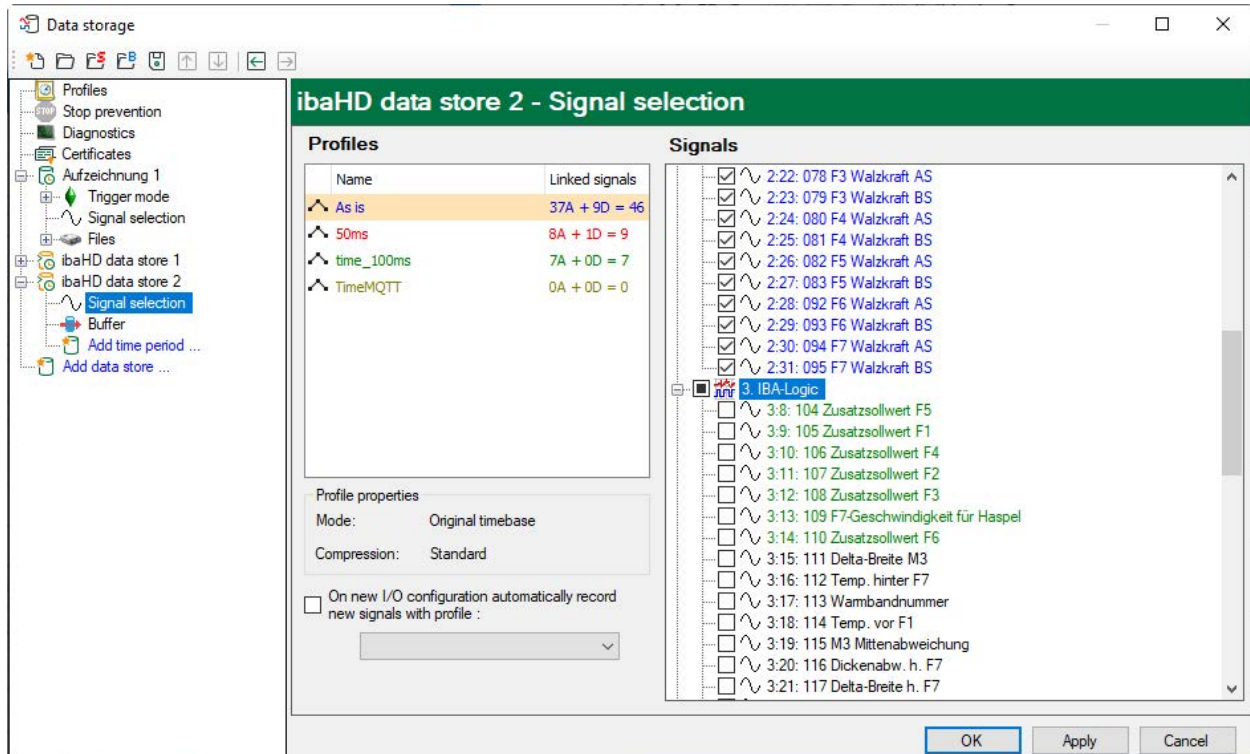
After the time-based HD data store was configured, the signals which shall be recorded there, must be selected. The signal selection is carried out in the same way as for normal data store with *ibaPDA*. Select the "Signal selection" link in the tree beneath your established data store.

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 84.

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**

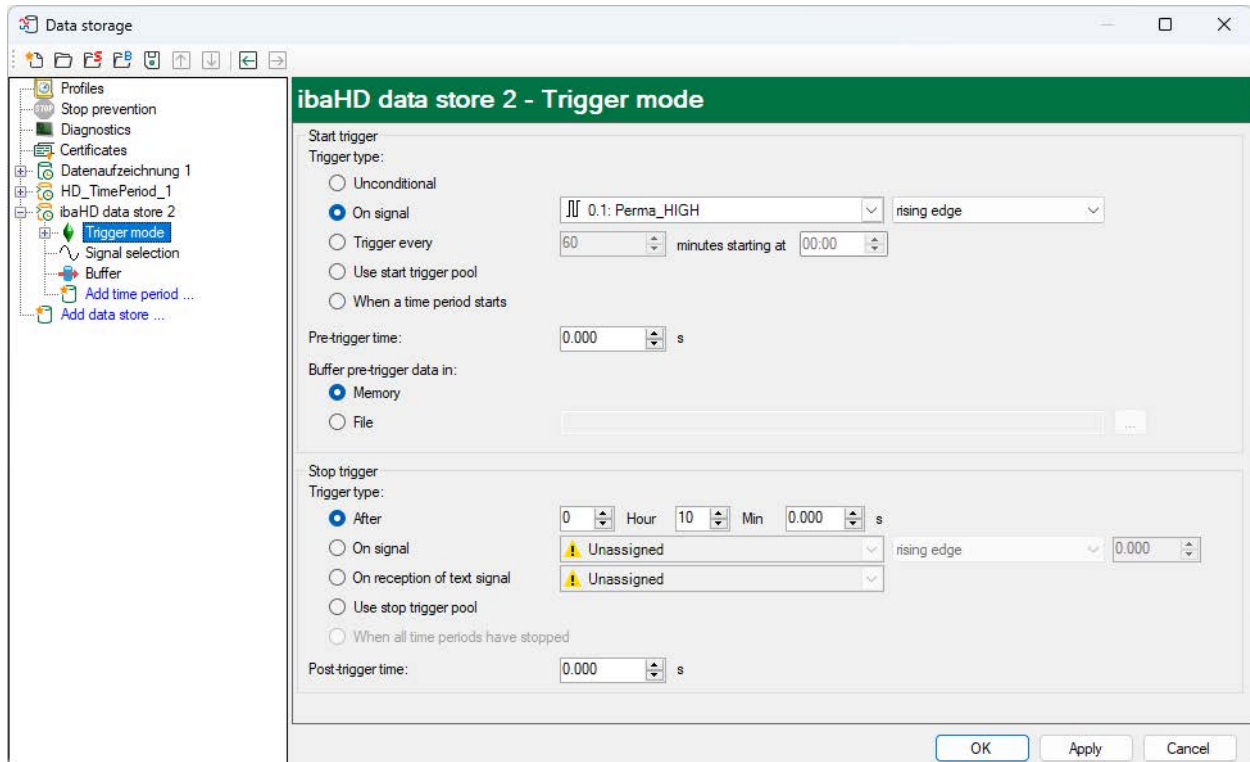
To apply the already existing signal selection, e.g. from *ibaPDA* data storage for *ibaHD-Server*, you can use the export and import function. For this purpose, please click with the right mouse button in the right "Signals" field and select the commands "Import" / "Export" in the appearing context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

If signal conflicts are detected during the check, the new configuration is appended (see [Select ibaHD-Server and HD store, page 88, 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

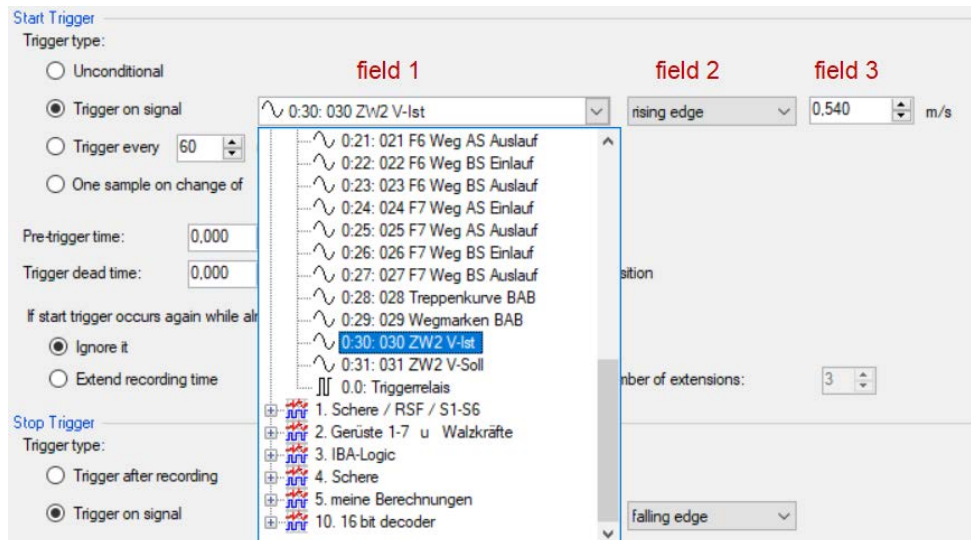
Unconditional

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.

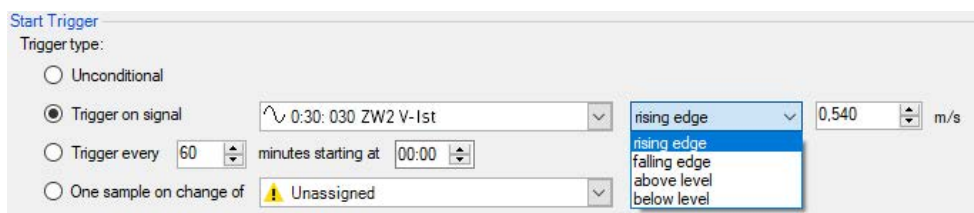
- Field 1: Drop-down list for signal selection (available analog and digital signals)
- Field 2: Drop-down list for selecting edges or levels
- Field 3: Drop-down list for selecting the trigger level value given in the specific physical unit (field 3 is only enabled in case of analog trigger signals)



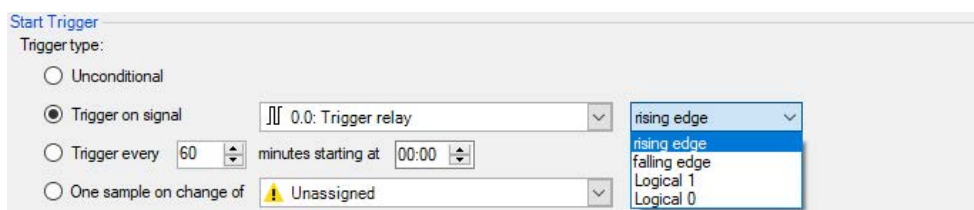
Both analog and digital signals can serve as triggers. Select the signal to be triggered via the signal tree in the selection list in field 1.

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 digital.

- 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 a time period starts

Enable this option if you want recording to start as soon as any period in the same ibaHD 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 storage 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 post-trigger 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 ibaHD 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, part 5, *Data recording*.

When all time periods have stopped

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

Post-trigger time

If this function is selected by entering a time, recording is only stopped when this post-trigger 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:

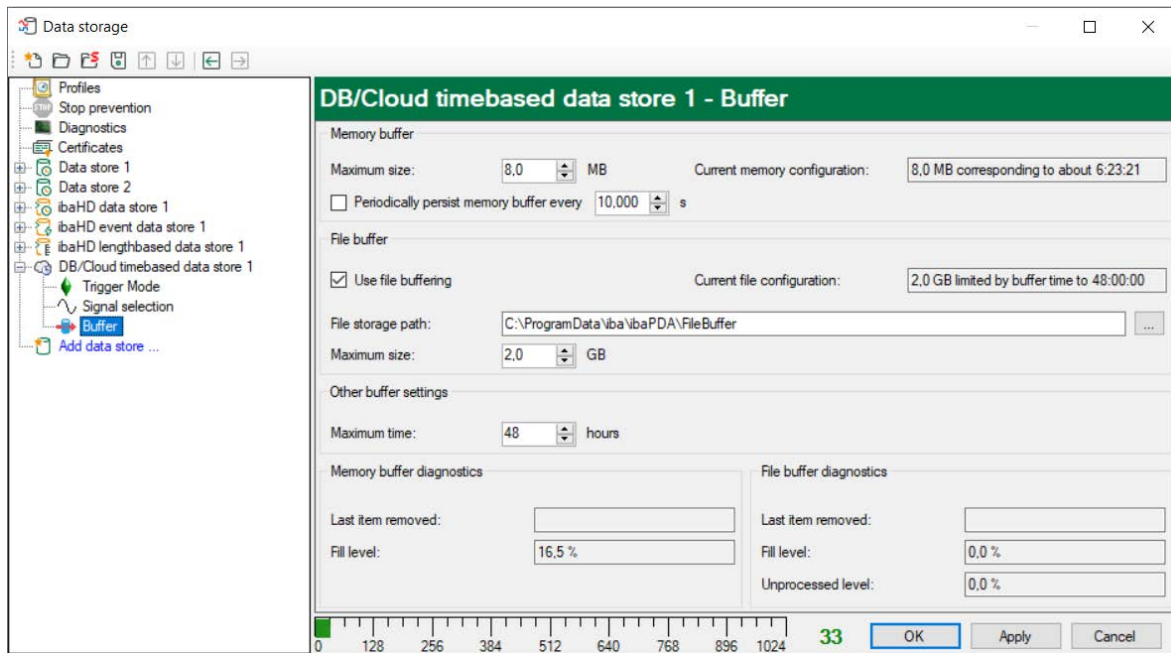
- ibaHD timebased/eventbased/lengthbased
- DB/Cloud timebased
- Kafka cluster timebased
- MQTT timebased
- MindSphere timebased
- InfluxDB timebased

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 of DB/Cloud 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

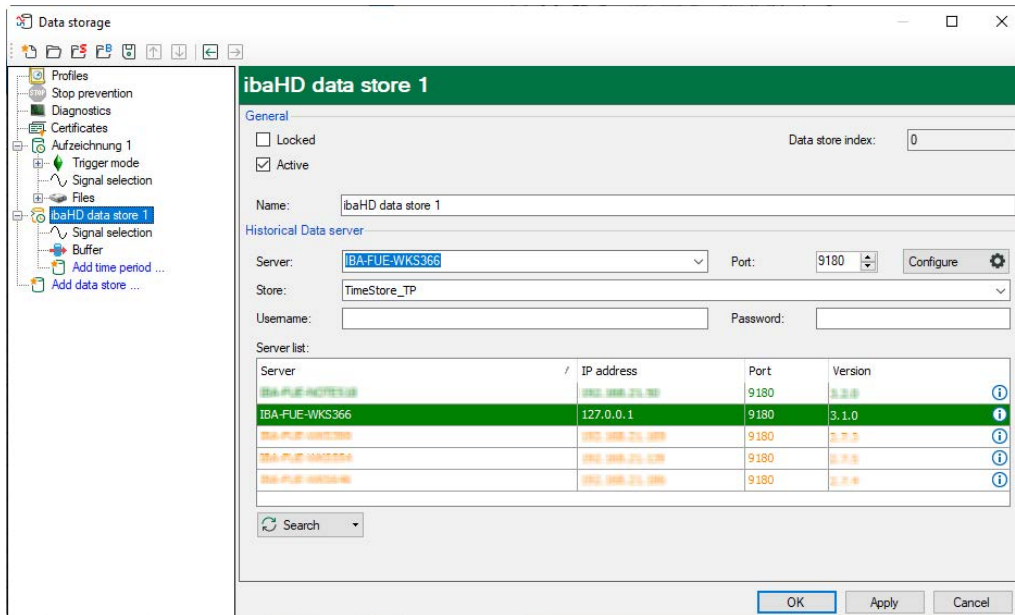
The fill level indicates what percentage of the buffer size is currently filled with buffered data.

Unprocessed level

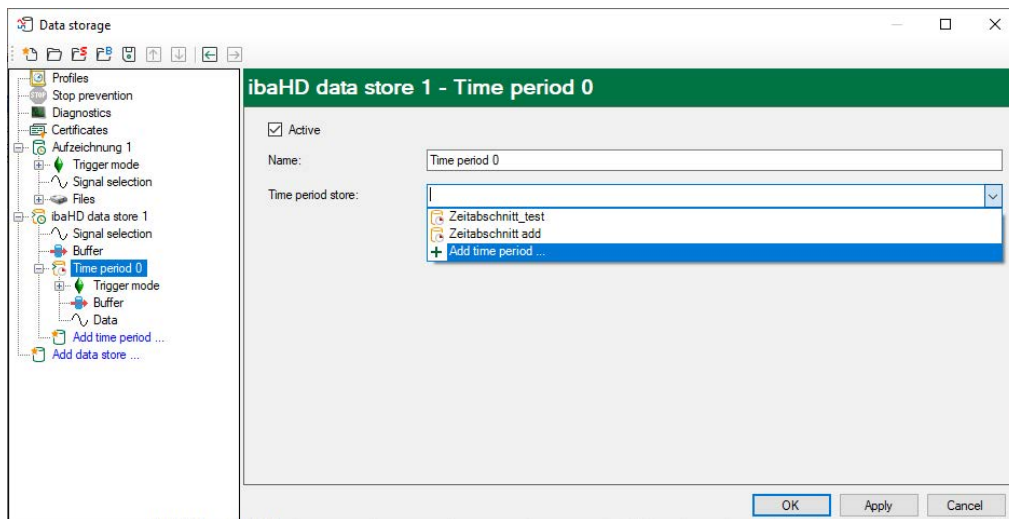
Items transferred to the target system are not deleted immediately in the file buffer. Only when a buffer file is completely read, it is deleted. Therefore, it is possible that only a part of a buffer file contains data that has not yet been transferred. The fill level refers to the existing buffer files,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

To configure time periods in a time-based data storage, click on the *Add time period* link below the ibaHD data store.



The following dialog box appears:



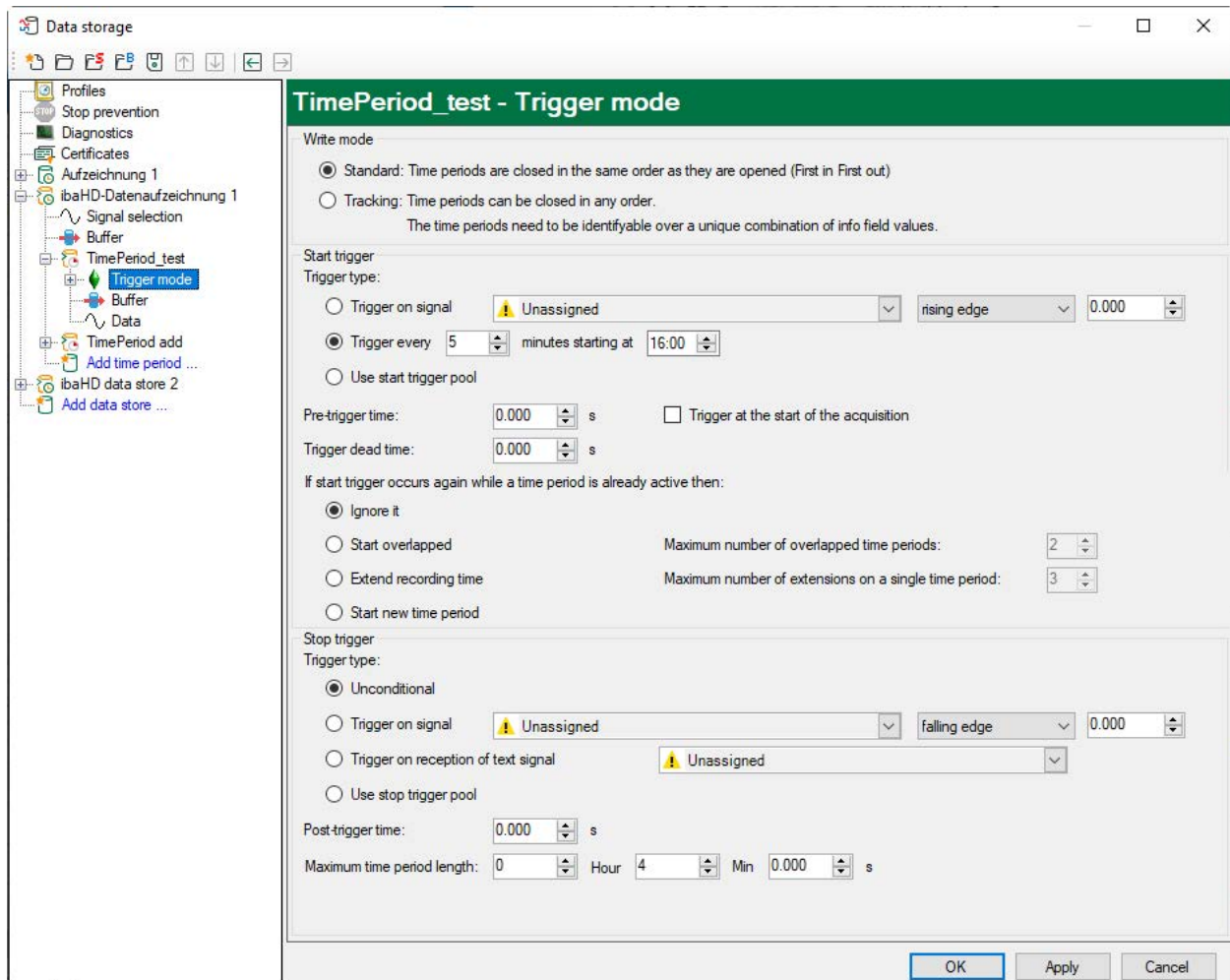
Enter a name for the time period and select the time period store to which you want to write the data. Only time periods that are not yet being written/used by a HD storage are displayed. If no time period stores are available, for example during initial commissioning, you must configure time period stores first.

The configuration dialog for the HD stores can be accessed either here in the *ibaPDA* data storage configuration using the *Add time period* drop-down menu or using the ibaHD Manager, on the *General* tab.

For more detailed information about configuring time period stores, see chapter [Configuring an HD store for time periods](#), page 39.

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.

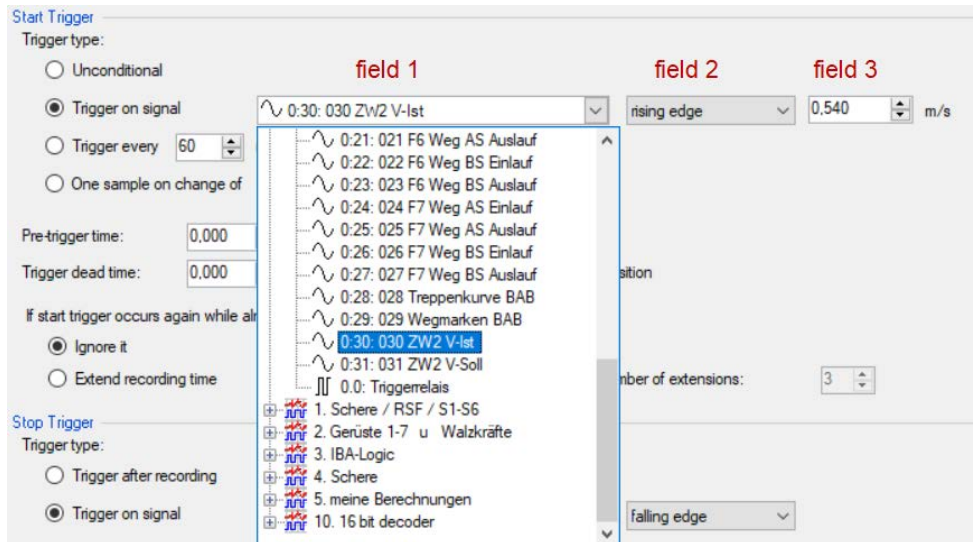
Trigger settings in standard mode

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.

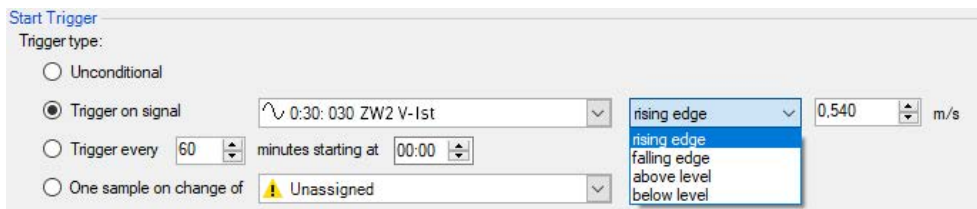
- Field 1: Drop-down list for signal selection (available analog and digital signals)
- Field 2: Drop-down list for selecting edges or levels
- Field 3: Drop-down list for selecting the trigger level value given in the specific physical unit (field 3 is only enabled in case of analog trigger signals)



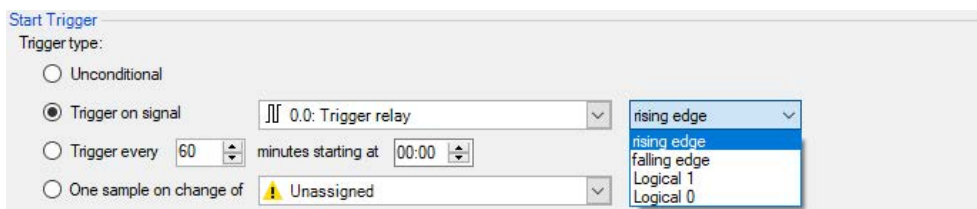
Both analog and digital signals can serve as triggers. Select the signal to be triggered via the signal tree in the selection list in field 1.

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 digital.

- 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

TimePeriod_test - Trigger mode

Write mode

☐ Standard: Time periods are closed in the same order as they are opened (First in First out)

☒ Tracking: Time periods can be closed in any order.
The time periods need to be identifiable over a unique combination of info field values.

Start trigger

Trigger type:

☐ Trigger on signal ⚠ Unassigned rising edge

☒ Trigger every 5 minutes starting at 16:00

☐ Use start trigger pool

Pre-trigger time: 0.000 s ☐ Trigger at the start of the acquisition

Trigger dead time: 0.000 s

Stop trigger

Trigger type:

☒ Unconditional ⚠ This means that ibaPDA will never close the time period. It should be closed by another application.

☐ Trigger on signal ⚠ Unassigned falling edge

☐ Trigger on reception of text signal ⚠ Unassigned

☐ Use stop trigger pool

Post-trigger time: 0.000 s

Maximum time period length: 0 Hour 4 Min 0.000 s ⚠ Time periods whose start time is more than the maximum time period length before the stop trigger time will not be closed.

Time period identification:

Info field name	Info field value	Active
Name	12:0: Produkt-ID	<input checked="" type="checkbox"/>
070 F6 Drehzahl	⚠ Unassigned	<input type="checkbox"/>
071 F6 Strom	⚠ Unassigned	<input type="checkbox"/>
072 F7 Drehzahl	⚠ Unassigned	<input type="checkbox"/>

If stop trigger occurs and the identified time period is already closed then:

☒ Ignore it

☐ Overwrite the previous end time with the new end time

OK Apply Cancel

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

TimePeriod_test - Data

Time period name

Base name: Next number:

Example: pda844

☒ Add base name
 ☒ Add number
 ☐ Add start date and time
 ☐ Add start trigger name

☐ Add text signal
 ☐ Remove all blanks

☒ At start trigger
 ☐ At stop trigger

Info fields

Signal	Display name	DB column name	Data type	Unit	Sample at	Active
0. Hydr. Anstellung						
1. Schere / RSF / S1-S6						
2. Gerüste 1-7 u. Walzkraf...	070 F6 Drehzahl	070 F6 Drehzahl	FLOAT	%	Start trigger	<input checked="" type="checkbox"/>
3. IBA-Logic						
4. Schere	071 F6 Strom	071 F6 Strom	FLOAT	%	Start trigger	<input checked="" type="checkbox"/>
5. meine Berechnungen	072 F7 Drehzahl	072 F7 Drehzahl	FLOAT	%	Start trigger	<input checked="" type="checkbox"/>
9. Produktinfos	073 F7 Strom	073 F7 Strom	FLOAT	%	Start trigger	<input checked="" type="checkbox"/>
10. 16 bit decoder	092 F6 Walzkraf...	092 F6 Walzkraf...	FLOAT	t	Start trigger	<input checked="" type="checkbox"/>
12. Produktdaten von Level	093 F6 Walzkraf...	093 F6 Walzkraf...	FLOAT	t	Start trigger	<input checked="" type="checkbox"/>
	094 F7 Walzkraf...	094 F7 Walzkraf...	FLOAT	t	Start trigger	<input checked="" type="checkbox"/>
	095 F7 Walzkraf...	095 F7 Walzkraf...	FLOAT	t	Start trigger	<input checked="" type="checkbox"/>
	113 Warmbandn...	113 Warmbandn...	FLOAT	Nr.	Start trigger	<input checked="" type="checkbox"/>
	Dicke nach F7	Dicke nach F7	BOOL		Start trigger	<input checked="" type="checkbox"/>
	F7 Gerüst belegt	F7 Gerüst bel...	BOOL		Start trigger	<input checked="" type="checkbox"/>
	F6 Gerüst belegt	F6 Gerüst bel...	BOOL		Start trigger	<input checked="" type="checkbox"/>
9:0: Produktnr	Produktnr	Produktnr	STRING		Start trigger	<input checked="" type="checkbox"/>
5:0: BandNr	BandNr	BandNr	FLOAT		Start trigger	<input checked="" type="checkbox"/>
12:0: Produkt-	Produkt-ID	Produkt-ID	STRING		Start trigger	<input checked="" type="checkbox"/>

OK Apply Cancel

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:

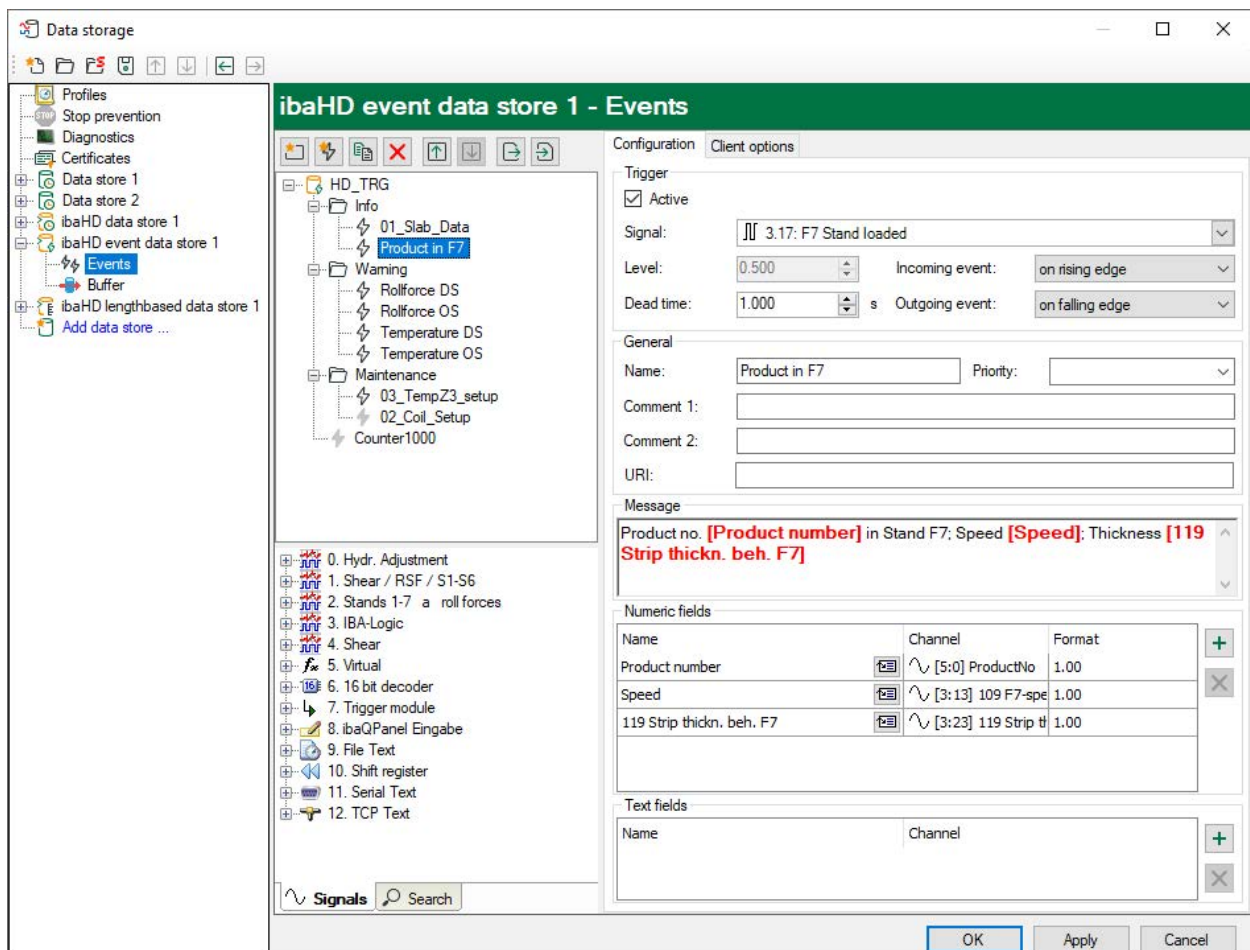
- **Signal:** Signal whose value is to be written to the info field
- **Display name:** The display name for the info field. By default, the signal name is used. The same name may not be used twice for the display name.
- **DB column name:** The name of the database column that will contain this info 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.

6.2.6 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 119.

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 which has to trigger the event.

Level

This value is only relevant to 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 or outgoing event.

Here, you set how the incoming event shall be triggered.

- In case of an analog signal as the trigger, the setting *on rising edge* means that the value of the trigger signal has to exceed the level value to trigger the incoming event.
- In case of an analog signal as trigger, the setting *on falling edge* means that the value of the trigger signal has to fall below the level value to trigger the incoming event.

Outgoing event

Here, you set how the outgoing event is triggered.

When the incoming event is triggered *on rising edge*, the outgoing event can only be triggered *on falling edge* and vice versa.

Dead time (reaction time)

The dead time describes the time period for which the incoming events cannot be triggered once more after the triggering. Over this, series of events at fluttery signals can be suppressed.

Tip



If you want to store only incoming signals, please set the value *never* for *Outgoing event*"

Incoming event:

Outgoing event:

never
on falling edge

Tip



Use virtual modules in the *ibaPDA* I/O Manager to create more complex triggers out of the stored analog and digital signals. For the events, you can select these signals as trigger.

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 technosttring.

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

Name	Channel	Format
Product number	[5:0] ProductNo	1.00
Speed	[3:13] 109 F7-speed for tens	1.00
119 Strip thickn. beh. F7	3:13: 109 F7-speed for tension reel	
	3:14: 110 add. setpoint F6	
	3:15: 111 Delta-width M3	
	3:16: 112 Temp. behind F7	

Here, you select the signal whose current value has to be entered into the message while triggering the event.

Column Format

Name	Channel	Format
Product number	[5:0] ProductNo	1.00

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.

Formatting


Minimum number of digits before decimal point: 1

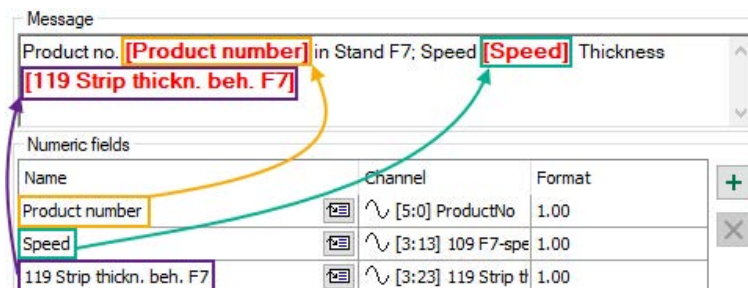
Number of digits after decimal point: 2

Format positive numbers: add nothing

Example: 1.00
-1.00

OK Cancel




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).



Message

Product no. **[Product number]** in Stand F7; Speed **[Speed]** Thickness

[119 Strip thickn. beh. F7]

Name	Channel	Format
Product number	 ^ [5:0] ProductNo	1.00
Speed	 ^ [3:13] 109 F7-spe	1.00
119 Strip thickn. beh. F7	 ^ [3:23] 119 Strip th	1.00

Text fields

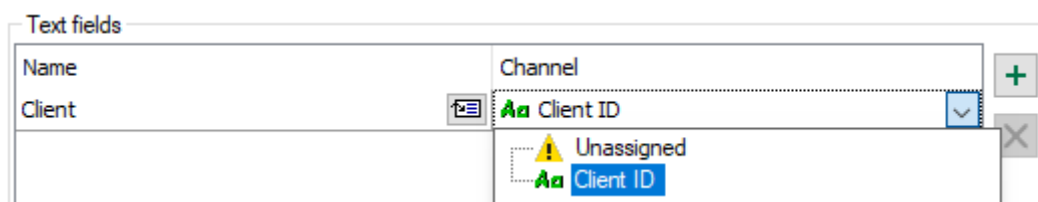
In the table, you can define up to eight placeholders for texts which can be used in the message.



Column Name


Here, you enter a random name for the text field.

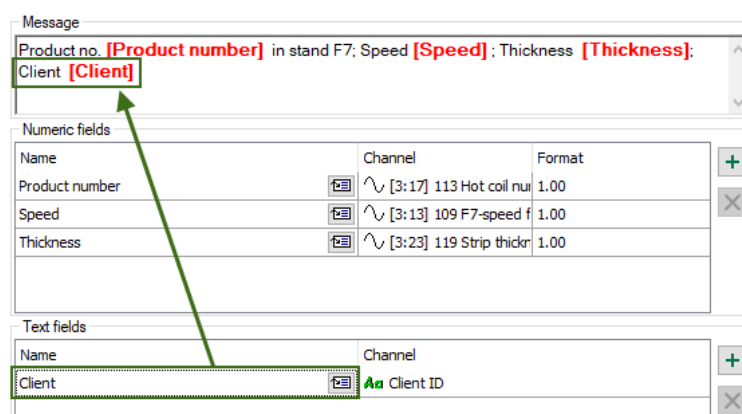
Column Channel

Here, you select the text signal whose current value has to be entered into the message at the triggering of the event.



Name	Channel
Client	 Client ID
	Unassigned
	 Client ID




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).




Message

Product no. **[Product number]** in stand F7; Speed **[Speed]**; Thickness **[Thickness]**;

Client **[Client]**

Name	Channel	Format
Product number	 ^ [3:17] 113 Hot coil nu	1.00
Speed	 ^ [3:13] 109 F7-speed f	1.00
Thickness	 ^ [3:23] 119 Strip thicke	1.00

Name	Channel
Client	 Client ID

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!

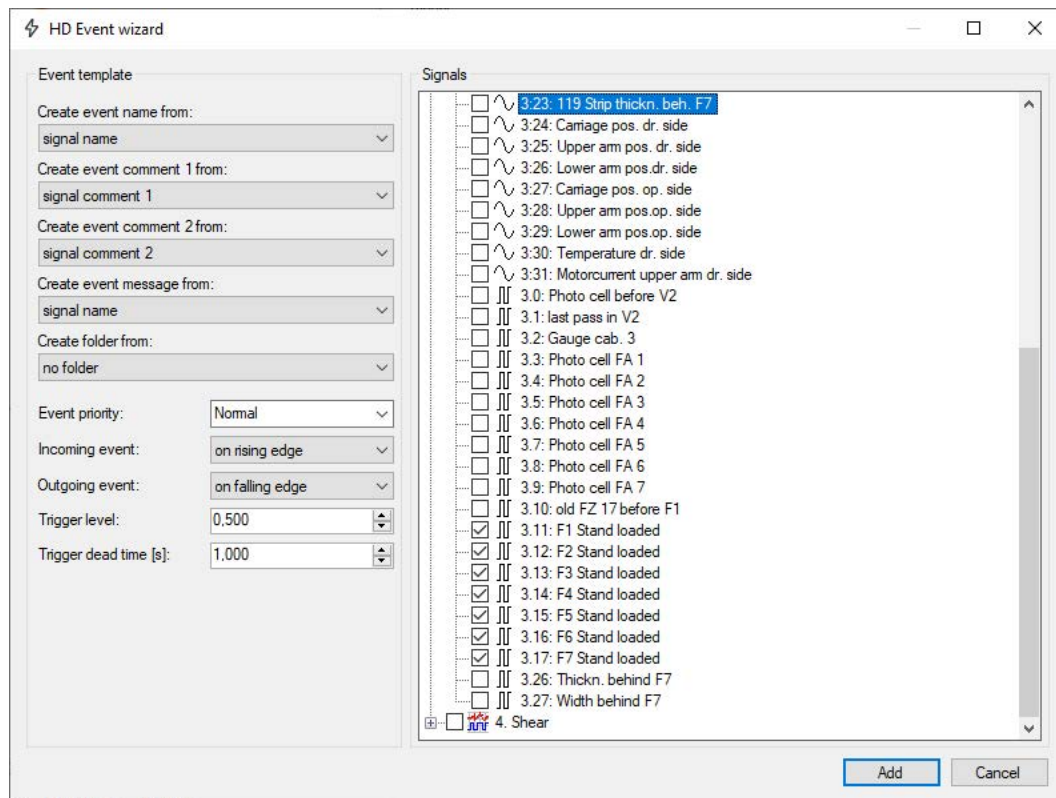
Note

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 HD event wizard

The HD event wizard opens automatically as soon as you drag a signal or complete module from the signal tree pane into the event tree pane. If you have built a folder structure for the events drag the desired signal onto the correct folder.

