

1 Brief description

Objective of the module:

With help of this module you learn to recognise general operating elements of the Sinumerik Operate, and how to differentiate them from one another.

Description of the module:

The general operation of a Sinumerik Operate will be described.

Depending on the machine manufacturer the following operating elements can be used:

- Operator panels (OP)
- CNC-full keyboard
- Machine control panel (MCP)

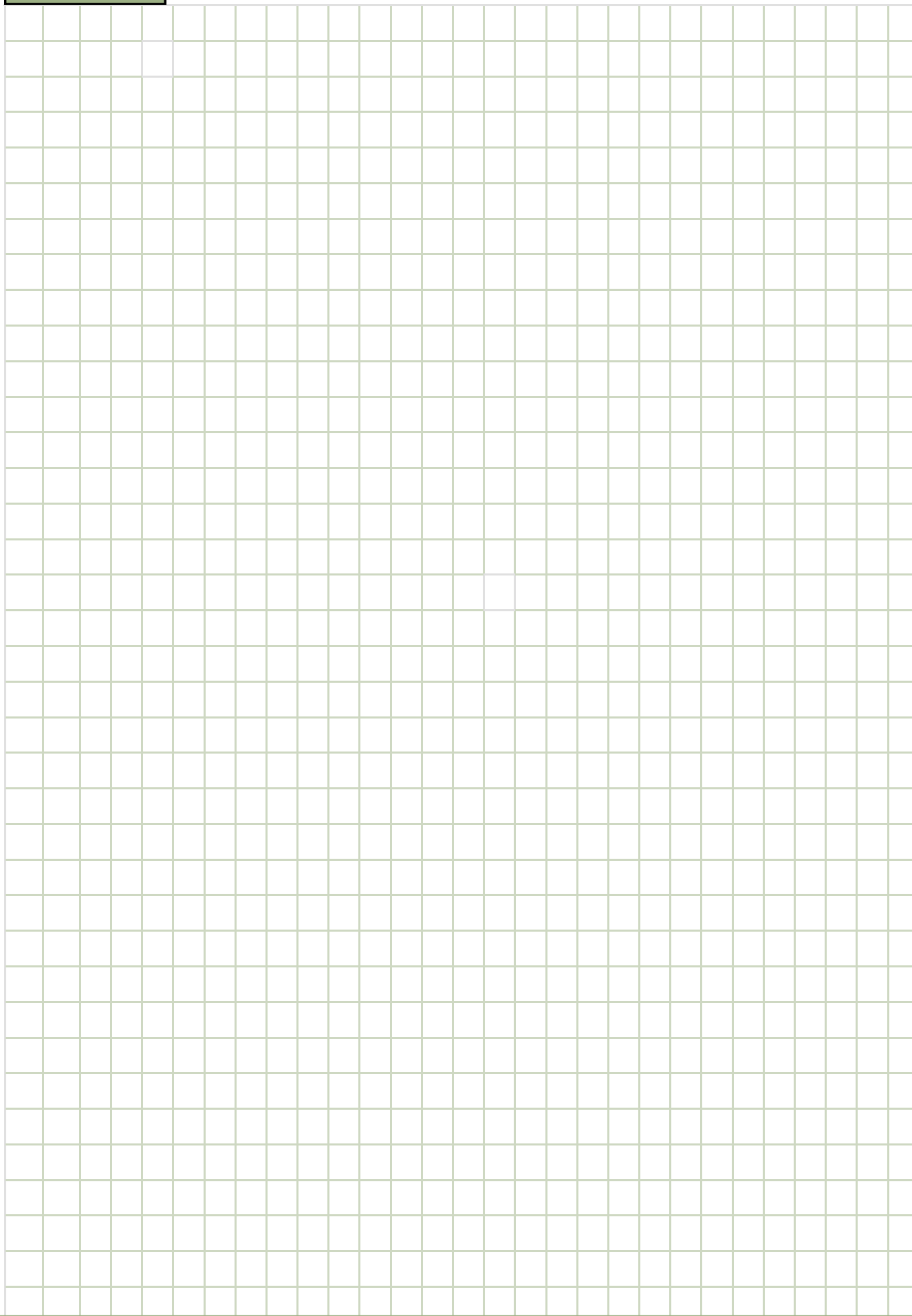
Content:

