FormControl
MEASUREMENT SOFTWARE FOR
PRODUCTION MONITORING

BLUM
focus on productivity

MEASUREMENT BY MOUSE CLICK.

THAT'S HOW EASY WORKPIECE INSPECTION IN THE MACHINING CENTRE IS WITH THE HELP OF FORMCONTROL MEASUREMENT SOFTWARE.

It makes no difference whether the workpiece has a freeform surface or standard geometry.
The user is alerted to machining errors during the process, so reworking can be carried out using the original clamping setup. Production is simplified and accelerated, and transport and storage times between the machining centre and the measuring machine are reduced or even avoided completely.

MORE MANUFACTURING RELIABILITY AND PRODUCTIVITY!

– Fast checking of machining in 3 and 5-axis machines

– No delays, as immediate reworking possible

– Early detection of rejects by means of measurement checks between machining steps

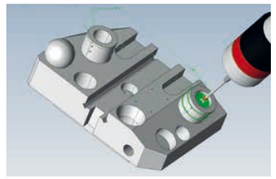
– High process reliability through real-time production monitoring

– Avoids unnecessary storage, set-up and waiting times

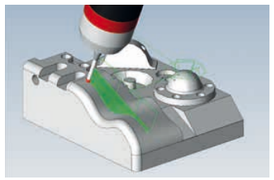
– Reporting and documentation of final quality

– Use of existing 3D data by supporting the most common CAD interfaces

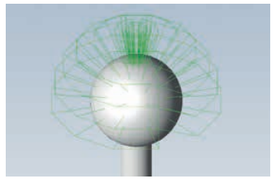
– Automation option: Automatic execution of multiple measurement jobs without operator intervention



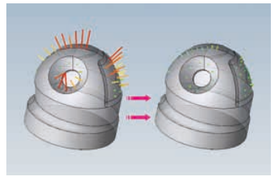
Measuring & evaluation of standard geometries: 3 and 5 axis



Measuring & evaluation of free-form surfaces: 3 and 5 axis

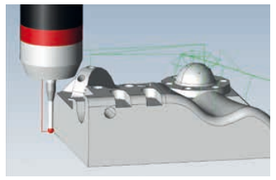


Time saved: One-off calibration



Correction of clamping errors through integrated alignment function

Informative measurement protocols



FormControl collision monitoring – prevents damage

Software FormControl

- Contour Measurement
- Diameter Measurement
- Position Measurement
- Roundness Measurement
- Cylindricity Measurement
- Concentricity Measurement
- Workpiece Inspection
- Distance Measurement
- Angle Measurement
- Reference/Chain Dimensioning

EARLY RECOGNITION OF ERRORS

– CLAMPING ERRORS

– INCORRECT MILLING PARAMETERS

– INCORRECT TOOL DIMENSIONS

– INCORRECT TOOL ORIENTATION

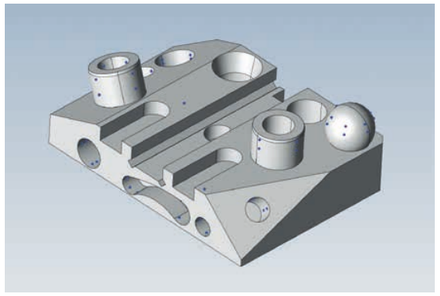
– TOOL WEAR

– THERMAL MACHINE DRIFT

WORKING WITH FORMCONTROL

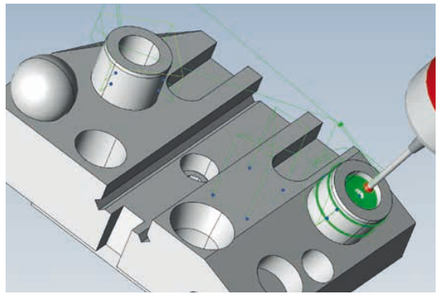
STEP BY STEP TOWARDS GREATER PRECISION

Step 1: Project configuration



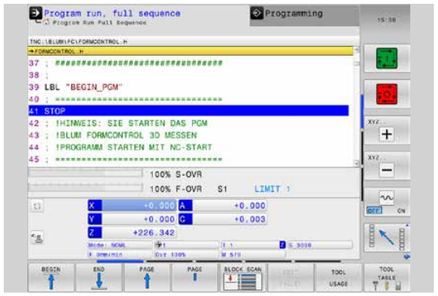
Transfer of surface data from the CAD/CAM system to FormControl. Definition of the measurement points by mouse click.

Step 2: Project optimisation



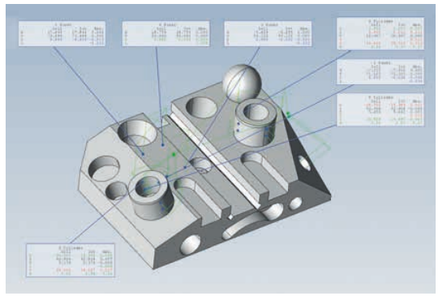
Measurement points can be shifted on the basis of their coordinates. Probe paths are computed and displayed automatically. Reliable collision monitoring on the PC.

Step 3: Measurement in the machine



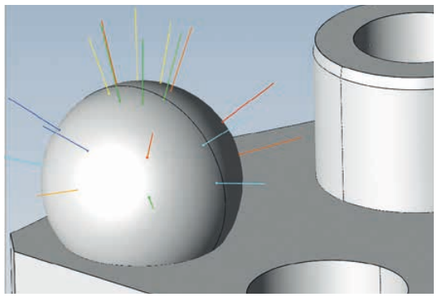
The NC program is created and sent to the machine control via ADIF, then the measurement procedure starts.

Step 4: Feedback and display of results



Measurement results are reported automatically via ADIF. Individual display of measurement values.