With the help of the wizard, you create events directly from the signals which you had configured in the I/O manager. You can select one or multiple signals, which should be configured as events. Therefore, the properties of the signals (signal name, comment 1 and 2) can automatically be transferred to the properties of the events.



Event template

Create event name from

Select from the drop-down list how the event name has to be assigned. "Signal name", "signal comment 1" and "signal comment 2" can be selected.

The default setting is "signal name".

Create event comment 1 from

Select from the drop-down list how the "event comment 1" has to be assigned. "Signal name", "signal comment 1" and "signal comment 2" can be selected.

The default setting is "signal comment 1".

Create event comment 2 from

Select from the drop-down list how the "event comment 2" has to be assigned. "Signal name", "signal comment 1" and "signal comment 2" can be selected.

The default setting is "signal comment 2".

Create event message from

Select from the drop-down list how the "event message" has to be assigned. "Signal name", "signal comment 1" and "signal comment 2" can be selected.

The default setting is "signal name".

Event priority

Here, you select the priority of the events which are created by the assistant.

Incoming event

Here, you set how the incoming event shall be triggered.

- In case of an analog signal as trigger, the setting "on rising edge" means that the value of the trigger signal has to exceed the trigger value to trigger the incoming event.
- In case of an analog signal as trigger, the setting "on falling edge" means that the value of the trigger signal has to fall below the trigger value to trigger the incoming event.

Outgoing event

Here, you set how the outgoing event is triggered.

- When the incoming event is triggered on "Rising edge", the outgoing event can only be triggered on "Falling edge" and vice versa.
- When only incoming events have to be compiled, please select the setting "never".

Trigger value

This value is only relevant to analog signals. Enter the value above or below which the event is to be triggered.

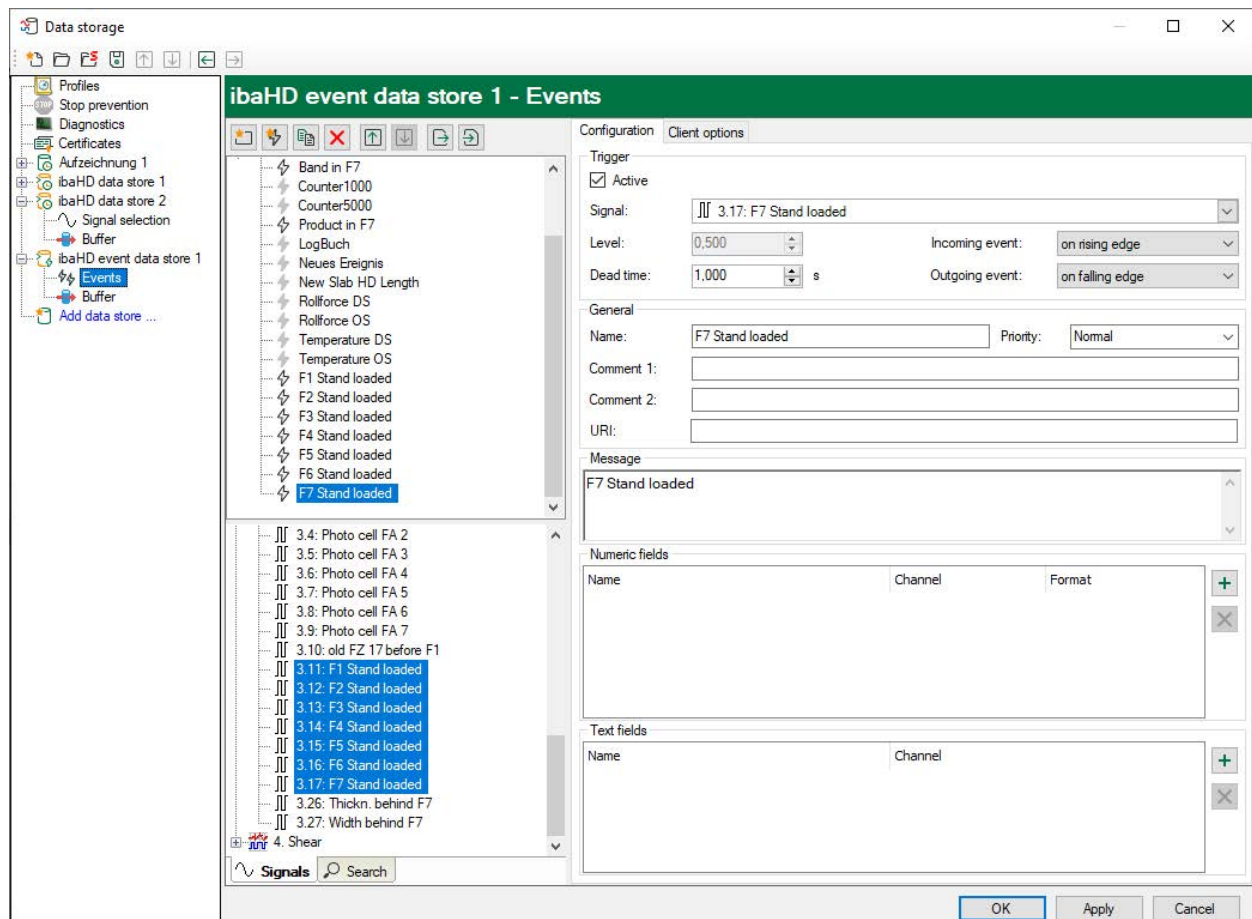
Trigger dead time

The dead time describes the time period for which the incoming events cannot be triggered once more after the triggering. This can be used to suppress showers of events with fluttering signals.

Signals

Here, you select the signals from which events shall be created using the settings in the event template via the check boxes.

Click on the <Add> button to create the events. Having added 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 shown on the connected client computers in the event display and which commands are sent to the trend views 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 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 define how long the period before and after an event should be, which should be displayed in the trend view after the event time has been called up.

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 option 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.

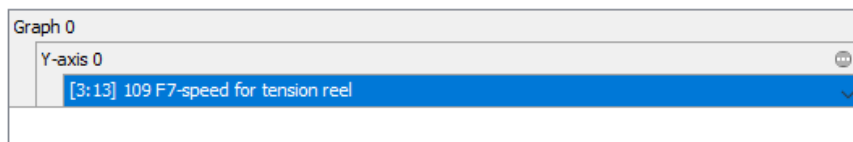
The buttons and their functions:


	Add signal
	Add signal on new Y-axis
	Add signal on new graph
	Remove signal

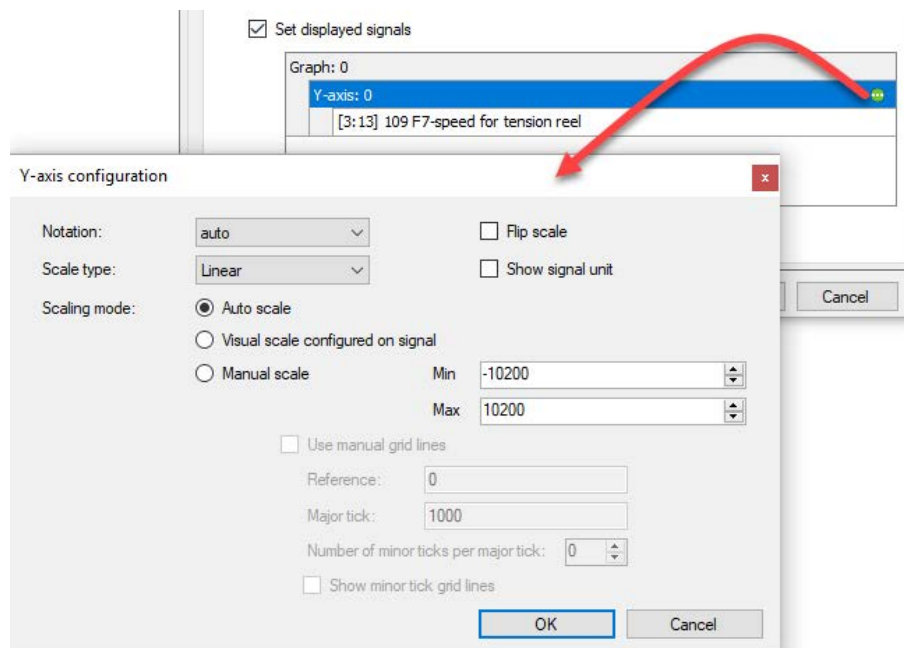
Proceed as follows:


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.

☒ Set displayed signals

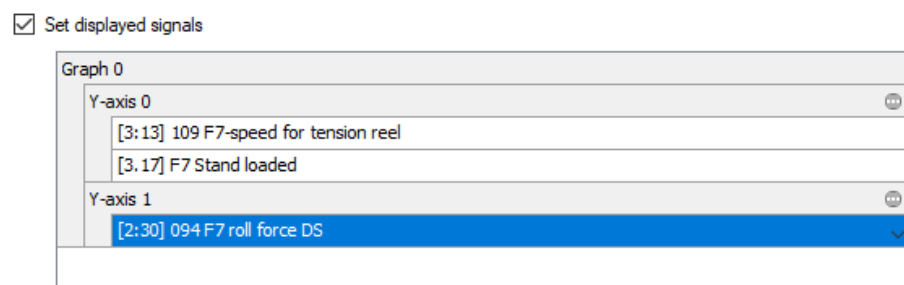



3. If you click on the icon on the Y-axis plane  , you can specify additional settings of the Y-axis, such as the scaling.



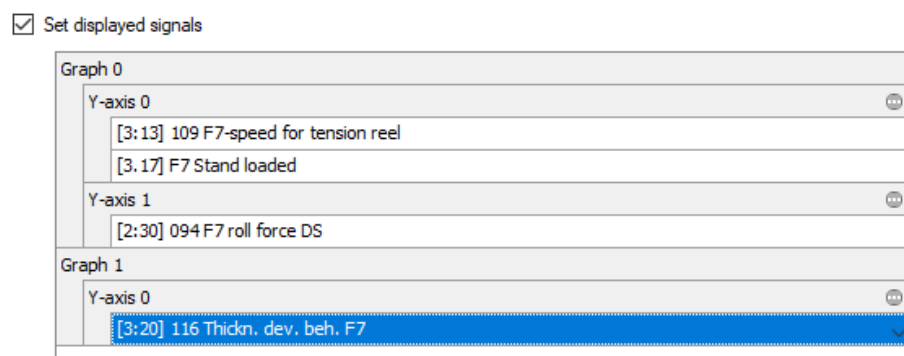
4. If you want to add additional signals that are to be displayed on the same Y-axis and in the same trend graph, simply click on <Add signal>.
5. If you want to display a signal in the same trend graph with a different Y-axis, for example due to a different physical unit or a different scaling, then click on the button *Add signal on new axis* .


Another Y-axis plane is added in the list field under which you can select signals again.



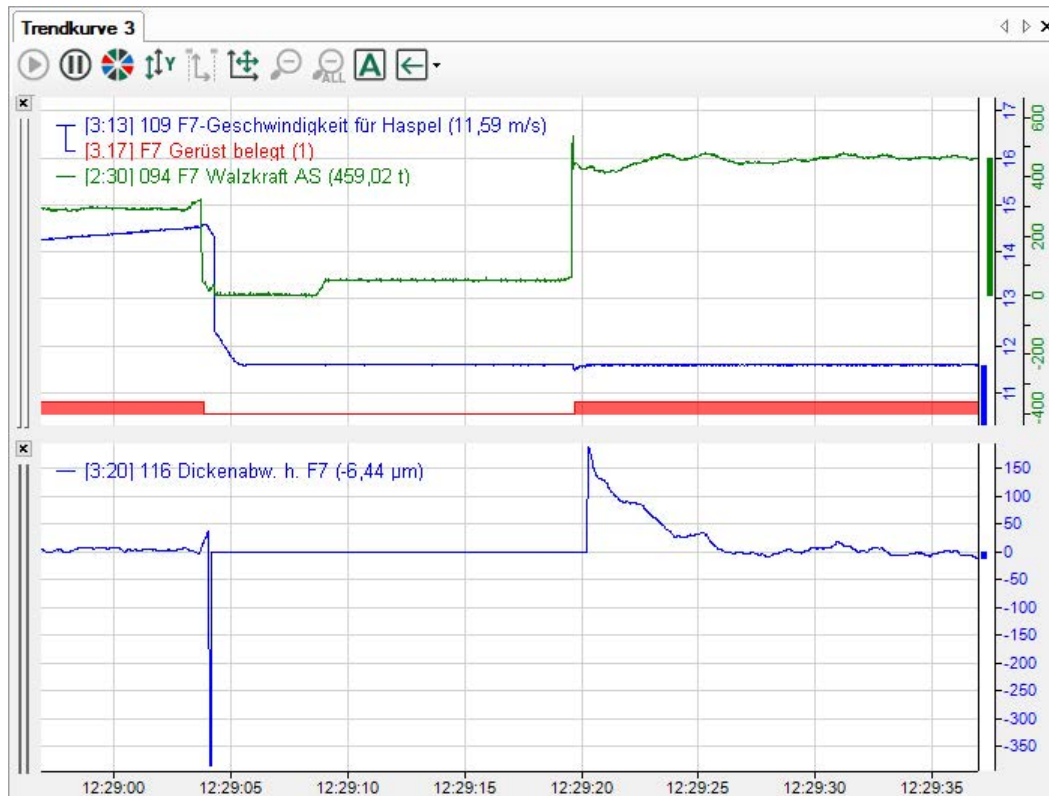
6. If you want to add a new trend graph in the trend view, then click on the button *Add signal on new graph*. 

A new graph 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 graph, 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.

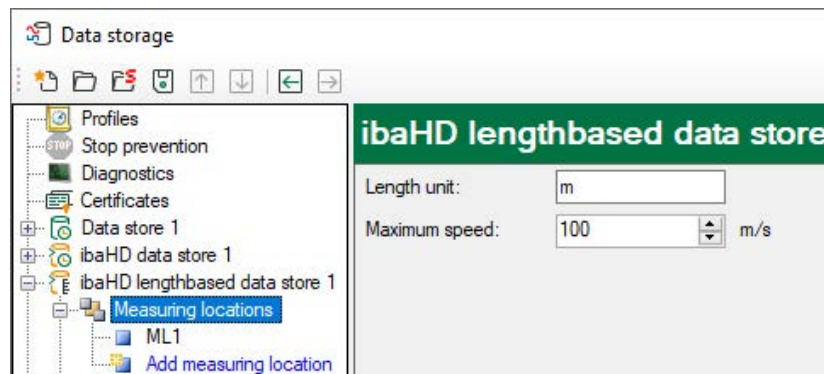
For a length-based data store, multiple measuring locations (ML Measuring Location) can be defined. At least one measuring location has to be defined. Measuring locations serve for the grouping of measuring signals that are created in the plant/in the process at the same place and which have a product reference.

Refer also to the introducing example in chapter [➤ Length-based data store](#), page 29.

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.

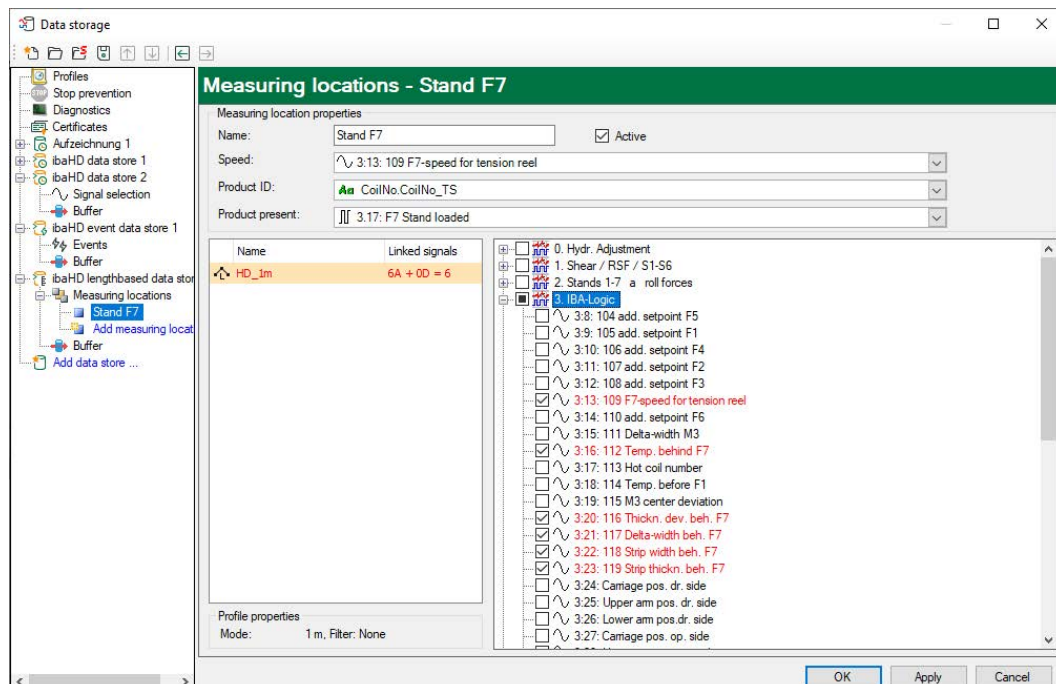
Mark the branch "Measuring Locations" with the mouse and enter the length unit and maximum speed here. The length unit only serves for a correct labeling, e.g. of the axes. The maximum speed is used for a reasonable limitation of the actual speed, to limit the speed, that is used to calculate the length 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 re-naming of a measuring location could lead to invalid signal references in the *ibaPDA* client.

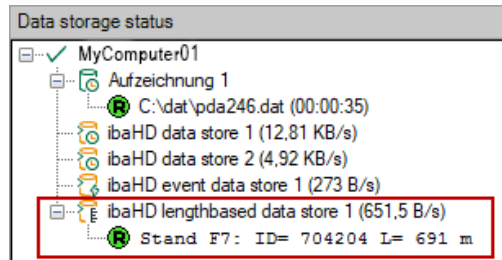
Speed

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.

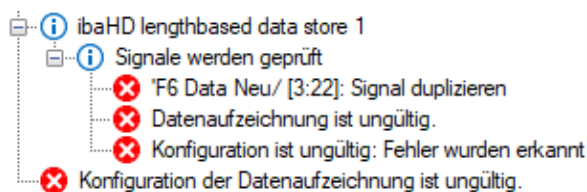
Selecting signals

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

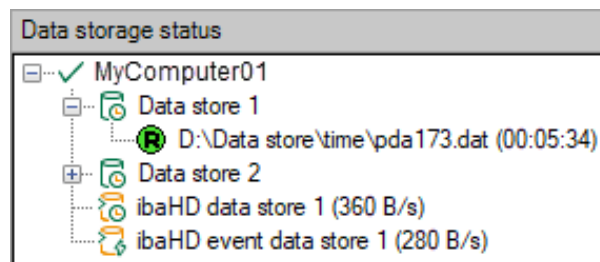
By clicking on the icons <Go> and <Stop> in the *ibaPDA* client, respectively, the recording is started and stopped.



6.2.9 Data storage status

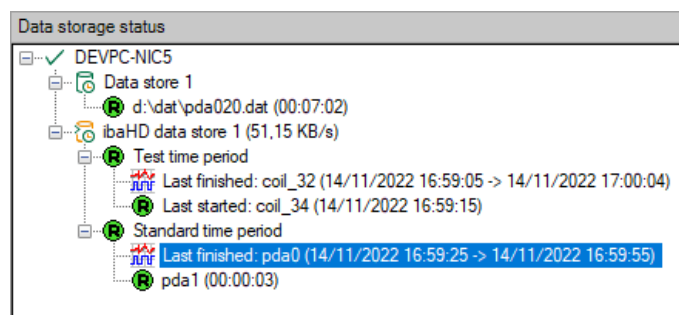
On the *Data storage status* range, the status of the HD data stores is displayed and which data volume is currently being written on the *ibaHD-Server*.

Example with a time based dat file, currently recording:

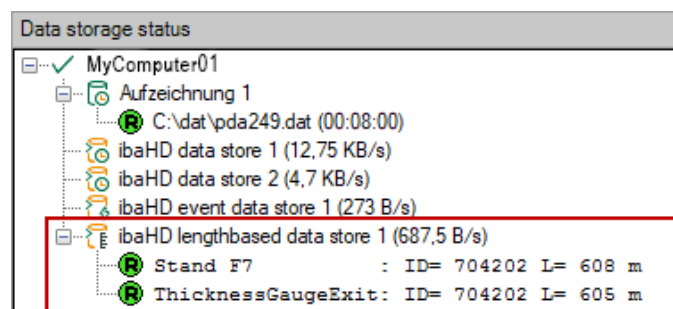


For time-based HD data stores with time periods, the current status of the time periods is shown. When recording in standard mode, the last finished time period and the currently recorded time period are displayed (in the example Standard time period).

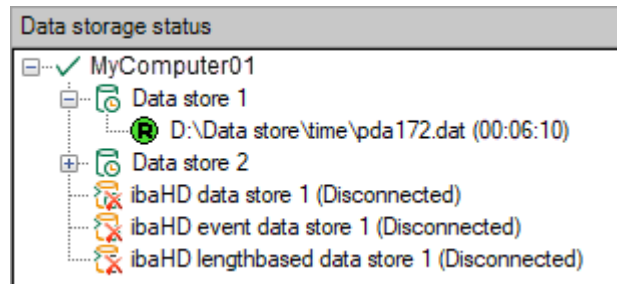
The last finished time period and the start time of the currently recorded time period are displayed in the tracking mode (in the example Test time period).



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

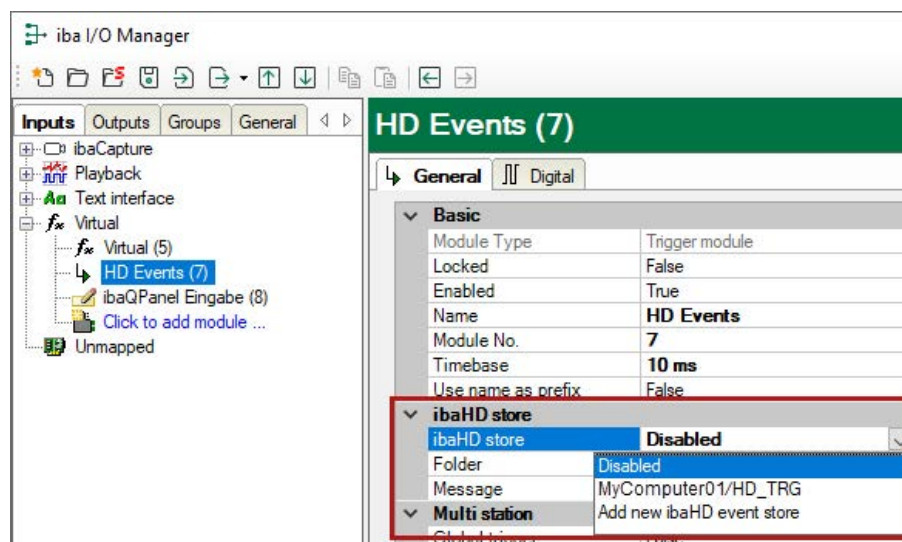


ibaPDA periodically tries to restore an interrupted connection to the *ibaHD-Server*. When a connection of an HD data store has been interrupted or restored, this will be compiled in the event log of the *ibaPDA*.

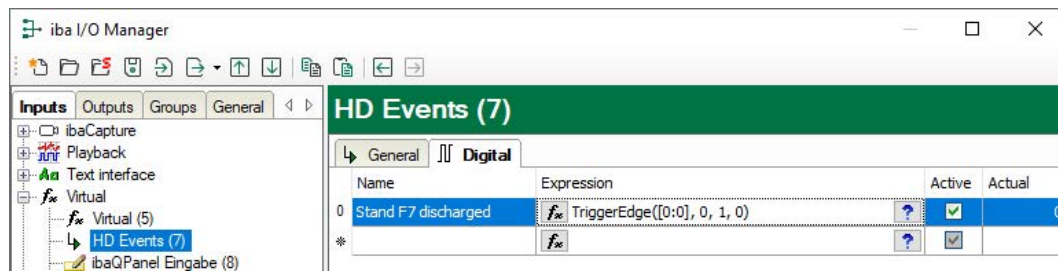
Event Log		
Type	Date and Time	Description
	7/26/2022 10:09:13 AM	Connection to ibaHD server MyComputer01\HD_Time1 is restored
	7/26/2022 10:09:13 AM	Connection to ibaHD server MyComputer01\HD_TRG is restored
	7/26/2022 10:08:33 AM	Connection to ibaHD server MyComputer01\HD_TRG is lost
	7/26/2022 10:08:33 AM	Connection to ibaHD server MyComputer01\HD_Time1 is lost

6.2.10 Generating events by trigger modules

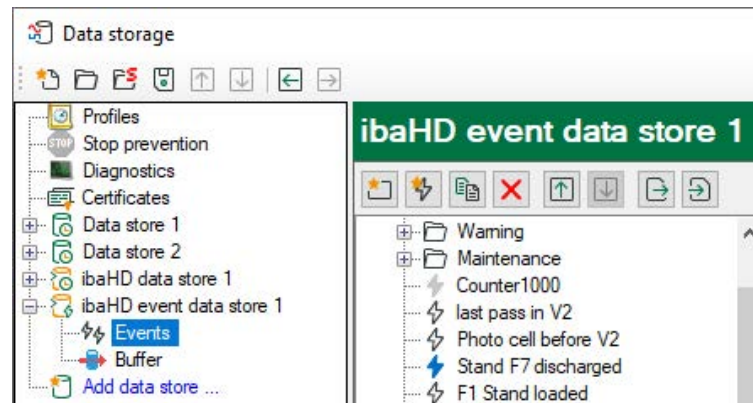
When configuring trigger modules in the *ibaPDA* I/O Manager, you can define in the module settings in which HD event store the trigger firings are written as events.



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.



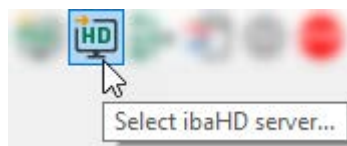
7 HD views in ibaPDA

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:

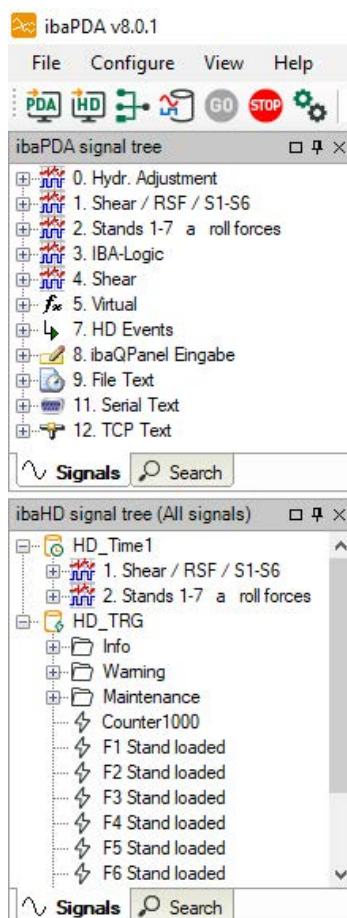
Click on the button in the toolbar



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.



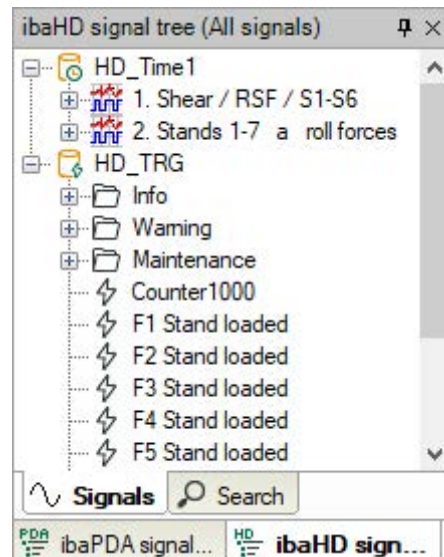
You can display and hide the HD signal tree via the menu *View – ibaHD signal tree*.

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.

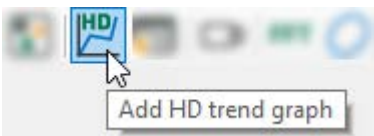



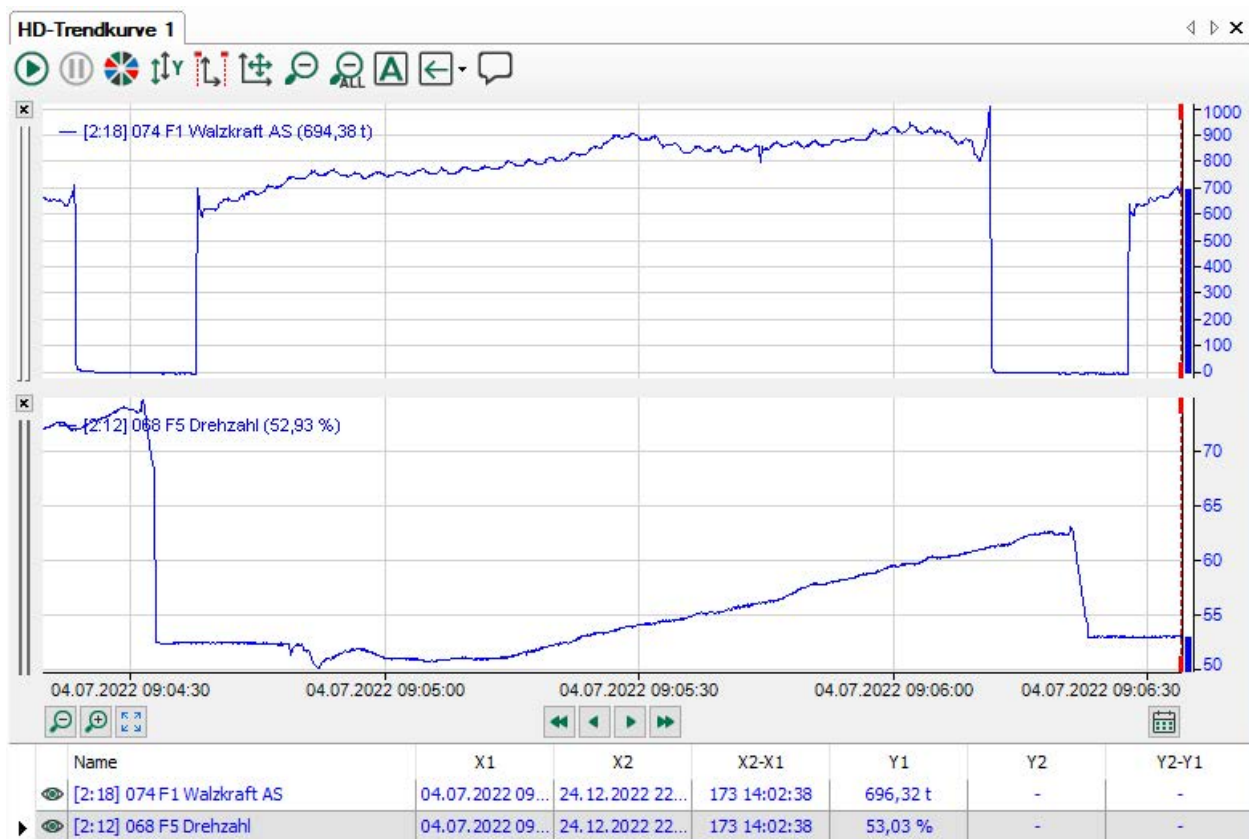
7.2 HD trend graph

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

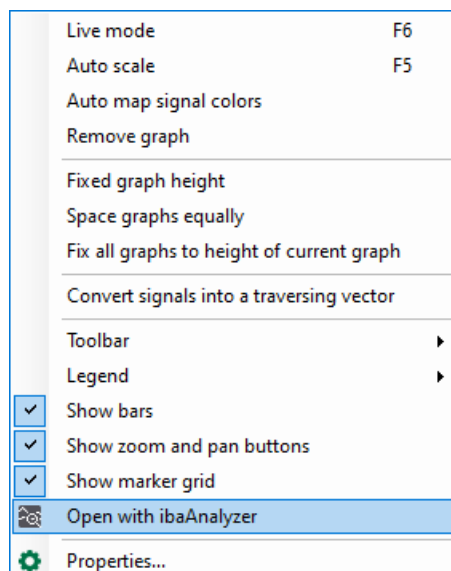
-  and then drag signals with the mouse from the HD signal tree and drop them into the trend graph via drag & drop.
- 
- double click on a signal in a HD signal tree (time- or length-based).
- or drag an event from the HD signal tree (time- or length-based) and drop it on the empty work space of the *ibaPDA* client.



The display of the historical trend graph is the same as the display of the normal trend graph. The difference is that the data are coming from *ibaHD-Server* and not from the *ibaPDA* server. When time-based storages are used, 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:

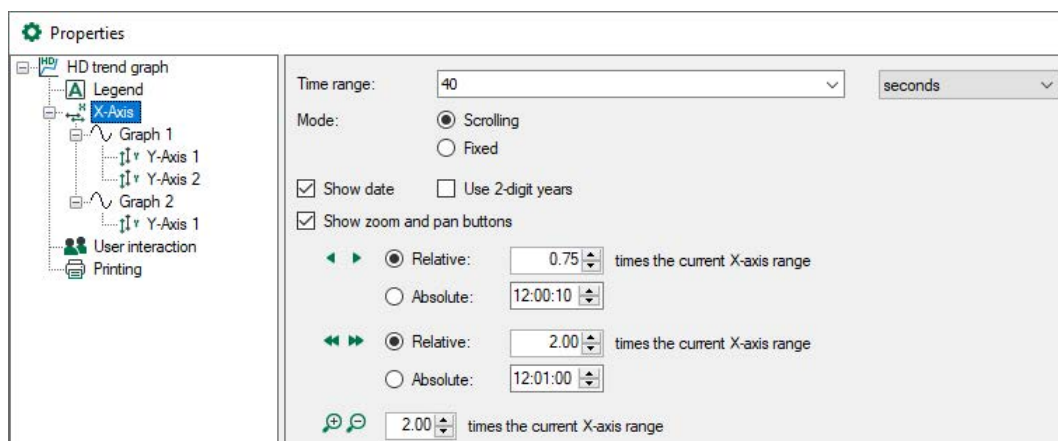
	Zoom function
	Scroll
	Jump to a date

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 more information, see chapter [ibaHD-Server in ibaQPanel](#), page 167.

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.

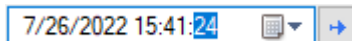
Example: if the X axis indicates a range of 100 s and if the time stamp goes to 10:00:00, a small step jumps to the left by 75 s on 09:58:45 and a large step to the left by 200 s on 09:56:40.

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

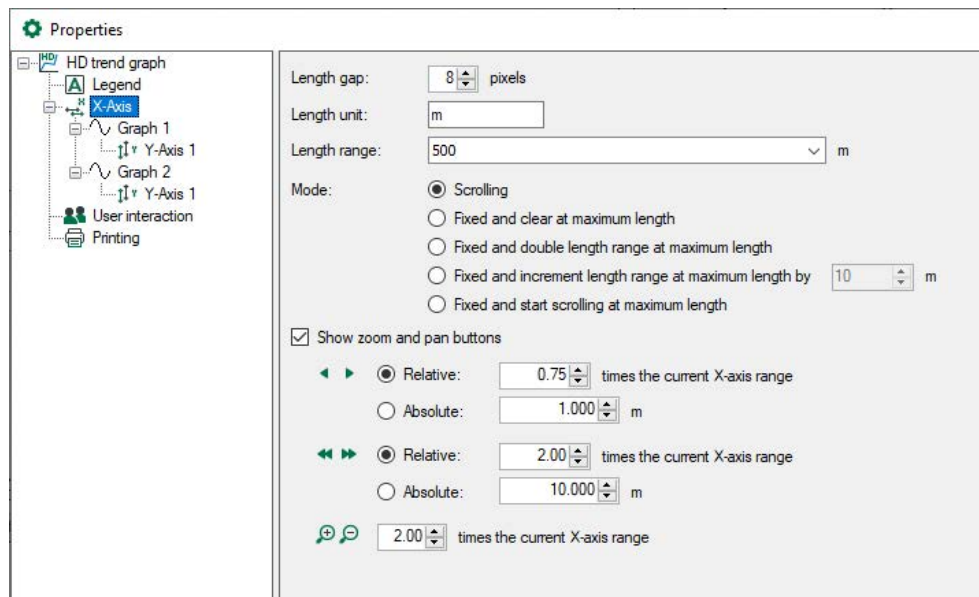


Please find additional information about the settings of the display e. g. scaling the Y axis, using the markers etc. in the manual or the online help of *ibaPDA*.

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.

The difference is mainly 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 rather consecutive sections where the length scale always increases from 0 to a final 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 find the respective 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 practice, however, the current value can differ from that, since 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 base 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 is fed in the specified direction. The graph gets cleared when resetting the length signal. 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 is fed in the specified direction. The graph gets cleared when resetting the length signal. 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 continues to move by the specified amount. If the end of scale is reached before 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 is fed in the specified direction. The graph gets cleared when resetting the length signal. 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 feeding in the middle of the base axis. If 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 with maximum length	The fixed base axis shows a scale from 0 to length range value. The graph is fed in the specified direction. The graph gets cleared when resetting the length signal. 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 scrolling

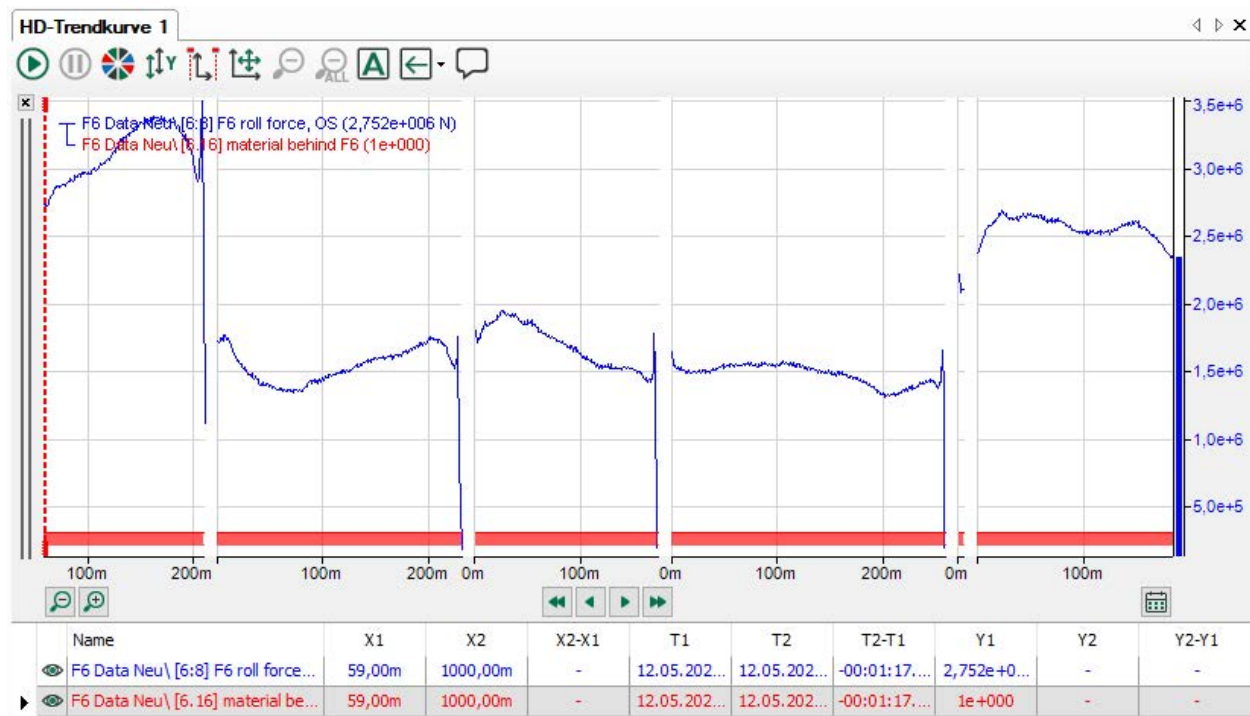
Functions and properties correspond to those of the time-based HD trend graph.

