



ibaPDA-Data-Store-SAP-HANA

Data streaming into SAP HANA

Manual Issue 1.3

> Measurement Systems for Industry and Energy www.iba-ag.com

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The current version is available for download on our web site www.iba-ag.com.

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1 About this manual

This documentation describes the function and application of the data store *ibaPDA-Data-Store-SAP-HANA*.

This documentation is a supplement to the *ibaPDA* manual. Information about all the other characteristics and functions of *ibaPDA* may be found in the *ibaPDA* manual or in the online help.

You will find basic information about data storage in *ibaPDA* in the *ibaPDA* manual part 5.

1.1 Target group and previous knowledge

This documentation addresses qualified professionals, who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if he/she is capable of assessing the work assigned to him/her and recognizing possible risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

This documentation in particular addresses persons, who are concerned with the configuration, test, commissioning or maintenance of the supported database, cloud or cluster storage technology. For the handling of *ibaPDA-Data-Store-SAP-HANA* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge of *ibaPDA*
- Basic knowledge of databases, cloud or cluster storage technology

1.2 Notations

In this manual, the following notations are used:

Action	Notation
Menu command	Menu <i>Logic diagram</i>
Calling the menu command	Step 1 – Step 2 – Step 3 – Step x
	Example:
	Select the menu <i>Logic diagram – Add – New function block</i> .
Кеуѕ	<key name=""></key>
	Example: <alt>; <f1></f1></alt>
Press the keys simultaneously	<key name=""> + <key name=""></key></key>
	Example: <alt> + <ctrl></ctrl></alt>
Buttons	<key name=""></key>
	Example: <ok>; <cancel></cancel></ok>
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.

Тір



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 Introduction

Different types of data stores are available in *ibaPDA* for different purposes and methods of data storage. Depending on the licenses registered in the dongle, different types of data stores are available for configuration in the dialog.

This documentation describes the "DB/Cloud timebased data store" type of recording. This recording type writes timebased data to a database, such as SAP HANA, SQL Server, Oracle, MySQL or PostgreSQL.

No measurement files are generated, but the data is written to a table in the database. You define the table structure using the storage profile, see chapter **7** Storage profiles, page 15.

Chapter **7** Signal selection, page 18 describes the selection of the signals that are to be recorded.

The data can be continuously recorded or recorded by trigger, see chapter **7** *Trigger mode*, page 19.

2.1 System requirements

The following system requirements are necessary when using data storage in a SAP HANA database:

- *ibaPDA* v8.1.0 or higher
- License for *ibaPDA-Data-Store-SAP-HANA*
- SAP HANA client installation (64 bit)

The licenses are staggered according to the number of signals that should be written in a database. The number of used data stores is unlimited.

Order no.	Product name	Description
30.670141	ibaPDA-Data-Store-SAP-HANA-64	Data streaming to SAP HANA; 64 sig- nals
30.670142	ibaPDA-Data-Store-SAP-HANA-256	Data streaming to SAP HANA; 256 sig- nals
30.670143	ibaPDA-Data-Store-SAP-HANA-1024	Data streaming to SAP HANA; 1024 signals
30.670151	upgrade-ibaPDA-Data-Store-SAP-HA- NA-64 to 256	License for extension from 64 to 256 signals
30.670152	upgrade-ibaPDA-Data-Store-SAP-HA- NA-256 to 1024	License for extension from 256 to 1024 signals

Table 1: Available licenses for the data storage in SAP HANA databases

3 Data store configuration

3.1 Add a data store

Open the dialog for data storage configuration in the *Configure – Data storage* main menu or by clicking on button \Im in the main toolbar.

In order to add a new data store, click on the blue link *Add data store* in the tree structure. You can also right-click on the data store node in the tree structure and choose *Add data store* from the context menu.

Select *DB/Cloud timebased data store* for the recording of timebased data into a database or cloud.

Add data store
Data store type :
Timebased data store ibaQDR data store ibaHD timebased data store ibaHD event data store ibaHD lengthbased data store DB/Cloud timebased data store Kafka cluster timebased data store MindSphere timebased data store MQTT timebased data store InfluxDB timebased data store
This type of data store writes timebased data to a time series database or cloud like e.g. SQL Server, Oracle, MySQL, PostgreSQL and SAP HANA.
OK Cancel

3.2 Database type SAP HANA

First select the database type SAP HANA and then configure the other necessary settings.