Step 5: Evaluation

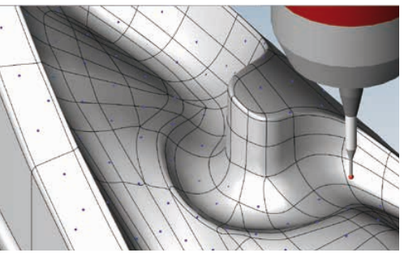


Large numbers of measurement points can optionally be displayed using needle pointers or coloured points.
Departure from tolerances can easily be detected.

Step 6: Measurement protocol

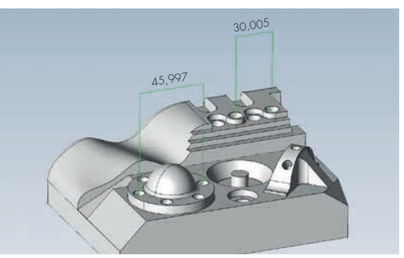
A measurement protocol is issued in tabular form.
Measurement values can be exported in CSV format.
Workpiece views and company logo are freely selectable.

FEATURES & FUNCTIONS
INTUITIVE & TIME SAVING



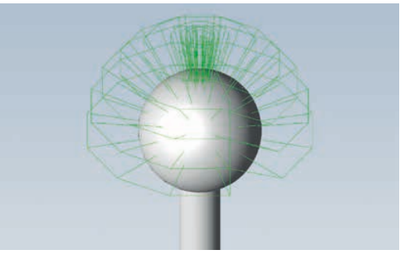
MEASUREMENT AND EVALUATION OF FREE-FORM SURFACES

In the production of free-form surfaces it is important that the actual workpiece contours fit the values stored in the CAD model as exactly as possible. With the help of FormControl, deviations from the ideal shape are detected through measuring various points (programmed/actual value comparison) and shown on screen or in the measurement protocol.



MEASUREMENT AND EVALUATION OF STANDARD GEOMETRICAL ELEMENTS

For workpieces with standard geometrical elements such as drill hole and pin, sphere, cone, bar, groove, radius and step, FormControl provides for flexible measurement of the most important parameters. The integrated evaluation functions can be used for simple determination of the spacing and angles between geometrical elements, but also element-specific angles such as cone and axis angle. Spacing can be documented using both reference dimensioning as well as chain dimensioning.



REDUCTION OF IDLE TIMES - ONLY ONE CALIBRATION NEEDED

FormControl uses an intelligent mathematical routine that makes calibration steps during the measurement processes completely unnecessary. So calibration is only necessary when a new touch probe is used or after replacement of a stylus.
The calibration compensates for the measurement behaviour of the touch probe in spatial terms as well as the influences of the machine and control system on the measurement.

ADIF – THE AUTOMATIC DATA INTERFACE

ADIF makes childsplay of measurement in the machining centre:

– Creation of the measurement program by mouse click

– Automatic transfer of the program to the machine control and return of the measurement results to FormControl

OPERATION TAILORED TO THE WORKSHOP SITUATION

FormControl is very easy to operate. Even complex projects can be configured and executed quickly.

– Grid function allows for fast deployment of measurement points

– Grouping of measurement points with the same properties (setting up/evaluation)

– Measurement points can be read in from CAD/CAM system

– Simple evaluation of geometric shape tolerances

OPTIONS
EXTENSIONS FOR EFFICIENT PROCESSES

BEST-FIT

FormControl's Best-Fit algorithm computes the orientation of the workpiece in such a way that the measurement points fit the CAD model as closely as possible. The user can then transfer the Best-Fit values as displacements and rotations to the machine and continue machining with the modified zero point.

– Continue machining with optimised positioning

– Compensation of systematic measuring errors

– Individual weighting of measurement values

ALIGNMENT FUNCTION 2.0

The alignment function allows the user to create a reference between the physical workpiece and the CAD coordinate system. To do this, the position of the workpiece need not be changed, but instead FormControl generates a new, modified workpiece coordinate system.

– Simple re-setting through automatic correction of the workpiece position in up to 5 machine axes

– Axis locking for application-specific alignment

– Fast rework due to elimination of time-consuming, manual alignment

– No scrap resulting from the machining of badly aligned workpieces

FORMCONTROL AUTOMATION

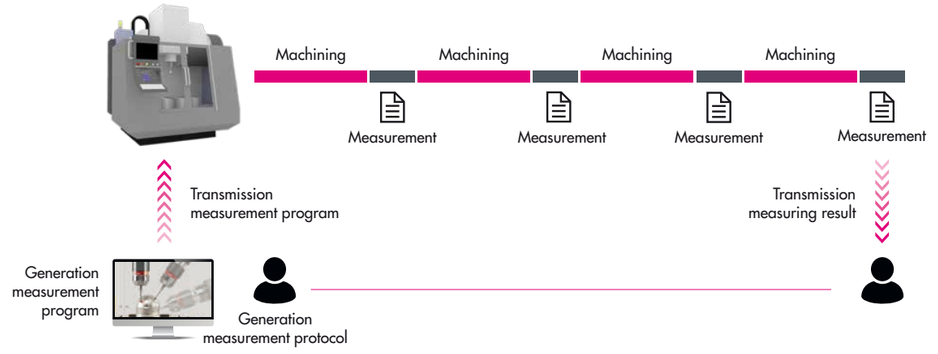
Minimally manned cutting processes require intelligent options to continuously document the production quality. The option, FormControl Automation enables the automatic execution and logging of measurement jobs in-between and after machining.

– Automatic execution of measurement jobs on different workpieces

– Easy assignment of measurement job and component due to unique ID

– Fast creation of a large number of measurement protocols

– Implementation of minimally manned, highly productive cutting processes in tool and mould making and in the aerospace industry



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