HEIDENHAIN

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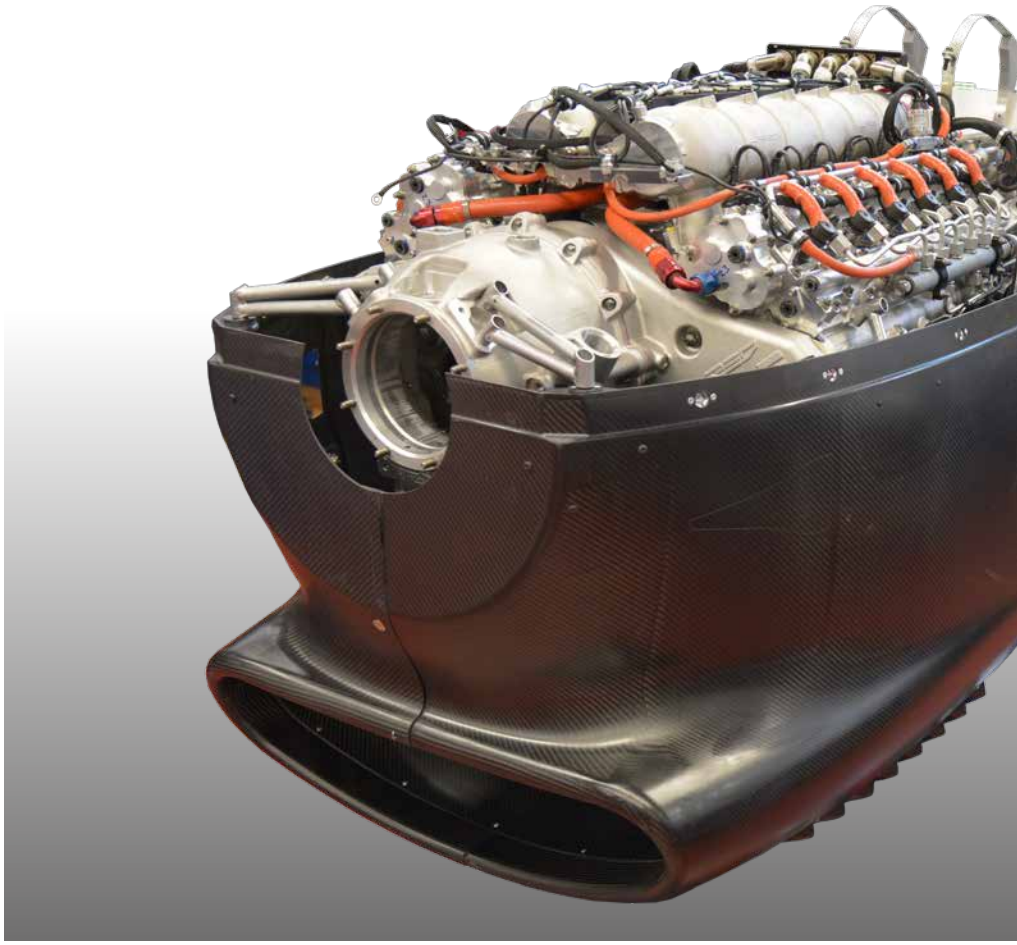
Klartext

The Magazine from the World of HEIDENHAIN Controls

Touch the Essence

The new TNC 620 makes the touchscreen shop-floor capable

Editorial



Dear Klartext Reader,

In this edition we present you with the **next generation of the TNC 620**. The new TNC 620 with touchscreen facilitates workflows and saves time in production thanks to intuitive control, context-sensitive support and the familiar HEIDENHAIN operational design.

Prior to the Moulding Expo 2017, the Klartext team discovered really special tool and mold makers distributed throughout Germany. Each of these companies benefits from outstanding know-how in their own ways. We visited the mold maker **Braunform** in Bahlingen am Kaiserstuhl, a company manufacturing highly complex multi-component injection molding tools. We also found out how the young team at **Fischer Nachfolger** from Germany's Ore Mountains region significantly accelerated tool production with a new machine and the AFC control function. We also got to know **CRS Licht-Formtechnik** from Berlin, a company specializing in the production of curved forms for plastic luminaire covers using blow-molding.

All have one thing in common—an enthusiasm for HEIDENHAIN controls and high levels of accuracy in production. Find out just how intelligent and efficient toolmaking can be.

Read and enjoy, with best wishes from the Klartext staff!

Read from page 6 how the team at Fischer Nachfolger reduces its machining time with the AFC (Adaptive Feed Control) function.