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.

The columns are filled with values if the scrolling of the trend display has been stopped (pause button).

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	-	Time stamp 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 Annotations and attachments

In any HD trend representation, you can always add one or more annotations. Annotations are saved in an event-based HD store as manually added events and are shown in the event table.

Annotations are intended to document an observation or a remark accurately in time and to save them in the HD store.

In addition, each annotation 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 the use on the one hand and to optimize the management of annotations in the *ibaHD-Server* on the other, annotations (once created) can be saved in a tree structure. This allows you to build a library of types or categories of annotations that you can then always reuse. You can configure the annotations by topic, for example ("failure", "quality", "mechanics", "production", etc.).

To enter an annotation in the event table, you then have to select the appropriate configured annotations ("topic") from the drop-down list and complete them with a current message that you enter by hand.

To create an annotation, proceed as follows.

1. During the ongoing acquisition, click on the annotation 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 annotation and click.



The "Create annotation" dialog opens.

3. If necessary, correct the time stamp of the annotation.
4. The last chosen annotation 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 an annotation, 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 *annotation* column.
6. If you want to add an additional document (image file, report file, text file or Office file) to the annotation, 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. Close 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 annotations before, click on the gear icon in the "Create annotation" 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 *ibaHD-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 annotation
-  Remove
-  Move up
-  Move down

10. If you configure a new annotation, give it a meaningful understandable name.
11. If necessary, select a degree of priority. In the event table, the annotation will be handled like other events with the same priority, e.g. 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 an annotation in the trend graph, the entry of a message is not forgotten, enable the option *Make message mandatory*. The dialog for creating an annotation then cannot be closed if the message field is empty.
14. If you want to make sure that when entering an annotation in the trend graph, the entry or selection of an attachment is not forgotten, enable the option *Make file attachment mandatory*. The dialog for creating an annotation then cannot be closed if the *file attachment* field is empty.
15. Close the dialog with <OK>. You 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".

Configuration Client options

Trigger

☒ Active

Signal: 3.17: F7 Stand loaded

Level: 0.500 Incoming event: on rising edge

Dead time: 1.000 s Outgoing event: on falling edge

General

Name: Product in F7 Priority:

Comment 1:

Comment 2:

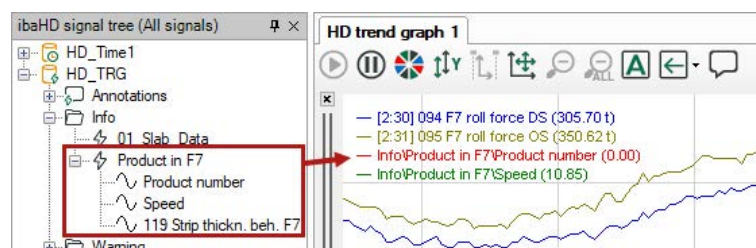
URI:

Message

Product no. [Product number] in Stand F7; Speed [Speed]; Thickness [119 Strip thckn. beh. F7]

Numeric fields		
Name	Channel	Format
Product number	[5:0] ProductNo	1.00
Speed	[3:13] 109 F7-spe	1.00
119 Strip thckn. beh. F7	[3:23] 119 Strip th	1.00

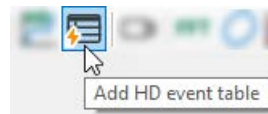
The numeric fields are available in the HD signal tree under the event node.



7.3 Event table

An event table opens if you click in the *ibaPDA* client

- on the icon in the tool bar.



- or make a double click on an event in the HD signal tree.

Event	Time	Message	Priority	Trigger	Ack
Rollforce DS	1:52:09 PM	Rollforce over55: 59.67			<input type="checkbox"/>
Rollforce OS	1:52:09 PM	Rollforce OS too high: 59.67	Hoch		<input type="checkbox"/>
Rollforce DS	1:52:09 PM	Rollforce over55: 0.00			<input type="checkbox"/>
Rollforce OS	1:52:09 PM	Rollforce OS too high: 0.00	Hoch		<input type="checkbox"/>
New Slab HD Le...	1:52:09 PM	New Material: X 1035			<input type="checkbox"/>
Rollforce DS	1:52:06 PM	Rollforce over55: 55.30			<input type="checkbox"/>
Rollforce OS	1:52:06 PM	Rollforce OS too high: 55.30	Hoch		<input type="checkbox"/>
Counter5000	1:52:04 PM	Warnung: Cooling is missing: 25869.38	Hoch		<input type="checkbox"/>
02_Collier_Setup	1:52:02 PM	1459.00 w 939.00			<input type="checkbox"/>
Temperature OS	1:52:02 PM	OS EdgeTemperature: -9999.00			<input type="checkbox"/>
Temperature DS	1:52:02 PM	-9999.00 = Temperature DS			<input type="checkbox"/>
Temperature DS	1:51:55 PM	1055.00 = Temperature DS			<input type="checkbox"/>
Temperature OS	1:51:55 PM	OS EdgeTemperature: 917.00			<input type="checkbox"/>

Toolbar

The tool bar 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.
	Opens the editor for creating event queries
	Carries out the event query which has been selected in the drop-down list.
	Copies the row(s) selected in the event table to the clipboard. Only possible in pause mode.
	Exports the row(s) selected in the event table to an Excel or text file. Only possible in pause mode.
	Acknowledges all events displayed in the event table

Status bar


The status bar 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 "Acknowledgment" column. Clicking on the button  acknowledges all of the events displayed at once.


Note



The acknowledgment of an event cannot be reversed.

Filter line

The upper line 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. Select a search option via the <ABC> button or <=>. Then enter the search string or a value.

Event	Time	Message	Priority	Ack
				

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 "Acknowledgment" column, the following filter allocations are possible:


☐ No filtering active.

☐ Only not acknowledged events are displayed.


☒ Only acknowledged events are displayed.

Note



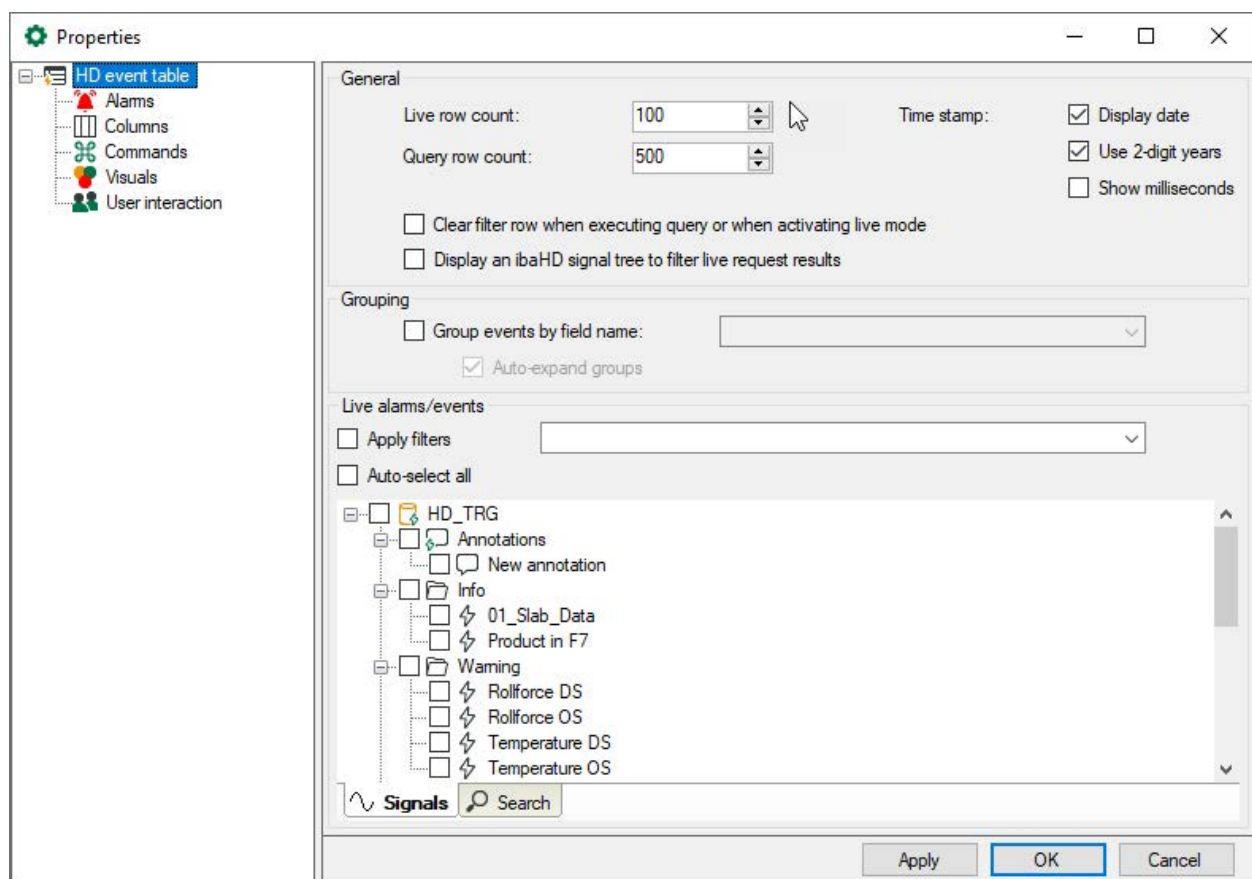
The icon  The icon in the status row of the event table indicates that a filter is active in the filter line.

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.

By clicking  on the filter icon, you clear the filter line completely, i.e. also eventually active filters in the hidden fields are deleted again.

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.

Time stamp

- **Display date:**
Enable this option for displaying the date together with the time stamp in the "Time" column. Otherwise, only the time stamp will be shown.
- **Use 2-digit dates:**
For the display of the time stamp in the "Time" column, you can select a double digit display of the year. Otherwise, a four-digit display is shown.
- **Show milliseconds:**
For the display of the time stamp in the "Time" column, you can select the milliseconds option. Otherwise, only seconds are displayed.

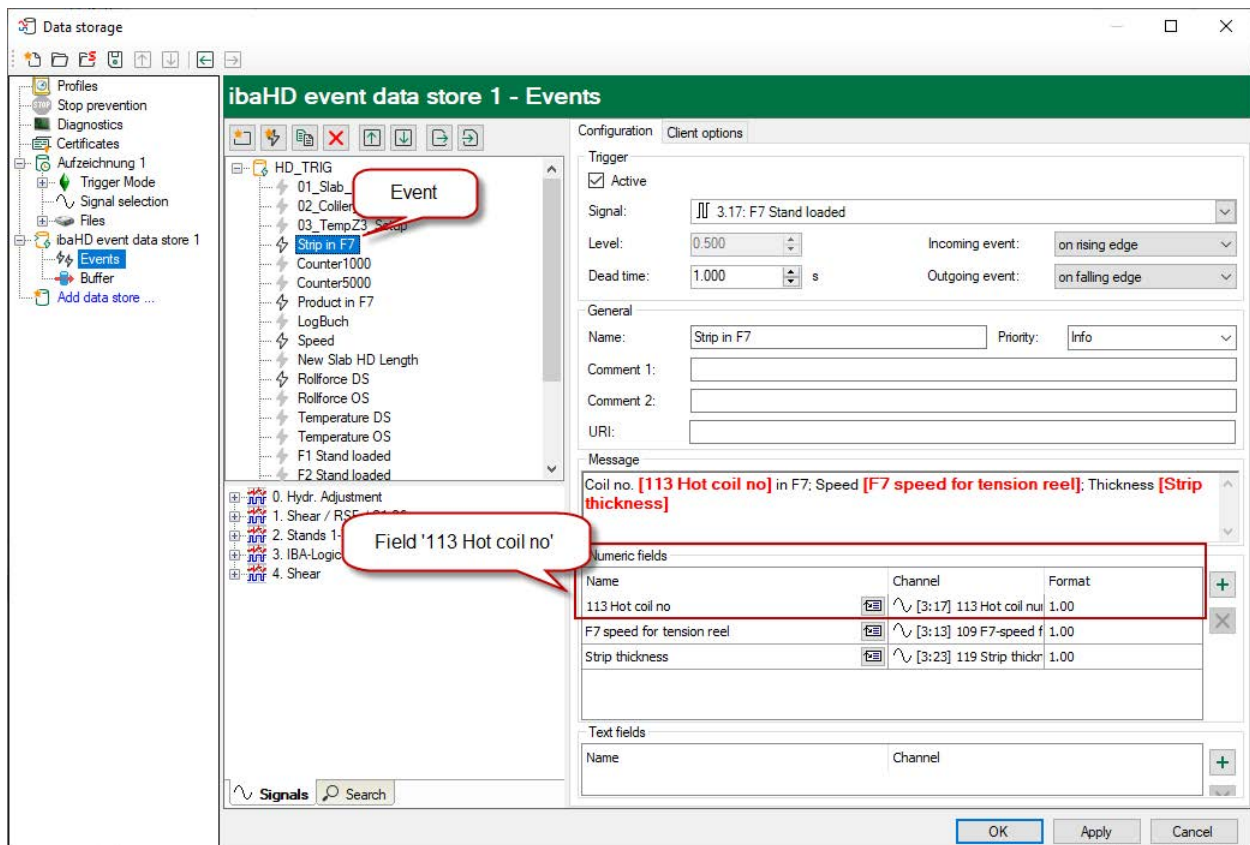
Clear filter row when executing query or when activating live mode

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.

Grouping

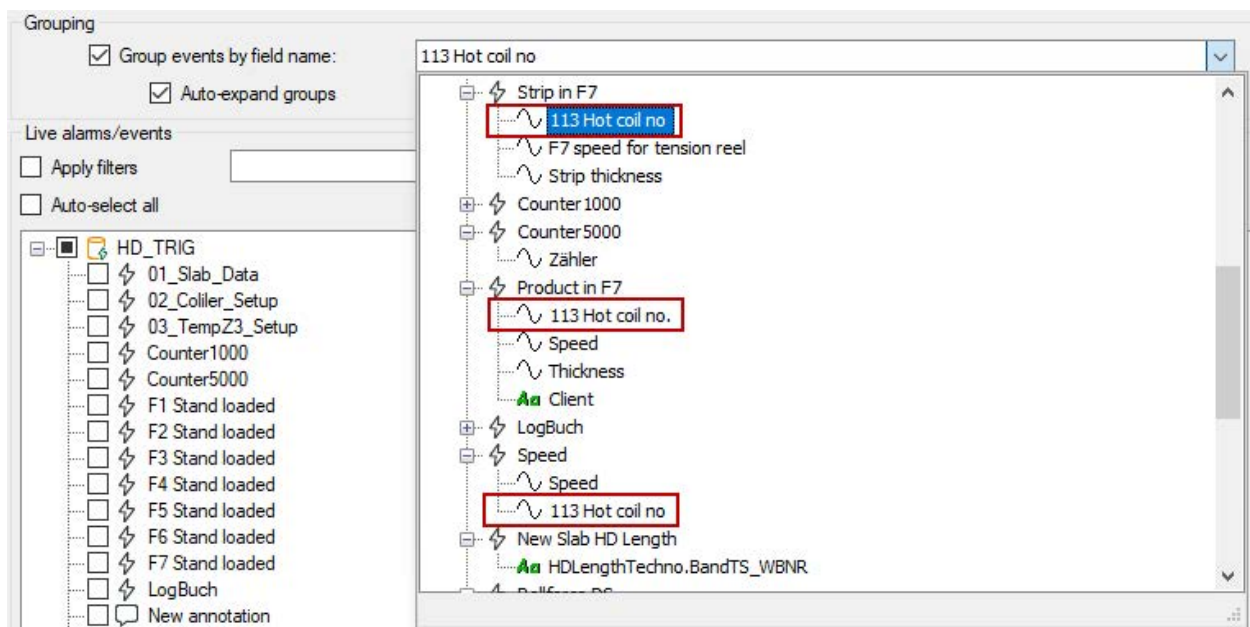
By activating this option you can group events in the table. The grouping is made with a (dynamic) field which is used in the events (see event configuration).

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:

Events					
New folder/SpeedMax					
Event	Trigger	Time	Message	Priority	Ack
4204					
Strip at thickness gauge	→	2:53:51 PM	Strip 4204.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:53:51 PM	Strip 4204.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:53:37 PM	Strip 4204.00 present		<input type="checkbox"/>
Strip at thickness gauge	→	2:52:35 PM	Strip 4204.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:52:35 PM	Strip 4204.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:52:20 PM	Strip 4204.00 present		<input type="checkbox"/>
4203					
Strip at thickness gauge	→	2:52:20 PM	Strip 4203.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:52:20 PM	Strip 4203.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:52:05 PM	Strip 4203.00 present		<input type="checkbox"/>
Strip at thickness gauge	→	2:51:12 PM	Strip 4203.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:51:12 PM	Strip 4203.00 left stand F7	Normal	<input type="checkbox"/>
4202					
Strip at thickness gauge	→	2:57:48 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:57:48 PM	Strip 4202.00 left stand F7	Normal	<input type="checkbox"/>
Strip at thickness gauge	→	2:57:32 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Strip at thickness gauge	→	2:50:56 PM	Strip 4202.00 entered thickness gauge exit	Low	<input type="checkbox"/>
Stand F7 discharged	→	2:50:55 PM	Strip 4202.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:50:55 PM	Strip 4202.00 present		<input type="checkbox"/>
Photo cell FA7	→	2:50:41 PM	Strip 4202.00 present		<input type="checkbox"/>
4201					
Stand F7 discharged	→	2:57:32 PM	Strip 4201.00 left stand F7	Normal	<input type="checkbox"/>
Photo cell FA7	→	2:57:31 PM	Strip 4201.00 present		<input type="checkbox"/>

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.

Events					
New folder/SpeedMax					
Event	Trigger	Time	Message	Priority	Ack
4204					
4203					
4202					
4201					
4200					
Cut head end	→	3:05:19 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:05:06 PM	Measure roll up		<input type="checkbox"/>
Cut head end	→	3:05:05 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:04:40 PM	Measure roll up		<input type="checkbox"/>
New Coil	→	3:03:40 PM	New Coil number: 704201	Normal	<input type="checkbox"/>
Cut head end	→	3:03:27 PM	Shear cut head end		<input type="checkbox"/>
Cut head end	→	3:03:14 PM	Shear cut head end		<input type="checkbox"/>
Measure roll up	→	3:03:14 PM	Measure roll up		<input type="checkbox"/>

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

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.

Tip



In the event table, you can always enable and disable columns via the 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 in the event table later.

The comment is shown in the *Acknowledgment comment* column in the event table.

Allow user text input for comments

If you enable this option, then any plain 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.

Info URI

Clicking the URI shown here opens the URI in the computer's default browser.

If this column is not displayed, you can also open the URI by using <Alt>+click on any area of the event entry.

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.

Event fields

Event field columns

☒ Create columns for event fields

☐ Dynamically create columns for all fields in table

☒ Create columns for the following fields:

Product number

Speed

I 119 Strip thickn. beh. F7

*

If you use dynamic fields in the event messages that display actual values of the measured variables, for instance, then you can enable additional columns in the event table for these fields here in the area of the event fields.

One advantage of these additional columns is that they can filter the event table according to the field values.

Example from the event definition with dynamic numeric fields (HD data storage):

Message

Coil no. [113 Hot coil no] in F7; Speed [F7 speed for tension reel]; Thickness [Strip thickness]

Numeric fields

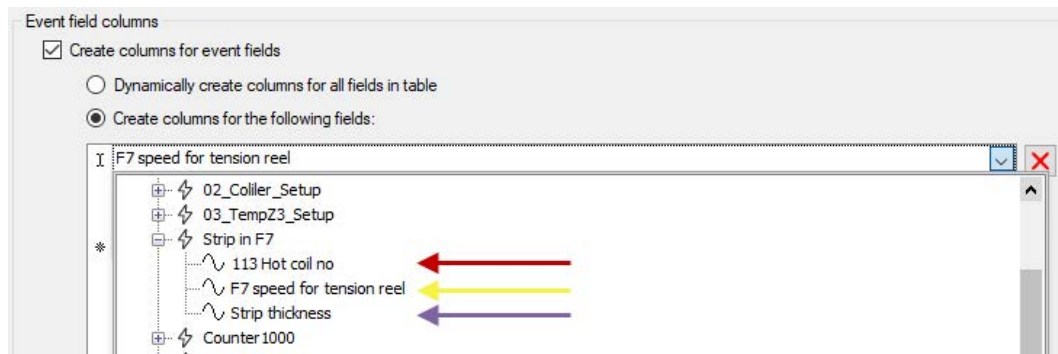
Name	Channel	Format
113 Hot coil no	<div><div></div><div>^ [3:17]</div></div> 113 Hot coil nu	1.00
F7 speed for tension reel	<div><div></div><div>^ [3:13]</div></div> 109 F7-speed f	1.00
Strip thickness	<div><div></div><div>^ [3:23]</div></div> 119 Strip thickr	1.00

Example of display of event fields and the associated columns in the event table:

Event	Trigger	Time	Message	/	Ack	F7 speed fo...	Strip thickness	113 Hot coil no
Strip in F7	<div><div></div><div></div></div>	8/1/22 4:46:07 PM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29		<input type="checkbox"/>	10.853	2.285191	4200
Strip in F7	<div><div></div><div></div></div>	8/1/22 4:47:55 PM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29		<input type="checkbox"/>	10.853	2.285191	4200
Strip in F7	<div><div></div><div></div></div>	8/1/22 4:42:16 PM	Coil no. 4200.00 in F7; Speed 14.59; Thickness 2.29		<input type="checkbox"/>	14.59354	2.292516	4200

By selecting the corresponding option field, you can optionally have the columns displayed automatically or select them specifically by hand.

Click on the drop-down list for a targeted selection. A window with the event tree opens, just as the events were defined when configuring the HD storage. Once configured, you will find the corresponding numeric fields or labels under the event nodes.

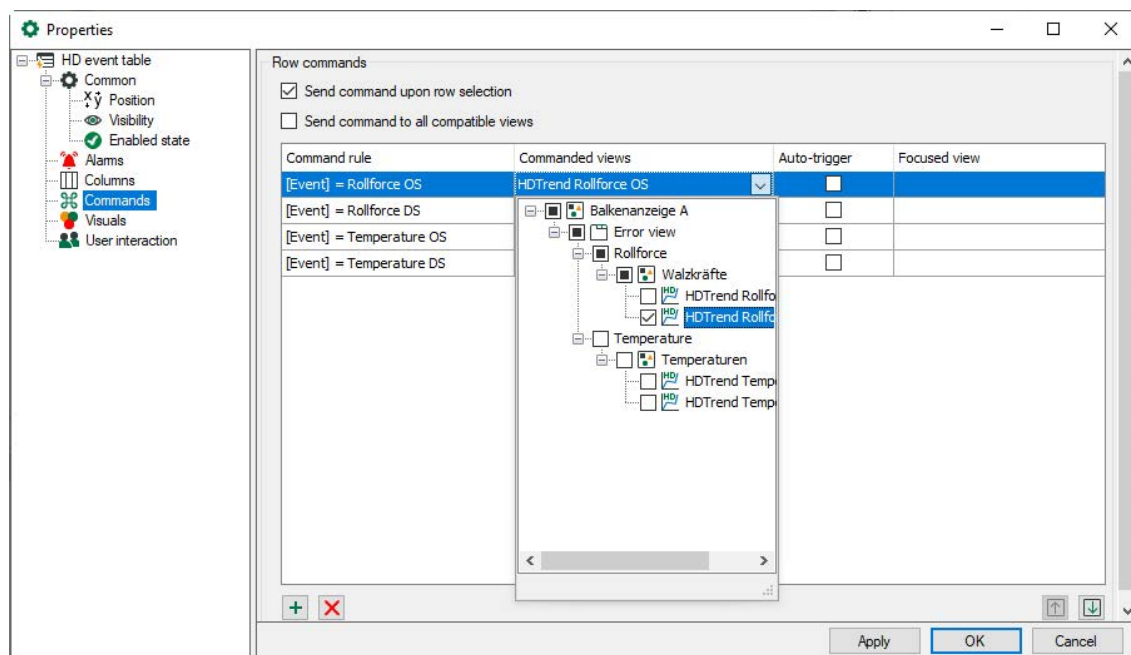


Click on the desired field and it will be included in the list for event field columns.

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.

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.

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.



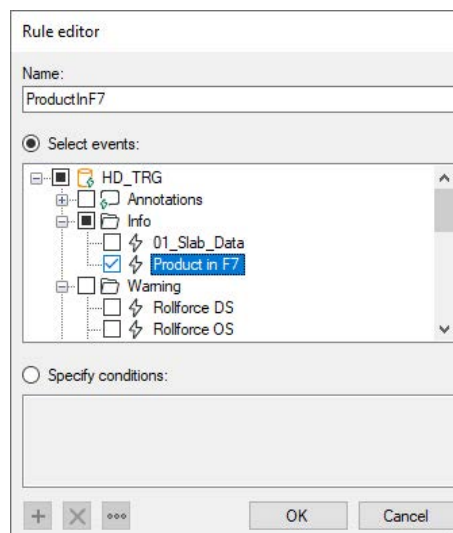
Deletes the marked rule.



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.

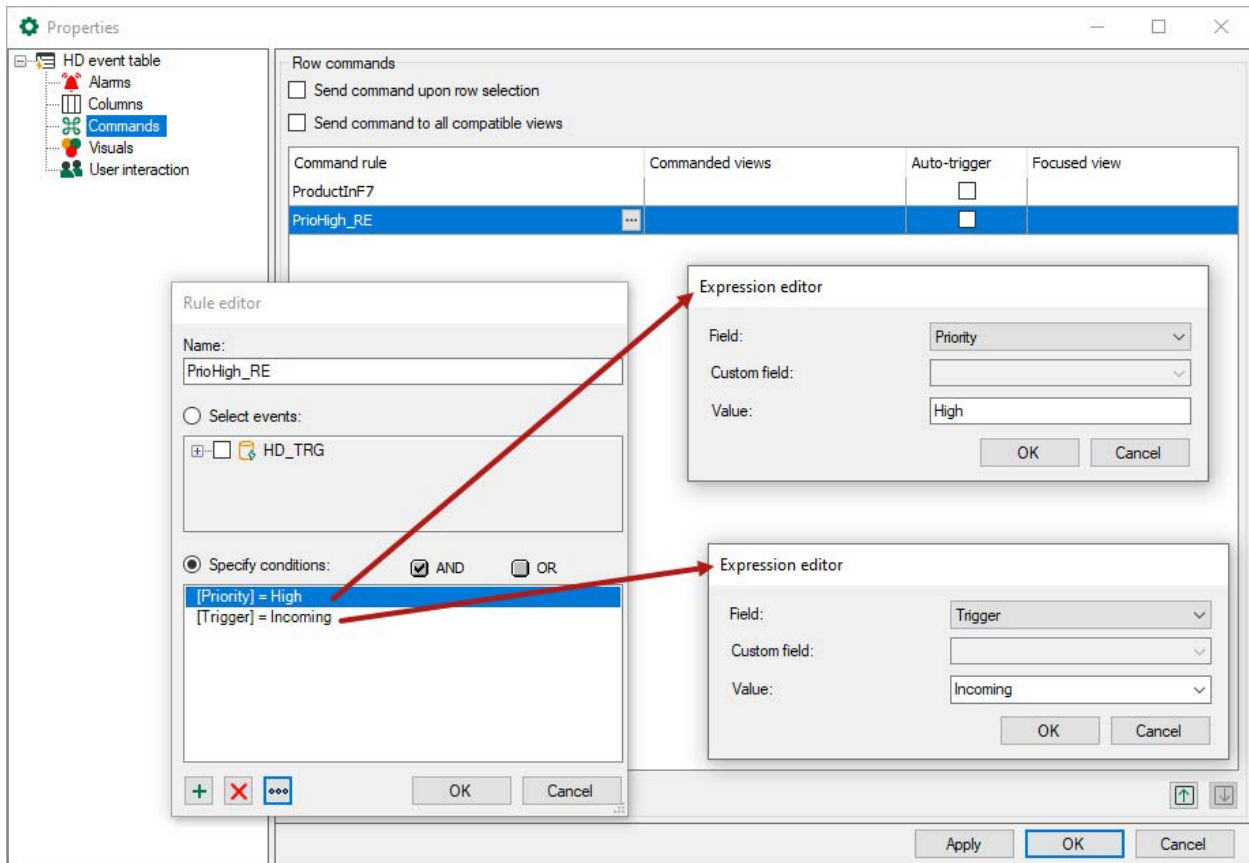
If a condition contains several expressions, then these will be linked with a logical AND or OR.

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.

Expression editor

Field: Custom

Custom field: 113 Hot coil no

Value: 4200

OK Cancel

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".

Numeric fields

Name	Channel	Format
113 Hot coil no	[3:17] 113 Hot coil number	1.00
F7 speed for tension reel	[3:13] 109 F7-speed for tension r	1.00
Strip thickness	[3:23] 119 Strip thickn. beh. F7	1.00

This argument would be met, for example, for the following event:


Events

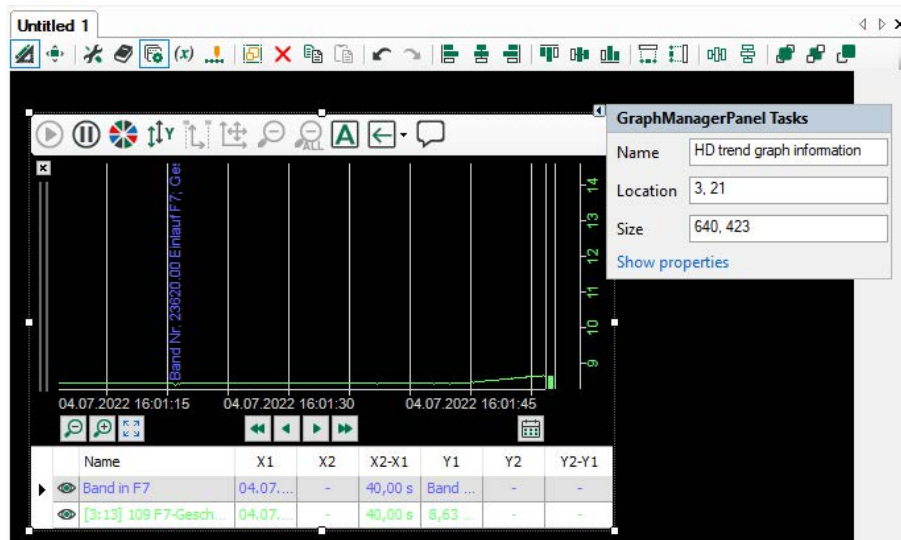
New folder/SpeedMax

Event	Trigger	Time	Message	Priority	Ack
Strip in F7		8/2/22 10:28:56 AM	Coil no. 4200.00 in F7; Speed 10.85; Thickness 2.29	Info	<input type="checkbox"/>
Strip in F7		8/2/22 10:23:17 AM	Coil no. 4200.00 in F7; Speed 14.59; Thickness 2.29	Info	<input type="checkbox"/>

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.

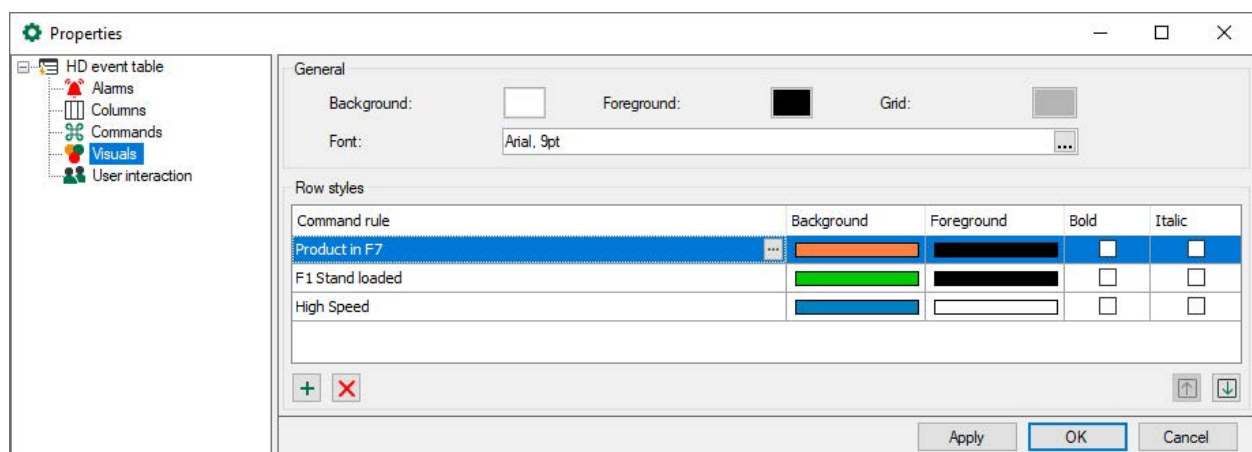
In the "Pane" heading in the properties of the event table, you can set such row styles locally on the *ibaPDA* client.

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

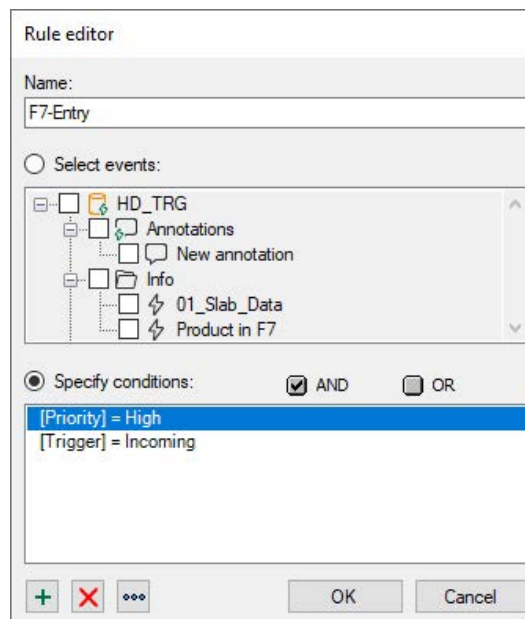


By double-clicking, the list of rules is checked from the top to the bottom. At the first applied rule, the check will be finished and the style modification will be made.

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.



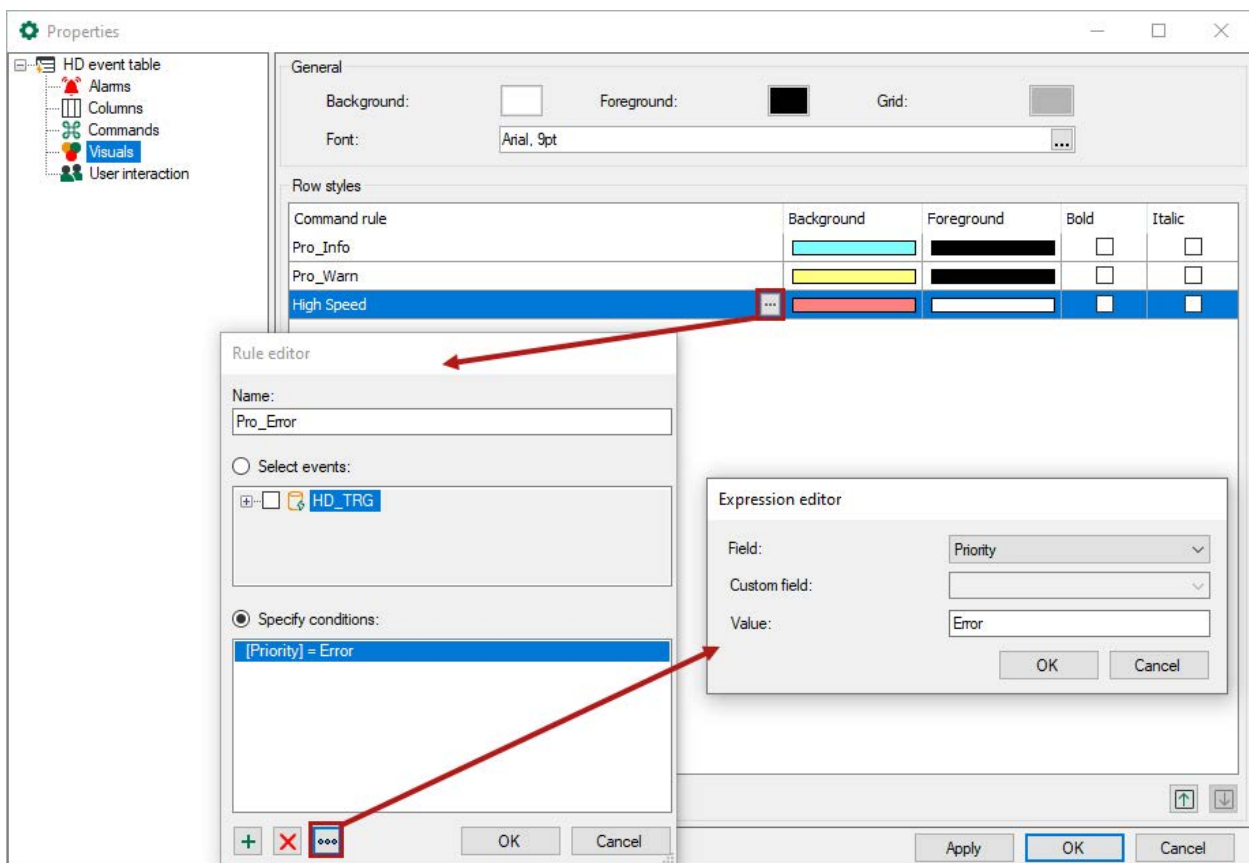
Deletes the marked expression.



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".

