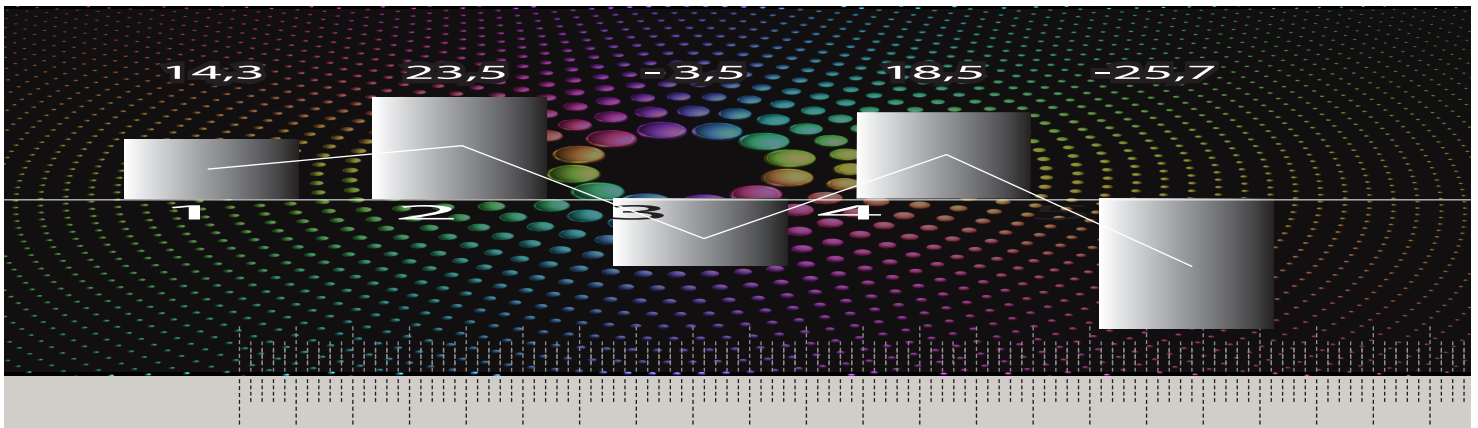




MRA Measuring Computer



MRA Compact



MRA / MRA COMPACT

MRA / MRA COMPACT

Hardware Description

Adaptable with modules, there are 2 different hardware versions available: MRA and MRA-Compact.

Measuring Computer MRA

The measuring computer MRA is a touchscreen panel computer with decentralized measurement recording. The measurement recording is done either with the USB or Ethernet ports. There are digital traces for orbit interface (Solarton) available and can be directly attached to the USB interface. Digital transducers can also be attached such as the DPW or DSPW.



Measuring Computer MRA-Compact

The measuring computer MRA-Compact is enclosed in a sheet metal housing and has a touchscreen computer with integrated recording of the measurements. There are snap in modules for pneumatic or (LVDT) electronic measuring. The system has 4 bays for these modules. Standard interfaces include COM1, COM2, Ethernet, USB, and 2 WT connections. In addition, the MRA-Compact can be expanded with additional interfaces such as Digital I/O's, Profibus, etc.



Measurement Programming

The creation of a measurement program is accessible after entering a password. Four different password levels exist to allow for various levels of access. You can copy, delete, or edit the programs depending on your level of access. It is possible to use an existing program, copy it, then edit it for a very quick way of creating a new program. All necessary functions for manual measuring or automated applications are present. The menus are structured for easy access to the program definitions.

The key links are supported with a wide range of functions and mathematical calculations. They can be configured with different options.