Operator panel layouts of the Sinumerik Operate

CNC-full keyboard

Machine control panel

828D/840Dsl SINUMERIK Operate

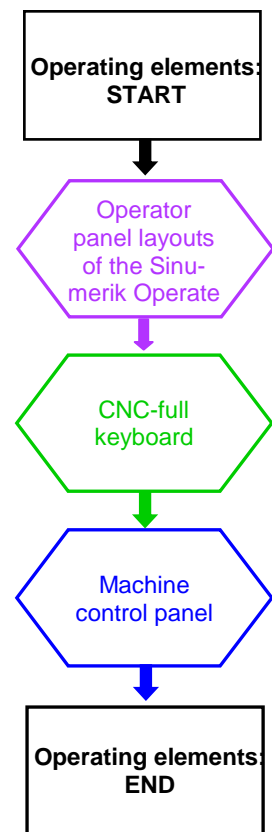


Operating elements: Description

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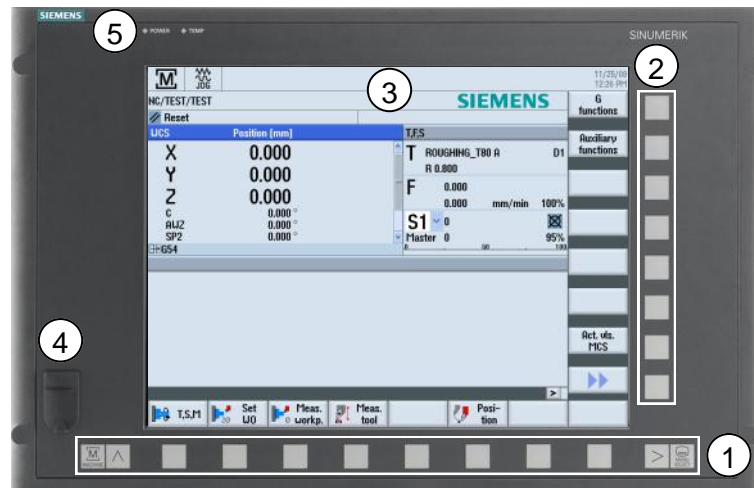
Notes :

Notes

The operator panel (OP) consists of the following operating elements:

- Membrane keyboard with 8 + 4 horizontal and 8 vertical softkeys
- Colour display (10.4" Display on 828D, 15" Display on 840D sl)
- Front-USB-plug on operator panel front (840D sl),
- USB, CF-card, Ethernet on operator panel front (828D)
- Fully integrated QWERTY CNC-keyboard (828D)

2.1 Operator panel layout of the Sinumerik 840D sl:



- ① Horizontal softkey strip (HSK) with 4 screen keys (2 each located on the left and right side)
- ② Vertical softkey strip (VSK)
- ③ 15" TFT-colour display
- ④ Front-USB-plug (Sinumerik 840D sl) , e.g. for connection of external memory media, mouse or keyboard
- ⑤ Status-LED: Power
Status-LED: Temp

2.2 Operator panel layout of the Sinumerik 828D



Notes

- ① Horizontal softkey strip with 4 screen keys (2 each located on the left and right side) (HSK)
- ② Vertical softkey strip (VSK)
- ③ 10,4" TFT-colour display
- ④ USB, CF-card and Ethernet on panel front behind removable cover
- ⑤ Ready-LED (Status red/green), NC-LED (Status LED of the NC) and CF-LED (write/read access on CF-card) behind lockable and removable cover
- ⑥ Integrated QWERTY CNC-keyboard (*for reference see section 3*)

2.3. Horizontal and vertical Softkey bar (HSK/VSK)

Softkeys are buttons, which are dynamically linked with programmed functions. These functions are presented on the monitor above the softkey bar (HSK) or to the left of the softkey bar (VSK) as a strip of icons.

- The 8 horizontal softkeys are used to access the individual operation sectors including further menu layers. There is an associated vertical menu strip/Softkey strip for each of the horizontal menu points.
- The 8 vertical Softkeys are functions associated with the presently selected horizontal Softkey.

The function will be called up when the vertical softkey is pressed.

The content of the vertical softkey bar can therefore change once again if a sub-function to the selected function is chosen.

The horizontal softkey bar consists furthermore of:

- 4 screen keys (*see pictures below*)



“MACHINE”-key:

Calls-up the operating area “MACHINE” (in operating mode “JOG”, “MDA” or “AUTO”).



“Recall”-key:

Jumps to the next highest menu level.



“Extend”-key:

Extends the horizontal softkey bar.



