WinNC Starting Information

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Contents

W: Accessory Functions

Activating accessory functions ... W1
Robotic Interface ... W1
Automatic doors ... W1
Win3D View ... W1
Tool modelling with the 3D-Tool Generator ... W2
Enable edit ... W3
Generating a new tool ... W3
Copying a tool ... W4
Changing an existing tool ... W4
Selecting a tool colour ... W4
Visualizing a tool ... W5
Sorting function ... W5
DNC interface ... W6
OPC UA umati Interface WinNC ... W6

X: EMConfig

General ... X1
How to start EMConfig ... X2
How to activate accessories ... X3
High Speed Cutting ... X3
Easy2control on screen operation ... X4
Easy2control settings ... X5
Machine room camera ... X5
Input devices ... X6
How to save changes ... X6
How to create machine data floppy disk or machine data
USB flash drive ... X6

Y: External Input Devices

Easy2control On Screen operation ... Y1
Scope of supply ... Y1
Operating areas ... Y2
Machine room camera ... Y5
Installing the camera ... Y5
Operating the camera ... Y6

Z: Software Installation Windows

System prerequisites ... Z1
Software installation ... Z1
Variants of WinNC ... Z1
Network card (ACC) ... Z2
Starting WinNC ... Z3
Terminating WinNC ... Z3
Checks by EmLaunch ... Z4
Licence input ... Z6
Licence manager ... Z6

W: Accessory Functions

Activating accessory functions

According to the machine (turn/mill) the following accessories can be taken into operation:
- automatic tailstock
- automatic vice/clamping device
- Air purge system
- Dividing attachment
- Robot interface
- Automatic doors
- Win3D view simulation software
- DNC interface
- OPC UA umati Interface

The accessories are activated with EMConfig.

The OPC UA umati interface WinNC is activated via a separate installation programme.

Robotic Interface

The robotic interface is used to connect the concept machines to an FMS/CIM system.

The most important functions of a concept machine can be automated via the inputs and outputs of an optional hardware module.
The following functions can be controlled via the robotic interface:
- Program START / STOP
- Door open / closed
- Quill clamp / back
- Clamping device open / closed
- Feed STOP

Note:
The functionality of the Win3D-View is depending on the control software that is used.

Automatic doors

Preconditions for activation:
- The auxiliary drives must be switched on.
- The main spindle must be still (M05 or M00) - this also means that the run-out phase of the main spindle must be ended (program dwell time if required).
- The feed axes must be still.
- The tool changer must be still.

Behavior when automatic doors active:

Opening door
The door can be opened manually, via the robot interface or DNC / OPC UA umati- interface.
In addition, the door opens when the following commands are executed in the CNC program:
- M00
- M01
- M02
- M30

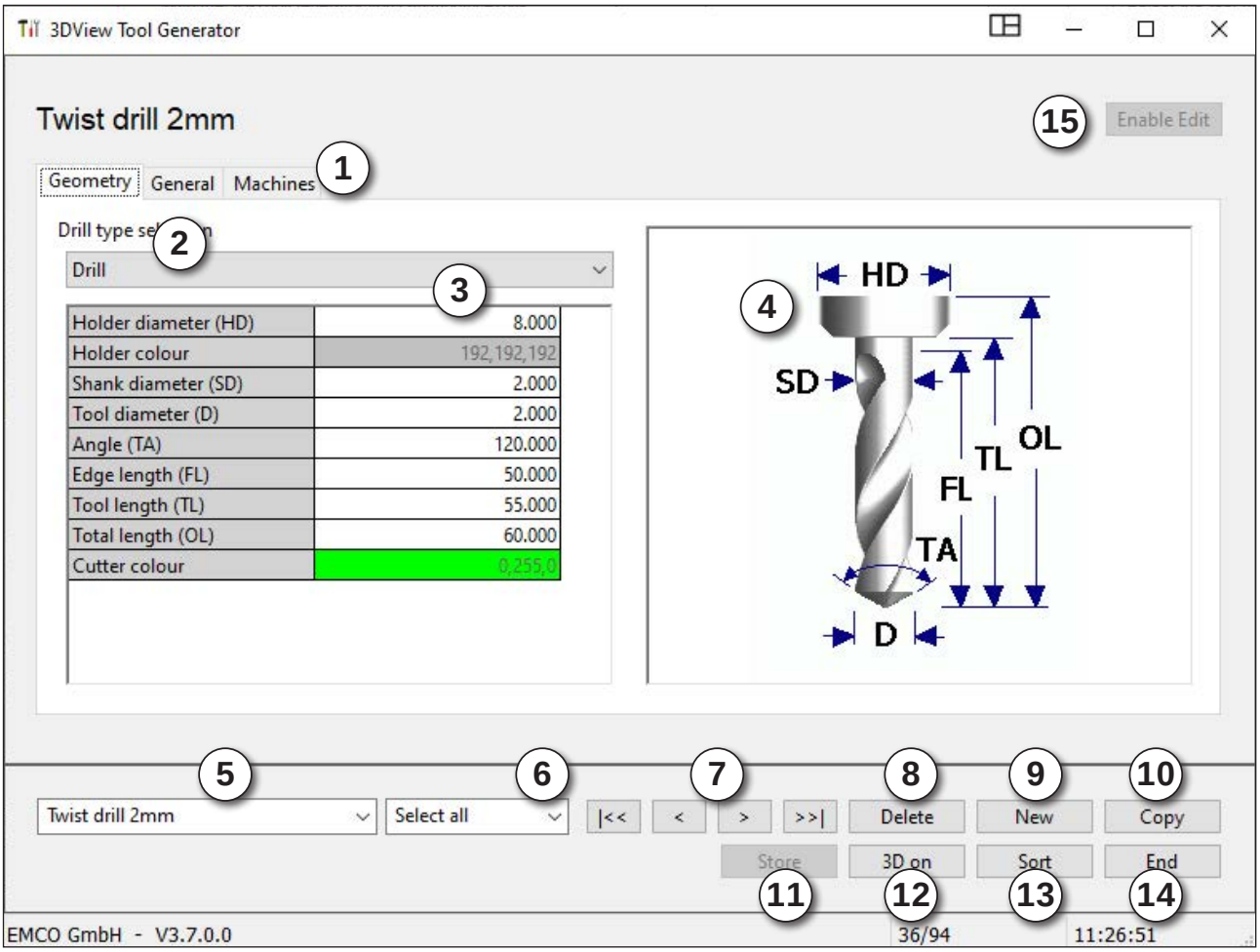
Closing door:
The door can be closed by manually pressing the button via the robot interface. Depending on the machine type and the configuration it is possible to close the door via the DNC / OPC UA umati interface.

Win3D View

Win3D View is a 3D simulation for turning and milling, which is offered as an additional option for the WinNC product. Graphical simulations of CNC controls are primarily designed for industrial practice. The Win3D View screen representation goes beyond the industrial standard. Tools, raw parts, clamping devices and the processing steps are represented extremely realistically. The programmed movement paths of the tool are checked by the system for a collision with clamping device and raw part. A warning message is issued when there is danger. This makes possible to have understanding and control of the manufacturing process already on the screen.
Win3D View is used to visualize and prevent costly collisions.
Win3D View offers the following advantages:
- Extremely realistic representation of workpiece
- Tool and clamping device collision control
- Cut representation
- Zoom functions and turning of views
- Representation as solid or wireframe model

Tool modelling with the 3D-Tool Generator

With the 3D-ToolGenerator you can modify existing tools and create new tools.



