

A close-up photograph of a microscope's objective lens and stage, with a blue tint overlay. The lens is positioned above a circular metal component on the stage. The text is overlaid on the right side of the image.

Q-DAS Erfa group  
Meeting 59  
Teams meeting nov 2020

# Agenda

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- Questions from last meeting
- News about Metrology and Statistics from Denmark and abroad
- General information
  - Information on validation of the calculations in procella
- Data collection with procella
  - Use of additional data in connection with the data collection
- Creation and use of control plans (Test plans)
- Using SPC during data collection

A close-up photograph of a microscope's objective lens, labeled "25-1", positioned above a cylindrical metal part. A thin, vertical beam of light is directed at the part. The scene is overlaid with a semi-transparent blue filter.

# Questions related to the last meetings



A close-up photograph of a microscope's objective lens, labeled '25-1', measuring a cylindrical metal part. The scene is bathed in a blue light, and the background is blurred. The text 'News about Metrology and Statistics from Denmark, Sweden and abroad' is overlaid in white on a semi-transparent blue band across the middle of the image.

# News about Metrology and Statistics from Denmark, Sweden and abroad

# ISO standards TC 69

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## New Standards published

- [ISO/TR 22914:2020](#)
- Statistical methods for implementation of Six Sigma — Selected illustration of analysis of variance

## Under development

- [ISO/DIS 16355-1](#)
- Application of statistical and related methods to new technology and product development process — Part 1: General principles and perspectives of Quality Function Deployment (QFD)
- [ISO/DIS 16337](#)
- Application of statistical and related methods to new technology and product development process — Robust Tolerance Design (RTD)
- [ISO/DIS 13528](#)
- Statistical methods for use in proficiency testing by interlaboratory comparison

# ISO Standards TC 213

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- 150 standards published and a number under development under development
- [ISO/DIS 2692](#)
- Geometrical product specifications (GPS) — Geometrical tolerancing — Maximum material requirement (MMR), least material requirement (LMR) and reciprocity requirement (RPR)
- [ISO/DIS 8062-3](#)
- Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts — Part 3: General dimensional and geometrical tolerances and machining allowances for castings
- [ISO/DIS 8062-4](#)
- Geometrical product specifications — Dimensional and geometrical tolerances for moulded parts — Part 4: Rules and general tolerances for castings using profile tolerancing in a general datum system
- [ISO/DIS 10360-10](#)
- Geometrical product specifications (GPS) — Acceptance and reverification tests for coordinate measuring systems (CMS) — Part 10: Laser trackers

# ISO Standards TC 213

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- [ISO/DIS 10360-13](#)
- Geometrical product specifications (GPS) — Acceptance and reverification tests for coordinate measuring systems (CMS) — Part 13: Optical 3D CMS
- [ISO/DIS 12179](#)
- Geometrical product specifications (GPS) — Surface texture: Profile method — Calibration of contact (stylus) instruments
- [ISO/DIS 21920-1](#)
- Geometrical product specifications (GPS) — Surface texture: Profile — Part 1: Indication of surface texture
- [ISO/DIS 21920-2](#)
- Geometrical product specifications (GPS) — Surface texture: Profile — Part 2: Terms, definitions and surface texture parameters
- [ISO/FDIS 22081](#)
- Geometrical product specifications (GPS) — Geometrical tolerancing — General geometrical specifications and general size specifications

# New version of VDA 5

- Members in VDA 5

## Zusammensetzung Arbeitskreis VDA Band 5 Mitglieder im Arbeitskreis (Stand: 16.09.2020)



Dr. Babl	Christian	Continental Automotive GmbH
Conrad	Stephan	Hexagon (Q-DAS GmbH)
Gahlen	Thomas	ZF Friedrichshafen AG
Dr. Gerhorst	Frank	Ford-Werke GmbH
Heitzer	Rainer	BMW AG
Hoffmann	Marcus	AUDI AG (AK-Leitung)
Hoppe	Mario	BMW Motorrad
Koch	Thomas	Volkswagen AG
Malek	Branko	AUDI AG
Matousek	Stepan	Schaeffler
Ofen	Rolf	IO-MQS
Schardt	Christoph	Volkswagen AG
Dr. Schultz	Wolfgang	Hexagon (Q-DAS GmbH)
Steuber	Ulf	Volkswagen AG
Weiss	Manfred	Webasto SE
Wötzel	Marco	Daimler AG

Unterstützung durch:

Wang	Weï Min	TU Berlin
Müller-Ott	Teresa	VDA QMC





# Umgesetzte neue Struktur VDA Band 5

Aufteilung in Hauptband und Praxishandbuch erhöht Anwendbarkeit



## Unique selling points (USP) des VDA Bands 5

### Umgang mit nicht geeigneten Messsystemen /-prozessen



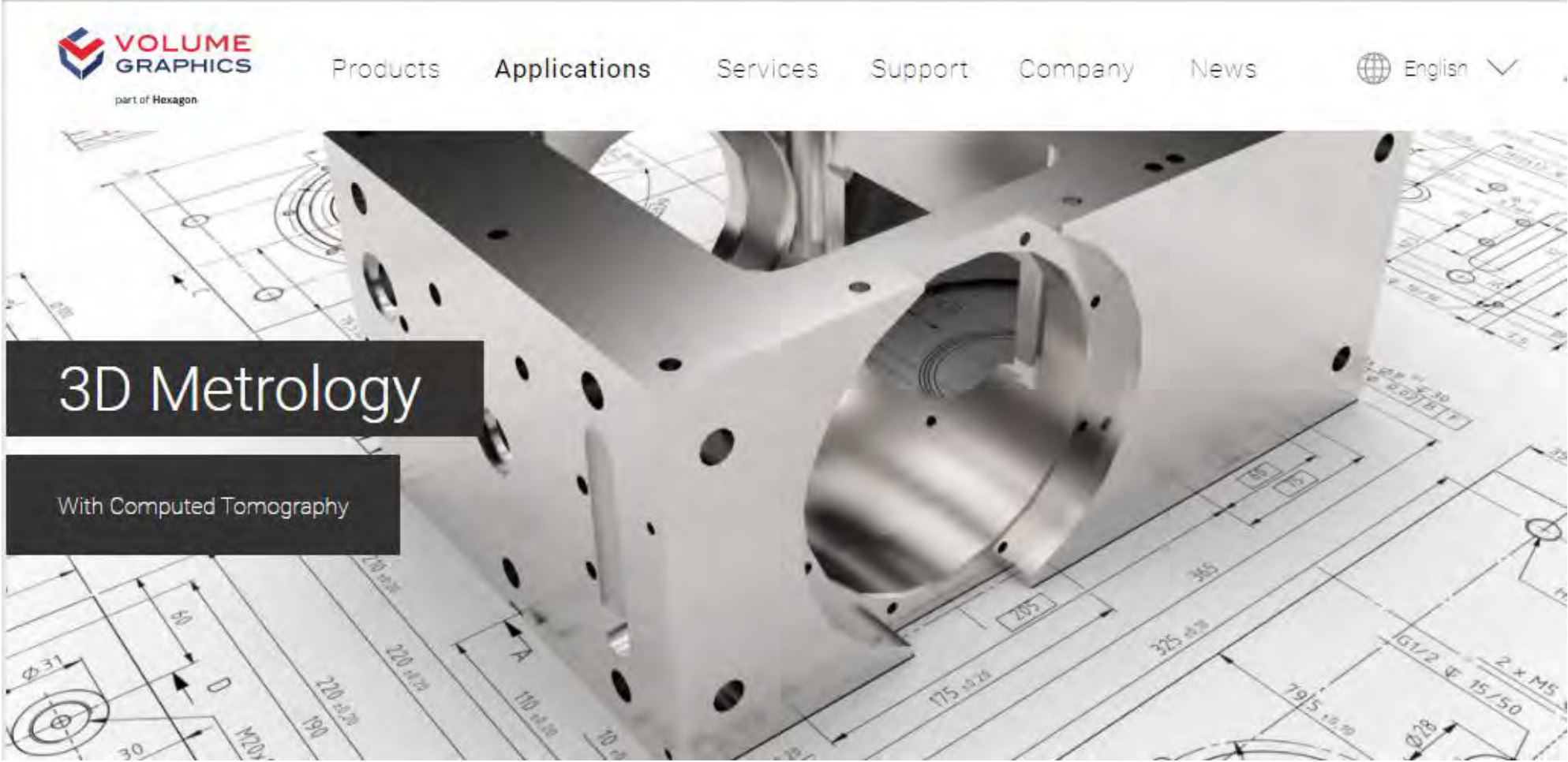
- Optimierung der Mess- und Prüfprozesse
- Risikoanalyse und temporäre Freigabe
- Berücksichtigung der Messunsicherheit an den Spezifikationsgrenzen
- Reflexion und ggf. Anpassung der Grenzwerte und Toleranzen
- FT-Regelung für Messprozesse mit kleinen Toleranzen
- Verringerung der Messunsicherheit durch Mehrfachmessung
- Absprache mit Kunden



A close-up photograph of a microscope's objective lens, labeled '25-1', positioned above a cylindrical metal component. A thin, vertical beam of light is directed at the top surface of the metal part. The scene is overlaid with a semi-transparent blue filter.

# News from Q - DAS

# Volume Graphics now a part of Hexagon Cooperation with Q-DAS





# Newest versions of Q-DAS products

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- The present version 12 is 12.0.3.1
- The present version 13 is 13.0.1.5
- Q-DAS IMC version 2-released
- Intelligent monitoring and control of the production process
- The new version of Q-DAS IMC intelligent machine control software establishes a link between tool data and measured values and enables clear communication between machine tools and the database with additional controllers.
- NEW RELEASE Q-DAS eMMA 3.2.0
- Faster and improved analysis of 3D measurement data

# Changes V13

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Minimum 48 change's in the software from 13.0.1.5 to 13.0.2.0.1

Most important

- The window bar to maximize /Minimizing was for graphics in maximized condition 3-times available.
- As soon as the measured value acquisition over an interface occurs, the notes in the graphics no longer shown.
- Fixed update problem when integrating a parts protocol into the measured value logging.
- Incorrect behavior while filtering the weekdays with the "time/date" filter function. - Error corrected
- The graphic "Individual values all characteristics rotated "was not shown when the first characteristic was an attributive feature. –Error corrected
- When using a filter combination (complex filter) with the conditions "last X measured values or last complete time", and not sufficient measured values present the measured values from time unit before war reloaded. However, all measurements were loaded in reverse chronological order. - Error corrected
- The option "Common additional data fields " In Procella had no function if the dialog "Additional data" was opened in the middle of the measurement sequence. -Error corrected
- The Q-DM (Upload) option "Measured values update based on " does not function together with the additional data field "K0056".