🕄 Data storage				— 🗆 X
:*1 🗗 🗗 🗊 🛧 ⊍ ∈ ∋				
Profiles Stop prevention	DB/Cloud time	based data store 1		
Diagnostics Gratificates Go Data store 1 Jobal Devent data store 1 Jobal D data store 1	General Locked Active		Data store	index: 0
Comparison of the second	Name: Database Database type:	DB/Cloud timebased data store 1		
Lee Ministry Add data store	SAP Hana database conn Server address: User name:	hanaServer:39013 system	Database: Password:	systemdb
	HANA client version: Table Table name:	2.4.171.0]	Test connection
	Timebase: Write data every:	1.000 ÷ s 100 ÷ samples		Check table
	0 128 256 384	512 640 768 896 1024	0 ок	Apply Cancel

General

Locked

You can lock a data store in order to prevent an accidental or unauthorized change of settings.

Active

Activate the data storage in order to record data. However, you can configure various data stores and disable data stores that are not required.

Data store index

Unique index of all existing DB/Cloud data stores. You need to reference this index e.g. in the virtual function DataStoreInfoDB/Cloud() for generating diagnostic data for a specific DB/Cloud data store.

Data store name

You can enter a name for the data store here.

Database

Database type

Select your database type from the drop-down menu, here SAP HANA.

Server address, Database

Enter the address of the server and the name of the database you want to connect to.

User name/Password

Enter user name and password as login. This option must be configured accordingly in the database.



HANA client version

The version of the SAP HANA client is displayed here (information only).

Note



Prerequisite for using the data store is the installation of the SAP HANA Client (64 bit) including the ADO.NET Data Provider.

For instructions on how to install the client and how to verify the correct registration of the data providers, see chapter **7** Notes on SAP HANA client installation, page 25

<Test connection>

Use the <Test connection> button to test the connection. When testing the connection, *ibaP-DA* attempts to call up the current list of available tables and fill out the *Table name* drop- drop down list in the *Table* area. If the connection is successful, the version of the database is also output.

Table

Table name

Select an existing table from the drop-down menu or enter the name of a new table. The table name can be a full table name consisting of schema name and table name separated by a dot, for example "iba.test". If the table name does not include the schema name then the table will be created in the default schema of the configured user.

Timebase

Enter a timebase for the table. All data in the table are equidistant. All timestamps will be aligned to the timebase.

Note that you can only specify he time base when creating the table because it is a system parameter of the table. The time basis can be changed later only by deleting and recreating the table, which causes the data in the table to be lost.

Write data every x samples

Instead of inserting 1 row at a time into the database it is much more efficient to insert multiple rows at once. This can be controlled via the *Write data every x samples* option.

<Check table>

Via the <Check table> button you can check if the table exists and if all required columns exist and have the correct data type. The required columns depend on the selected signals and their storage profile. Therefore, before checking the table, you should configure the storage profile, see **7** *Storage profiles*, page 15 and select the signals, see **7** *Signal selection*, page 18.

If you check the table after configuring the storage profile and selecting the signals, the table will be created automatically in the database by *ibaPDA*.

In case the table already exists in the database and the structure is compliant with the configuration, a confirmation message appears.



If a table already exists in the database and the structure is not compliant with the configuration, the following dialog is shown listing the differences:

Check table			-		Х
Column	Data type	Status			Fix
	datetime2	ОК			
S LOCAL_TIME	datetime2	Column is not available			\square
() [SP_Speed]	real	ОК			
(i) [SP_Tension]	real	ОК			
🚫 [AV_Tension]	real	Column is not available			
🚫 [AV_Temperature]	real	Column is not available			\checkmark
(i) [Product_Cycle_Cnt]	real	ОК			
() [Product_Ident]	nvarchar	ОК			
(i) [Customer]	nvarchar	ОК			
😢 [Product_Start]	bit	Column is not available			
() [Tension_high]	bit	ОК			
() [Temperature_high]	bit	ок			
A SP_Temperature	real	Column is no longer required			
AV_Speed	real	Column is no longer required			
		Fix columns		Can	cel

Each line corresponds to one column:

- The first column shows the message type: Info, warning or error.
- The second column shows the column name.
- The third column shows the data type.
- The fourth column shows the current message.
- In the last column you can select which columns you want to correct. The faulty columns are always selected. They cannot be deselected because a correction is mandatory. If you click on <Fix columns>, *ibaPDA* tries to correct the selected columns.