An example of the parameters:

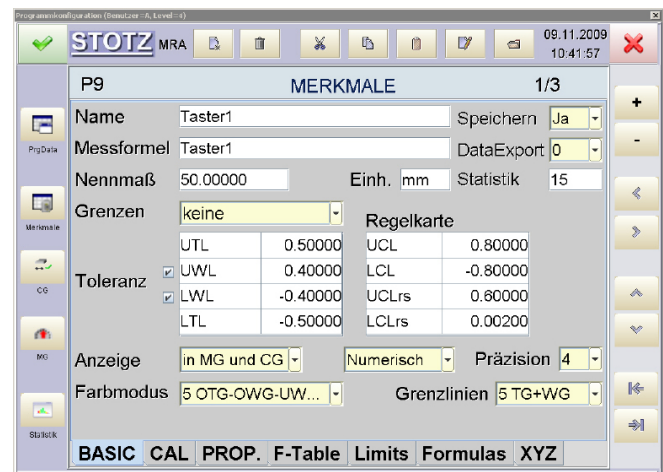
- Tolerance limits, warning limits and action limits
- Determining the display resolution
- Type of Measurement
- Type of Calibration
- Definition of Statistics
- Definition of I/O level

A measurement plan can be created easily and quickly.

Measurement Plan / Menu Selection (display below also available in English)

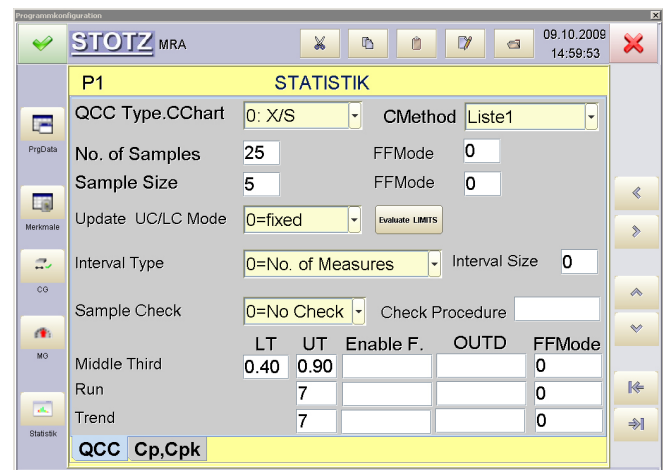


Measurement Plan / Features (display below also available in English)



To evaluate the measurement data, data can be output in dfq in accordance to the format and interfaces via Ethernet.

Measurement Plan / Statistics (display below also available in English)

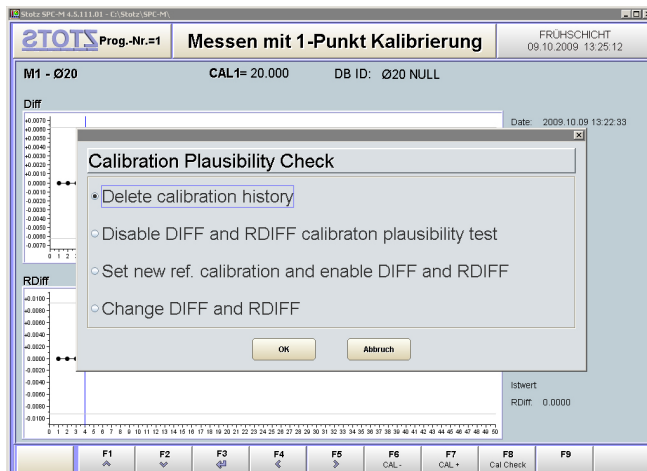


Calibration

The calibration is prepared for the diverse requirements. Individual masters can be assigned to the different measuring groups. If appropriate, a master can be used for several workpiece types in different measuring groups.

With multi-point calibration, you may have up to four calibration points carried out. This can improve the sensor linearity.

