Rexroth

MTC200/TRANS200
NC Screen

Application Manual

SYSTEM200

DOK-CONTRL-NC*SCR**V22-AW01-EN-P

Rexroth Indramat

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Purpose of Documentation This documentation describes the structure of NC screen, the window contents and the option dialogs.

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Contents

1 General Information About NC Screen

1.1 Overview of NC Screen

Area of application

The NC screen supports controller families TRANS200 and MTC200.

Note:	Passages which are not valid for both controller families are identified with the valid controller family in parentheses.	
	(MTC200)	for controller family MTC200
	(TRANS200)	for controller family TRANS200

General

The NC screen is used to display important states of the controller. This provides the user with a quick overview of the current status of the controller and the machine.

MTC200 can integrate windows with status displays and windows to display and to edit NC data within an NC screen.

The display refers to the controller and process selected in the "Control selection" dialog box (main menu).

The address and name of the controller are displayed in the header.

Structure

The NC screen consists of a header (see Section 1.2 Header) and several windows which contain different functions. The windows can be focussed (see Section <F8> "Active", p. 2-2); they provide their special functions in the F-key area.

The following window contents are described in the following subordinate points:

- Position Display
- Spindle and Feed Display
- Active NC Program Display
- Active M Codes Display
- Active G Codes Display
- Tool Display (MTC200)
- Feed Display (MTC200)
- MDI Block Input (MTC200)
- NC Program Status Display (MTC200)
- Active NC States (MTC200)

Editors in NC screen

(MTC200):
In addition, it is possible to display the following editors in a window of the NC screen.

⇒ see NC variables editor (MTC200)

⇒ see NC events editor (MTC200)

⇒ see D corrections editor (MTC200)

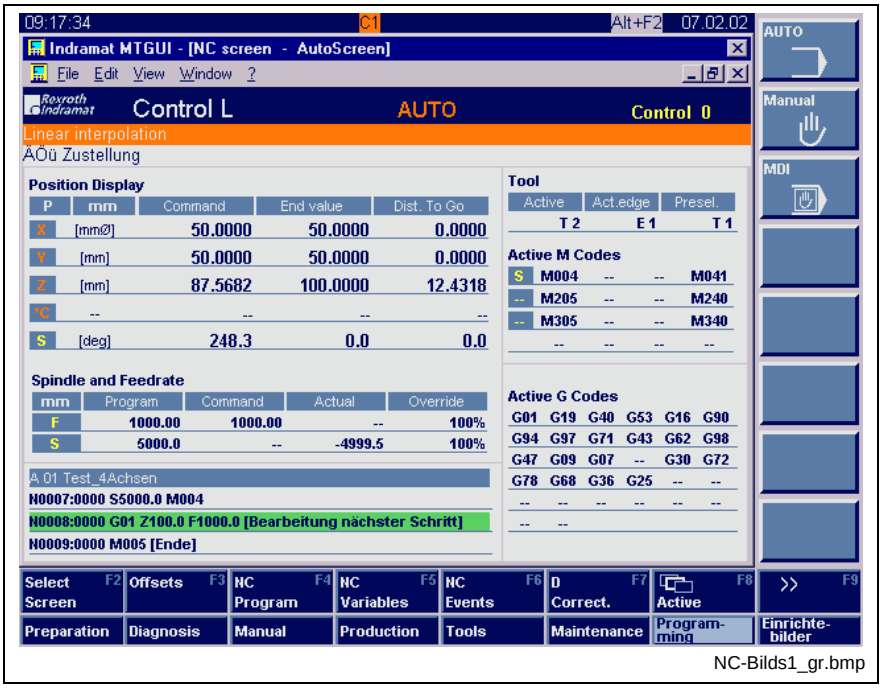
⇒ see Zero shifts editor (MTC200)

Configurability

- The individual window contents can be adjusted to the corresponding application with the Options dialog boxes.
- MTC200:
  The NC screen can be configured in edit mode by replacing windows (see Section 5.3 Configuration of Screen).