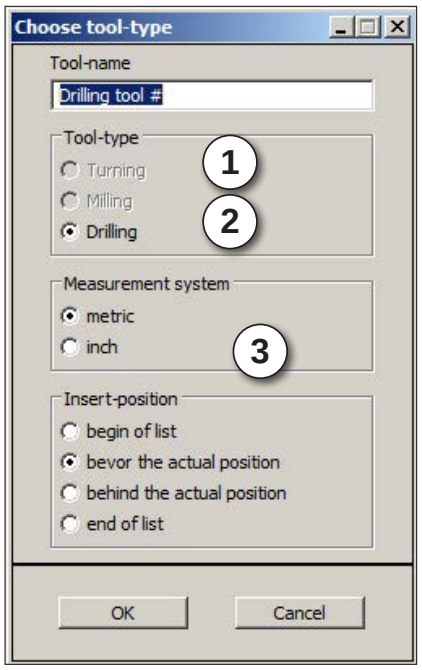
1 Register cards for "Geometry", "General" and "Machines" for drilling and milling tools and "Tip", "Holder", "General" and "Machines" for turning tools.
2 Selection of tool types
3 This window enables the input of tool dimensions.
4 Graphical support for the tool dimensioning
5 Choice of tools for the selected tool type
6 Choice of tool types (here: only drill)
"Turning tool", "Milling tool" and "Drilling tool" reduce the tool choice to the respective type (here: only drilling tools are listed).
"All" does not reduce the tool choice.
7 Buttons for quickly browsing through the tools
|<< go to first tool in the group
>>| go to last tool in the group
< go forward in the list by one tool
> go back in the list by one tool
8 Button to delete tools
9 Button to create new tools
10 Button to copy tools
11 Button to save changes
12 Button for 3D visualization
13 Button to sort tools
14 Button to terminate the 3DView tool generator

Enable edit

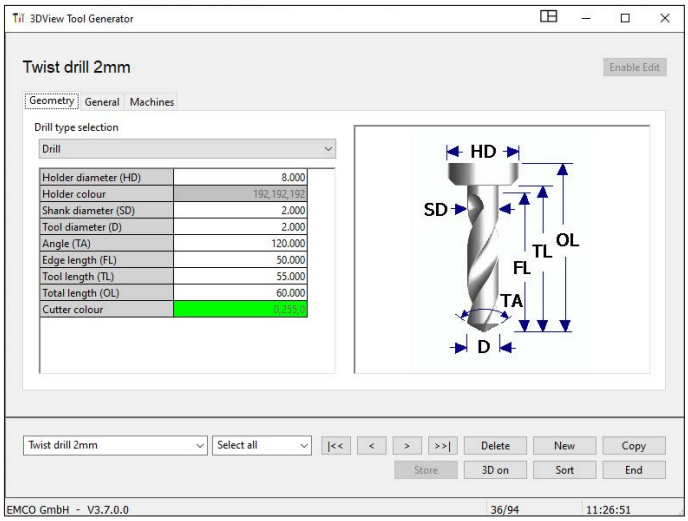
Editing is activated with this button (15).
In order to make changes in the 3D ToolGenerator, the password “emco” must be entered.
This activates the Delete (8), New (9) and Copy (10) functions.

Generating a new tool

- Set the selection for tool types to "Selection all".
- Press the button to generate new tools.
- Select the tool name (1), the tool type (2) and the measurement system (3).



- Confirm the entries with "OK".



- Define all tool dimensions.
- Define all tool colours (see "select tool colour").

Copying a tool

Copy

- Call the tool you wish to copy.
- Press the button to copy tools.
- Enter the new tool name.
- Confirm the inputs with "Save".

Store

- Confirm the entries with "Store".

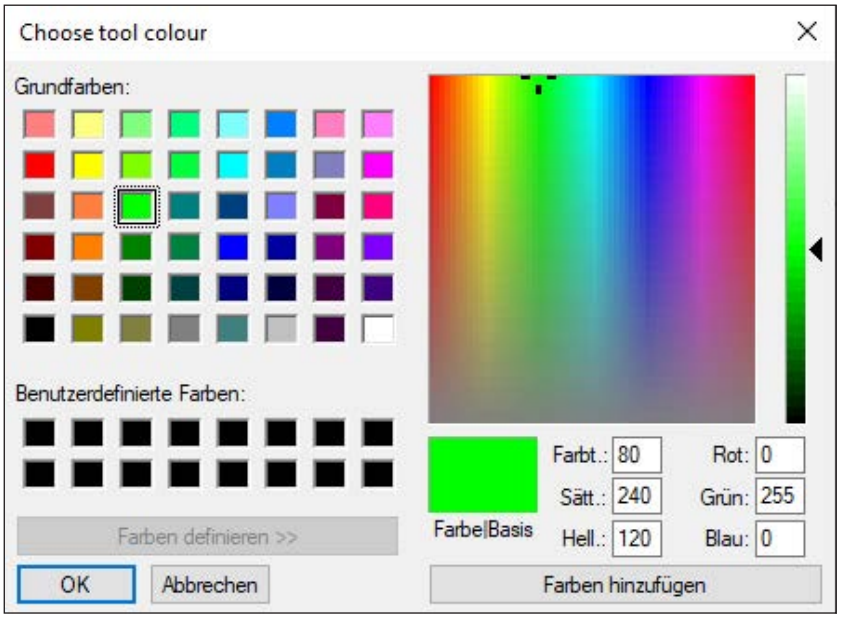
Changing an existing tool

- Call the tool you wish to change.
- Change the values.

Store

- Confirm the entries with "Store".

Selecting a tool colour



- Make a double click with the mouse pointer in the coloured box of the tool colour. The window "Select tool colour" will appear.
- Select the required colour.

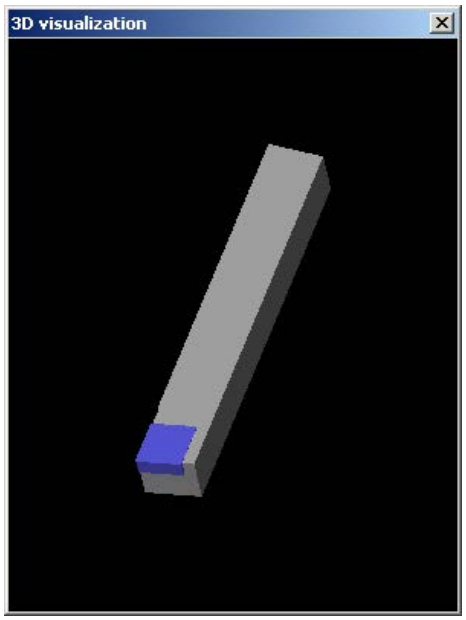
OK

- Confirm the entries with "OK".

Visualizing a tool

3D on

- Press the button for 3D visualization.



Rotating image
At any time you can rotate the simulation image in one plane as required by pressing and holding the left mouse button. For movements around the Z axis press “Shift” + left mouse button + mouse movement to the right or to the left.

Strg

Zooming
You can zoom the tool simulation image in or out by means of „Ctrl“ + left mouse button + mouse movement upwards or downwards

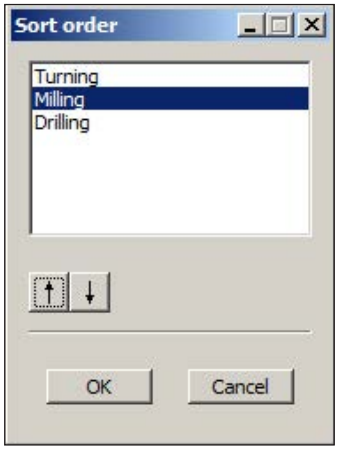
Shifting
Press the right mouse button + mouse movement in the required direction to shift the simulation image.

Sorting function

The sorting sequence makes it possible to display the tools being sorted according to tool types. Every time the sorting sequence is changed, the selection for tools will be updated.

Sort

- Press the button for sorting.



- Define new sorting sequence.

OK

- Confirm the entries with "OK".

DNC interface

The DNC interface (Distributed Numerical Control) enables the control system (WinNC) to be controlled remotely via a software protocol.
The DNC interface is activated with EMConfig, by indicating TCP/IP or a serial interface for the DNC.
During the installation of the control software, the DNC interface is enabled and configured, and can be reconfigured with EMConfig later on.

The DNC interface creates a connection between a higher-level computer (production control computer, FMS computer, DNS host computer, etc.) and the control computer of an NC machine. After activation of the DNC drive the DNC computer (Master) takes over control of the NC machine (Client). The DNC computer takes over complete control of the manufacturing. The automation fittings such as door, chuck (collet), quill, coolant, etc. can be controlled from the DNC computer. The current status of the NC machine is visible on the DNC computer.

The following data can be transferred or loaded via the DNC interface:
- NC Start
- NC Stop
- RESET
- Approach reference point
- Periphery control
- Override data

The DNC interface can be operated with the following CNC control types:
- EMCO WinNC for Sinumerik Operate T and M
- EMCO WinNC for Fanuc31i T and M
- EMCO WinNC for Heidenhain TNC640

Further details of the functions and the DNC protocol can be found in the accompanying product documentation.