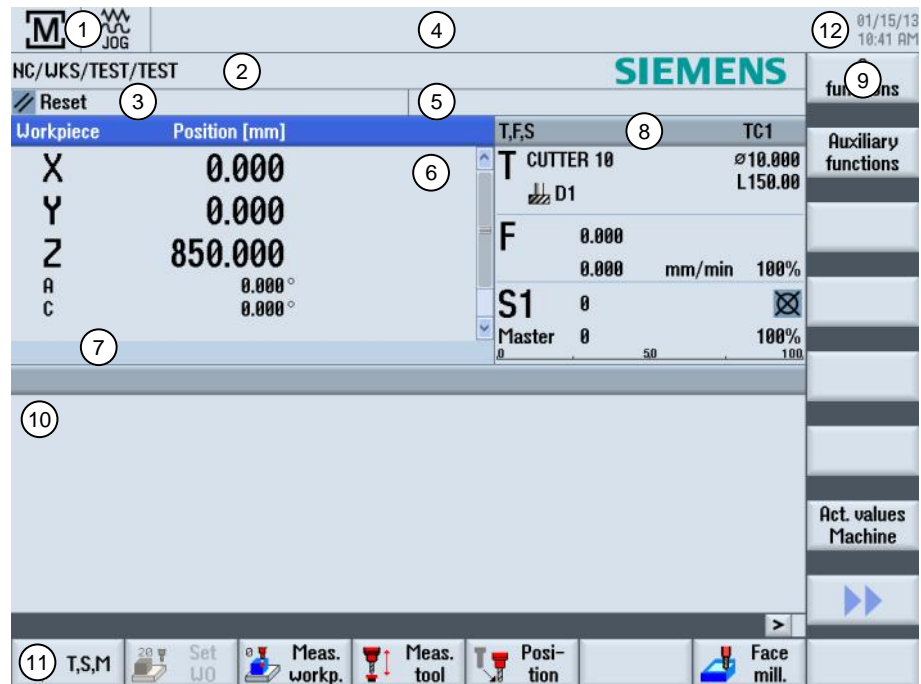
“MENU SELECT”-key:

Calls the main menu for operating area selection.

Notes

2.4 Screen area

The screen is laid out as follows:



- | | | | |
|---|---|---|--------------------------------|
| ① | Operation sector | ⑧ | Display of: |
| ② | Program path and name | – | T = Active tool |
| ③ | Status, program influence and program name | – | F = Present feedrate |
| ④ | Alarm and message line | – | S = Actual spindle revolution |
| ⑤ | Channel operation messages | – | Spindle load factor in percent |
| ⑥ | Position readout for the axes | ⑨ | Vertical softkey bar (VSK) |
| ⑦ | Display of the active zero point and rotation | ⑩ | Working window |
| | | ⑪ | Horizontal softkey bar (HSK) |
| | | ⑫ | Date and Time |

According to the model of operating panel that is used, a CNC-keyboard can be integrated for operation and programming.

The keys that are described here can also be located directly on the operator panel.

The layout of the operating panel is described in the documentation of the machine manufacturer.

Below follows a description of the basic keys of the CNC-Full keyboard.

CNC-Full keyboard “KB 483”:



Alpha-Block Hotkey-Block Cursor-Block Number-Block.

- Alpha-Block: The alpha-block features the letters A, ..., Z, the space key and the special character for the input of text.
- Hotkey-Block: The hotkey-block serves the direct selection of operation areas.
- Cursor-Block: The cursor-block is used for navigation around the screen display.
- Number-Block: The number-block features the numbers 0 ... 9, the decimal point and special characters for the input of numerical characters and operators.

Keys in the Alpha-Block



BACKSPACE

Clears a value in the input field.
If in edit mode, the character in front of the cursor will be cleared.



TAB

Indent the cursor by several characters.



SHIFT

If the Shift-key is held depressed, the upper character on keys with double usage will be entered.



CTRL

With the following key combinations navigation in the work plan and the G-Code-Editor is carried out:

- Ctrl + NEXT WINDOW: Jump to the beginning.
- Ctrl + END: Jump to the end.



ALT

ALT-Key

Notes

**INPUT**

- Accepts an edited value
- Opens / closes a directory
- Opens a file

Keys in the Hotkey-Block**MACHINE**

Opens up the operating area "Machine" (JOG, MDA, Auto). Corresponds to the yellow HSK 1 "Machine"

**PROGRAM**

Opens up the operating area "Program". The key corresponds to the yellow HSK 3 "Program".

**OFFSET**

Opens up the operating area "Parameter" (Tool list, Tool wear, Magazine, Work offset, User variable, Setting data). The key corresponds to the yellow HSK 3 "Parameter".

**PROGRAM MANAGER**

Opens up the operating area "Program manager". The key corresponds to the yellow HSK 4 "Program Manager".

**ALARM**

Opens up the actual Alarmlist-window. The key corresponds to the VSK 1 "Alarm list" in the operating area "Diagnostics".

**CUSTOM**

This key can be customized by the machine manufacturer.

See the machine manufacturer's documentation .

Keys in the Cursor-Block**ALARM CANCEL**

Clears an active alarm shown in the alarm and message line that is identified with this symbol.

**CHANNEL**

Selects a channel from 1 - n.

**HELP**

Opens the context-sensitive help window in a split-screen view. In case of the G-Code editor the help documentation with intelligent support for programming instructions is called up.

