

SIEMENS

SINUMERIK

SINUMERIK 840D sl Universal

Operating Manual

Valid for:
SINUMERIK 840D sl / 840DE sl
Software
CNC system software for 840D sl / 840DE sl V4.92
SINUMERIK Operate for PCU/PC Version
V4.92

06/2019
A5E44903533B AB

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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.

Proper use of Siemens products

Note the following:

WARNING
--

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.
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Trademarks

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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 users of universal machines running the SINUMERIK Operate software.

Benefits

The operating manual helps users familiarize themselves with the control elements and commands. Guided by the manual, users are capable of responding to problems and taking corrective action.

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

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 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. Products and solutions from Siemens 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. using firewalls and/or network segmentation) are in place.

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

Industrial security (<https://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 become available, and that only 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 (<https://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, 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.
- On completion of commissioning, check all security-related settings.
- Protect the drive against unauthorized changes by activating the "Know-how protection" converter function.

Introduction

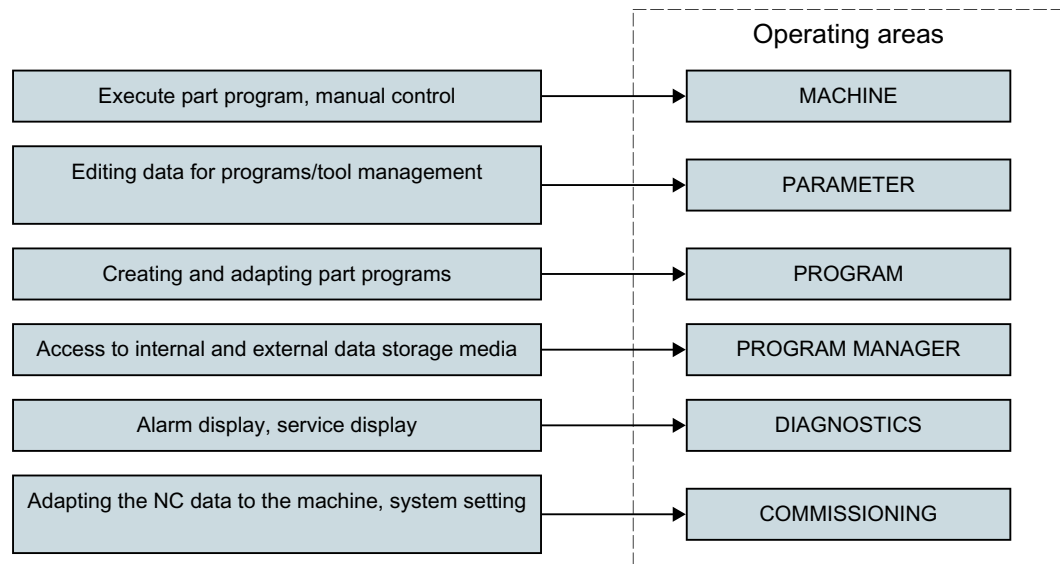
2.1 Product overview

The SINUMERIK control system is a CNC (Computerized Numerical Control) for machine tools. You can use the CNC to implement the following basic functions in conjunction with a machine tool:

- Create can adapt part programs
- Execute part programs
- Manual control
- Access internal and external data media
- Edit data for programs
- Manage tools, zero points and further user data required in programs
- Diagnose control system and machine

Operating areas

The basic functions are grouped in the following operating areas in the control:



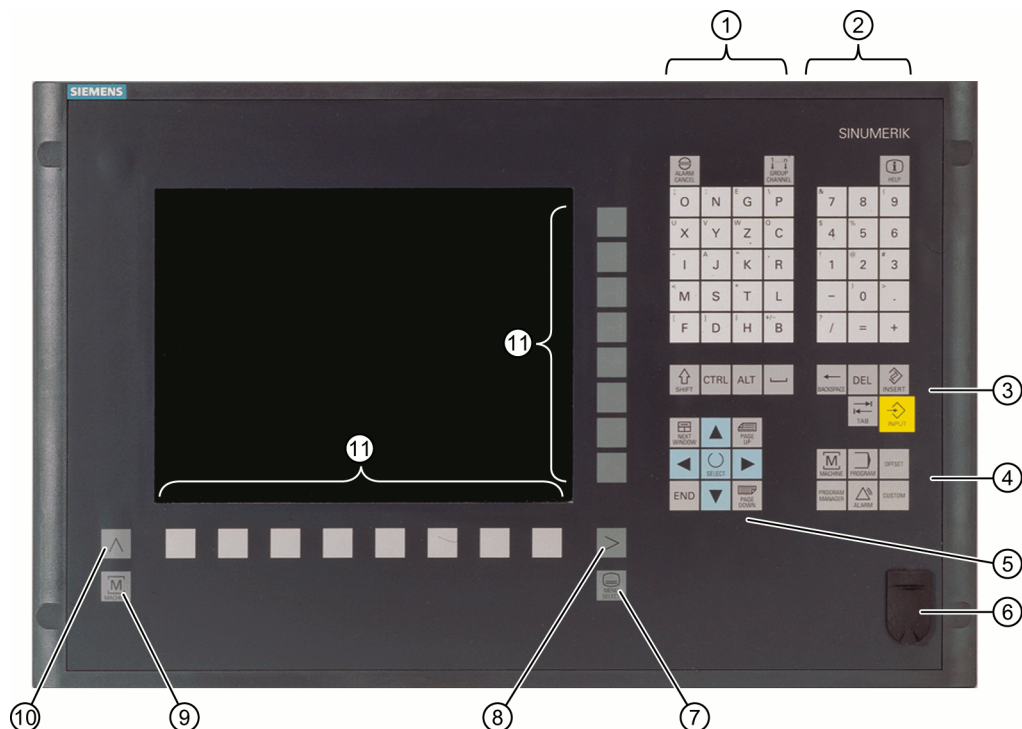
2.2 Operator panel fronts

2.2.1 Overview

The display (screen) and operation (e.g. hardkeys and softkeys) of the SINUMERIK Operate user interface are via the operator panel front.

Operator controls and indicators

In this example, the OP 010 operator panel front is used to illustrate the components that are available for operating the controller and machine tool.



① Alphabetic key group

With the <Shift> key pressed, you activate the special characters on keys with double assignments, and write in the uppercase.

Note: Depending on the particular configuration of your control system, uppercase letters are always written

② Numerical key group

With the <Shift> key pressed, you activate the special characters on keys with double assignments.

③ Control key group

④ Hotkey group

⑤ Cursor key group

⑥ USB interface

⑦ Menu select key

⑧ Menu forward button

⑨ Machine area button

⑩ Menu back key

⑪ Softkeys

Further information

Further information about the OP 010 and other usable operator panel fronts can be found at:

- Operating Components Equipment Manual - Handheld Units (<https://support.industry.siemens.com/cs/ww/en/view/109736210>)
- Equipment Manual OP 010 (<https://support.industry.siemens.com/cs/ww/en/view/109759204>)
- Equipment Manual OP 012 (<https://support.industry.siemens.com/cs/ww/en/view/109741627>)
- Equipment Manual OP 015A (<https://support.industry.siemens.com/cs/ww/en/view/109748600>)
- Operating Components Equipment Manual - TCU 30.3 (<https://support.industry.siemens.com/cs/ww/en/view/109749929>)
- HT 8 (<https://support.industry.siemens.com/cs/ww/en/view/109763514>)

2.2.2 Keys of the operator panel

The following keys and key combinations are available for operation of the control and the machine tool.

Keys and key combinations

Key	Function
	<ALARM CANCEL> Cancels alarms and messages that are marked with this symbol.
	<CHANNEL> Advances for several channels.
	<HELP> Calls the context-sensitive online help for the selected window.
	<NEXT WINDOW> * • Toggles between the windows. • For a multi-channel view or for a multi-channel functionality, switches within a channel gap between the upper and lower window. • Selects the first entry in selection lists and in selection fields. • Moves the cursor to the beginning of a text. * on USB keyboards use the <Home> or <Pos 1> key

**<NEXT WINDOW> + <SHIFT>**

- Selects the first entry in selection lists and in selection fields.
- Moves the cursor to the beginning of a text.
- Selects a contiguous selection from the current cursor position up to the target position.
- Selects a contiguous selection from the current cursor position up to the beginning of a program block.

**<NEXT WINDOW> + <ALT>**

- Moves the cursor to the first object.
- Moves the cursor to the first column of a table row.
- Moves the cursor to the beginning of a program block.

