

Application report

SCHÜTTE SCX Automatic lathe with several tool holders



3 - Button operation

With the monitoring system

Toolinspect

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Data transfer:

CNC control:

Chipping material:

Digital

Siemens 840D

Stahl/V2A

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Technical modifications are reserved.

The tool and process monitoring system **Toolinspect**[®] shows the following advantages:

- At the NC program only minimal modifications are required.
- A brief instruction held by the operator is sufficient for Toolinspect
- An auto-optimised working monitoring algorithm helps to reduce machine set-up times and running-in periods and adapts the monitoring parameters automatically to the different operating conditions (temperature, tool wear, etc.).
- The system is at A.Monforts – CNC machines with different chipping processes (rotating, milling, drilling, galling, winch etc.)
- Toolinspect can be carried out with the current CNC controls (**Siemens, Bosch Rexroth, Fanuc, Indramat, Bosch, Heidenhain**)
- **Automatical system protection and data protection** on a extern CF card.
- Extern modul with an own mobile processor.
- Automatical cognition of tool change through the tool magazine and therefore no service necessary.
- **Adaptive regulation of chipping processes.**
- Turning moment data are read-out of the CNC control. Hereby higher machining speeds can be achieved.
- Selection of processing in three single segments. Hereby can be guaranteed an exact monitoring:

Contact of material (fluctuations)
Principal chipping (processing remains the same)
Final processing (possible fluctuations)

Further information at: www.mcu-gmbh.de

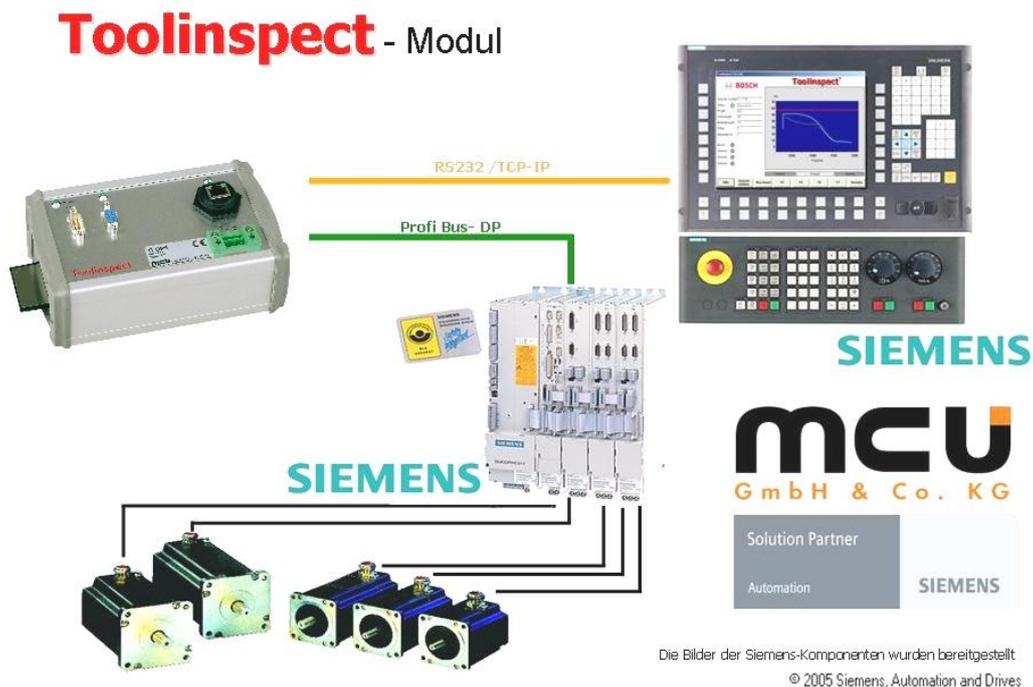
- Fluctuations at the process are recognised automatically and the monitoring boundaries adapt themselves to the modifications without the operator's intervention.
- **Diagnosis tools for the optimisation of processes** are available through Standard-Office programs.
- Processings with really short process times <0,2s can be monitored.
- The computer's resources of the CNC control are strained only slightly.
- An expansion for the allocation of MDE/BDE data from the SPS is possible.