In case the changes that have to be done to an existing table according to your configuration are too profound, the existing table has to be deleted and a new one will be created. This will lead to the loss of the data in the existing table.

3.3 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 will be 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 will be 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.

Province research								
🕄 Data storage				$ \Box$ \times				
* 🗗 🔁 🖱 🛧 🖵 🔿								
Profiles Stop prevention	DB/Cloud time	based data store	1 - Buffer					
Diagnostics Certificates	Memory buffer							
Data store 1	Maximum size:	8.0 🖨 MB	Current memory configuration:	8,0 MB corresponding to about 6:23:21				
ib - o Data store 2 ibaHD data store 1	Periodically persist memory buffer every 10.000 🚖 s							
ibaHD event data store 1 ibaHD lengthbased data store 1	File buffer							
DB/Cloud timebased data store 1 Trigger Mode Single cloud time	Use file buffering		Current file configuration:	2.0 GB limited by buffer time to 48:00:00				
	File storage path:	C:\ProgramData\iba\ibaPDA	\\FileBuffer					
Add data store	Maximum size:	2.0 🖨 GB						
	Other buffer settings							
	Maximum time:	48 🔶 hours						
	Memory buffer diagnostics		File buffer diagnostics					
	Last item removed:		Last item removed:					
	Fill level:	16,5 %	Fill level:	0.0 %				
			Unprocessed level:	0.0 %				
	0 128 256 3	384 512 640 76	8 896 1024 33	OK Apply Cancel				

Memory buffer

The memory buffer is always enabled. It cannot be deactivated, since 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

This option can be enabled only 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 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.

The same file directory can be used 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 will not be 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.

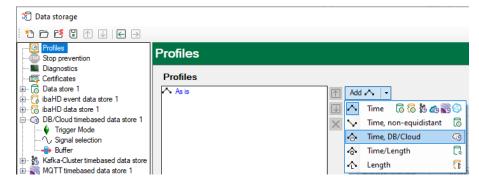
4 Storage profiles

There is a special storage profile for the *DB/Cloud timebased data store*. In the storage profile you define which value from the signals is written to the table per timebase.

4.1 Add profile

To add a DB profile, select the *Profiles* node in the tree structure of the data storage configuration dialog.

Open the drop-down list on the right under <Add> and select *Time, DB/Cloud*.



4.2 Profile Time, DB/Cloud

🕄 Data storage									\times	
: *3 🖻 🔁 🖥 🕥 🔍 🗲 🖻										
Profiles Stop prevention	Profiles									
Diagnostics Certificates	Profiles									
Data store 1	As is	\uparrow	Add 🔿 🔹							
i⊞ 🔁 ibaHD event data store 1 i⊞ 🔂 ibaHD data store 1	Time, DB/Cloud 1		Profile properties							
B/Cloud timebased data store 1		×		ime. DB/Cloud					3	
Trigger Mode Signal selection		~		ime, DB/Cloud 1						
Buffer				ine, DB/Cloud 1						
🗄 👸 Kafka-Cluster timebased data store			Filtering : None	O Min						
MQTT timebased data store 1			Average							
<u> </u>			O Average	U Miax						
			ID column value: Vone V							
			ID column size:							
			Value column na	ne: Signal name	\sim					
			Value column size	e: 128 🔶 char	racters					
			Add column f							
			Preview	or local time						
	Data store 1 : No signals linked		I_TIME	LOCAL_TIME	Signal 0 name	Signal 1 name	Signal '	2 name		
	ibaHD data store 1 : No signals linked		12:11:09.000	14:11:09.000	9,5	text 532	92207	2 name		
	DB/Cloud timebased data store 1 : No signals linked MQTT timebased data store 1 : No signals linked		12:11:10.000	14:11:10.000	6,6	text 208	7564			
	Kafka-Cluster timebased data store 1 . No signals linked		12:11:11.000	14:11:11.000	4,5	text 47	80161			
			12:11:12.000	14:11:12.000	7,8	text 663	83507			
			12:11:13.000	14:11:13.000	0,2	text 481	85501			
			12:11:14.000	14:11:14.000	1,1	text 314	14969			
								_		
< >						OK A	pply	Cano	el	

Profile properties

Туре

Displays the profile type (information only)

Name

Enter a name for the profile.

