

INNOVATION and TRADITION

MESAS Quality management systems do not only provide a variety of Vers.ard functions capable to solve most problems of quality management, but also a number of flexible tools enabling you to create special solutions by yourself. And if this is even not enough, our team of highly qualified programming and application engineers will elaborate your individual solution. Take the chance to profit by our expertise as a hard- and software system provider.

- MESAS MQMD Software for Microsoft **Windows** is the innovative consecution of MESAS Software operating successfully on DOS systems for over 10 years.
- Traditionally **easy handling** due to
 - transparent menu structure
 - online assistance
 - catalogue functions
- **Centralized or decentralized data management**
- interfaces to existing MESAS SPC systems operating under DOS
- **Data export to external software** like Q-DAS qs-STAT or Microsoft Excel
- Open **Client/Server** architecture
- **Static and dynamic** measuring routines
- **Easy programming editor** for assignment of measuring inputs to their respective characteristics, for definition of mathematical or logical relations between measuring inputs, for measurement control and operator instruction
- **Tool correction programming**
- **Drivers for various types of measuring equipment** (transducers digital measuring equipment, incremental probes, pneumatic probes, digital measuring equipment etc.)
- **Comprehensive reporting system** for quality documentation - adoptable to your requirements
- Planning and realization of your **Quality Management Network**

Check list specification and management

- For simple check lists or complex applications
- Flexible programming of measuring control for static and dynamic measuring tasks

Header:
Part related data like part no. or part name etc.

Inspection steps:
Parameters for inspection and calibration, inspection intervals and frequency, conditions for operator intervenience, etc.

Characteristics:
Specification of nominals, tolerances, warning- and control limits etc.

MQMD Measuring

The software can be operated by means of a Vers.ard ASCII-keyboard or by the industrial MESAS operator panel.

Measurement displays

- Column display
- Part picture
- Alpha-numerical listing
- chronol. listing of individual measurements
- Quality Control Charts
- Multiple Quality Control Charts
- or combinations of the above displays

Measurement results are coloured differently depending on their quality:

- G**: OK
- N**: Rework
- A**: Scrap
- W**: Violation of warning limits

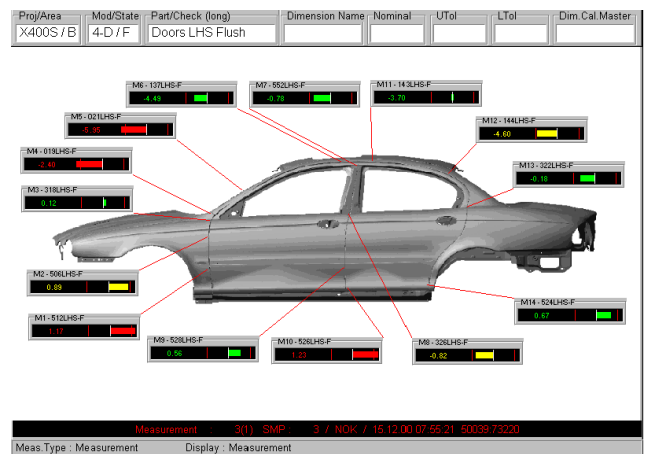
The sample result shows up automatically at the end of a sample.

Online messages indicate special events like Run, Trend, Middle Third

Ongoing calculation of control limits and capability indices (cp, cpk)

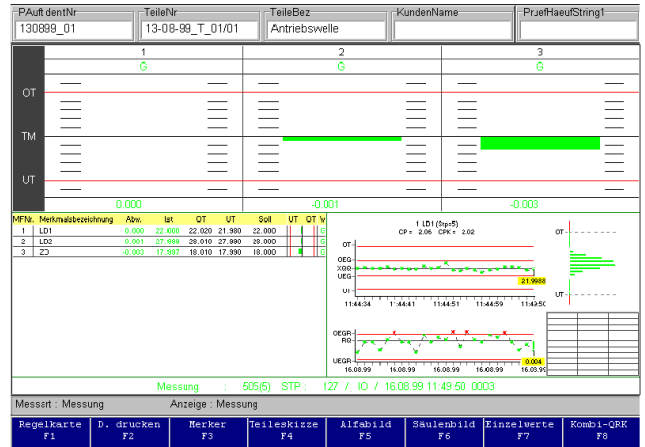
The display on the right shows a combination of alphanumeric listing with column display and zoomed value of the selected characteristic.

