Web-based product and process analysis

ibaDaVIS

ibaDaVIS
Data Visualization and Information Service

Areas of application:

- Visualization of characteristic values and measurement data
- Interactive product and process analysis
- Visualization of quality data with dynamic limits
- Root cause analysis with drill-down and in-depth analysis

Web-based view of relevant data

ibaDaVIS allows the visualization and analysis of your process and quality data as well as characteristic values in the web browser. You can interactively access detailed data from the overview on the dashboard.

The big picture at a glance

With ibaDaVIS, you get a completely new overview and greater clarity through in-depth insights into your data and processes.

Systems and machines can be compared with each other based on their characteristic values. The information that you need to analyze and monitor your systems and machines – and to identify weak points and potential for optimization – can be shown quickly and easily.

Changes in the process can be tracked directly or analyzed over long periods of time. Long-term trends, histograms, tables or pie charts are both visualization and filter elements in one.

Plant operators, process engineers and decision-makers are all looking at the same data with ibaDaVIS, no matter whether on a PC, mobile tablet or smartphone.

The latest web technology

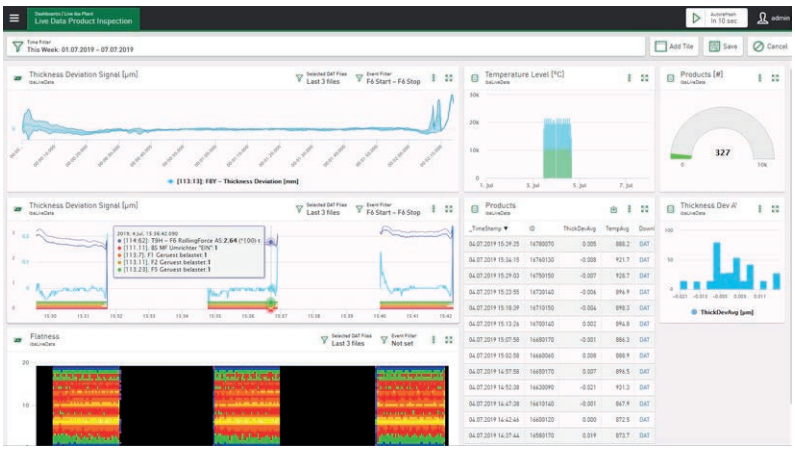
ibaDaVIS uses the latest web technologies. All common web browsers, such as Google Chrome, Mozilla Firefox and Microsoft Edge are supported. The responsive design allows convenient operation, even on tablets or smartphones. Only a web browser is required in order to connect to ibaDaVIS. The installation of an additional app is not necessary.

ibaDaVIS also supports HTTPS through Windows or general certification for a secure connection setup as well as secure data transmission.

The status of ibaDaVIS can be monitored at any time via a status

At a glance

- Visualize and analyze process and quality data
- Web-based and platform-independent – access from anywhere
- Flexibly configurable dashboards for a wide range of user groups
- Representation as time trend, histogram, scatter chart, table, gauge, and pie chart
- Interactive detailed analysis through flexible filtering of process and quality data
- Comprehensive access to measurement files, ibaHD data and databases
- Display of characteristic values and high-resolution measurement values in one dashboard



Meaningful displays can be realized with different tile types

Several measurement files can be appended to each other (top) or compared directly in the stacked view (middle). In the envelope view (bottom), the maximum, mean and minimum values are displayed as trends.

app on the Windows host PC on which ibaDaVIS is installed. The ibaDaVIS Status app is represented by an icon in the taskbar and offers all necessary service functions.

Visualize and analyze data from different sources together

Dashboards visualize quality or characteristic values from databases, measured values from iba measurement files and HD data in tiles. Data from time-based and event-based HD stores or the information stored for time periods can be visualized.

Time periods index the continuously recorded data in ibaHD-Server and thus combine the advantages of triggered DAT files with the continuous long-term storage in ibaHD-Server.

Time periods mark any areas, such as a product, a tool change or a shift. In addition to the start and stop time, further information such as characteristic values or texts for a time period can be stored in ibaHD-Server.

Current measurement data or characteristic values from different sources can be combined in one or more dashboard views in ibaDaVIS. Thus, ibaDaVIS enables central access and joint analysis of decentrally acquired data.