**NEXT WINDOW**

Activates the next subwindow in the actual working window. By pressing "CTRL + NEXT WINDOW" in the G-Code editor window you can jump to the first line of the program code.

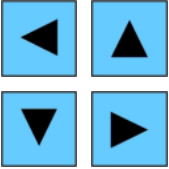
**PAGE UP or PAGE DOWN**

Paging up or down in a directory or the work plan.

Further keys in the Cursor-Block

**END**

Locates the cursor in the last input field of a parameter mask. In the G-code editor the cursor will be set to the end of the active line and by pressing STRG + END the cursor jumps to the end of the last line of the program.

**Cursor-Keys**

Navigates through the various fields or lines on the screen.

While in a program listing, the “cursor-to-the-right”-key opens a directory or a program. To change to the next level above the present level press the “cursor-to-the-left”-key.

**SELECT**

With this key you can select amongst several given alternatives.

Keys in the Number-Block

**BACKSPACE**

Clears a value in the active input field.

While in the edit mode, just the character in front of the cursor will be cleared.

**DEL**

Deletes the value in the parameter field.

While in the edit mode, just the character behind the cursor will be deleted.

**INSERT**

Activation of the insertion mode or the pocket calculator. Opens a parameter menu in an input field if available.

**INPUT**

- Accepts an edited value
- Opens/closes a directory
- Opens a file

Notes

Notes

Depending on the type of operating panel the machine manufacturer may be using either a SIEMENS or his own machine control panel for the operation of the machine.

This section describes the standard-keys of the Siemens machine control panel.

Depending on the machine further keys may be used; such information should be taken from the documentation by the machine manufacturer.

Machine control panel "MCP 483":



Below follows a description of the keys of the machine control panel and their function:



EMERGENCY-STOP-key

Press this key in the case of an emergency, i.e. if human life is endangered or if the machine or work piece could be damaged.

All drives will be braked to a standstill with the greatest possible braking torque.

Note:

For further reactions that may be caused by pressing the EMERGENCY-OFF key please refer to the documentation by the machine manufacturer.



RESET

- Stops the machining from executing the presently running program. The NC-control unit remains synchronized with the machine. It is now in the basic condition ready to commence a new program run.
- Clears an active alarm.



JOG

Selection of the operating mode "JOG".



TEACH IN

Creation of programs in interactive mode with the machine.



MDA

Selection of the operating mode "MDA" (Machine Data Automatic).



AUTO

Selection of the operating mode "Machine Auto".

**SINGLE BLOCK**

Runs a program block-by-block (single block).

**REPOS**

Repositions and re-approaches a contour.

**REF. Point**

Approaches a reference point.

**VAR** (Variable JOG step)

Traverse through an incremental dimension with variable step lengths.

**Inc** (Incremental JOG step)

Traverse through an incremental dimension with a given step size of 1, ..., 10000 increments.

The actual length of an incremental step depends on a machine datum.



Note:

Read the machine manufacturer's documentation.

**CYCLE START**

Starts a program run.

**CYCLE STOP**

Stops a program run.

**Axis keys**

Axis (X, Y, Z, 4, 5, 6) selection.

to

**Direction keys**

For traversing an axis either in the positive or negative direction.

**RAPID**

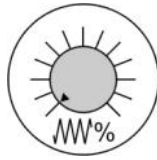
For traversing an axis at rapid traverse rate (fastest speed).

**WCS MCS**

Toggling between the work piece coordinate system (WCS) and the machine coordinate system (MCS).

Notes

Notes



Feed / Rapid traverse override

For increasing or reducing the programmed feedrate. The programmed feedrate is represented by 100% and can be varied within the range of 0% to 120%, in rapid traverse only up to 100%. The new adjusted value appears as an absolute and percentage value in the feed status display on the screen.



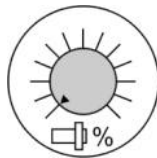
FEED STOP

Stops the machining of the currently running program, in order to stop the axes.



FEED START

Continuation of the program as from the present block and to increase the feedrate to the programmed value.



Spindle override

For increasing or reducing the programmed speed. The programmed speed corresponds to 100% and can be varied within the range of 0% to 120%. The new value thus selected appears as an absolute value and as a percentage in the speed status display on the screen.



SPINDLE STOP

To stop the spindle.



SPINDLE START

To start the spindle.

Key switch



Position 0
No key
Access stage 7



Position 1
Key 1 **black**
Access stage 6



Position 2
Key 1 **green**
Access stage 5



Position 3
Key 1 **red**
Access stage 4

Lowest access stage



Increasing access rights



Highest access right
(Key switch)

Further access rights (Access stage 3 - 0) are possible by means of passwords.