| OrderIdentNo | PartLbl | DrawingNo | OperationName | CharLabelShort | | | |
|---|----------------------------|-----------------|----------------|----------------|------------|--------------|--------------|
| 0 | linder head S63 / Zyl. 1-4 | 1 407 003 Z-012 | | Diameter bore | | | |
| 1 | 2 | 6 | 41 | 42 | 43 | 44 | |
| G | G | G | G | G | G | G | |
| UT | | | | | | | |
| TM | | | | | | | |
| LT | | | | | | | |
| 0.904 1.893 0.0 189.971 189.990 189.976 189.973 | | | | | | | |
| Measurement: 246(1) SMP 50 / OK / 04.03.99 03:01:44 | | | | | | | |
| Meas.Type: Measurement Display: Measurement | | | | | | | |
| QCC F1 | PrintScreen F2 | ActionFlag F3 | Part sketch F4 | AlphaScreen F5 | Columns F6 | Originals F7 | Combi-QCC F8 |



| OrderIdentNo | PartLbl | DrawingNo | OperationName | CharLabelShort | | | | | | |
|---|----------------------------|-----------------|----------------|----------------|------------|--------------|--------------|----|----|----------------------------------|
| 0 | linder head S63 / Zyl. 1-4 | 1 407 003 Z-012 | | Diameter bore | | | | | | |
| CharNo | CharactLabel | Dev. | Act. | UT | LT | Nom | LT | UT | WT | SMP for charact. "Diameter bore" |
| 1 | Diameter bore | -0.056 | 0.904 | 1.000 | -1.000 | 1.000 | | | | CharType: Variable 0.904 |
| 2 | Depth bore | -0.107 | 1.893 | 1.000 | -1.000 | 2.000 | | | | CharType: Variable |
| 6 | Surface properties | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | | | | Smp-No.: 50 |
| 41 | Zentf -Du -V- | -0.029 | 189.971 | 0.000 | -0.029 | 190.000 | | | | Smp-Size: 5 |
| 42 | Zentf -Du -Z- | -0.010 | 189.990 | 0.000 | -0.029 | 190.000 | | | | Quantity: 1 |
| 43 | Zentf -Du -Xupper | -0.024 | 189.976 | 0.000 | -0.029 | 190.000 | | | | Xbar: 0.9040 |
| 44 | Zentf -Du -Xupper | -0.027 | 189.973 | 0.000 | -0.029 | 190.000 | | | | S: 0.00000 |
| | | | | | | | | | | Min: 0.904 |
| | | | | | | | | | | Max: 0.904 |
| | | | | | | | | | | Range: 0.000 |
| 0.904 | | | | | | | | | | |
| Measurement: 246(1) SMP 50 / OK / 04.03.99 03:01:44 | | | | | | | | | | |
| Meas.Type: Measurement Display: Measurement | | | | | | | | | | |
| QCC F1 | PrintScreen F2 | ActionFlag F3 | Part sketch F4 | AlphaScreen F5 | Columns F6 | Originals F7 | Combi-QCC F8 | | | |

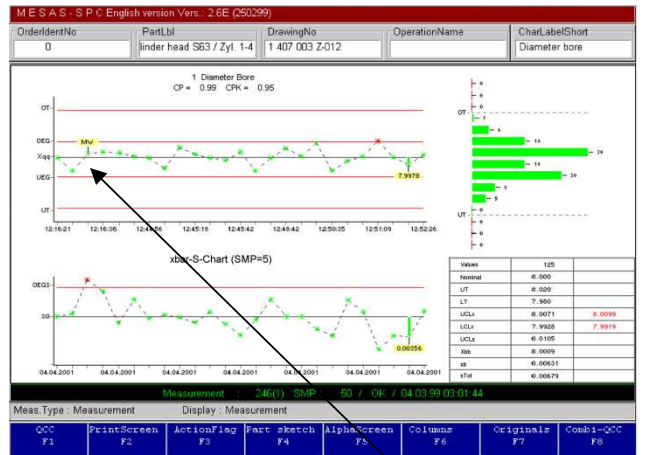
The displays can be combined individually.
The display on the right shows a combination of columns, alphanumeric listing and quality control chart.



Quality control charts for online evaluation of the production process

- Vers.ard Xbar-/ S-chart with histogram based on the last 25 samples
- Xbar-/ S-chart based on alternating groups of samples
- Xbar-/ R-chart over the last 25 samples
- Xbar-/ Rr-chart (moving range) over the last 100 measurements
- C-chart for attribute characteristics
- Individuals chart over the last 100 measurements

Action flags can be added to the quality control chart to mark special events like tool change, faulty measurement etc.