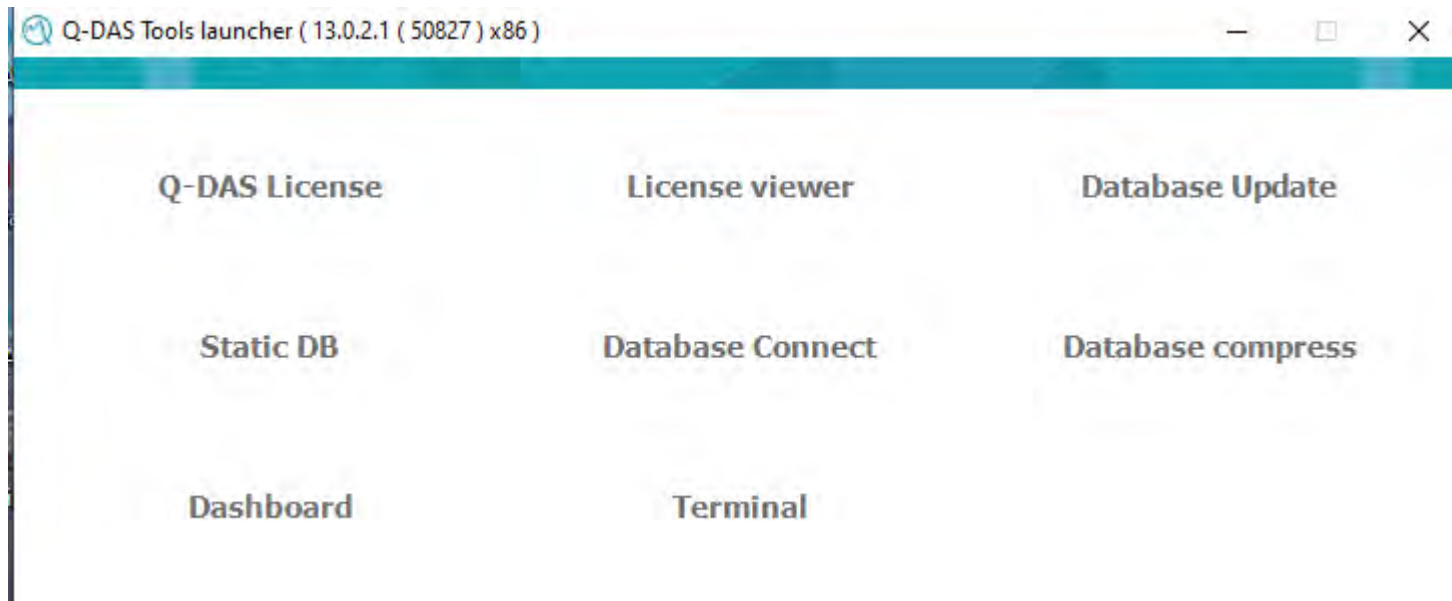
# Changes V13

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- The filtering by overall evaluation of characteristics for "Total Capability Indices" graphics was modified.
- Deactivating the VALUE GUID in the additional data set has the effect that records from the database could no longer be saved. Since this is a wanted state, the configurator will now when creating such a set be informed. Furthermore, in the "Read from database" dialog indicated that it is a read-only mode for that reason.
- Confirming a measurement in CMM reporting was synchronized with the upload cycle, measurements were not timely approved, but first approved at the next upload cycle – corrected
- The font size of the selected data or additional data to be written did not respond to the set Font size for the dialog. –Error corrected

# New functions in V13

- Tool Launcher
- Update of databases
- License viewer
- Static DB – Database creation
- License - changes licenses
- Database connections - tools
- Access databases repair
- Dashboard
- Terminal



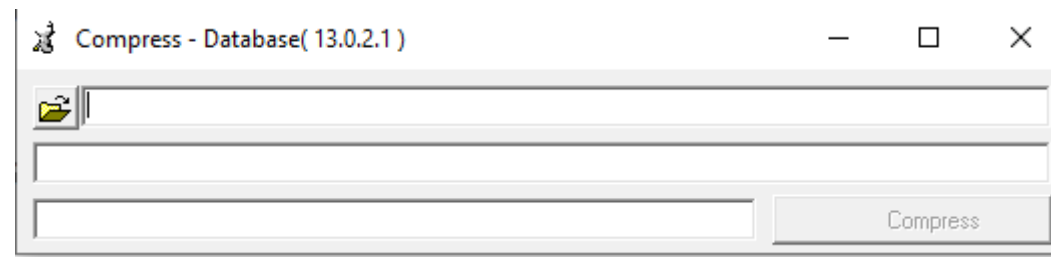


# Special functions

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- Dashboards
  - Configuration of uploads
  - Edit catalogs
  - Log file settings – alarms logging

## Compress Access databases



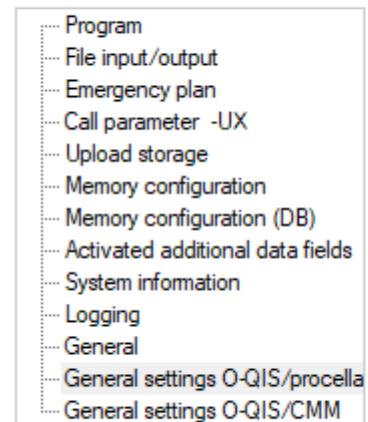
# New function

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- Solution on the problems about "measured value loggin".
- With the new version V13 (Release 13.0.2.1) the new storage concept for Q-DAS Procella is activated by default in new installations (in the configuration database).
- As soon as the configuration user not only has exactly one layout for the whole company things got more complicated because different measuring stations or departments required then different configurations.
- The cause is in the configuration of the data sets, the graphical user interface and the requirement for looking for special measuring methods.

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## System configuration



A screenshot of a configuration menu with a list of options. The options are: Program, File input/output, Emergency plan, Call parameter -UX, Upload storage, Memory configuration, Memory configuration (DB), Activated additional data fields, System information, Logging, General, General settings O-QIS/procella, and General settings O-QIS/CMM. The 'General settings O-QIS/procella' option is highlighted with a grey background.

## General settings O-QIS/procella

- Never save alarms
- Save alarms manually
- Force saving alarms manually
- Save alarms in the background
- Always save alarms

## Measured value logging window

- Save configuration in new format

# New Functions

- New controlplan
- Part mask definition
  - Choose the layout

The screenshot shows a software interface with several input fields and a dropdown menu. At the top, there are two input fields labeled 'Drawing Amendment' and 'Drawing name'. Below them is a dropdown menu currently showing 'internal configuration'. A second dropdown menu is open, displaying a list of options: 'Standard view' (highlighted in blue), 'Summary/input', 'Summary/input 2', 'Summary/input 3', 'Summary/input 4', 'Summary/input 5', 'Summary/input 6', and 'Summary/input 7'. To the right of this dropdown is a 'Measureme' field with the value 'no'. Below the dropdown menu, there are two more input fields: 'Contractor name' and 'Work Cycle / Operation no.'. The interface also includes labels for 'Manufact' and 'Material' next to their respective input fields.

# New function

- Reset layout

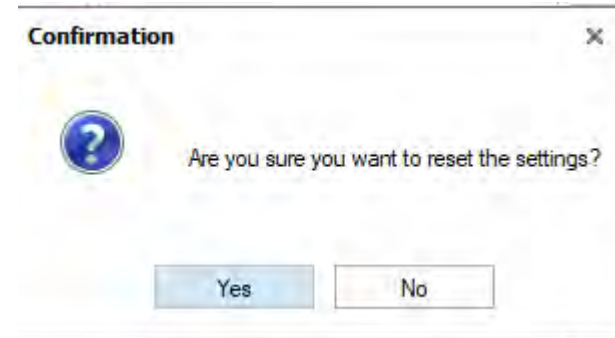
Database - QDAS\_DATA\_001

All parts

???		
Hulplade		
Shaft		
0	3-0243C0	
0 433 171 914	Hole type	
0 433 171 914	Hole type	
1	Test 13	
1231	testemne	
✓ 150-4175	Test_IBR	
151-4175	Tandsæt	
3-0242B	Front cover	
3-0242B	Frontcover	
3-0243C	Back cover	
3-0243C	Back cover	
3-0243C0	Back cover	
4711	Shaft 1x30	
4712	Shaft 1x30	
4713	Shaft 1x30	
F 123	Test Defe	
F 123	Test Defe	
ISO/TR 11462-3	Test Data	

✓ 1 Højde af krans  
✓ 2 Højde af krans  
✓ 1a Højde af hjul

- New query
- New Query for user group
- Add to query
- Import query
- New field
- Part no.
- Part descr.
- Part Amend.stat.
- select part values
- automatic selection
- Select period
- Show filter
- Configuration
- Reset configurations**





# New function

## Read from database

Part selection

Part no. (K1001) / Part descr. (K1002) / Part Amend.stat. (K1004)

Characteristics selection

Char.No. (K2001) / Char.Descr. (K2002)

Database - QDAS\_DATA\_001

All parts

- New query
- New Query for user group
- Import query
- New field
- Part no.
- Part descr.
- Part Amend.stat.
- select values of all parts....
- automatic selection
- Select period
- Search for parts without default configuration
- Show filter
- Configuration
- Reset configurations
- Save parts to files

Length 0.3  
Length 5.6  
Length 69.8  
Surface Prof  
Length 0.3  
Chamfer 0.2  
Flatness ? 0.  
Length 39.5  
Flatness ? 0.  
Radius R 0.2  
Length 77.1  
Length 1.8  
Diameter ø 5  
Length 0.70  
Length 2.4  
Length 2.5  
Length 1.3  
Length 16.4  
Length 1.6  
Length 50.0

## Part Mask: Search for parts and characteristics

- Search for parts and characteristics with **individual** settings
- Search for parts and characteristics with **inherited** settings

start search

Reset settings

Parts and characteristics

- // Shaft /
- 0 433 171 914 / Hole type nozzle / 20050819
- 0 433 171 914 / Hole type nozzle / 20050819
- 1 / Test 13 /
- 150-4175 / Test\_IBR /
- 151-4175 / Tandsæt / V1
- F 123 / Test Defective Units No. 1 /
- F 123 / Test Defective Units No. 1 /

# New function

- Definition of additional data

## System configuration

- Program
- File input/output
- Emergency plan
- Call parameter -UX
- Upload storage
- Memory configuration
- Memory configuration (DB)
- Activated additional data fields**
- System information
- Logging
- General
- General settings O-QIS/procella
- General settings O-QIS/CMM