If the DNC interface is operated with TCP/IP, it will wait for incoming connections on port 5557.

OPC UA umati Interface WinNC

The OPC UA umati interface WinNC is an umati-compatible OPC UA server for connecting a Concept machine to external systems via the network. Machine data can be read out via this interface. In addition, the machine can be controlled via commands and control-specific parameters can be set.
This interface can be operated with the following CNC control types:

- EMCO WinNC for Sinumerik Operate T and M
- EMCO WinNC for Fanuc31i T and M
- EMCO WinNC for Heidenhain TNC640

The server is based on the following Companion Specification of the OPC Foundation:

- OPC 40501-1: Machine Tools - Monitoring and Job Overview mit MachineTool Basic Server Profile

and the following facets:

- MachineTool Monitoring Server Facet
- MachineTool Tools Server Facet
- MachineTool Errors and Alerts Server Facet

For further details on the functionality and connection settings of the OPC UA umati interface WinNC, please refer to the product documentation supplied.

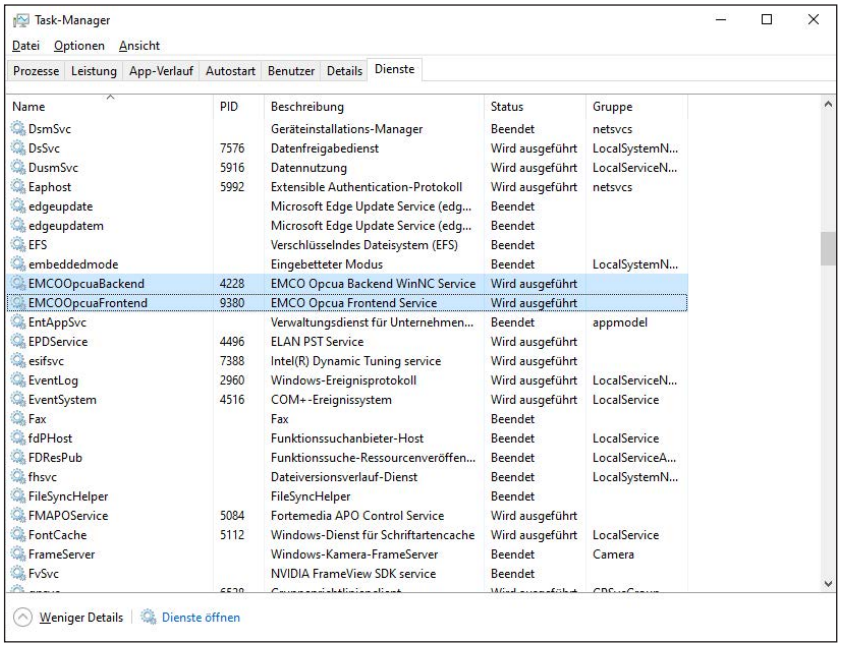
Start-up

For start-up, the following steps should be carried out after installing the WinNC:

Install OPC UA Server with umati_opcua.exe.

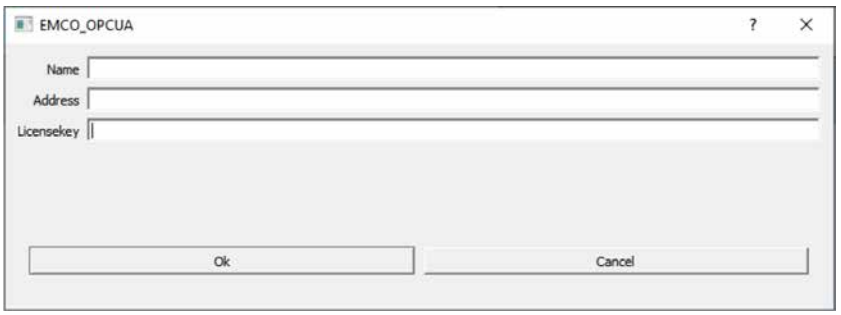
Two services will be started automatically:
- EMCO Opcua Backend WinNC Service
- EMCO Opcua Frontend Service

This can be controlled in the task manager:

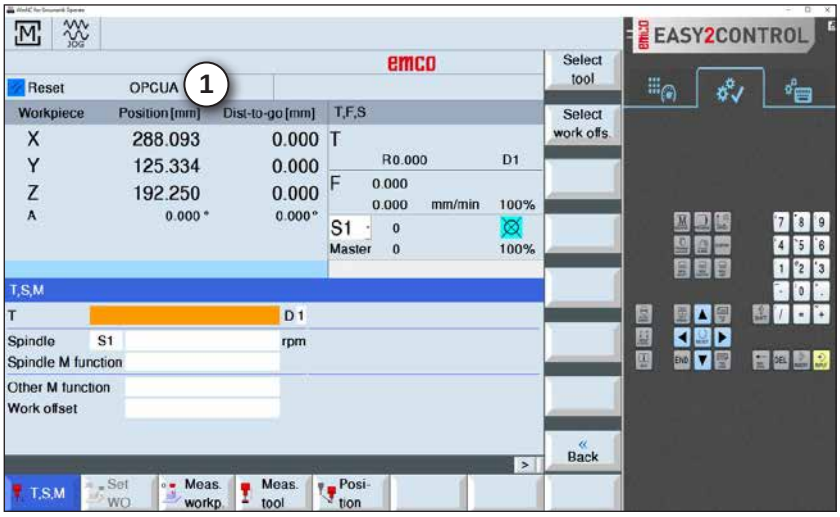


Licensing

For licensing, the OPC UA umati Interface licence must be entered when starting the WinNC for the first time.

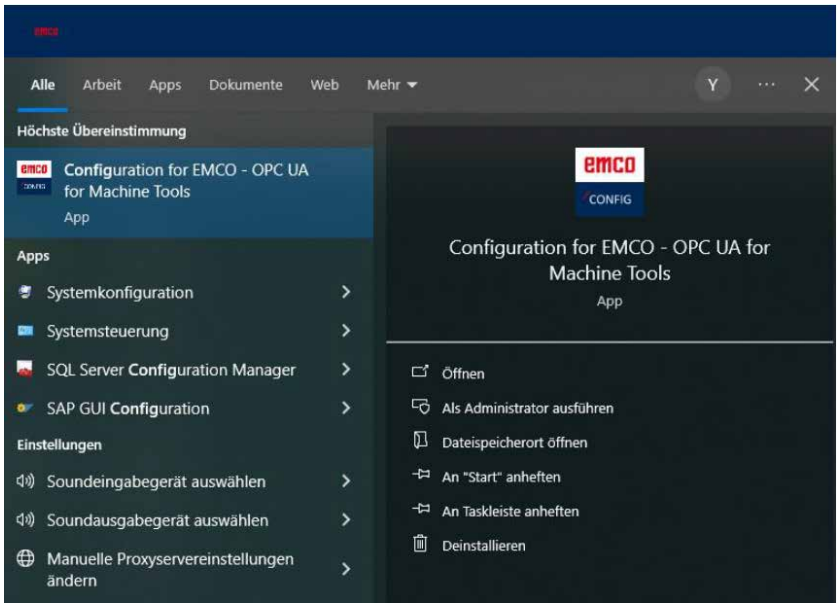


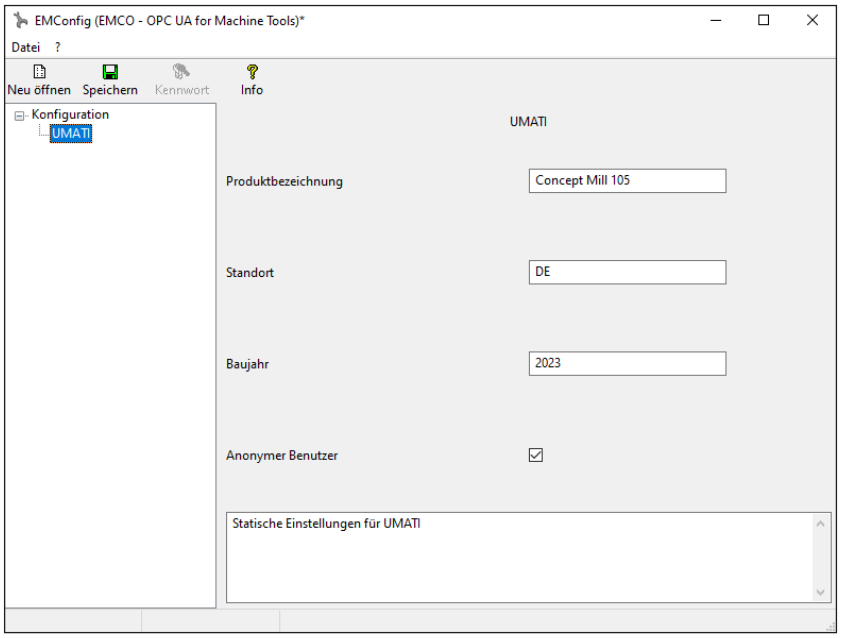
If the connection between the services and the controller has been established correctly, there is an OPCUA display (1) in the status bar of the controller, as shown here in the example of the HMI Operate.