- MTC200:
  Using the NC screen configurator, new NC screens and groups of NC screens can be generated (see Section 5.6 NC Screen Configurator (MTC200)).

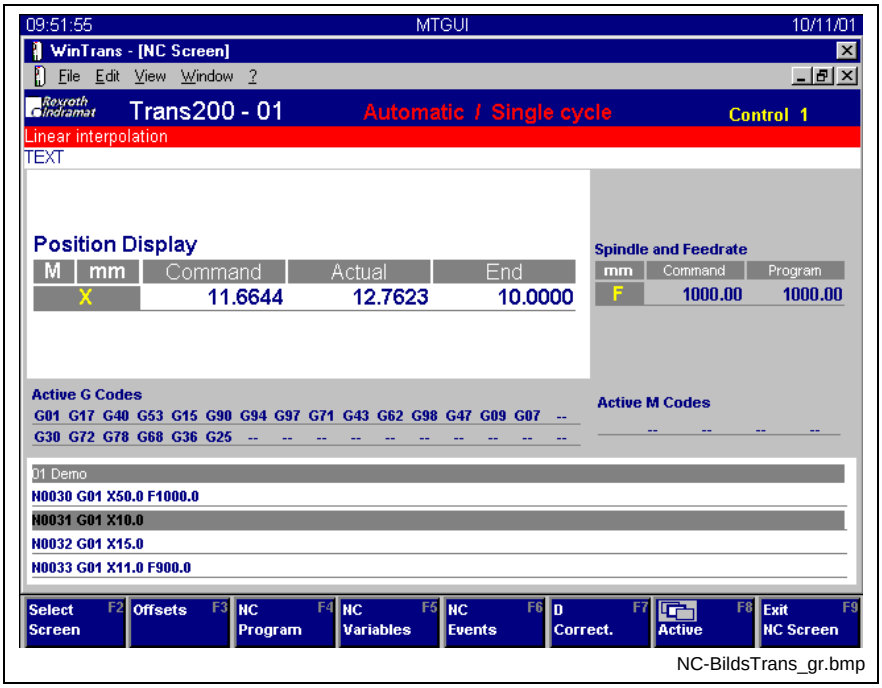
NC screen for MTC200



NC-Bilds1_gr.bmp

Fig. 1-1: Example of NC screen with standard configuration of MTC200

NC screen for TRANS200



NC-BildsTrans_gr.bmp

Fig. 1-2: Example of NC screen of TRANS200

User Management

Certain functions are protected by User Management.

These functions are available only if the user has the associated authorization. See User Management, "Rights of user" dialog box, "NC screen" tab.

1.2 Header

The header is a part of NC screen but is also used in the same form in other applications of the user interface. It contains general information about the current controller and the current process. The header for MTC200 can be changed during runtime.

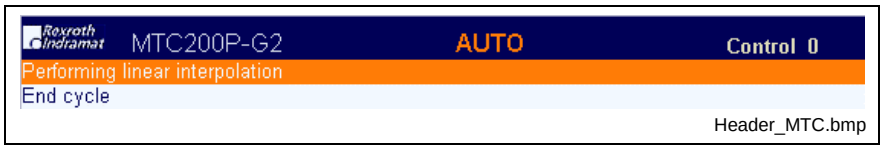


Fig. 1-3: Example for a standard header of MTC200

The header shown above is separated into 3 differently colored lines. Other contents can be selected in the edit mode of NC screen (see Section 5.5 Configuration Header); the contents of the figure is thus only an example. The header of TRANS200 can not be changed. The three lines of the figure have the following contents:

1. **Info line with dark blue background**
   - **Rexroth Indramat logo:**
     A bitmap with the Rexroth Indramat logo is displayed.
   - **Designation of control:**
     The name of the selected controller is displayed in white letters in the left-hand section of the info line (in the example, "Control L").
   - **Operating mode:**
     The operating mode is displayed in red letters (in the example, "AUTO"). For controller types, the operating mode display is differently executed (see note for operating mode display).
   - **Control number:**
     The local number of the active controller (local device No.) is displayed with the text 'Control *No.*' in yellow letters.

