SIEMENS

SINUMERIK

SINUMERIK 840D sl
Smart machine tool operation

System Manual

Valid for
Control
SINUMERIK 840D sl

CNC software version 4.8 SP3
WinCC V15 Update 1

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

> ### ⚠ DANGER
> indicates that death or severe personal injury **will** result if proper precautions are not taken.

> ### ⚠ WARNING
> indicates that death or severe personal injury **may** result if proper precautions are not taken.

> ### ⚠ CAUTION
> indicates that minor personal injury can result if proper precautions are not taken.

> ### NOTICE
> indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

Preface

SINUMERIK documentation

The SINUMERIK documentation is organized into the following categories:

- General documentation/catalogs
- User documentation
- Manufacturer/service documentation

Additional information

You can find information on the following topics at the following address (https://support.industry.siemens.com/cs/de/en/view/108464614):

- Ordering documentation/overview of documentation
- Additional links to download documents
- Using documentation online (find and search in manuals/information)

If you have any questions regarding the technical documentation (e.g. suggestions, corrections), please send an e-mail to the following address (mailto:docu.motioncontrol@siemens.com).

mySupport/Documentation

At the following address (https://support.industry.siemens.com/My/ww/en/documentation), you can find information on how to create your own individual documentation based on Siemens' content, and adapt it for your own machine documentation.

Training

At the following address (http://www.siemens.com/sitrain), you can find information about SITRAIN (Siemens training on products, systems and solutions for automation and drives).

FAQs

You can find Frequently Asked Questions in the Service&Support pages under Product Support (https://support.industry.siemens.com/cs/de/en/ps/faq).

SINUMERIK

You can find information about SINUMERIK at the following address (http://www.siemens.com/sinumerik).

Target group

This documentation is intended for planners, installers, configuration engineers, technicians and decision-makers

Benefits

The System Manual imparts knowledge of the properties and functions of new operating possibilities of the SINUMERIK Operate software on multitouch panels in widescreen format. The manual provides the target group with an overview of the options to achieve optimum solutions for operating concepts.

Standard scope

This documentation describes the functionality of the standard scope. Extensions or changes made by the machine manufacturer are documented by the machine manufacturer.

Other functions not described in this documentation might be executable in the control. However, no claim can be made regarding the availability of these functions when the equipment is first supplied or in the event of servicing.

Furthermore, for the sake of clarity, this documentation does not contain all detailed information about all types of the product and cannot cover every conceivable case of installation, operation or maintenance.

Note regarding the General Data Protection Regulation

Siemens observes standard data protection principles, in particular the principle of privacy by design. That means that

this product does not process / store any personal data, only technical functional data (e.g. time stamps). If a user links this data with other data (e.g. a shift schedule) or stores personal data on the same storage medium (e.g. hard drive) and thus establishes a link to a person or persons, then the user is responsible for ensuring compliance with the relevant data protection regulations.

Technical Support

Country-specific telephone numbers for technical support are provided in the Internet at the following address (https://support.industry.siemens.com/sc/ww/en/sc/2090) in the "Contact" area.

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Fundamental safety instructions

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1.1 General safety instructions

⚠ WARNING
Danger to life if the safety instructions and residual risks are not observed
If the safety instructions and residual risks in the associated hardware documentation are not observed, accidents involving severe injuries or death can occur. ● Observe the safety instructions given in the hardware documentation. ● Consider the residual risks for the risk evaluation.

⚠ WARNING
Malfunctions of the machine as a result of incorrect or changed parameter settings
As a result of incorrect or changed parameterization, machines can malfunction, which in turn can lead to injuries or death. ● Protect the parameterization (parameter assignments) against unauthorized access. ● Handle possible malfunctions by taking suitable measures, e.g. emergency stop or emergency off.

1.2 Warranty and liability for application examples

Application examples are not binding and do not claim to be complete regarding configuration, equipment or any eventuality which may arise. Application examples do not represent specific customer solutions, but are only intended to provide support for typical tasks.

As the user you yourself are responsible for ensuring that the products described are operated correctly. Application examples do not relieve you of your responsibility for safe handling when using, installing, operating and maintaining the equipment.

1.3 Industrial security

Note

Industrial security

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, systems, machines and networks.

In order to protect plants, systems, machines and networks against cyber threats, it is necessary to implement – and continuously maintain – a holistic, state-of-the-art industrial security concept. Siemens' products and solutions constitute one element of such a concept.

Customers are responsible for preventing unauthorized access to their plants, systems, machines and networks. Such systems, machines and components should only be connected to an enterprise network or the Internet if and to the extent such a connection is necessary and only when appropriate security measures (e.g. firewalls and/or network segmentation) are in place.

For additional information on industrial security measures that may be implemented, please visit:

Industrial security (http://www.siemens.com/industrialsecurity)

Siemens' products and solutions undergo continuous development to make them more secure. Siemens strongly recommends that product updates are applied as soon as they are available and that the latest product versions are used. Use of product versions that are no longer supported, and failure to apply the latest updates may increase customer's exposure to cyber threats.

To stay informed about product updates, subscribe to the Siemens Industrial Security RSS Feed at:

Industrial security (http://www.siemens.com/industrialsecurity)

Further information is provided on the Internet:

Industrial Security Configuration Manual (https://support.industry.siemens.com/cs/ww/en/view/108862708)

> ⚠️ **WARNING**
>
> **Unsafe operating states resulting from software manipulation**
>
> Software manipulations (e.g. viruses, trojans, malware or worms) can cause unsafe operating states in your system that may lead to death, serious injury, and property damage.
>
> * Keep the software up to date.
> * Incorporate the automation and drive components into a holistic, state-of-the-art industrial security concept for the installation or machine.
> * Make sure that you include all installed products into the holistic industrial security concept.
> * Protect files stored on exchangeable storage media from malicious software by with suitable protection measures, e.g. virus scanners.
> * Protect the drive against unauthorized changes by activating the "know-how protection" drive function.

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Modern machine operation

2

2.1 Introduction

Trends in the field of machine tools

Industrie 4.0 and increasing digitalization are affecting more and more processes and work sequences in modern factories. This starts with the product design and goes as far as CNC operation.

The appearance and design of the machine play an equally important role as the intuitive operability of the user interface.

Ever larger screens with ever higher resolutions offer room for individual, flexible user interface designs and for integrating third-party applications.

In the meantime, the everyday use of smart phones and tablets have made users very familiar and comfortable with multitouch solutions. Nowadays, they expect a comparable level of operating convenience in the operation of CNC in their working environment.

Smart Operation - Intelligent CNC operation

Smart Operation for the SINUMERIK 840D sl is the response to the requests for easy and intuitive operation, flexibility and individualization in the display, and control of the machines.

This manual gives you an overview of the possibilities of optimizing the operating concept on the machine with SINUMERIK Operate and SINUMERIK Create MyHMI /WinCC. With it, the following objectives are reached:

- Time savings, e.g. through intuitive and faster operation

- Productivity, e.g. carrying out operations in parallel with the simultaneous display of important information from various operating areas, as well as monitoring the machine and its status

- Efficiency and cost savings, e.g. by replacing hardware buttons with software buttons

2.2 Content of the "Smart machine tool operation" manual

This manual provides information about the following topics:

- SINUMERIK Operate with "SINUMERIK Operate Generation 2" user interface
  User-friendly multitouch operation

  – Touch operation

  – Intuitive and efficient operation with finger gestures

  – User-friendly input on virtual keyboards

- SINUMERIK Operate on widescreen panels with sidescreen
  Individual design of the operating concept and adaptation of it to the work sequence

  – Widgets and pages

  – ABC keyboard and MCP keys

- Machine OEM-specific HMI using SINUMERIK Integrate Create MyHMI / WinCC
  Greatest possible degree of freedom in the creation of design, navigation and screen contents.