Set up

To set up the machine correctly for the customer, settings can be made in a special configuration tool: To do this, the app “Configuration for EMCO - OPC UA for Machine Tools” must be opened and executed as an administrator.





For the changes to take effect, either the services or the computer must be restarted.

X: EMConfig

General

Note:
The settings which are available in EMConfig are depending on the machine and the control that is used.

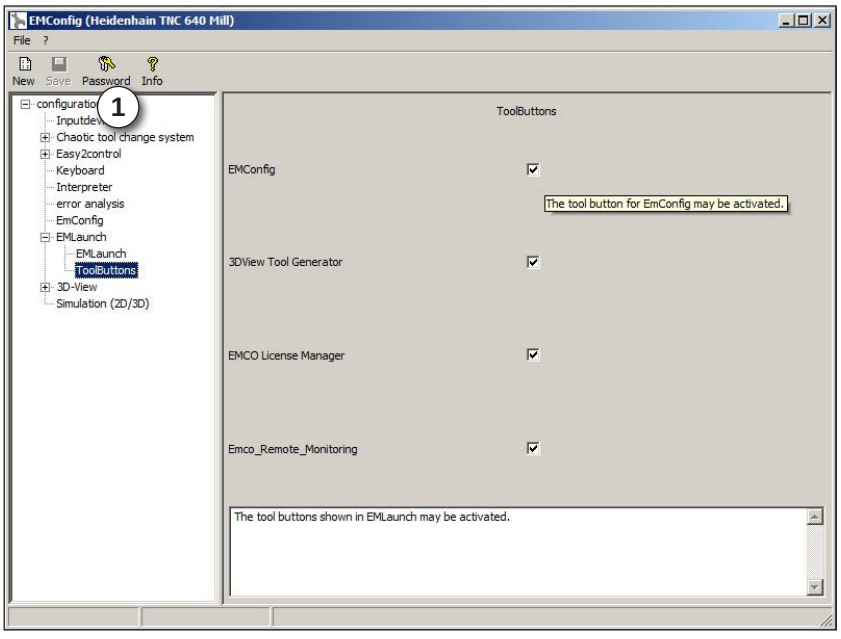
EMConfig is a configuration software for WinNC. EMConfig helps you to alter the settings of WinNC.

The most important settings are:
- Control language
- System of measurement mm - inch
- Activate accessories
- Selection of interface for control keyboard

Using EMConfig you can also activate diagnostic functions in case of troubles - that way you get help immediately.

Safety-related parameters are protected by a password. They can only be activated by set-up technicans or by technical support representatives.

Note:
In order to be able to make changes in EMConfig, the password “emco” must be entered (1).



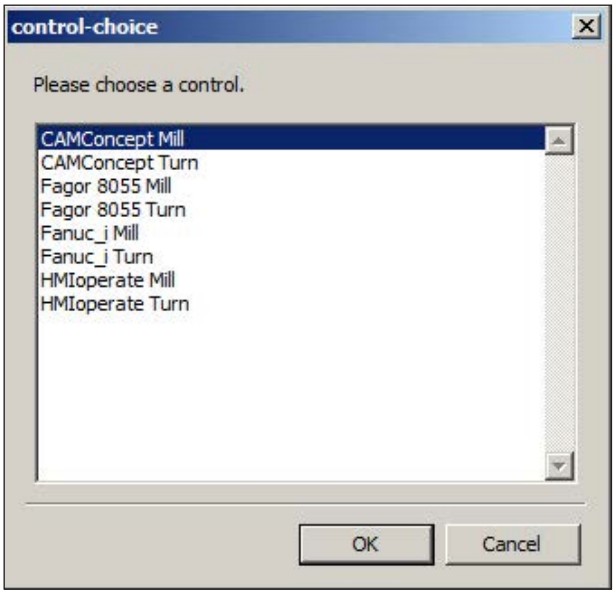
EMLaunch configuration

The following ToolButtons for EMLauch can be activated or deactivated, e.g.:
- EMConfig
- 3DView Tool Generator
- EMCO License Manager
- Emco_Remote_Monitoring

Icon for EMConfig

How to start EMConfig

Open EMConfig.



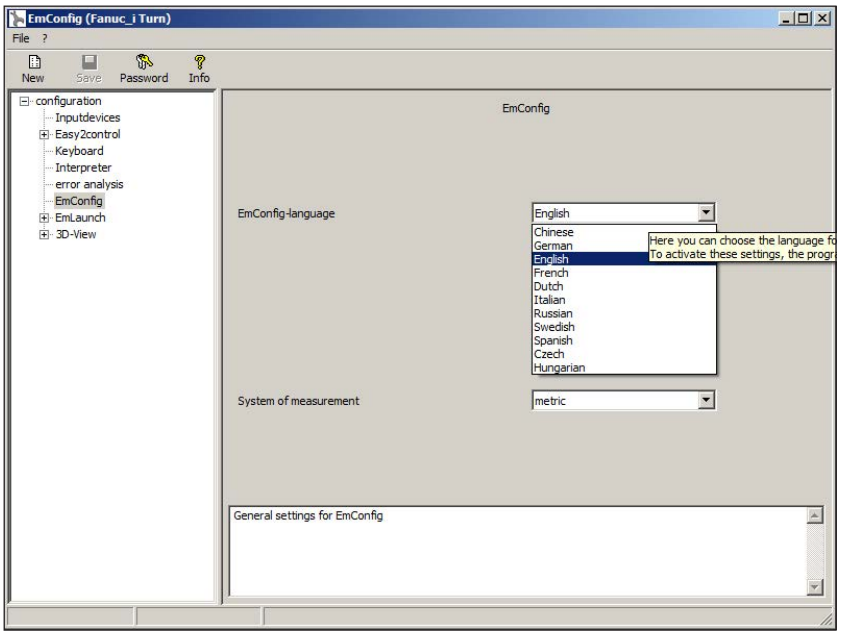
Selection box for control type

In case several control types are installed, a selection box will appear on the screen.

Select the required control type and click OK.

The following settings are only valid for the selected control type.

The window for EMConfig appears on the screen.



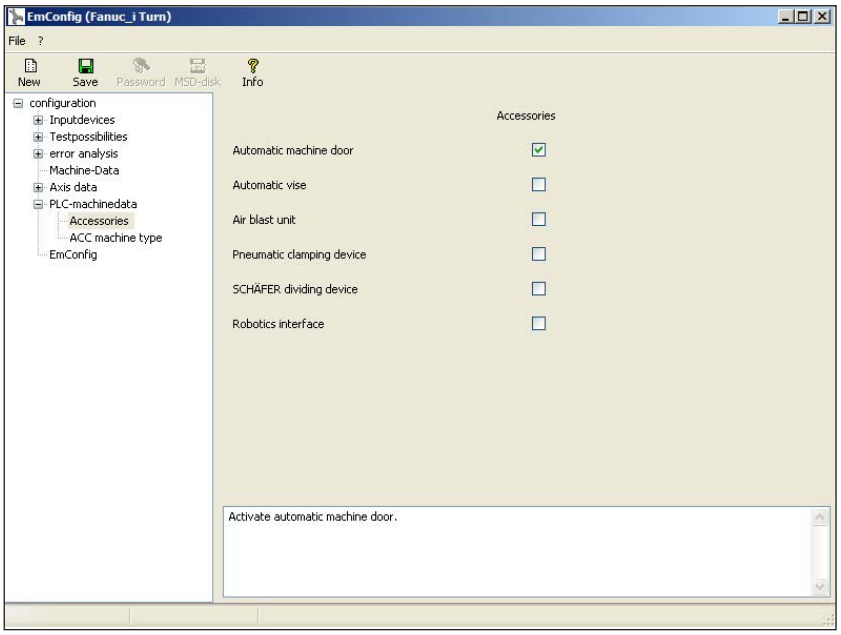
Change the language of EMConfig

Here you can change the language of EMConfig. In order to activate the settings, restart the program.