Flexible configuration

In the navigation area of ibaDaVIS, dashboards can thematically and hierarchically be organized by location, machine, or user groups. Images can be assigned to dashboards and folders to simplify navigation.

You can easily build your own, customized dashboard using the different tile types, such as line charts, scatter charts, histograms, bar charts, tables, gauges or pie charts, value displays and heat maps. Bullet graphs visualize several statistical parameters and the last registered values for a particular value series.

The data can be shown directly or in aggregated form, depending on the selected tile type. All tiles can be quickly and easily resized and individually placed using drag & drop.

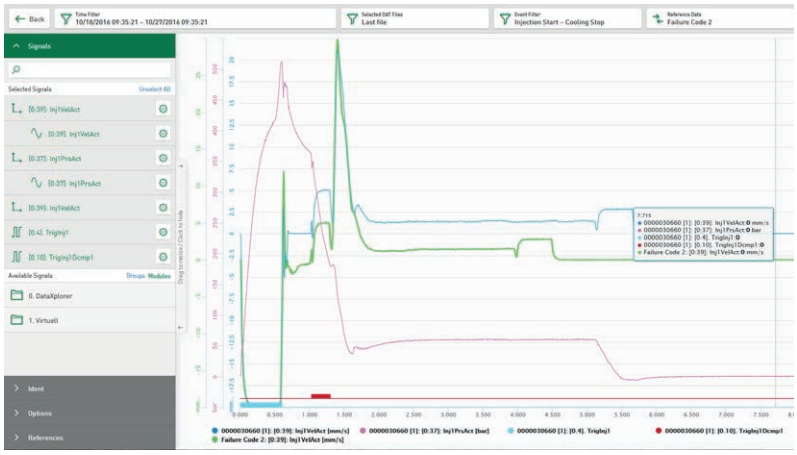
Share and document analysis results

You can share dashboards with current filters representing your analysis results as link with colleagues. The current filters, views and selected table entries are retained. In this way you can share your results and also document them.

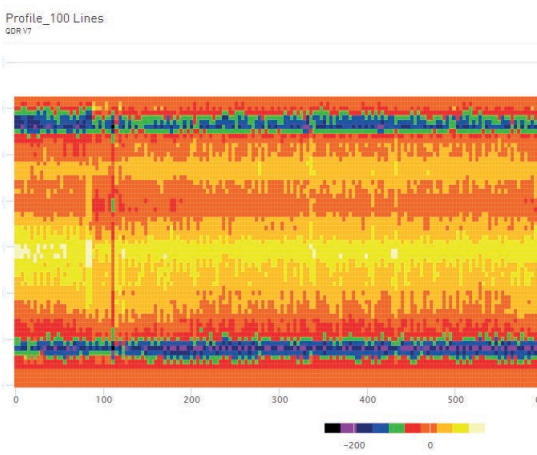
Display and compare measurement files directly

Time and length-based signals from a measurement file in DAT format can be visualized in a line chart. Data from up to 50 measurement files can be displayed and analyzed together in this way.

Several measurement files, for example identical process steps, can be stacked in line charts and compared. The signal trend for the newest file can be visually highlighted. The files can also be simply appended to each other or



Current signal trends can be compared with reference signals (golden curve).



Flatness profile in the heat map view

even displayed as an envelope view. This enables a detailed in-depth analysis based on the high-resolution measurement data.

Comparison with reference signals

Signals from reference files can be displayed for comparison. You can choose the most recently created measurement files or select specific files as reference signals; for example, based on a product ID or a time stamp. Alternatively, the reference file can be imported from a different data source.

Visualize vector signals

Vector signals can be visualized in a special heat map view. This allows signals from flatness or profile measurements to be clearly displayed. Both time and length-based data are supported in this view.

Compare signals and calculate characteristic values with virtual functions

Virtual functions can be used to quickly and easily compare signals or trends and calculate statistical and other values. You can use different sources for comparisons and calculations: Data from database tables, signals from DAT files as well as time-based signals or event-based data from ibaHD-Server.

The result of a virtual function can be visualized as a virtual signal in diagrams. Virtual signals can also be used for further calculations.