  – Portrait format/landscape format

  – Virtual keyboard and MCP keys

  – Showing the web browser, PDF files (with multitouch operation) and camera

  – Machine data acquisition (central storage of variables, display of diagrams and tables, etc.)

  – Access to drive data (SINUMERIK S120)

  – Support of secondary operator panels and connection to SINUMERIK HT8

  – Integration of the Fanuc user interface and data connection to the Fanuc controller

Multitouch operation with SINUMERIK Operate

3

3.1 Overview

Widescreen-format multitouch panels are optimized for multitouch operation, e.g. the OP 015 black, on which SINUMERIK Operate is active with the "SINUMERIK Operate Generation 2" user interface.

Machine manufacturer

Activate user interface "SINUMERIK Operate Generation 2" using machine data MD9112 $MM_HMI_SKIN.

Multitouch panel

OP 015 black

Figure 3-1   OP 015 black multitouch panel with "SINUMERIK Operate Generation 2" user interface

With this user interface, multitouch can be used for all operator actions. Using multitouch makes operation based on SINUMERIK Operate a lot faster.

References

Further information on the subject of "user interface" is available in the following literature:

● SINUMERIK Operate (IM9) / SINUMERIK 840D sl Commissioning Manual (https://support.industry.siemens.com/cs/document/109752360)

● SINUMERIK Integrate Run MyScreens (BE2) / SINUMERIK 840D sl Programming Manual (https://support.industry.siemens.com/cs/document/109752511)

● SINUMERIK 840D sl Easy XML / SINUMERIK 840D sl Programming Manual (https://support.industry.siemens.com/cs/document/109752366)

3.2 User interface

3.2.1 Screen layout

Touch and gesture operator controls for SINUMERIK Operate with the "SINUMERIK Operate Generation 2" user interface.
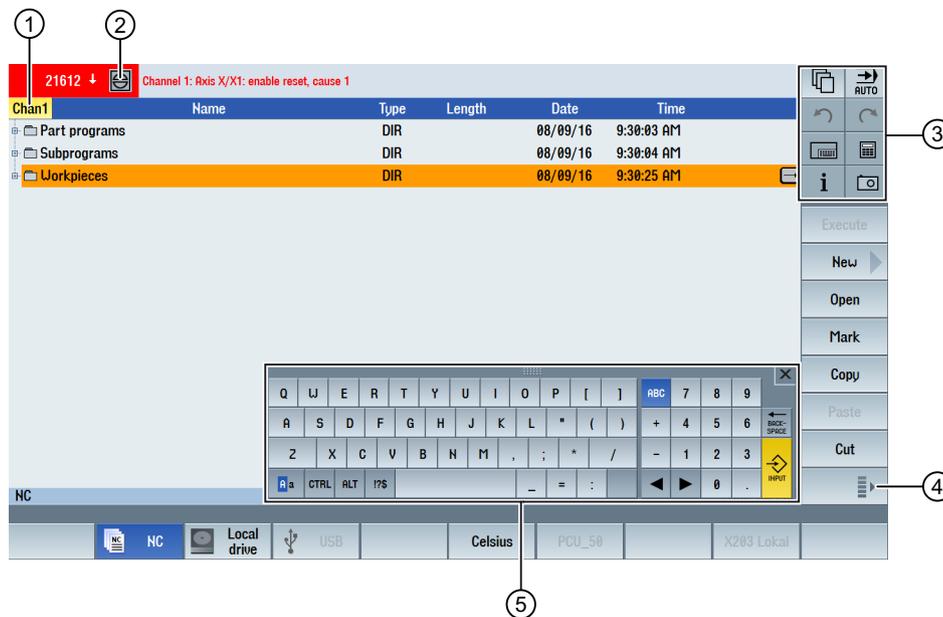
①   Changing the channel
②   Cancel alarms
③   Function key block
④   Display next vertical softkey bar
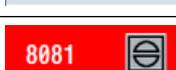⑤   Virtual keyboard

3.2.2 Operator controls on the "SINUMERIK Operate Generation 2" user interface

3.2.2.1 Function key block

Operator control	Function
[M]	**Switch operating area** Tap the current operating area, and select the desired operating area from the operating area bar.
[→ AUTO]	**Switch operating mode** The operating mode is only displayed. To switch the operating mode, tap the operating area and select the operating area from the vertical softkey bar.

Operator control	Function
	Undo Multiple changes are undone one by one. As soon as a change has been completed in an input field, this function is no longer available.
	Restoring Multiple changes are restored one by one. As soon as a change has been completed in an input field, this function is no longer available.
	Virtual keyboard Activates the virtual keyboard.
	Calculator Displays a calculator.
	Online help Opens the online help.
	Camera Generates a screenshot.

3.2.2.2 Further operator touch controls

Operator control	Function
>	Advances to the next horizontal softkey bar. When page 2 of the menu is called, the arrow appears on the right.
∧	Advances to the higher-level menu.
	Advances to the next vertical softkey bar.
8081	Tapping the Cancel alarm symbol clears all queued cancel alarms.
Chan1 NC/	If a channel menu has been configured, it is displayed. Tapping the channel display in the status display switches you to the next channel.

3.2.2.3 Virtual keyboard

If you called the virtual keyboard using the function key block, then you have the option of adapting the key assignment using the shift keys.

①	Shift key for uppercase and lowercase letters
②	Shift key for letters and special characters
③	Shift key for country-specific keyboard assignment
④	Shift key for full keyboard and numerical key block

Hardware keyboard

If a real keyboard is connected, the icon of a minimized keyboard appears in place of the virtual keyboard.

    Use the icon to open the virtual keyboard again.

3.3 Operating with finger gestures

3.3.1 Touch-sensitive user interface

When using touch panels, wear thin gloves made of cotton or gloves for touch-sensitive glass user interfaces with capacitive touch function.

If you are using somewhat thicker gloves, then exert somewhat more pressure when using the touch panel.

Compatible gloves

You will operate the touch-sensitive glass user interface on the Operator panel optimally with the following gloves.