The website for TNC operators

www.klartext-portal.com

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Klartext for Quiet Moments

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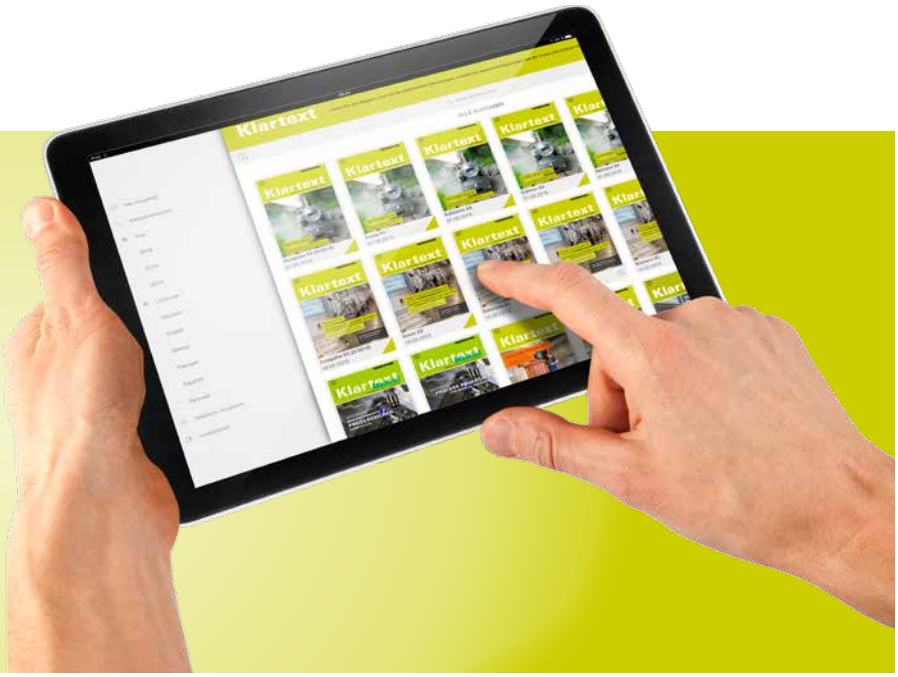
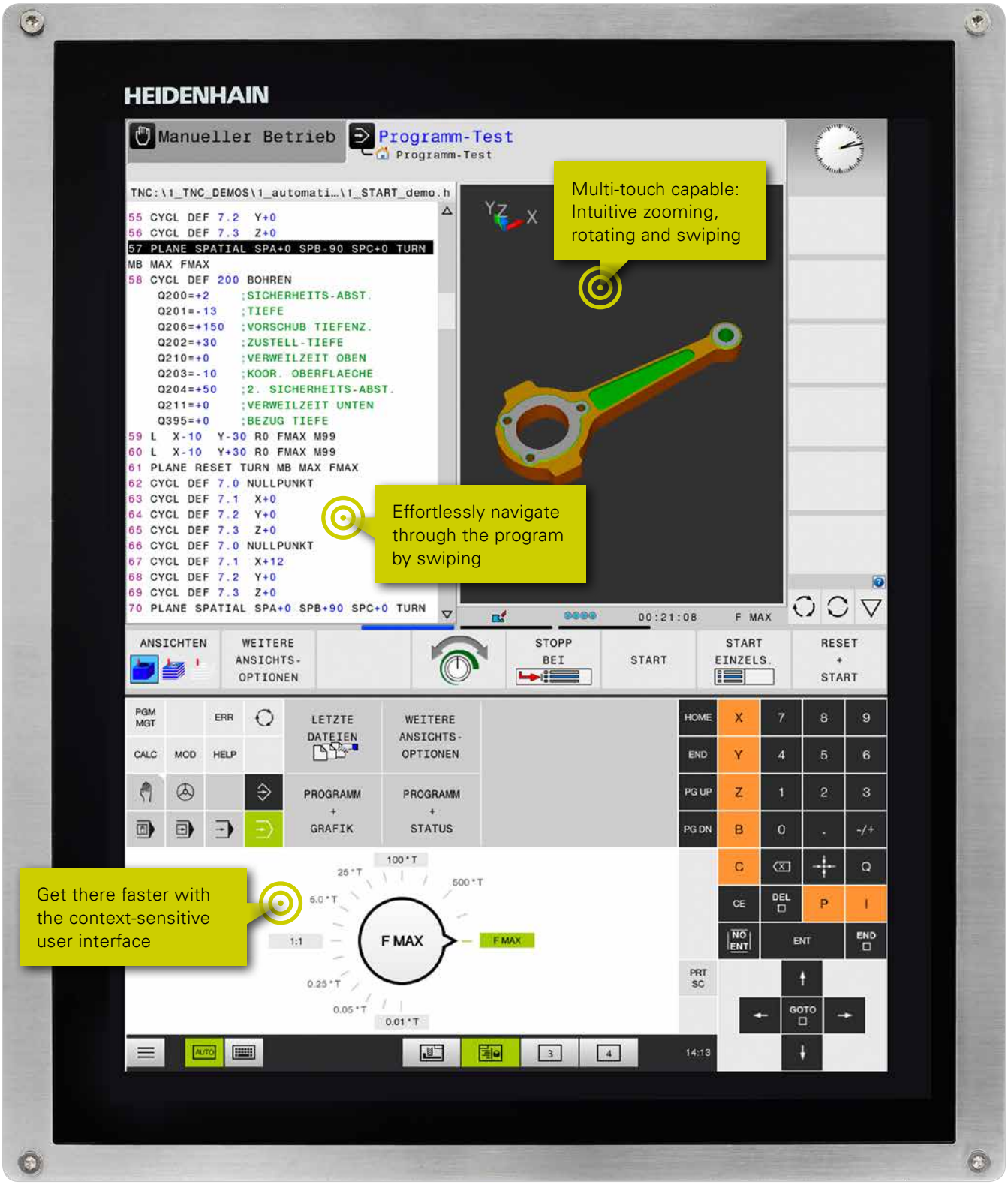


Touch the essence

The new TNC 620 makes the touchscreen shop-floor capable



Immediately feels at home with the touchscreen: TNC user Rudolf Lohner

> “Those who've already worked with a TNC control will feel at home straight away with the touch display.”
>
> Rudolf Lohner, TNC user in Prototype Construction at HEIDENHAIN

The new generation of the TNC 620 with software version 04 is the very first HEIDENHAIN control with a touchscreen. Operation is via hand gesturing familiar to you from your smartphone or tablet PC—simple, quick and intuitive. Rudolf Lohner works in prototype construction at HEIDENHAIN's Development division. He has been testing the first prototypes under genuine machine shop conditions since August 2016 and is highly enthusiastic.

"My colleagues from Control Development wanted to play a trick on me," said an amused Rudolf Lohner. "When returning to my machine after the company vacation in August 2016 they'd secretly installed a control with touch operation. And then they waited until I called to ask how to operate it. They would have waited a long time though! It was only after a whole week that I actually needed to ask my colleagues something about the operation—they saw straight away that the issue was difficult to find out and had to be improved for the future series."