Monitoring system:

The device **Toolinspect** serves as a monitoring of tools and chipping machines. The data that is needed for this task are transferred over a Profibus-DP interface. The monitoring strategy is chosen self-dependently through an integrated software. The required parameters are detected by MCU GmbH & Co. KG once or by the tool machine manufacturer and are then inserted.

Pic. Siemens 840D Integration

Siemens 840D mit Toolinspect Ti/DP1



The visualisation on the control pane (up to Win98) is connectet through a TCP/IP or RS232 interface with the hardware. Alternatively the visualisation gets realised through a additional control panel.

The company Alfred H. Schütte:

The company Alfred H. Schütte in Köln is a leading, worldwide operating manufacturer of machine tools. The company produces automatic lathes with several tool holders and 5-arbor CNC grinding machines and is with these products represented through affiliated companies on all continents. The sales of Schütte offers the german market a huge trading program of foreign machine tool producers. The company is stamped by a large tradition and strong innovation. Founded in 1880, in the year 2005 Schütte celebrated its 125 year long existence. The family business has stayed as such during four generations, the general manager Carl Martin Welcker is the great-grandson of the company's founder.

Type series SCX- The new generation

Schütte presents the first member of a new generation of lathes with several tool holders called SCX-26. The type series SCX achieves the vision of a „multi-single-spindle“, which makes several processing options and an easy operation possible.

Features:

- Arbitrary driving speed on each principal arbor through liquid cooled motor arbors with a high dynamik and traction in a arbor cylinder
- High-precised arbor cylinder positioning over a threepart Hirth-denticulation
- CNC compound slide rest on all processings on standard
- End wall processing with solid and highly-precised positioned linear spool valve
- Revolver function for the application on compound tool, can be applied on all layers
- Drilling and milling with Y-arbor on all bank attitudes and length attitudes possible
- Extremely cheerful working space without channels, without drives, cabels and pipes.
- Modular system modules on mechanisms and tools, all units can be built position-independent
- Easy backfitting for mechanisms
- Standardised interface hitch for the tools
- Interior coolant delivery up to 100 bar on each processing station possible
- Processing of the second tool piece wing with 2 additional arbors and processing stations with the input of up to 6 tools
- All options of the first-wing-processing can be used for the back-wing-processing
- Controlling of up to 62 arbor with Sinumerik 840D
- Operator assistance through adapted controlling surface for operating and programming
- Revolver functions, Y-arbors and tools retroffited

Test Result:

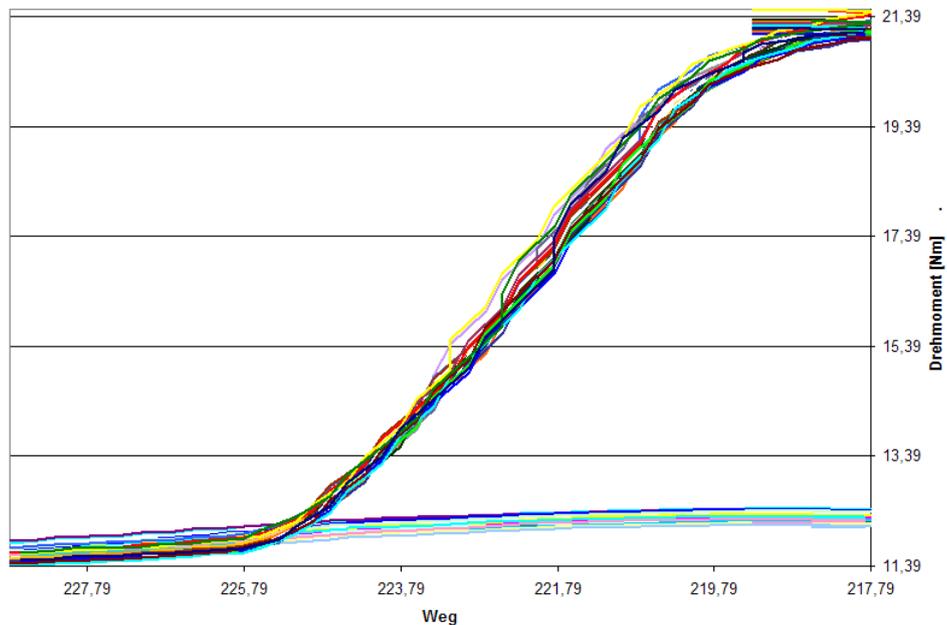
After the installation the machine was operated with steel work pieces Through the Toolinspect System all the processings such as drilling up from 3,0mm and turning could be monitored on a safe way. As the system operation was realised through a 3 function key, a short instruction by the operator was enough.