Selection of calibration settings (display below also available in English)

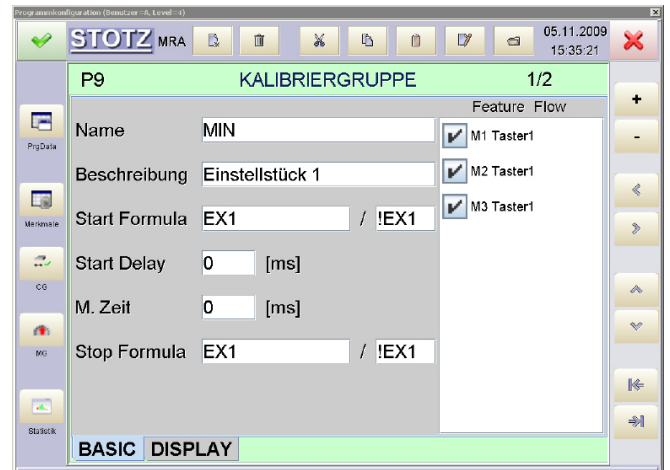


The calibration history is displayed for the master. Plausibility can be set to warn of an out of tolerance calibration and will stop the calibration from occurring.

Calibration for 1-Point calibration (single master) display available in English

| ID | Merkmal | Istwert | DIFF | RDIFF | CAL1 | CALM ID |
|----|------------|---------|--------|--------|--------|----------|
| 1 | Ø20 | 19.996 | -0.004 | -0.004 | 20.000 | Ø20 NULL |
| 2 | Ø10 | 10.000 | 0.000 | 0.000 | 10.000 | Ø20 NULL |
| 3 | Ø15 | 15.001 | 0.001 | 0.001 | 15.000 | Ø20 NULL |
| 4 | Ø3 | 3.006 | 0.006 | 0.006 | 3.000 | Ø20 NULL |
| 5 | Abstand 13 | 13.006 | 0.006 | 0.006 | 13.000 | Ø20 NULL |
| 6 | Abstand XX | 5.486 | -0.004 | -0.004 | 5.490 | Ø20 NULL |

Calibration overview of the past calibrations (display also available in English)



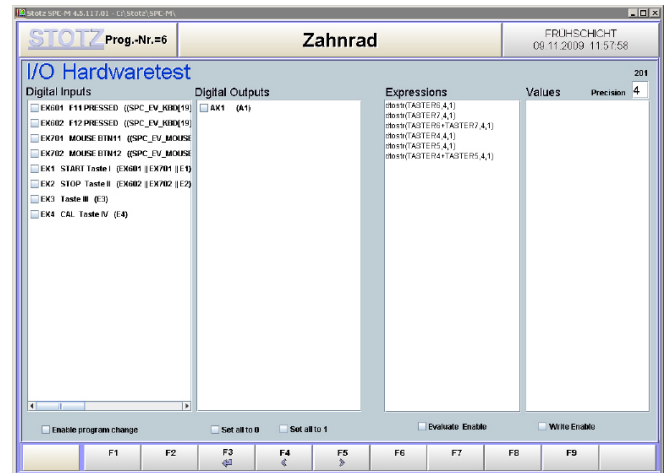
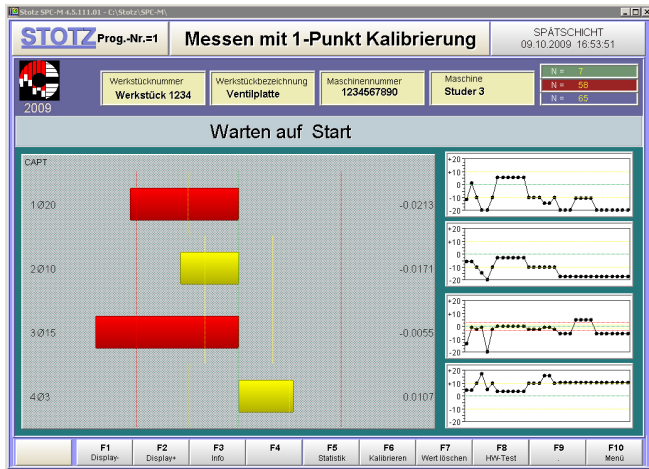
Simple assignment of the master dimensions to the appropriate measuring points. The organization of the masters is made in a catalog.

Advanced Features

The software concept allows for each application to have the appropriate solution. For special needs, the program designer (PD) can be programmed with special applications. Since the possibilities are very extensive, we offer multi-day training. Alternatively we can provide you the solution through our application team.

