# QC – Feature Libraries S36

Specification of the KLIPPEL ANALYZER SYSTEM (QC Version 7, dB-Lab 212)
Document Revision 1.9

| FEATURES | BENEFITS |
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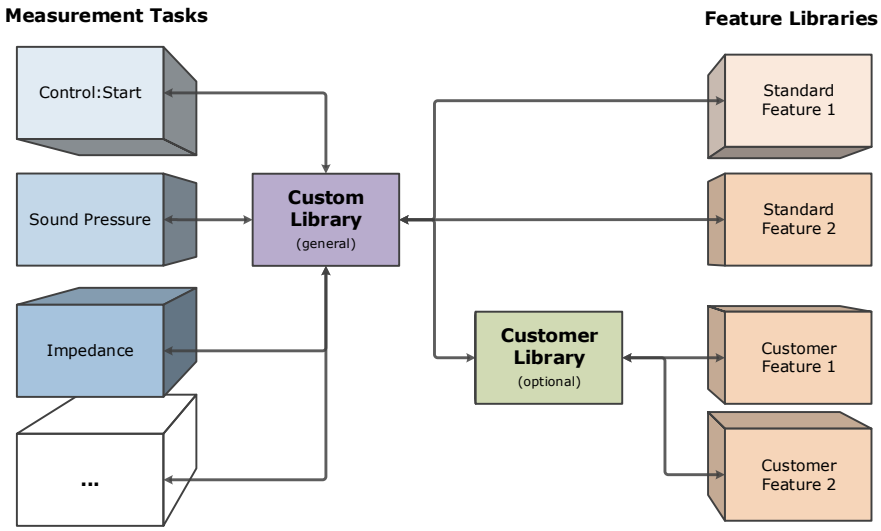
| • General infrastructure for customizing standard Klippel QC tasks<br>• Several features can be combined independently<br>• Customization code is encapsulated in dedicated feature libraries<br>• Implemented by Klippel on request | • Customized features working in conjunction with standard QC tasks<br>• Full consistency with standard software and better update compatibility<br>• Include and combine specific custom features with minimal time/cost effort |




Easily customize the QC software with prepared or customer specific features that can be combined easily. No modification of the standard software is required in order to keep full consistency with software updates. The customization infrastructure allows effective and cost-efficient modification that may be provided by Klippel on request.

**APPLICATIONS:**

- QC Standard software
- All QC modules

## CONTENTS

# 1 Overview

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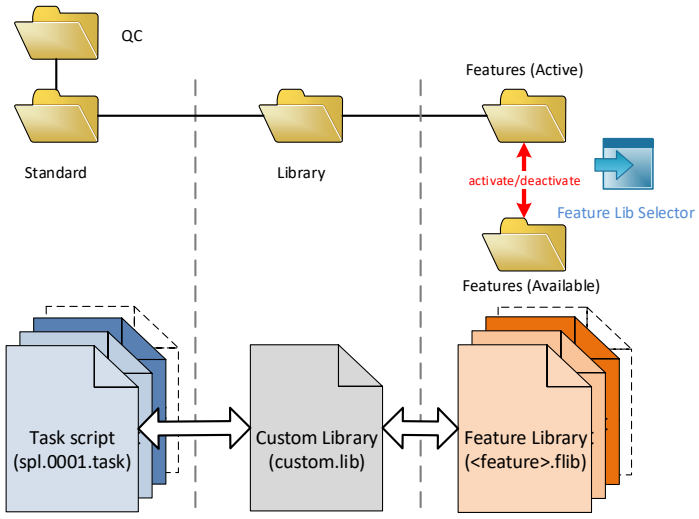
| **Summary** | The custom library infrastructure allows customizing standard measurement tasks of the QC software by linking external feature libraries. These libraries use a universal interface which allows including external code without actually modifying the source code of the standard QC modules (tasks).<br>Specific features are implemented in individual feature libraries that can be linked into standard task scripts easily. |
| **Principle** | Most measurement tasks that can be added to the test sequence provide an interface to the custom library. This library acts as a link between the standard measurement task and individual feature code that is available in external feature libraries.<br>  |
| **Activation / Installation** | Default features are automatically installed and need to be activated using the *Feature Library Selector* tool which is available during QC Installation or directly from the *QC Start* or *dB-Lab* software (Tools/Feature Library Selector). Features (default and custom) can be combined freely. Customer specific features must be installed separately before they can be activated while standard features are installed with the QC software.<br>**QC System Feature Library Selector**<br>The table below lists all available and all currently activated custom features. Click on the checkboxes to switch on/off or update features.<br>↻ Click Here to Refresh Feature List<br>Feature Name / State / Active / Available / Info<br>Batch Execution ☒ 5.0 5.0 Execute batch files after test results are available<br>Resonance from SPL ☐ 5.0 Extract resonance frequency from peak in sound pressure frequency response<br>Serial Number Validation ☐ 5.0 Check entered serial numbers for a user-defined prefix<br>Text File Data Logging ☐ 5.0 Export single value and curve results to text file<br>🕮 Click here to open feature library reference<br>For adjusting custom feature settings, every QC task provides a text-based general multi-purpose input parameter. |
| **Requirements** | • QC Standard software (from software version 3.0) or<br>• QC in R&D framework (from dB-Lab 210) |