Mätprocessens kapabilitet  
11-11-2020

## Activated additional data fields

Standard

Standard

<input checked="" type="checkbox"/> Batch number	<input checked="" type="checkbox"/> Standard
<input checked="" type="checkbox"/> Cavity number	<input checked="" type="checkbox"/> K0055
<input checked="" type="checkbox"/> Operator name	<input checked="" type="checkbox"/> K0056
<input checked="" type="checkbox"/> Text	<input checked="" type="checkbox"/> K0057
<input checked="" type="checkbox"/> Machine number	<input checked="" type="checkbox"/> K0058
<input checked="" type="checkbox"/> Process parameter	<input checked="" type="checkbox"/> K0059
<input checked="" type="checkbox"/> Gage number	<input checked="" type="checkbox"/> K0060
<input checked="" type="checkbox"/> Part ID number	<input checked="" type="checkbox"/> K0061
<input checked="" type="checkbox"/> Reason for test	<input checked="" type="checkbox"/> K0062
<input checked="" type="checkbox"/> Production number	<input checked="" type="checkbox"/> K0063
<input checked="" type="checkbox"/> Work piece fixture number	<input checked="" type="checkbox"/> Subgroup ID
<input checked="" type="checkbox"/> Order	<input checked="" type="checkbox"/> Value position in subgroup
<input checked="" type="checkbox"/> K0054	<input checked="" type="checkbox"/> Values GUID

All None New Delete

File name: C:\ProgramData\Q-DAS\Local\PLANT\DEFAULT\Others\V13\_AddDataUsageSets.IN

# Q-DAS standard reports

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- You can download the Q-DAS reports V13 and use them also in V12
- <https://www.q-das.com/en/service/support-hotline#faqs> | | |

## V13 Default Reports

After an installation the default reports are saved in the folder ...\\PLANT\\DEFAULT\\Reports. The complete package can be downloaded here: [Default Reports V 13.0.1.3 \(ZIP 1.82 MB\)](#)

- We can have them on our homepage also.
- Your special reports?
- Your strategy?

# Reports

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- New reports with the CAD version



Metrologic CalibWeb

Measurement Equipment  
Calibration management

# Measurement Equipment Information



[Back](#)   [Logout](#)

Document Information	Meas. Ranges	Accessories	History	Use Log
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**Instrument Info**

Instrumt No	0-3.4		
Serial No.			
Class	Måleudstyr		
Name	Dorn_Special		
Type	Glat Go/NoGo		
Characteristic	12H7		
Manufacturer	Mauser		
Modell			
Ext.Reg.No			
Supplier			
Standard			
Reg. Date	Wed, 12 Jan 2000	by/Owner	DEMO
Last edit date	Thu, 22 Nov 2018	By	DATATRANS
Purch. Date	Wed, 12 Jan 2000	Initial Price	
AccountNo	xx		

**Use and Calibration info**

State of Calibration	<span style="background-color: green; color: black;">Y</span>	Checked out days since calibr.	0
Check out	<span style="background-color: red; color: black;">N</span>	Colour Label	43
Calibration Date	Mon, 27 Apr 2009	Calibration procedure	
Calibr. Interv.	18 M	Returned for calibration	N
Due Date	Wed, 27 Oct 2010	Instruction No	5rev.1
		Version	
Calibration Location	Målerum	I/E	I
Use Status	None		
Gauge User	None		
Employee No.			
Use Location	None		
Cost location	Produktion		
Home Base			

**Comment notes**





# Measurement Equipment Calibration System CalibWeb

Calib is a calibration management program with additional Web viewer solution.

## Features:

- Ready for tablet or smartphone
- Send list for next calibration by mail
- Monitor the use, calibration and repair of your equipment
- Report your calibration results and document traceability
- **Data exchange to Q-DAS software**
- Use barcode reader for quick search of the equipment status

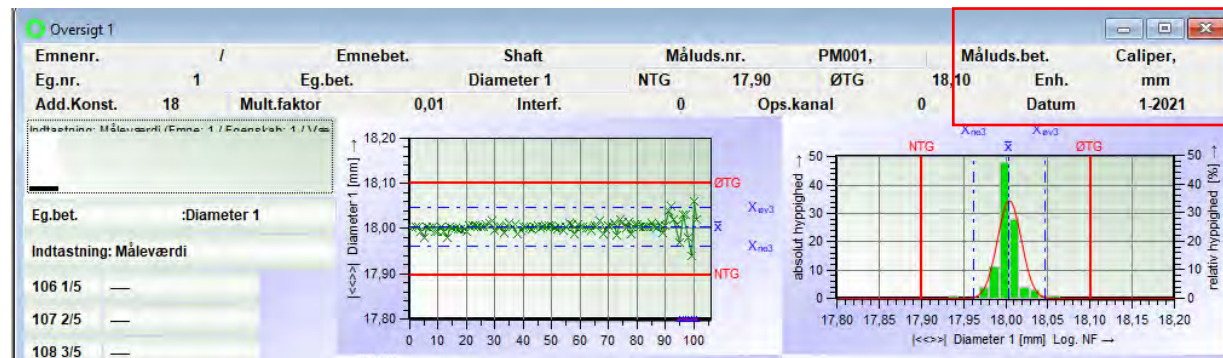


The screenshot displays the CalibWeb interface. At the top left is the METROLOGIC logo. The top right shows a user greeting: "Welcome Jacob Kratmann Nielsen" and a "Logout" link. Below this is a navigation bar with several tabs: "3 Kasserede udstyr", "1995", "01", "01", "2028", "01", "01", "Reset", and "Search". The main content area is a table with three columns: "DUE", "TITEL", and "HIBERNATE". The "DUE" column has values "117-", "119-Metrologic-Målerum", and "43029-". The "TITEL" column lists various equipment items, including "0-3.4-Produktion-Drejeafd." and "0001-Metrologic-Metrologic" through "0013-Metrologic-Metrologic". The "HIBERNATE" column is currently empty.

DUE	TITEL	HIBERNATE
117-	0-3.4-Produktion-Drejeafd.	
119-Metrologic-Målerum	0001-Metrologic-Metrologic	
43029-	0002-Metrologic-Metrologic	
	0003-Metrologic-Metrologic	
	0004-Metrologic-Metrologic	
	0005-Metrologic-Metrologic	
	0006-Metrologic-Metrologic	
	0007-Metrologic-Metrologic	
	0008-Metrologic-Metrologic	
	0010-Metrologic-Metrologic	
	0011-Metrologic-Metrologic	
	0012-Metrologic-Metrologic	
	0013-Metrologic-Metrologic	

# Data exchange Q-DAS products and Calibration management

- Use the instrument information from Calib during data collection.
- Save MSA information in the calibration program.
- Document the due date during the data collection.



A close-up photograph of a microscope's objective lens, labeled '25-1', positioned above a cylindrical metal component. A thin, vertical blue beam of light is directed at the top surface of the part. The entire scene is overlaid with a semi-transparent blue filter.

# Validation of software

# Validation

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- ISO 11462-3 Guidelines for implementation of statistical process control (SPC) –
  - Part 3: Reference data sets for SPC software validation
  - Standard released
  
- ISO11462-4 Part 4: Reference data sets for measurement process analysis software validation
  - Still under development
  - Will be released next year

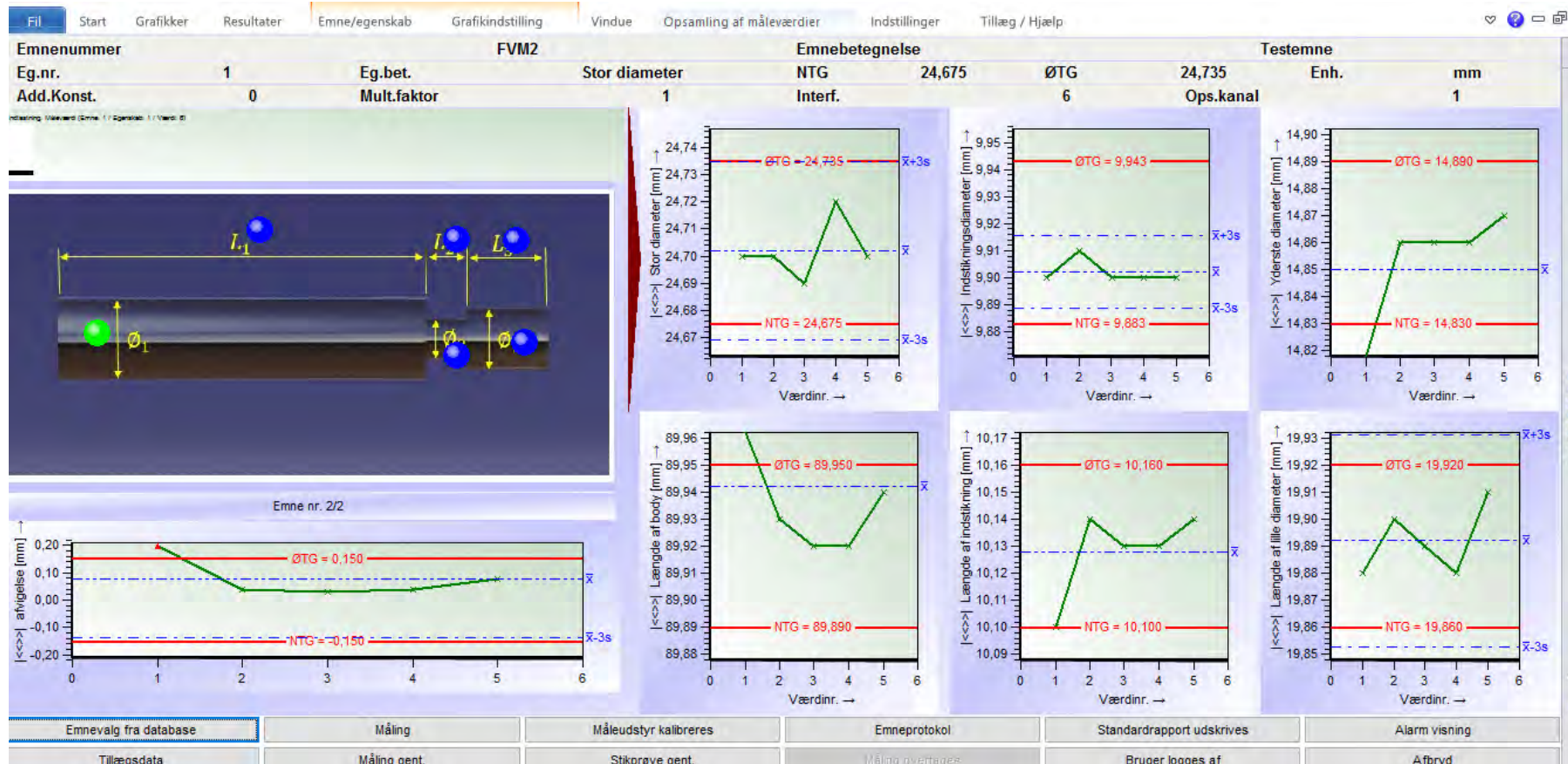


A close-up photograph of a microscope's objective lens, labeled '25-1', positioned above a cylindrical metal part. A thin, vertical blue line of light or fluid is visible between the lens and the part. The background is a soft-focus blue. The text 'Data collecting Procella' is overlaid in white on the right side of the image.