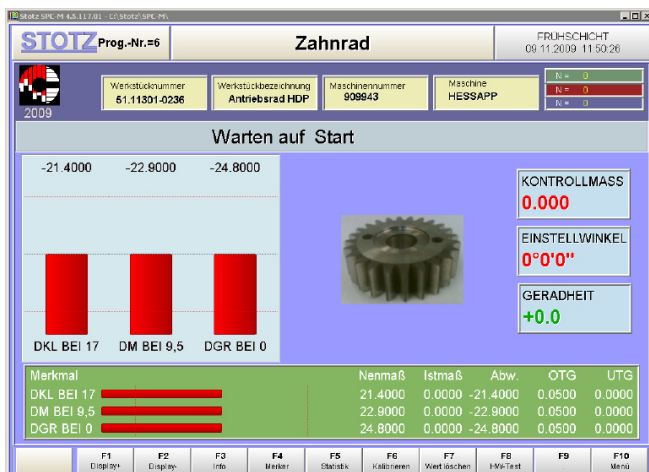
The mode settings for hardware test and diagnosis of the signals are very helpful. Additionally you can set the in-and outputs, so a quick connection with an interface for automation is possible.

Hardware test



A feature display with integrated workpiece image is shown and if necessary, with sequential testing procedures, the corresponding feature on the workpiece image is possible.

Online- Workpiece picture with Feature display (display available in English)



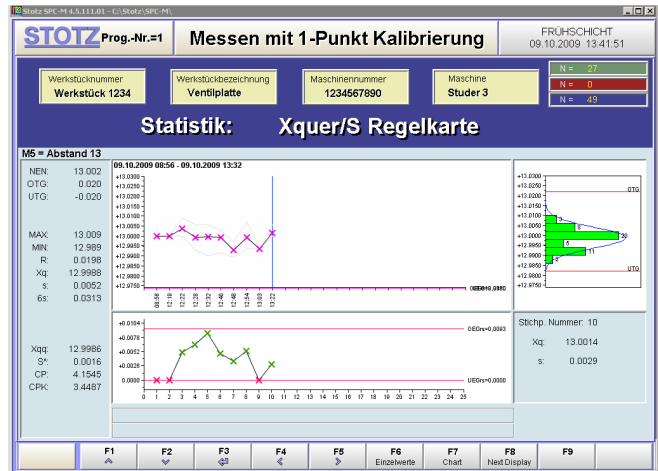
Statistics

For process control and monitoring of various statistical analysis functions with the appropriate graphical and numerical displays. The configuration of the evaluation can be made when creating the measuring plan or at a later date. The following functions are available: :

- Control chart \bar{x} / S , \bar{x} bar / R , \bar{X} ~ / R with histogram with single values or a sample display
- Values graphically or numerically
- Measurement Counters
- Pareto
- Histogram

Events can be specified to the measured values in catalogs and be assigned with the occurrence.

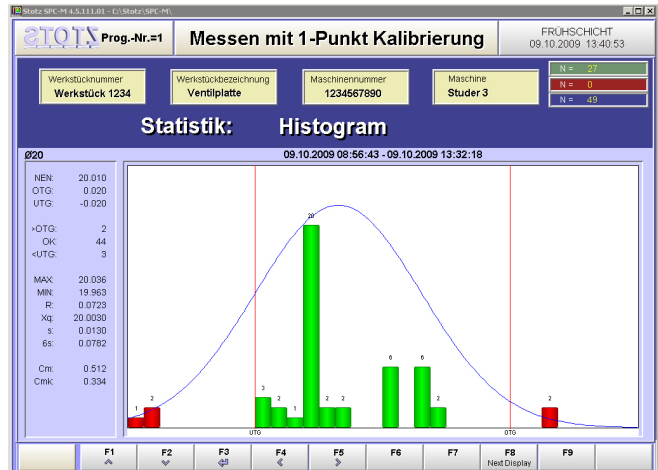
Histogram (display below also available in English)