Rudolf Lohner has been working in prototype construction with TNC controls since 1986. Flexibility is required, which is why programming the machine in the workshop is daily practice. "It's actually child's play on the touchscreen," said Rudolf Lohner about the programming. "Simply swipe the screen with your finger to scroll the program up and down. I can find the program block I'm looking for much quicker than with the conventional control. And I can also directly input the values very quickly with the keyboard displayed on the touchscreen."

The rapid 3-D graphic simulation displays whether the implemented change has the desired effect. This feature makes Rudolf Lohner go into raptures: "I've now been working for a good half a year on this prototype and I can't imagine how I could have managed it with the graphics on the classic control. If I want to take a closer look at a detail, I take the graphic on the touchscreen, set my preferred view, zoom in and out and rotate or slide in any direction—in fact almost as if I'm analyzing the actual workpiece in my hand. Nothing stutters and it’s all pixel perfect—it's great."

And how about converting from the classic TNC 620 to the new generation with touchscreen? "Our developers have once again clearly understood how to transfer familiar, reliable features into the next generation of controls and combine it all with touch operation. I find the context-sensitive user interface really useful. Everything I need for operation is close at hand. I don't need to do a long search anymore, just a short swipe through the soft key row is sufficient. Those who've already worked with a TNC control will feel at home straight away with the touch display. As you can see, I didn't even need any familiarization time!"

By the way: The new NC software version 04 is also available for hardware models with conventional operation. This means the new generation of the HEIDENHAIN TNC 620 provides even simpler operation, high reliability in use and ideal suitability for future requirements.

A video also shows more information about the new TNC 620 with touch-screen: www.klartext-portal.com/controls/tnc-620-standard-milling/main-properties

Performance and accuracy:The 5-axis universal machining center UD100-5A from MTRent with HEIDENHAIN iTNC 530

Performance right down the line

The TNC function AFC—Adaptive Feed Control—accelerates the trochoidal milling process

"We were amazed to see the cutter suddenly racing to the other side." The young operations manager Matthias Puffe and his colleagues tell about initial attempts with Adaptive Feed Control. The software option of the iTNC 530 HEIDENHAIN control came with a new 5-axis universal machining center from MTRent. Since that time the small company of Fischer Nachfolger is highly enthusiastic about the benefits—major time savings with roughing cycles along with protection for its milling cutters and machine components.

Purchasing a UD100-5A was the first step toward 5-axis simultaneous machining for the cutting and stamping tool constructor from Schwarzenberg in the Ore Mountains. The young CNC company was mainly aiming for higher performance with hard machining, e.g. with wear-resistant 1.2379 to 68 HRC steel.

Tangible time savings were achieved in a low volume project. "40 minutes down to 29 minutes is pretty impressive," said a keen Matthias Puffe. During a test series they analyzed how the TNC function AFC impacted roughing cycles for a sensor cover. In a first step the contour was roughed out by machinist Christian Müller with SL Cycle 22. Then they started the AFC—adaptive feed control accelerated the cutting process by 27 % down to 29 minutes. This certainly aroused the team's ambition.

AFC accelerates roughing

The HEIDENHAIN control regulates the machining feed rate automatically with activated AFC depending on spindle power—the lower the load, the higher the feed rate. The control increases the feed rate where less material is removed. "This makes us quicker than the others," said the pleased operational manager Matthias Puffe. This is important for his customers if they require a part at short notice, e.g. if something fails in the press works.

Value retention: The AFC software option of the iTNC 530 HEIDENHAIN control protects both tool and machine.

"We can go to the limit with AFC and be sure nothing can happen."

Matthias Puffe, Operational Manager at Fischer Nachfolger

Just as important for Fischer Nachfolger is that the tools are spared unnecessary wear. "It's a big cost factor for us—our cutters last around 15 % longer with AFC," said Matthias Puffe. AFC prevents a tool breaking or seizing up. The machine spindle can also be damaged if a large cutter breaks away. "We can go to the limit with AFC and be sure nothing can happen."

Modern strategies for exploiting potential

The young team wanted to know more and continued with the test series. They decided to machine the sensor covers with the new trochoidal milling strategy. With trochoidal milling the tool operates in trochoidal movements with large cutting depths and high cutting speed.

Konrad Egermann programmed the machining using the MAXX Machining roughing module from hyperMILL®, purchased via Cintec AG. The result: With trochoidal milling, machining time was reduced even more significantly from the original 40 minutes to just 8 minutes. "Absolutely great," enthused the operational manager. "And now we want to find out whether AFC can save us time here as well." With activated AFC function the process was actually reduced by a further two minutes, meaning further time savings of 8 % were achieved thanks to AFC.

Simple parts are programmed directly on the machine with Cycle 275 TROCHOIDAL SLOT.

A stable machine tool with everything you need

The new 5-axis universal machining center from MTRent scored with Matthias Puffe because it offered everything required. "It's pretty tight in our hall, so we need compact installation dimensions but with a large table." said Puffe. "We like the fact that we can really get up to the end of the table with the traverse distances, and good accessibility was also important."

It had to be a HEIDENHAIN control because the team already has experience with them and appreciates their simple operation. The robust UD100-5A with swivel head milling and rotary table with a diameter of 1 meter provides many software options as standard. The machine tool enables Fischer Nachfolger to exploit its processes to the full. Ideas for new NC programs have also been known to come about over a beer during the evening. The young cutters also gather inspiration from appropriate forums.

Purchasing the new machine is an important step for the future of the small company—and accuracy and performance are perfectly harmonized thanks to HEIDENHAIN controls.