Filtering

Select here which value from the signal will be written into the table every timebase. The following values can be selected:

- None: The signal value at the time at which the timebase expires is taken. All other values in the time range are ignored.
- Min: The smallest signal value within the timebase.
- Average: The average value of the signal in the timebase.
- Max: The largest signal value within the timebase.

Configure columns of the table

The table into which data is written using the data store always has a timestamp column with the unchangeable name *I_TIME*. The timestamp is always generated in UTC time.

In addition to the *I_TIME* column, a second time stamp column *LOCAL_TIME* with the local time of the *ibaPDA* server computer can be added optionally. To do this, the option *Add column for local time* must be enabled.

In the table, you can optionally specify an ID column that can be used as a key. The default name is *I_ID*. You can choose whether to use the ID column, and if so, which value should be inserted. The ID column value drop-down menu provides the following options:

- None: No ID column will be used.
- Fixed: A fixed text will be written into the ID column. This could be used for example when multiple *ibaPDA* systems are writing to the same table as an identification of the *ibaPDA* system. Enter the desired text in the input field to the right.
- Text signal: The value of a text signal. Select the desired text signal in the selection field to the right.
- Signal ID: The ID of the signal this profile is applied to. Example:
 A_0_1 means analog signal (A) with the signal ID in *ibaPDA* [0:1]
 D_0_1 means digital signal (D) with the signal ID in *ibaPDA* [0.1]
- Signal name: The name of the signal this profile is applied to.
- Signal comment 1: The first comment of the signal this profile is applied to.
- Signal comment 2: The second comment of the signal this profile is applied to.

ID column size

Here you can specify a character length for the ID column.

Value column name

The *Value column name* option determines the name of a column in which a signal value is written. You can choose between:

- Fixed: Fixed column name means, that the data of each signal will be written to a separate row. It is recommended to use the ID column to determine to which signal the data belongs.
- Signal ID: The column name is the signal ID. Example:
 A_0_1 means analog signal (A) with the signal ID in *ibaPDA* [0:1].
 D_0_1 means digital signal (D) with the signal ID in *ibaPDA* [0.1].
- Signal name: The column name is the signal name. Characters that are not allowed in column names in the respective database type are replaced by underscores.
- Signal comment 1: The column name is derived from the first comment of the signal.
- Signal comment 2: The column name is derived from the second comment of the signal.

For all settings except "fixed", a row contains the data from multiple signals.

You specify the maximum character length in the *Value column size* field.

The preview shows a general example how a table with the current settings will look like.

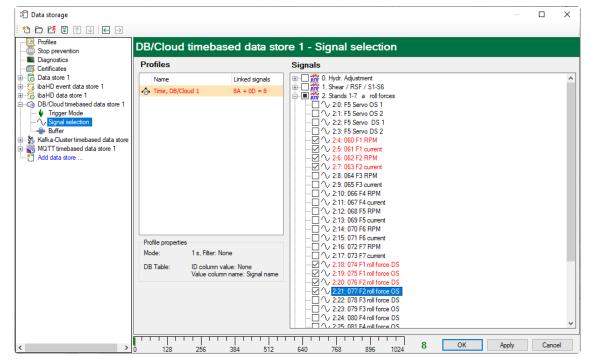
Note



Additional information about the storage profiles can be found in the *ibaPDA* manual, part 5.

5 Signal selection

To record signals, you have to assign the signals to a storage profile of the type *Time*, *DB/Cloud*. Select the signal selection node below your *DB/Cloud timebased data store* to open the signal selection dialog.



In the profile list, select the storage profile to which you want to assign certain signals. Set a check mark in the selection fields next to the signals which you would like to assign to this profile. A signal can only be assigned to one profile per data store.