2. **Diagnostic line (orange)**
   - The orange line contains the current short message of the active process.

3. **NC note line (white)**
   - The active note from the NC program (contents of square bracket '[ ]'in NC program) is displayed in the white line.

Note: Operating mode display:
MTC200:
The operating mode display is controlled by the PLC. The texts to be displayed and the process connection of the display field (assignment of PLC variables) are executed with profile 'MCI_IfCmd.PRF'. The descriptions for configuration of the process connection and the texts can be found in the WinHMI documentation, chapter 'Header'.
TRANS200:
A combination of the operating mode and the operating submode is displayed in this field. In contrast to MTC200, the display is not configurable.

1.3 Online / Offline Operation

Online operation

All figures in the document show the NC screen in online operation. In other words, the process connection is functioning and corresponding values are displayed in all value fields (e.g. axis coordinates).

Offline operation

NC screens can be called in offline operation. A screen appears in which all value fields (e.g. axis coordinates) are empty. In offline operation, for example, the NC screen can be configured.

In the transition from online to offline operation while the NC screen is active, the NC screen is terminated after a message box is issued.

Offline operation for a device can be executed in two ways:

1. In the system configurator.
2. By calling the controller selection and pressing the "ON↔OFF" button.

Indicators for an NC screen in offline operation are:

1. Axis values etc. in the NC screen are empty.

Navigation is possible.

Calling up the NC data is possible.

Calling up the options is possible.

1.4 Shortcuts

In the NC screen, special shortcuts can be used in addition to the general shortcuts (e.g. <Ctrl>+<Alt>+<Shift>+<Q> for the Prog key):

- <Ctrl>+<Alt>+<E>
  (MTC200) To switch on the Edit mode, i.e. an F key bar with which the current NC screen can be configured. See Chapter 5 Configuration of NC Screen and Header (MTC200).
- <CTRL>+<Alt>+<Shift>+<N> (<Next> key)
  To call up the dialog box for process selection.

2 Operation of NC Screen

2.1 General Information About Operating NC Screen

The NC screen is started by calling the main menu or with the project navigator. Operation is executed by pressing the F-keys with the mouse or with the hardware keys.

- Entries in nonfocussed windows (see Section <F8> "Active") always refer to the entire NC screen;
- Entries in focussed windows always refer to the individual window.

MTC200:
There is a second F key level for the expansion of F keys.
The transition from an F key level to the next is always executed with key <F9>.

The functions on F keys <F2>, <F8> and <F9> are described in following sections. In the first F key level of MTC200 and in TRANS200, the corresponding online NC data is branched with keys <F3> to <F7>. The keys thus have a distribution function. The functions assigned to keys <F4> to <F6> in the second F key level of MTC200 are functions to handle NC programs.

Fig. 2-1: F key assignment of NC screen level 1 for MTC200

Fig. 2-2: F key assignment of NC screen level 2 for MTC200

Fig. 2-3: F key assignment of NC screen for TRANS200

<F2> "Select Screen"

Different screens with fixed window splits are available for the NC screen.

Different screens are available in a selection box (MTC200: 6, TRANS200: 3).

Another screen is selected with <Cursor left> or <Cursor right> and pressing the <Enter> key or double-clicking the mouse.