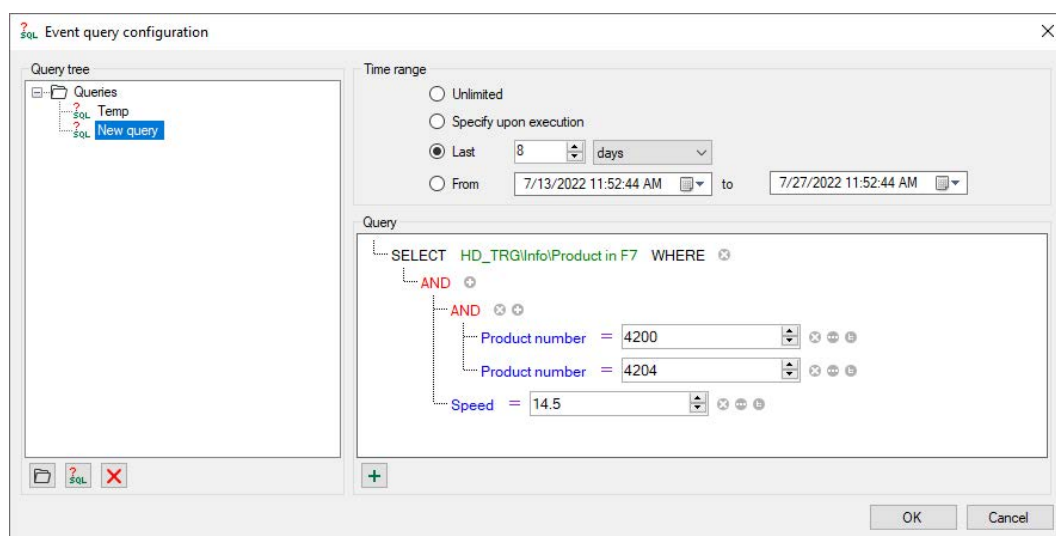


The row styles shown above as an example change the appearance of an event table as follows:

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	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input type="checkbox"/>
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	<input type="checkbox"/>
Coil on Uncoiler 2		25.04.12 12:00:25	New Coil '4AB12346 'on Uncoiler #2 (Diam.: 1675 mm, Thickn.: 1.01 mm)	Information	<input type="checkbox"/>
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	<input checked="" type="checkbox"/>
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	<input checked="" type="checkbox"/>
New Coil welded		25.04.12 11:59:17	Coil '4AB12345 'welded (Diam.: 1870 mm, Thickn.: 1.02 mm)	Information	<input type="checkbox"/>
Coil on Uncoiler 1		25.04.12 11:58:24	New Coil '4AB12345 'on Uncoiler #1 (Diam.: 1870 mm, Thickn.: 1.02 mm)	Information	<input checked="" type="checkbox"/>

7.3.2 Configuration of event queries

Click on the icon in the tool bar of the event table to configure event queries.



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 them.

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.

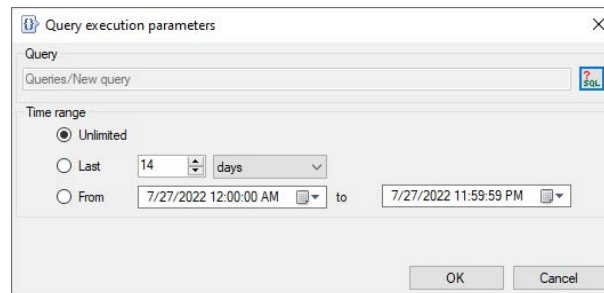


Deletes the marked node and eventually secondary nodes in the tree structure.

Time range

Every query is run over a defined time range. There are several options for narrowing the time range.

- **Unlimited:** The query covers the entire HD recording
- **Specify upon execution:** After clicking the start button for the query, the dialog appears which requires a specification of the time range.



The dialog box titled "Query execution parameters" contains a "Query" field with the text "Queries/New query" and a small "SQL" icon. Below this is the "Time range" section with three options: "Unlimited" (selected), "Last" (with a value of 14 and a unit of "days"), and "From" (with two date-time pickers showing "7/27/2022 12:00:00 AM" and "7/27/2022 11:59:59 PM"). At the bottom are "OK" and "Cancel" buttons.

Clicking on <OK> executes the query.

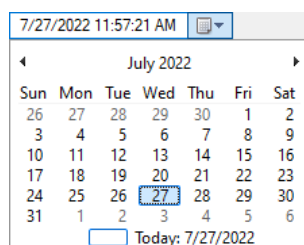
- **The last xx minutes/hours/days/weeks/months:** The query only extends to a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- **From *Date* to *Date*:** The query extends to a time period between the set days (including).

Tip



To set the current date, please open the Date & Time Picker by clicking on the arrow to the bottom.

Here you select the entry below "Today...".

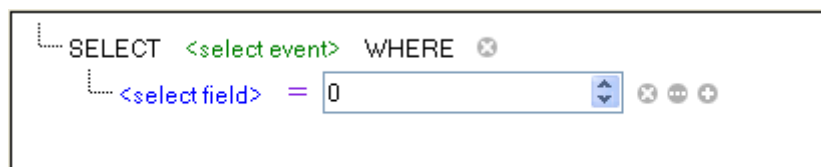


The interface shows a date-time picker for "7/27/2022 11:57:21 AM". Below it is a calendar for "July 2022" with days of the week (Sun to Sat) and dates (1 to 31). The date "27" is highlighted. At the bottom, it says "Today: 7/27/2022".

Query details

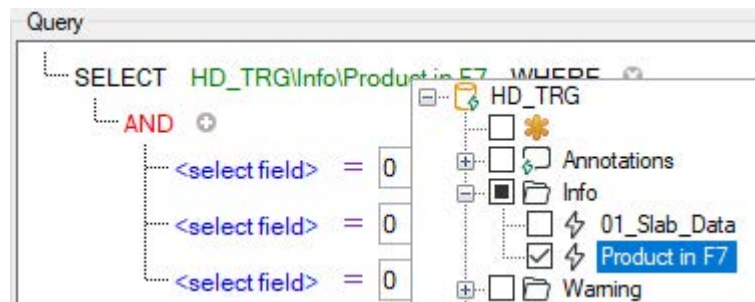
Here, you create the proper query in a SQL like notation.

- Clicking on the icon **+** adds a SELECT instruction to the query marked in the tree.

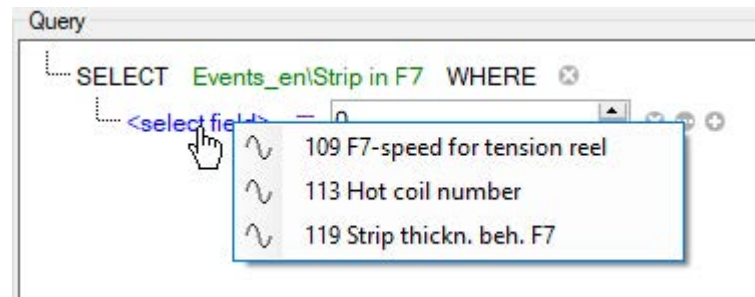


The query editor shows a tree structure with a "SELECT" instruction. The text "<select event>" is highlighted in green. Below it, the text "<select field>" is followed by an equals sign and a text box containing the number "0". There are also icons for deleting, adding, and toggling the query.

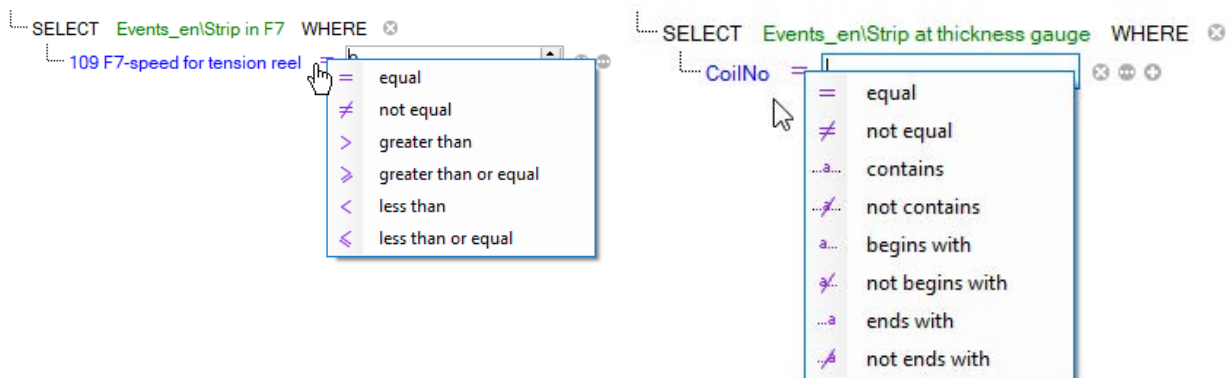
- By clicking on the green text, you open the event tree of the *ibaHD-Server*. Select the event you are searching for here .



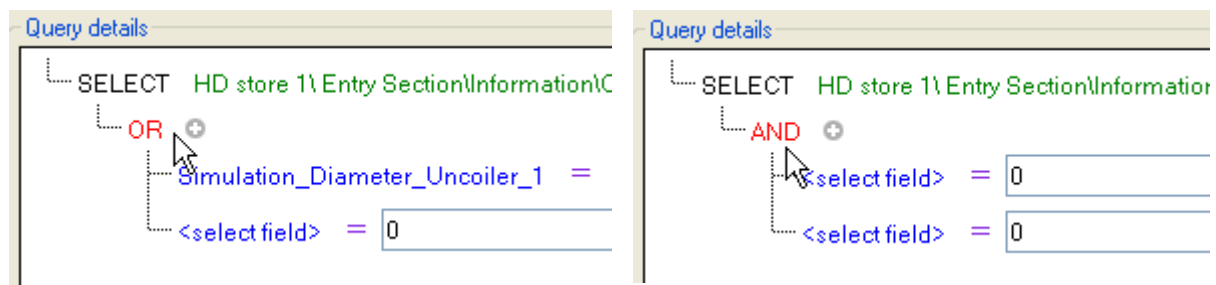
- Click on the blue text to select possible numeric and text fields.



- Depending on the selected field (numeric or text field) a list of operators is displayed by clicking on the violet equal sign. Select the requested operator.



- Behind the elements, there are different buttons which you can use to extent 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 arguments by clicking on the operator.




By clicking on <OK>, the editor is closed and the created queries are stored.

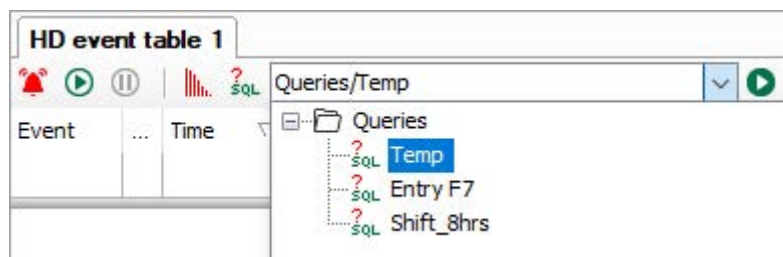
Note



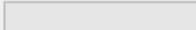
The event queries are stored on the *ibaHD-Server*. Therefore, the queries are available to all *ibaPDA* clients when they are connected with the *ibaHD-Server*.

Execution of event queries

- At first, select the desired query from the list in the toolbar and then click on the button  on the right to execute the query.




- According to the complexity of the query and the number of the found events, the execution can take some time. You can see the current progress of the running query in the status line of the event table.

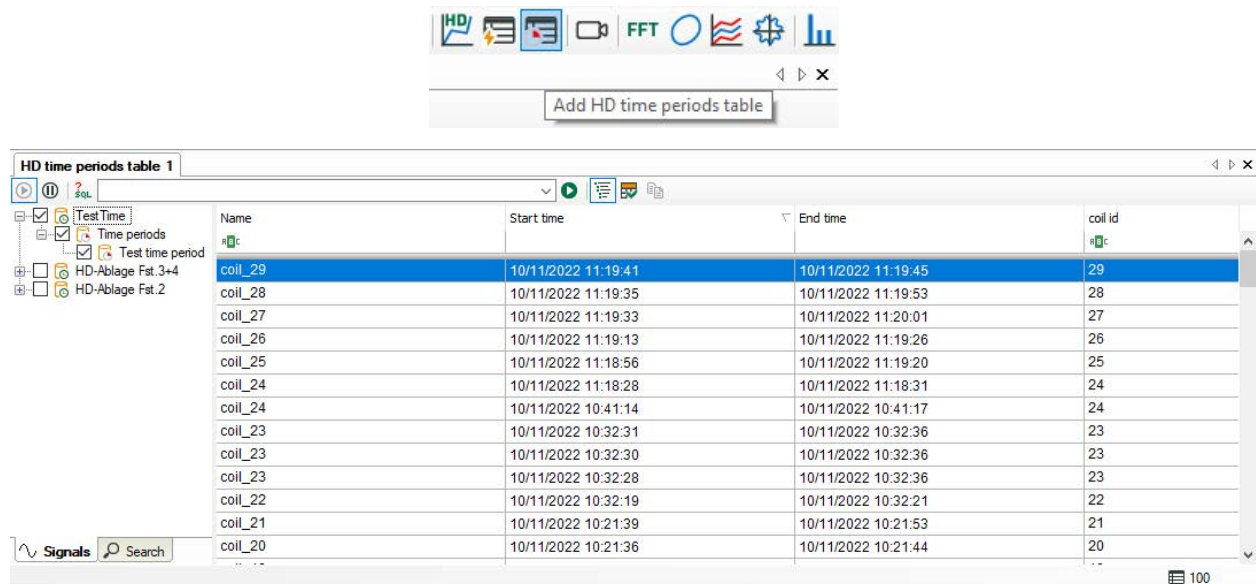
Executing query 

- After completion of the query, the number of the found events is displayed in the status line. A query can return more events than lines exist in the event table. To display possibly existing other events, please click on the blue link "more..." in the status line.


 100 [more...](#)

7.4 HD time periods table









The time periods table can be used to display different time periods from multiple time period stores in an *ibaHD Server*. An HD time periods 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. Or
- Use drag & drop to drag a time period store from the HD signal tree to the table. Or
- Right-click to open the properties of the time periods table and select the time period store.

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.
	Opens the editor for creating SQL-queries.
	Carries out the SQL-query which has been selected in the drop-down list.
	Shows the 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

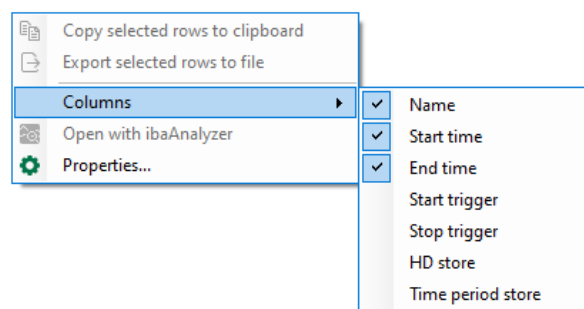
The status bar is at bottom of the table. It provides information about SQL queries carried out (e.g. status of the running query, number of results, error messages) and whether a filter is currently active.

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 context menu.



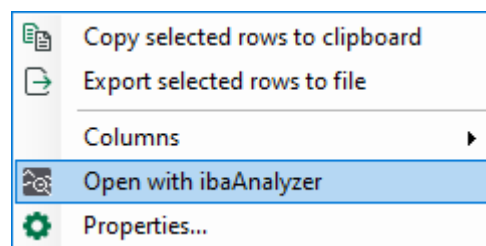
In the upper section of the context menu, you can select the standard columns, and in the lower section the columns for the info fields. The info field columns that appear in the context menu can be configured in the properties of the time periods table, see next section.

Filter row

The top line in the time period table is used to filter the table. A detailed description of the filter functions can be found in the appendix, chapter [Advanced filter in tables](#), page 234.

Open time periods in ibaAnalyzer

Selected time periods can be opened directly in *ibaAnalyzer*. To do this, select a row in the time period table and choose the *Open with 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.



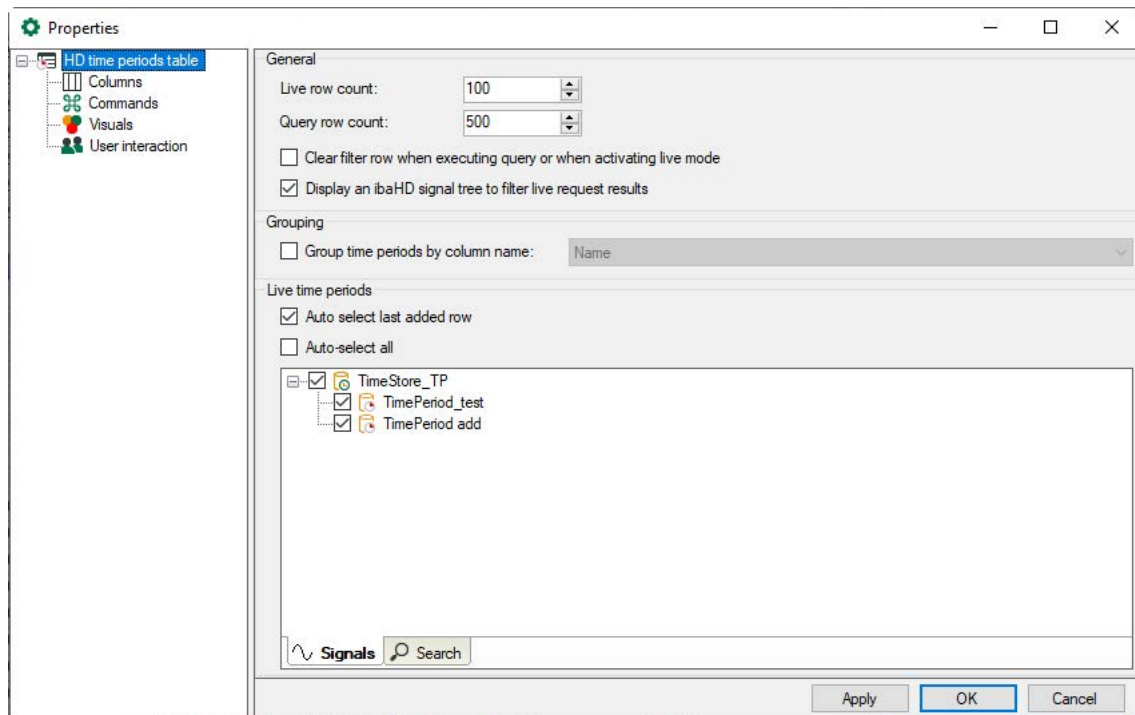
Prerequisite is *ibaAnalyzer* version 8.1 or higher. If an older version of *ibaAnalyzer* is installed, the time period is opened, but no info fields are displayed. The name of the file will just contain the start and end time, but no time period name. When a time period without an end time is opened in *ibaAnalyzer* then the current time will be used as end time.

In pause mode you can select multiple rows. When multiple rows are selected and you use the *Open with ibaAnalyzer* command then each row is 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



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.

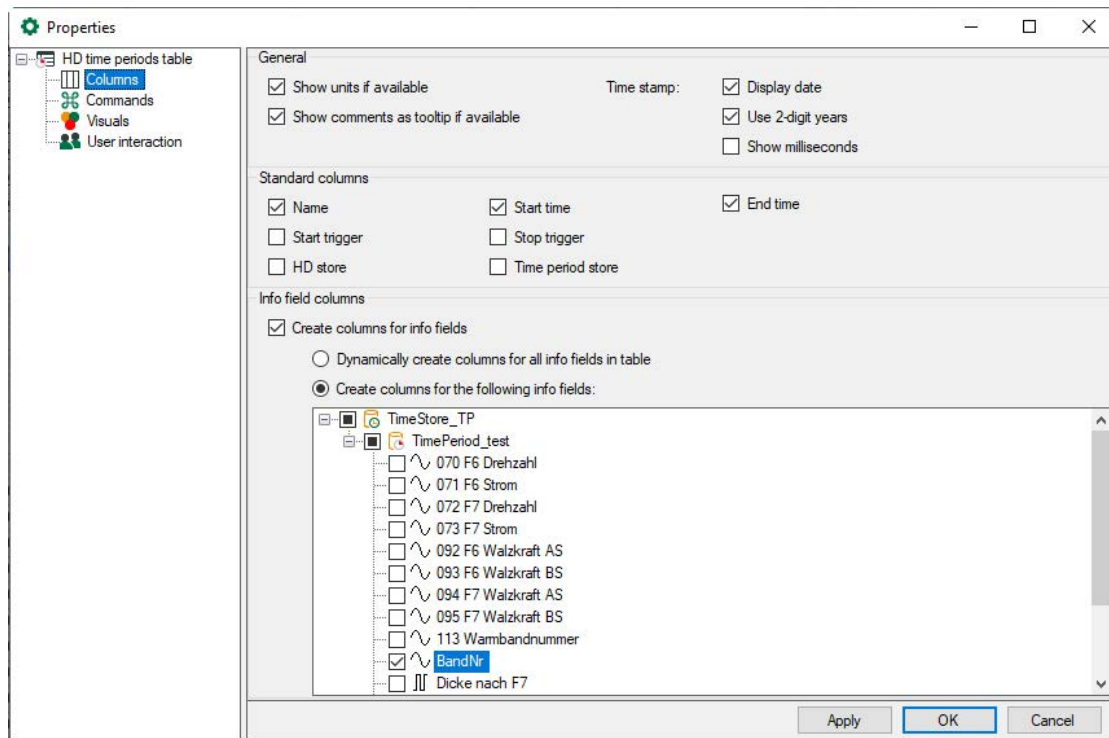
Grouping

Enabling this option allows you to group time periods in the table using columns. Select a column in the adjacent field.

Live time periods

Here, you can specify whether the last row added is to be selected automatically. 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.

7.4.1.2 Columns



General

Use the options to choose how the data will be formatted in the columns.

Standard columns

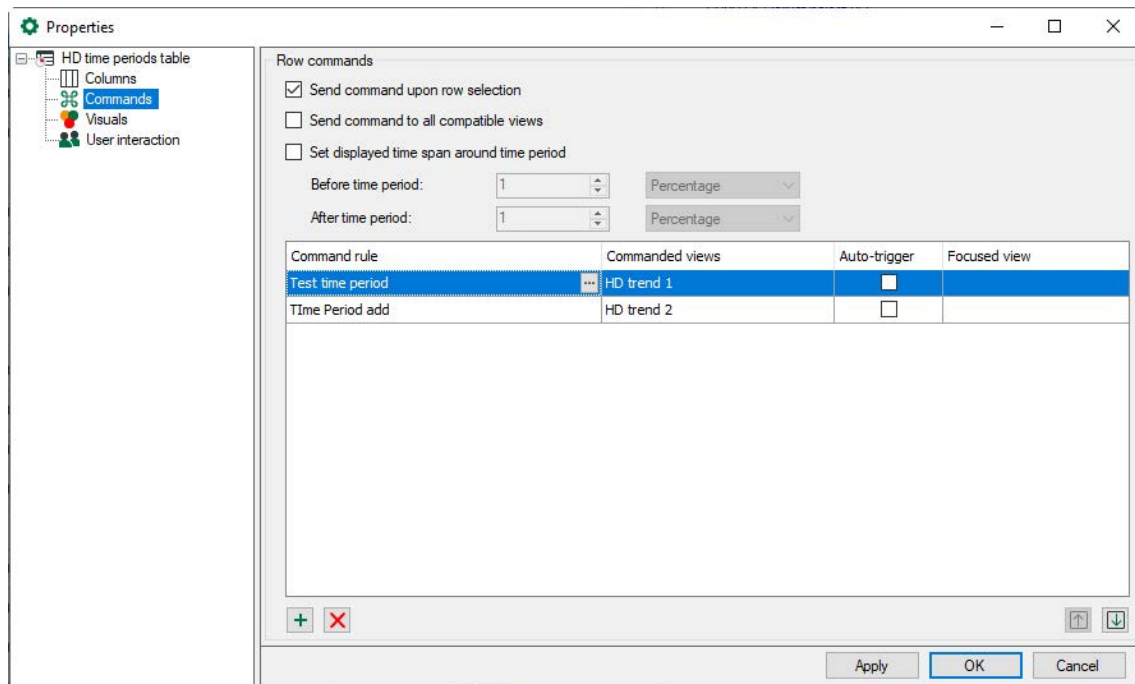
The selected columns are displayed in the HD time periods table.

Info field columns

You can select the info fields in the tree structure for which a column is added. It is also possible to automatically add columns for all info fields. The selected columns can then be shown or hidden using the context menu in the table. If info fields from different HD time period stores have the same database column name, they are merged a single column in the table.

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.
- **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.

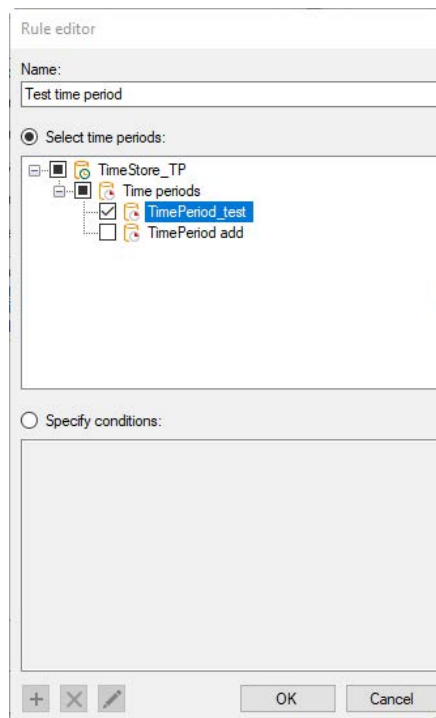


Deletes the selected rule.



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.

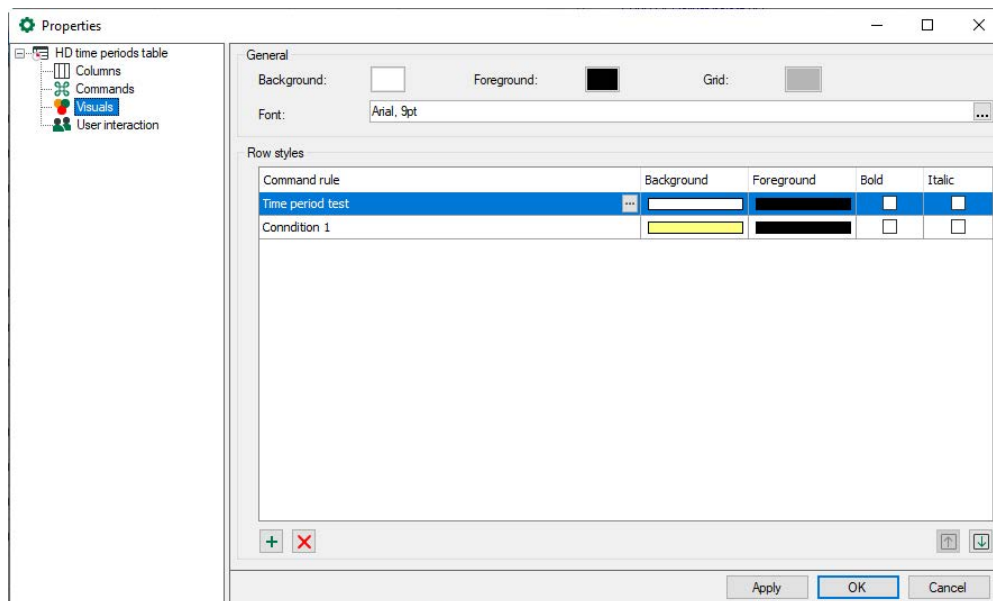
If a condition is met, the trend view is switched.

Configuring conditions

The procedure for configuring a condition is the same as that for event tables. See chapter [Commands](#), page 142.

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

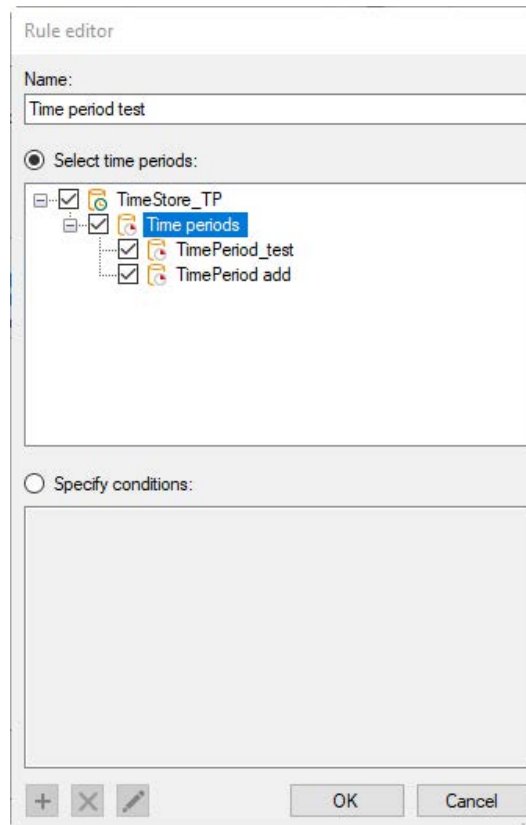
Note



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.

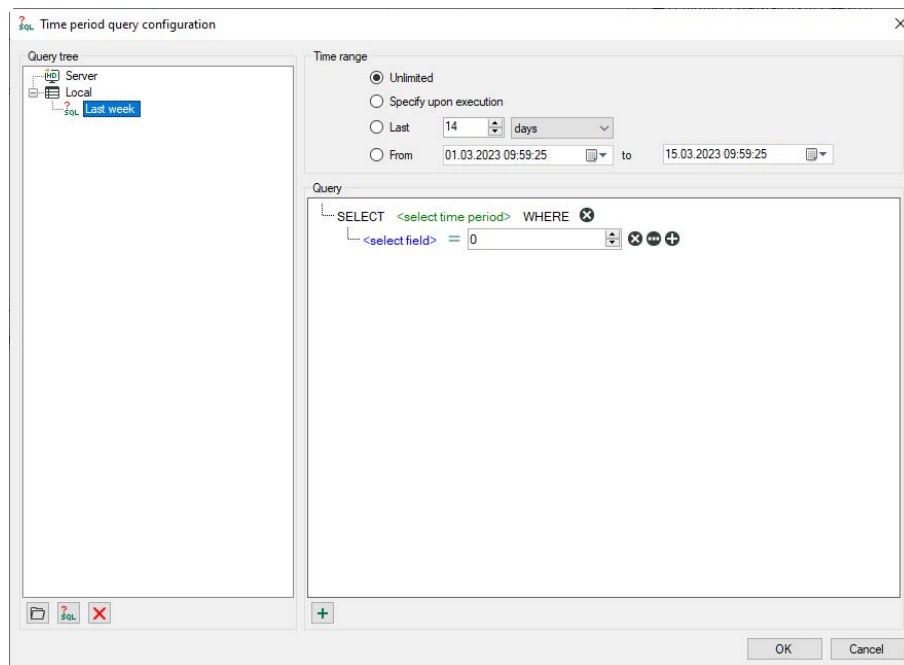


Opens the editor for editing the expression.

7.4.2 Configuration of queries




In the toolbar of the HD time periods table, you can filter the rows displayed by certain criteria. Enter a value or configure a query by clicking on the icon. If you remove a value, the filter is deleted.

Click on the  icon in the toolbar for the time periods table to configure queries.



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 eventually secondary nodes

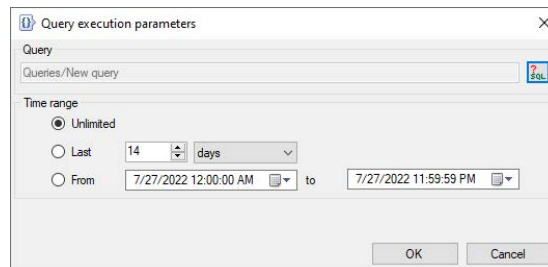
There are two types of queries:

- *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



The dialog box titled "Query execution parameters" contains a "Query" field with the text "Queries/New query". Below it, the "Time range" section has three options: "Unlimited" (selected), "Last" (with a value of 14 and a unit of days), and "From" (with a date range from 7/27/2022 12:00:00 AM to 7/27/2022 11:59:59 PM). At the bottom are "OK" and "Cancel" buttons.

Clicking on <OK> executes the query.

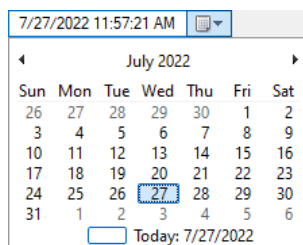
- The last xx minutes/hours/days/weeks/months: The query only covers a fixed period of time from the start of the query, e.g. the last 8 hours for a shift overview.
- From *Date* to *Date*: The query covers the time period between the set days (inclusive).

Tip



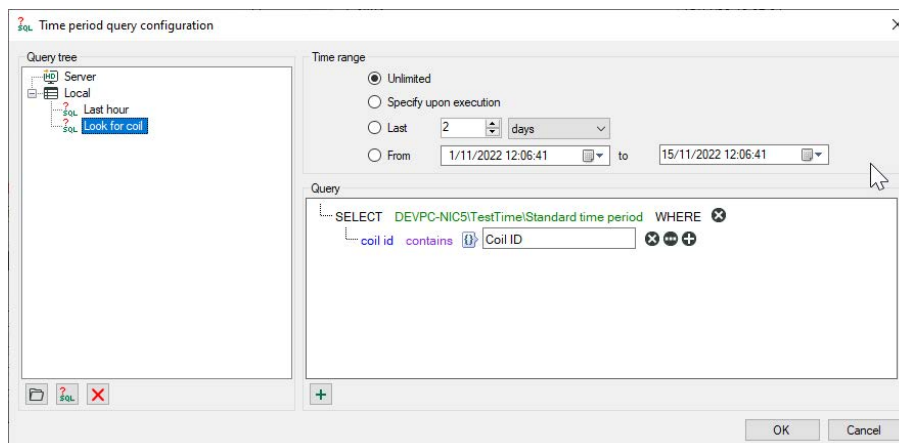
To set the current date, open the Date & Time Picker by clicking on the down arrow.

Here you can select the entry under "Today..."



The Date & Time Picker shows a calendar for July 2022. The date 27 is highlighted. Below the calendar, it says "Today: 7/27/2022".


Query details



The "Time period query configuration" dialog box shows a "Query tree" on the left with a tree structure including "Server", "Local", "Last hour", and "Look for coil". The "Time range" section has three options: "Unlimited" (selected), "Specify upon execution", and "From" (with a date range from 1/11/2022 12:06:41 to 15/11/2022 12:06:41). The "Query" field contains the SQL query: `SELECT DEVPC-NIC5[TestTime]Standard time period WHERE coil id contains Coil ID`. At the bottom are "OK" and "Cancel" buttons.

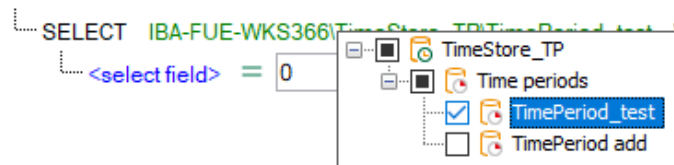
Here, you create the actual query using notation similar to SQL.

The query begins with a SELECT statement.



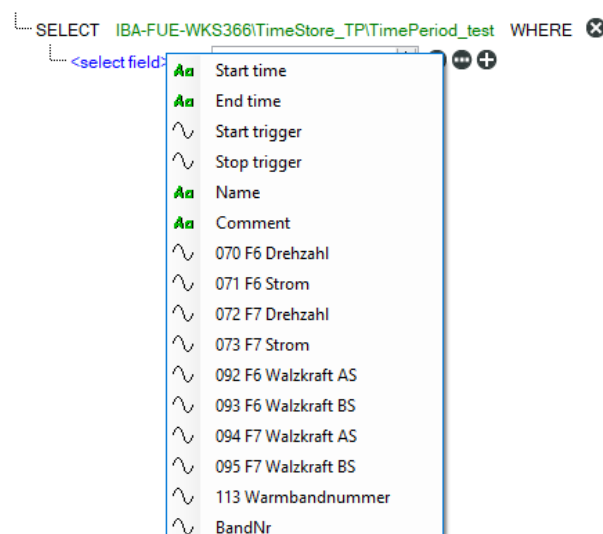
```
SELECT <select time period> WHERE
<select field> = 0
```

Clicking on the green text opens the tree structure for the configured time periods. Select the time period you want to search for.



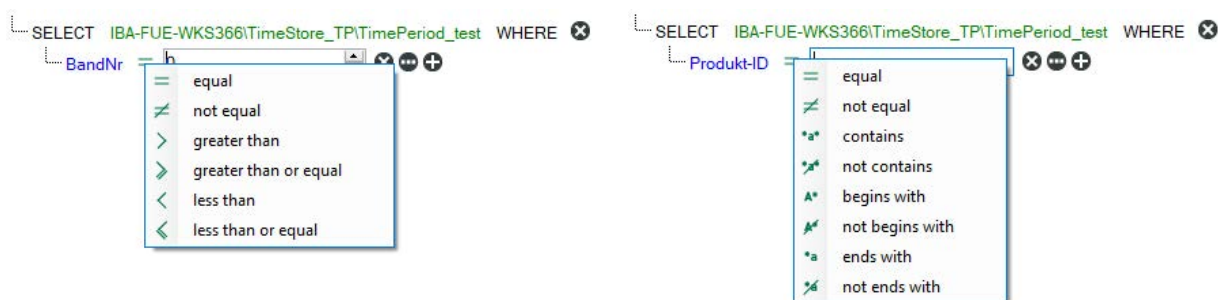
```
SELECT IBA-FUE-WKS366\TimeStore_TP\TimePeriod_test
<select field> = 0
```

Click on the blue text to select a column in the table or any existing information fields.



```
SELECT IBA-FUE-WKS366\TimeStore_TP\TimePeriod_test
<select field> BandNr WHERE
```




Depending on the selected field (numeric or text field), clicking on the green equals symbol displays a list of operators. Select the required operator.



```
SELECT IBA-FUE-WKS366\TimeStore_TP\TimePeriod_test
BandNr = [operator] WHERE
```

```
SELECT IBA-FUE-WKS366\TimeStore_TP\TimePeriod_test
Produkt-ID = [operator] WHERE
```

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 the statement for a new expression

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.

HD time period table 1

SQL Bandnr

Name	Start time	End time	InfoField...	InfoField_Produ...
pda1836_094360	2/22/23 12:09:13 PM	2/22/23 12:10:46 PM		094360
pda1837_027460	2/22/23 12:11:03 PM	2/22/23 12:12:00 PM		027460
pda1838_081800	2/22/23 12:12:18 PM	2/22/23 12:13:09 PM		081800
pda1839_013160	2/22/23 12:13:14 PM	2/22/23 12:14:49 PM		013160
pda1840_093120	2/22/23 12:14:59 PM	2/22/23 12:15:45 PM		093120
pda1841_094360	2/22/23 12:15:59 PM	2/22/23 12:17:33 PM		094360
pda1842_027460	2/22/23 12:17:49 PM	2/22/23 12:18:47 PM		027460
pda1843_081800	2/22/23 12:19:04 PM	2/22/23 12:19:56 PM		081800
pda1844_013160	2/22/23 12:20:01 PM	2/22/23 12:21:35 PM		013160
pda1845_093120	2/22/23 12:21:45 PM	2/22/23 12:22:31 PM		093120
pda1846_094360	2/22/23 12:22:45 PM	2/22/23 12:24:19 PM		094360
pda1847_027460	2/22/23 12:24:35 PM	2/22/23 12:25:33 PM		027460
pda1848_081800	2/22/23 12:25:50 PM	2/22/23 12:26:42 PM		081800
pda1849_013160	2/22/23 12:26:47 PM	2/22/23 12:28:22 PM		013160
pda1850_093120	2/22/23 12:28:31 PM	2/22/23 12:29:17 PM		093120
pda1851_094360	2/22/23 12:29:32 PM	2/22/23 12:31:05 PM		094360
pda1852_027460	2/22/23 12:31:22 PM	2/22/23 12:32:19 PM		027460
pda1853_081800	2/22/23 12:32:37 PM	2/22/23 12:33:28 PM		081800
pda1854_013160	2/22/23 12:33:33 PM	2/22/23 12:35:08 PM		013160
pda1855_093120	2/22/23 12:35:18 PM	2/22/23 12:36:04 PM		093120
pda1856_094360	2/22/23 12:36:18 PM	2/22/23 12:37:52 PM		094360
pda1857_027460	2/22/23 12:38:08 PM	2/22/23 12:39:06 PM		027460
pda1858_081800	2/22/23 12:39:23 PM	2/22/23 12:40:15 PM		081800
pda1859_013160	2/22/23 12:40:20 PM	2/22/23 12:41:54 PM		013160
pda1860_093120	2/22/23 12:42:04 PM	2/22/23 12:42:50 PM		093120
pda1861_094360	2/22/23 12:43:04 PM	2/22/23 12:44:38 PM		094360
pda1862_027460	2/22/23 12:44:54 PM	2/22/23 12:45:50 PM		027460

40 [more...](#)

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

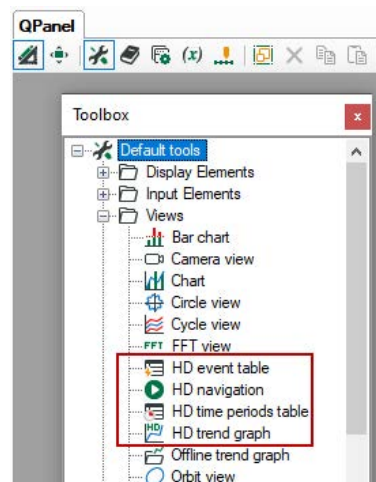


Here, it is only responded to the characteristics of *ibaQPanel* in connection with *ibaHD-Server*.