- Dermatril L
- Camatril Velours type 730
- Uvex Profas Profi ENB 20A
- Camapur Comfort Antistatic type 625

- Carex type 1505 / k (leather)
- Reusable gloves, medium, white, cotton: BM Polyco (RS order number 562-952)

Thicker work gloves

- Thermoplus KCL type 955
- KCL Men at Work type 301
- Camapur Comfort type 619
- Comasec PU (4342)

3.3.2   Finger gestures for multi-touch operation

Tap
- Select window
- Select object (e.g. NC set)
- Activate entry field
    – Enter or overwrite value
    – Tap again to change the value

Tap with 2 fingers
- Call the shortcut menu (e.g. copy, paste)
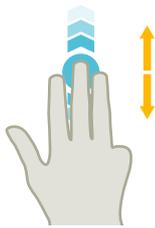

Flick vertically with one finger
- Scroll in lists (e.g. programs, tools, zero points)
- Scroll in files (e.g. NC program)

Flick vertically with two fingers
- Page-scroll in lists (e.g. NPV)
- Page-scroll in files (e.g. NC programs)

Flick vertically with three fingers

- Scroll to the start or end of lists
- Scroll to the start or end of files

Flick horizontally with one finger

- Scroll in lists with many columns

Spread

- Zoom in to graphic contents (e.g. simulation, mold making view)

Pinch

- Zoom out from graphic contents (e.g. simulation, mold making view)

Pan with one finger

- Move graphic contents (e.g. simulation, mold making view)
- Move list contents

Pan with two fingers

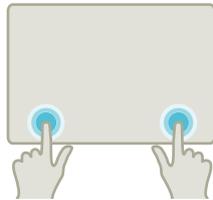- Rotate graphic contents (e.g. simulation, mold making view)

Tap and hold

● Open input fields to change

● Activate or deactivate edit mode (e.g. actual block display)

Tap and hold using 2 fingers

● Open cycles line by line to change (without input screen form)

Tap with two index fingers

● Tap with two fingers simultaneously in the lower right and left-hand corners of the panel to open the TCU menu. The menu has to be opened for service purposes.

Note

Flicking gestures with several fingers

The gestures only function reliably if you hold the fingers sufficiently far apart. The fingers should be at least 1 cm apart.

SINUMERIK Operate expansion using a sidescreen

4

4.1 Overview

Widescreen format panels offer the option of using the additional area for displaying additional elements next to the SINUMERIK Operate screen for obtaining information faster and for faster operation. This sidescreen must be activated. To do this, a navigation bar is displayed.

You can display the following elements above the navigation bar:

- Displaying (widgets)
  - Space-saving: The contents of widgets can be scrolled horizontally and vertically
  - Clearly structured: The widgets can be minimized
  - Informative: All information always at a glance
- Virtual keys (pages)
  - ABC keyboard
  - MCP keys
    Saves mechanical keys and additional keyboards, and allows individual adaptations

Requirements

- A widescreen format multitouch panel (e.g. OP 015 black) is required to display widgets and pages.
- It is only possible to activate and configure a sidescreen when using the "SINUMERIK Operate Generation 2" user interface.
- Licenses for SINUMERIK Operate with sidescreen (Page 43)

References

For information on activating the sidescreen and to configure the virtual keys, refer to the following literature:

- SINUMERIK Operate (IM9) / SINUMERIK 840D sl Commissioning Manual (https://support.industry.siemens.com/cs/document/109752360)
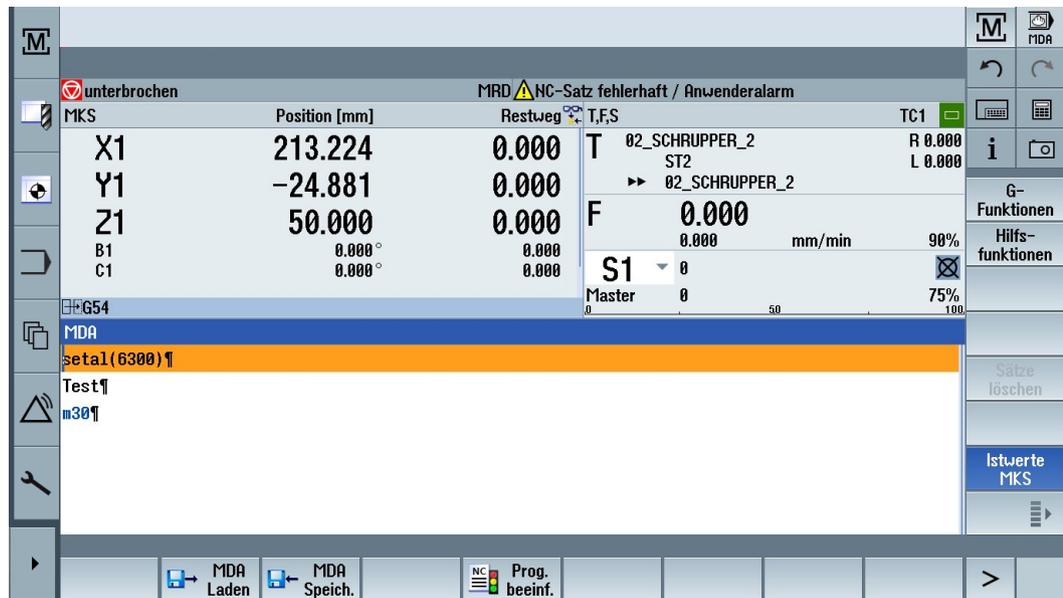
4.2 Sidescreen with standard windows

Machine manufacturer
You activate the sidescreen using machine data
MD9114 $MM_SIDESCREEN = 1.

When the sidescreen is activated, a navigation bar is shown on the left-hand side of the user interface.

This navigation bar can be used to switch directly to the desired operating area, and to show and hide the sidescreen.


Navigation bar

Operator control	Function
	Opens the "Machinery" operating area.
	Opens the tool list in the "Parameter" operating area.
	Opens the "Work offset" window in the "Parameter" operating area.
	Opens the "Program" operating area.
	Opens the "Program manager" operating area.
	Opens the "Diagnostics" operating area.
	Opens the "Commissioning" operating area.

Operator control	Function
◀	Hides the sidescreen.
▶	Shows the sidescreen.

4.3 Operation in the sidescreen

Open sidescreen

- Tap the arrow on the navigation bar to show the sidescreen.
  The standard widgets are displayed in minimized form as the header line.
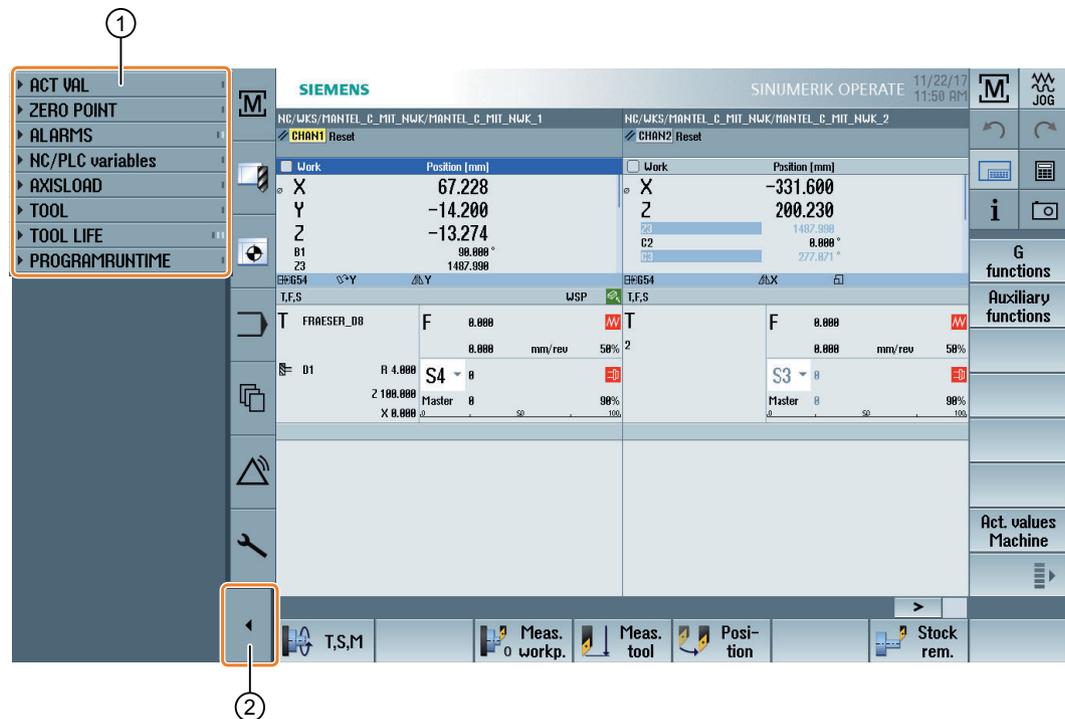
① Widget header lines