Note:
Select the desired menu item. The appropriate function is explained in the text box.

How to activate accessories

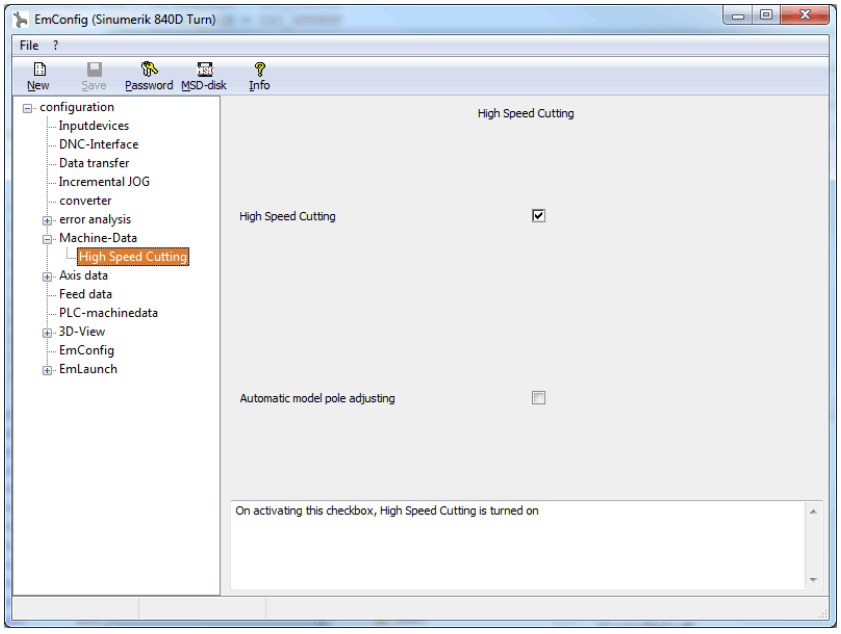
When you install accessories on your machine, you need to activate them here.



Activate accessories

High Speed Cutting

On activating this checkbox, High Speed Cutting is turned on.

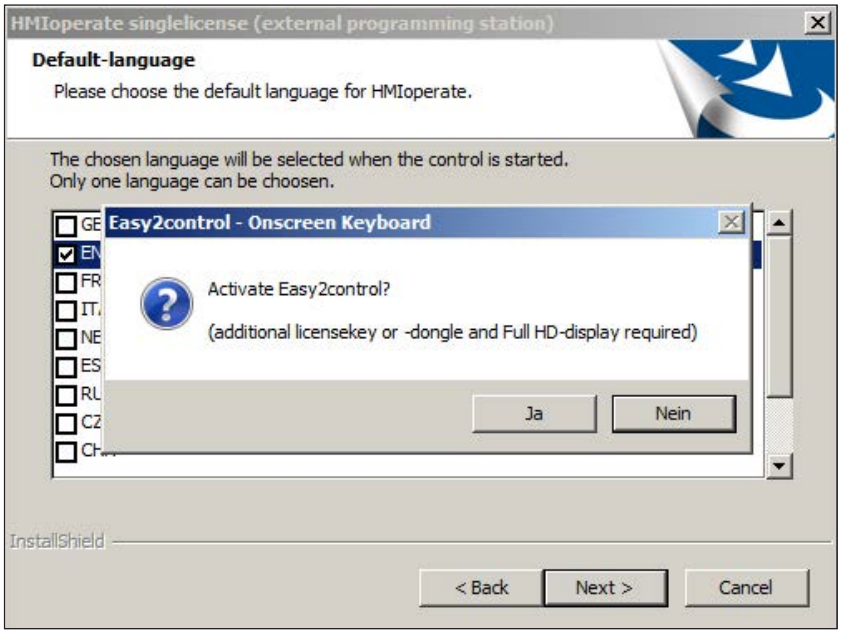


Activate High Speed Cutting

By using high speed cutting, the setting of the axis controller is adjusted. This gain is only effective until the programmed feed rate of 2500 mm/min and allows contour faithful retraction of the tool path and generating of sharp edges.
If the feed is set up to higher than 2500 mm/min, it is automatically reset to the normal operating mode and sanded and rounded edges are created.

Easy2control on screen operation

Note:
If Easy2control is used after demo version without the hardwaredongle or a valid license key, the controls are diactivated and an appropriate alarm is output by the controller. However, the virtual keyboard is displayed completely.



Activating Easy2control

When installing the software WinNC you will be prompted to activate Easy2control. In order to use the Software for a programming station without restriction, the license key must be entered or the license dongle supplied must be connected to a free USB port.

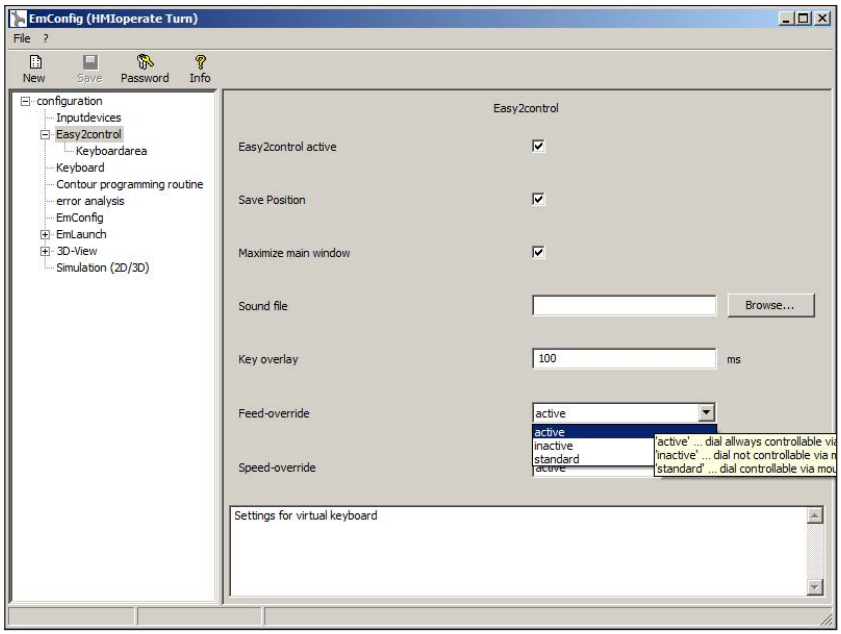
For lathes and milling machines of the Concept series 55/60/105 with connected Easy2Operate keyboard no license dongle is necessary.

Using Easy2Operate on a programming station requires either

- a license dongle, or
- a license key, or
- a connected Easy2Operate keyboard.

Easy2control settings

This mask allows you to enable or disable Easy-2control and make settings.



Easy2control settings

Dial feed-override and dial speed-override:

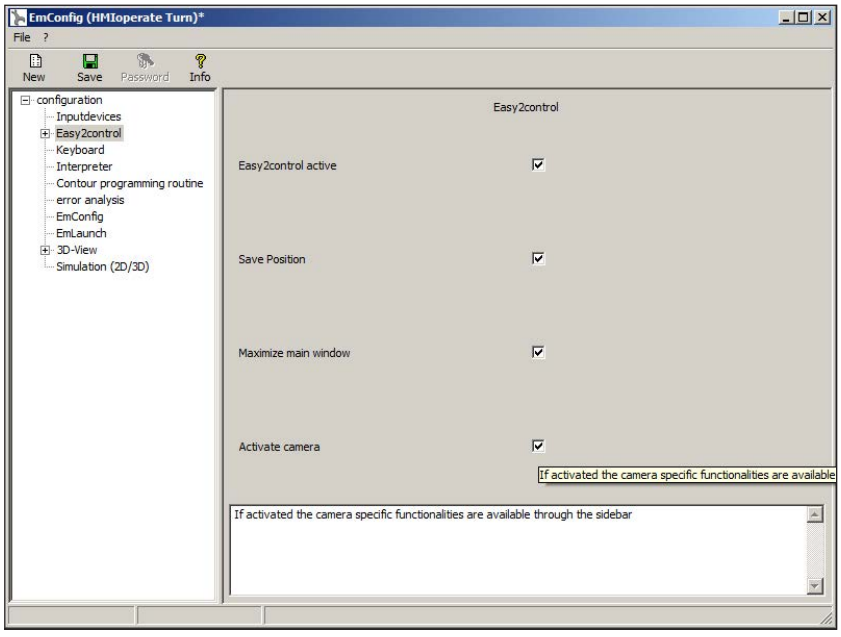
- **Aktive**: dial always controllable via mouse/touchscreen (even with available hardware- version).
- **Inaktive**: dial not controllable via mouse/touchscreen.
- **Standard**: dial controllable via mouse/touchscreen when no hardware-version is available.