# Data collecting Procella

# Data collecting with Procella

- Still all the different layout can be used





# Creation of testplans



When to use nominal and ordinal Characteristics?

nominal characteristics  
1 new nominal characteristic Default

ordinal characteristics  
1 new ordinal characteristics Default

When you want to define the different results

Before using this characteristics you may define the possible results in the Ordinal catalog.  
This catalog is valid for both types.

The screenshot shows the Metrologic software interface. The 'create new characteristics...' dialog box is open, showing settings for 'Characteristics', 'Measurement procedure', and 'Start window'. The 'Characteristics' tab is active, showing options for 'variable characteristics', 'Group Characteristics', 'Positional tolerances', '3D-Positional tolerances', 'attribute characteristics', and 'Error log sheet'. Each option has a numeric input field and a 'Default' button.

Below the dialog box, the 'Ordinal Classes Catalogue' table is visible. It has columns for 'cons. no.', 'Number', 'Description', 'Evaluation', 'Rank', and 'O.K./n.O.K.'. The table contains 7 rows of data.

cons. no.	Number	Description	Evaluation	Rank	O.K./n.O.K.
1	1	Okay		0	O.K.
2	2	Not okay		1	n.O.K.
3	3	Okay		0	O.K.
4	4	Rework		1	n.O.K.
5	5	Not okay		2	n.O.K.
6	6	Very good		0	O.K.
7	7	Good		1	O.K.

# Input Nominal/Ordinal characteristics in value mask

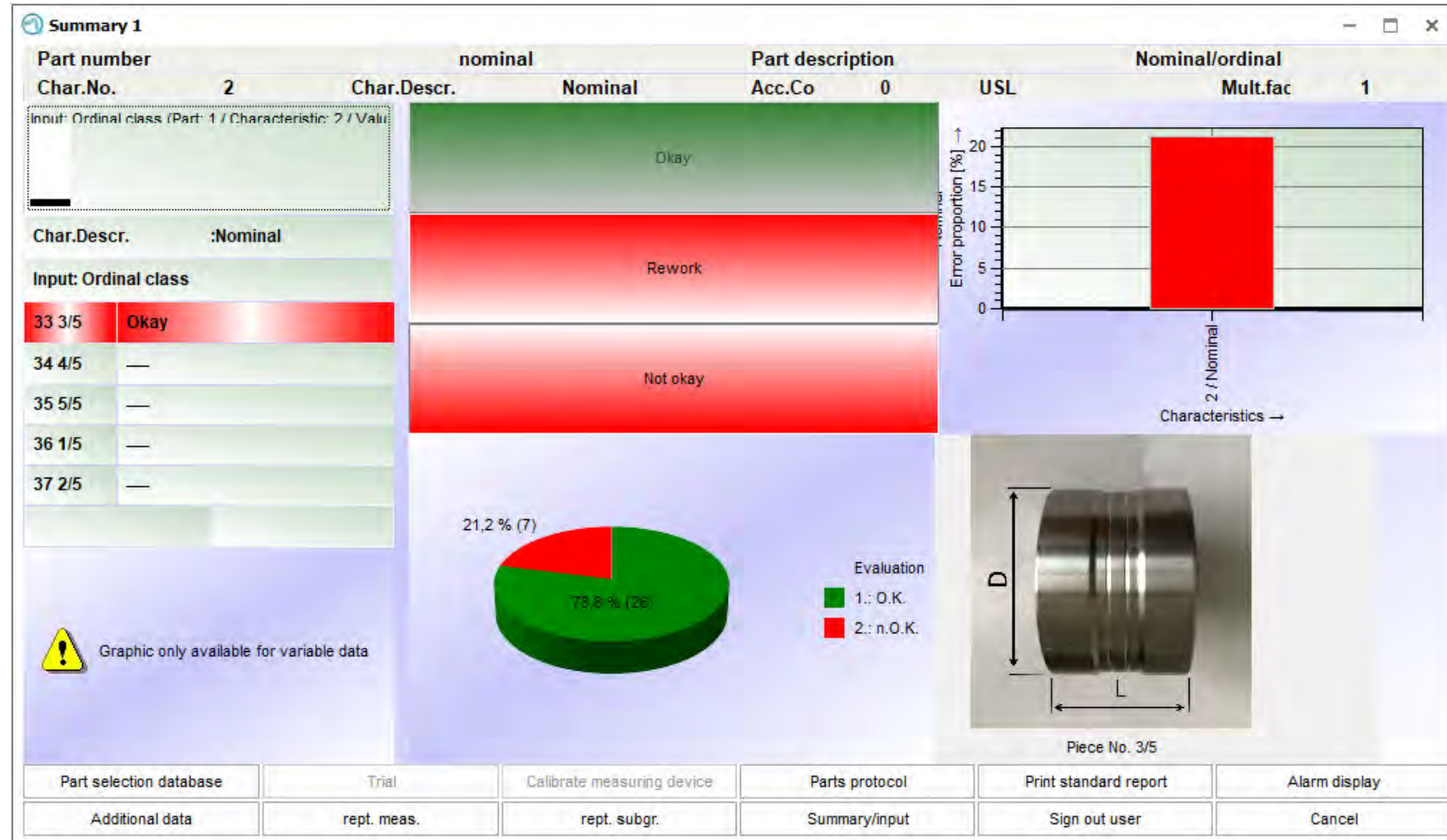
- Value mask.
- Input assistance gives you the possibility to fill in results.
- You can define the different possibilities from the catalog,
- You can define the number of results to be filled in.

The screenshot displays the 'Values mask' application window. At the top, there are input fields for 'Characteristic' (Number: 2, Description: Nominal, Up.Spec.Lim., Lo.Spec.Lim., Transformation Factor: 1, Constant: 0). Below this is a table with columns for 'Ordinal' and 'Nominal' values. The table contains 15 rows, with the 8th row highlighted in red and yellow. To the right, an 'Input assistance / values example' dialog box is open, showing 'Characteristic: 2 Value: 8 Field: Ordinal class'. It includes a 'Select class' dropdown menu with 'Okay' and 'Not okay' options, and fields for 'Number of records per interval' (set to 2) and 'Number of sequences to be created' (set to 3). The dialog also has 'OK', 'Cancel', and 'Help' buttons.

	Ordinal	Nominal
1	Okay	Not okay
2	Okay	Okay
3	Okay	Okay
4	Okay	Okay
5	Okay	Okay
6	Okay	Okay
7	Okay	Okay
8		
9		
10		
11		
12		
13		
14		
15		

# Input Nominal/Ordinal characteristics in measurement value logging

- Use classified input (F7810)
- Use a subcatalog
- Use Pie (F3760)
- Nominal = ex. true/false
- Ordinal = Ordinal data is quantitative data which have naturally occurring orders. It can be named, grouped and also ranked.
- Ex. Critical, Significant, Important, not important-



# Operating instruction

Pop up info before the measurement logging

- You can inform the operator about the measurement procedure before the data collection.
- Configuration: Define the field in the characteristic mask to store the info.

Preview    Preview of template

Characteristic

Additional data

Reset additional data !

Takeover

Inspection interval

**Notes**

Recording data

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Operating instructions upon switch of character

**Operating instruction**

Before the measurement

Before the subgroup

Never display!

**Operator prompt contents**

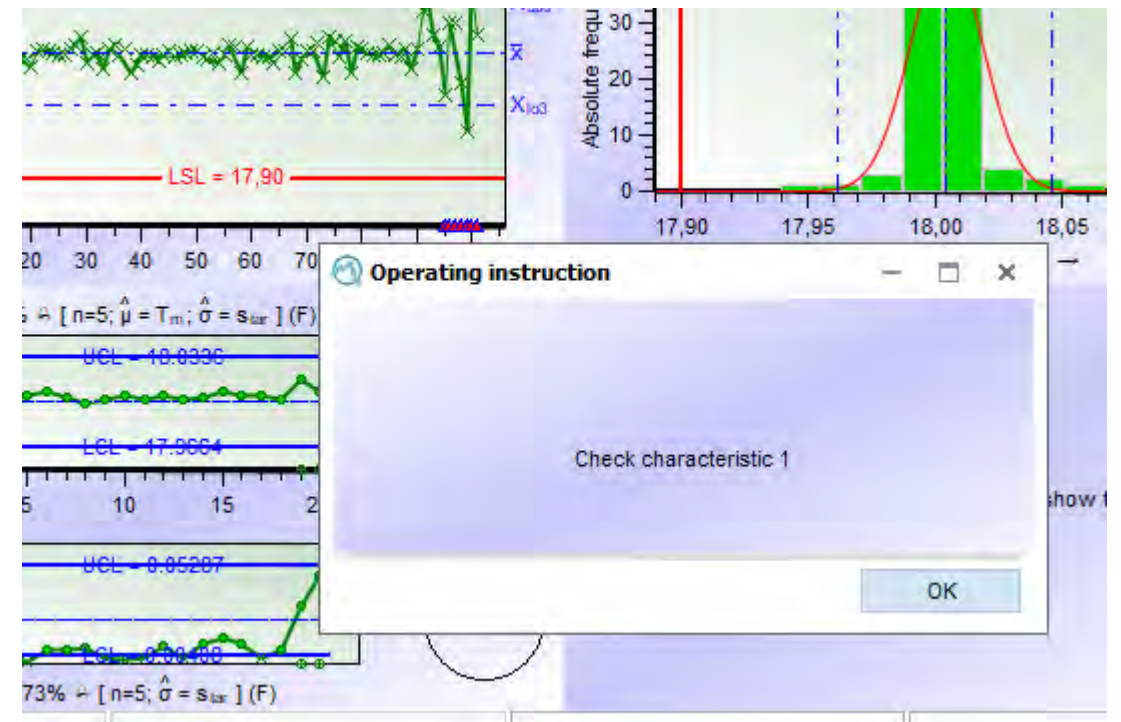
Contents of a characteristic field  >>

Discrete characteristic

Display acknowledges measurement

Access external file

Transfer field contents  >>



# Additional data

- Additional data are information linked to the measurement values.
- There are several ways to input additional data.
  1. In "part selection database" menu
  2. In a pop up field before the measurement logging (Measurement Value logging window)
  3. In a pop up field in the measurement logging window
  4. In the Value Mask window
  5. In the Value Chart graphics (after the measurement logging)

## Input additional data fields

Additional data | Input screen masks

**Input additional data fields**

Mandatory change  
Mandatory input  
Input  
Additional data of the last measurement

<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	attribute
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Date
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Time
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Batch number
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Order
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Cavity number
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Operator name
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Machine number
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Gage number
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Process parameter
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Text



# Measurement procedure

- The “Measurement procedure” settings are only available in O-QIS in the procella module. You may adjust settings for the recording of measured values. The adjusted settings refer to the data set specific settings for an automated switch of characteristic.
- If you switch characteristics manually, please do not activate any option except for *jump to measurement start after measurement is completed and/or Always observe input sequence*
- Check this box to keep the input position even if you switch characteristics manually.