② Arrow key for showing/hiding the sidescreen

Navigating in sidescreen

- To scroll through the list of widgets, swipe vertically with 1 finger.
  - OR -

- To return to the end or to the beginning of the list of widgets, swipe vertically with 3 fingers.

Open widgets

- To open a widget, tap the header line of the widget.

4.4 Standard widgets

4.4.1 "Alarms" widget

The widget contains all the messages and alarms in the alarm list.

The alarm number and description are displayed for every alarm. An acknowledgment symbol indicates how the alarm is acknowledged or canceled.

Vertical scrolling is possible if multiple alarms are pending.

Wipe horizontally to switch between alarms and messages.
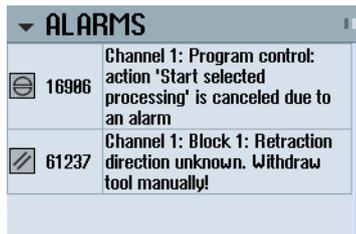
4.4.2 "Axle load" widget

The widget shows the load on all axles in a bar chart.

Up to 6 axes are displayed. Vertical scrolling is possible if multiple axes are present.

4.4.3 "Tool" widget

The widget contains the geometry and wear data for the active tool.

The following information is additionally displayed depending on the machine configuration:

● EC: Active location-dependent offset - setting up offset

● SC: Active location-dependent offset - additive offset

● TOFF: Programmed tool length offset in WCS coordinates, and programmed tool radius offset

● Override: Value of the overridden movements that were made in the individual tool directions

```
 ▼ TOOL                             ‖
  ╟  FRAESER_D8
  ‖  D1       Length X  Length Z  Radius
  Geometry              100.000    4.000
  Wear
  EC
  SC
```

4.4.4 "Service life" widget

The widget displays the tool monitoring in relation to the following values:

● Operating time of tool (standard time monitoring)

● Finished workpieces (quantity monitoring)

● Tool wear (wear monitoring)

Note

Multiple cutting edges

If a tool has multiple cutting edges, the values of the edge with the lowest residual service life, quantity and wear is displayed.

It possible to alternate between views by scrolling horizontally.

```
 ▼ TOOL LIFE                    ‖‖‖
  🔧 PLANFRAESER
     ST1              10:00 min   ◑
  ⬛ BOHRER_12
     ST1              20:00 min   ◑
  ▣ SCHRUPPSTAHL
     ST1             100:00 min   ◕
  ⬛ BOHRER_8
     ST1             180:00 min   ◕
```

4.4.5 "Program runtime" widget

The widget contains the following data:

● Total runtime of the program

● Time remaining to end of program

This data is estimated for the first program run.

Additionally, progress of the program is visualized in a bar chart as a percentage.

```
 ▼ PROGRAMRUNTIME                 ‖
  Programm Rest              Gesamt
  ▮
  0:00:00h                  0:27:12h
```

4.4.6 "Zero point" widget

The widget includes values of the active work offset for all configured axes.

The approximate and detailed offset, as well as rotation, scaling and mirroring are displayed for each axis.

4.4.7 "Actual value" widget

The widget contains the position of the axes in the displayed coordinate system.

The distance-to-go for the current NC block is displayed while a program is running.

4.4.8 "NC/PLC variables" widget

The "NC/PLC variables" widget displays the NC and PLC variables.

The variable name, data type and value are shown for each variable.

Only those variables that are currently displayed in the "NC/PLC variables" screen in the "Diagnostics" operating area are shown. To update the list in the "NC/PLC variables" widget following a change in the "NC/PLC variables" screen in the "Diagnostics" operating area, collapse and expand the widget again.

Vertical scrolling is possible.

## 4.5 Sidescreen with pages for the ABC keyboard and/or machine control panel

Not only standard widgets but also pages with ABC keyboards and machine control panels can be configured in the sidescreen of a multitouch panel.

Configure ABC keyboard and MCP

If you configured ABC keyboard and MCP keys, then the navigation bar is extended for the sidescreen:
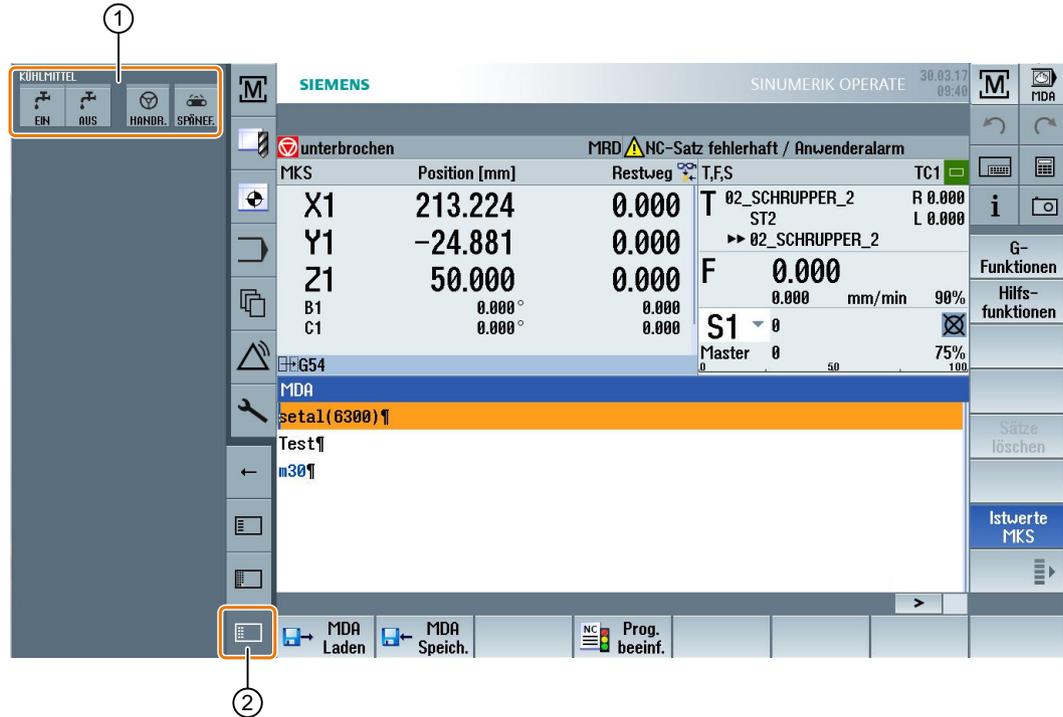
Operator control	Function
	Display of standard widgets in the sidescreen
	Display of an ABC keyboard on the sidescreen
	Display of a machine control panel on the sidescreen