Machine room camera

The accessory machine room camera is available for all controls which support Easy2control.

Danger:

Make sure the machine room camera is placed properly in the work area that collisions with the tool turret and the axes are avoided.



Activate camera

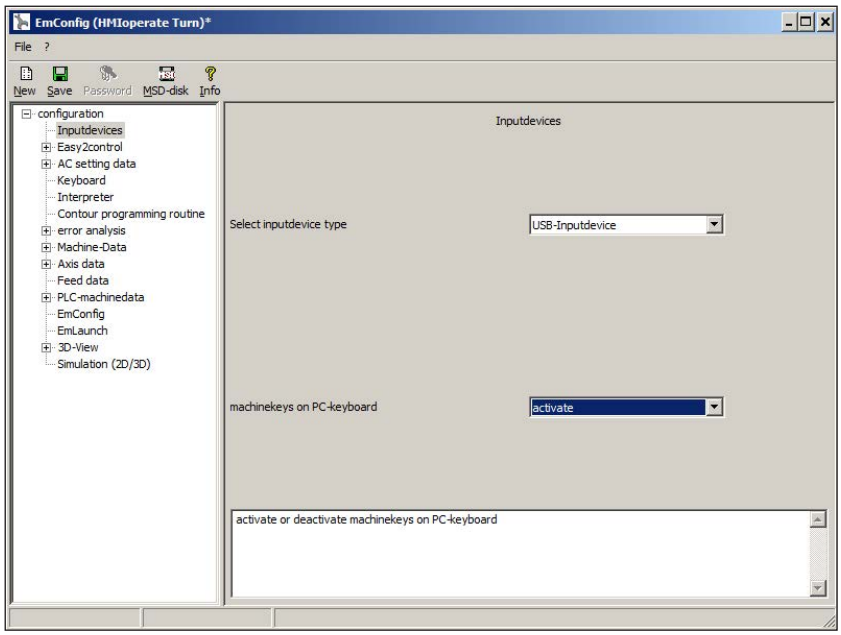
Please refer to chapter Y “external input devices” for more information about the installation guide for the the camera.

Attention:

The camera may not be operated without the supplied waterproof case.

If the camera is operated without the waterproof case it may be damaged by coolant and chips.

Input devices



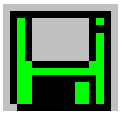
Settings for the input devices

- **Select input devices**
  select the keypoard type.
- **Machinekeys on PC keyboard**
  the keyboard can be activated or deactivated.

The setting is available for the following controls:

- EMCO WinNC for Sinumerik Operate
- EMCO WinNC for Fanuc31i
- EMCO WinNC for Heidenhain TNC640
- CAMConcept

How to save changes



After the settings, the changes must be saved.

Select "Save" or click on the icon.

Note:
Input fields highlighted in red indicate inadmissible values. Inadmissible values are not saved in EMConfig.

After saving the changes, create a machine data floppy disk (MSD) or a machine data USB flash drive.

How to create machine data floppy disk or machine data USB flash drive

After having changed the machine data, the machine data floppy disk or the machine data USB flash drive must be in the appropriate drive.
Otherwise your changes cannot be saved and get lost.

Y: External Input Devices

Easy2control On Screen operation

Easy2control adds a range of attractive applications to the successful interchangeable control system used in EMCO training machines. Suitable for use in machines and simulation workplaces alike, it displays additional control elements directly on the screen and, when used together with a touchscreen monitor, provides the ideal input interface.

Scope of supply

The software for Easy2control is part of the control software.

Single license:	Best. Nr.: X9C 120
Multiple license	Best. Nr.: X9C 130

Technical data for the screen:

16:9 Full-HD Monitor (1920x1080) at the minimum

Currently available controls (T and M):

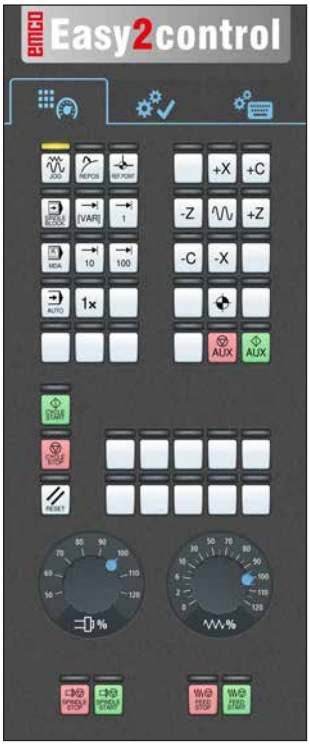
- EMCO WinNC for Sinumerik Operate
- EMCO WinNC for Fanuc31i
- Emco WinNC for Heidenhain TNC 640 (M only)

A connected Easy2Operate keyboard unlocks Easy2control even without a separate license.

Note:
If a Full HD monitor is used without touchscreen function, the control is operated just with mouse and keyboard.