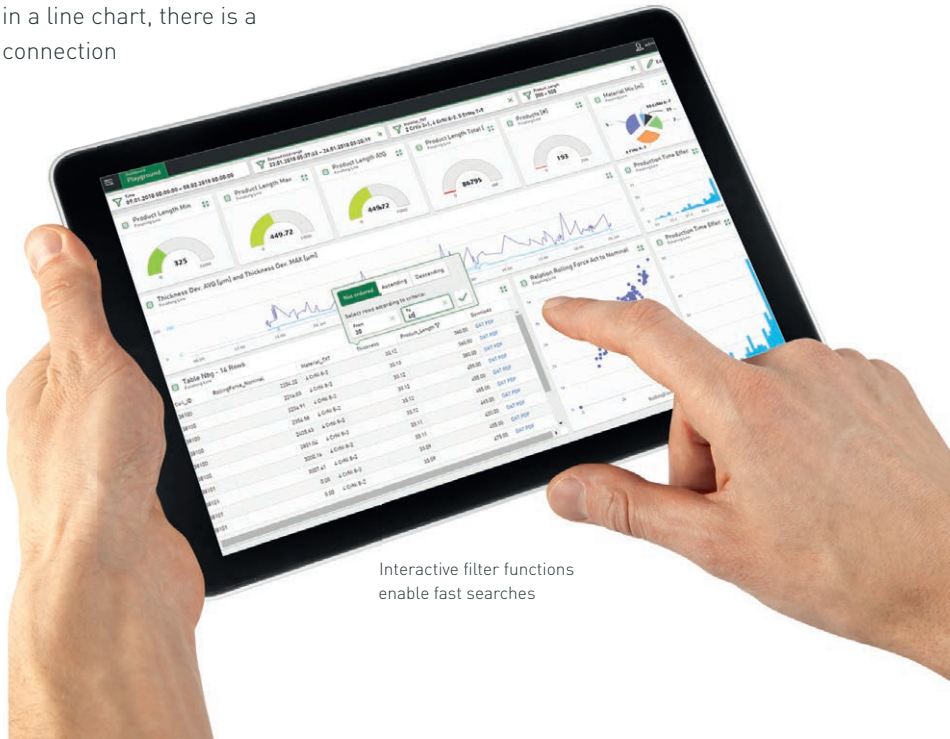
In this way, for example, limit value violations can be displayed and easily detected.

Display of time periods from ibaHD-Server

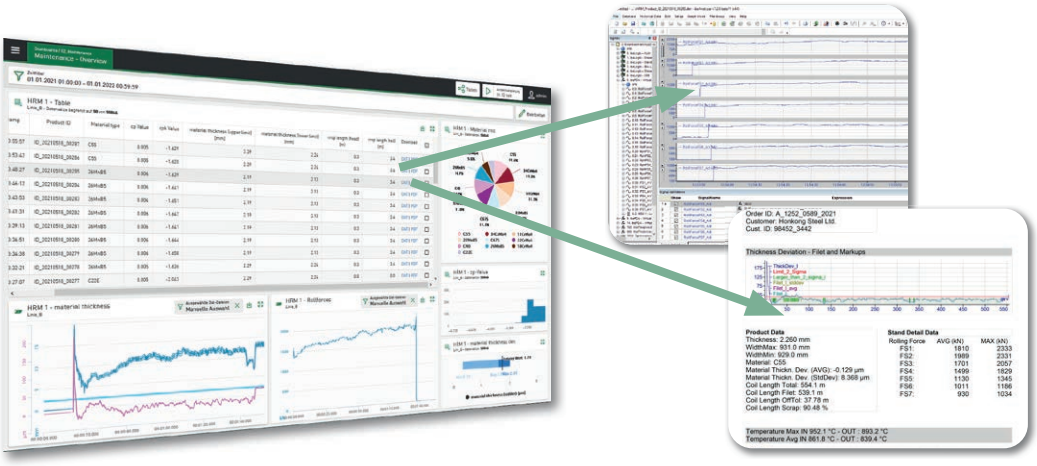
The information saved for the time periods can be displayed in any tile type, such as histograms, pie charts and line charts. If the time periods are displayed in a table and the measured values from ibaHD-Server are also displayed in a line chart, there is a connection between the table and the measured value display. If you select one or more rows in the table, only the corresponding measurement data is visualized in the line chart.

Custom color schemes

The color schemes of the displayed value trends and signals can be customized. It is possible to globally assign a default color to a specific signal or value. For example, the temperature value in the line chart or histogram is always displayed in red and can thus be identified more easily. The trend and signal colors are preset via a color scheme. The color scheme can be changed very easily if desired.



