



## □ Test Plan Types – Food for Thought

The [Q-DAS CAMERA Concept](#) implements performance measurement systems efficiently for quality assessment in industrial production. It provides tools and procedures designing a well-structured and dynamic performance measurement system. Users can perform process analyses quickly in all phases of quality data flow and task-related software packages offer practical solutions.

The opportunity of a task-specific evaluation of data has already been described in a different [PIQ article](#). The article you are currently reading, however, focuses on the evaluations the CAMERA Concept is able to perform and illustrates its versatility. The supply chain provides the required resources or material and vendor components, and is also responsible for organising delivery to the market. Customer satisfaction evaluation, customer support in new projects and market observation are some of the main tasks of this sector.

### ● Quick access to the benefits of Q-DAS software products

Before you are able to use the products of the Q-DAS CAMERA Concept, you first have to record data. The major advantage of Q-DAS solutions is that you are able to record and process data from different sources quickly. You use the ASCII data format to transfer results from various measuring machines or other “writing systems“ (e.g. test equipment) and to connect numerous kinds of portable measuring equipment to Q-DAS software via interface.

However, this quick access to the Q-DAS CAMERA Concept might lead to an unstructured recording and storage of measured values making it hard to evaluate and apply the data. Some considerations and definitions, however, help to establish clear rules of how to handle the flow of data and information in terms of statistical process control.

Looking at the single phases of the **CAMERA Concept** we realize that the on-line control loop of the process and the data flow is included in the first two steps - “**collecting**“ and “**assessing**“. The “**managing**“ phase offers a well-structured storage of data with all the options a database provides and based on a defined data format. If required, a user evaluates data in the “**evaluating**“ phase whereas the next step - “**reporting**“ – focuses on an automated evaluation and provision of data. The “**archiving**“ phase compresses the data and gives an overview of huge data volumes and / or periods. These data can then be archived.

You will benefit from a logical and clear data structure in all these phases.

### ● Data model

The information in the Q-DAS world are transferred and stored based on K-fields or database structures. Basically, there is a (simplified) data model consisting of three levels, namely

- part (K1000 fields)
- characteristic (K2000 fields)
- values (K0000 fields).

These terms seem to explain themselves at first glance. On closer examination, however, you may apply this data model in a creative way. Each of these three levels includes a multitude of K-fields. A K-field always carries information, e.g. K1001 provides you with the part number according to the

ASCII transfer format manual but customers sometimes use it e.g. as “drawing number”, “material number” or “part type number” depending on the respective situation. Another field (K0014) is referred to as “part ident (number)” and seems to be similar to the field described before.

The ASCII transfer format manual does not specify an absolute meaning; it does not even intend to do so.

Let’s have a look at the “bundle of K-fields“ offering information about the “machine”.

The **part level** (K1000 fields) includes e.g. K1081 “machine number text“, K1082 “machine description“ and K1083 “machine number“; the **characteristic level** (K2000 fields) specifies K2301 „machine number text“ and K2302 “machine description“. Even the **measured value level** (K0000 fields) provides you with K0010 “machine“.

## ● Which field is the one I need?

“It depends... but it is important!“

Allocating the right information to the K-fields is crucial for an efficient application of Q-DAS software and the illustration of process control. In order to provide you with sufficient food for thought, we offer you a list of questions our customers have to answer prior to the implementation of our software. Many Q-DAS customers will know these questions from our “K-field” or “**CAMERA Concept**” workshops.

Here is a (brief) list of questions we like to use during our workshops at the customer’s:

1. What is your process?
  - a) What is characteristic about your process?
  - b) Which factors affect it?
2. How do you qualify your process?
  - a) Inspection planning (control plan)?
  - b) Measurement process?
  - c) Qualification of machines?
  - d) Process capabilities?
3. How do you want to control your process?
  - a) Do you “only“ want to record data?
  - b) Which part of your production does the on-line control loop represent?
  - c) Which part of your production does the off-line control loop include?
4. Which structures do exist?
  - a) Are there any product families, generations, etc.?
  - b) What are the hierarchies you apply in the manufacturing process?
  - c) Are there any specific operations available in your manufacturing process?
5. How do you organise your change management?
  - a) Does each change in a drawing also affect the test plan?
  - b) Do you modify test plans without changing the corresponding drawing?

6. Which sources of data do you use (measuring machines, procella, other)?
  - a) Are these sources AQDEF compliant?
7. Do you apply all phases of the CAMERA Concept?
  - a) If not, do you intend to extend the functional range of Q-DAS products later and would you like us to consider this fact right from the start?

## ● Test plan versions

The answers to some of these questions might be quite similar and you can only answer many of these questions in your specific context. Here is an example based on the K-fields “part number” and “machine” we have already mentioned before. It shows how these K-fields influence the respective test plan version.

Initial situation:

### **Part = test plan**

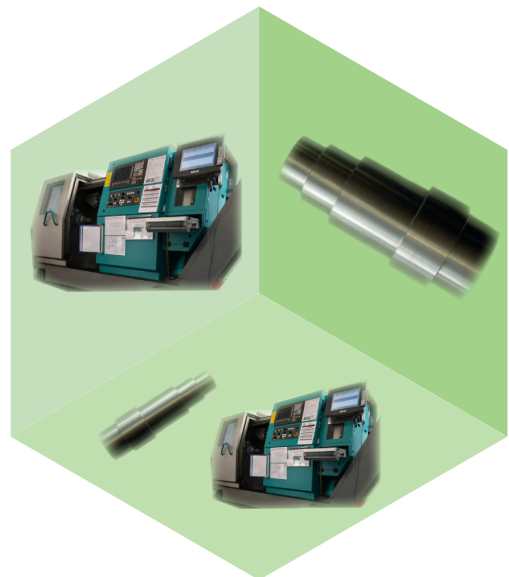
Keeping the part number at the header data level (K1000 fields) is a frequently used approach. You thus create a test plan for **each part type / material**. In some cases, this approach, however, leads to a very high number of test plans requiring considerable modification effort.

### **Part + machine = test plan**

By considering that the machine has an impact on the process (which is the case in many manufacturing procedures), the number of **test plans per machine** multiplies (at least when several machines are able to produce the same part types). This version, however, makes the process more “tangible“ and thus controllable.

### **Machine = process = test plan**

Having a closer look at the manufacturing **process**, you might come to realise that the influence of the produced part (part type number / drawing number, etc.) is not decisive for process control. When e.g. an operation processes a multitude of similar parts whose tolerances for the measured characteristic are the same, you may record the corresponding values in a single test plan. You can thus reduce the number of test plans by combining them.



There are even more types of test plans than the three we have shown above. A fact that all of them have in common is that you will not lose (waste) any recorded information. This is where you benefit from the variability of the ASCII transfer format and its multitude of K-fields.

The document mentioned at the beginning of this article focuses on different options of how to evaluate information by combining or allocating data sets. This article is merely about defining distinct test plans particularly aiming at data recording and process control.



## ● Conclusion

You may implement your Q-DAS system quite quickly; however, a clear structure of the data flow and a forward-looking planning pays off. We are pleased to support you in planning your investment. Please contact us to find out about our CAMERA Concept workshops!



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