Operating areas

EMCO WinNC for Sinumerik Operate

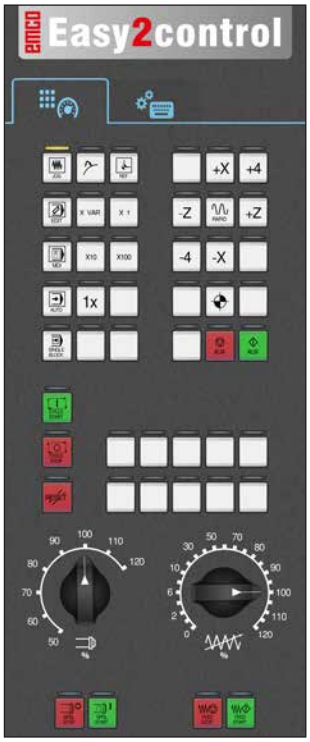


Machine control panel

Controller-specific operation

Control operation complete

EMCO WinNC for Fanuc 31i



Machine control panel

Control operation complete

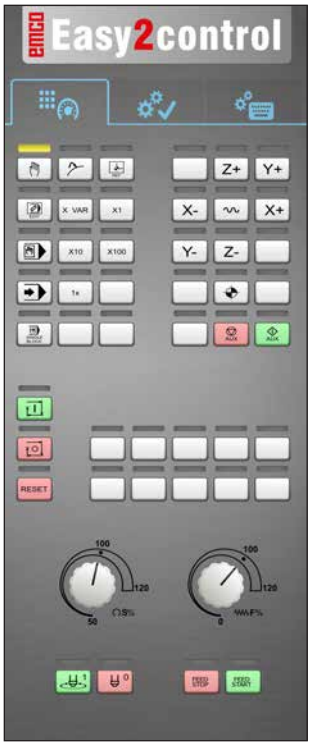
Emco WinNC for Heidenhain TNC 640

Machine control panel

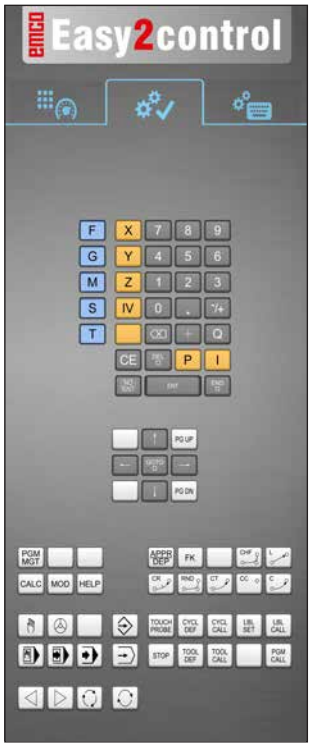
Controller-specific operation

Control operation complete

Heidenhain TNC 426



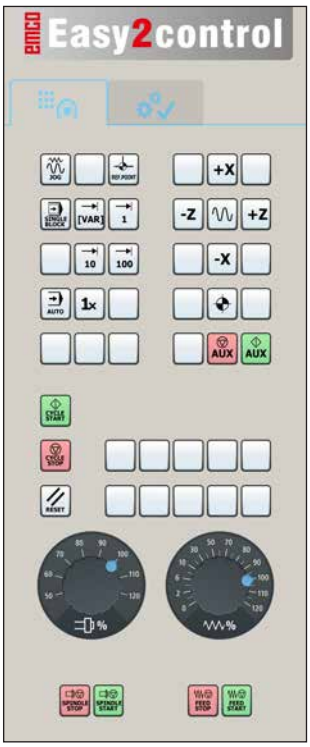
Machine control panel



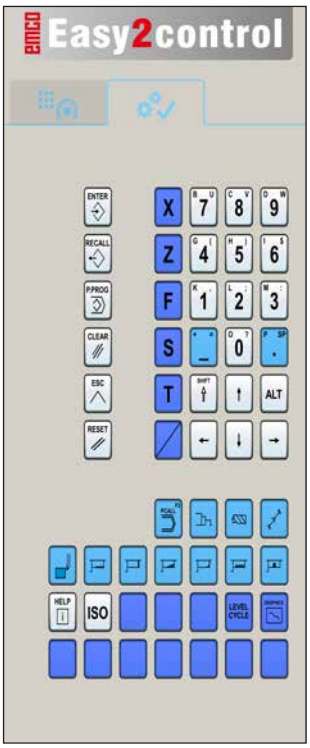
Controller-specific operation

Control operation complete

Fagor 8055



Machine control panel



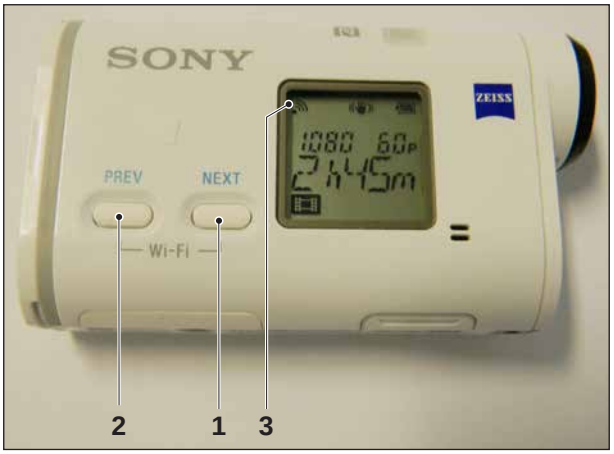
Control operation complete

Refer to the chapter “Key Description” of the respective control description for operation and key function.

Note:
The screen display, based on customer-specific configurations, may look different.

Machine room camera

This accessory is no longer available!



Activating WLAN

Connect WLAN

Installing the camera

Requirement

USB WLAN adapter for the machine.

Setup WLAN

- press NEXT (1) or PREV (2) until an operating mode appears which supports WLAN, e.g. MOVIE. The symbol for WLAN (3) appears in the corner on top left.
- Open EMConfig and activate the camera.
- Connect the WLAN adapter to the USB port to the machine.
- Open windows network and sharing centre (4).
- Select the wireless network, enter the password and finish the connect setup.
  The name of the network (5) and the password are supplied together with the camera.
- Open the control software with activated Easy-2control.

Operating the camera

- Click the Easy2control logo to open the sidebar.

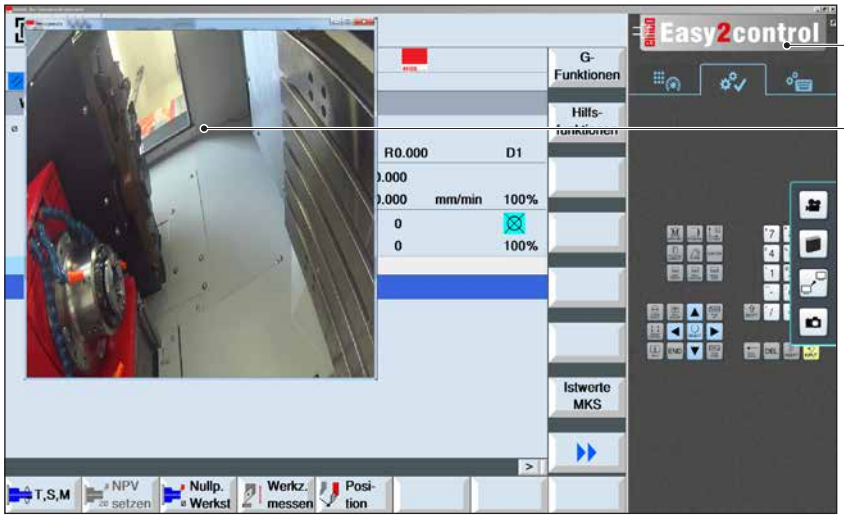
Functions of the sidebar

- Click the camera symbol to open the preview window (2).

- Open the operating manual of the control.

- Option for the second screen:
  - duplicate screen
  - screen extention to two monitors

- Creates a screenshot of the control in *.png format.



Operating the machine room camera

Note:
The option for the second screen is only available for machines CT/CM 260 and 460.

Attention:
The camera may not be operated without the supplied waterproof case.

If the camera is operated without the waterproof case it may be damaged by coolant and chips.

Z: Software Installation Windows

System prerequisites

Machine with integrated control PC
- All Concept machines
- Machines that were converted to ACC
- MOC with Windows 7 or higher (32 / 64 Bit)

Machines with included control PC and programming stations
- Windows 7 or higher (32 / 64 Bit)
- free hard drive space 400 MB
- Programming station: 1*USB, machine version: 2*USB
- TCP/IP-capable network card for machine version)

Recommended system prerequisites
- PC Dual Core 2 GHz
- Working memory 4 GB RAM
- free hard drive space 2 GB
- Interface:
  Easy2Operate: 1x USB for machine keyboard
  Machine connection:
  1x LAN (cable connection), only for machine licence
  optional: LAN or WLAN for network connection

Software installation

- Start Windows
- Start the installation application on the USB stick or your download file.
- Follow the instructions from the installation guide.

For more informations regarding software installation and / or software update please refer to the documentation “short description for WinNC update installation”.

Note:
PC TURN and PC MILL have to be equipped with the conversion kit for ACC in order to operate EMCO WinNC.

Variants of WinNC

You can install EMCO WinNC for the following CNC control types:

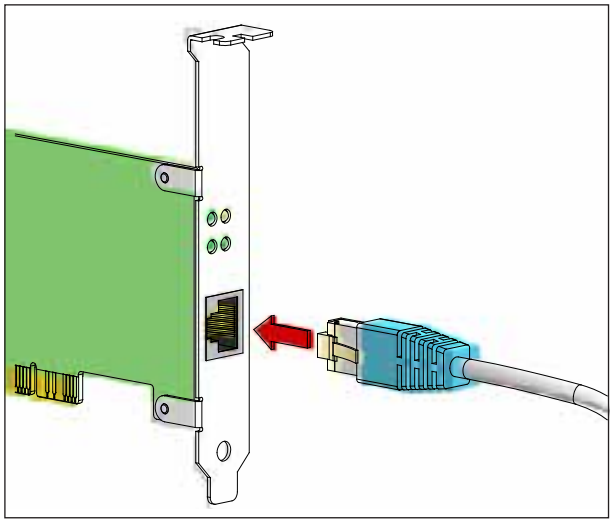
- EMCO WinNC for Sinumerik Operate T and M
- EMCO WinNC for Fanuc31i T and M
- EMCO WinNC for Heidenhain TNC640
- HEIDENHAIN TNC 426
- FAGOR 8055 TC and MC
- CAMConcept T and M

In case there are several control types installed, a menu appears when starting EM Launch from which you can select the desired type.
The following versions can be installed from the WinNC variants:

- Demo licence:
  The demo licence is valid for 30 days after the first use. 5 days before the demo licence expires, you can enter another valid licence key (see licence manager)
- Programming station:
  Programming and operation of the appropriate CNC control type is simulated by WinNC on your PC.
  - Single user licence:
    Authorizes to external programming of CNC-controlled machine tools on one PC workstation.
  - Multi-user licence:
    Authorizes to external programming of CNC-controlled machine tools. The multi-user licence can be installed on an unlimited number of PC workstations or in a network within the institute registered by the licensor.
  - Educational licence version:
    Is a time-limited multi-licence especially for schools and educational institutes.
- Machine licence:
  This licence allows to directly operate a PC-controlled machine (PC TURN, Concept TURN, PC MILL, Concept MILL) of WinNC as if it was operated by an ordinary CNC control.