Interactive filter functions enable fast searches



With one click, you can open the respective measurement files containing the raw values in ibaAnalyzer or the corresponding product report

Quick and easy selection of time ranges

ibaDaVIS shows characteristic values or measurement values from the same defined time range on all tiles. The time range can be set directly with the date and time or relatively, for example for the last 7 days. A number of preset time ranges, such as "last month" or "this week", facilitate the selection. In addition, multiple work shifts can also be defined and used as an additional filter. All tiles are updated directly after the selection and display values from the desired time range.

Interactive filter and search functions

The tiles also serve as filter objects. By clicking on a segment in the pie chart, the filter is set to the selected group. For example, a certain material group can be selected this way. The filter has an immediate effect on all tiles of the dashboard. This makes it easy to perform technological analyses interactively, for example to analyze and compare the quality values of specific material classes.

By zooming in a line chart, you can very quickly narrow down the time range for all parameters shown on the dashboard.

To examine the parameters of a specific product, for example, simply enter the product number into the table. The table immediately shows the product-related characteristic values and offers the iba measurement file or the previously created product report for download.

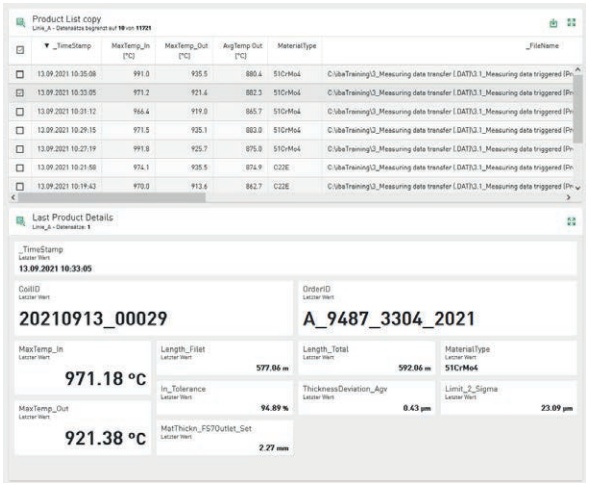
Line charts of measurement files also allow you to filter for specific process details based on defined events. For a better comparison of the found signals, they can be synchronized to the same start event.

Table and value display visualization

In tables containing many values, often not all important columns can be shown in the visible area. Instead of interactively moving the non-visible columns into the display area, values can also be shown using the value display tile type. The values that are displayed row-based in the table are visualized on a separate tile in the value display. The position and size of the value display cells are configurable so that important values can also be clearly highlighted.

Values displayed in the value display are based on the last entry in the respective data source in the default setting. Instead of displaying the last value of a filtered value series, you can also use formulas in the value display to display statistical parameters such as maximum value, minimum value, number or average values of the value series.

A direct connection between the value display and the table, which use the same data source, allows to directly read more details about a specific data set. If you select a row in the table, the value display will show the



The selected table values are highlighted in the value display

values that also belong to the selected data set from the table.

There is also a connection between the table and the line chart. If the user marks an entry in the table, a marker is set in the line chart, which highlights the entry in time.

If the line chart shows signals from DAT files, the function goes even further. The line marked in the table is used as a link to the measurement file. The measurement signals of the marked DAT file are displayed in the line chart and the user can read the signal details for the marked product or process step directly in the dashboard.

Updating values

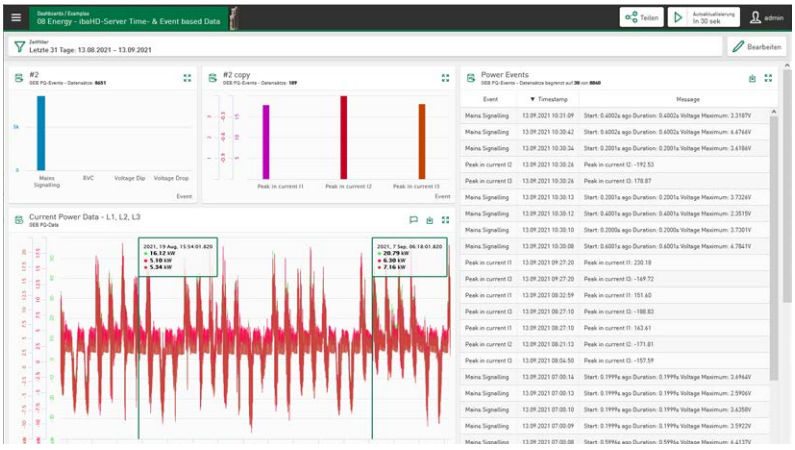
It is also possible to add comments to data sets or even change values in a table. You can define which columns in the database can be updated and which users have the permission to do so. If values are updated, the system also logs who made the changes and when. This ensures that any comments added or updates applied can be tracked with total transparency.