## Measurement procedure

### Measurement procedure

- Always observe input sequence
- Activate procedure control through subgroup incidences
  - Complete test at end of cycle
  - reset saved positions of the procedure control
  - jump to measurement start after measurement is completed
  - Manual characteristics switch in current inspection only
  - Do not allow manual switch of characteristics

### Measurement and inspection finalization

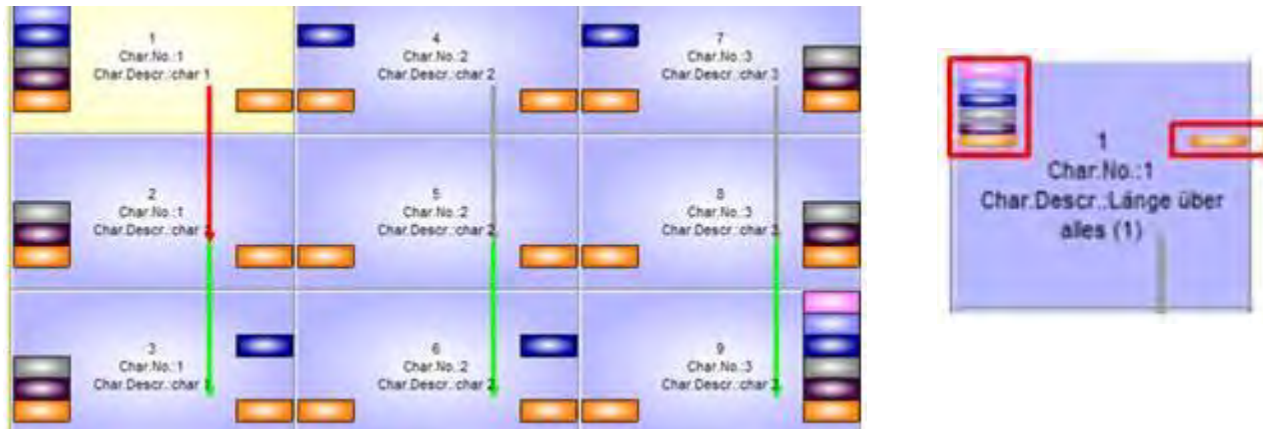
- Finalize measurement completely
- Finalize inspection completely

### Activate and deactivate characteristics

- Activate / deactivate characteristics having the same field content
  - Characteristics field  
0 >>
- Fill in not recorded characteristics
  - Standard event  
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# Test plan

- It is easier for users to see what the current input position is if the “Test plan” graphic is included in the respective “Summary / input” window.
- When using the “manual” input sequence please note that the forced input sequence is deactivated. Otherwise you would not be able to switch to any further characteristic.



- The respective start and the end are highlighted with a bar in the same colour. You may change the colour and the content of each bar, the width and the height individually.
- *Activate procedure control through subgroup incidences*
- If you check this box, the *Always observe input sequence* option is also activated.

# Test plan

- You can change colours and deactivate some of the boxes in this menu



- In order to gain even more information from the test plan, you may display different icons for various tasks in the test plan, e.g. when to store data, enter additional data or display alarms.

# Testplan

---

- Additional boxes can be defined



## *Always observe input sequence option*

---

- By checking this box the program always considers the subgroup incidences specified in the characteristics mask in this measurement run. Characteristics are only measured in every n-th measurement run now.

Subgroup size	Subgroup type	Subgr.incid
5	fixed	1

- If the subgroup incidence is set to “0” or “1”, the respective characteristics are measured in each measurement run.

### Special case: subgroup incidence of ”-1“

- Select a subgroup incidence of ”-1“ in order never to record this characteristic in a normal measurement run. Use this setting for special characteristics that shall be recorded in special measurements (Setting|Special measurement) e.g. after the end of a shift.



# Part measurement

---

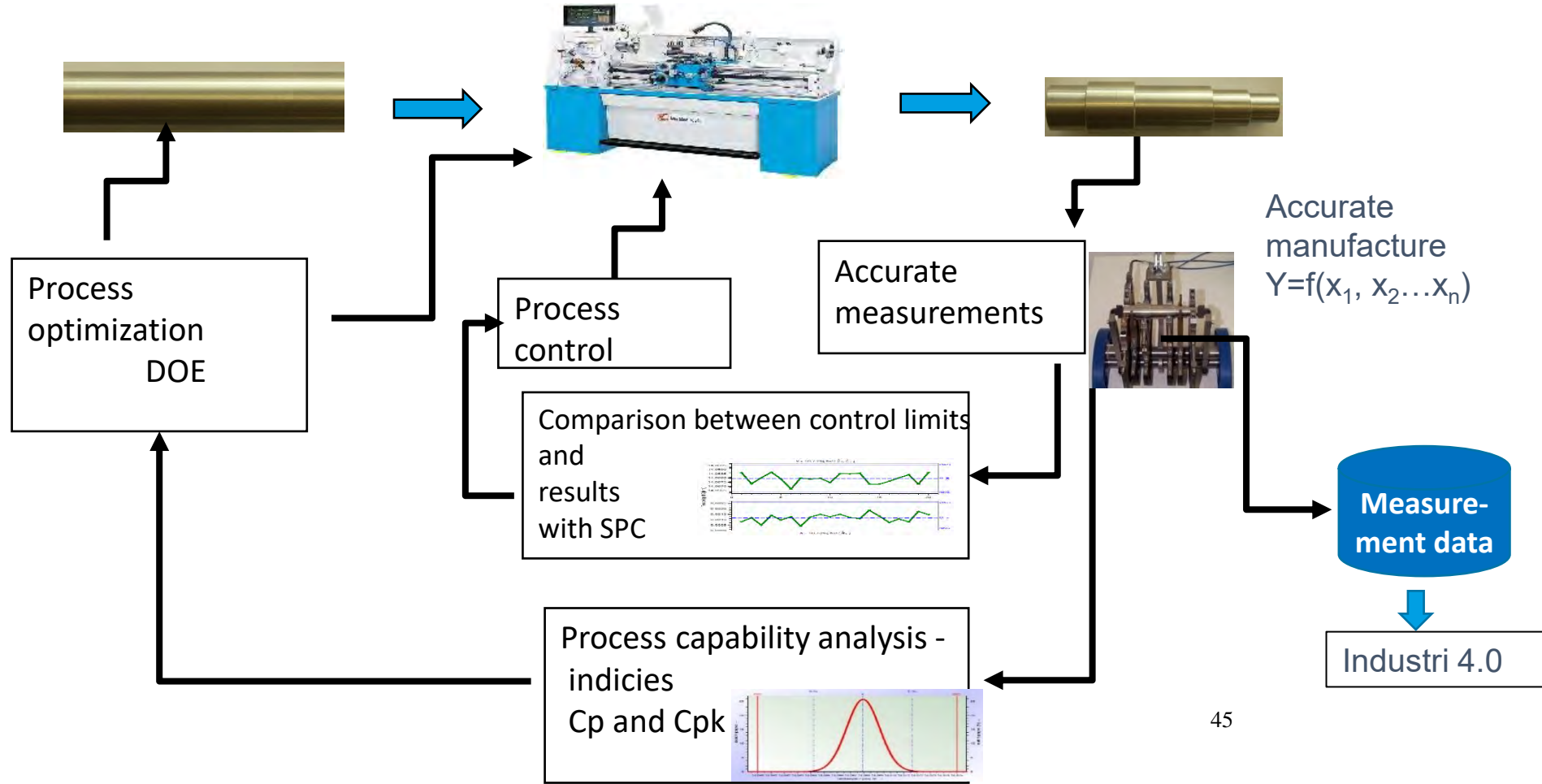
- This option combines all characteristics of the part into a single measurement.

## Input sequence settings

- None
- Part measurement
- Group measurement

- Group measurement
- This option combines all characteristics of the group into a single measurement
- Use group measurement also if you have e.g. two different fixtures.

Note about group measurements: In case you activated the *Group measurement* option but there are not any logical groups in the data set, each characteristic is considered to be a group.



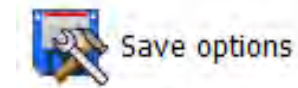
# How to use SPC chart in Procella



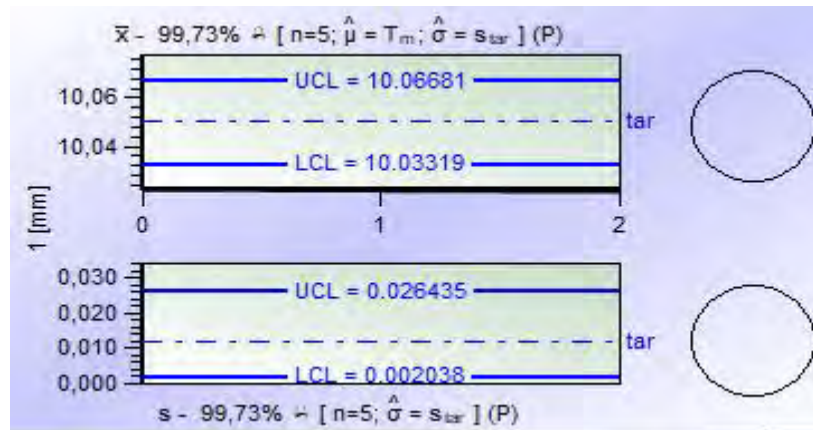
• Two different situations:

1. No Control Chart is present in the file/record set.

- a) Procella can calculate a control chart based on the tolerance and the capability requirement.
- b) Procella do not save the chart if you do not mark this setting:



Always save online QCC with data set



2. Control Chart is present in the record set.

- a) The control chart is stored in the dataset from qs-STAT

# Predefined SPC chart in Procella



- The SPC chart can be calculated without existing data if it is defined in the evaluation strategy.