Basic conditions:

Basically at all processings you can find very different process data with the most different turning moment values and process fluctuations.

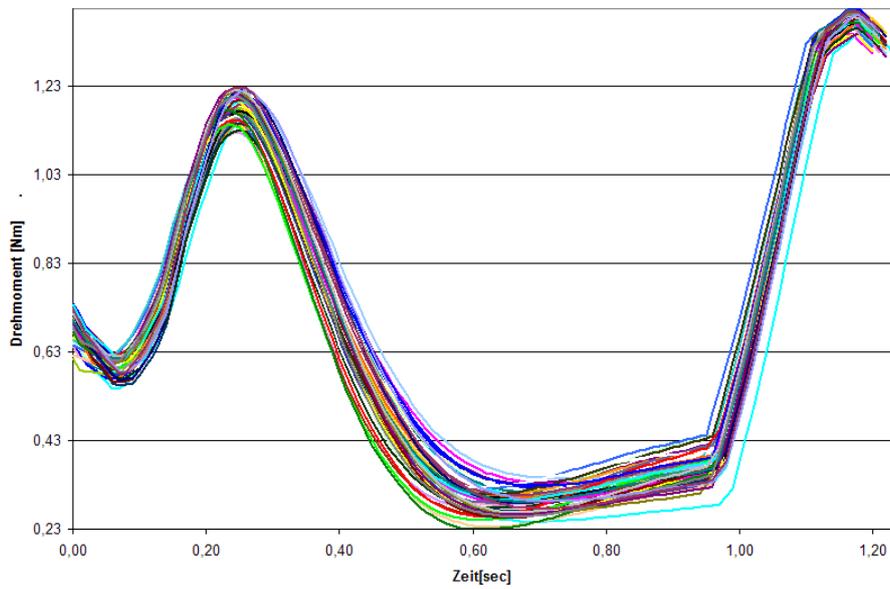
In Picture 1 (VHM-Bohren 3,5mm) very reproducible processes are shown, therefore the monitoring of the tools is guaranteed.

Pic.1



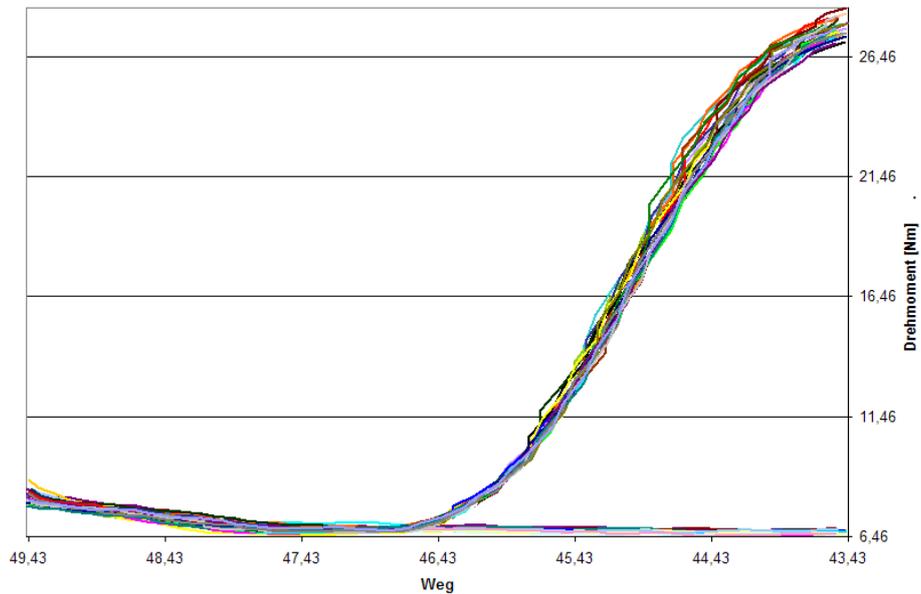
In Picture 2 (turning) with cutting chisel, here a chip removal of 0,8mm is ablated. Here you can only recognise little allowance fluctuations.