The *Profile properties* section displays some information about the configured timebase, filtering and column naming of the selected profile.

DB/Cloud data stores are licensed for each database type separately, e. g. SAP HANA, Oracle, SQL Server etc. These licenses are staggered according to the number of signals written to the database.

You can find the current number of selected signals in all DB/Cloud data stores of one database type at the bottom of the dialog, similar to the number of configured signals in the I/O Manager. The length of the bar corresponds to the licensed number of signals.

In the above example, it is possible to write up to 1024 signals in several data stores of the same DB type. Currently 8 signals are enabled.

When you have configured all signals you want to write to the database, go back to the main node of the data store. There you can check the table with the <Check table> button.

6 Trigger mode

The description applies to the following types of data stores:

- DB/Cloud timebased
- Kafka cluster timebased
- MQTT timebased
- MindSphere timebased
- InfluxDB timebased.

In the *Trigger Mode* node, you determine when data is recorded, here using the example of *DB/ Cloud timebased data store*.

🕄 Data storage		_		×
: 🎌 🖻 🔁 🕄 🛧 🜙 🗲 🖻				
Profiles Stop prevention	DB/Cloud timebased data store 1 - Trigger Mode			
Diagnostics Certificates Data store 1 Diable Vent data store 1 Diable Devent data store 1 Dible Down table data store 1 Dible Down timebased data store 1 Dible Could timebased data store 1 Add data store	Start Trigger Trigger type: ○ Unconditional ● Trigger on signal ① I 1.28: Measure roll up ○ Trigger every 60 ÷ ● One sample on change of ▲ Unassigned Pre-trigger time: 0.000 ÷ s Trigger dead time: 0.000 ÷ s Trigger occurs again while already recording then :			^
	Ignore it O Extend recording time Maximum number of extensions: 3	A T		
	Stop Ingger Trigger type: Trigger after recording Image: Trigger on signal Image: Trigger on signal Image: Trigger time : 0.000 s			~
< >	0 128 256 384 512 640 768 896 1024 8 ОК Ар	ply	Cance	el

Start trigger

You initially choose whether you would like to continuously record or it should be fired by a trigger.

Unconditional

The data is continuously recorded with this selection. In this case, the recording will start immediately at the start of the measurement or when pressing the "GO" button.

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. The signal to trigger on is to be selected from the drop-down lists (see picture below, field 1). In the drop-down list, you will find the well-known signal tree containing available signals. Select the signal you want to use as trigger signal.

Start Trigger Trigger type:							
O Unconditional	field 1		field 2		field 3		
Trigger on signal	1 0:30: 030 ZW2 V-Ist	\sim	rising edge	~	0,540	† m	n/s
 Trigger every 60 ÷ One sample on change of 		^					
Pre-trigger time: 0,000							
Trigger dead time: 0.000			sition				
If start trigger occurs again while a Ignore it	If						
Extend recording time Trigger	∬ 0.0: Triggerrelais 1. Schere / RSF / S1-S6		nber of extensions:		3 📫		
Trigger type:							
 Trigger after recording 							
Trigger on signal	 III 10. 16 bit decoder 	~	falling edge	~			

Depending on whether a digital or an analog signal was selected, the fields 2 or 3, respectively, are offered allowing the trigger event to be defined more specifically.

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

Start Trigger Trigger type: O Unconditional					
Trigger on signal	へ 0:30: 030 ZW2 V-1st	\sim	rising edge \sim	0,540	➡ m/s
○ Trigger every 60 ÷	minutes starting at 00:00		rising edge falling edge		
 One sample on change of 	🔥 Unassigned	\sim	above level below level		

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

Start Trigger Trigger type: O Unconditional				
Trigger on signal	∬ 0.0: Trigger relay	\sim	rising edge \sim	
○ Trigger every 60 ▲	minutes starting at 00:00		rising edge falling edge	
One sample on change of	🔥 Unassigned	\sim	Logical 1 Logical 0	

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.

One sample on change of

When the value of the selected signal changes, a sample is recorded. The recording will stop after one sample, until the next signal change is detected. A deadtime can be configured to determine a minimum amount of time between samples. Before the deadtime has elapsed, no new sample will be recorded.