Enthusiastic: representative Operational Manager Matthias Puffe (center) with TNC operator Christian Müller (right) and CAM programmer Konrad Egermann (left)

Efficient:
The TNC function AFC (Adaptive Feed Control) in conjunction with trochoidal milling

Simply quicker milling with AFC

The software option Adaptive Feed Control (AFC) from HEIDENHAIN is contained in the **Dynamic Efficiency** package of functions. AFC automatically adapts the feed rate of your machine to material removal. This means you always work with the highest possible feed rate across the complete machining cycle.

Benefits of AFC
- Increased process reliability
- Reduced load on the machine
- Shorter machining time

Handling is extremely easy—start simply by pressing the AFC ON soft key. The TNC can save the spindle power automatically with a previously executed teach-in cut. Only the minimum and maximum feed rate in %, feed rate in the air, feed rate during material entry/removal (%), control responsiveness (%) and other parameters such as behavior with overload need to be defined in a table. If you already have experience with AFC you can also directly adopt the maximum spindle power value.

When the maximum spindle power and a minimum feed rate are reached, AFC responds in accordance with the predefined overload reaction: Either the machine stops, inserts a replacement tool, outputs an error message or an action defined by the machine tool builder is triggered.

The **Dynamic Efficiency** package of functions includes the ACC (Active Chatter Control) option as well as AFC. ACC is an effective control function for reducing a machine's tendency to chatter.

Benefits of ACC
- Significantly better cutting power
- Higher metal removal rate (up to 25 % and more)
- Low forces on the tool, thereby increasing service life

Dynamic Efficiency also includes the trochoidal milling cycle.

Benefits of trochoidal milling
- Engagement of the entire cutter length
- Higher metal removal rates
- Relief from mechanical load on the machine

The mechanical collision protection of the TS 460 touch probe allows it to yield—unit and machine are not damaged.

The TS 460 touch probe—safety first!

"It happened in the past that a touch probe was broken off," explained Matthias Puffe. This is no longer the case with the TS 460. The mechanical adapter between the touch probe and taper shank deflects the TS 460 with light collisions—the complete unit yields and the machine stops. Matthias Puffe: "Because the joint is at the top, the complete touch probe is monitored and not just the tip. Definitely a good feature." Also, the collision protection adapter thermally decouples the touch probe from the spindle. This means it cannot heat up with a high-temperature spindle and very long probe processes, which in turn is good for accuracy.

The toolmaker frequently uses automatic probing, e.g. the 410 DATUM RECTANGLE INSIDE touch probe cycle. This quickly and accurately determines the zero point. The TS 460 touch probe rapidly and safely supports workpiece measurement particularly on machines with 5-axis machining.

REMOTE DESKTOP MANAGER

From the man at the control to the helmsman

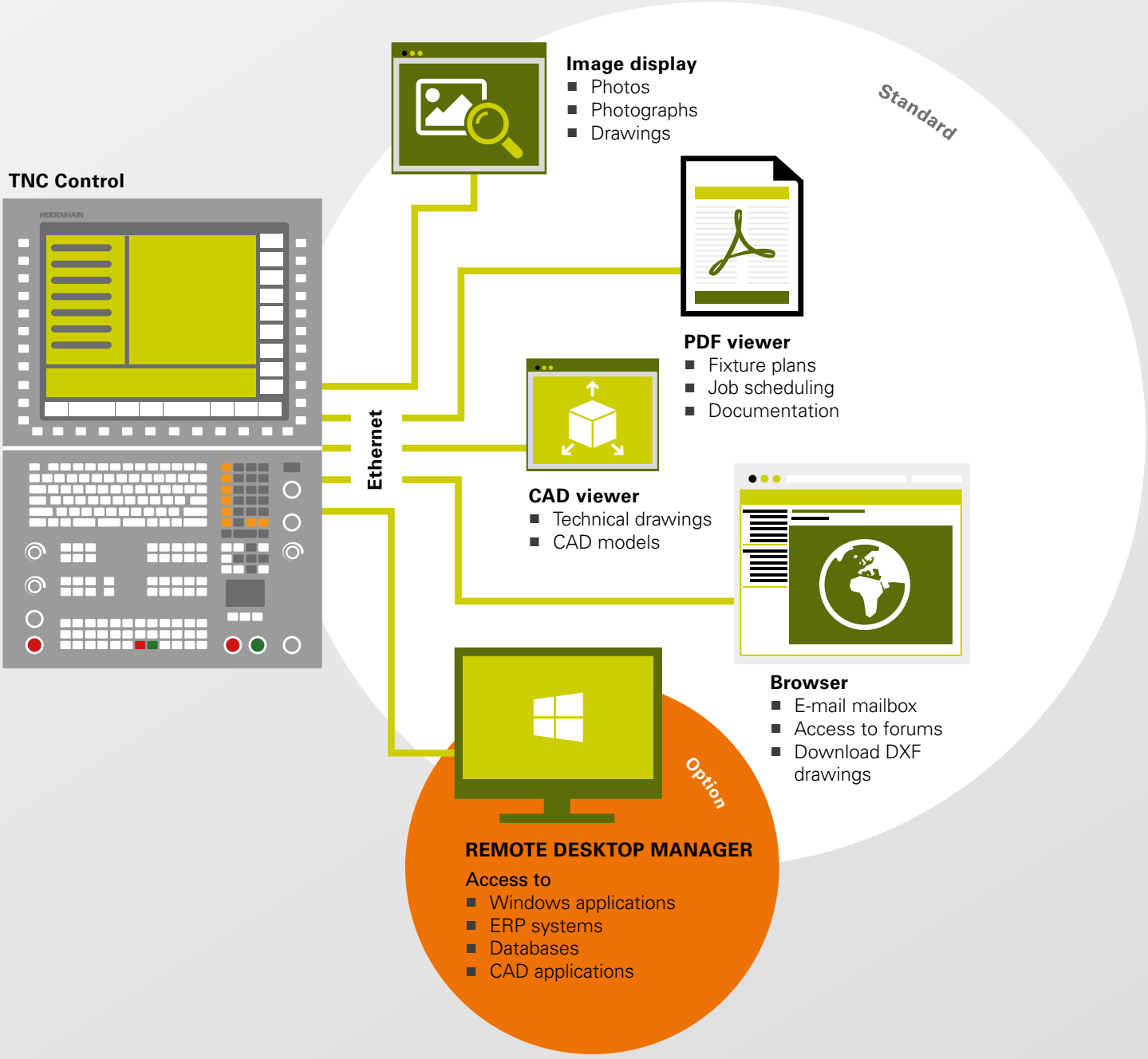
How to utilize data from the company network on the TNC control

