

DATA TRANSFER TO THE Q-DAS SYSTEM – EASY, ISN'T IT?

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One of the most frequent tasks we face in projects is to provide recorded measurement information to the Q-DAS software. However, there are different ways to transfer data – sometimes a transfer takes place immediately and sometimes it is very difficult and takes a lot of time. This article offers the most important facts regarding data transfers from different systems.

First, we assume that the term “data transfer” implies the application of recorded information and measured values referring to a test plan. This assumption leads to the question about the contents a data set has to include for Q-DAS. Since our target is statistical process analysis, we need some specific information. We at least require

- product and part information (number, description ...)
- characteristic information (description, tolerances ...)
- measured value information (measured value, time ...).

These pieces of information are enough to make a statistical evaluation. You may still store further information on the product, characteristic or measured value level, such as order, batch, customer, operator, etc. They might become quite interesting later on when you want to filter data.

Since we assume that the Q-DAS software does not record the data in this case, the respective third-party system already had to record the required information so that the data are physically available. You either transfer these data by providing the corresponding files or you save them directly to a database. There is no other alternative.

FIRST CASE: FILE CONTAINING ALL REQUIRED INFORMATION

A typical example is the application of a coordinate measuring machine. The measuring program has already defined the measurement procedure, i.e. an operator specified the part and characteristics to be measured and added the respective measured values after the measurement. All this information is exported after the end of the measurement, saved to a file and stored in a folder.

So far, so good. You would be done if there was only one uniform data format worldwide. However, this is not the case. Although the contents are the same, each manufacturer writes the information in a different way to a file. Even when they select a CSV format (comma separated values) for the output, the format does not define the positions of the contents.

Example

A CSV file has to contain the following information:

Part number: **12**

Characteristic number: **3**

Characteristic description: **diameter**

Measured value: **13,40**

Example of CSV file 1:

12;3;diameter;13,40

Example of CSV file 2:

13,40;diameter;3;12

The problem is obvious. In general, software is not able to interpret information on its own. It does not know whether 13,40 represents a measured value or a specification limit or whether it refers to a time and actually means 1.40 pm.

You kind of “teach“ the software what it has to know. The result is called converter, i.e. someone sits in front of a computer and defines that the characters from the first position to the first semicolon designate the part number, then the characteristic number and so on. This is the only way how the software is able to interpret information correctly. It is the same way with any other data format.



The Q-DAS format is an open data format that every system is theoretically able to write. You can create it by using a text editor. each piece of information is assigned to so-called K-fields and you use these K-fields to write the information. A Q-DAS file having the same contents as the CSV files above looks as follows.

K0100 1

(for reasons of control; this K-field tells the software that the file contains a characteristic)

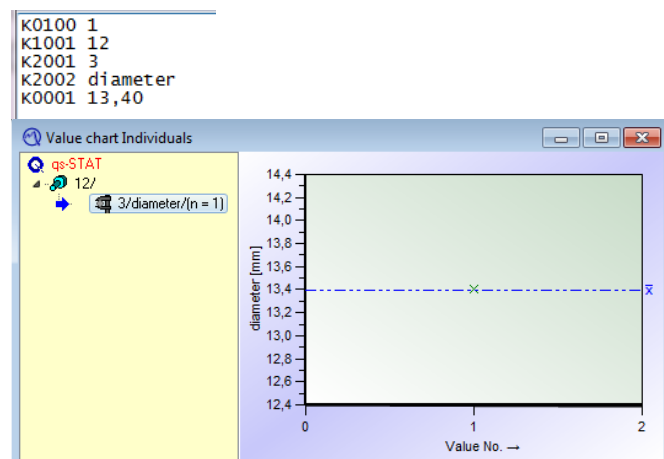
K1001 **12**

K2001 **3**

K2002 **diameter**

K0001 **13,40**

This is the structure of the file when opened in qs-STAT.



These K-fields thus define the structure and you may add further information, e.g. tolerances etc. by writing the respective K-field. You thus solve the problem of the CSV file since the information is linked with corresponding K-fields and you do not have to worry about the position within the file. Each K-field is clearly assigned to a specific content.

Most measuring machines already output files in the Q-DAS format. In order to use it, manufacturers often have to release a “Q-DAS interface” providing this format. Compared to a converter, this is the better solution in case the costs incurred are reasonable. The structure a converter applies is always fixed. As soon as you add some new content, you have to adapt the converter. However, if you use a Q-DAS interface providing the Q-DAS data format and you add a new K-field to a file, the system is able to interpret this new information correctly at once since the Q-DAS software relates each new field correctly and clearly to the right information.

You may either visualise and evaluate the generated data immediately in the Q-DAS software O-QIS or save them directly to the Q-DAS database. qs-STAT is able to access this database for further analysis.