Pre-trigger time

You can configure a pre-trigger time and then the recording begins by the pre-trigger time before the trigger event. 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 start triggers *Trigger on signal, Trigger every ...* and *One sample on change of*. The trigger dead time determines the time of suppressing subsequent triggers after a trigger occurred.

If the dead time, for instance, 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 recording to start immediately at acquisition start or as soon as you apply a new data storage configuration, you also need to check the *Trigger on acquisition start* option. If you do not enable this option, the recording first starts once the trigger is fired.

If start trigger occurs again while file is already recording, then:

You can determine here what should happen if a new start trigger occurs while a recording is already running.

Ignore it:

If you select this option, the system ignores any new start trigger during a running recording for as long as the stop trigger occurs

Extend recording time:

If you select this option, the system extends the duration of the running recording upon occurrence of another start trigger during an ongoing recording. This occurs as often as set in the "Maximum number of extensions" field. If the max. number of extensions is reached, all subsequent start triggers will be ignored. Of course, the recording is stopped immediately by any stop trigger.

Stop trigger

The settings for the stop trigger are made in the same way as those for the start trigger. Here, both analog and digital signals can also be used as triggers.

Trigger after recording of x hours x minutes x seconds

Here you can configure a time span according to which the recording is ended after the occurrence of the start trigger.

Trigger on signal

See explanation for start trigger above.

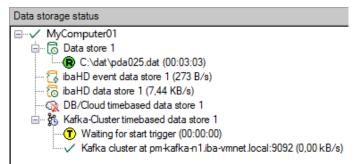
Post trigger time

You can configure a post trigger time and then the recording ends by the post trigger time after the stop trigger event.

7 Diagnostics

7.1 Data storage status

The data storage status window shows the current status of the data stores.



All defined data stores and their respective status are displayed here, depending on the data store, with server address, acquisition duration, write speed, etc.

The icon in front of the name indicates the current status of the storage:

Wait for the start trigger (only for triggered recording)

Recording in progress

Post-trigger phase; stop trigger occurred, but acquisition continues until the post-trigger time is over

Disabled or faulty data store is indicated by a red cross in the data store icon.

Right-clicking on this node allows you to manually send a start or stop trigger.

7.2 Diagnostics of data stores

The *Diagnostics* node in the data storage tree offers information about the system load by the data stores. The measurement must be running.

🕄 Data storage									_	
: *1 🖻 🔁 🖥 🛧 🖵 🗧 🕁										
	Dia	gnostics								
Diagnostics Certificates	Total I	load in acquisition thread caus	sed by data stores: 0,36	%					Reset	statistics
E Co Data store 1 E Co Data store 1 E Co Data store 1	[Data store		Write speed	d (KB/s)	Memory buf	fer(KB)	File buffer	(MB)	Acquisition
	1	Name	Destination	Average	Max	Average	Max	Average	Max	Thread load
OB/Cloud timebased data store 1		 Erfassungsthread (0,36%) 								
☆ Kafka-Cluster timebased data store ☆	6	Data store 1	C:\	9,02	53,64	0,00	0,00			0,19%
Add data store		ibaHD event data store 1 (ltabl)		0.07	0.00	0,00	0.01			0.000/
		ibaHD event data store 1 ibaHD data store 1 (0,21%		0,27	0,39	0,00	0,01			0,02%
	8	ibaHD data store 1	MyComputer01\HD_Time2	7,01	9,28	0,00	1,59			0,04%
		DB/Cloud timebased data s								
	0	DB/Cloud timebased dat	hanaServer:39013	0,00	0,00	0,00	0,00			0,03%
		Kafka-Cluster timebased d								
	<u>\$</u>	Kafka-Cluster timebased		0,00	0,00	268,83	296,07			0,02%
		MQTT timebased data stor		-0.00	0.00	222.10				
		MQTT timebased data st	localhost		how actual va		355,22			0,05%
				W	/rite speed un	iit 🕨	✓ KB/s			
							MB/s			
							MB/h			
< >								ОК	Apply	Cancel

The performance values of all data stores are shown in the table. There is one row per data store. The rows are grouped according to the threads that write the data.

