

CmController 9



The CmC 9 is the latest addition to the proven CmController lineup, a universal measuring system for determining the positioning accuracy of SMT systems. When designing the CmC 9, the focus was on increasing the measuring speed while simultaneously improving the measuring accuracy. A further development focus was placed on improving the operating concept. The use of the CmC 9 makes it possible to analyze and optimize the accuracy behavior of the production process and to detect the causes of errors at an early stage. The expert level enables the experienced user to handle even more extensive inspection tasks. The system consists of the components listed below.

Base Unit

Dimensions (LxWxH): ca. 746 x 675 x 1510 mm

Operating height: 1150 mm

Weight: approx. 185 kg

Three-axis gantry system

340 x 300 x 5 mm

Extendable universal measuring plate holder for measuring plates up to 340 x 240 mm

Camera system with telecentric optics and an image field size of 6 x 5 mm

Transmitted light illumination

Wheel system

Vision Software CmCVis2

- Vision software for performing the measurement
- Highly accurate and robust correlation algorithms
 - Improved angle measurement on chip components
 - Increased measurement speed for test plans with cluster layouts

Measurement Capability

The measuring accuracy is checked with a calibrated measuring plate of type MPL00 based on IPC 9850, which fulfils the requirements mentioned there regarding measuring instrument capability and reproducibility for the following process limits to be verified.

| Measuring task | Suitable Process Limits | |
|---|-------------------------|--------------------|
| | x/y [μm] | theta [$^\circ$] |
| TQFP100 | 10 | 0.07 |
| 0603 Chip Single Measurement ² | 25 | 1.5 |
| 0603 Chip Quadruple Measurement ³ | 20 | 1.00 |
| SOIC16 | 25 | 3.00 |



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Statistical Software CmCStat6.0 Expert

Used for planning, analysis and archiving of measurements.

Suitable for determining the positioning accuracy of the following SMT systems:

- Placement
- Screen Printer
- Dispensers
- Laser Labeling Systems
- Routers

Guaranteed traceability of measurement results through documentation of the lines and machine configuration in a database

Individual test plan design with regular or free arrangement of the test points

Cluster layouts with multiple chip components in one measurement window to increase the measurement speed

Testing of individual machines or simultaneous testing of several machines in the same line with the same range of components and the same specification

Use of real and ideal SMT components¹ or glass dummies

IPC 9850 compatible test plans

Consideration of different head/nozzle/camera configurations for test planning and evaluation

Assistance in finding the causes of deviations

- Grouping of measured values with regard to affiliation e.g. to certain heads
- Extensive graphical representation of measured values
- Trend analyses

Simulation of corrections

Calculation of capability parameters according to the percentile method

Support of different distribution models

Easy creation of test reports in PDF format

Export of measured values as CSV and DFQ

Measuring Speed

The measuring speed depends largely on the underlying test layout. For this reason, the following information refers to the measurement with the MPL00, which is also used to prove the measuring instrument capability. For the test the vision software CmCVis2 is started and the measuring plate zero point is defined.

| Test Plan | Procedure | Number of components | Measuring points in FOV ⁴ | Measuring Time [min:sec] |
|--------------|--|----------------------|--------------------------------------|--------------------------|
| TQFP100 | Quadruple measurement | 12 | 1 | < 1:45 |
| Chip Cluster | Quadruple measurement (Wide-Field-of-View) | 128 | 16 | < 0:45 |
| Theta Chip | Quadruple measurement (Wide-Field-of-View) | 56 | 1 | < 1:45 |
| Theta Chip | Quadruple measurement (Narrow-Field-of-View) | 56 | 1 | < 3:10 |

¹ Pin geometry needs to match the glass board

² Locating via one reference point

³ Locating via four reference points

⁴ Field of View



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