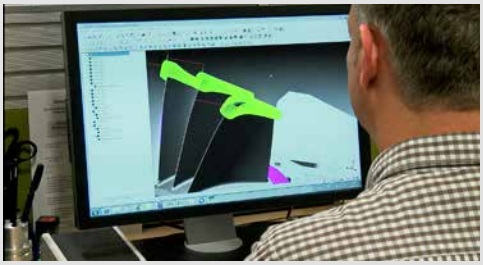
With their standard functions, TNC controls already enable users in machine shops diverse access to data in their company networks. The REMOTE DESKTOP MANAGER in the Connected Machining package of functions also supports the use of Windows applications and data processing. This enables you to directly integrate your expertise from the workshop into all processes and actively organize them.

You need no more than an Ethernet connection between the control and the company network and your required network access rights. You can then utilize a major part of the data in your company on the control on the shop floor: A CAD viewer, PDF viewer, image display and the web browser Mozilla Firefox are all contained in the standard range of functions of TNC controls. This enables you for example to view drawings and use all web-based applications such as your e-mail inbox or corresponding documentation and ERP systems.

If you need more, the REMOTE DESKTOP MANAGER gives you access to all Windows applications. It helps you to connect to any Windows PC in the company network or an industry PC in the electrical cabinet of your machine for example. Simply pressing the key on your control keyboard comfortably switches the control screen to the Windows PC interface for use of all programs and data at this location.

Connected Machining—standard functions and the Remote Desktop Manager at a glance





Access CAD/CAM applications from the TNC control—with the press of a button.

See the video for more information about Connected Machining: www.klartext-portal.com/programming/features-from-industrial-practice-explained-in-detail/connected-machining

TNC makes a flying start with piston aircraft engines

RED Aircraft puts its trust in a highly motivated team and HEIDENHAIN TNC controls

The idea came from Managing Director Vladimir Raikhlin: "Let's construct a modern piston engine for the aviation sector." The company of RED Aircraft GmbH has now been developing an unusual motor concept for the aircraft industry since 2008 with a high level of commitment and extensive technical complexity. The aim is to make the use of modern piston engines much more attractive for aviation. The advantages: Less fuel consumption, lower emissions and a significantly lower-cost solution compared to turbine jet engines. The need for quality and accuracy is exceedingly high because reliability is imperative in aeronautics. As a consequence, RED Aircraft, located in Adenau in the Upper Eifel, Germany consistently relies on HEIDENHAIN controls.

The new RED A03 engine with 404 kW, a diesel piston engine driven with kerosene, received European Aviation Safety Agency (EASA) approval in December 2014. Use of a water-cooled piston engine in the aviation industry is a real innovation. An in-house developed gear transmission is part of the V12 engine that connects to the propeller with a gear reduction of 1.88. The EECU electronic engine control, compliant with safety level A, is also an innovative RED Aircraft development.

TNC ensures good starting conditions

HEIDENHAIN controls with their wide range of functions ensure that the new engine generation is manufactured with high levels of process reliability. "All our engine parts are very fastidious and demanding," said Head of Production Guido Scheuer. A particular challenge is the weight. “Every gram that doesn’t need to be raised into the air is good,” explained Head of Development Nor-

> “Definitely a huge advantage with the HEIDENHAIN control: The box tells me exactly what it wants!”
>
> Guido Scheuer, Head of Production at RED Aircraft

bert Kreyer. The complete RED A03 unit weighs around 370 kg with gear transmission. RED Aircraft optimizes each component and bought parts are also reworked. The wall thicknesses of the purchased turbocharger casings are reduced for example.

Orienting and determining the reference point of the precast components is already an art in itself. This is however achieved simply and efficiently with support of HEIDENHAIN touch probe cycles. The solid aluminum cast engine blocks are aligned according to best-fit specifications of the foundry. A touch probe then measures the orientation points on an inclined plane. The iTNC 530 generates the required spatial angle from this for defining a new coordinate system for machining.

TNC controls with maximum accuracy

Measuring complexity at RED Aircraft is immense, particularly with the production of prototype and pilot-series parts: For quality assurance the company measures its components on 3-D measuring machines in an in-house climate-controlled measuring room as well as before and after machining in the machine tool itself. This enables possible deviations to be detected in good time. Relative dimensions, fits and geometrical tolerances are monitored in the machining center whilst the component is still clamped. The iTNC 530 offers many probing cycles for this purpose that can be conveniently called via the touch probe function.

Specific positions need to be reworked if deviations are identified. No problem for the TNC—machine operator Christian Esch simply jumps back to a particular position in the NC program with GOTO for example. The TNC also features multilevel mid-program start-up: Operators can quickly and reliably locate the desired entry point.

TNC makes programming simple

RED Aircraft frequently uses the option of mapping complex programs in main- and subprograms. The programmer Achim Brenner is keen on this modular approach—he inputs all definitions such as tools, speeds, feed rates and cycles into the main program. He manages the machining processes themselves, whether programmed on the machine or from the CAM, in subprograms. In this way he can also replace them when needed. The complete team at RED Aircraft like this simple and easy-to-understand handling. Head of Production Guido Scheuer finds he can still work well with the HEIDENHAIN control even after longer times away. "The TNC always prompts which entry it needs from me." The uniform operating concept is a definite advantage for Scheuer, enabling him to flexibly utilize both his machines and employees.