Visualize distribution of characteristic values

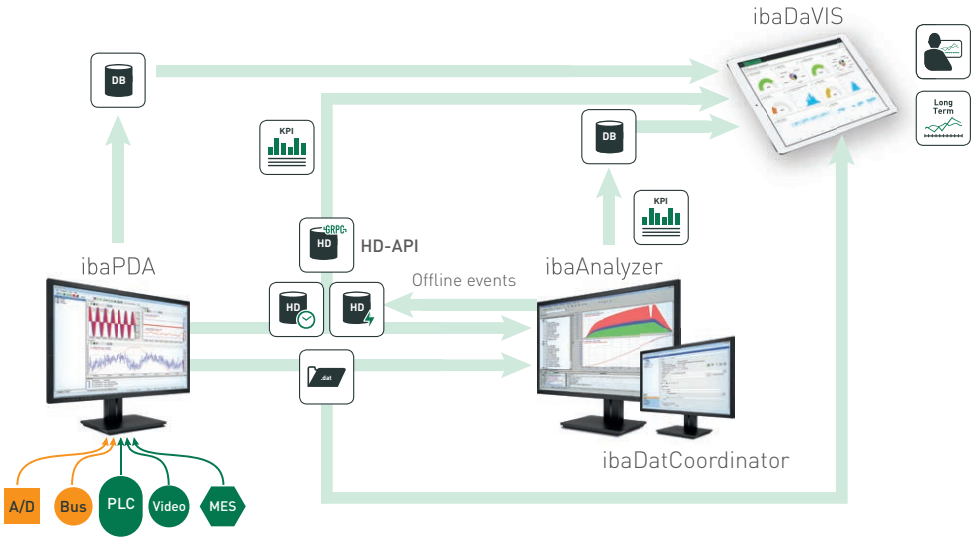
In the bar chart, KPIs can be sorted by time or grouped by a selected category. The data can be aggregated or sorted into bars that are displayed side by side or as stacked bars. In this way, the distribution of properties in certain categories can be visualized.

Drill down to the raw data

Access to the raw values is essential in order to examine and understand the causes for process deviations, process changes, outliers or potential for optimization in detail. To do so, the iba data files can be downloaded from the server and opened and evaluated with ibaAnalyzer, including the referenced analysis rule. This ensures that all relevant information for the product and process analysis is always seamlessly available at a glance.



Display data from ibaHD-Server; e.g., for energy monitoring



Measurement data from databases and cloud

ibaDaVIS currently provides access to iba measurement data from ibaPDA and ibaHD-Server as well as databases. A database that is managed via a cloud service can also be used to access data and information, such as a locally hosted database. With ibaPDA, it is also possible to stream measurement data directly into a database via database interfaces and to query them with ibaDaVIS.

Access to HD data

Time-based signals and events can be queried, visualized, filtered and analyzed directly from ibaHD-Server. The displayed time range can cover microseconds or even years. Depending on the sampling time, even large amounts of data are visualized almost without delay.

Data from ibaHD-Server or database tables can be visualized on the same dashboard over the same time range.

Two interactive markers can be displayed in trend and heat map displays showing values from ibaHD-Server. The markers can be moved freely in the display. The time range between the markers can be transferred directly into ibaAnalyzer for detailed analysis.

An additional license ibaHD-Server-API-Read is required on the ibaHD-Server side to access ibaHD data.

Integration in the iba system

Based on the iba measurement data, characteristic values can be determined with ibaAnalyzer according to the respective requirements. With ibaAnalyzer-DB, additional key information, such as production date, batch numbers or product numbers, can be extracted into your database.

ibaDaVIS searches on the basis of these fields and determines the characteristic value or measured value trends. Information of the iba database model is used to access the reports or the original iba measurement file.

Calculated process characteristics or product and batch information can also be posted as an offline event in an event-based HD store. The postprocessing is realized with the software ibaDatCoordinator.