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.

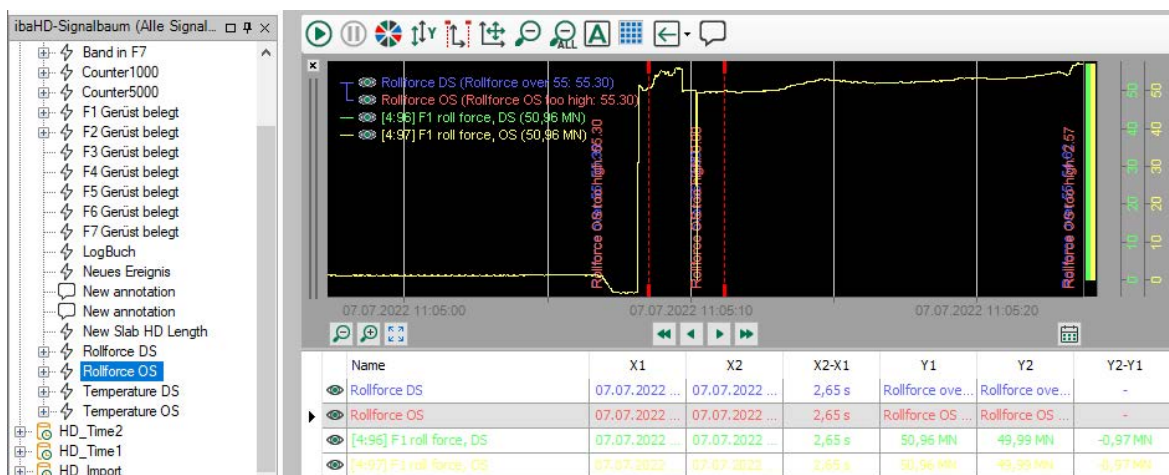
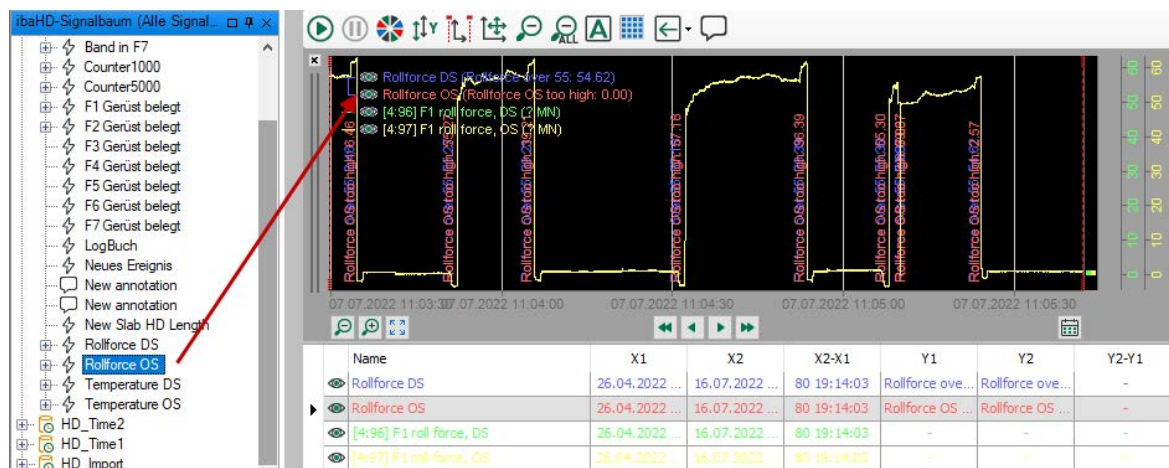
7.5.1 HD trend graph – extended functions

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 104).

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

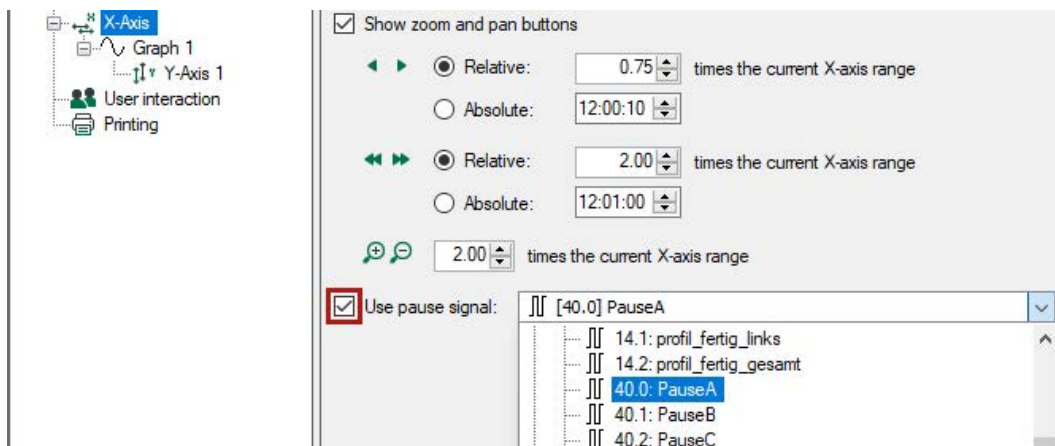
If you run the HD trend graph in live mode in *ibaQPanel* and you want to display an event as text channel, it is currently urgently necessary that at least another time- or length-based analog or digital signal is displayed simultaneously. This is necessary to run the scrolling of the X-axis.

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-based 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.

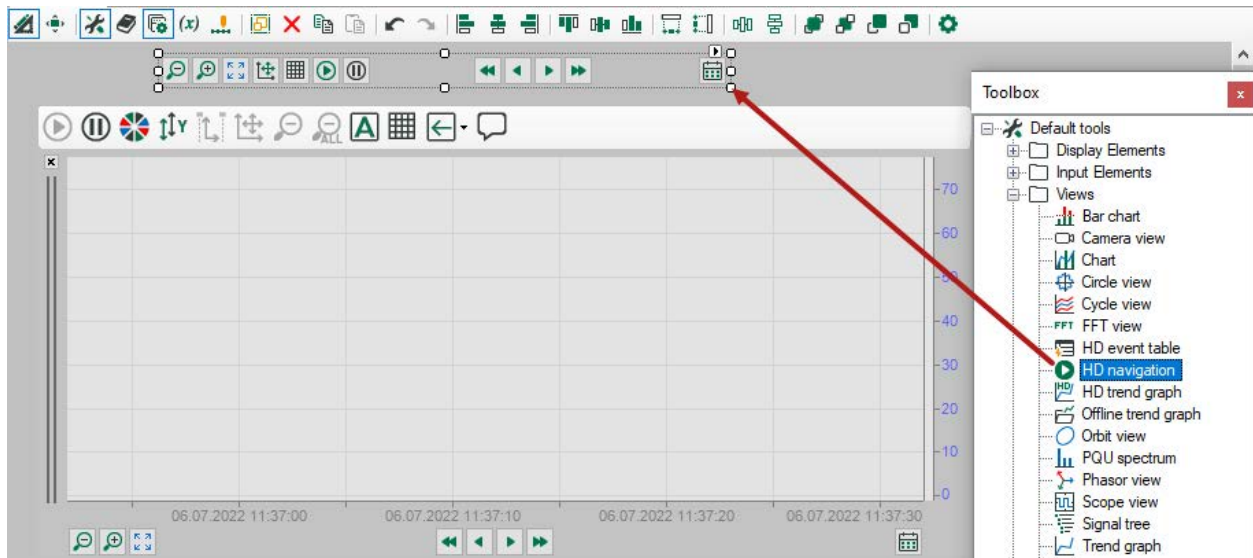
For the use of a pause signal with a time-based HD trend graph, this pause signal has to be included in the HD signal tree of a time-based HD store.

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 124](#).

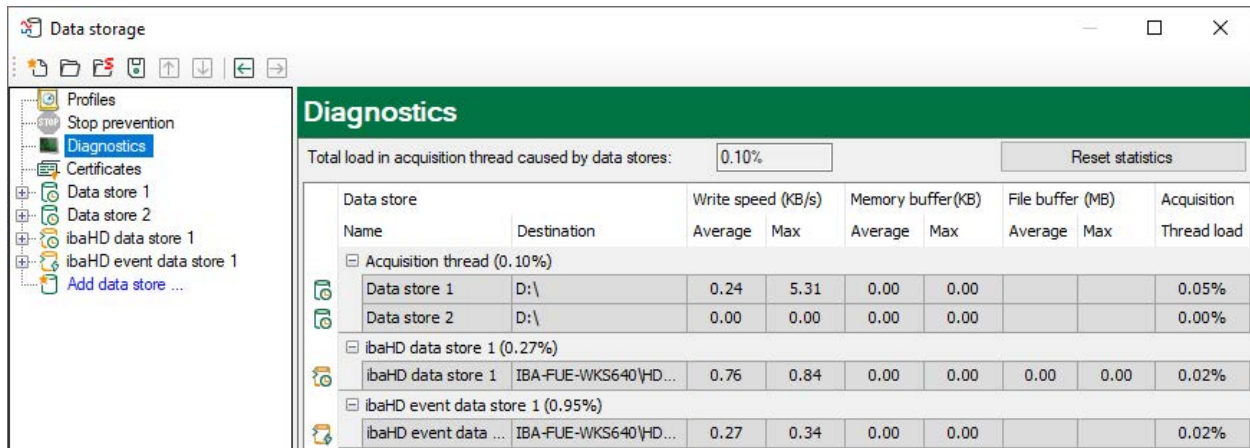
	Zoom function
	Zoom reset
	Display/hide the marker table ¹⁾
	Play, pause
	Scroll (big and small steps)
	Jump to a date

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.



Diagnostics

Total load in acquisition thread caused by data stores: 0.10% Reset statistics

Data store		Write speed (KB/s)		Memory buffer (KB)		File buffer (MB)		Acquisition
Name	Destination	Average	Max	Average	Max	Average	Max	Thread load
Acquisition thread (0.10%)								
Data store 1	D:\	0.24	5.31	0.00	0.00			0.05%
Data store 2	D:\	0.00	0.00	0.00	0.00			0.00%
ibaHD data store 1 (0.27%)								
ibaHD data store 1	IBA-FUE-WKS640\HD...	0.76	0.84	0.00	0.00	0.00	0.00	0.02%
ibaHD event data store 1 (0.95%)								
ibaHD event data ...	IBA-FUE-WKS640\HD...	0.27	0.34	0.00	0.00			0.02%

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 *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 *ibaHD-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



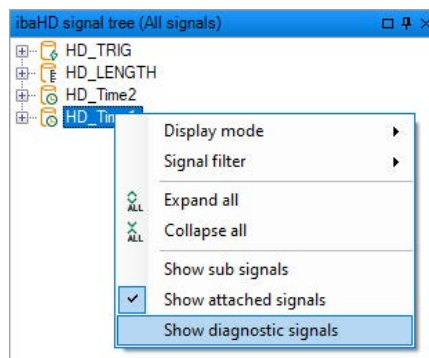
You can find information regarding the store types that are no HD stores in the *ibaPDA* manual.

7.6.2 Display diagnostic signals

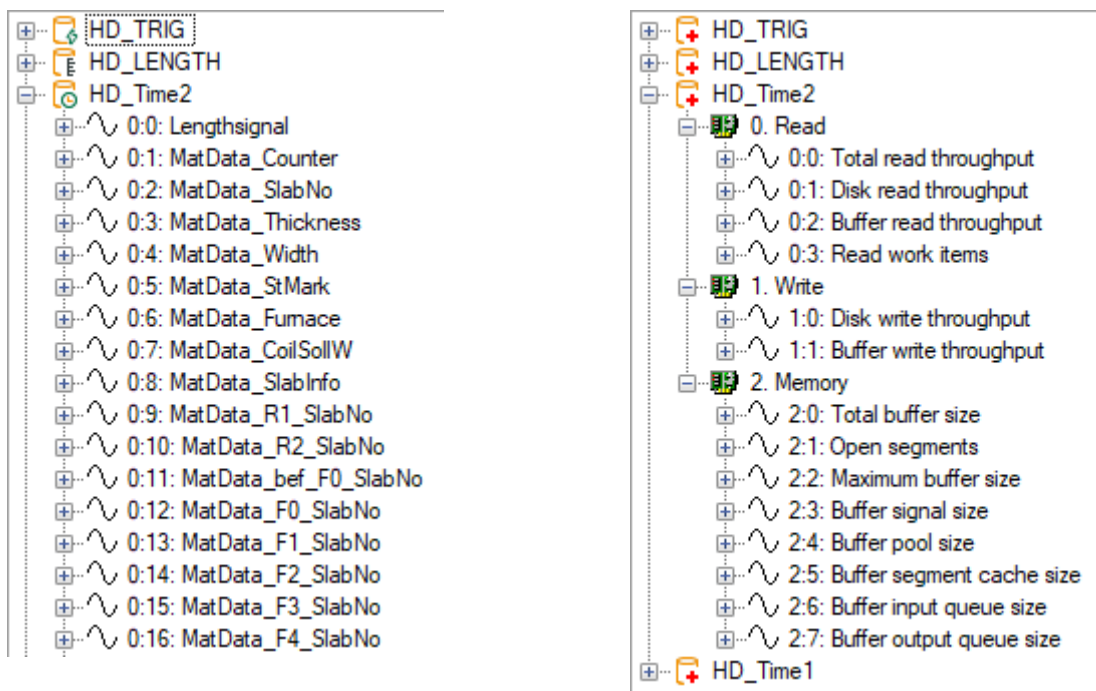
In addition to the configured measuring data, *ibaHD-Server* records a series of specific diagnosis data for every HD store in a special diagnosis memory. The data provide information about the performance of the system during writing and reading access as well as about the use of the memory and the 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 data 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 173.



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 ↗ *Creating and managing backups*, page 203, 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.

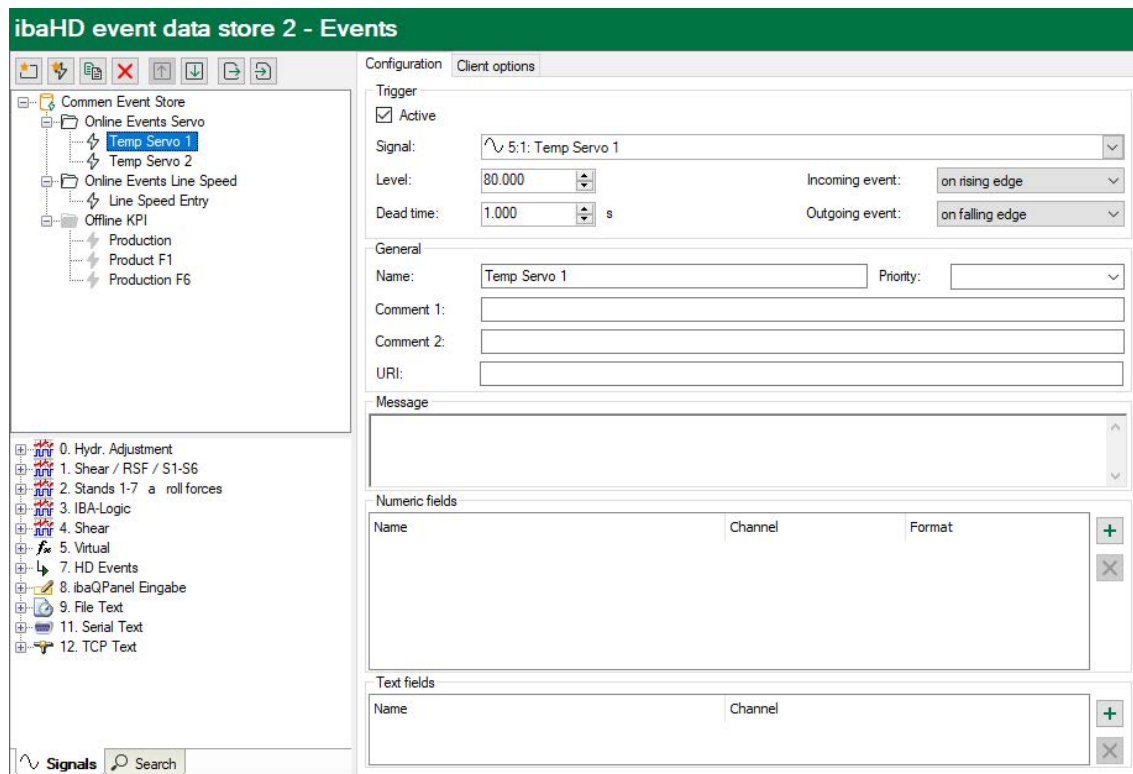
These calculations can be made not only for live data, but also for data that lie in the past.

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 triggered 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

It is possible to provide access to data with *ibaAnalyzer* which were recorded with *ibaHD-Server*. In *ibaAnalyzer*, a special HD query dialog is available providing the following functions:

- Configuring the connection to one or several *ibaHD-Server(s)*
- Signal preview
- Limiting the query period by specifying the desired acquisition time
- Formulation of a signal-based query condition

The result of an HD query is a so-called pseudo data file which is structured similarly to a regular iba data file and with which the same operations can be executed as with regular data files (show signals, executing calculations, creating reports, extracting, etc.).

Other documentation

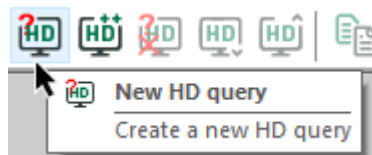


You can find detailed information regarding the handling of *ibaAnalyzer* and the analysis function in the *ibaAnalyzer* manual.

9.1 Menu and tool bar

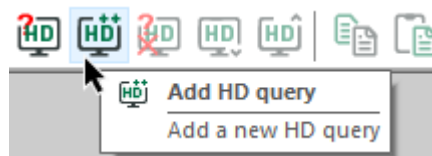
The functions in the *Historical data* menu are described in *ibaAnalyzer* manual, chapter *The menu – Historical data*.

If you want to start a new HD query, click on *Historical data – New HD query* in the menu or the corresponding button.

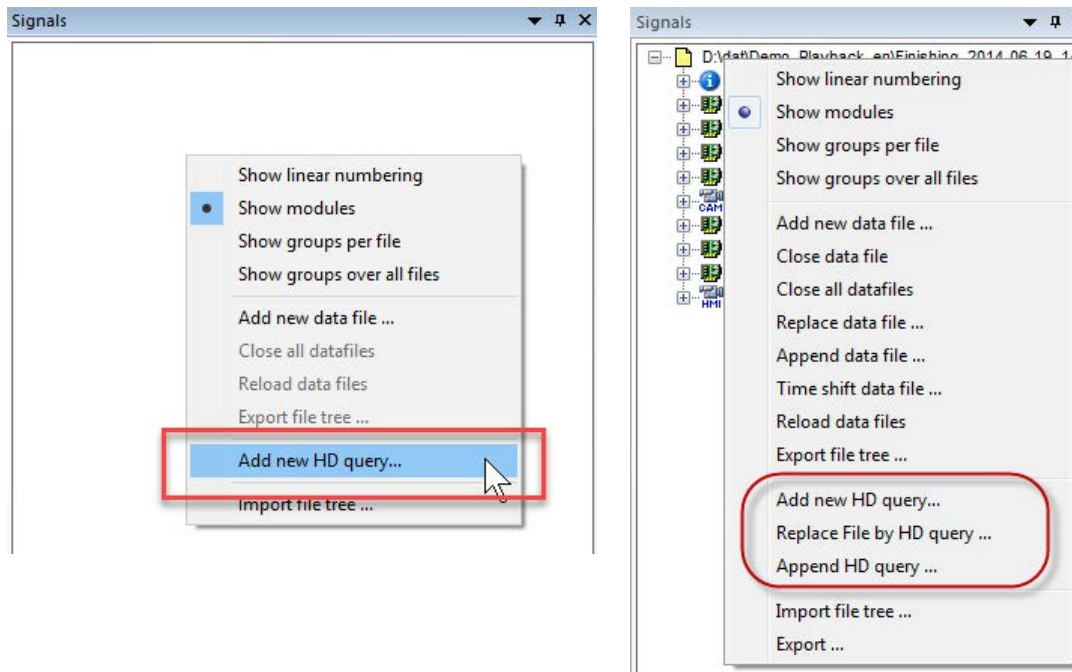


Files or HD queries in the signal tree are replaced by the new query.

If there already is an HD query or a data file in the signal tree and you want to add an HD query, click *Historical data – add HD query* in the menu or click on the corresponding button.



The context menu of the signal tree window also contains some commands for adding, replacing or appending. Example in the following figure: Context menu in the signal tree window, left without measurement file, right with measurement file



9.2 The HD query dialog

After clicking on one of the above-mentioned menu commands, the HD query dialog opens.

If you use the HD query function for the first time, you first need to establish a connection to *ibaHD-Server* and the desired HD store(s). You can then configure and execute the query.

If required, you can later change the connection settings at any time.

You can configure several different HD stores and provide them with an unambiguous name. The HD stores are listed to the left in the dialog. You can enter a description for each HD query and you can determine whether the HD query should be saved in the analysis rule.

The configuration of an HD query is divided into the following steps:

- Establishing the *ibaHD-Server* connection
- Setting the query time range for the query
- Formulating the signal condition for the query (optional)

9.2.1 Configuring ibaHD-Server connection

If not yet opened, click on the button <Select server...> in the HD query dialog window.

Server	IP address	Port	Version
MyComputer01	127.0.0.1	9180	3.0.0
MyComputer02	192.168.80.42	9180	2.7.5

This dialog shows a table including the computers recognized in the network running an *ibaHD-Server* (service). If required, you can update the table by clicking on <Search>.

Green entries indicate *ibaHD-Servers* with existing stores and data. Red entries indicate *ibaHD-Servers* of an incompatible version.

Select the desired *ibaHD-Server* in the table and the name is displayed in the "Address" field at the top.

Alternatively, you can manually enter the computer name or IP address in the field.

The port number must comply with the setting of the selected *ibaHD-Server* service, which is usually the case. Confirm your selection by clicking on <OK>.

If an *ibaHD-Server* with enabled user administration is selected, the username and password must still be entered.

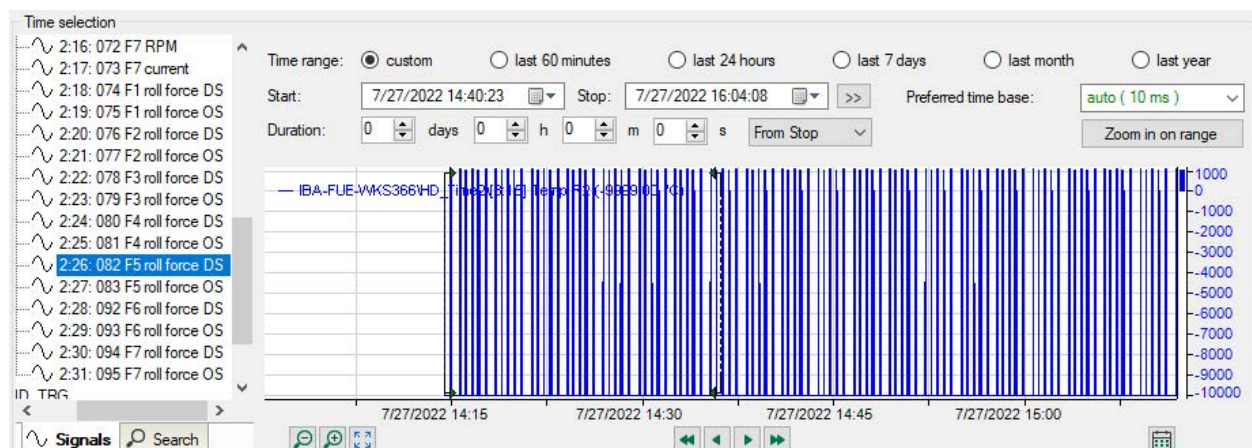
In the next step, select one or several HD store(s) to be taken into consideration when querying. Time based and event based HD stores are offered in the area *Select ibaHD store*.

Set a check mark for the stores that you want to use for the query. In the query result, a separate pseudo data file appears for the selected storage in the signal tree. If you do not select a store, separate pseudo data files are created for all stores.

If you have completed these settings, select the time range.

9.2.2 Select time range for the query

The *Time selection* area includes all control elements to select the time range for which the query is to be executed.



Options fields facilitate the selection of the time range:

- *Custom*: Select this option if you would like to select the time range manually with markers in the preview window or with the time control elements.
- *last 60 minutes*: Select this option to query a time range that starts one hour before the current time and lasts until the current time.
- *last 24 hours*: Select this option to query a time range that starts one day back from the current time and continues until the current time.
- *last 7 days*: Select this option to query a time range that starts one week before the current time and continues until the current time.
- *last month*: Select this option to query a time range that 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 of the month before the current month.
- *last year*: Select this option to query a time range that starts on the same day and at the same time as one year before the current time and until the current time. The length of the time range corresponds to the number of days of the year before the current year.

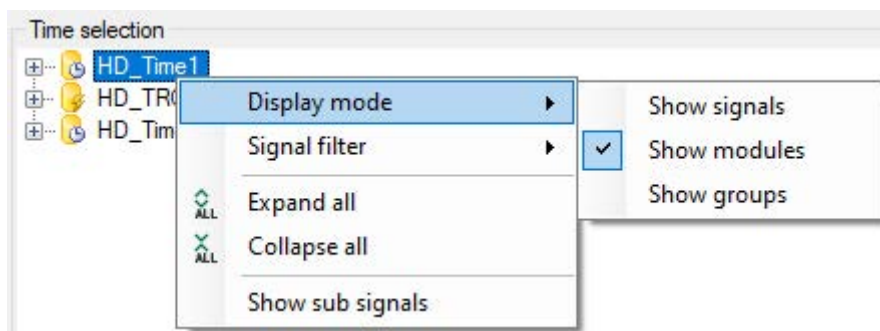
With all options except *custom*, the time range at the time of query execution is re-evaluated.

The toolbar is hidden in the signal view by default in order to create more room for the preview. It can be displayed again by clicking on the graphic with the right mouse key and selecting “Display toolbar” in the context menu.

Signal tree

The signal tree is located in the left area of the dialog. There, you will find the HD stores that you marked before under *Connection*. Under each HD store, you will find the signals saved by *ibaHD-Server*.

In the signal tree window, the context menu provides different commands for the display mode and filtering of the signals.

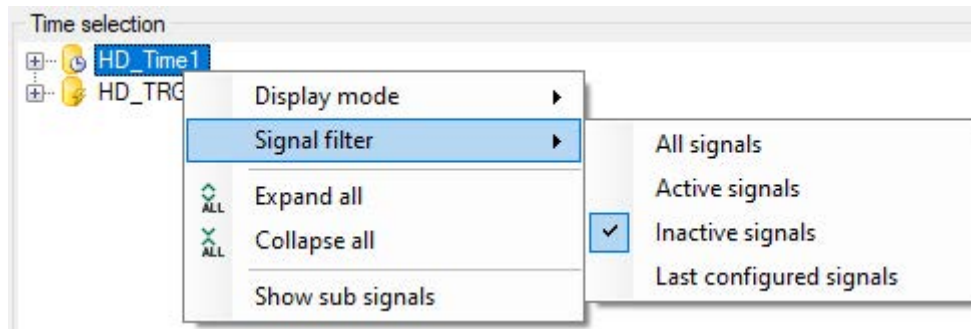


The display mode determines how the signals should be displayed in the tree.

Note



The setting selected for the display mode is taken over for the normal signal tree in *ibaAnalyzer* and vice versa.



The filter settings define which signals are displayed. Active signals are signals which are currently also being written in the HD store. Inactive signals are signals which have been recorded, but are currently not being written.

Moreover, the signal tree window offers a search function in order to search for particular signals. The function is equivalent to the search function in the normal *ibaAnalyzer* search window.

HD trend graph view

The big part on the right of the dialog can display signal curves. You can display the desired signals via drag & drop or double-click as usual.

The control elements for navigating basically equal those known of the HD trend graph in *ibaPDA*:

- Zooming in and out of the time axis with the mouse wheel
- Zooming in and out by configurable factors with the plus/minus buttons
- Navigating towards the past or future with configurable step buttons
- Navigate to a certain date using the calendar function
- Moving the time axis towards the past or future with the mouse



Only a "Live" mode is not available.

In addition to this, there are means for limiting the desired section. If you have found the point in time or time range you want to request with the navigation tools, you need to set the start and end point of the time range.

- Start and stop markers

As soon as a signal is displayed, there are two green markers on the signal strip. You can move the markers using the mouse and thus very easily set the start and end time by setting the relevant time period to be within the green arrow tips.

The cursor changes as follows:

-  if the mouse is on the start marker
-  if the mouse is on the stop marker

If you hold down the <Shift> key during shifting, both markers are shifted in the same distance.

- Entering starting/stopping time and length of time

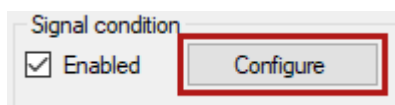
In addition to the markers, there are also other means for limiting the time range.

- Selection of an option field
- Input fields or calendar function for date/time from start and stop time if the option *Custom* has been selected:
 If you move the markers, the values in the fields will be updated accordingly. You can also enter date and time directly. The markers are then positioned accordingly.
 If you click on the (>>) button on the right side of the date field of the stop marker, the stop marker is automatically positioned on the current point in time whereas the signal values currently being available in the HD store are loaded.
- <Zoom in on range> button
 As the markers are always bound to the point in time set on the X axis, they are not repositioned when zooming in or out or when moving the X axis. Also moving the markers or changing the start and stop time values does not induce an automatic adjustment of the zoom factor. Thus, they can be very close to each other or they can be outside the window. By clicking on the button, the zoom factor and position are set in such a way that the selected time range is displayed in the center of the signal strip. Start and stop markers are always positioned at one quarter and three quarters of the visible X axis segment.
- Duration input fields
 The duration, i.e. the width of the time range, is displayed in these fields. The values are adjusted accordingly while shifting the markers. However, you can also directly enter the time in days, hours, minutes and seconds. If you change the time values by entering or using the up and down buttons, the markers will be positioned according to the button nearby.
 - "From stop": stop marker fixed, start marker is shifted
 - "From start": start marker fixed, stop marker is shifted
 - "Centered": the center of the selected range is stationary, both markers are shifted symmetrically to this.

If you change a time value using the up and down buttons while holding down the <Ctrl> key, the other values are set to zero.
 If you directly enter the numerical values, hold down the <Ctrl> key and press <Enter> to apply the value and to set the other values to zero.
- Preferred time base
 You can select from the preferred time base drop-down list a time base with which the data is to be loaded if possible. *ibaHD-Server* automatically tries to find the optimal time. There is more information on this topic in the next chapter.

9.2.3 Formulate signal condition

Using the function of the conditional query, you can limit the query to certain events or signal states within the time period set under *Time range*.



Enable the function in the *Enabled* field. Signal conditions are configured in a separate dialog, which you open with the <Configure> button.

You can choose whether you would like to search for conditions forwards or backwards in time. If *forwards* is selected, *ibaAnalyzer* starts to search for events of the specified condition, starting from the start time to the end time. If *backwards* is selected, *ibaAnalyzer* starts the search from the end time to the start time (i.e. backwards in time).

Maximum time range for each HD query result

The query for a particular signal condition can provide several events, because a pseudo dat file is created every time the condition is met. The maximum length of these query results can be set here.

If you want to use a stop trigger (see below), this setting limits the length of the query result if the stop trigger is to fail.

Start trigger

By configuring the start trigger, you configure the condition that defines the event or the signal state to be searched for. The time of occurrence of the event is the start of the query result or the pseudo dat file. The end of the query result is either determined by a stop trigger (see below) or the setting for the maximum time period (see above).

Various editor functions are available in the *Start trigger* field for formulating the signal condition.



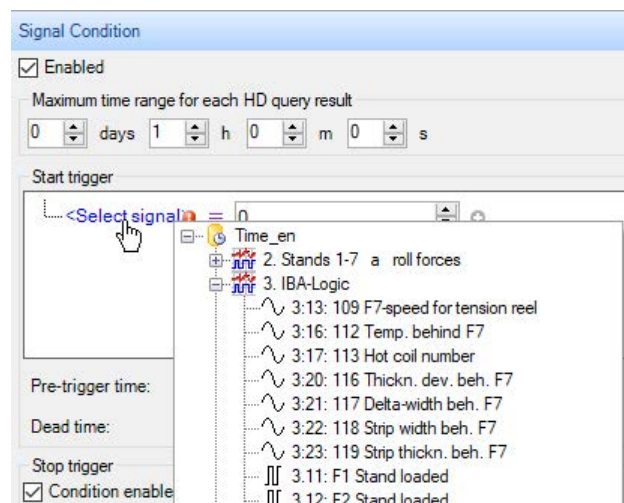
Legend

1	Blue font	Signal tree for the signal selection
2	Operator	Comparison operators to choose from
3	Comparison value	Digital signals: True / False Analog signals: Value input or spinner
4	Remove expression	The entire expression or group is removed.
5	Add expression group	Indented with a separate logical link, additional expressions can be added, which are first linked within the group. The group result then leads to the result with the superordinate link.
6	Logical link	Default = AND, can be toggled to OR with a mouse click.
7	Add expression	

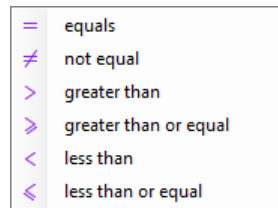
The start trigger is fired when the overall result of the condition is met.

The following example shows the procedure for creating a condition.

1. Click on the blue text “Select signal” and select the desired signal for the condition in the signal tree, such as a digital signal.



- Click on the operator sign and select the operation. For example equal or unequal for a digital signal.



- Click on the field for the comparison value and select one, e.g. "true" for a digital signal.

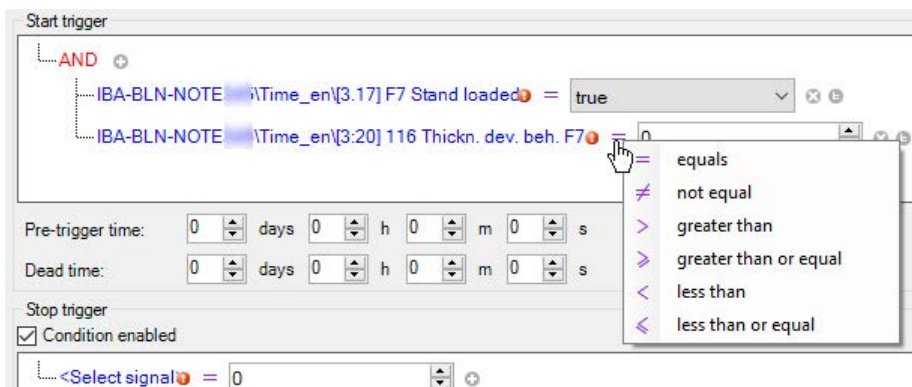


- If you want to add another condition, click on the  icon.



A new expression is created and logically linked to the previous one with AND.

- Formulate a second expression, for example with an analog signal, that you compare with a limit.




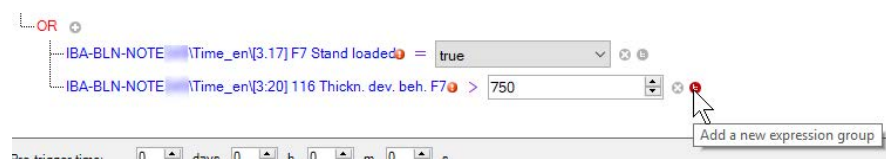
- Enter the desired limit that should fire the trigger if exceeded by the selected analog signal. Here in the example it is 750 μm .



7. Both expressions must be “true” with the AND link so that the trigger is fired. If you want the trigger to be fired already when only one condition is met, then click on the red AND in order to switch to the OR link.



8. You can also cascade conditions by grouping expressions. To create a group, click on the  icon in the expression that should be the first member of the group.



9. The expressions of the group are combined with their own logical link, default = AND.



To add additional expressions to the group, use the  icon at the group level.

Pre-trigger time

The pre-trigger time setting determines how much time should be included in the query before the start trigger.

Dead time (reaction time)

By setting the dead time, you determine how long the time period after a start trigger is before a new start trigger is detected again.

Stop trigger

You can specify the end of a query range with the stop trigger. The settings for formulating the condition, the post trigger time and the dead time logically correspond to those for the start trigger.

Limit number of HD query results to...

You can limit the number of query results here, which are loaded in *ibaAnalyzer* as a file group.

9.2.4 Formulating conditions for events

The queries based on a condition can also contain events. The following options are available:

- It is possible to specify the event itself so that the condition is met each time when the event is triggered. In addition, it can be specified that the condition is met if the trigger comes in, goes out or both.

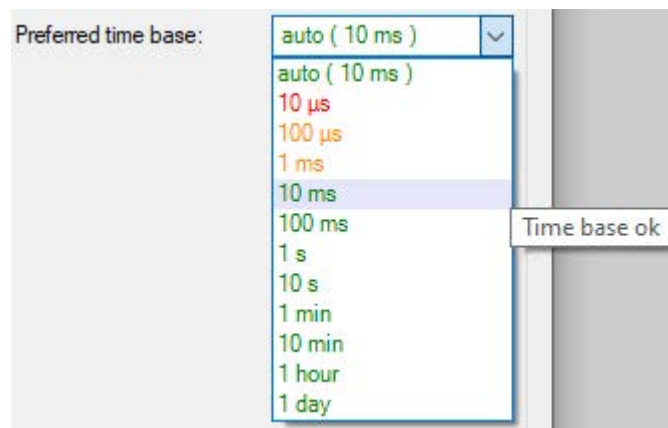
- It is possible to use a numeric field of the event and to check for a limit value. This is comparable to applying a condition to an analog ibaHD signal.

- Text fields of an event can be checked to see whether they are the same or partially the same as a certain text.

- The conditions for events can be linked with other event conditions or with conditions for normal ibaHD signals with the Boolean operators AND or OR.

9.2.5 Select the preferred time base

You can set the preferred time base via the drop-down list in the HD query dialog in the *Time selection* area.



Using this selection list, you can select a time base with which the loaded signal values are to be displayed later on. Depending on the time resolution of the requested data, select a small time base (high resolution) or a larger time base (lower resolution).

The values contained in the list are integral standard values and are usually only approximations. The actual time base with which the data can be loaded is determined by the storage in *ibaHD-Server*. Only the original time base (highest resolution) and the automatically determined time bases of the different consolidation levels are available.