4.6 Example 1: ABC keyboard in the sidescreen
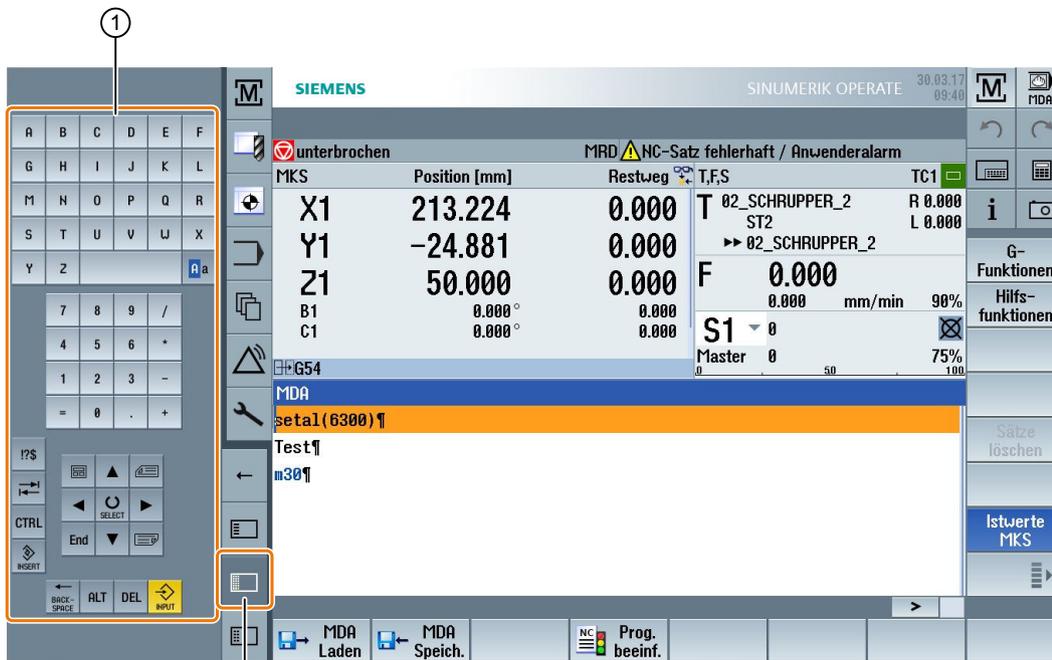
①   ABC keyboard

②   Key to display the keyboard

4.7 Example 2: Machine control panel in the sidescreen

① Machine control panel
② Key to display the machine control panel

4.8 SINUMERIK Operate Display Manager

4.8.1 Overview

With a panel with full HD resolution (1920x1080), you have the possibility to work with the Display Manager.

The Display Manager permits you to see a lot of information at a glance.

With the Display Manager, the screen area is divided into several display areas.

In addition to SINUMERIK Operate, widgets, keyboards, a machine control panel and various applications are provided in the various areas.

Software option

The option "P81 - SINUMERIK Operate Display Manager" (6FC5800-0AP81-0YB0) is required for the "SINUMERIK Operate Display Manager" function.

> ⚙ **Machine manufacturer**
>
> You activate the Display Manager with the machine data
> MD9114 $MM_SIDESCREEN = 2.

References

For further information on the activation and configuration of the Display Manager, please refer to:

- SINUMERIK Operate (IM9) / SINUMERIK 840D sl Commissioning Manual (https://support.industry.siemens.com/cs/document/109752360)

For further information on Full HD Panels, please refer to:

- Operator panel fronts manual: TOP 1500, TOP 1900, TOP 2200 / SINUMERIK 840D sl (https://support.industry.siemens.com/cs/document/109752353)
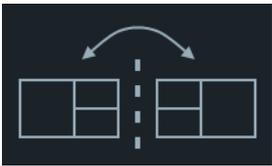
4.8.2 Screen layout

The standard supply of a SINUMERIK Operate Display Manager offers the option of choosing between 3-display areas and 4-display areas.
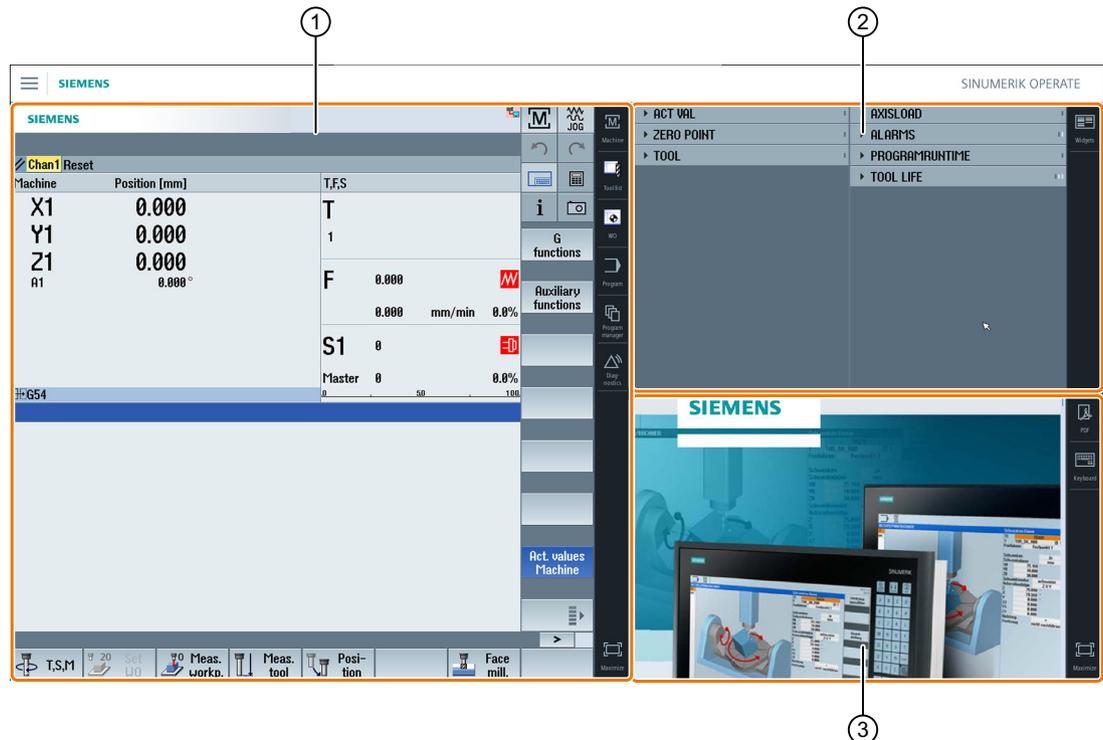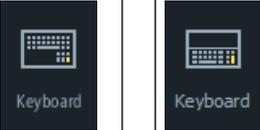

① SINUMERIK Operate with navigation bar for switchover of the operating area

② Display area for standard widgets

③ Display area for applications (e.g. PDF)

4.8.3 Operator controls

The Display Manager is activated.