Language variety for international use

The display language of the menus and dashboards in ibaDaVIS can be switched in the browser or directly in the user profile. The languages German, English, French, Italian, Portuguese, Spanish, Russian, Chinese and Japanese are available.

Licenses

ibaDaVIS is protected software. The licenses are differentiated according to the number of configurable tiles. The base version of ibaDaVIS contains 12 tiles. The number can be expanded with upgrade licenses, each with 12 tiles. The number of dashboards and registered users of ibaDaVIS are freely selectable and not subject to licensing limitations.

Requirements

- Database system to include the index table or general table with time-based column (supported databases: MS SQL Server, MySQL, Maria DB, SQLite, ORACLE and PostgreSQL)
- Access to ibaHD-Server data via additional license ibaHD-Server-API-Read
- Central Windows PC (or VM) running ibaDaVIS service and providing access to the database system or cloud service
- Internet browser on the client terminal device

Transparent visualization for more process stability

At a plastics manufacturer, production with several injection moulding machines is to be continuously monitored and can be seamlessly traced. ibaDaVIS enables live monitoring and evaluation of all quality-relevant data over the entire process chain.

- Continuous recording of process data in high resolution
- Intuitive evaluation for special error analysis
- Process optimization through continuous data acquisition

The project

Production with several injection molding machines at a plastics manufacturer is to be continuously monitored from a central location and be fully traceable. In addition, the declared goal is to identify deviations and errors, to quickly identify the causes, and monitor effects of parameter changes at the machine.

The technology and products

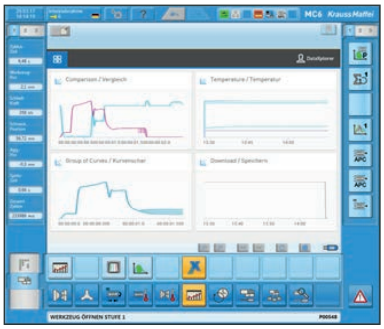
Several hundred signals are acquired synchronously and in high resolution at each injection molding machine and recorded in ibaPDA, such as the temperature, injection pressure, cavity pressure, etc. The signal curves are visualized with ibaDaVIS directly in the machine control and always offer a current insight into any machine.

ibaAnalyzer also uses user-defined analysis rules to calculate the relevant key figures for the process. The measurement data and characteristic values are then extracted into a database with ibaAnalyzer-DB.

Afterwards, all quality-related process data can be accessed for each individual injection cycle. The data can be intuitively and manually evaluated for targeted troubleshooting.

Automatic reporting

In addition, the data is automatically summarized in a report with ibaAnalyzer-Reportgenerator and displayed clearly. Using the QR code on any component, the component-specific report can be accessed at any time. This allows complete tracking of all product and process data per component



Visualization of the signals at the display

- online by smartphone, tablet or PC, no matter where you are.

Production-specialists thus have a data-based basis for making decisions in order to optimize production and increase process reliability.

Order information

Order no.	Name	Description
34.040010	ibaDaVIS	Data Visualization and Information Service (12 tiles)
34.040100	ibaDaVIS-upgrade by 12 Tiles	Upgrade by 12 tiles

ibaPDA data store DB/Cloud

30.671020/1/2	ibaPDA-Data-Store-Oracle-64/256/1024	Data streaming into Oracle DB/Cloud, 64/256/1024 signals
30.671030/1/2	ibaPDA-Data-Store-SQL-Server-64/256/1024	Data streaming into SQL Server DB/Cloud, 64/256/1024 signals
30.671040/1/2	ibaPDA-Data-Store-PostgreSQL-64/256/1024	Data streaming into PostgreSQL DB/Cloud, 64/256/1024 signals
30.671050/1/2	ibaPDA-Data-Store-MySQL-64/256/1024	Data streaming into MySQL DB/Cloud, 64/256/1024 signals

ibaHD-Server

30.800001	ibaHD-Server-API-Read	gRPC-API interface to query stored signals and events from existing HD stores

ibaDatCoordinator

34.010510	ibaDatCoordinator-DB	ibaDatCoordinator Add-On Task to publish time series and calculated values automatically into different database systems

iba AG Headquarters Germany

Office address
Koenigswarterstr. 44
D-90762 Fuerth

Mailing address
P.O. box 1828
D-90708 Fuerth

Tel.: +49 (911) 97282-0
www.iba-ag.com
info@iba-ag.com

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