## 2 Available Standard Feature Libraries

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| **Batch Execution**<br>*batch_exe.flib.klb* | **Overview**<br>• execute batch files at the end of a test when all test results and the overall verdict are available<br>• Important test parameters (DUT serial number, database path, start time etc.) are supplied as environmental variables to allow conditional batch execution and to supply additional test information<br>**Applicable to Task**<br>• Control Task (Control:Start/Control:Finish)<br>**Task Parameters**<br>• ExecBatAfterTest - file path of batch file to be executed<br>• ExecBatSilent - execute batch file in background<br>• ExecBatWait - wait for completion<br>• ExecBatAfterLog - execute batch file after data logging |
| **Data Logging to Text File**<br>*curveLog.flib.klb* | **Overview**<br>• extends the standard data logging output of the QC software with direct *ASCII* text file export<br>• selected results and corresponding limits are exported to tab separated value files<br>• directly import measured data into third party software (e.g., spreadsheet, statistics)<br>**Applicable to Tasks**<br>• Sound Pressure (SPL)<br>• Sound Pressure + Impedance (SPL-IMP)<br>• Impedance (IMP)<br>• Motor + Suspension Check (MSC)<br>• Balanced Armature Check (BAC)<br>• Linear Suspension Test (LST)<br>• Spectrum Analysis (SAN)<br>• Air Leak Detection (ALD)<br>• Multi-Tone Distortion (MTD)<br>• IO & Prompt (IO)<br>• Post Processing (PP)<br>**Task Parameters**<br>• TxtLogTargetDir - target folder for text data logging (static/dynamic, rel/abs); activates text logging<br>• TxtLogCurveFileName - file name pattern for curve output<br>• TxtLogValueFileName - file name pattern for single value output<br>• TxtLogCurveList - list of curves to be exported (default: all)<br>• TxtLogValueList - list of single values to be exported<br>• TxtLogHideHeader - do not use header in output files<br>• TxtLogPrecision - numerical precision of exported data |

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| **Validation of Serial Numbers**<br>*validateSN.flib.klb* | **Overview**<br>• checks the entered serial number. It is comparing it to a user definable prefix. If the prefix is not matching the beginning of the serial number, it is blocking the measurement.<br>• A message box offers to retry entering a valid serial number. In case of a second fail, the test will finish (logout).<br>**Applicable to Task**<br>• Control Task (Control:Start/Control:Finish)<br>**Task Parameters**<br>• validateSN_Prefix - required prefix for any serial number used in test<br>• validateSN_Length - required number of serial digits<br>• validateSN_Enable - activates/deactivates feature |
| **Resonance from SPL**<br>*calc_SPL_ resonance.flib.klb* | **Overview**<br>• Extract resonance frequency from peak in sound pressure frequency response or spectrum<br>• Limits / verdicts added to SPL, SPL-IMP, SAN tasks<br>**Applicable to Tasks**<br>• Sound Pressure (SPL)<br>• Sound Pressure + impedance (SPL-IMP)<br>• Spectrum Analysis (SAN)<br>**Task Parameters**<br>• SPLRes_Enable - enables the feature<br>• SPLRes_fmin - defines the bandwidth max SPL search<br>• SPLRes_fmax - defines the bandwidth max SPL search<br>• SPLRes_Lim_min - limits for target max SPL value<br>• SPLRes_Lim_max - limits for target max SPL value<br>• SPLRes_fLim_min - limits for target resonance frequency range<br>• SPLRes_fLim_max - limits for target resonance frequency range |
| **Square Wave Test Stimulus**<br>*square_wave.flib. klb* | **Overview**<br>• Standard sine sweep signal is replaced by square wave sweep<br>**Applicable to Tasks**<br>• Sound Pressure (SPL)<br>• Sound Pressure + impedance (SPL-IMP)<br>• Impedance (IMP)<br>**Task Parameters**<br>• Square_Enable - enables the feature |
| **Stepped Sine Sweep Test Stimulus**<br>*step_sine.flib.klb* | **Overview**<br>• Standard continuous logarithmic sine sweep signal of *Sound Pressure* task is replaced by a discrete stepped sine sweep signal<br>**Applicable to Tasks**<br>• Sound Pressure (SPL)<br>**Task Parameters**<br>• stepSineEnable - enables the feature<br>• stepSineMinCycles - minimum number of cycles per frequency step<br>• stepSineMinTime - minimum duration of each step (in s) |