When selecting the preferred time base, the following cases can occur:

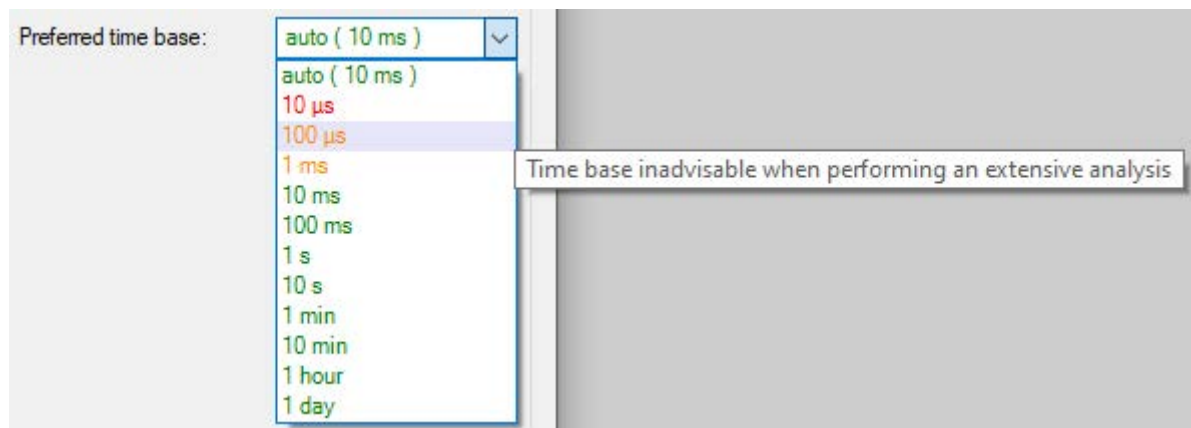
Selection	Result
Preferred time base equals an existing time base in the HD store	The data is loaded with this time base.
Preferred time base is smaller than any time base in the HD store	The data is loaded with the smallest time base available.
Preferred time base is between a smaller and larger time base in the HD store	<p><i>ibaHD-Server</i> makes the decision as to which available time base will be loaded based on the following formula:</p> <p>The larger time base is loaded if</p> $\frac{\text{sample period of coarser level}}{\text{preferred time base}} < \frac{\text{preferred timebase}}{\text{sample period of finer level}}$ <p>Otherwise, the smaller time base is loaded.</p>

Depending on the time range set, the selected time base has significant impact on the data volume.

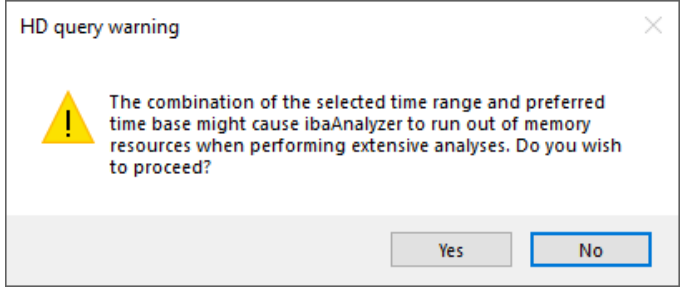
In the HD query dialog, you can only set the time range for the query, but you cannot select particular signals. For an HD query, all signals contained in the HD store in question are loaded for the set time range.

If the set time base is very small and the time range very large, the data volume to be loaded can exhaust the storage capacity so that further processing or analyzing the data is only possible to a limited extent, if any. *ibaHD-Server* thus calculates the data volume to be expected depending on the set time range and indicates the borders with the help of a color change of the time base values in the drop-down list. The *Auto* setting always selects the optimum time base automatically.

In addition to this, a tool tip points to possible difficulties if the relevant time base is selected nonetheless.

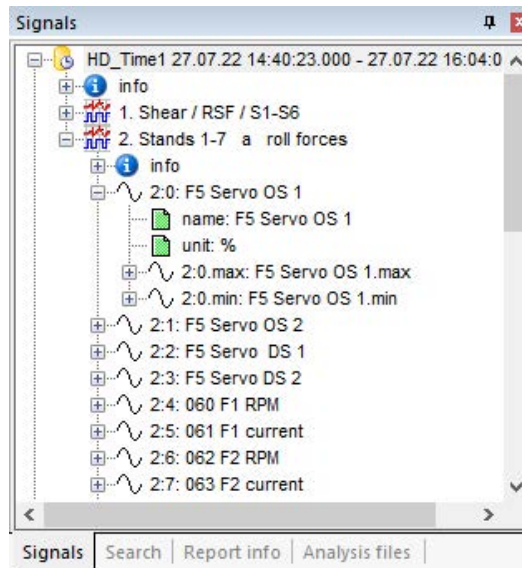


Color	Meaning
Red	<p>Adjusted time range and this time base would require more storage capacity than <i>ibaAnalyzer</i> is able to provide. When selecting this time base without minimizing the time range, an error message occurs if you click <OK> for exiting the dialog.</p> <div data-bbox="566 1191 1248 1460"> <p>Could not perform the HD query</p> <p>ibaAnalyzer cannot allocate enough memory for the number of samples resulting from the selected time range. Please choose a larger time base or select a shorter time range.</p> <p>OK</p> </div> <p>After acknowledging the message, you can set a different time range and/or time base in the HD query dialog.</p>

Color	Meaning
Orange	<p>Due to the adjusted time range and this time base, <i>ibaAnalyzer</i> can provide sufficient storage capacity. However, only limited analysis functions are available or only few signals can be displayed. When selecting this time base without minimizing the time range, an error message occurs if you click <OK> for exiting the dialog.</p>  <p>The combination of the selected time range and preferred time base might cause ibaAnalyzer to run out of memory resources when performing extensive analyses. Do you wish to proceed?</p> <p>Yes No</p> <p>After acknowledging the message, the query is executed.</p>
Green	<p>With the adjusted time range and this time base, no problems are expected also with extensive analysis. If you click <OK> to exit the dialog, the query is executed.</p>

9.3 HD query results (pseudo data files)

The result of an HD query over a time range is entered in the signal tree of *ibaAnalyzer* just like a data file (pseudo data file).



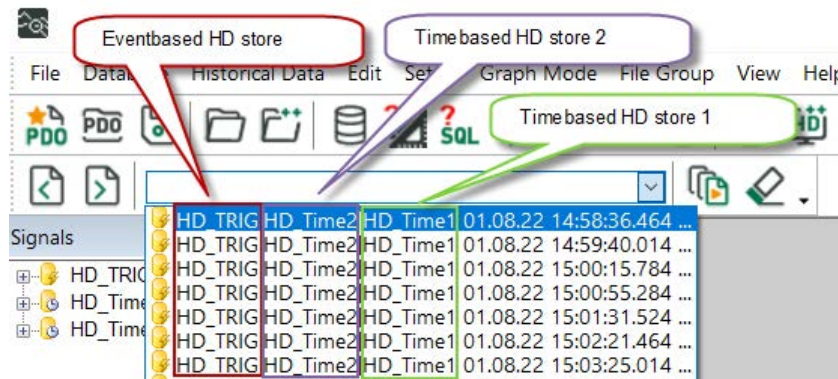
In general, the signals of an HD query are treated the same way as the signals from a normal data file.

In principle, analyses created by means of a data file can also be applied to the HD query results and vice versa.

If you want to save the HD query in a separate file independently of the analysis (pseudo .dat file with ending .hdq), then use the export function *Export HD query file...* in the context menu of the signal tree.

Depending on the selected options in the *HD server* tab in the strip settings or preferences, the maxima and minima of the aggregated values of a signal are queried as sub-channels. This can be particularly interesting when selecting a large time base or with regard to data of a higher aggregation level. "Outliers" can thus be easily identified.

Results of an HD query with signal condition are listed in the file group field, as there is typically more than one result. By default each result will be represented by one line in the file group field, even if there are multiple HD stores involved.



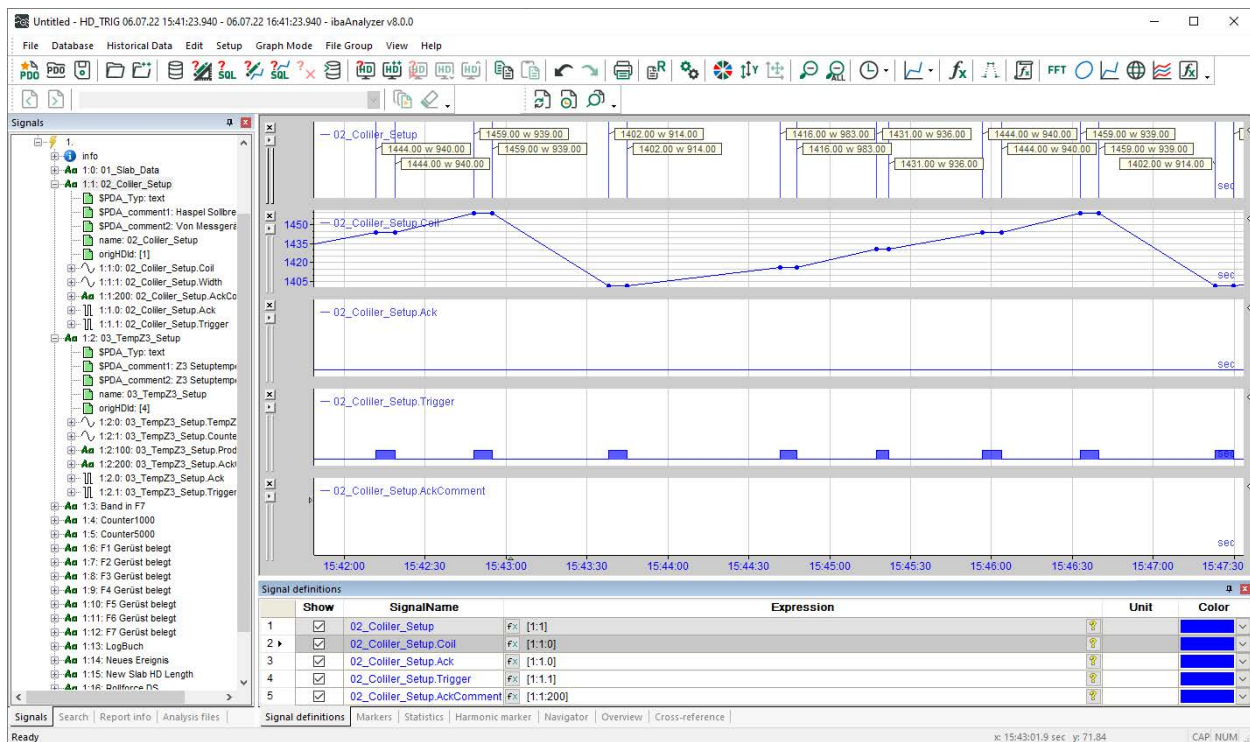
If you want the results being listed separated by HD stores in the file group field, you have to enable the option *Show query results over different stores as separate entries* in the preferences, *HD Server* tab.

9.4 HD query results of an event based HD store

In *ibaAnalyzer*, events are available as text channels. If numeric fields are defined for the event, these events are available as analog, non-equidistant subchannels of the event text channel. All text fields of the events are also available as subchannels of the event text channel.

Three additional signals are present for each event:

- The **.Ack* signal: a non-equidistant digital signal that is true for each event that has been confirmed and false for each event that has not been confirmed.
- The **.Trigger* signal: a 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.
- The **.AckComment* signal: A text channel containing the confirmation comments.



If you select the display option *Shows groups per file* or *Show groups across all files* in the signal tree (by right-clicking on the signal tree), then the groups displayed correspond to the folders in which the results are organized on the ibaHD server.

9.5 Drill-down function

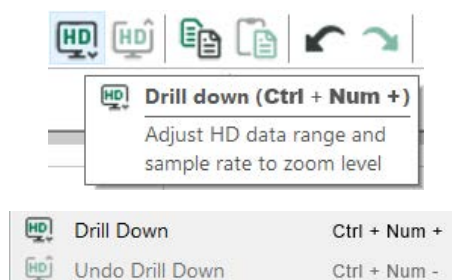
Unlike the HD trend graph in *ibaPDA*, data is not reloaded when using the zoom function in *ibaAnalyzer*. The number of samples and thus the resolution of the signal curve remains unchanged.

If, for example, an HD query with a time base of 1 min was executed, because the time range was sufficiently large, the distance of 1 min is kept also in case of zooming in. So, there is no new information due to zooming in.

Thus, a drill-down can be executed in the zoomed-in presentation.

In case of a drill-down, the time range and time base are re-calculated according to the set zoom level and the data is requested accordingly from *ibaHD-Server*.

For executing a drill-down, you can use the corresponding button or the command in the *View* menu:



Button and menu command are only available if it was zoomed in before. If you want to execute another drill-down, you have to keep on zooming in.

The executed drill-down operations are saved in a stack and can be undone individually. The button and the menu command for *Undo drill-down* are available if at least one drill-down had been executed.



Drill-down operations are only applied to pseudo data files whose signal(s) is/are displayed in the currently selected signal strip or used in an expression, which is displayed in the currently selected signal strip.

According to this, a drill-down can only be undone for pseudo data files to which the displayed signals or expressions relate.

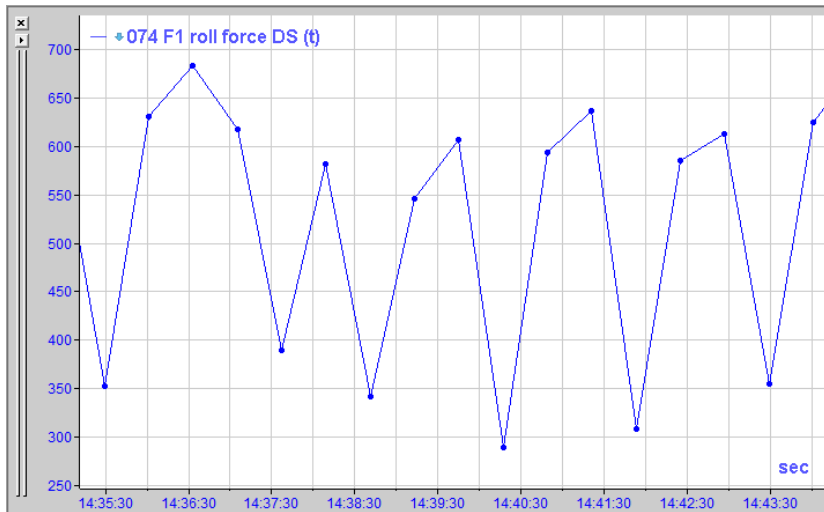
If you execute a drill-down, you practically execute a modified HD query. The original pseudo data file in the signal tree is overwritten accordingly. The HD query generated by a drill-down has the following characteristics:

- Same *ibaHD-Server* and same HD store
- Time range in accordance with the zoomed X axis range
- A preferred time base, calculated according to the following formula:

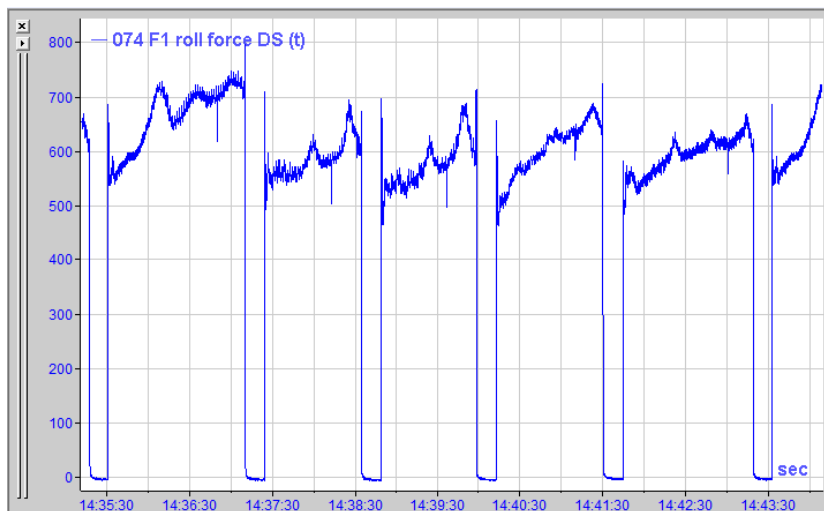
$$\text{new preferred time base} = \frac{\text{zoomed time range length}}{\text{old queried time range length}} \times \text{old preferred time base}$$

Example

An HD query over a time range of 2 days and 8 hours with a time base of 30 s provides the following picture 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.



9.6 Sub-channels min/max

If you have not enabled the options *Also query aggregated minimum channel* and *Also query aggregated maximum channel* in the default settings of *ibaAnalyzer*, tab *HD server*, these channels are automatically loaded as sub-signals for each analog signal in the event of an HD query.

In the figure, you can see measured value and sub-signals for max. and min. in the signal tree on the left, on the right the curves 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 means that the maximum and minimum values are not stored in the HD store, but rather are dynamically determined first with the HD query, with respect to the preferred or calculated time based for display in *ibaAnalyzer*.

In this way, you receive information about which maximum and minimum values occurred in the time base intervals for aggregation. The "outlier" measured values are therefore not lost.

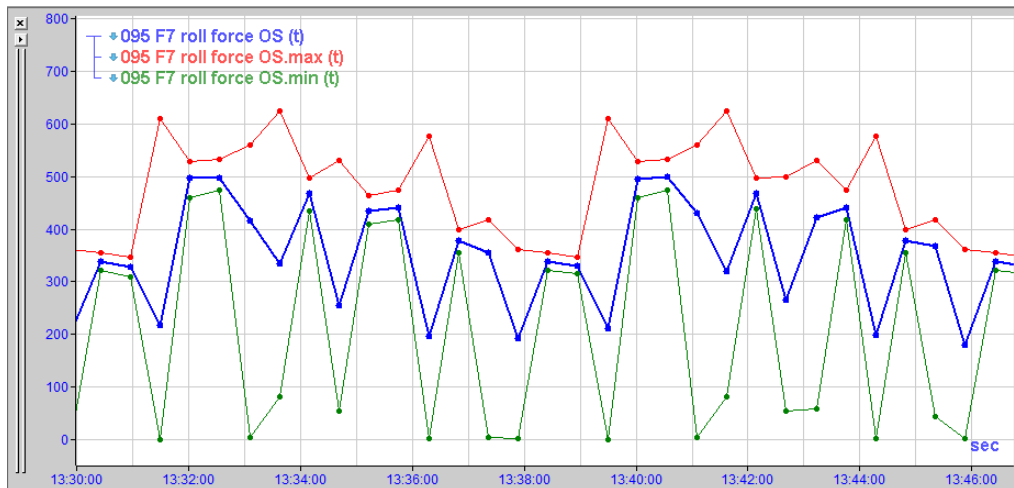
The following figure is intended to illustrate how the maximum values are determined, for example.



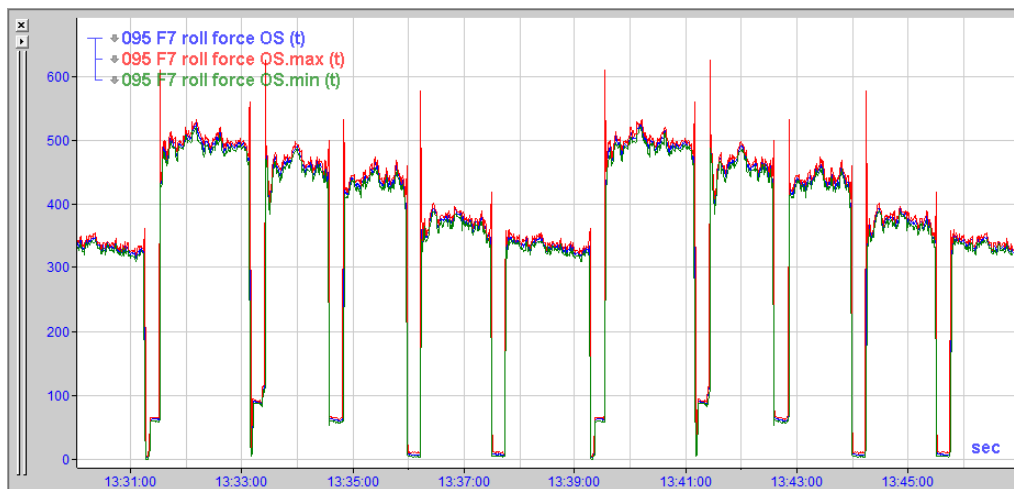
In this example, the preferred time base for the HD query is 800 ms. The aggregated values for the measured value (cannot be seen here) as well as the maximum and minimum values are written in this grid.

The blue curve in the background shows the measured values in the highest resolution as they would appear after a drill-down. It can easily be seen how the maximum value of the blue curve from the 800 ms interval is drawn on the red curve.

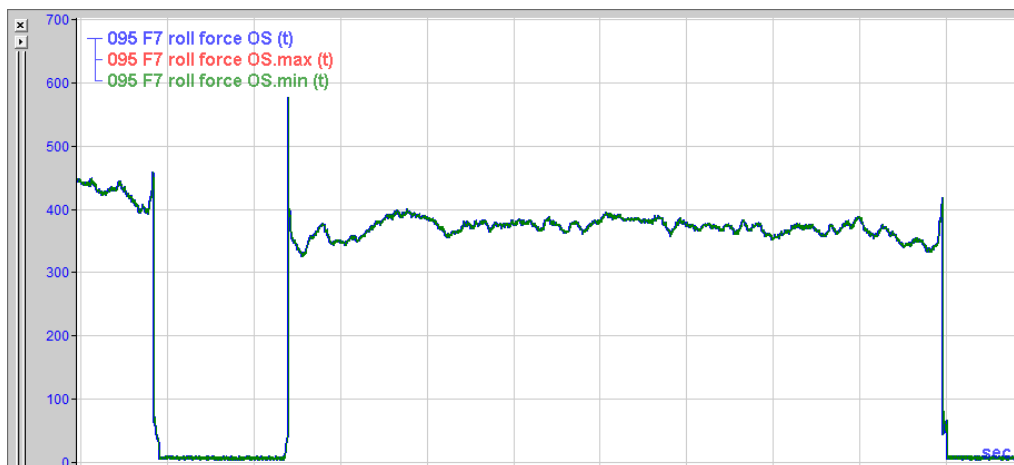
If you perform a drill-down in a display with maximum and minimum signals, then the curves get closer to each other until they are congruent at the smallest time base that the HD store offers. Curves after zooming into an HD query with a time base of about 30 s:



Curves for the same time range after an initial drill-down:



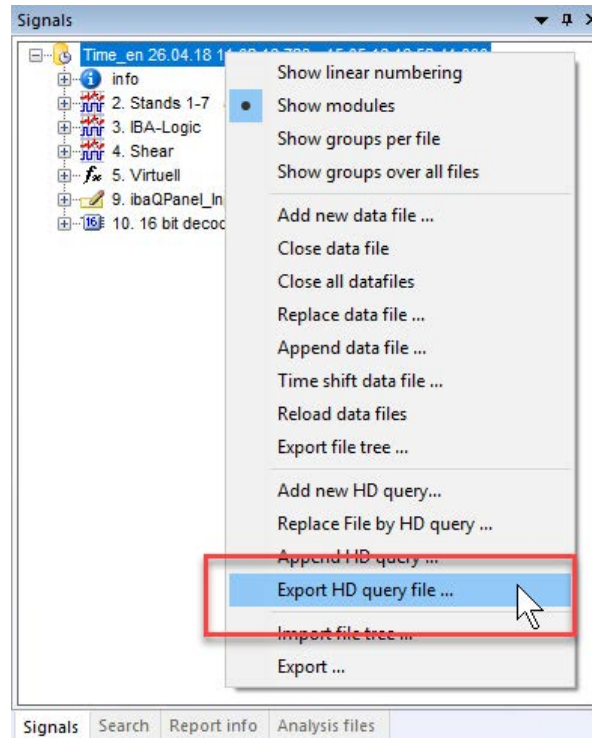
Curves after zooming in and drilling down again (highest resolution); in this example, you can only see the green curve still, because it is in the foreground and covers the others.



9.7 Export/import of an HD query

An HD query can be exported and imported in a file form.

If you have carried out an HD query, to export click in the signal tree window with the right mouse button and select *Export HD query file...* in the context menu.



The dialog *Save data file* opens where you can select the destination path and enter a file name. The file contains the ending .hdq and can be re-opened like a dat file:

- with the dialog *Open data file*
- by double clicking in Windows Explorer
- by drag & drop from Windows Explorer into the signal tree window
- by drag & drop to the desktop icon of *ibaAnalyzer*

Since 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.

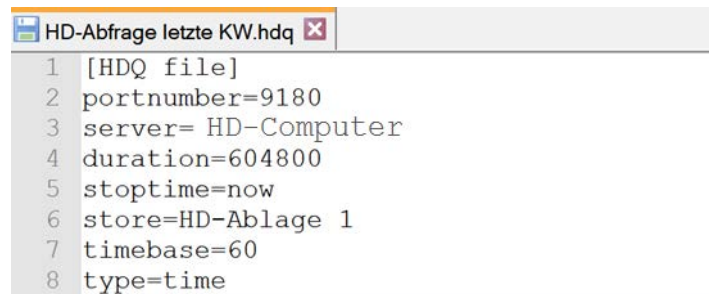
The exported HD query (HDQ file) can be edited with a text editor.

Example of an exported HD query:

Content	Description
[HDQ file]	Identification HD query
portnumber=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-Ablage_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

A 'duration' can also be specified in seconds instead of 'starttime' or 'stoptime.' The value 'now' can be specified as 'stoptime.'

In this way, queries for a consistent time period can be formulated, e.g. for the last 7 days, always from the time when the query is executed or the HDQ file is opened. Example of HD query for the last 7 days from "now":



```

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

```

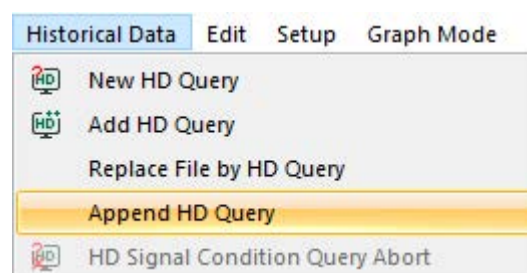
The HD-query files with suffix .hdq can be used like normal data files in the command line execution of *ibaAnalyzer* too.

9.8 Append HD query

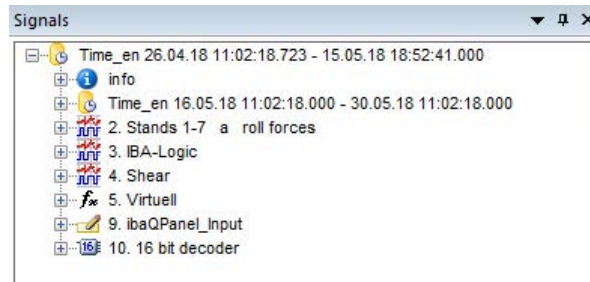
Just like normal data files, HD queries can also be attached to already-opened HD queries or data files in order to display longer time periods.

It only makes sense to append it to a data file if the signal structure of the data file and the HD data store is the same.

You can find the function either in the *Historical data* menu or in the context menu of the signal tree window:



When you execute the command, the configuration dialog for the HD query opens where you can set another query time range. After executing the query, the new query result is now nested in the signal tree.



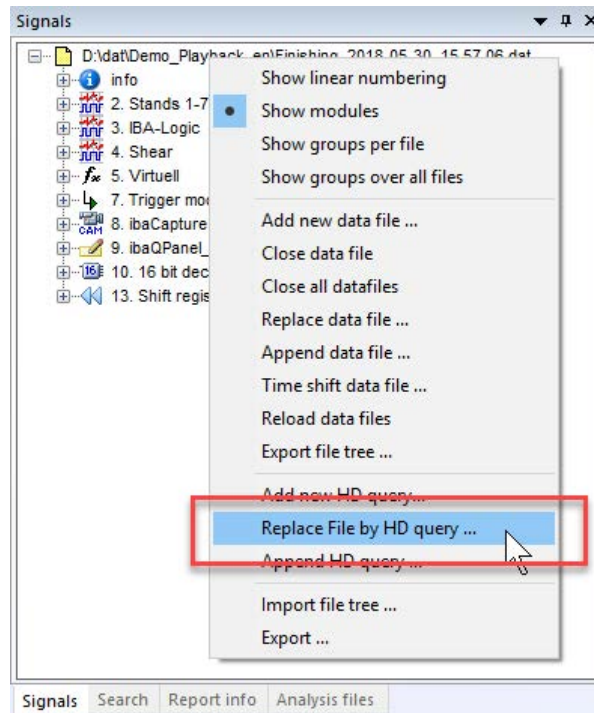
Note



To ensure a timely appearance in the trend views, make sure that *Synchronize files on recording time* is enabled in the X-axis settings.

9.9 Replace file by HD query

You will find the command *Replace file by HD query...* both in the *Historical data* menu as well as in the context menu of the signal tree window.



This command opens the configuration dialog for the HD query where you can set a new time range and/or 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 window (next to each other or appended), then the 'replace' command will affect the marked file or query.

9.10 Export of an HD query in a standard measuring file

If an HD query (pseudo data file) is loaded to *ibaAnalyzer*, a normal iba data file with the extension *.dat* can be created with the usual export function (menu *file – export...*). With this method, an HD query can also be provided to other users who do not have a connection to the HD server.

9.11 Automation of HD analyses

For regularly recurring analyses of HD data, e.g. for the creation of day or shift reports, an automation of the HD query with the help of *ibaDatCoordinator* is suitable.

In contrast to the usual *ibaPDA* storages, where the execution of the *ibaDatCoordinator* jobs are triggered with the creation of new data files, this possibility is not available for the “endless” HD recordings.

The application *ibaDatCoordinator*, however, has the possibility to execute planned jobs and tasks from version 1.22 on. Thereby, the execution of analyses can be made independently from the creation of new data files.

This is how a planned, i.e. a time-controlled job, that cyclically executes an HD query, can be defined with the *ibaDatCoordinator*. So, any evaluation and further steps such as the creation of reports or the extraction into a data base can be automated with the according configuration of HD query and analysis (*.pdo).

10 Creating and managing backups

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 to

- create backups,
- mount backups,
- attach backups and
- restore backups

Notes about backup 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*. 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 already exist during the restore operation.

10.1 Create backup

Backups are generally classified in two different types:

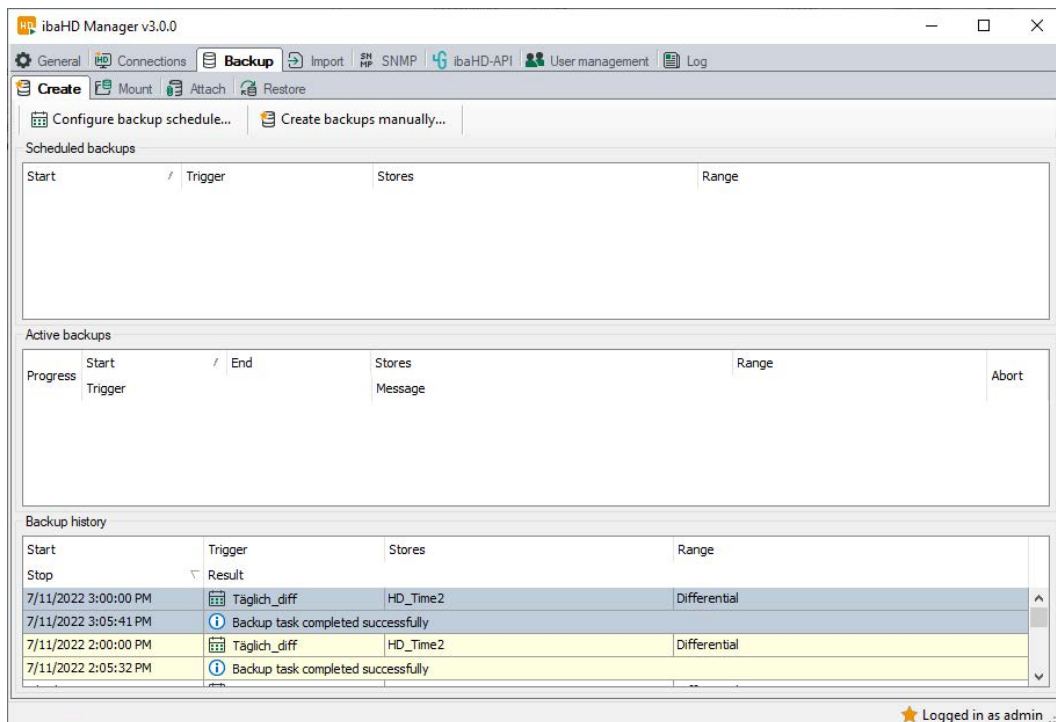
- Complete backup
- Differential backup

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 of the *ibaHD Manager*, there is an overview under the *Create* tab to show the statuses of planned, active, and completed backups.

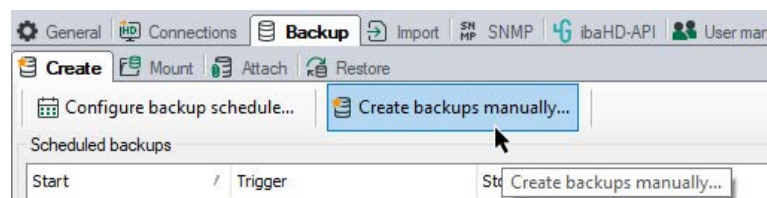
Backups can be started manually or automatically following a time schedule.



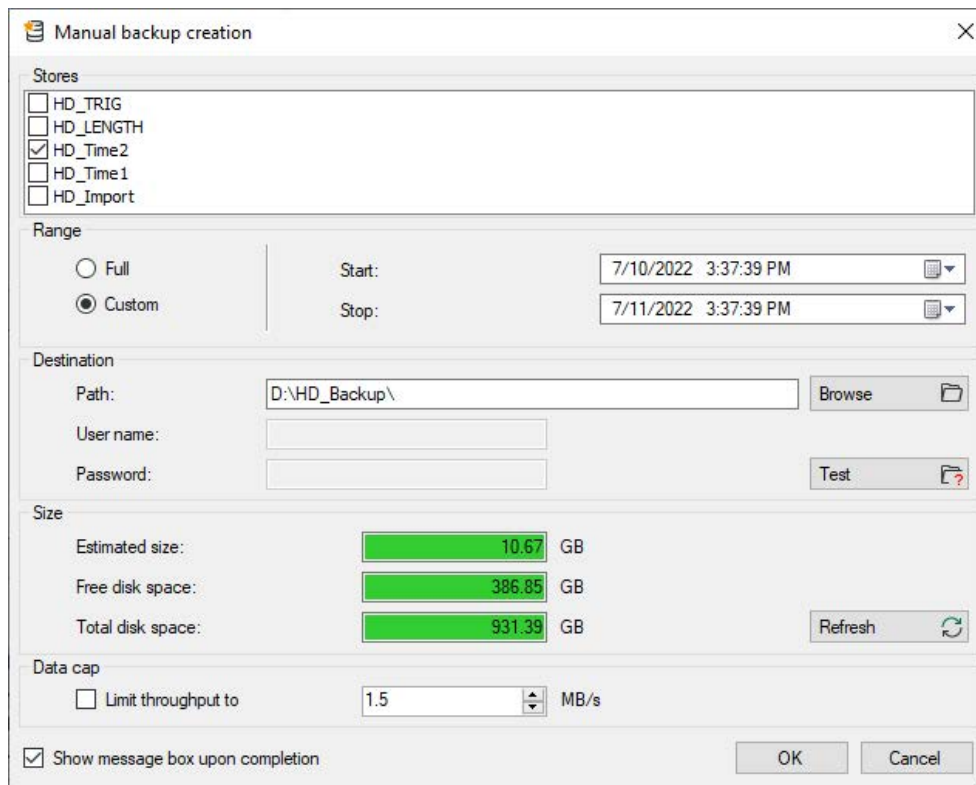
10.1.1 Creating a backup manually

A manually-created backup is created if necessary and corresponds to a snapshot of the currently stored data.

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



In the *Manual backup creation* dialog, make the necessary settings.



Manual backup creation

Stores

- ☐ HD_TRIG
- ☐ HD_LENGTH
- ☒ HD_Time2
- ☐ HD_Time1
- ☐ HD_Import

Range

☐ Full Start: 7/10/2022 3:37:39 PM

☒ Custom Stop: 7/11/2022 3:37:39 PM

Destination

Path: D:\HD_Backup\ Browse

User name: Test

Password: ?

Size

Estimated size: 10.67 GB

Free disk space: 386.85 GB

Total disk space: 931.39 GB Refresh

Data cap

☐ Limit throughput to 1.5 MB/s

☒ Show message box upon completion OK Cancel

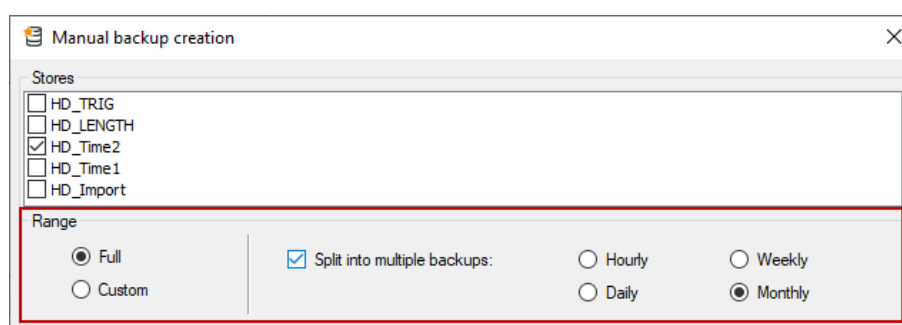
Stores

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 divide this into several backups, such as each the length of a month.



Manual backup creation

Stores

- ☐ HD_TRIG
- ☐ HD_LENGTH
- ☒ HD_Time2
- ☐ HD_Time1
- ☐ HD_Import

Range

☒ Full ☒ Split into multiple backups: ☐ Hourly ☐ Weekly

☐ Custom ☐ Daily ☒ Monthly

Destination

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.

Data cap



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 HD 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 <Refresh> 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.

