INTERFACES

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You ask. We answer.

Clearly defined interfaces are essential for a smooth transfer of data. Looking back on more than 27 years of company history, Q-DAS has assigned a high priority to the simple connection of measuring instruments and the data transfer with other systems almost right from the start. Q-DAS experts answer important questions about interfaces in the following article.

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Why are the connection of measuring instruments and the data transfer of crucial importance in recording measured values?

You have to face various systems recording or processing quality data in industrial production. It is necessary to collect all local data and information in a central data pool in order to have a comprehensive overview of process and product quality. You can, however, only establish central data storage in a reasonable way by applying flexible interface standards. These standards are able to connect a multitude of data sources reliably and easily.

Which other objectives besides flexibility and reliability do data interfaces pursue?

A main objective is data quality with regard to its structure and content. Data quality ensures that all relevant information for significant evaluations is available, i.e. the quality of data has a direct impact on the decision quality with respect to process and sequence control. If you cannot gain any beneficial information from the data, you will not be able to answer key questions e.g. about process optimization or the reduction of non-conformity costs.

How can we reach these objectives?

In the end, we can only reach this objective by applying standards. Q-DAS came to realize this fact quite early and thus developed and offered a file format for the data exchange of quality information in industrial production. This Q-DAS ASCII transfer format quickly became accepted in the automotive industry, especially because of its simplicity and clear structure. Many suppliers of measuring systems demand the application of this format today. The AQDEF data format (advanced quality exchange format) specified by an industrial work group is also based on this format.
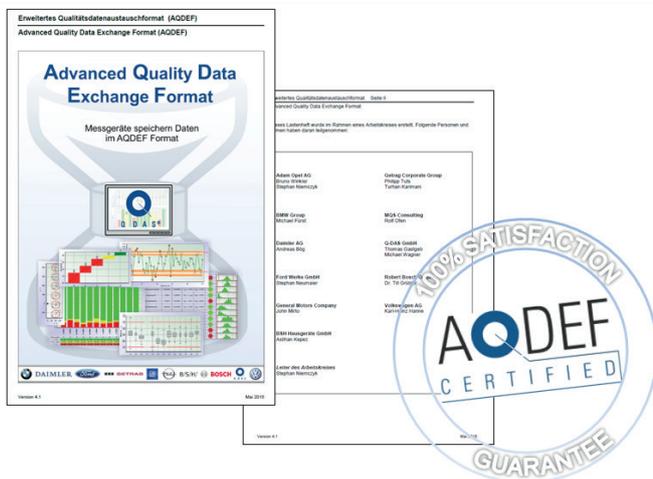
What are the main characteristics of AQDEF making it some kind of an industry standard?

AQDEF combines the technical and content-related aspects of exchanging and transferring quality data. The correct notation of the format is a basic requirement in order to collect data from various data sources in a data pool and to evaluate them all together. However, the correct notation does not ensure that all systems provide all available and required data and deliver the contents leading to the desired gain of knowledge. It is not enough to record

the measurement result since additional data, such as machine, cavity or serial number, are also important to evaluate data based on such criteria. Only these evaluations create added value and the full potential of statistical evaluations contributes to an increase in efficiency. AQDEF accommodates all these aspects by specifying data fields that must be supported or that can be activated if required. The work group thus succeeded in defining a cross-industry interface standard covering most applications. Most manufacturers of measuring instruments support this standard.

Which other advantages does AQDEF have, especially for Q-DAS customers?

Provided that AQDEF is supported, we may integrate systems directly into the process data network. Q-DAS QM tools can immediately process the data available in this network. We can generate data even before starting the production, e.g. for measurement process capability analysis in solara. MP and machine acceptance in qs-STAT. Furthermore, a certification of the interface provides safety; Q-DAS issues this certificate on request. Being a member of the AQDEF work group, we are involved in the development of the standard. The requirements of our customers provide the basis of this development.

What are the alternatives when AQDEF cannot be supported?

There are always situations in which AQDEF cannot be supported. There might be old or in-house developed systems whose adjustments require a lot of technical effort or that cannot be adjusted. Sometimes the costs for an adjustment or the acquisition of an AQDEF interface are just too high. Since any system is generally able to provide recorded data in an Excel table or in a text format, it is usually possible to apply a converter in order to transfer the data to the Q-DAS world. In addition to the translation of the foreign format into the Q-DAS data format during the conversion, you may supplement missing information with default parameters in order to close the content gap. The potential of statistical evaluations will not or only slightly be affected. By integrating the converter configuration into the Q-DAS Upload, you may transfer foreign data automatically to the Q-DAS database without any interaction of the user. Even though a converter is a special development that solves interface problems quite well, this solution is unfortunately very inflexible. In case the writing system – for whatever reason – changes the structure of the output format, the converter needs to be adapted accordingly.

Is a direct data interface possible?

Measuring instruments that do not apply their own measurement software, e.g. portable measuring equipment such as calliper, micrometre or hardware boxes, can be connected to the computer by cable or by radio. They transfer the measured values directly to the recording software. Unfortunately, there is not any standard for the transfer via serial or USB interface. You have to create an individual configuration of the interface parameters for single measuring instruments or equipment groups. The interface packages of procella and O-QIS, however, already support more than 180 measuring instruments and multiplexers making it very easy to transfer data. The boxes have the advantage of connecting several measuring instruments; in addition, modular concepts offer the option to combine different connection types. More and more manufacturers choose Ethernet systems. In case of measuring instruments or systems that are not supported yet, we check the implementation of an interface.

What if the Q-DAS solution is part of a superordinate system or a system landscape?

We always consider the implementation of a Q-DAS solution in the context of the customer's available IT infrastructure. As a matter of fact, further systems, such as ERP, CAQ and MES, can play an important role in processing quality information. Each of these systems, even the Q-DAS solution,

has its own specific field of application and helps to get a comprehensive overview of product and process quality. This is the reason why the interfaces for the exchange of data are also of utmost importance. The portfolio reaches from highly integrated solutions to a "simple" data transfer based on the already mentioned AQDEF file format.

An example is the interaction between Q-DAS products and SAP. In this case, we apply the SAP-specific interfaces SAP-QM STI or IDI. You may transfer data packages for statistical evaluation to qs-STAT or download inspection lots for data recording in procella and report respective usage decisions back. This is a typical scenario when SAP is the leading system with respect to data management and inspection planning. Even other situations based on both SAP interfaces are possible to offer users the benefits of both systems as a complete solution.

The interaction between MES solutions and Q-DAS products also offers an integrated and beneficial solution, last but not least due to the consolidation of information collected from manufacturing processes and production facilities offering different points of view on the data (e.g. display and evaluation of quality information on the one hand and information about status and workload on the other hand). The design of the interface in the end depends on the role both systems shall occupy. As an example, Q-DAS products record and evaluate quality data after the recording is triggered by the status information provided by the MES whereas statistical alarms trigger further actions in the MES. Similar to the presented SAP solution, the MES can also act as a leading system and transfers data packages for statistical evaluation to qs-STAT.

In general, you may always trace back the interfaces between Q-DAS and third-party systems to AQDEF structures, either to the ASCII or the XML version. Consequently, they always comply with a standard. Such integration into a system landscape is always defined together with the customer in order to find the best suitable solution.