Operator control	Function
≡	**Menu** Tap on the menu to select the desired arrangement of the display areas.
	3 display areas • SINUMERIK Operate (with function block) • Widget area • Applications area (PDF, virtual keyboard)
	4 display areas • SINUMERIK Operate (with function block) • Widget area • Applications area (PDF, virtual keyboard) • Area with virtual keyboard
	Mirroring display areas Mirrors the selected arrangement of the display areas.
M Machine ... ⚠ Diag-nostics	**Navigating in SINUMERIK Operate** Tap on the corresponding icon to directly open the desired operating area.
Widgets	**Widgets** The following widgets are available by default: • Actual values (Page 26) • Zero point (Page 26) • Tool (Page 24) • Axle load (Page 24) • Alarms (Page 24) • Program runtime (Page 25) • Service life (Page 25)
PDF	**PDF** Opens the PDF stored here.

| Operator control		Function
Keyboard	Keyboard	**Virtual keyboard** Displays a QWERTY keyboard in the display area for applications as well as in the 4th display area below SINUMERIK Operate. If the virtual keyboard is selected while the maximum representation of the display area is active, the keyboard opens as a pop-up. The keyboard can be moved as required on the display by means of touch operation.
Maximize		**Maximizing the display area** Enlarges the area with the SINUMERIK Operate and the area for the applications to the full extent of the panel.
Minimize		**Minimizing the display area** The area with the SINUMERIK Operate and the area for the applications are reduced back to their original size.
MCP		**Machine Control Panel** Shows a machine control panel. **Note**: Please observe the information provided by the machine manufacturer.

Machine OEM-specific HMI using SINUMERIK Integrate Create MyHMI / WinCC

5

5.1 Overview

The integration of SINUMERIK Operate in a WinCC interface combines the advantages SINUMERIK Operate with the capabilities of the WinCC runtime:

- Intuitive CNC operation with SINUMERIK Operate

- The user interface can be easily individualized with SINUMERIK Integrate Create MyHMI / WinCC and SIMATIC WinCC Advanced.
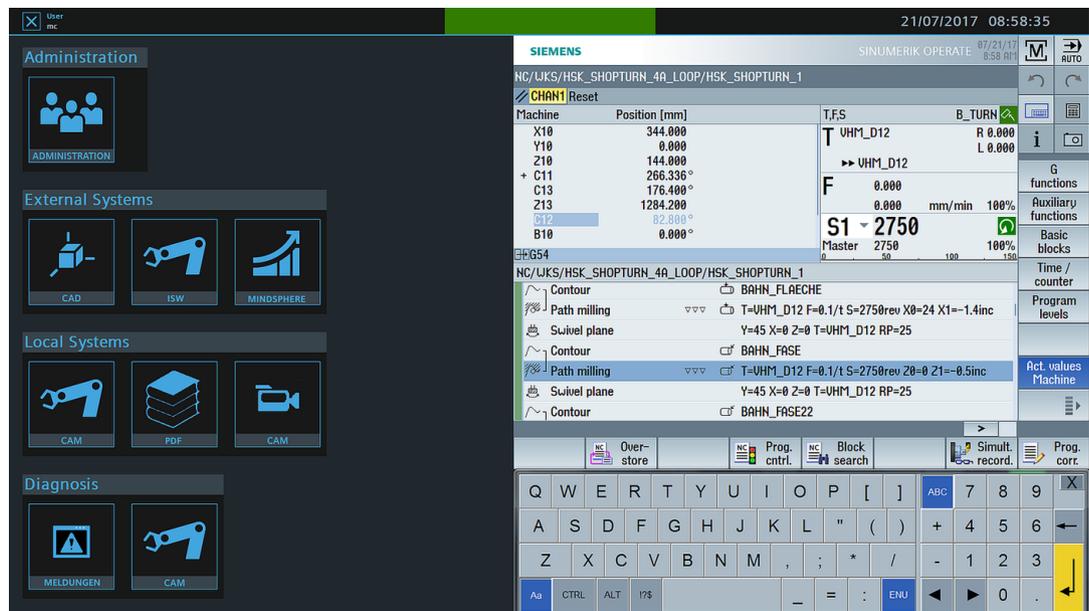
Advantages of SINUMERIK Operate

- The familiar user interface shortens training times for users

- User-friendly operation of the multitouch panel with gestures

Possibilities of WinCC

- Virtual MCP
  Can be designed and individualized as required

- Clearly structured menu-based operation
  Creation of modern user guidance through touch technology and thus direct access to information

- Further design possibilities for the clearly structured operation
  Switchover via tabs, and/or use of popup and slide-in windows

- Virtual keyboard / Virtual SINUMERIK keyboard
    - Efficient input through central keyboard for all input elements
    - Keyboard permanently integrated into the interface
- Document display
    - Access to digital documents (e.g. manuals, drawings in PDF format)
    - Operation of the documents with multitouch and gestures
- Intranet/Internet access
  Connection to web-based services via browser control (e.g. web-based order management)
- 3rd party applications
  Integration of standard applications and self-developed applications
- Fanuc connection
  Creation of a cross-control operating concept with a Fanuc user interface and data connection to Fanuc controllers.
- Secondary operator panels
  Support of additional main operator panels and secondary operator panels
- SINAMICS S120 support
  Direct access to drive data
- Additional functions
    - Message system (system and user-defined messages)
    - User administration
    - Archiving (e.g. process values, variables)

Prerequisites

- Licenses for SINUMERIK Operate with WinCC basic application (Page 43)

References

For information on configuration please refer to the following literature:

- SINUMERIK Integrate Create MyHMI /WinCC V15 Configuration Manual (https://support.industry.siemens.com/cs/document/109752377)
- SIMATIC WinCC Advanced V15 System Manual (https://support.industry.siemens.com)
- SIMATIC WinCC Advanced V15 System Manual – programming reference (https://support.industry.siemens.com)

5.2 WinCC – the easy and flexible way to create machine OEM-specific operating concepts

Using the SIMATIC WinCC (TIA Portal) engineering system, you can simply and conveniently configure operating solutions for a machine OEM-specific operating concept.

The WinCC (TIA Portal) engineering software allows the configuration of all HMI applications – from the simplest operating solutions up to complex applications.

Another advantage is the interaction with STEP7 in the TIA Portal that, for example, makes multiple inputs unnecessary and guarantees consistent data management.