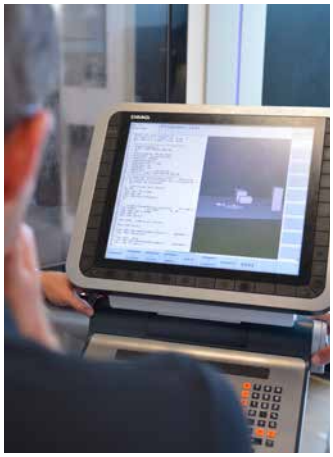
HEIDENHAIN controls are well-known for their reliability. This is also a mandatory characteristic for the technically complex engines. The new RED A03 is used in aircraft with a take off weight of 5670 kg and a maximum of nine seats. The engine is currently being tested extensively in a Yak 52. Its efficiency weight is correct, its take off power is equivalent to a turbine jet engine and aviation acrobatics are also no problem.

Conclusion

Managing Director Vladimir Raikhlin is certain of the future capability of his new engine design. His team works with a high level of enthusiasm on the development and production of kerosene piston engines for the aviation industry. RED Aircraft puts quality and reliability first in its products and processes. HEIDENHAIN controls fit in well with this concept—universally deployed, they ensure all components are produced for extremely accurate fitting while offering simple operation and efficient functions.

Head of Development Norbert Kreyer optimizes the RED Aircraft engines to ideal efficiency weight.

Complex parts simply programmed: The HEIDENHAIN iTNC 530 on a Deckel Maho machining center



Fully committed: Jens Mühlens, Achim Brenner, Guido Scheuer and Christian Esch (left to right)

RED Aircraft GmbH

The company has its roots in motor sport. Since 2008, RED Aircraft from Adenau in the Rhineland-Palatinate has been developing and producing a new generation of aviation engines: Water-cooled piston engines based on the diesel principle. Inspired by optimized developments in the automotive engine sector, the company utilizes the low efficiency weight of these motors. The first engine approved, the 12 cylinder RED A03 with 404 kW, powers aircraft with a take off weight of up to 5670 kg and a maximum of nine seats.

+ red-aircraft.com

… so thorough, so smooth with the TNC 640

Workshop programming and 3-D graphic simulation provide reliability for machining operations

How does the TNC 640 get your shaver into shape? Braunform GmbH produces injection molds for typical personal care products such as shavers and many more besides. In the charming town of Bahlingen am Kaiserstuhl, Germany, HEIDENHAIN controls regulate machining of the forming tools. A new C 12 5-axis machining center from HERMLE accurately and efficiently implements modifications and repairs to the injection mold tools. The programs for this purpose are created directly on the TNC 640. Tested beforehand with the high-performance HEIDENHAIN 3-D graphic simulation function, they quickly provide reliable machining results.

A symbiosis of size and class

The full-service spectrum of Braunform GmbH from the wine-growing town of Bahlingen is extensive: injection mold tools are produced for the pharmaceutical industry, personal care, consumer products, packaging, automotive, electrical and water technology. The company's mold making division has more than 180 employees.

To ensure high quality plastic parts and efficient production, the experienced mold makers support customers with tool development and, where necessary, in optimizing the articles. As a company focusing on innovation, Braunform offers specific know-how, for example with the development and production of multi-component molds that can process or combine different materials in a single operating step.

Braunform also has specific expertise in the production of high-cavity tools capable of generating 16-, 32-, 48- and even 96-fold plastic parts in one step. These high-efficiency production processes inject plastics into the molds so that quality and appearance satisfy the most stringent demands.

Before a product is extruded by the millions from its mold, the mold and injection molding process are brought to production maturity together with the client. The Braunform technical center offers a special service for this purpose: The mold maker goes into pilot series on its own injection molding machines if the customer desires—putting the finishing touches to both process and tool.

Multi-cavity expertise: Multi-component injection mold tools for the production of consumer products

Injection molds must meet the highest demands at Braunform, and this includes state-of-the-art, efficient production

Exploiting the machine

The impressive output of molds assumes optimum production processes with CAD/CAM programming, automation and diverse, high-performance machinery. To avoid disrupting the creation process with new molds, Braunform benefits from an in-house, well equipped modification and repair shop. In a bastion of automated program generation, a highly modern TNC 640 asserts itself with a classic HEIDENHAIN strength—workshop programming.

Klartext programs are created directly on the control for typical modification and repair jobs such as setting new contours and milling over welded areas. The experienced machine operators have to execute the required milling passes as quickly and accurately as possible on the HERMLE C 12. It's for this reason that the operators really appreciate the HEIDENHAIN cycles, enabling them to program frequently recurring machining operations consisting of several machining steps especially quickly and conveniently.

Maximum efficiency on a compact setup space:
TNC user Ingo Kleis (left) and Head of Technology Thomas Adler (right) praise the stable and accurate HERMLE C 12 machining center with TNC 640 control.

