SKIPPING OF NC BLOCKS
Notes on the documentation

This description is only intended for the use of trained specialists in control and automation engineering who are familiar with the applicable national standards.
It is essential that the documentation and the following notes and explanations are followed when installing and commissioning the components.
It is the duty of the technical personnel to use the documentation published at the respective time of each installation and commissioning.

The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

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General and safety instructions

Icons used and their meanings

This documentation uses the following icons next to the safety instruction and the associated text. Please read the (safety) instructions carefully and comply with them at all times.

Icons in explanatory text

1. Indicates an action.
   ➔ Indicates an action statement.

DANGER

Acute danger to life!
If you fail to comply with the safety instruction next to this icon, there is immediate danger to human life and health.

CAUTION

Personal injury and damage to machines!
If you fail to comply with the safety instruction next to this icon, it may result in personal injury or damage to machines.

NOTE

Restriction or error
This icon describes restrictions or warns of errors.

Tips and other notes

This icon indicates information to assist in general understanding or to provide additional information.

General example

Example that clarifies the text.

NC programming example

Programming example (complete NC program or program sequence) of the described function or NC command.

Specific version information

Optional or restricted function. The availability of this function depends on the configuration and the scope of the version.
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1 Overview

Task
Specific blocks can be skipped in the NC program. The “Skip block” function defines optional processing steps such as measuring loops, test blocks, dummy steps etc. within an NC program.

Characteristics
Skips are taken into account when a NC program is processed.
- If the “Skip block” function was activated on the operating console (HMI).
- When the PLC was activated by a BOOL command before the main program start.

Programming
The function is activated by a preceding “/” character.

Parametrisation
The following HMI objects are required to select and control the function.
- HMI mc_command_block_ignore_w
- HMI mc_command_block_ignore_r
- HMI mc_active_block_ignore_r

Links to other documents
For the sake of clarity, links to other documents and parameters are abbreviated, e.g. [PROG] for the Programming Manual or P-AXIS-00001 for an axis parameter.

For technical reasons, these links only function in the Online Help (HTML5, CHM) but not in pdf files since pdfs do not support cross-linking.
2 Skip NC blocks

2.1 Skip block / ignore block

Specific NC blocks can be skipped by prefixing them with a "/" character. The controller ignores NC blocks if the function "Skip block" is enabled on the operating console (HMI) or enabled by a BOOL command via the PLC before the main program starts.

The function defines optional processing steps in an NC program such as measuring loops, test blocks, etc.

![Diagram of Skip NC blocks](image)

Figure 1: Enabling/disabling Skip block via HMI or PLC
The enable/disable status of the Skip block function is taken over at program start and remains effective until program end.
Every change in skip setting during program processing is only considered the next time the main program is started.
2.2 Multiple skip levels

This function is available as from CNC Build V3.01.3021.1 and higher.

NOTE

Changing the interface to HMI and PLC
The BOOL data type was changed to 32 bits for the skip levels.

You can now use up to 10 skip levels in the NC program using this extension. The different skip levels can be set either on the operating console (HMI) or in the PLC before the main program starts.

The syntax programming is a slash "/" followed by a number to define the skip level:

/1 Skip level one, enabled by the 1st bit, Hex.wert = 0x1
/2 Skip level two, enabled by the 2nd bit, Hex.wert = 0x2
...
/10 Skip level ten, enabled by the 10th bit, Hex.wert = 0x200

Example:

/5 N100 G00 X150 (block is ignored if level 5 is enabled)

The maximum number of skip levels is 10.
This number is not parameterisable.
Figure 2: Enabling/disabling skip levels via HMI or PLC

```
N01 D6 ; tool radius
/4 N10 X0 Y0 Z0
N20 G42
/ N30 X100
...
/3 N40 M304
N90 Z100
```
Skip level representation

```plaintext
%skip_levels
N0 G0 X0 Y0 Z0
/1 N10 X1 (Alternative: /N10 X1)
/2 N20 Y2
/2 N25 Y2.5
/3 N30 Z3
/4 N40 X-1
/4 N45 X-1.5
/4 N47 X-1.8 (Skip with no level specified, therefore Level 1)
/10 N50 Y-2
/100 N60 Z-30 (Error 21655)
/N99 X9
N999 M30
```

The valid range of skip level values is from 1 to 10. If a value is programmed outside this range, "Error 21655" is output.

For compatibility reasons the skip level without a number "/", "/1" and "/0" have the same meaning. Both are set by the 1st bit in the control bit string of the HMI / PLC.
2.3 Enable/disable

2.3.1 Enabling/disabling via HMI

The "Skip block" function can be enabled and disabled with the HMI object mc_command_block_ignore_w.

The state can be checked by the HMI objects mc_command_block_ignore_r and mc_active_block_ignore_r.

CNC Builds < 3021.1

![Image of ISG object browser for CNC Builds < 3021.1](image)

Figure 3: Enabling a single skip in the ISG object browser

Value range of mc_command_block_ignore_w: TRUE/FALSE

CNC Builds >= 3021.1 and higher

![Image of ISG object browser for CNC Builds >= 3021.1](image)

Figure 4: Enabling skip level in ISG object browser

mc_command_block_ignore_w is a bit string in which the 10 lower bits are used to enable or disable skip levels.

If the remaining bits are assigned, there is no reaction. They are ignored.
Setting `mc_command_block_ignore_w` in the ISG object browser

The single data `mc_command_block_ignore_w` is assigned 0x16 in the ISG object browser.

```plaintext
%skippingtest3.nc
N010 G00 X0 Y0 F500
N020 G1 X50
/ N030 G1 X60
/1 N040 G1 X80 Y10
/2 N050 G1 X100 Y20  (skipped)
/3 N060 G1 X120 Y30  (skipped)
/4 N070 G1 X140 Y40
/5 N080 G1 X160 Y50  (skipped)
/6 N090 G1 X180 Y60
/7 N100 G1 X180 Y70
/8 N110 G1 X140 Y80
/9 N120 G1 X100 Y90
/10 N130 G1 X40 Y100
N140 G1 X0 F2000
N150 G1 Y0
N160 M30
```
2.3.2 Enabling/disabling via PLC

A control unit in the PLC can be assigned to enable or disable the skip block function.

Enabling uses the following single data:

**For CNC Builds > V2.11.2800**

```
MC[channel_idx].addr.MCControlDecoder_Data.MCControlBoolUnit_ProgramBlockIgnore
```

**For CNC Builds > V2.11.2800**

```
gpCh[nChanIdx].decoder_mc_control.program_block_ignore.command_w
```

This is a control unit of type MC_CONTROL_BOOL_UNIT.

---

**As from CNC Build V3.01.3021.1**

The expanded function is available. The control unit was changed to 32 bits.

The control is called Unit program_block_ignore and it is a MC_CONTROL_UNS32_UNIT type.

Enabling uses the following single data:

```
gpCh[nChanIdx].decoder_mc_control.program_block_ignore.command_w
```

The single data is a bit string in which the 10 lower bits are used to enable or disable skip levels.
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