Active backups					
Progress	Start	End	Stores	Range	Abort
	Trigger		Message		
	7/11/2022 3:41:59 PM	11/07/2022 15:46:01	HD_Time2	7/10/2022 3:37 PM > 7/11/2022 3:37 PM	
	manual		Backup von Segment 'HD_Time2/0000057D' (31,59 MB/s)		

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

Backup history			
Start	Trigger	Stores	Range
Stop	Result		
7/11/2022 3:41:59 PM	manual	HD_Time2	7/10/2022 3:37 PM > 7/11/2022 3:37 PM
7/11/2022 3:46:21 PM	Backup task completed successfully		
7/11/2022 3:00:00 PM	Täglich_diff	HD_Time2	Differential
7/11/2022 3:05:41 PM	Backup task completed successfully		

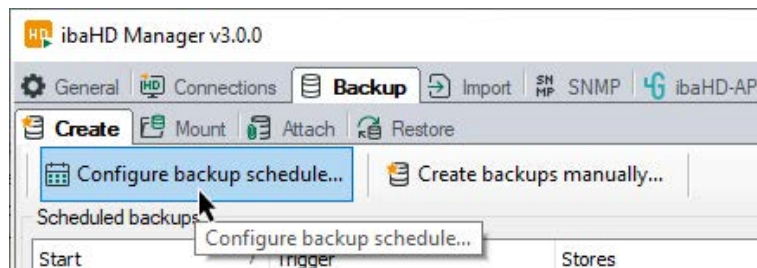
10.1.2 Schedule automatic backups

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

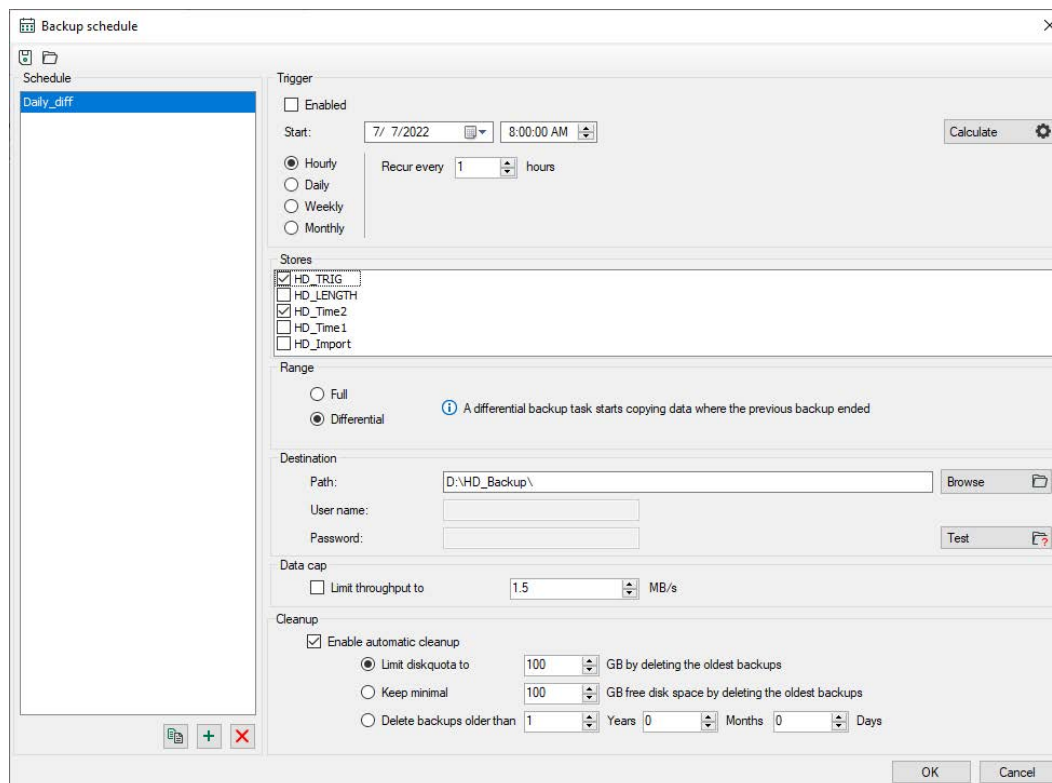
A scheduled backup is only executed if the *ibaHD-Server* service is running. The defined backup schedules are part of the *ibaHD-Server* configuration and are automatically stored internally.

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*, menu button *Configure backup schedule...*




In the “Backup schedule” dialog, make the necessary settings.



Schedule

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

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

Use the button  to 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, the option *Enabled* must be activated.

Select when the backup is to be started by setting the interval as well as the start date and 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 button <Calculate> to see the next trigger dates.

Stores

Select the HD stores the backup is to be created for.

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.

Destination

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.

Data cap

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 HD 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.

Cleanup

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

Then click on <OK> to complete the backup schedule.

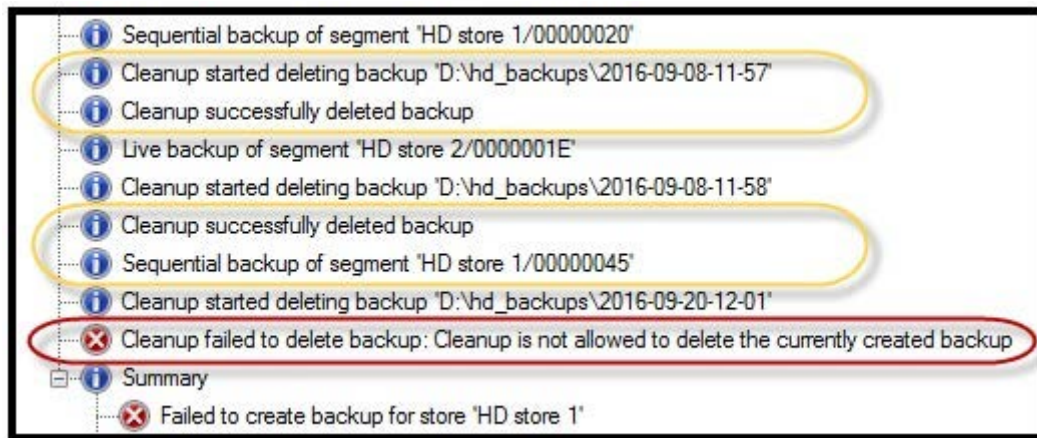
The progress of the backup is shown in the *Create* tab in the *Active backups* area.

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

If you want to store your backup planning in a separate xml file, click on the ‘Save schedule to file’ icon to the upper left in the dialog. Conversely, you can import a scheduling configuration from a suitable xml file with the ‘Open schedule from file’ icon.

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).

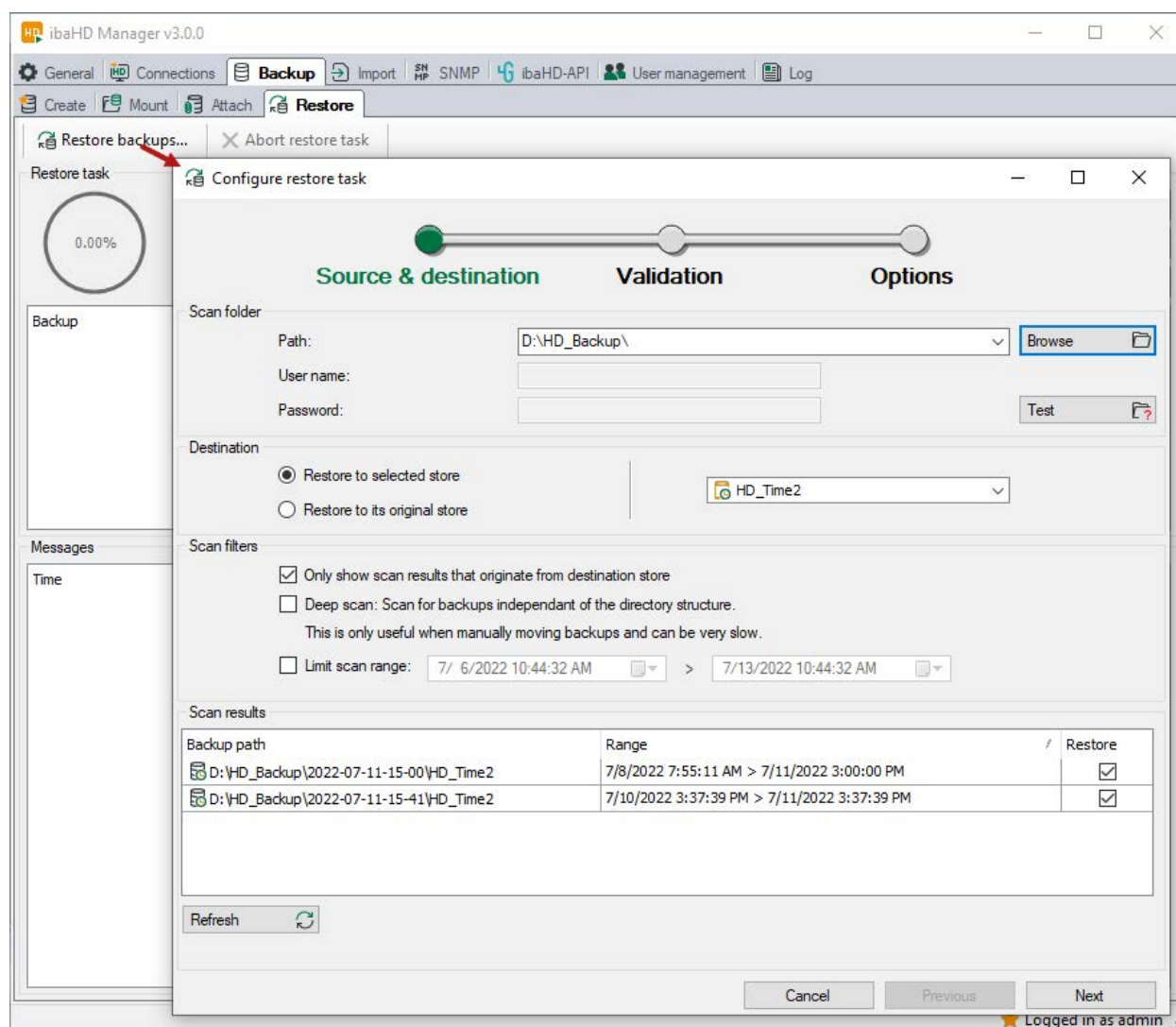
10.2 Restore backup

Restoring a backup means that all data in the HD store that covers the same time period 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 process of restoration is broken down into three steps:

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

10.2.1 Source & destination

In the *ibaHD Manager*, select the *Backup* tab – subtab *Restore*, menu 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.

Search results and search filter

Click the <Update> button to start the search for available backups.

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

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

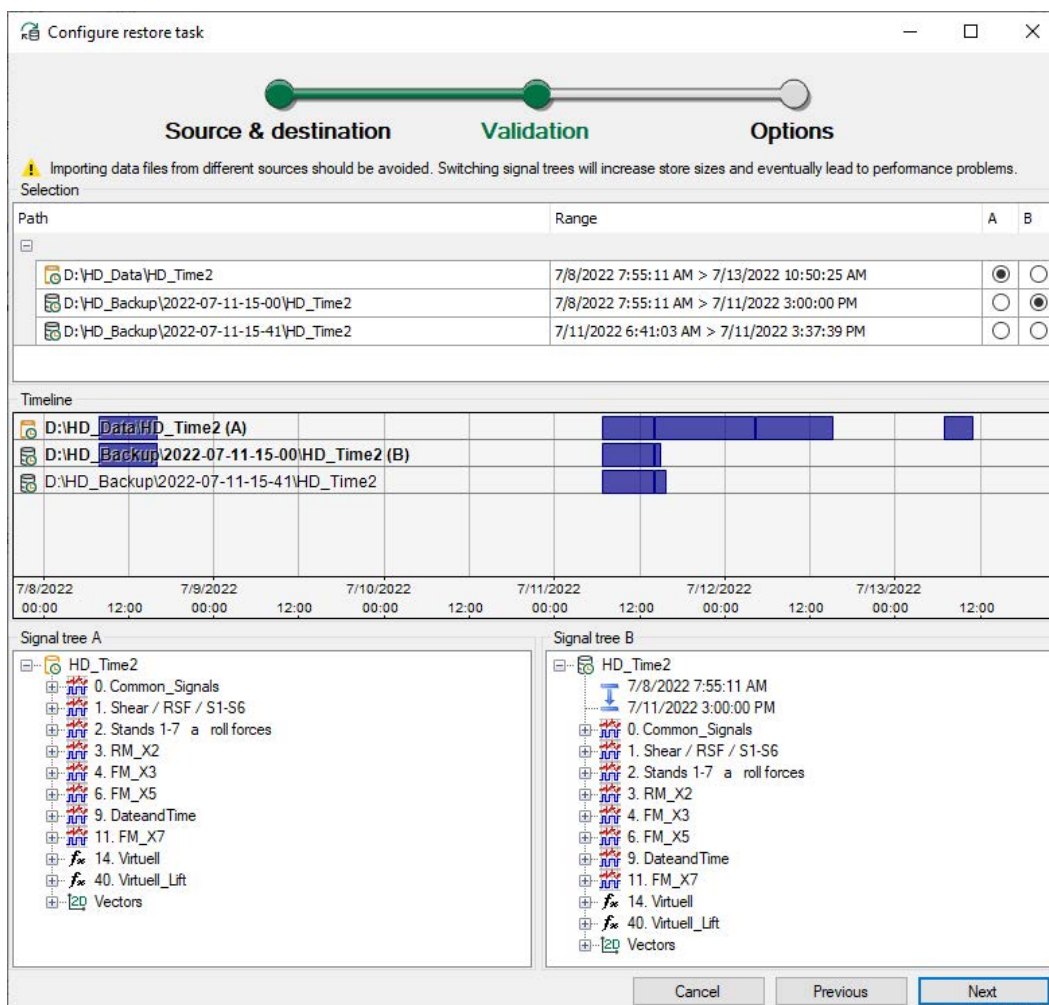
If you have selected the restoration in the original stores under the target, then this option is also enabled.

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 proceed to the next step.

10.2.2 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.

10.2.3 Options

Configure restore task

Source & destination Validation **Options**

Input

☐ Verify data in backups before executing the restore operation ⓘ

☐ Skip data in erroneous segments instead of generating errors ⓘ

Working copy

☒ Restore to working copy ⓘ

☐ Custom working copy directory: ⓘ

Path:

User name:

Password:

Working copy	Disk space
Path	Required Available
D:\HD_Data\HD_Time2	29.49 GB 375.95 GB

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

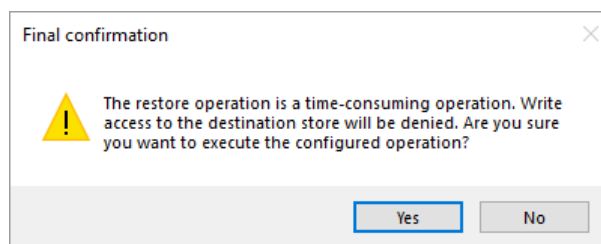
Enable this option if there is no more sufficient memory capacity for the working copy in the destination store. You can then specify a custom directory on which the working copy is to be created. If a UNC network drive is being used, then this network drive must be accessible during the entire restore.

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>.

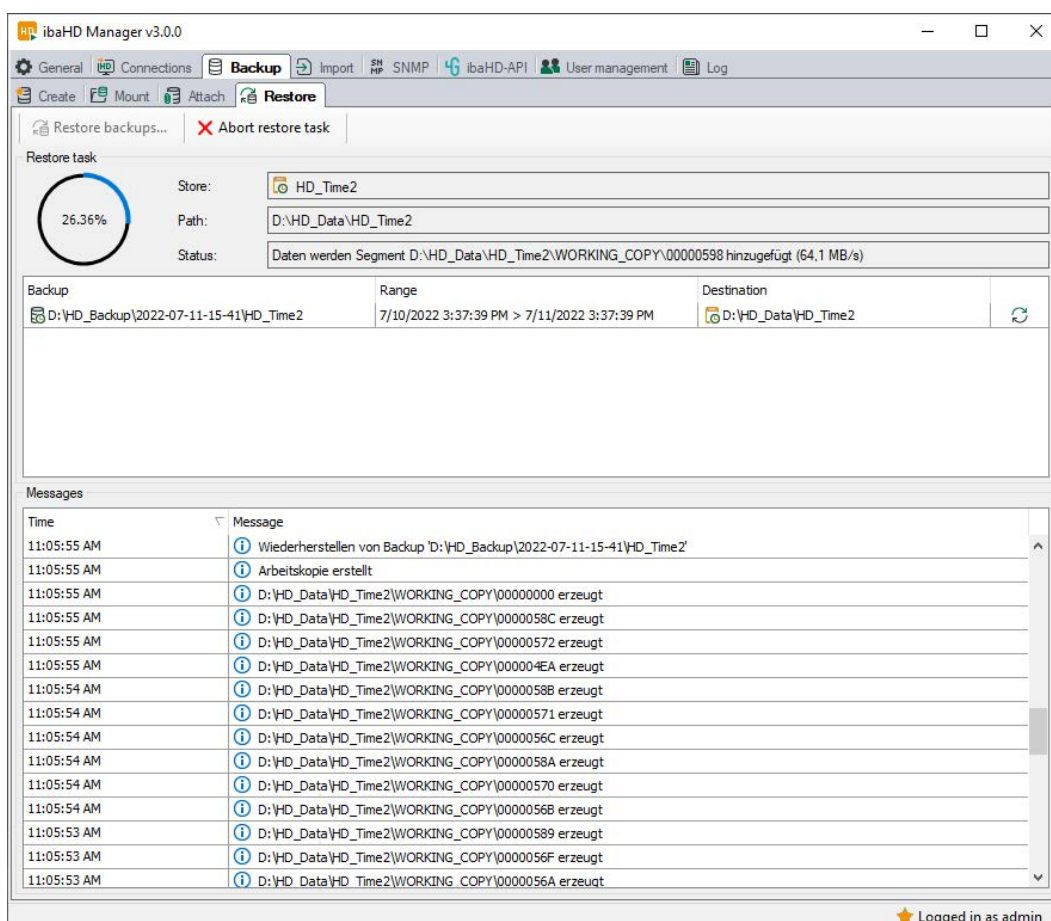
10.2.4 Start the restore operation

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.



10.3 Mount backup

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:

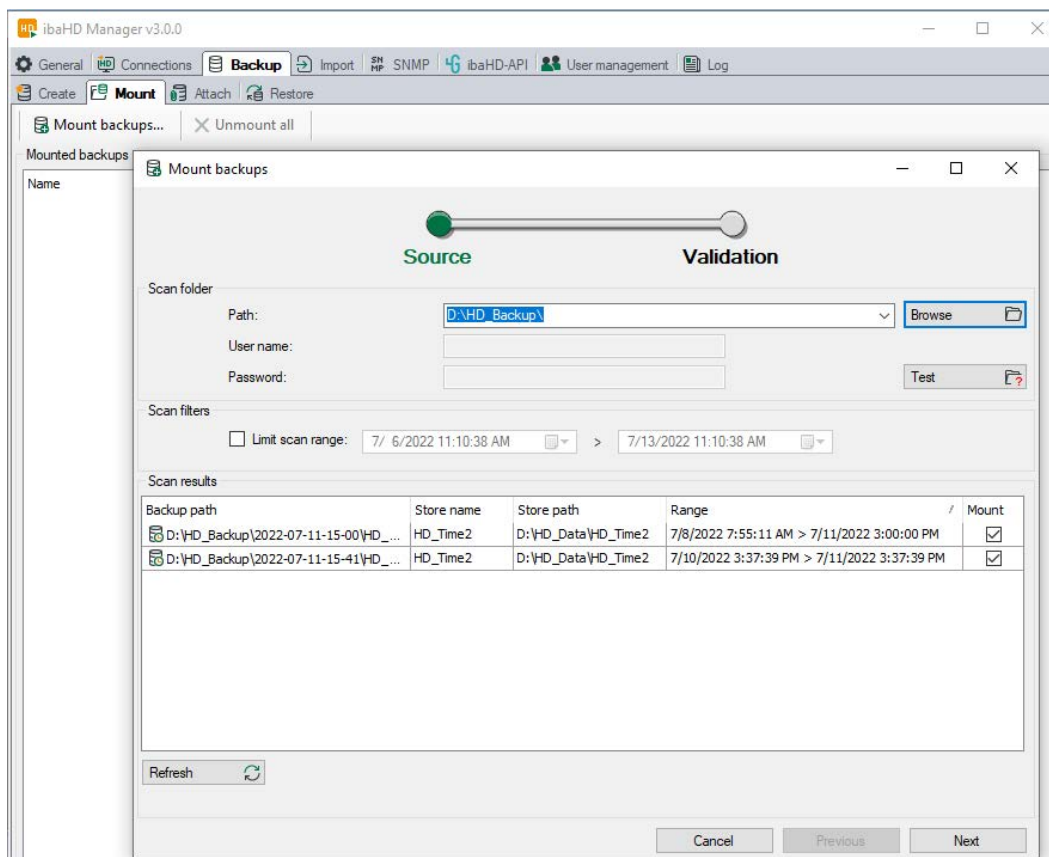
- *ibaHD-Server* must be installed on the computer that you want to use to access the backup. No dongle/license is required.
- An HD store does not need to be configured for this *ibaHD-Server*.
- No HD store with the same name may be active on the computer on which you want to mount the backup.
- The desired backup must be on a **local drive** of the same computer.
- If the backup has been mounted to the *ibaHD-Server* using the *ibaHD Manager*, the backup can be accessed both locally as well as via the network with *ibaAnalyzer*. The backup on the HD 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.

The process of mounting divides into two steps:

- Setting the source
- Validation

10.3.1 Source

In the *ibaHD Manager*, select the *Backup* tab, follow-up tab *Mount*, menu 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. Only local drives are permissible.

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

Scan results and scan filters

Click the <Refresh> 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 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 scan results are not to be mounted, remove the check mark in the column *Mount*.

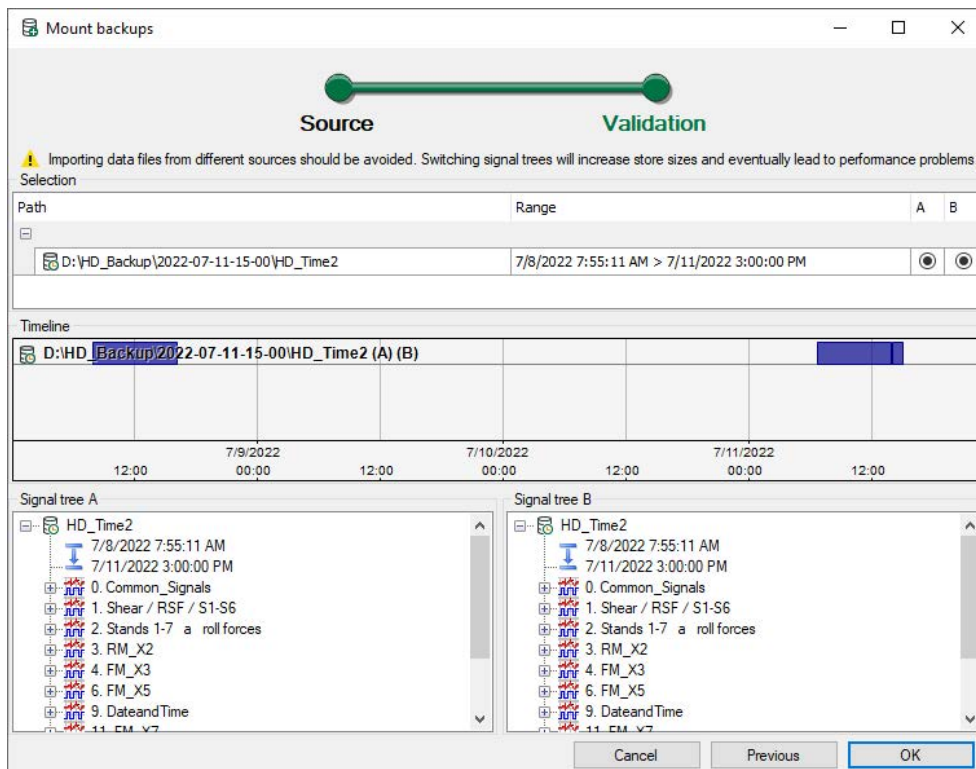
Note



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.

10.3.2 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.

10.4 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 nevertheless be able to carry out an analysis of the past quarter, you 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:

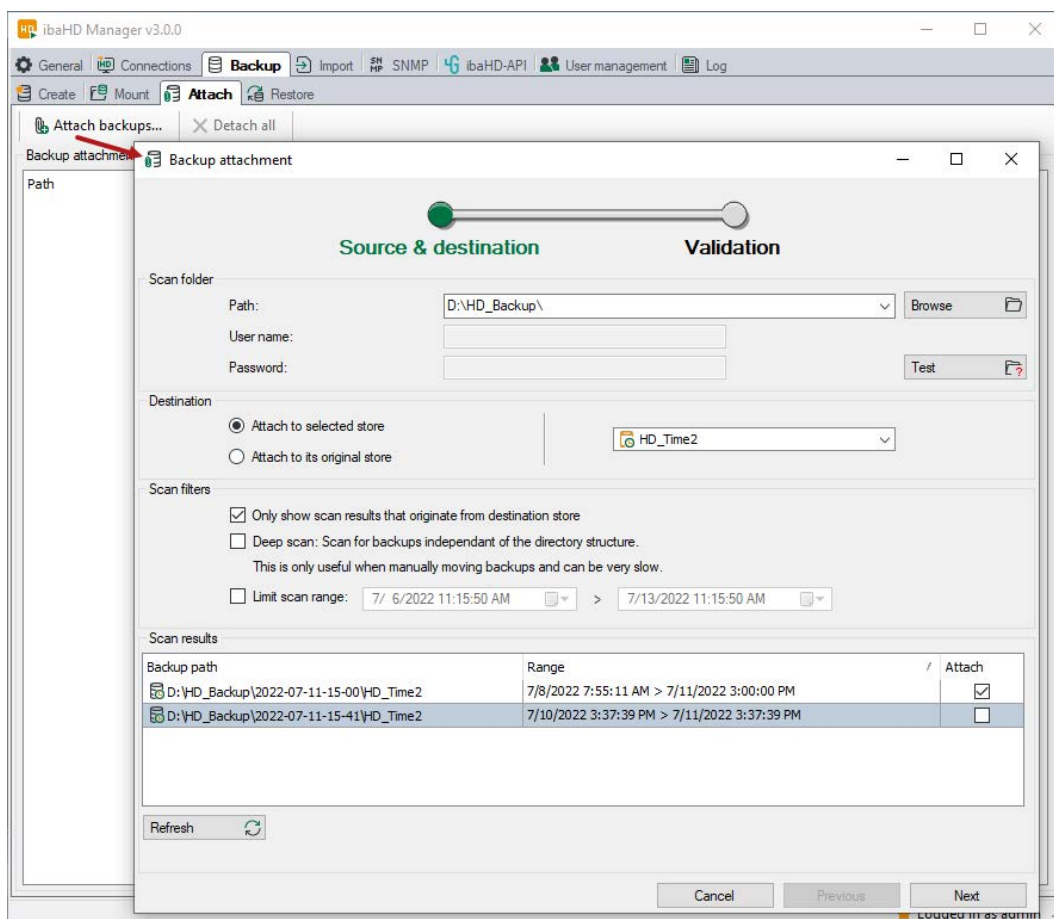
- The backups that are to be attached may be in a different storage location than the active HD store, but it must be a local drive. Therefore, you can also cover large time periods for which the active storage of the *ibaHD-Server* computer is not configured.
- Backups can be attached to an active HD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

The process of appending is divided into two steps:

- Setting the source
- Validation

10.4.1 Source

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



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

Path, user name, password

Specify the path where the backup to be attached is located or select it using the browser. Only local drives are permissible.

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

Destination

Select here 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 each backup 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. Should the stores contained in the backup not be available on the HD server, you can ensure their automatic creation during the attaching by enabling the option *Create non-existing stores*.

Scan results and scan filter

Click the <Refresh> 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 results that originate from destination store*. This option is enabled by default in order to list the backups matching the destination.

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 scan results are not to be attached, remove the check mark in the column *Attach*.

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

10.4.2 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.

11 Importing data files

ibaHD-Server offers the possibility of importing existing iba data files in an HD store. In this way, older data sets that were already archived prior to the introduction of *ibaHD-Server* are transferred to an HD store to benefit from the HD functions. iba data files can only be imported into time-based HD stores.

It is permissible to use the data file import during HD data storage.

Note



Data files can be imported automatically using *ibaDatCoordinator* (v2.0 or higher). With a so-called *ibaHD import* task, *ibaDatCoordinator* monitors the directory in which the data files are written. After completing a data file, *ibaDatCoordinator* starts the import into the configured HD store.

Additional information about the configuration of the *ibaHD import* task can be found in the manual about the product *ibaDatCoordinator*.

The process of importing the data file is broken down into three steps:

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

11.1 Data file import source & destination

In the *ibaHD Manager*, *Import* tab, select the menu button *Import data files....*



Import data files

Source & destination **Validation** **Options**

Scan folder

Path:

Username:

Password:

☐ Check subdirectories

DAT file password:

Destination

Import into:

Username:

Filter

☐ Limit data range: >

Scan results

⚠ Importing data files from different sources should be avoided. Switching signal trees will increase store sizes and eventually lead to performance problems.

File path	Last modified	Start	Data stop	Import
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 11:59:17 AM	7/6/2022 11:39:17 AM	7/6/2022 11:59:17 AM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 12:19:17 PM	7/6/2022 11:59:17 AM	7/6/2022 12:19:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 12:39:17 PM	7/6/2022 12:19:17 PM	7/6/2022 12:39:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 12:59:17 PM	7/6/2022 12:39:17 PM	7/6/2022 12:59:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 1:19:17 PM	7/6/2022 12:59:17 PM	7/6/2022 1:19:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 1:39:17 PM	7/6/2022 1:19:17 PM	7/6/2022 1:39:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 1:59:17 PM	7/6/2022 1:39:17 PM	7/6/2022 1:59:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 2:19:17 PM	7/6/2022 1:59:17 PM	7/6/2022 2:19:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 2:39:17 PM	7/6/2022 2:19:17 PM	7/6/2022 2:39:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 2:59:17 PM	7/6/2022 2:39:17 PM	7/6/2022 2:59:17 PM	<input checked="" type="checkbox"/>
D:\QPanel\ibaQPanel_Demo\DAT\220706\QPan_202...	7/6/2022 3:19:17 PM	7/6/2022 2:59:17 PM	7/6/2022 3:19:17 PM	<input checked="" type="checkbox"/>

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Make the necessary settings in the *Import data files* dialog.

Path, user name, password

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

If the data files in a folder are stored structured in additional subdirectories, enable the option *Check subdirectories* so that all data files are included.

DAT file password

If the data files are password-protected, enter the password here.

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

Destination

Here select the HD store into which the file(s) is (are) to be imported. All active HD stores of the respective HD server are shown. If the HD store is password-protected, enter the user name and password here.

Scan results and filters

Click the <Refresh> button to start the search for existing data files.

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."

At the bottom right under the <Next> button, the total number of data files found is shown.

If many data files are contained in the source directory, the restriction of the time period under “filter” helps. Only data files from the set time are then shown.

Depending on the number of data files and the store location, the completion of the search results may take a while. There may be slight delays, especially if the data files are located on one network drive.

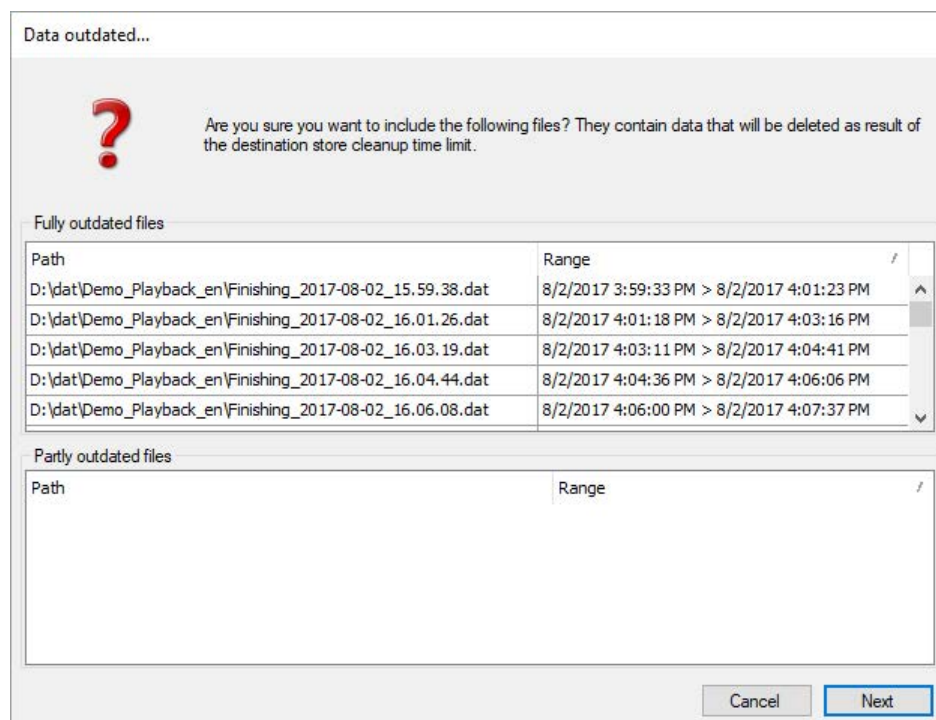
All data files are opened in the background and the most important information is read out, such as the start and end time.

If data files in the search results are not to be imported, remove the check mark in the column *Import*.

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

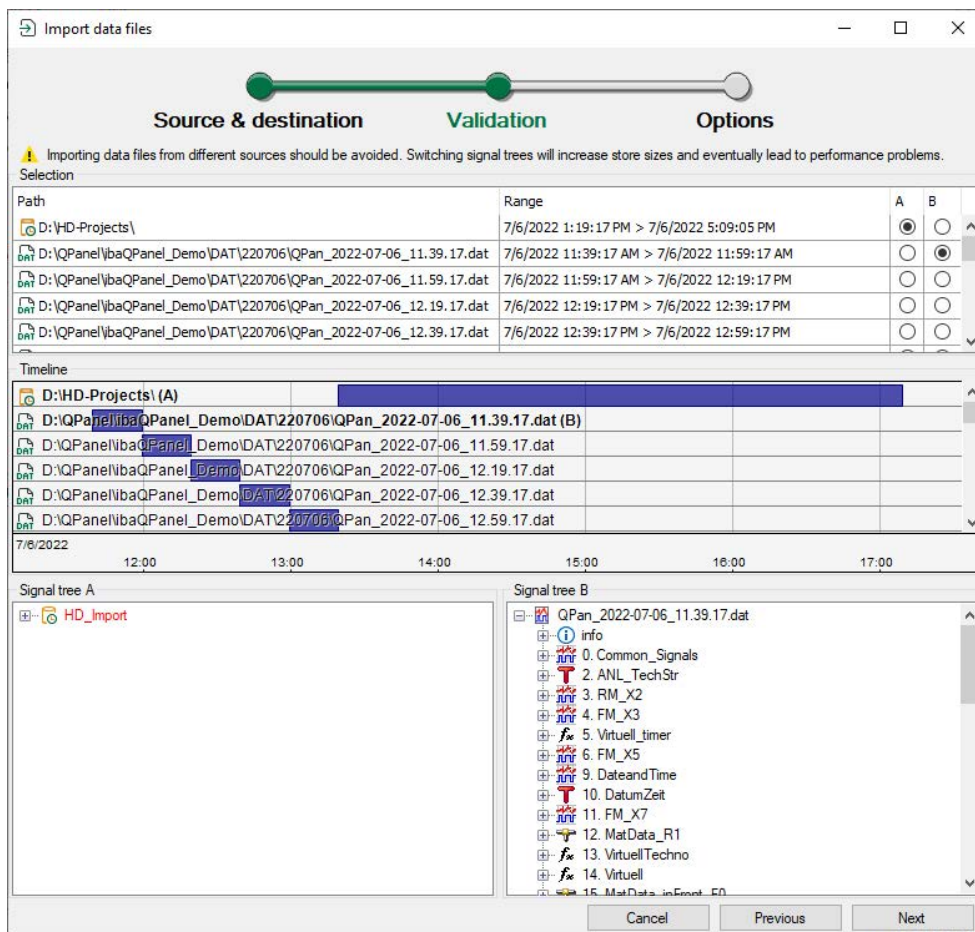
A note may already appear at this point that the selected data files come from a time range, dating before the valid maximum time range of the HD store. Changing the time limit in the HD store configuration may solve the problem.

Data outdated



A data file may be outdated if the time period of the HD store is set so that the data from the data file is no longer in this time period and would be deleted again immediately by the clean-up function.

11.2 Validation



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

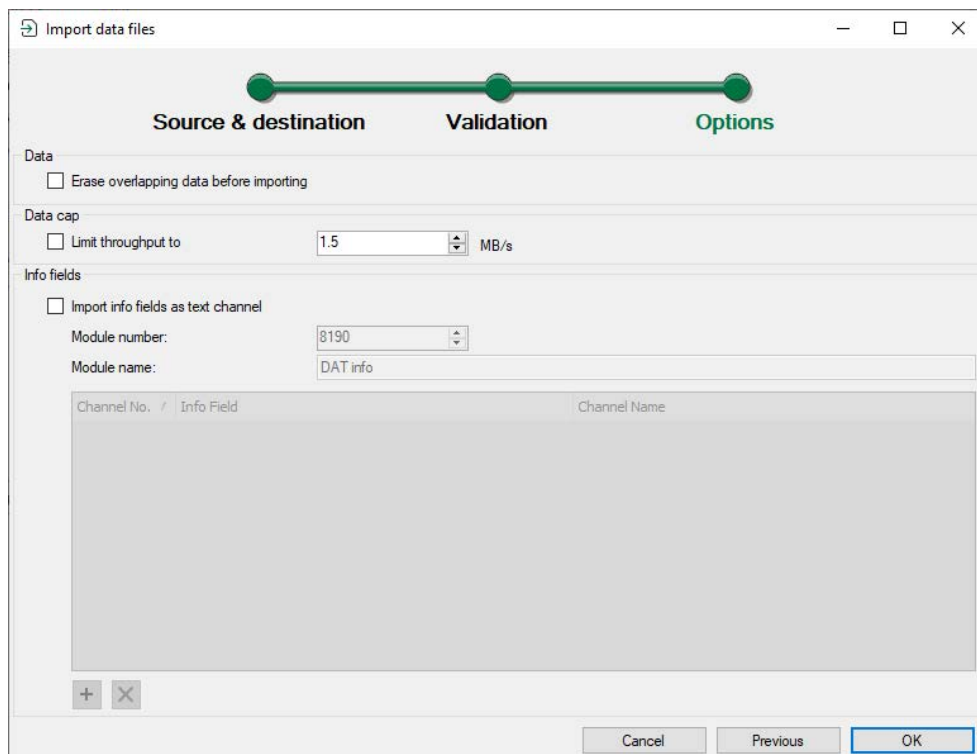
Below this along a timeline the databases are shown in a destination store and in the backups as bars. If you position the mouse in the timeline area, you can zoom with the mouse wheel. You can move the time axis with the mouse on the time scale (hold down the left mouse button).

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 data file and destination store match each other. Differences between the signal trees are highlighted with red font.

The example in the image above shows the import of several data files into a still empty HD store.

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

11.3 Options



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

Erase overlapping data before importing

If you enable this option, all data in the HD store that overlaps with the data in the data file is removed before the import is executed.

If you set the check mark, a message appears informing you that no write processes are possible in the HD store if deletion is required.

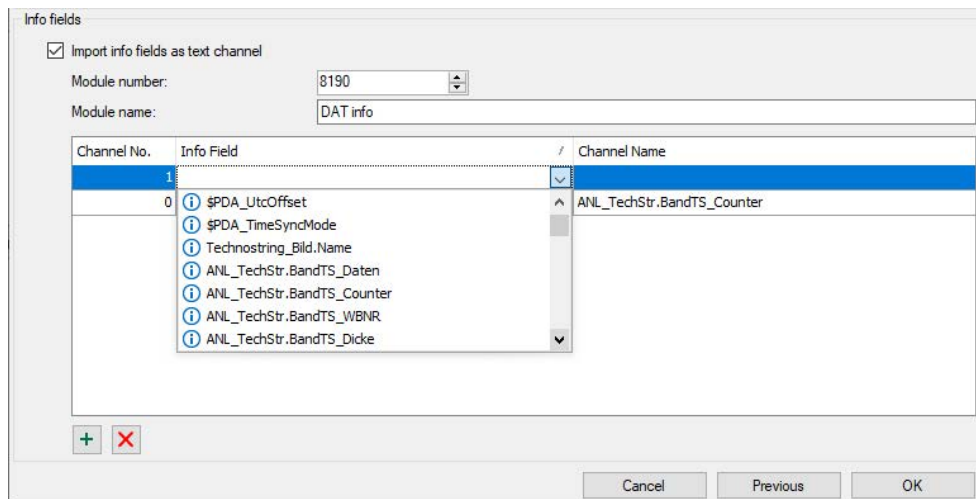
That is why this option should only be enabled if there is no online recording on the respective HD store by *ibaPDA*.

Limit throughput to ... MB/s

If you enable this option, the data throughput during import is limited to the value set next to it. This may be useful if data from the online acquisition is to be written in the respective destination store at the same time.