In this case, you just need a Q-DAS file. There is a list of manufacturers supporting the Q-DAS data format with all the aspects mentioned above ([certificates issued with individual scope of fields](#)). From a technical point of view, this solution does not cause any problems and the Q-DAS file is generated based on the respective specifications. But what about the contents?

The example shown above technically represents a Q-DAS file. However, what if you have to filter a certain machine number from the data for analysis purposes or for an order? This information also has to be added by applying K-fields, e.g.


```
K0100 1
K1001 12
K2001 3
K2002 diameter
K0001 13,40
K0010 3 [machine number 3]
K0053 order for company Smith
```

First, the measuring program thus has to request this information and the export program must write these two new fields to the file. This is the very reason why one of the lists of certified companies is called “certificates with individual scope of fields”. How many K-fields a manufacturer supports – 5, 7, 200 or more – is up to him. This might, however, easily cause complications. You purchase a Q-DAS interface and think you are done. Now you want to record the order number but it does not work. So you ask Q-DAS for help and the answer you get is: “Oh, unfortunately, your interface does not support this K-field”. This problem offended not only few users but many and in the end, Q-DAS founded the AQDEF (advanced quality data exchange format) working group. The basic idea behind this working group is to select a subset of all K-fields everyone is likely to be okay with and the respective provider of the interface has to be able to write these. This is how to ensure that you just “tick” the K-field of the order to simply write this information to the file. However, you have to purchase a machine being AQDEF certified. A list of all AQDEF certified companies is available [here](#).

Not only measuring machines apply this procedure to generate files, even any kind of writing system is able to use it, e.g. PLC machine controls, optical measurement systems, etc.

SECOND CASE: THIRD-PARTY DATABASES

Q-DAS frequently has to face databases for various tasks and of different providers in projects. A realistic statement of a Q-DAS customer might be as follows:

 We apply a MES (manufacturing execution system) saving our data to a SQL database. So we are able to load the data directly from this database and open them in qs-STAT, aren't we?

Even though this question sounds quite simple, it includes some different issues and thus requires several answers. Let's have a look at each issue.

There is obviously a Microsoft SQL database system available.

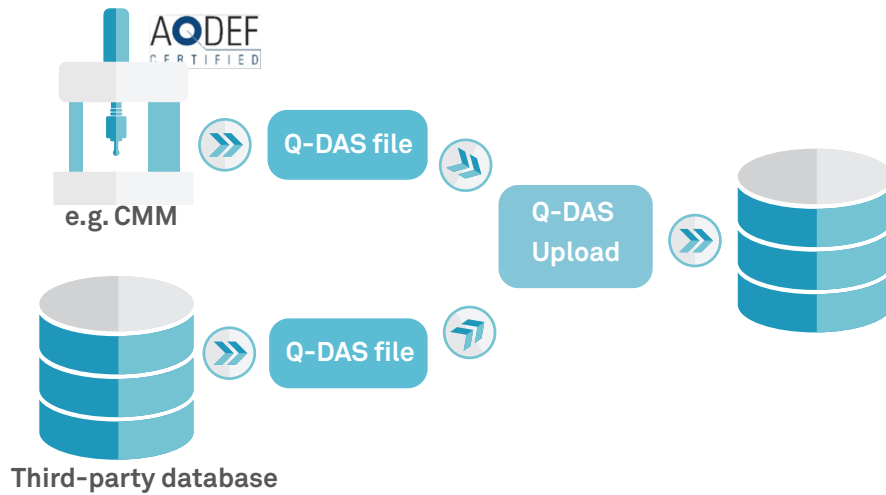
- This is good. Q-DAS software is also able to apply MS-SQL databases; however, the structure of a MS-SQL database differs depending on its application or software provider. Why? The software only accesses names of tables in the database. Provider A calls this table “part number” whereas provider B stores the same contents in a table called “article code”. The software searches for the table name it expects but if this name is not available, the software will not work.

A MES might not write all the information required for an evaluation. Maybe it records the downtime of machines but not the control limits of quality control charts.

- You have to define which information you need and whether it is available.

The final answer is that, yes, you can transfer data. Q-DAS can even use a SQL database but not the already existing one. We need a second one providing all the data relevant to the Q-DAS software in the correct structure. You also have to define whether you want to transfer all data or only some of them to the Q-DAS database and when you want to transfer new values.

From a technical perspective, the transfer is frequently based on the Q-DAS data format because it is easy to write and can be transferred automatically from our programs to a database. The Q-DAS Upload tool is free of charge. You can thus connect our software to any third-party system; the applied structure or database system does not matter.



Q-DAS supports customers in specifying K-fields and implementing the data format technically.

Interested in this topic?

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