- Takeover Online QCC from data set
  - Carry out preliminary calculation for Online QCC if there is no QCC in data set
- Always carry out preliminary calculation for Online QCC
- start without Online QCC

- You can save the SPC.chart in Procella
- But be careful what you save.

**Quality Control Chart** [X]

Location charts | Variation charts

Shewhart Location Chart

Chart type

- Average chart
- Median chart
- Raw values chart

Non-interference probability

- 99%
- 99,73% ( $\pm 3s$ )
- User

Options

- Calculation of warning limits
- No QCC limits with natural boundaries

Estimator for

$\sigma = \frac{\text{Upper Specification Limit} - \text{Lower Specification Limit}}{6,0}$  \* Requirement for preliminary potential capability index (normal distribution)

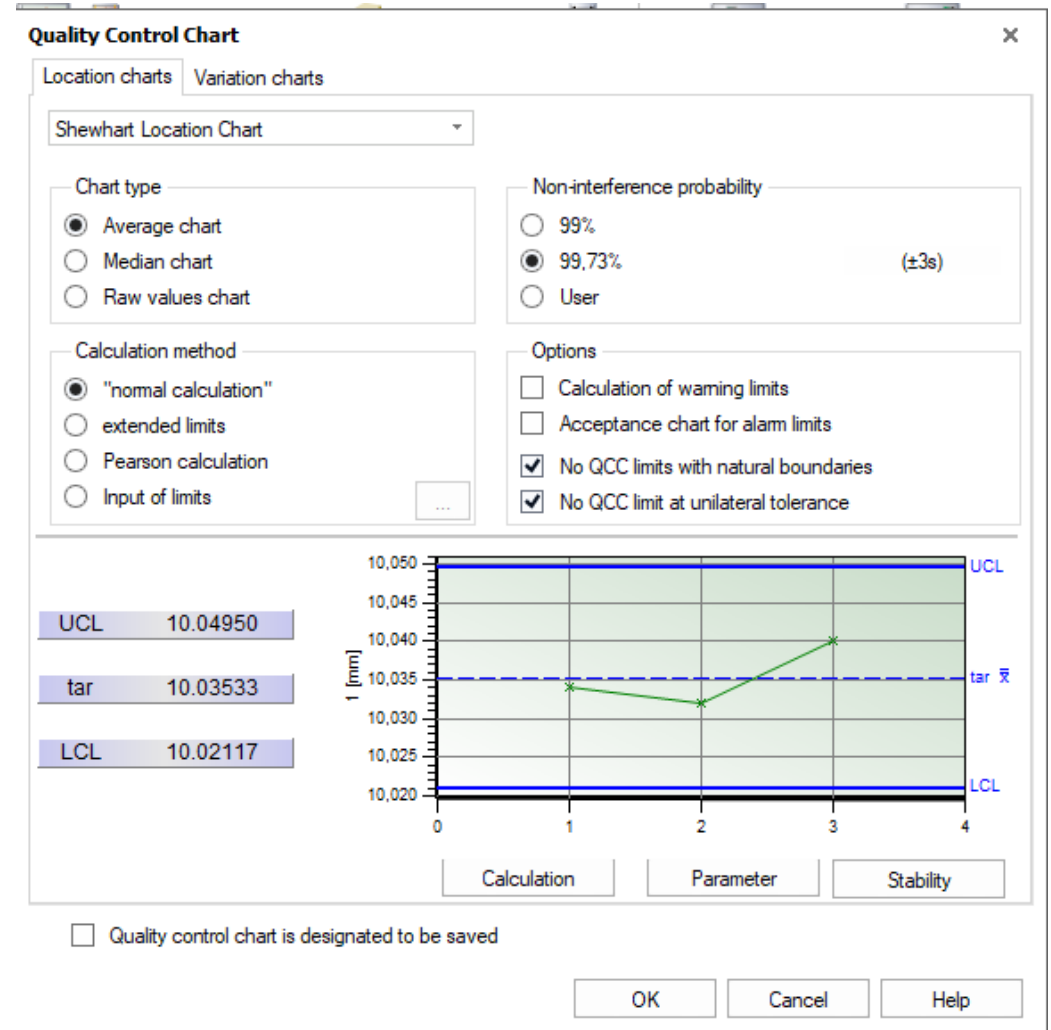
Stability

OK Cancel Print Help

# Definition of the SPC-chart in qs-STAT process analysis



- Design or modify the SPC chart in Graphics/SPC QCC.
- Define the location and variation chart.
- Choose between these charts
  - Shewhart
  - (modified Shewhart)
  - Acceptance
  - EWMA
  
- You should use the defined SPC-chart in your datacollection

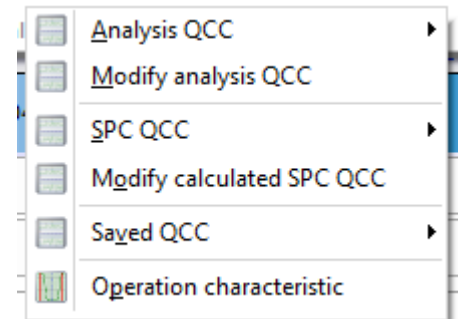




# Different types of quality control charts in Q-DAS



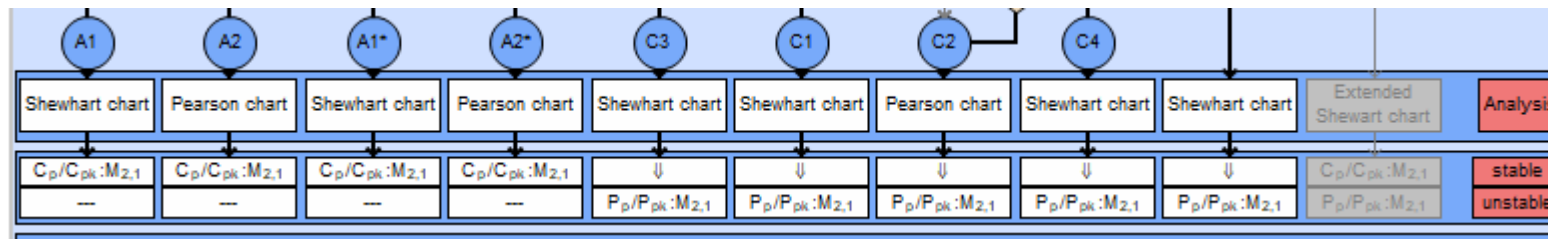
- There are different types of quality control charts available for various applications. There are analysis QCCs, SPC QCCs, saved QCCs and online QCCs but you may also select and use the operation characteristic.
  - There are different designs for each type of chart (e.g. Analysis QCC | Design 1 to Design 6). As the description indicates the only difference is in the design, but the calculation remains the same.
  - In the data collection with Procella you will always use the Online QCC.
- When you define the QCC in qs-STAT then the SPC QCC will be transferred into an Online SPC QCC.



# Analysis SPC chart

The analysis QCC is used to determine the stability of the data set and defines whether to use the nominal value of the *QCC stable* or *QCC unstable* tab in the evaluation strategy requirements. In case of instabilities, the characteristic is considered to be not capable. If a process characteristic is assessed to be stable, there are not any or only an insignificant number of control limit and specification limit violations.

Not capable processes will be evaluated using Pp/Ppk.



After opening a data set or after selecting the *Execute evaluation* option the analysis QCC is always recalculated according to the respective evaluation strategy. This QCC will not be stored.

# SPC QCC

The SPC QCC serves as a template storing the quality control chart for data recording (O-QIS / procella). It is automatic calculated by evaluation in qs-STAT. You may modify it and save it in qs-STAT. Be aware of that every time you save the data set or save it for specific characteristics only the actual Online Chart in Procella will be changed (depending of the settings).

The calculation of the SPC Chart is defined in the evaluation strategy.

After opening a data set or after selecting the *Execute evaluation* option the program always calculates the analysis QCC according to the respective evaluation strategy.

Save options

Always save calculated distribution with data set

Always save classification with data set

Save SPC QCC to the data set

Save catalogue data to file

Save trend compensation in data set

Save detected value ranges

save with attribute 190 (reversible)

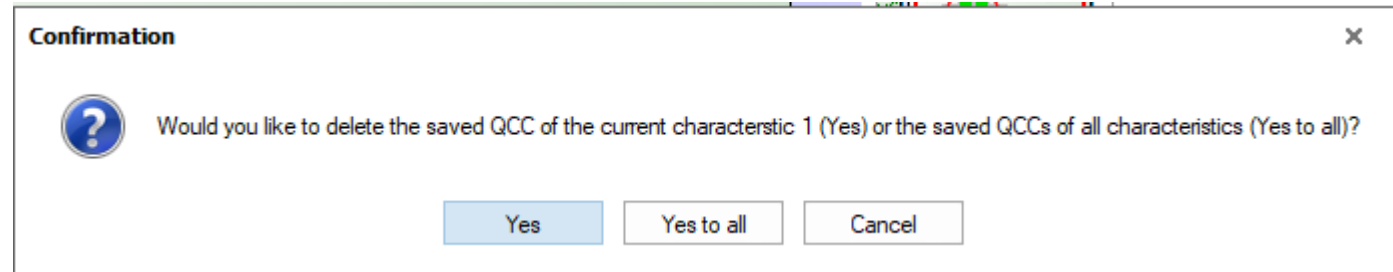
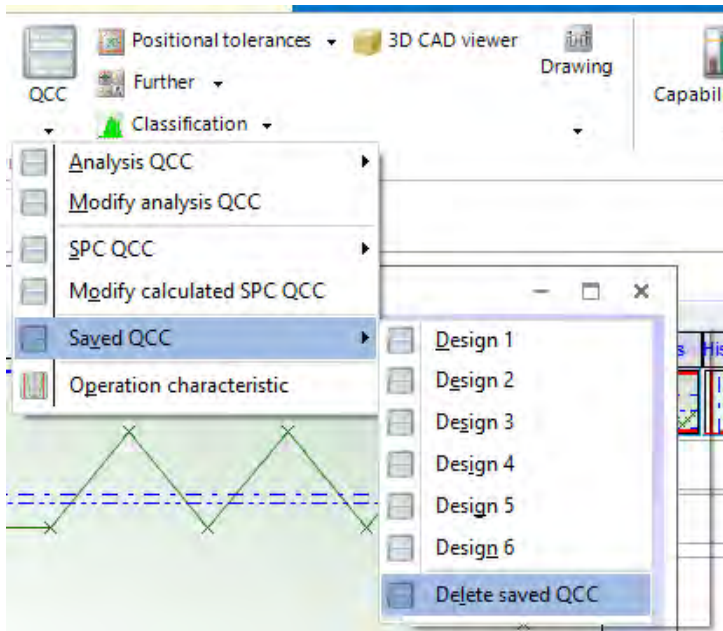
save with attribute 255 (keep)

save with attribute 256 (delete)