Danger:
Removal and installation of the network card must only be carried by skilled personnel. The computer must be disconnected from the power supply (pull the power plug).

Note:
During a machine installation one network-card is reserved exclusively for the control of the machine.



Connection of the machine to the PC

Network card (ACC)

for:
Concept Turn 55
Concept Mill 55
Concept Turn 105
Concept Mill 105
Concept Turn 60

Only for machines with ACC kit:
PC Turn 50
PC Mill 50
PC Turn 100
PC Mill 120

Network card type: TCP/IP compatible network card

Setting the network card for the local connection to the machine:

IP address: 192.168.10.10
Subnetmask 255.255.255.0

In case of problems observe the instructions of your operating system (Windows help).

Instructions:
If the network connection to the machine could not be established at the start, the above adjustments are to be made.

Starting WinNC

If you choose AUTO START YES during the installation of your machine version, WinNC starts automatically after switching on the PC.

Otherwise proceed as follows:

1 Switch the machine on.

2 Wait for 20 seconds to ensure that the machine operating system is running before the network connection to the PC is established. Otherwise it is possible that no connection can be established.

3 Switch the PC on and start Windows.

4 Click on the start symbol at the bottom.

5 Select program, the installed folder, and start WinNC Launch.

6 The start image will be shown on the screen. The licence holder is registered in the start screen.

7 If you have only installed one CNC control type, it starts immediately.

8 If you have installed several CNC control types, the selection menu appears.

9 Select the desired CNC control type (use cursor buttons or mouse) and press ENTER to start it.

10 If you use the control keyboard, you can select the desired CNC control type with the cursor buttons or mouse and start with the "NC-Start" button.

11 Tool Buttons (1) can be configured in EMConfig.

Selection menu EMLaunch

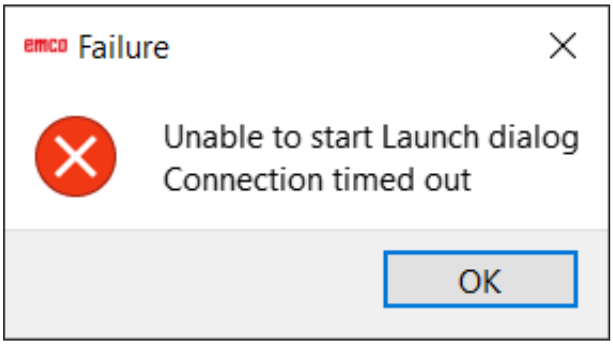
Note:
EMLaunch displays all WinNC und CAMConcept controls that are installed in the same directory.

Terminating WinNC

1 Switch off auxiliary drive with AUX OFF.
Only for machine places, not for programming stations.

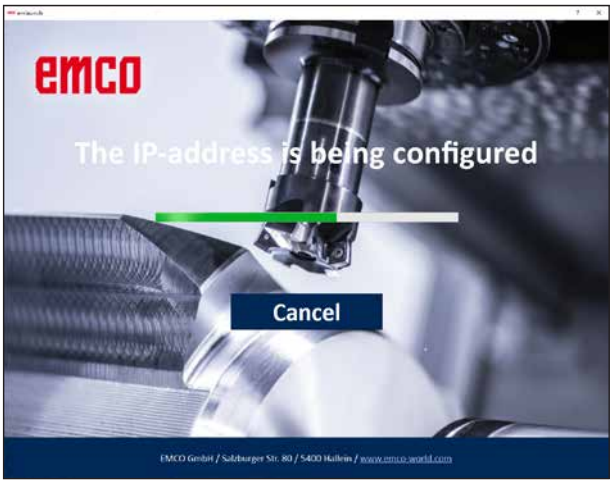
2 By simultaneously pressing these buttons WinNC for Sinumerik Operate will be terminated specifically.
This corresponds to Alt+F4 on the PC keyboard.

Checks by EmLaunch



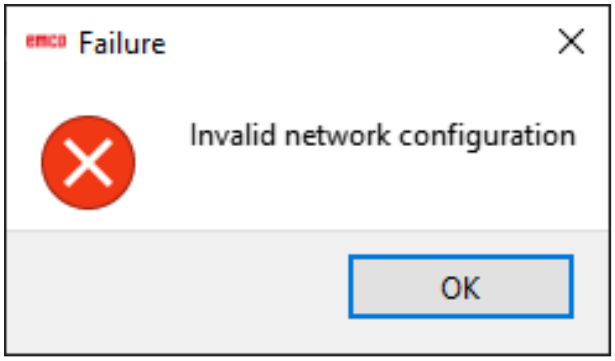
Connection to the machine failed

An incorrect IP address was entered, the connection to the machine cannot be established.



IP-address configuration

It is attempt to configure the IP address automatically via DHCP.



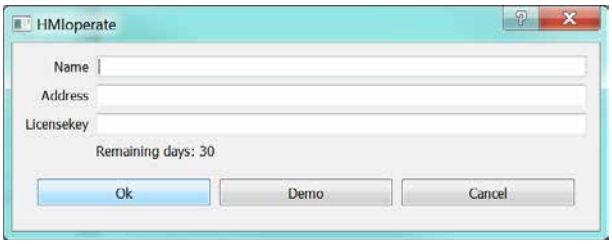
Network connection is not possible

In the ACC / ACpn-machine version EmLaunch is checking if a machine is available:

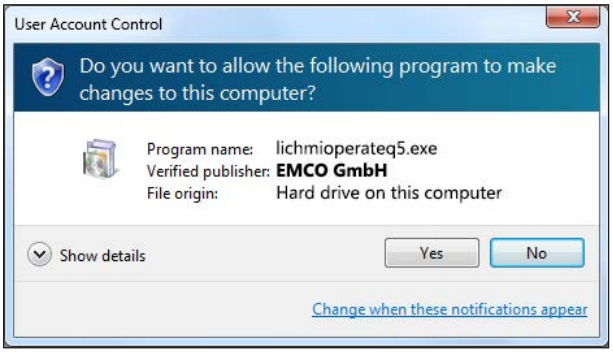
During the network configuration, the IP address is not configured correctly and DHCP for automatic configuration of the IP address is disabled. Connection to the machine is not possible.

Conncection to the machine is OK

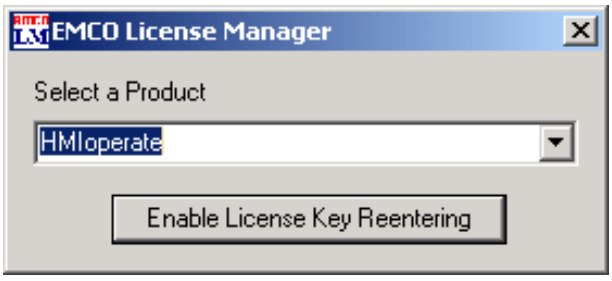
The connection to the machine is completed and the corresponding control can be started.



Input window licence key enquiry



Run EMCO licence manager upon licence key input



EMCO Licence Manager

Licence input

After the installation of an EMCO software product, an input window appears during initial operation and asks for name, address and licence key. If an Emco USB-Stick is connected, this data is taken from the USB-Stick.
UAC dialogue appears upon saving licence input. In order to complete the licence input sucessfully, the dialogue must be confirmed.
This input window appears for every software product that is installed. In case a demo licence is desired (see page Z1), please select "DEMO". Then the input window reappears only 5 days before the expiry date of the demo licence. A subsequent input of a licence key is also possible via the licence manager (see licence manager below).

Licence manager

For the release of additional function groups of existing EMCO software products it is necessary to enter a new licence key (exception: demo licence).

The EMCO Licence Manager enables the input of further new licence keys. For this purpose select the new product in the selection window and confirm the input.

The next time you start your control software an input window appears and asks you to enter name, address and licence key.

Please note that the licence key is asked for each software product individually. The picture on the left shows e.g. the input prompt for the licence key for the software product "HMIoperate".