Pic.2

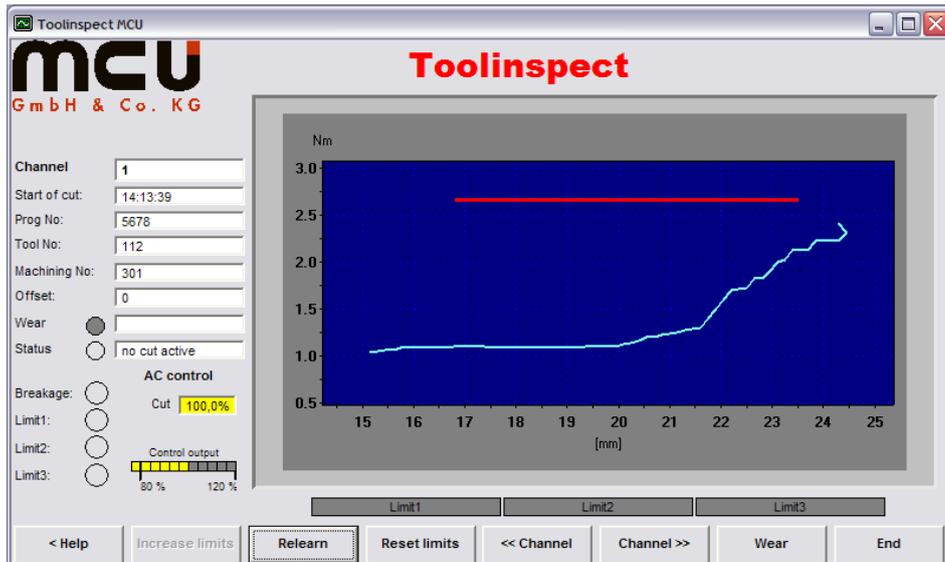


In Picture 3 (spot drill with 6,9mm) very reproducible processes are shown, therefore the monitoring of tools is guaranteed.

Pic.3



Operation and Visualization:



“Reset limits” button

This button resets the system for the active program (the program which is displayed in the interface under Prog. no.:.) to the original values and relearn is carried out. Machining operations which have been increased via the “Increase limits” button are reset.

“Relearn” button

This button is used to carry out “relearn”. The program-specific data (increased limits) are not reset. The limits readjust to the actual values in the following machine cycles. This function is required when changes have been made in the CNC program or for other reasons all monitoring limits should be recalculated.

“Increase limits” button

If Toolinspect repeatedly generates an incorrect message during the same operation, the “Increase limits” function can be used to **permanently** raise the switching threshold that generates the fault message. Increasing the limit value only affects the limit value for this specific cut and not for the tool as a whole. The increase is indicated graphically by a yellow marking of the limit or in the tool table. If the alarm is still generated in spite of the increase, the button can be activated again. In the case of limits 1 -3, this leads to deactivation (orange colour). The breaking limit can be increased any number of times and will not be deactivated.

“Help” button

This button is used to call the Help function. A second menu page is activated. It is described in section 3.9.6 "Extra Functions".

Summary:

The operation is very easy and only little adaptations are to be held at the CNC program. After the construction of new programs there are no adaptations to be made by the operator. The system adapts itself automatically to different operation situations (abrasion, temperature change, etc.)

The installation arranged itself easily. The adaptation at the SPS program, the integration in the control and the data connection through Profibus-DP or TCP/IP is extremely flexible and clearly structured. Alternatively, **Toolinspect**® can be connected through a serial interface with the computer.

Sales:

MCU GmbH & Co. KG:

If you have further questions relating to the application report, please contact the sales office MCU GmbH & Co.KG in Winnenden.

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Informations to the data paper

The pictures of controls and modules are each copyrighted by the control manufacturer.

The given data serve to information.

Subject to alterations!

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