OK Cancel Help

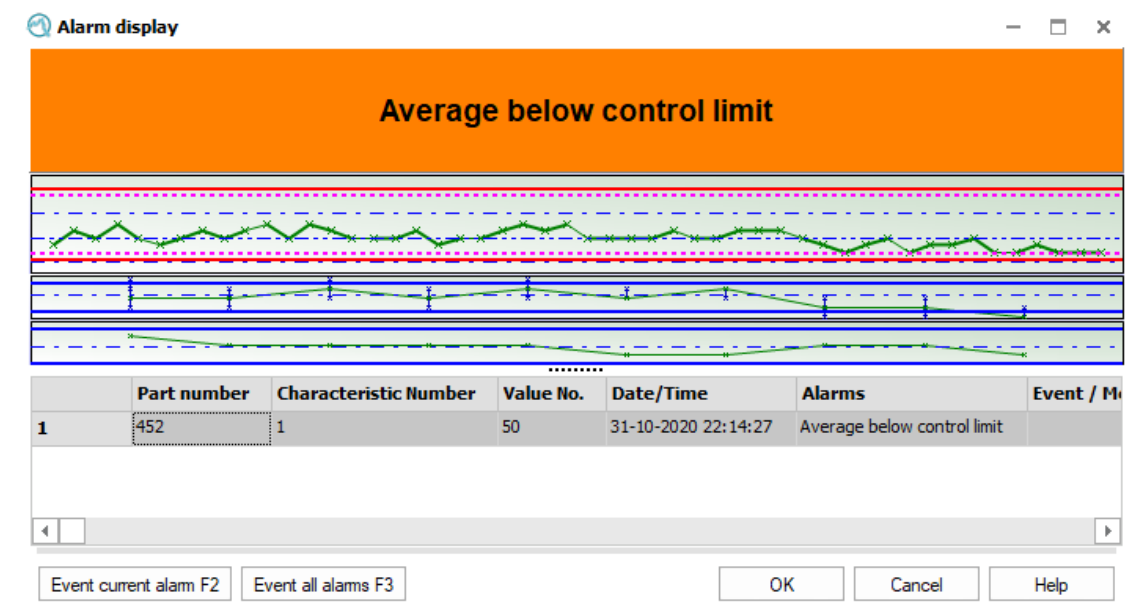
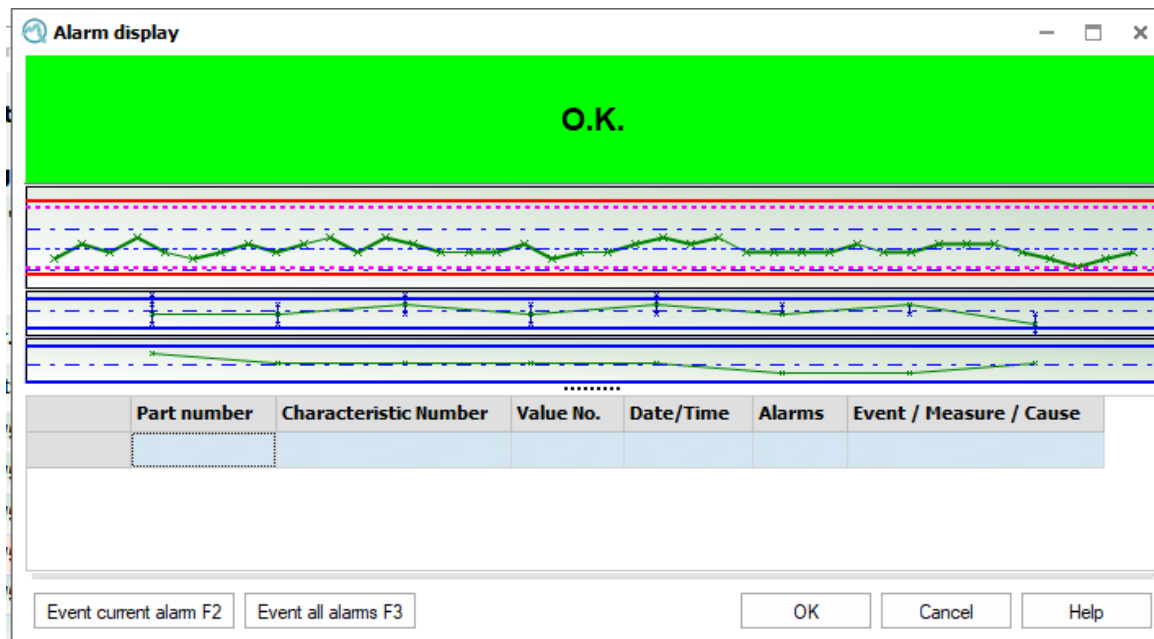
# Saved QCC

- Use the saved QCC to observe the limits saved at last of the last saved QCC.
- In case you want to delete a saved QCC, you apply the “Delete saved QCC” function under Graphics | Individual characteristic graphics | QCC | saved QCC. You have got the option to delete the saved QCC of the current characteristic or the saved control charts of all characteristics.



# Online QCC

- You apply the online QCC in order to detect alarms during the recording of data in O-QIS / procella. Depending on the settings adjusted in the evaluation strategy, an online QCC may be the last saved SPC QCC or a preliminary QCC. In case you do not use any QCC at all, the program does not record any alarms.

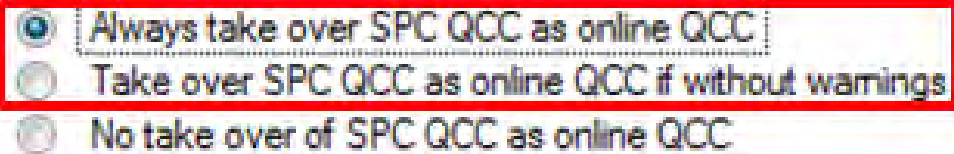




# Save options

---

- You options for saving control charts are restricted in O-QIS / procella. The save options in procella store the online QCC to the data set . You may change the respective online QCC by using the Modify online QCC or Input online QCC option under Graphics|QCC|Online QCC.
- You may also take over the SPC control charts after its calculation as an online QCC in O-QIS; however, you have to activate one of the following two radio buttons in the evaluation strategy .











- The control charts are only saved in case the Always save online QCC with data set save option is activated. The storage always applies to all characteristics. You cannot modify the QCC for a single characteristic in procella.

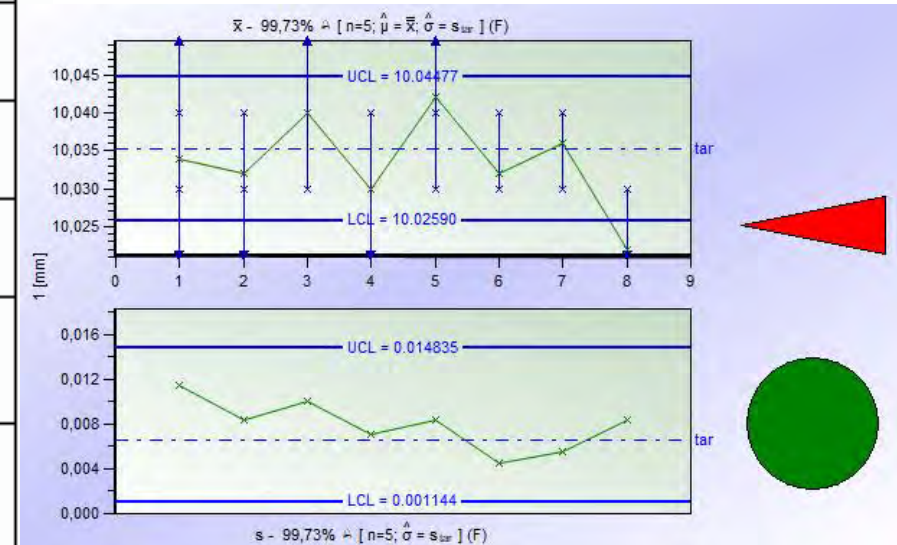
# Show control limits and individuals



Use this icon to show an additional process evaluation by means of symbols.

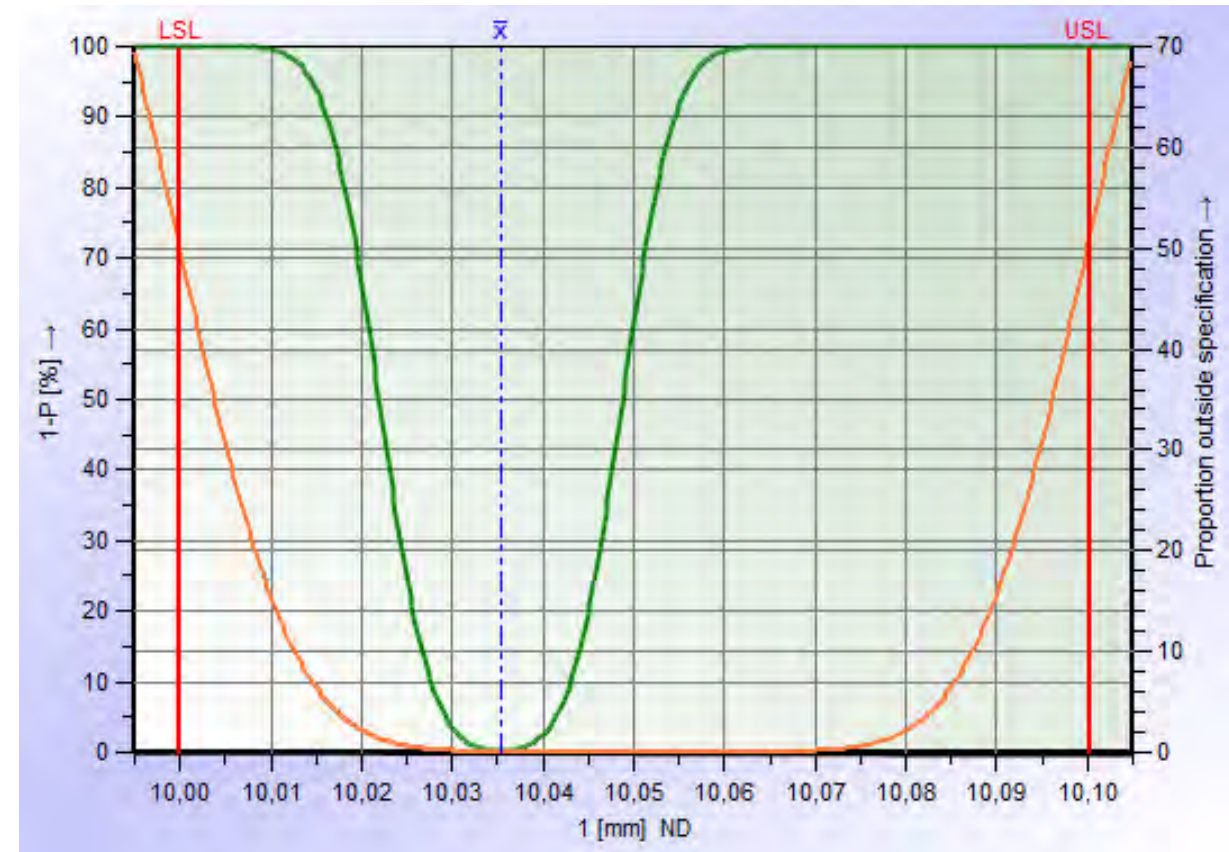
The following table explains the meaning of the single symbols.