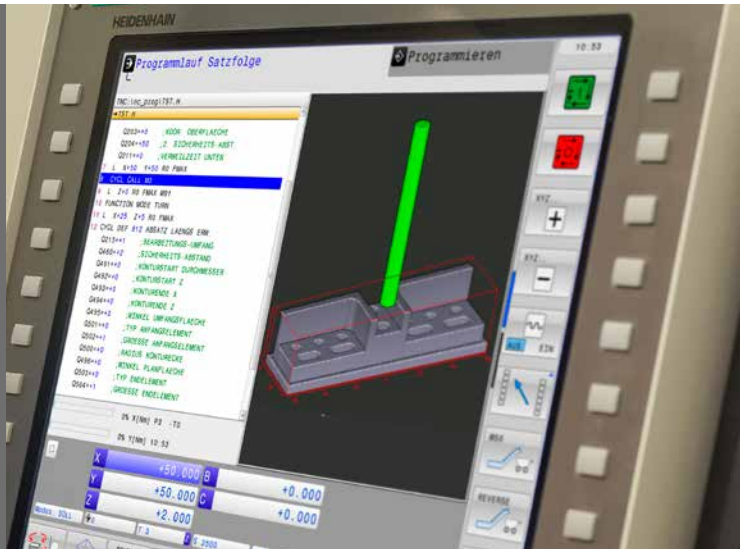
> “It’s important for us to generate programs for repairs as flexibly and quickly as possible on the control.”
>
> Thomas Adler, Head of Technology at Braunform

3-D simulation graphics

The rich-detail 3-D graphic simulation of the TNC 640 generates meaningful machining previews for both milling and turning operations.

The function simulates external machining programs and programs created on the machine, and

- considers the actual machine kinematics,
- displays the workpiece accurately and in full detail,
- supports freely selectable perspectives and viewing options during simulation,
- monitors tool condition and tool calls.



3-D graphic simulation: Control with self-monitoring

The machine operator gains maximum safety if he knows the machining result before the actual machining. This is exceedingly important for Head of Technology Thomas Adler: The precisely detailed 3-D graphic simulation of the latest HEIDENHAIN control means he can be sure that errors in the NC program or cutting problems can be promptly identified and corrected. This saves both time and paper because the HEIDENHAIN control makes many test and inspection tasks superfluous thanks to its reliable and informative simulation. This means both machine operator and the control have one factor in common—they adopt conclusive monitoring of the machining programs themselves.

Gaining accuracy more quickly

The time-intensive creation of the injection molds benefits from any innovation able to shorten the production and optimization process. As a consequence, high-performance, high speed cutting machines support the highly accurate but time-intensive electrical discharge machining. Fundamentally, the tolerance of the mold must be designed one exponent more accurately than required by the plastic part—with a typical tolerance of one tenth, this results in a tolerance of one hundredth for the mold.

HEIDENHAIN controls are known for their high accuracy in motion control. For this reason not only Braunform's high speed cutting machines but also their other milling centers are usually equipped with an iTNC 530. KinematicsOpt is almost always part of the package: Machine operators can simply measure the rotary and tilted axes themselves with special cycles. The TNC then determines the errors in the space from the tilting of the axes. The cycle computes an optimized kinematic machine definition and stores this in the control. The process needs little time but ensures accurate machining of the parts with repeatable accuracy over long time periods.

The next generation does without nothing

In the modification and repair division, the operators don't want to relinquish the tried-and-trusted benefits of HEIDENHAIN controls. Before purchasing the new, compact C 12 5-axis machining center with TNC 640, discussions with HERMLE and HEIDENHAIN indicated that compatibility between the new generation of controls and previously used controls was ensured. "At Braunform we've had good experience with HERMLE—we appreciate the characteristics of the stable and accurate machines. On the control we find it important to generate the programs for repairs as flexibly and quickly as possible," reported Thomas Adler.

For the experienced machine operator Ingo Kleis, this was his first TNC 640. However, the well-matched tandem of machine and control with its Klartext dialog-guided TNC programming language achieves reliable results even with complex repair jobs. This meant that Ingo Kleis quickly gained a “good feeling” after just a short time on the new machine with the new control.

Precision mold making for clean rooms

HEIDENHAIN controls are associated with optimum surfaces in mold making. However, “clean surfaces” at Braunform not only refers to the high surface definition of faces on the components but also “clean production”. The company offers production environments in their own clean room compliant with GMP C and D for medical and pharmaceutical clients, enabling complex production processes to be implemented. In-house developed injection mold tools complying with the company's own MED Mold® standard produce plastic products free of contamination, lubricants and particles.

TNC 320 a pleasure to use with mold machining

Through a retrofit with a TNC 320, CRS Licht-Formtechnik gains time and even greater diversity

When a machine that has proved its worth grows old and develops malfunctions an important decision must be taken—should a new machine be purchased or is it time for a retrofit? CRS Licht-Formtechnik GmbH in Ludwigsfelde, South of Berlin, Germany decided to upgrade: Their reliable Hartkämper milling machine was fitted with a modern HEIDENHAIN TNC 320 control. "It was the most economical solution," stated Christian Brüning from CNC Werkzeugmaschinenservice Berlin, the company implementing the conversion. The result is that the familiar machine remains in use, and quicker programming with more functions provides new potential.

Working with the TNC 320 and its 15" TFT color flat screen is highly user-friendly.

Jens Sommer, toolmaker at CRS, reported faults on the machine always occurring when the temperature increased. The next morning everything functioned again as usual—until the next failure. After replacing several components the operators were certain that the error was to be found with the 26-year old control.

Christian Brüning has experience in such situations. He was able to convince CRS about the advantages of a retrofit. It should definitely be a HEIDENHAIN control he said, because suitable program experience was already in the company. The TNC 320 provided the desired range of functions and the upgraded machine was ready in just two weeks.

For CRS the retrofit was especially advantageous and the mold maker is highly satisfied with the result: Thanks to the relatively simple conversion carried out routinely by Brüning, even the existing encoders could still be used because the TNC 320 recognizes their output signals. This now provides new production options for CRS with their retrofitted machine.

Getting started with modern programming

The familiarization process on the control was quick for Jens Sommer. He got up and running in next to no time thanks to the manual and by using his own initiative. "I work with the clearly arranged operating panel and finely detailed screen in a much more relaxed way," he said.