Counter module (display below also available in English)

| ID | Name | UTGn | OKn | OTGn | UTG% | OK% | OTG% |
|----|-----------------|------|-----|------|-------|--------|-------|
| 3 | Ø15 | 6 | 39 | 4 | 12.24 | 79.59 | 8.16 |
| 4 | Ø3 | 0 | 47 | 2 | 0.00 | 95.92 | 4.08 |
| 5 | Abstand 13 | 0 | 49 | 0 | 0.00 | 100.00 | 0.00 |
| 6 | Abstand XX | 0 | 31 | 18 | 0.00 | 63.27 | 36.73 |
| 7 | Durchmesser | 0 | 43 | 6 | 0.00 | 87.76 | 12.24 |
| 8 | Abstand 6,5 | 0 | 36 | 13 | 0.00 | 73.47 | 26.53 |
| 9 | Abstand 13,1 | 0 | 33 | 16 | 0.00 | 67.35 | 32.65 |
| 10 | Durchmesser 100 | 7 | 21 | 21 | 14.29 | 42.86 | 42.86 |
| 11 | Abstand XX | 0 | 36 | 13 | 0.00 | 73.47 | 26.53 |
| 12 | Durchmesser 30 | 2 | 43 | 4 | 4.08 | 87.76 | 8.16 |
| 13 | Abstand XX | 0 | 30 | 19 | 0.00 | 61.22 | 38.78 |
| 14 | Abstand 15,6 | 1 | 27 | 21 | 2.04 | 55.10 | 42.86 |
| 15 | Abstand 5,2 | 0 | 35 | 14 | 0.00 | 71.43 | 28.57 |
| 16 | Abstand 3,49 | 0 | 27 | 22 | 0.00 | 55.10 | 44.90 |
| 17 | Abstand 3,1 | 0 | 27 | 22 | 0.00 | 55.10 | 44.90 |

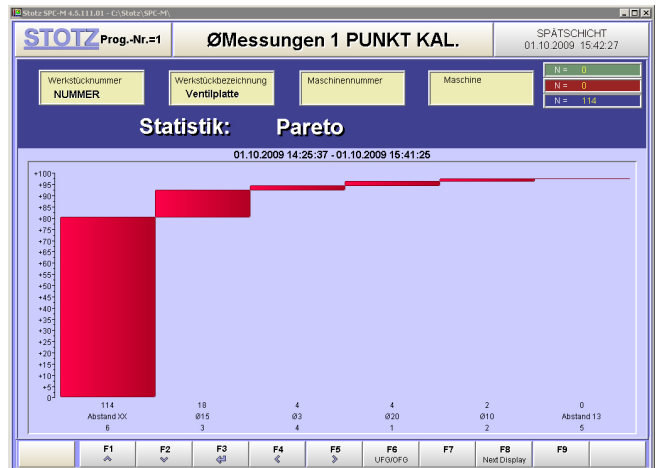
Histogram with feature values (display below also available in English)



Numerical measured values (display below also available in English)

