







## ... IN STATISTICAL PROCESS CONTROL

SPC (statistical process control) controls processes to detect deviations from specifications and significant changes on the operator level. Suitable measurement processes measure specified characteristics. Individual value charts, parts protocols or quality control charts show the results. The specifications depend on the respective task, e.g. the process does not exceed specified control limits or it does not exceed x% of the tolerance. In case of deviations, the operator is informed and can take corrective action.










For an easy recording of measurement results and additional data, the operator needs an input mask focusing on the current task. It thus includes all required data fields that the software completes automatically (e.g. by using barcodes or a transfer of measurement process values in real time). Catalogues provide operators with specified contents for these data fields.




<b>Error 1</b>		The provided quality control chart is not able to monitor the process or task properly or its control limits are too narrow and it includes stability criteria that are not suitable.
<b>Effect</b>		The process control becomes too "sensitive" (too many needless notifications). Operators permanently receive false error messages and cannot take appropriate corrective action. They are not able to focus on their work, become frustrated and stop using this tool.  The process control might also become too "vague". Operators overlook significant deviations.
<b>Solution</b>		Select the SPC quality control chart only after a comprehensive process analysis (run-off / similar process) in terms of ISO 22514-2:2015. qs-STAT specifies the suitable time-dependent distribution model automatically. Based on this model, the software provides users with the associated quality control chart including suitable control limits and stability criteria.




<b>Error 2</b>		You do not run an appropriate plausibility check during the transfer of measured values.
<b>Effect</b>		The system frequently records measured values that do not describe the process. Typical example: You trigger the recording of measured values even though the measuring equipment does not have any part available for measurement. These values might cause needless corrective actions and the system stores erroneous data in the database.
<b>Solution</b>		There are configuration options for the Q-DAS products procella or O-QIS that do not take over implausible measured values. The operator is informed about these values and has to release them manually to take them over.



## The seven most frequent errors in statistical process analysis

<b>Error 3</b>		A measurement procedure cannot be repeated.
<b>Effect</b>		The same part is measured several times. All data are transferred to the data pool. The subgroup now contains the wrong measured values and the calculated results are thus incorrect.
<b>Solution</b>		The option to repeat the last measurement or subgroup leads to more “honesty” in statistical process control and raises the data quality in the database.
<b>Error 4</b>		The operator has to work with an inappropriate input mask. The measurement procedure is not mapped or improperly mapped in the software. The input and evaluation masks are fraught with information. There are no mandatory input fields that must be completed.
<b>Effect</b>		The measurement and recording process are too complicated and take too long. The software shows irrelevant statistics. The operator is not able to focus on the essential and stops using this tool.
<b>Solution</b>		Q-DAS products procella or O-QIS map the ideal measurement procedure and, depending on the respective configuration, only show the information relevant to the operator. The recorded measured values are thus controlled in the background according to specifications. Alarms are only displayed in case of significant deviations. Operators focus on their main task without being afraid of missing important process changes.
<b>Error 5</b>		You do not apply any catalogues for additional data, events, measures and causes.
<b>Effect</b>		In order to be able to assess any specific process situation subsequently, you have to enter all relevant and descriptive information already while recording measured values. Otherwise, you cannot select data for the subsequent evaluation of a specific situation.
<b>Solution</b>		procella and O-QIS provide many catalogues and sub-catalogues for the description of additional data, such as events, causes and measures. Operators select the respective contents quickly and easily.

<b>Error 6</b>		Recorded data are not stored in a single central database because there is no interface to a central data pool available.
<b>Effect</b>		As long as the data is only stored locally, you cannot start a comprehensive analysis and evaluation of the actual situation. You are not able to conduct long-term analyses and build a well-structured data archive to fulfil the legal obligation to retain data.
<b>Solution</b>		Many measurement processes and SPC systems (e.g. procella or O-QIS) support the Q-DAS ASCII transfer format (or AQDEF standard). The Q-DAS CAMERA Concept collects the data from local recording stations and stores them automatically in a central data pool (Q-DAS database). You are able to evaluate various aspects of the actual situation.

<b>Error 7</b>		You did not conduct any capability analyses for the applied measurement systems.
<b>Effect</b>		The results might be regarded as incorrect leading to permanent discussions about the causes of these deviations or violated limits and whether they result from the machine or the measurement process.
<b>Solution</b>		Capability analyses have to be based on MSA or GUM / VDA 5. The Q-DAS product solara.MP supports you in performing them. Find more information in the reference manual "Measurement Process Qualification" or in corporate guidelines.

Use the Q-DAS software procella or O-QIS to avoid many of the errors listed above.