	Process location/variation n.o.k. (red) or o.k. (green)
	Control limit violation caused by last subgroup
	Violation of specification limits caused by the values of the last subgroup
	Run above / below the centre line
	Downward trend
	Upward trend
	Middle third, less than 40% within the middle third
	Middle third, more than 90% within the middle third



# Operation characteristic

- You open the “Operation characteristic” graphic by selecting Graphics | Quality control chart | QCC or by selecting Graphics | Individual characteristic graphic | QCC. The operation characteristic helps to evaluate the sensitivity of a quality control chart.
- The x-axis serves as the values axis and, depending on the settings, the control probability  $1-P$  [%], the non-interference probability  $P$  [%] or the average running length is plotted on the y-axis.



# Average run length

**Shewhart Location**

**Non-interference probability**

99%

99,73%

User  %

**Display type**

Interference probability

Non-interference probability

Average running length (ARL)

Sample size

---

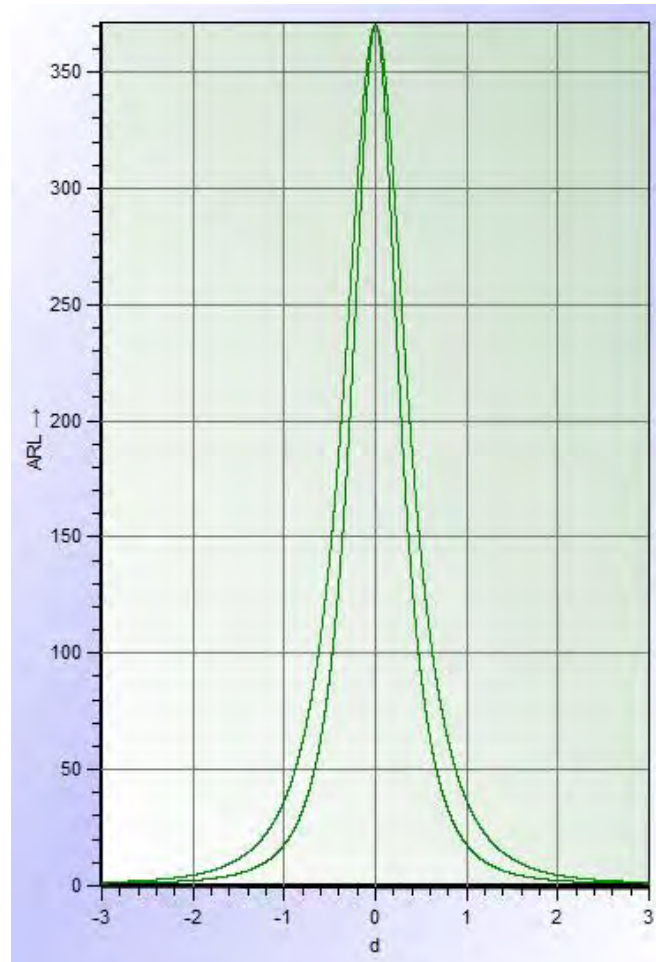
initial scale value

final scale value

**Location legend**

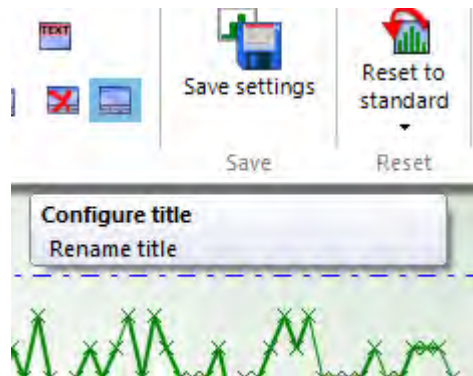
upper left       upper right

lower left       lower right



# Configuration of the measurement value logging

- Right click on the mouse or use "Setting/Configuration"
- You may also configure the testplan settings in the menu
- Change of the name

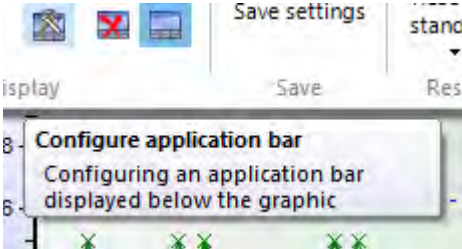


## Configuration of the logging sheet



# Configuration of the measurement value logging

- Configuration of the application bar
- You can define the content of buttons also with a graphic



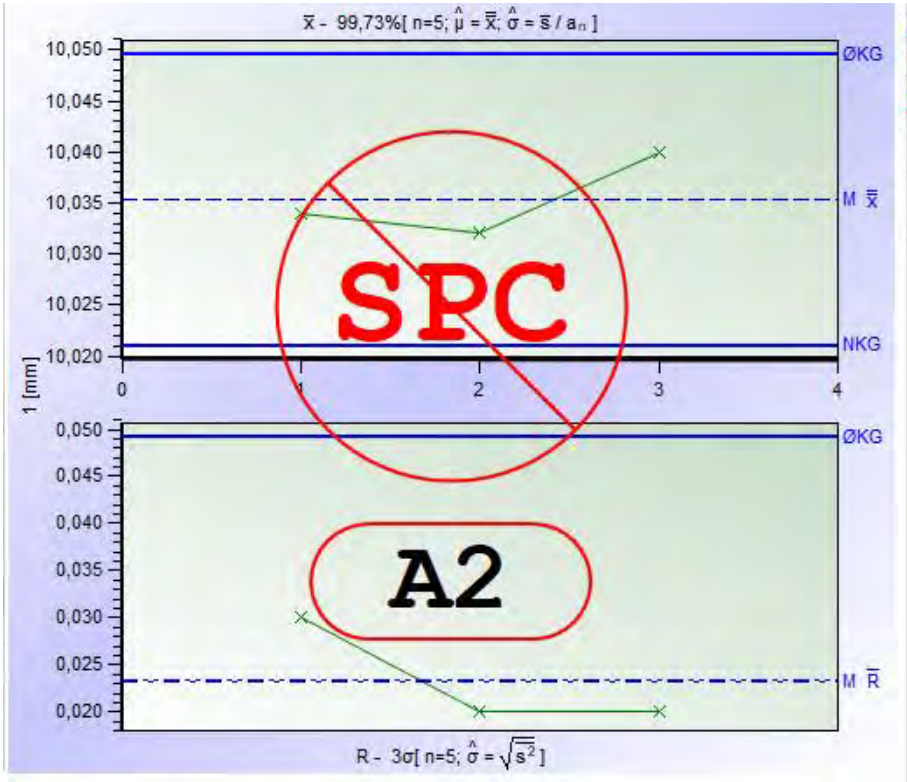
Define the window to the actual use  
 Save the window in the datafile/database

# Check of the SPC-chart

- You can check if the SPC-chart guarantee the requirements to the process (Cp).

**QCC warning messages**

- Potential Capability index
  - Upper Confidence limit < requirement
  - Value < requirement
  - Lower confidence level < requirement
- Critical capability index
  - Upper Confidence limit < requirement
  - Value < requirement
  - Lower confidence level < requirement
- Shewhart chart
  - Control limits larger than acceptance chart
  - Control limits outside tolerance limits
- Acceptance chart
  - Scope (UCL-LCL) < 99,73% Shewhart chart
  - Scope (UCL-LCL) < 99% Shewhart chart
  - Scope (UCL-LCL) <=0
- Location chart unstable
- Variation chart unstable



# Definition of the abbreviations

QCC warning messages

A	<input type="checkbox"/> Potential Capability index	
	<input type="radio"/> Upper Confidence limit < requirement	1
	<input type="radio"/> Value < requirement	2
	<input type="radio"/> Lower confidence level < requirement	3
B	<input type="checkbox"/> Critical capability index	
	<input type="radio"/> Upper Confidence limit < requirement	1
	<input type="radio"/> Value < requirement	2
	<input type="radio"/> Lower confidence level < requirement	3
C	<input type="checkbox"/> Shewhart chart	
	<input type="radio"/> Control limits larger than acceptance chart	1
	<input type="radio"/> Control limits outside tolerance limits	2
D	<input type="checkbox"/> Acceptance chart	
	<input type="radio"/> Scope (UCL-LCL) < 99.73% Shewhart chart	1
	<input type="radio"/> Scope (UCL-LCL) < 99% Shewhart chart	2
	<input type="radio"/> Scope (UCL-LCL) <=0	3
E	<input type="checkbox"/> Location chart unstable	
F	<input type="checkbox"/> Variation chart unstable	

Example based on the warning message displayed in the graphic above:

- A2 = Warning when the calculated Cp value is less than the required Cp value.
- B2 = Warning when the calculated Cpk value is less than the required Cpk value.
- D3 = The scope between UCL and LCL is equal or less than 0.
- E = Location chart is not stable.



A close-up photograph of a microscope's objective lens, labeled '25-1', positioned above a cylindrical metal part. The scene is overlaid with a semi-transparent blue filter. The text 'Configuration of upload program' is centered in white over this filter.

# Configuration of upload program

# Next meeting

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February