WinCC (TIA Portal) facilitates easier, more efficient configuration:

- Innovative configuration interface based on the latest software technologies
    - The common engineering in the TIA Portal leads to standardization of common functions – including the display on the screen. This makes it easier, for example, to operate the editors and leads to intuitive, efficient work.
    - You can reuse what you have already learnt in order to optimize the work and avoid errors.
- Extensive library concept for freely definable objects and picture blocks
    - The extensive picture blocks and libraries supplied allow high-quality operating screens to be created quickly and easily.
    - Object properties can be flexibly modified and individualized using dialogs and scripts.
    - Proven blocks are stored in user libraries. This saves engineering time and avoids errors.
- Intelligent tools for graphic configuration and mass data processing
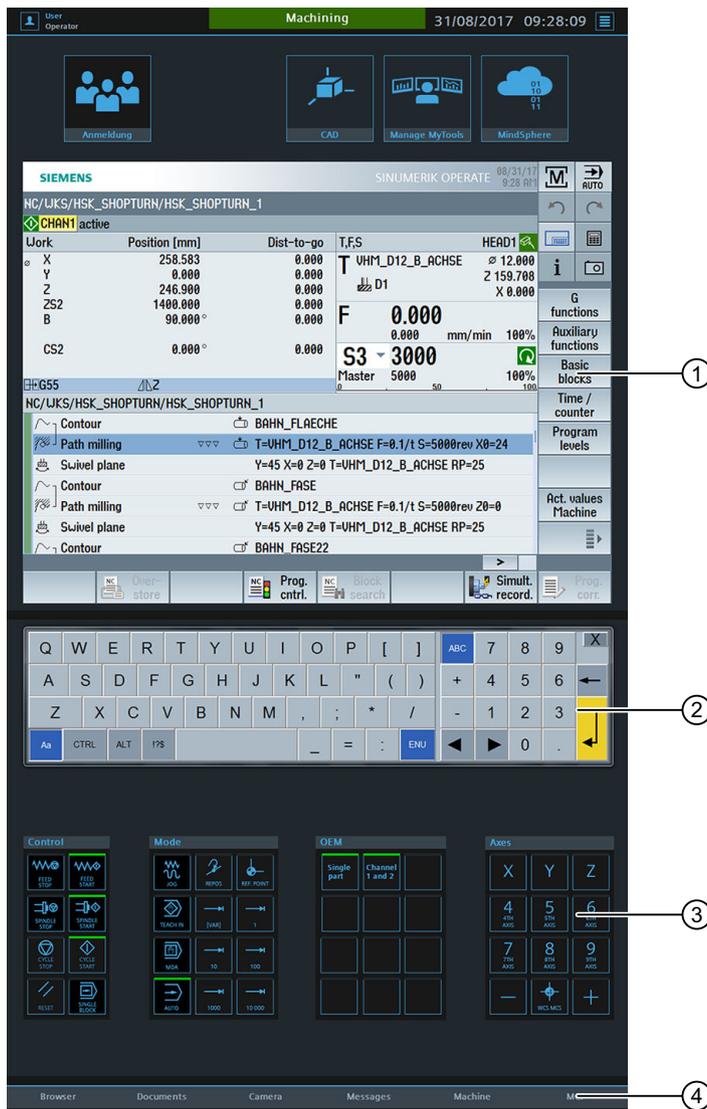   - Wizards are available to assist you with the configuration.

Note

Configuring with STEP 7 Classic

A proxy device can be configured if it is necessary for technical or system-specific reasons to continue creating the PLC program with STEP 7 Classic.

5.3 Creating machine OEM-specific operating concepts

①   SINUMERIK Operate

②   Virtual keyboard

③   Virtual machine control panel

④   Tab to switch over between views

Integrating SINUMERIK Operate in the user interface

Integrating SINUMERIK Operate provides some decisive advantages when implementing an efficient operating concept.

- Familiar operator interface for operating the control

- Access to SINUMERIK Operate in the overall operating concept

- Additional information in addition to SINUMERIK Operate

Integrating image elements and objects

- SINUMERIK Operate can be integrated into the overall screen as a picture element.

- On different WinCC screens, you have the option of using SINUMERIK Operate in different sizes (one resolution per WinCC screen).

- You have the option of using the widest range of graphic objects from image blocks and libraries, which are supplied, for visualization (e.g. part program view, buttons, input fields, gauges).

Virtual keyboard and machine control panel

The operation of SINUMERIK Operate can be enhanced, e.g. through additional virtual keyboards or virtual machine control panels.

This achieves a reduction in the number of conventional machine control panels and a more flexible design.

Accessing SINUMERIK 840D sl data

Connecting WinCC to SINUMERIK 840D sl allows access to PLC and NC data.

- Access to NC variables, GUD variables, machine and setting data

- NC alarms, DB2 alarms

- PI services
  Using program instance services, you can execute permanently defined operations on the NC

Additional information is provided in the SINUMERIK Integrate MyHMI /WinCC V15 Configuration Manual (https://support.industry.siemens.com/cs/document/109752377).

SINAMICS S120 support

You obtain direct access to drive data (e.g. utilization, speed values, etc.).

Integrating 3rd party applications

Standard applications, customer applications, and applications from solution providers can be integrated with little effort.

Fanuc integration

The integration of Fanuc is available for setting up an operating concept with control-independent HMI and company operator panel.

- The Fanuc user interface can be integrated into a customized operating concept.

- The data connection to Fanuc controllers is achieved with the aid of FOCAS 2:

  - CNC data (e.g. axis position, axis load)

  - PMC data (read and write data)

  - Alarms (status and alarm texts)

Displaying digital documents

- Access to digital documents (e.g. manuals and drawings in PDF format).
  Using a configurable PDF reader, PDFs that are stored on the IPC or are in the network can be accessed.
  The required information is quickly found with a full-text search. You can transfer content, and therefore speed up operation, with copy & paste.

Integrate camera image

A camera image can be integrated without an additional display device.

- The camera image allows remote processes to be observed and difficult to access areas to be monitored.

- Machine states can be documented and stored in this way.

Web browser

Connection to web-based services (e.g. web-based order management).

Pop-up and slide-in images

Content can be shown dynamically using pop-up and slide-in images.

- Pop-up images are suitable, e.g. for context-related displays or setting individual parameters.

- Slide-in images are suitable, e.g. for making status information available on the HMI with one tap.

Scripts

Scripts allow you to individually design objects.

Additional information is provided in the SIMATIC WinCC Advanced V15 System Manual – programming reference (https://support.industry.siemens.com).

SIMATIC SmartServer and SmartClient concept

A smart client in the WinCC user interface of the machine tool allows a connection to be established to a PC/office PC that can be remotely accessed. To do this, a smart server is required on the target PC. This allows applications to be integrated, for example CAD software, without having to run this application directly on the machine.

Configuring the main and secondary operator panels

Additional main and secondary operator panels can be integrated into your new operating concept.

- For example, they support a second main operator panel or secondary operator panels in addition to the WinCC main operator panel, e.g. at tool changing stations. You achieve faster communication with the machine due to optimized operator panels at the right location.

- You have the capability of connecting, for example, SINUMERIK HT 8 with SINUMERIK Operate as supplementary secondary operator panel. This permits flexible operation in your working area as well.

Additional information is provided in the SINUMERIK Integrate MyHMI /WinCC V15 Configuration Manual.

Creation of your own tools (controls)

You have the option of developing your own controls, which then allow you to further individualize your operating concept.