In each group row is the name of the thread and (in brackets) the utilization (100% means the thread is overloaded). The load average is displayed by default. But, you can switch between the average and actual value using the context menu.

The *Destination* column indicates the respective target to which the data is written, for example a hard disk partition, the address of the database, the address of the Kafka cluster, etc. The *Write speed* indicates how fast the data is written.

The *Memory buffer (kB)* columns indicate how much data is buffered in *ibaPDA*. The columns *File buffer (MB)* indicate how much data is buffered in the file buffer.

The Acquisition Thread load column indicates various information depending on the data stores. For timebased data stores, the Acquisition Thread load column indicates the amount of time needed for the run length encoding and writing to a disk. For DB/Cloud, MQTT, Kafka Cluster, InfluxDB and MindSphere data stores, the column indicates the load caused by the analysis of the triggers and creation of the row data.

For HD data stores, the partial processing time will be displayed, that is used for the creation of the data to be written on the HD server. These values already contain the run length encoding for timebased stores, event trigger calculation for event stores and the calculation of the length-based data for lengthbased stores.

Additional information about diagnostics can be found in the *ibaPDA* manual, part 5.

8 Appendix

8.1 Notes on SAP HANA client installation

Writing data from *ibaPDA* to a SAP HANA database via the SQL interface or DB/Cloud requires the installation of the SAP HANA client (64 bit).¹⁾

The installation of the SAP HANA client is described below step by step.

- 1. The installer with graphical user interface is started by double clicking on hdbsetup.exe.
- 2. Select the option *Install new SAP HANA Database Client*. Specify the installation directory and continue with <Next>.

SAP HANA Database Client Installation 2.4.171.1573163505		-		Х
SAP HANA				
Lifecycle Management				
I→2	3 4 4			
Define Client Properties Review & Confirm Install	Software Finish			
Choose an installation to update, or choose a path for a new in	stallation			
O Update SAP HANA Database Client	Installation Details			
\sim	To be installed			
Install new SAP HANA Database Client	Version: 2.4.171.1573163505 Mode: 32bit			
C:\Program Files (x86)\sap\hdb				
	Installation path: C:\Program Files (x86)\sap\ho	lbclient		
	< Desvious Marks		Care	
	< <u>P</u> revious <u>N</u> ext >		<u>C</u> ance	21

1) The SAP HANA client 64 bit runs with all ibaPDA versions including v8.1 32 bit.

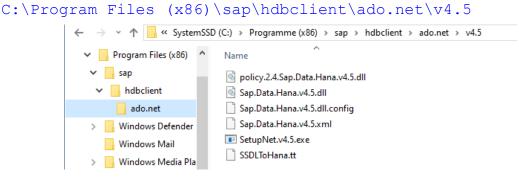
3. A manual selection of the different driver components is not possible. All components are always installed. It is important that the ADO.NET component appears in the list. Confirm the settings for the installation and continue with <Install>.

SAP HANA Database Client Installation 2.4.171.1573163505	-		×
SAP HANA Lifecycle Management			
Image: Client Properties Review & Confirm Install Software Finish			
Summary			
SAP HANA Database Client Installation Installation Path: C:\Program Files (x86)\sap\hdbclient OBBC Driver Name: HDBODBC32 Software Components (132.33 MB) ADO.NET (20.42 MB) Client Installer (19.72 MB) CommonCryptoLib (3.98 MB) DBCAPI (12.75 MB) Environment Script (0.00 MB) JBBC (11.51 MB) ODBC (15.54 MB) ODBC (15.54 MB) Product Manifest (0.00 MB) REPOTOOLS (16.13 MB) SQLDBC (40.79 MB) Installer (0.46 MB)			
< <u>P</u> revious Install		<u>C</u> anc	el

 \rightarrow The installation is executed.