CRS Licht-Formtechnik produces plastic luminaire covers by blow molding. The retrofit now makes it easier for the company to produce more complex molds. Tools for the purpose are made in-house. The molds are becoming increasingly diverse due to LED technology. For Jens Sommer, who programs directly on the machine, this is no problem at all. "With the many cycles I'm a lot quicker now—previously it all had to be programmed manually. Now the programs are done with just a few keystrokes."

A new feature for Sommer was the DXF Converter, enabling him to open DXF files directly on the TNC 320 to extract contours or machining positions. This simplifies the programming of the usually rounded contours typical for luminaire covers. Jens Sommer simulates each machining step beforehand. This enables him to detect faults on the contour and he also receives feedback if tools are not suitable. "If I get an error message then I simply don't press the start button." His machining is more reliable as a result and less scrap are produced.

Convenient lettering with engraving

For Jens Sommer, one of the control's highlights is the 225 Engraving machining cycle. This enables inscriptions and date stamps to be generated quickly and conveniently. After calling the cycle a diverse range of inputs is available: Engraving text, character height, distance between characters, feed rate, depth, safety clearance and several more.

Conclusion

The retrofit has provided new potential for CRS: It is now possible to produce more complex basin forms. Jens Sommer programs contours with various radii and inclined planes that merge into each other—these are simple to program with the TNC 320

Insufficient memory space is yesterday's problem: Data handling is comfortable with the TNC 320, even without a CAM system. If encoders need to be exchanged in the future, this is also possible—modern encoders with 1 Vpp output signal level can now be used with the TNC 320.

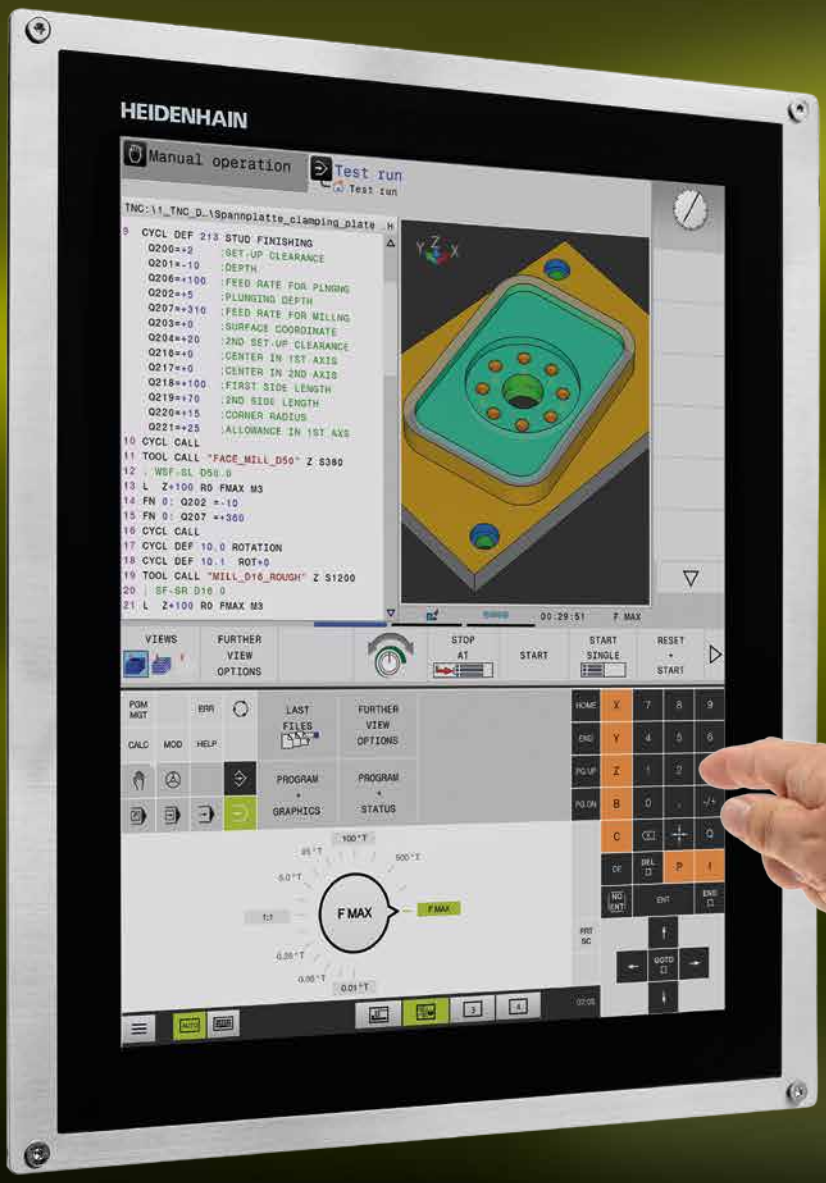
"I'm much quicker now with the many cycles—they all had to be programmed manually before. Now the programs are done with just a few keystrokes."

Jens Sommer, toolmaker at CRS

Jens Sommer, toolmaker at CRS Licht-Formtechnik, now saves much time programming with the new HEIDENHAIN TNC 320.

Pleased with the simple conversion to the TNC 320: Wilfried Resag (left) and Jens Sommer (right) from CRS Licht-Formtechnik with retrofitting expert Christian Brüning from CNC Werkzeugmaschinenservice (center)

HEIDENHAIN



TNC 620

Tailor-made for compact milling machines

The TNC 620 offers you a broad spectrum of applications for the economical manufacture of your products—from the simplest to the most complex parts. It supports you with well proven cycles, efficient options, and soon a new and innovative operational design. The new HEIDENHAIN TNC 620's touch screen reacts to your gestures while the context-sensitive user interface always displays exactly those elements that you may need for the situation. This not only facilitates operation, it also saves you space. So the new TNC 620 is the tailor-made control for compact milling machines: simple in operation, reliable in use, and graceful in appearance.

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