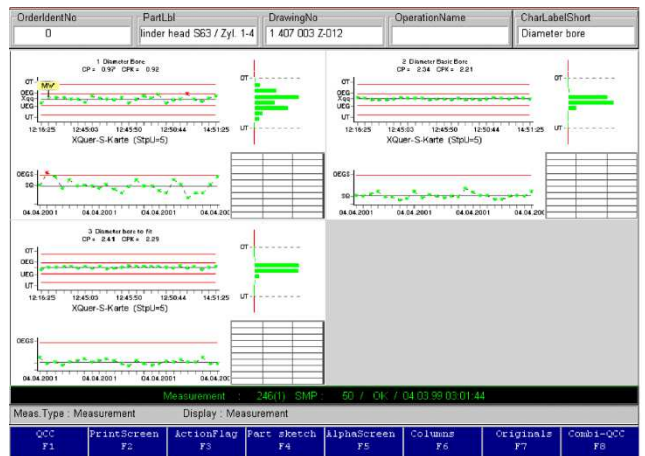


X-bar/s-chart with action flag (sample 3)

Multi-QCC:

- up to 4 quality control charts or
- up to 9 x-bar charts

Displayed on the screen at the same time.



MQMD Long Term Evaluation

MQMD Long Term Evaluation is a program for statistical evaluation, visualisation and reporting of measuring data gathered by MESAS MQMD for Windows and MESAS SPC for DOS.

Evaluation based on IATF 16949 or customer request:

- Preliminary process capability
- Process capability
- Measurement evaluation

Automatic or manual selection of distribution check method:
e.g. Normal-, Log-Normal-, Weibull, Rayleigh-, Folded distribution etc.

- Filter criteria for selection of measurements:
parts, characteristics, evaluation period, serial numbers, operators, machines etc.
- Choice of indices for variation and position
- Choice of quality control charts
- Calculation of control limits and process capability indices
- Automatic elimination of outliers
- Facility to highlight and/or exclude individual samples from evaluation

Diagrams on screen and printer

| | |
|--------------------------------|--|
| Pareto Analysis | Share of faulty characteristics |
| Histogram | Variable number of classes |
| Attribute chart | Fault index p/np or cu for attribute characteristics |
| Sample chart | Alphanumeric listing of samples |
| Multi-individuals-chart | Individuals chart for several characteristics in one diagram |
| Vers.ard quality control chart | Xbar- / s-chart or X-bar- / R-chart |
| Multi- quality control chart | 4-12 quality control charts on the screen at the same time |
| Moving quality control chart | Calculations are not based on fixed samples but on alternating groups of samples |
| Serial numbers | Simple individuals chart with serial number and operator |
| Overview | Up to 15 characteristics with alphanumeric information and histogram |

The screenshots display various quality control reports for 'MOTORENWERK FÄHIGKEIT'. The reports include:

- Pareto Analysis:** Shows the share of faulty characteristics.
- Histogram:** Shows the variable number of classes.
- Attribute chart:** Shows the fault index p/np or cu for attribute characteristics.
- Sample chart:** Shows the alphanumeric listing of samples.
- Multi-individuals-chart:** Shows the individuals chart for several characteristics in one diagram.
- Vers.ard quality control chart:** Shows the Xbar- / s-chart or X-bar- / R-chart.
- Multi- quality control chart:** Shows 4-12 quality control charts on the screen at the same time.
- Moving quality control chart:** Shows calculations are not based on fixed samples but on alternating groups of samples.
- Serial numbers:** Shows a simple individuals chart with serial number and operator.
- Overview:** Shows up to 15 characteristics with alphanumeric information and histogram.

The detailed report titled 'ANALYSE der Prozessfähigkeit' includes the following data:

Die Berechnung setzt eine Einlagigkeit 1. Art voraus
Offset = 0,00200

| Obere Toleranz | Untere Toleranz | Mittelwert | Streumaß |
|----------------|-----------------|------------|----------|
| OT | 0,04000 | 0,03000 | 0,00928 |

Errechnetes Maximum: 0,03790
Errechnetes Minimum: -0,06333
Sigma Däch: 0,00647

Fähigkeitsindex: 1,35603
Zentr. Fähigkeitindex: 1,47773
Ergebnis: Prozessfähig

! Der Prozess ist stabil!
! Der Analyse liegen weniger als 1000 Werte zugrunde!

Eingriffsgrenzen für X - quer: 0,01672
Kerfgriffsgrenzen für S: 0,01168

25 Bez. o: 0,01672
25 Bez. u: 0,01168

Datum: Donnerstag, den 10.02.1994
Stunde erstellt von: MESAS GmbH

All reports can be customized, e.g. by adding your company sign.

MQMD Master Data

Master data are global, program wide data, which are not subject to many changes, once they have been entered (e.g. parts- and characteristics data, suppliers, machines etc.). Master data are the base for catalogue assisted working with check lists and inspection orders.

Defining master data is useful, if you intend to centralize and evaluate your quality data within a superior or company-wide system (e.g. quality network).

The cataloguing and uniqueness of the master data allows an unambiguous assignment of the collected inspection data.

The master data management software provides a variety of catalogue criteria. Which ones you actually use, is depending on your company requirements.

Special Solutions

- On screen visualisation for operator guidance
- Classification
- Dynamic gear checks
- Fast Fourier (FFT)
- Roundness check (MZC)
- Camber and ovality check (BOP)