SAP HANA Database Client Installation 2.4.171.1573163505	-	×
SAP HANA Lifecycle Management		
Define Client Properties Review & Confirm Install Software Finish		
Installing SAP HANA Database Client Software		
✓ Installing Microsoft C/C++ Runtime		î
📀 Installing package 'Product Manifest'		
Installing package 'SQLDBC'		
Installing package 'ODBO'		
Installing package 'REPOTOOLS'		
Installing package 'ODBC'		
Installing package 'JDBC'		
Installing package 'DBCAPI'		
S Installing package 'node.js Client'		
S Installing package 'CommonCryptoLib'		
Ninstalling package 'ADO.NET'		
Installing package '.NET Core'		
		~

- 4. Confirm the successful installation with <Finish>.
- → After successful installation of the SAP HANA Client you find the ADO.NET Data Provider components in the following path by default:

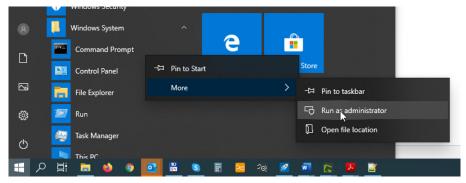


5. The data providers must also be registered in the machine.config configuration file of the computer. This is normally done automatically by the SAP HANA Client Installer. For verification open the configuration e.g. with the notepad text editor. You find the file here: %windir%\Microsoft.NET\Framework\v4.0.30319\Config

In the file there should an entry "SAP HANA Data" under the node "<DbProviderFactories>".

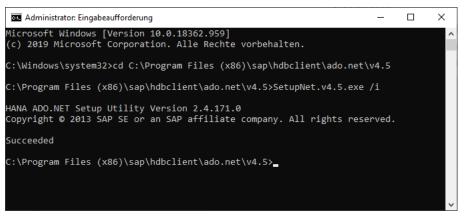
```
<system.data>
   <DbProviderFactories>
        <add name="SAP HANA Data Provider" invariant="Sap.Data.Hana" description=".NET Framework Data
        Provider for SAP HANA" type="Sap.Data.Hana.HanaFactory, Sap.Data.Hana.v4.5, Version=2.4.171.0,
        Culture=neutral, PublicKeyToken=0326b8ea63db4bc4" />
        </DbProviderFactories>
        <//system.data>
```

- 6. If the "SAP HANA Data Provider" registration is not available, you can execute it manually.
 - To do this, open a command prompt with the option *Run as administrator*.



- Change to the installation directory of SAP HANA Data Providers: C:\Program Files (x86)\sap\hdbclient\ado.net\v4.5\
- Execute the command "SetupNet.v4.5.exe /i".

 \rightarrow The SAP HANA Data Providers is then registered in the machine.config configuration file.



- 7. Restart the *ibaPDA* service.
- → In the configuration of the database connections in the *ibaPDA* client (SQL interface and DB/Cloud data store) a HANA client version number is now displayed:

∃→ iba I/O Manager						\times
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	Set all values to ze	ero when the connection to a database year if a database is not accessible DB name tition IIIII SAP Hana v @	is lost Database: Password:	X	Create new.	
				Add Cancel		
			Open k	ng file Re	set counters	
	0 256 512	768 1024 1280 15	36 1792 ∞ 16	4 OK Apply	Cano	;el
Data storage					- 0	>
5 🗗 🖆 🖫 🕥 💷 🖂 🖻						
Profiles Stop prevention	DB/Cloud ti	mebased data sto	re 1			
Diagnostics	General					
- 📴 Certificates						

	DB/Cloud time	based data store 1				
Diagnostics Certificates	General					
Data store 1			Data store	e index: 0		
ibaHD event data store 1	Active					
→ ¹ / ₁₀ ibaHD data store 1 → ¹ / ₁₀ DB/Cloud timebased data store 1	Name:	DB/Cloud timebased data store 1				
 Trigger Mode Signal selection 	Database					
	Database type:	SAP HANA		~		
Add data store	SAP Hana database connection					
	Server address:	hanaServer:39013	Database:	systemdb		
	User name:	system	Password:	•••••		
	HANA client version:	2.4.171.0		Test connection		
	Table					
	Table name:	IBA.TESTTABELLE		~		
	Timebase:	1,000 🜩 s		Check table		
	Write data every:	100 samples				
	0 128 256 384	512 640 768 896 1024	0 ок	Apply Cancel		

9 Support and contact

Support

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Email: support@iba-ag.com

Note



If you need support for software products, please state the license number or the CodeMeter container number (WIBU dongle). For hardware products, please have the serial number of the device ready.

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