Import info fields as text channel

If you enable this option, you can convert info fields from the data file into text channels and assign them to a module with the set number and the name.



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

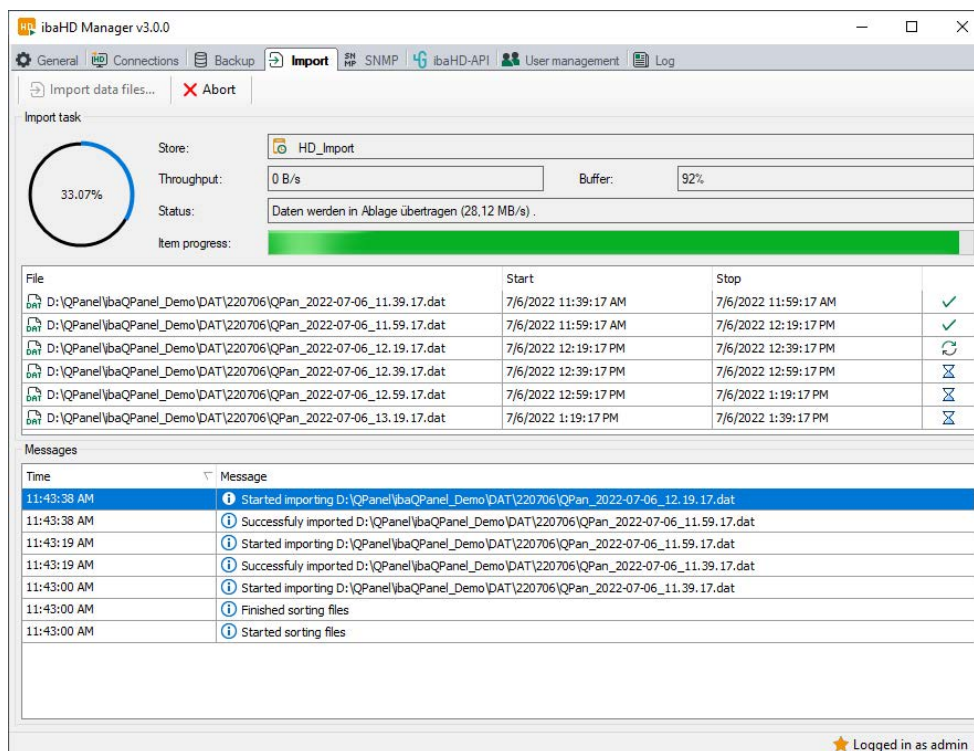
Proceed as follows to add a text channel:

1. Click on the green <+> button.
2. In the “Info field” column, open the drop-down list and select the desired info field. The system’s own info fields as well as all configured text channels (technostrings) will be shown.
3. If necessary, you can give the text channel a cleartext name in the “Channel name” column, under which the text channel is kept in the HD server.

Then click on <OK> in order to start the import.

11.4 Start the import

The progress of the import is logged in the dialog.



The percental progress is displayed in the upper left of the dialog.

During the import, the menu button *Abort* is available so that you can always cancel the import process. Former partial imports are irreversible.

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

The table in the middle shows the data files to be imported, whereby the status of the import is shown in the right column.

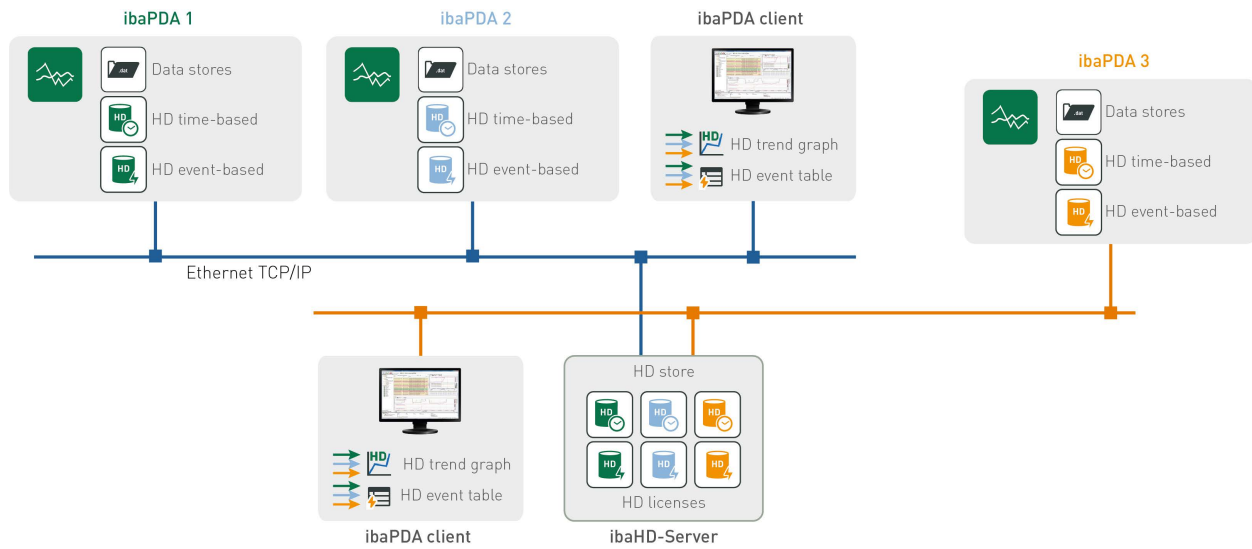
- Green check mark = import successfully completed
- Blue arrows = file is currently being processed
- Red cross = import failed

You will find the log messages in the lower area of the dialog.

12 Appendix

12.1 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*.

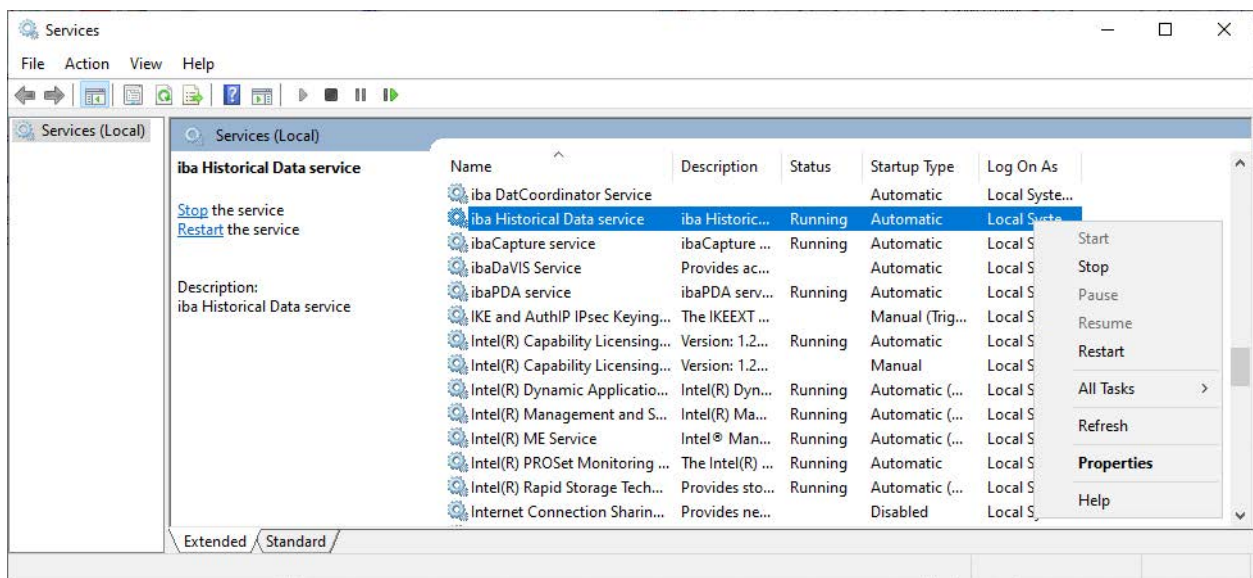
12.2 ibaHD-Server service

The 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.

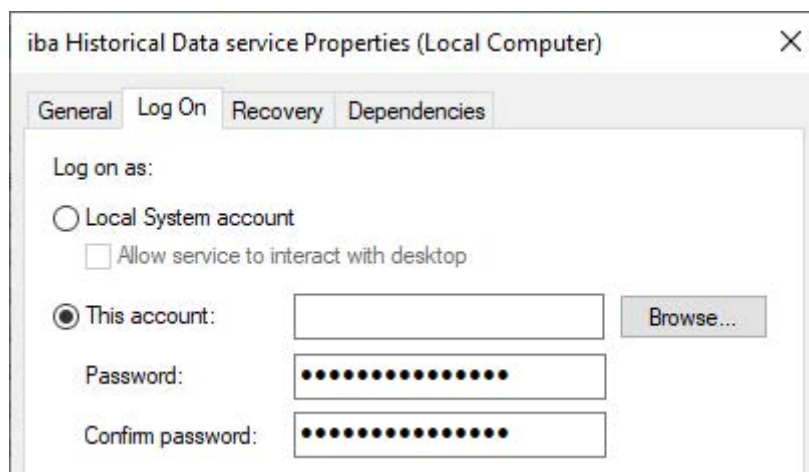
To view or to modify the current applicable user account for the *ibaHD-Server*, open the Windows service administration.

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>.

12.3 Tips for main and intermediate storage

Recommendations for setting up main and intermediate storages

- Main storage
 - Create a partition for each HD store
 - The drive should only be written by *ibaHD-Server*
 - Do not use the HD partition(s) as memory for data files or other purposes
- Intermediate storage
 - 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 used size of the intermediate store depends on the number of signals (independent if it is an analog or digital signal). The signals are stored in segment files. For each aggregation level *ibaHD-Server* has minimum one segment file.

ibaHD-Server has a limitation of the size of the segment file and also of numbers 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 determined the number of segment files per level and the size of the store.

For example:

Signalcount 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 used size of the intermediate storage cannot be determined due to the unknown number of data to be stored, but also because the number of signals can always change due to reconfiguration in *ibaPDA*. Therefore, *ibaHD-Server* expects the minimum size described in chapter [➤ Configure HD stores](#), page 34.

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.

12.4 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 *ibaHDMManager*. This way, you have a backup copy of the data.
See also [➤ Creating a backup manually](#), page 204.
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 204.

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.

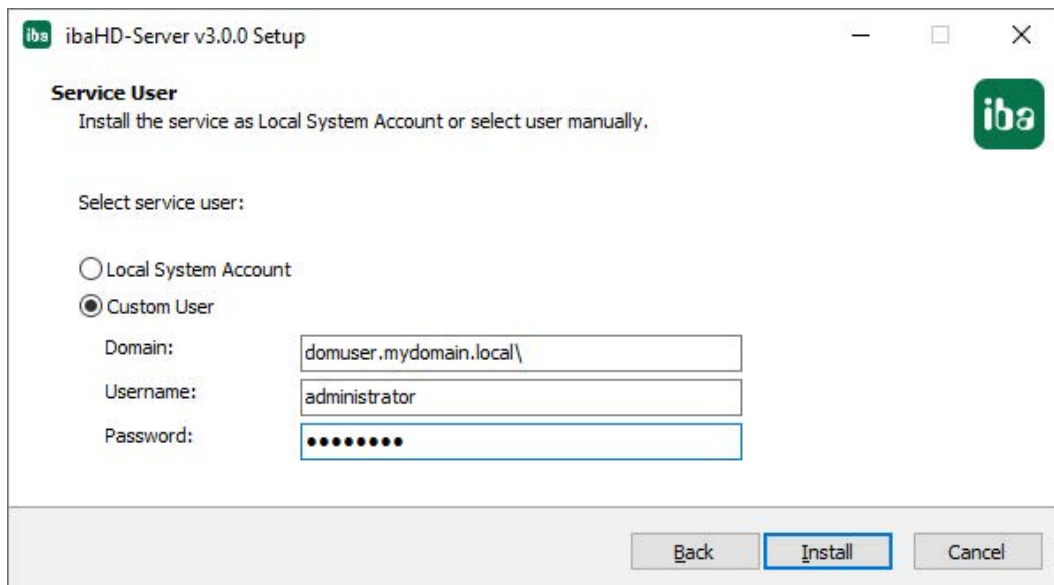
4. Stop the *ibaHD-Server* service, e.g. via *ibaHD Manager*.
5. Now copy the entire directory of the main storage to the new location.
6. When the copying process is finished, start the *ibaHD-Server* service again, e.g. via *ibaHD Manager*.
7. In the *ibaHD Manager*, select the new location of the 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.

12.5 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.

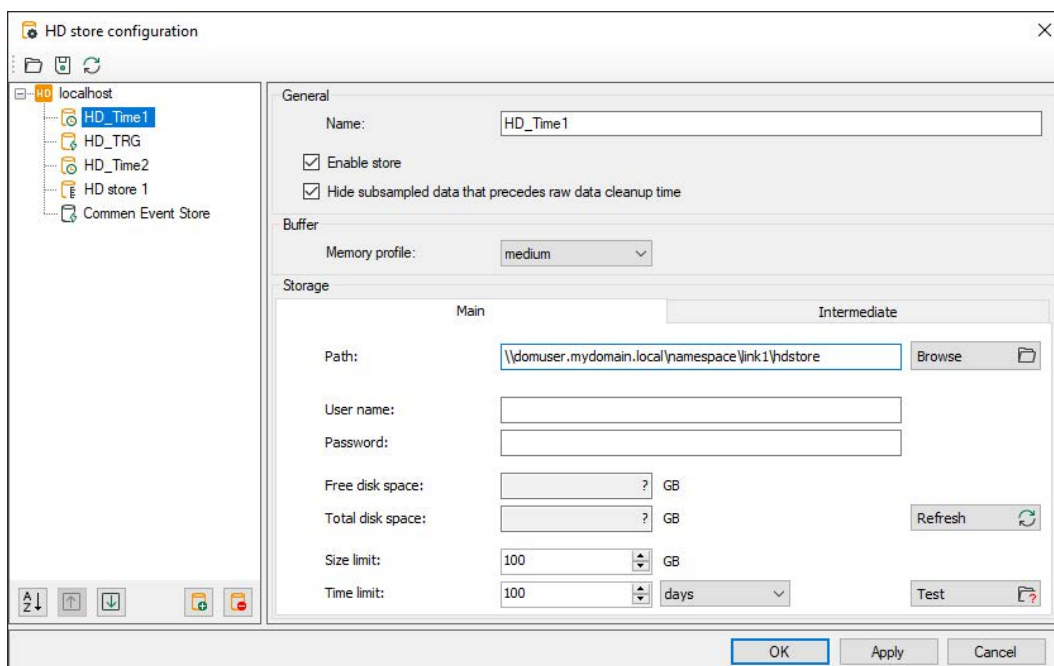
1. User of a domain

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.

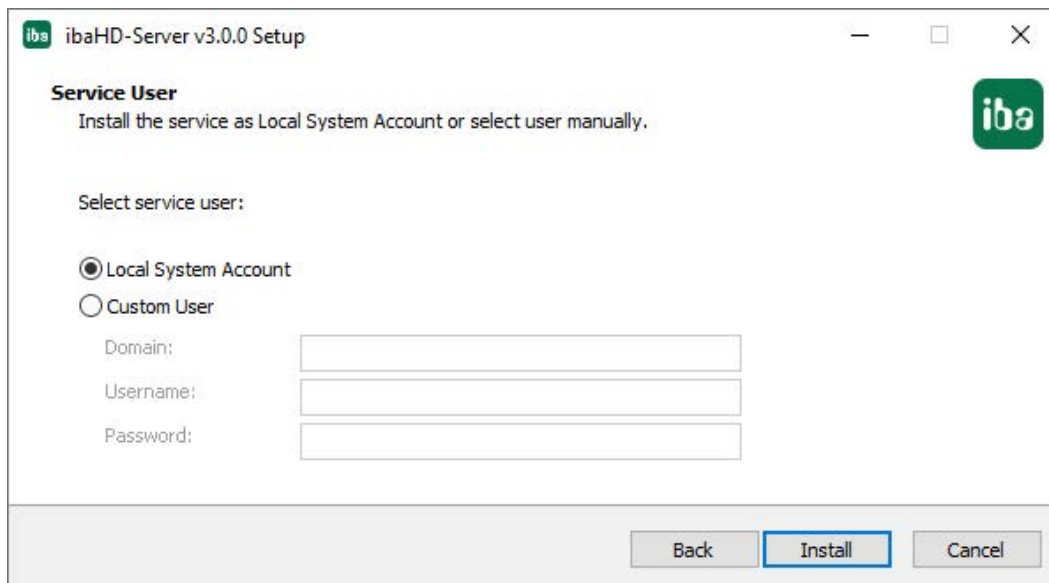
When configuring the HD store, the fields for user and password must then be left empty. Windows tries to automatically apply the session registration for the connection to other systems. If you want to make a connection to UNC paths outside the domain, you can still enter the necessary login credentials.



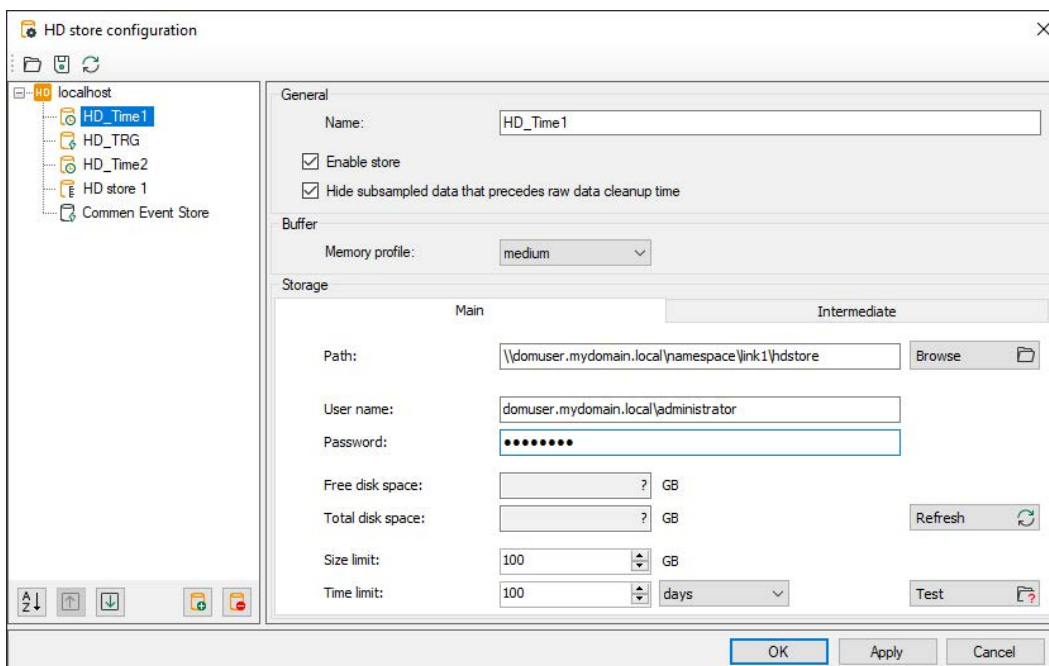
2. Local user

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.

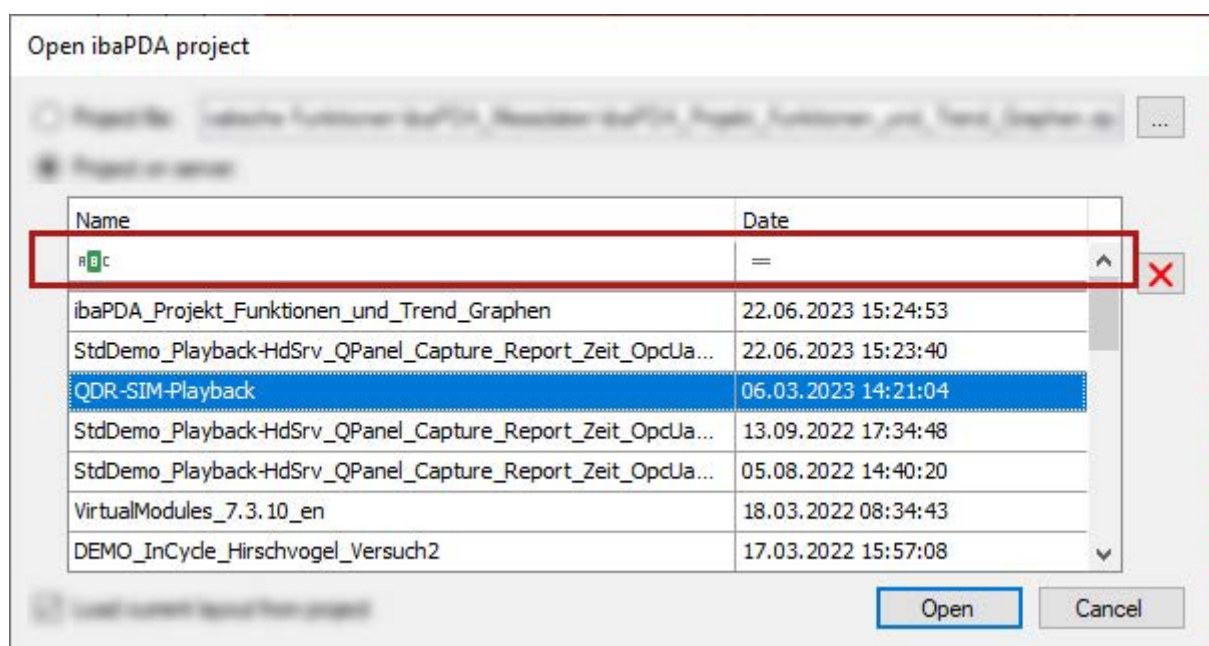


12.6 Advanced filter in tables

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.

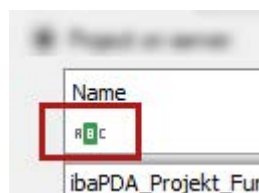
Event table						
SpeedMax						
Event	Trigger	Time	Message	Priority	Ack	
Strip in F7		26.06.23 15:53:22	Strip no. 704200.00 Entry F7; Speed 10.85; Thickness 2.29	Normal	<input type="checkbox"/>	
Speed>		26.06.23 15:53:06	Speed over 14,5 m/s; Coil no.. 704200.00	Normal	<input type="checkbox"/>	
Strip in F7		26.06.23 15:54:34	Strip no. 704200.00 Entry F7; Speed 10.85; Thickness 2.29	Normal	<input type="checkbox"/>	



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.







12.6.1 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.

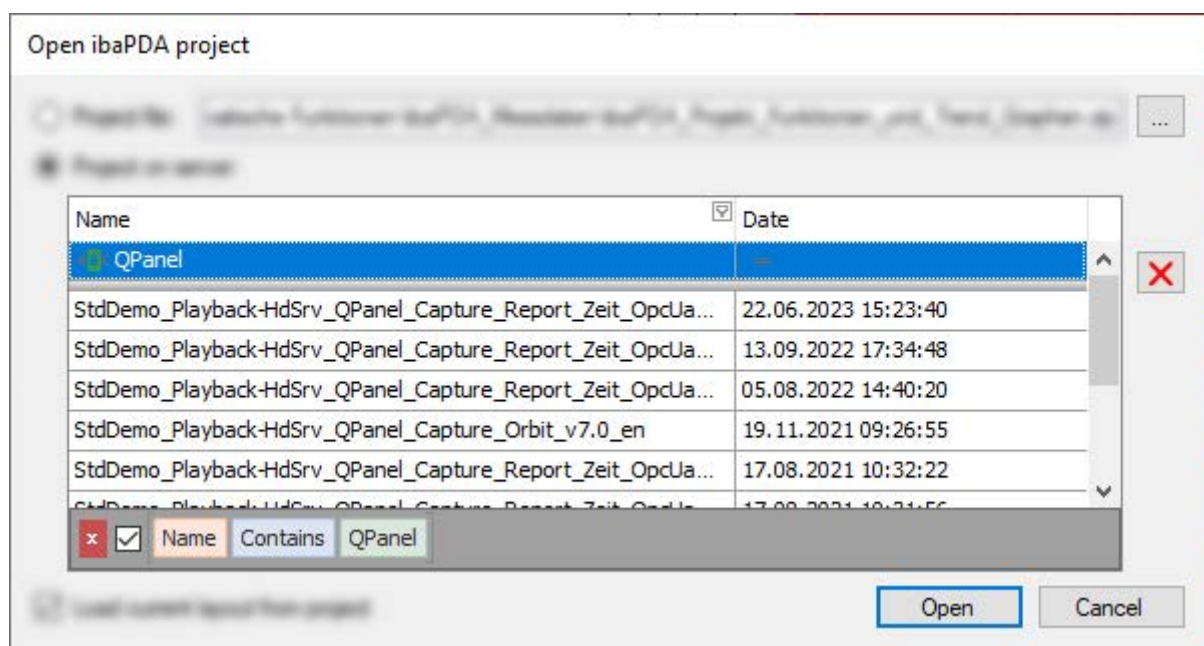
- = Equals
- ≠ Does not equal
-  Contains
-  Does not contain
-  Is like
-  Is not like
-  Begins with
-  Ends with
- > Is greater than
- ≥ Is greater than or equal to
- < Is less than
- ≤ Is less than or equal to

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.

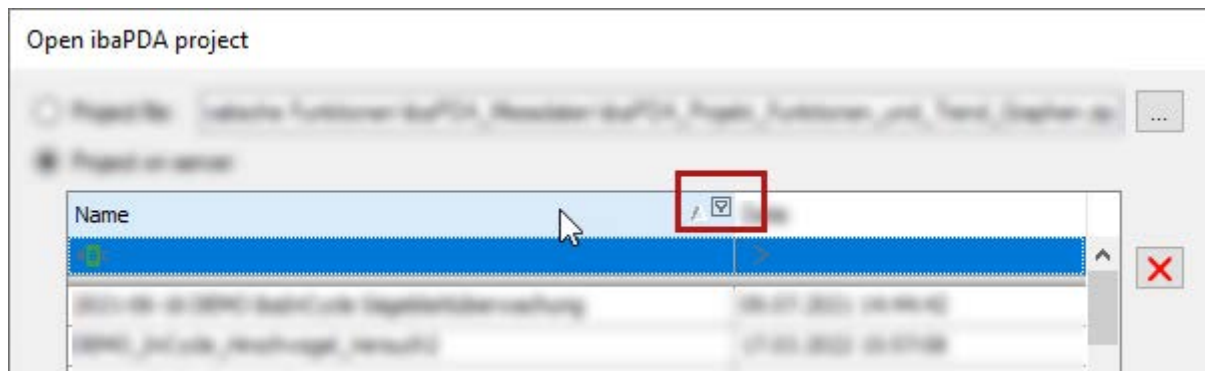
If you filter on multiple columns at the same time, the filters are shown as a logical AND combination.

Name	Date
Qp	18.08.2021 00:00:00
StdDemo_Playback-HdSrv_QPanel_Capture_Report_Zeit_OpcJa_S...	22.06.2023 15:23:40
StdDemo_Playback-HdSrv_QPanel_Capture_Report_Zeit_OpcJa_S...	13.09.2022 17:34:48
StdDemo_Playback-HdSrv_QPanel_Capture_Report_Zeit_OpcJa_S...	05.08.2022 14:40:20
StdDemo_Playback-HdSrv_QPanel_Capture_Orbit_v7.0_en	19.11.2021 09:26:55

☒ Name Contains Qp And Date > 18.08.2021 00:00:00

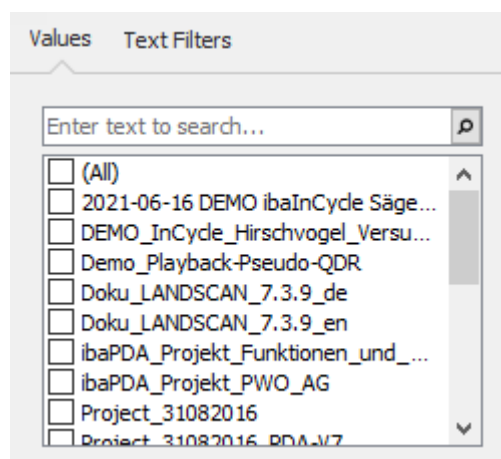
12.6.2 Advanced filter functions

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.

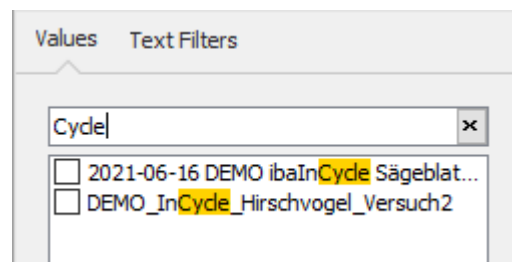


The advanced filter has two tabs:

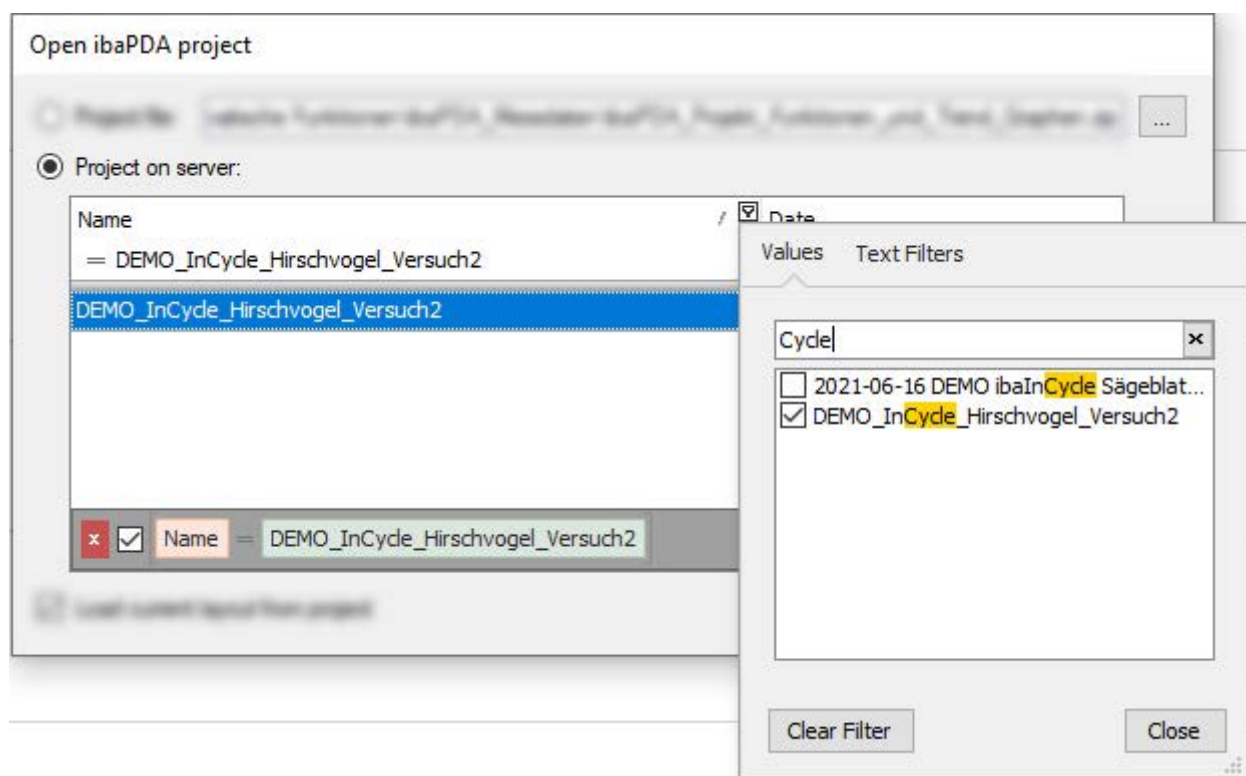
- *Values*, to search for a value or to select one or more values (similar to MS Excel)
- *Advanced filters*, to create a filter based on the value type
 In the example above, the value in the column *Name*, is a text and therefore the second tab is *Text Filters*. There would be a *Date Filters* tab 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.



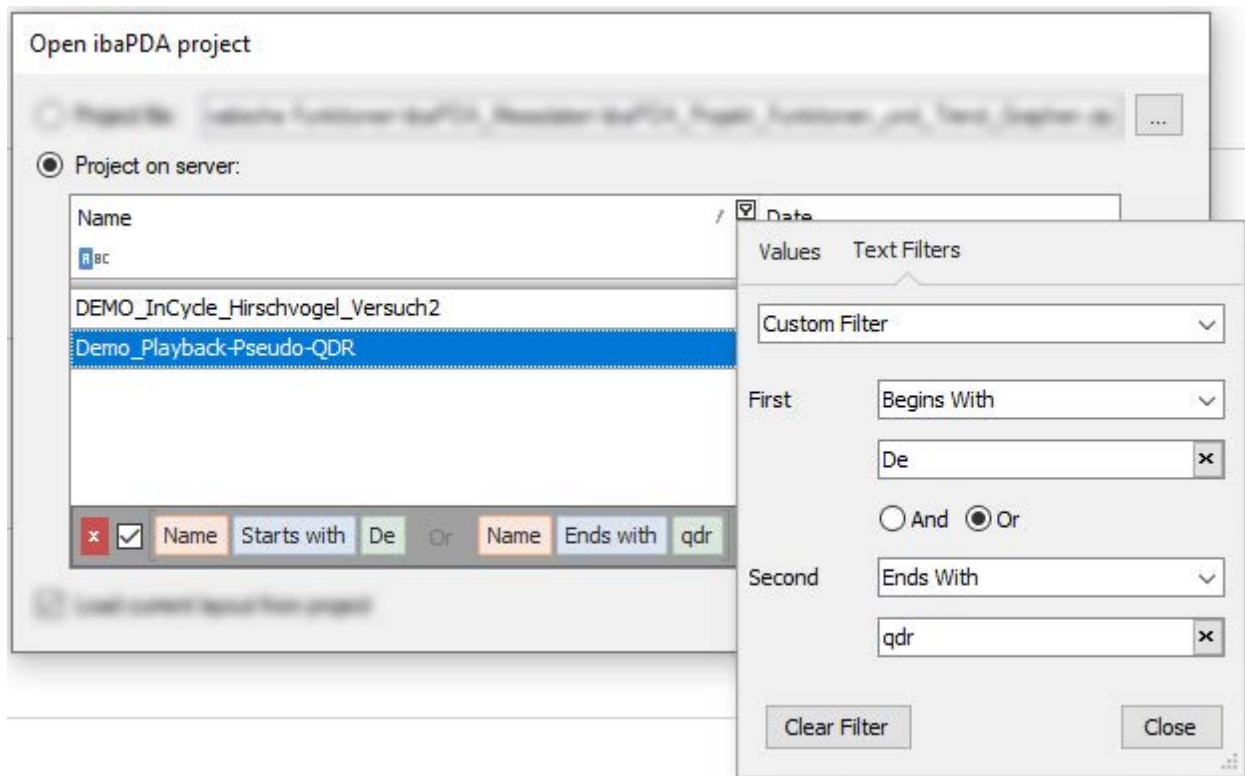
If you select one or multiple search results by a checkmark, only these rows will be displayed in the table.



Advanced filters

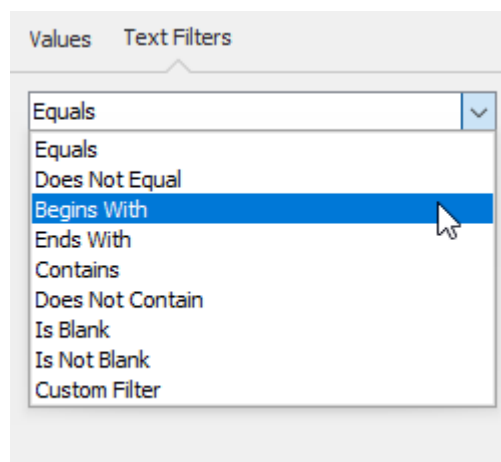
The filter options of the advanced filters depend on the column's value type. A column with numeric value, for example, has different filter options than a column with date values.

Moreover, each filter type provides a custom filter option. In case the standard filters are not sufficient for your needs you can use the custom filter option to create additional filters.



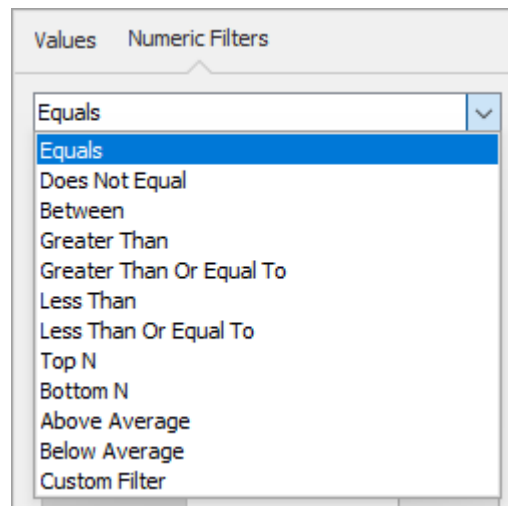
Text filters

Special text filters can be used in columns with text values.



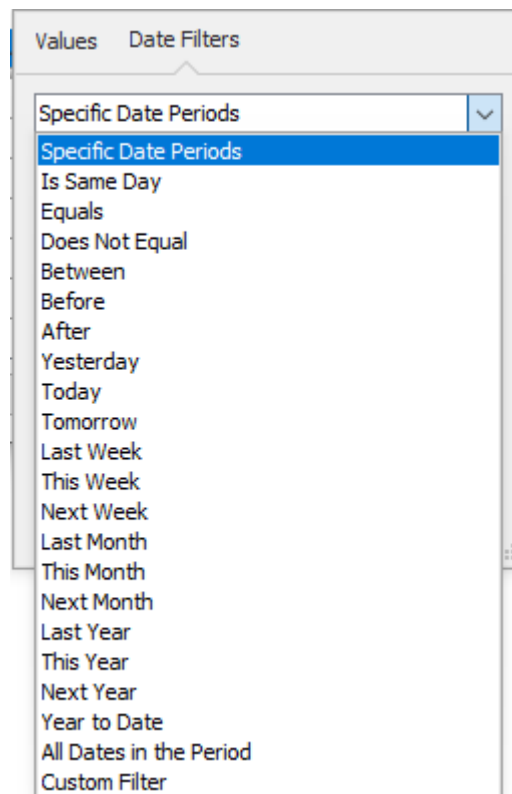
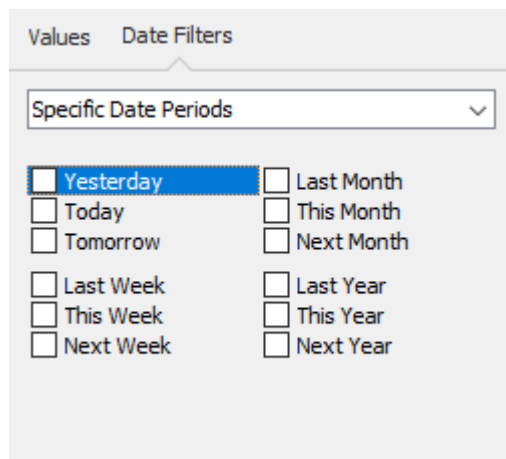
Numeric filters

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.



12.6.3 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.

The screenshot shows a dialog box titled "Open ibaPDA project". At the top, there are two radio buttons: "Project file" (selected) and "Project in server". Below the "Project file" option, there is a text input field containing "SIM" and a "Find" button. Below this is a table with two columns: "Name" and "Date". The table has one row with the text "QDR-SIM-Playback" in the "Name" column and "06.03.2023 14:21:04" in the "Date" column. At the bottom of the dialog, there are "Open" and "Cancel" buttons.

Name	Date
QDR-SIM-Playback	06.03.2023 14:21:04

13 Support and contact

Support

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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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