**<NEXT WINDOW> + <CTRL>**

- Moves the cursor to the beginning of a program.
- Moves the cursor to the first row of the current column.

**<NEXT WINDOW> + <CTRL> + <SHIFT>**

- Moves the cursor to the beginning of a program.
- Moves the cursor to the first row of the current column.
- Selects a contiguous selection from the current cursor position up to the target position.
- Selects a contiguous selection from the current cursor position up to the beginning of the program.

**<PAGE UP>**

Scrolls upwards by one page in a window.

**<PAGE UP> + <SHIFT>**

In the program manager and in the program editor from the cursor position, selects directories or program blocks up to the beginning of the window.

**<PAGE UP> + <CTRL>**

Positions the cursor to the topmost line of a window.

**<PAGE DOWN>**

Scrolls downwards by one page in a window.

**<PAGE DOWN> + <SHIFT>**

In the program manager and in the program editor, from the cursor position, selects directories or program blocks up to the end of the window.

**<PAGE DOWN> + <CTRL>**

Positions the cursor to the lowest line of a window.

**<Cursor right>**

- Editing box
Opens a directory or program (e.g. cycle) in the editor.
- Navigation
Moves the cursor further to the right by one character.

**<Cursor right> + <CTRL>**

- Editing box
Moves the cursor further to the right by one word.
- Navigation
Moves the cursor in a table to the next cell to the right.

**<Cursor left>**

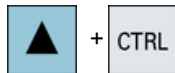
- Editing box
Closes a directory or program (e.g. cycle) in the program editor. If you have made changes, then these are accepted.
- Navigation
Moves the cursor further to the left by one character.

**<Cursor left> + <CTRL>**

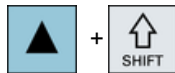
- Editing box
Moves the cursor further to the left by one word.
- Navigation
Moves the cursor in a table to the next cell to the left.

**<Cursor up>**

- Editing box
Moves the cursor into the next upper field.
- Navigation
 - Moves the cursor in a table to the next cell upwards.
 - Moves the cursor upwards in a menu screen.

**<Cursor up> + <Ctrl>**

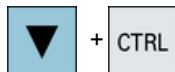
- Moves the cursor in a table to the beginning of the table.
- Moves the cursor to the beginning of a window.

**<Cursor up> + <SHIFT>**

In the program manager and in the program editor, selects a contiguous selection of directories and program blocks.

**<Cursor down>**

- Editing box
Moves the cursor downwards.
- Navigation
 - Moves the cursor in a table to the next cell downwards.
 - Moves the cursor in a window downwards.

**<Cursor down> + <CTRL>**

- Navigation
 - Moves the cursor in a table to the end of the table.
 - Moves the cursor to the end of a window.
- Simulation
Reduces the override.

**<Cursor down> + <SHIFT>**

In the program manager and in the program editor, selects a contiguous selection of directories and program blocks.

**<SELECT>**

Switches between several specified options in selection lists and in selection boxes.

Activates checkboxes.

In the program editor and in the program manager, selects a program block or a program.

**<SELECT> + <CTRL>**

When selecting table rows, switches between selected and not selected.

**<SELECT> + <SHIFT>**

Selects in selection lists and in selection boxes the previous entry or the last entry.

**<END>**

Moves the cursor to the last entry field in a window, to the end of a table or a program block.

Selects the last entry in selection lists and in selection boxes.

**<END> + <SHIFT>**

Moves the cursor to the last entry.

Selects a contiguous selection from the cursor position up to the end of a program block.

**<END> + <CTRL>**

Moves the cursor to the last entry in the last line of the actual column or to the end of a program.

**<END> + <CTRL> + <SHIFT>**

Moves the cursor to the last entry in the last line of the actual column or to the end of a program.

Selects a contiguous selection from the cursor position up to the end of a program block.

**<BACKSPACE>**

- Editing box
Deletes a character selected to the left of the cursor.
- Navigation
Deletes all of the selected characters to the left of the cursor.

**<BACKSPACE> + <CTRL>**

- Editing box
Deletes a word selected to the left of the cursor.
- Navigation
Deletes all of the selected characters to the left of the cursor.

**<TAB>**

- In the program editor, indents the cursor by one character.
- In the program manager, moves the cursor to the next entry to the right.