| | 09.10.2009 08:56:43 | 13.0000 | 28 | 12.40:12 | 12.992 |
|----|---------------------|---------|----|----------|--------|
| 1 | 09.56:43 | 13.0000 | 28 | 12.40:12 | 12.992 |
| 2 | 12.17:01 | 13.0000 | 27 | 12.46:28 | 13.001 |
| 3 | 12.17:06 | 13.0000 | 28 | 12.47:08 | 13.003 |
| 4 | 12.17:13 | 13.0000 | 29 | 12.47:53 | 13.003 |
| 5 | 12.17:15 | 13.0000 | 30 | 12.48:25 | 12.997 |
| 6 | 12.18:28 | 13.0000 | 31 | 12.48:27 | 12.997 |
| 7 | 12.19:30 | 13.0000 | 32 | 12.52:02 | 12.989 |
| 8 | 12.19:48 | 13.0000 | 33 | 12.52:04 | 12.989 |
| 9 | 12.19:47 | 13.0000 | 34 | 12.52:40 | 12.994 |
| 10 | 12.19:50 | 13.0000 | 35 | 12.54:41 | 12.984 |
| 11 | 12.22:10 | 13.0000 | 36 | 12.54:51 | 13.000 |
| 12 | 12.22:28 | 13.0000 | 37 | 12.55:44 | 13.007 |
| 13 | 12.23:44 | 13.0000 | 38 | 12.56:34 | 12.995 |
| 14 | 12.23:46 | 13.0000 | 39 | 12.56:44 | 13.000 |
| 15 | 12.28:15 | 13.0000 | 40 | 13.03:40 | 12.994 |
| 16 | 12.28:18 | 13.0000 | 41 | 13.03:43 | 12.994 |
| 17 | 12.29:04 | 12.9993 | 42 | 13.03:45 | 12.994 |
| 18 | 12.31:08 | 12.9993 | 43 | 13.03:46 | 12.994 |
| 19 | 12.31:48 | 13.0006 | 44 | 13.09:55 | 12.994 |
| 20 | 12.31:54 | 13.0006 | 45 | 13.09:56 | 12.994 |
| 21 | 12.32:39 | 13.0006 | 46 | 13.22:16 | 13.000 |
| 22 | 12.32:57 | 13.0006 | 47 | 13.22:24 | 13.000 |
| 23 | 12.36:06 | 13.0006 | 48 | 13.22:31 | 13.000 |
| 24 | 12.36:51 | 12.9980 | 49 | 13.32:18 | 13.006 |
| 25 | 12.36:54 | 12.9990 | | | |

Pareto diagram (display below also available in English)



Graphical display of measured values

Software- Summary

For each application, the Stotz-MRA is adaptable for the optimum design for many situations. The customer-specific design with modular construction guarantees an excellent price / performance ratio. The rugged design allows for continuous operation in an industrial environment.

The modular design allows for future tasks to be added and allow for a return on the investment.

The system can be used at both small and large manufacturing facilities. The system can expand its capabilities as the requirements grow.

Measurement concept will be adapted accordingly.

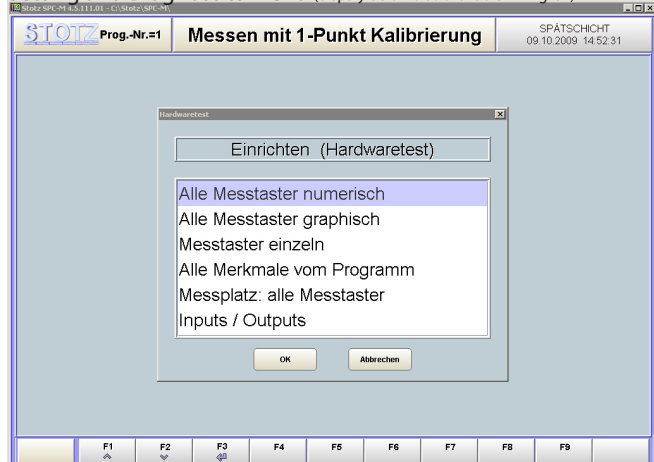
The software also meets extreme requirements regarding the calculation and presentation of the data. It is designed as a platform for various applications in data acquisition and the display can be customized to requirement. Ease of use with great functionality has been the goal of this software.

Easy-to medium inspection plans can be created without any programming environment, so additional program or adaptations to existing plans are very easy.

For more functionality, we have a tiered approach with program designers and application software -Lite, Standard and Advanced are available. This takes into account how involved you want to get into the programming details.

A tool for all systems: This software is used throughout the product line for all programmable STOTZ systems.

Setting and Diagnostics menu (display below also available in English)



Horizontal bar line display with numeric data (also available in English)



Horizontal bar line display with numeric data (also available in English)



For start-up or test measurements (display below also available in English)



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