## 5.4 Examples of the design for OEM-specific operating concepts.

5.4.1 Example 1 - Integration of SINUMERIK Operate into a WinCC interface with navigation keys

This example is characterized by role-specific and thematically structured navigation:

- Administrative tasks

- Simple integration and representation of information about external contents (documentation, camera, web contents)

- Service and maintenance

Operating concept with role-specific navigation
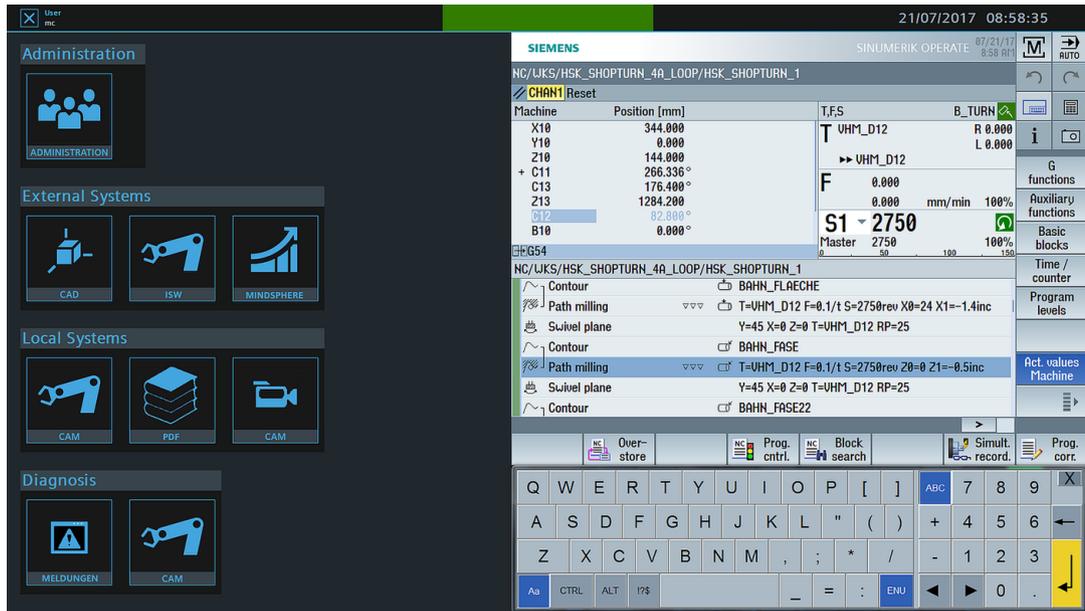
5.4.2 Example 2 - Integration of SINUMERIK Operate into a WinCC interface with PDF Viewer

This example demonstrates electronic production by directly accessing machine documentation.

- Representation of the setup plan parallel to the tool loading
- Copy & paste from the PDF directly into the tool list

Machine OEM-specific HMI using SINUMERIK Integrate Create MyHMI / WinCC

5.4 Examples of the design for OEM-specific operating concepts.

Parallel display of information directly on the machine

Appendix A

A

A.1 Prerequisites

licenses

SINUMERIK Operate with sidescreen		
Designation	**Article number**	**Meaning**
SINUMERIK Operate		
SINUMERIK Operate /PC	6FC5800-0AP87-0YB0	License for operating SINUMERIK Operate on one PC
SINUMERIK Operate /PCU	6FC5800-0AP88-0YB0	License for operating SINUMERIK Operate on the PCU
SINUMERIK Operate /NCU	6FC5800-0AS00-0YB0	License for operating SINUMERIK Operate on the NCU
SINUMERIK Operate /universal client	6FC5800-0AS87-0YB0	License for operating SINUMERIK Operate on the NCU for universal clients
SINUMERIK Operate Display Manager	6FC800-0AP81-0YB0	License for the SINUMERIK Operate Display Manager function

SINUMERIK Operate with basic application		
Designation	**Article number**	**Meaning**
Engineering		
WinCC Advanced V15	6AV2102-0AA05-0AA5	HMI engineering software in the TIA Portal on DVD; floating license; prerequisite for SINUMERIK INTEGRATE Create MyHMI /WinCC V15
SINUMERIK INTEGRATE Create MyHMI /WinCC V15	6FC5861-3YC45-1YA0	WinCC expansion for SINUMERIK 840D sl on DVD*; incl. single license
Runtime options for a basic application running on a Simatic IPC**		
SINUMERIK Operate /PCU (from V4.8 SP2)	6FC5800-….-.YB0	SINUMERIK user interface; prerequisite for SINUMERIK INTEGRATE Run MyHMI /WinCC
SINUMERIK INTEGRATE Run MyHMI /WinCC V15	6FC5800-0AP61-0YB0	License for operating WinCC Runtime Advanced in SINUMERIK 840D sl
Runtime options for basic application running on a 3rd party PC (no HT8, no TCU support)		
SINUMERIK Operate /PC (from V4.8 SP2)	6FC5800-….-.YB0	SINUMERIK user interface; prerequisite for SINUMERIK INTEGRATE Run MyHMI /WinCC
SINUMERIK INTEGRATE Run MyHMI /WinCC V15	6FC5800-0AP61-0YB0	License for operating WinCC Runtime Advanced in SINUMERIK 840D sl
Runtime for basic application with connection to Fanuc controller (no HT8, no TCU)		
WinCC Fanuc connection V15 Update 1	6FC5861-3YP00-1YB0	License for operating WinCC Runtime Advanced in SINUMERIK 840D sl with Fanuc connection
PC with Windows 7 Ultimate 64 bit or SIMATIC IPC with Windows Embedded Standard 7 Professional 64 bit		
Note: Windows Embedded can only be used with SIMATIC IPCs that have been appropriately released.		

* DVD also includes runtime software WinCC Runtime Advanced and SINUMERIK INTEGRATE Run MyHMI /WinCC Runtime

** Use of SINUMERIK PCU Base with use of an IPC, see SIOS message

For further information, refer to the SINUMERIK Create MyHMI /WinCC V15 (https://support.industry.siemens.com) sales and delivery release.

References

You can find additional information in the following reference:

- PCU Base Software (IM10) / SINUMERIK 840D sl Commissioning Manual (https://support.industry.siemens.com/cs/document/109752527)

A.2 Documentation overview SINUMERIK 840D sl

General documentation

SINUMERIK 840D sl			SINUMERIK 840D sl 828D	SINUMERIK 840D sl
Advertising brochure	Catalog NC 62	Catalog PM 21	System Manual Ctrl-Energy	System Manual Smart machine tool operation

User documentation

SINUMERIK 840D sl 828D	SINUMERIK 840D sl	SINUMERIK 840D sl 828D	SINUMERIK 840D sl 828D	SINUMERIK 840D sl SINAMICS S120
Operating Manual – Universal – Turning – Milling – Grinding	Create MyConfig Operating Manual	Programming Manual – Fundamentals – Job Planning – Measuring Cycles	Programming Manual – ISO Turning – ISO Milling	Diagnostics Manual, Alarms

Manufacturer/Service documentation

SINUMERIK 840D sl	SINUMERIK 840D sl SINAMICS S120	SINUMERIK 840D sl	SINUMERIK 840D sl SINAMICS S120
Equipment Manual – NCU – Operator components and networking – ADI4	System Manual Guidelines for machine configuration	Commissioning Manual – CNC: NCK, PLC, Drive – Base software and operating software	Lists Manual – Machine data – Interface signals – Variables

Manufacturer/Service documentation

SINUMERIK 840D sl 828D	SINUMERIK 840D sl	SINUMERIK 840D sl SINAMICS S120	SINUMERIK
Function Manual – Basic functions – Extended Functions – Special Functions – Synchronized Actions – ISO Dialects	Function Manual Tool management	Function Manual Safety Integrated	Configuration Manual – EMC installation guideline – Industrial security

Info / Training

SINUMERIK	SINUMERIK
Training documentation – Simple milling with ShopMill – Simple turning with ShopTurn	Tool and Mold Making Manual

Electronic documentation

DOConCD	Industry Online Support (SIOS)	Industry Mall

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