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| **Sequence Control**<br>*seq_ctrl.flib.klb* | **Overview**<br>• provides a basic test sequence control infrastructure for skipping or repeating measurement steps in a task sequence<br>• skip and repeat may be interactive (message box) or automatic<br>**Applicable to Tasks**<br>• all test tasks<br>**Task Parameters**<br>• SeqCtrl_SkipSilent - always skip the task<br>• SeqCtrl_AskSkipMsg - message shown in skip dialog<br>• SeqCtrl_AskRepeatMsg - message shown in repeat dialog<br>• SeqCtrl_RepeatsIfFail - number of task repetitions if FAIL<br>• SeqCtrl_AskRepeatIfFailMsg- message shown in repeat dialog (FAIL)<br>• SeqCtrl_OkMsgIfFail - message shown in dialog after FAIL<br>• SeqCtrl_SkipSilentInLimitCalib - skip limit calibration for selected task<br>• SeqCtrl_SkipIfPass - skip task if all previous results are PASS<br>• SeqCtrl_SkipIfFail - skip task if all previous results are FAIL<br>• SeqCtrl_SkipIfLastPass - skip task if previous tasks' results are PASS<br>• SeqCtrl_SkipIfLastFail - skip task if previous tasks' results are FAIL |
| **Relative Level to Golden DUT**<br>*RelLevelToGolden Dut.flib.klb* | **Overview**<br>• This feature unlocks a new result parameter *Relative Level* which is represents the average deviation to the *Frequency Response* of the *Golden DUT*<br>**Applicable to Tasks**<br>• Sound Pressure (SPL)<br>**Task Parameters**<br>• ReLev_Enable - if true, the relative level parameter is made available |
| **IO (Input/Output)**<br>*io.flib.klb* | **Overview**<br>• This feature adds additional, but less common IO options to all tasks (switch *Digital IO* pins after the measurement, operator message box after test)<br>**Applicable to Tasks**<br>• Any measurement task<br>**Task Parameters**<br>• IOFlib_Enable - enables the feature<br>• IOFlib_SetGpioVal - specify state of *Digital Output* pins<br>• IOFlib_SetGpioMask- specify mask for *Digital Output* pins<br>• IOFlib_MsgBoxAfter - message box test |
| **Adjust Limits**<br>*Adjust_Limuts.flib .klb* | **Overview**<br>• Operators get the opportunity to trigger limit adjustment of frequency response when minor violations of limits shall be accepted.<br>• Adjusted limits are applied as Grade in addition to the original limits. When a new test is within the adjusted limit but not within original limits, a warning together with a passed verdict is shown.<br>• The *QC Control Panel* (button) gets a new button „Adjust Limits", which replaces the „Calibrate Limits" function. Limit parameters "jitter" and "shift" define the adjustment of limits for each band of violation. The operator has to process each violation of the limit separately (multiple message boxes). |

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| | **Applicable to Tasks**<br>• Control Task and SPL task<br>**Task Parameters**<br>• adjLim_Enable - enables the feature<br>• adjLim_Password - Optional password for adjustment<br>• adjLim_DfltShift - Vertical shift of limit adjustment<br>• adjLim_DfltJitter - Jitter (horizontal shift) of limit adjustment |

## 3 General Parameters (Setup)

| **PARAMETER GROUP "CUSTOMIZATION"** (FOR CONTROL AND TASK SCRIPT) | |
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| **Customizations** | This check box parameter activates/deactivates the custom library infrastructure individually for every task. If this parameter is deactivated the corresponding task will show standard behavior. |
| **Parameters** | This is a multi-purpose parameter list to provide a basic user interface for feature properties. The string matrix can be filled with an arbitrary number of lines, each containing one custom parameter. It may contain various parameters related to different feature libraries in parallel.<br>This parameter is used for all feature parameters that do not affect limit/reference data validity. |
| **Setup** | This multi-purpose parameter is comparable to custom "Parameters", but it is used to define/modify properties which potentially invalidate limits or reference DUTs. |

Find explanations for symbols at:

http://www.klippel.de/know-how/literature.html

Last updated: March 04, 2022