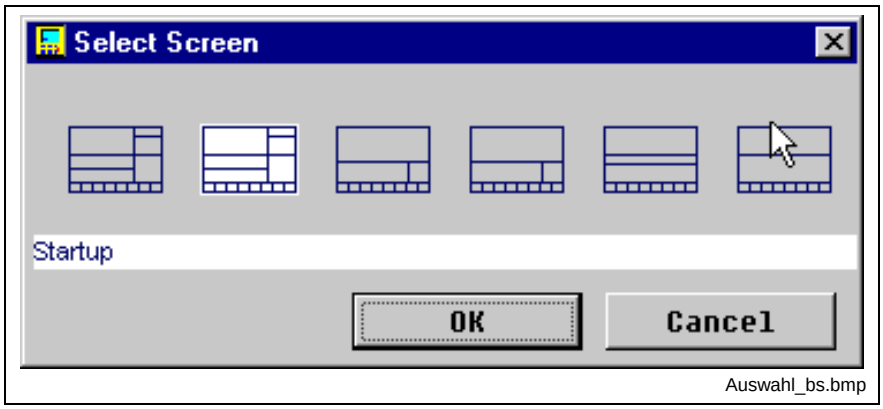


Fig. 2-4: Select NC screen in MTC200

<F8> "Active"

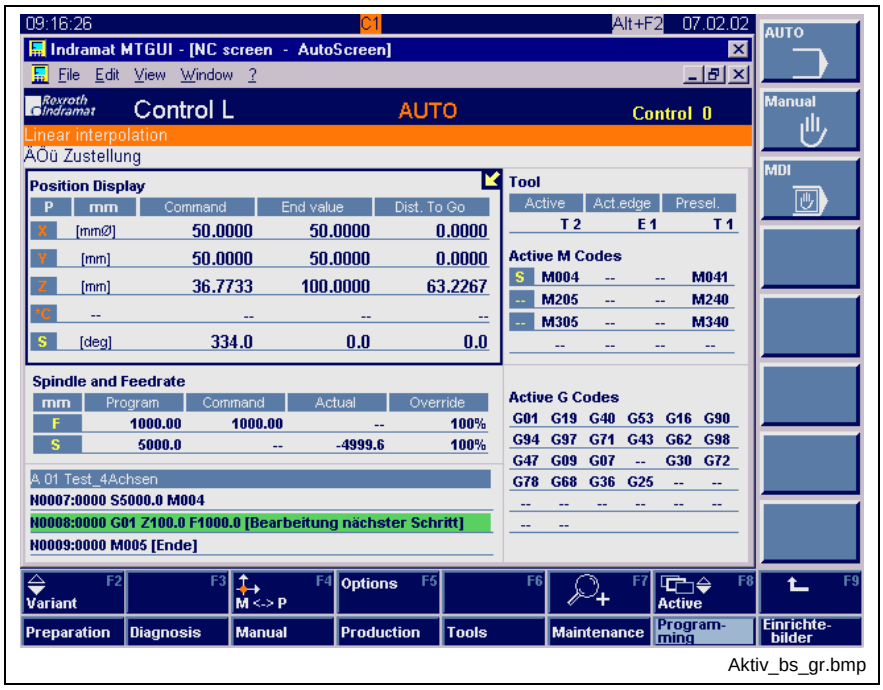
Key <F8> "Active" has two methods of operation:

- When the F key is pressed for the first time, the focus is set to a window of the NC screen. The focus is identified by a strong blue border around the window and an arrow in the top right-hand corner. At the same time, new functions are available in the F key area that are specifically assigned to this focused window.
- The focus switches to the next window each time that key <F8> "Active" is pressed again. The functions related to the newly selected window are also available in the F key area.

Pressing F keys <F9> "Back" or <Esc> cancels the focus (the blue border disappears) and reactivates the NC screen functions in the F key area.

Position display as an example of focussing a window

Focussing the position display also activates the related functions in the F key area.



Aktiv_bs_gr.bmp

Fig. 2-5: NC screen with active window position display

Calling the Main Menu, Exiting NC Screen

The dialog box for selecting the controller and the process can be called up in the main menu; to change the controller to be displayed, the main menu and then the controller selection must always be called.

The process can also be changed in this manner.

Process change with <Next> key

The second possibility for changing the process involves using the shortcut <Ctrl>+<Alt>+<Shift>+<N> (Next key) to call the dialog box for process selection.

Calling the main menu is always possible with System menu / Window / Main menu (or with keys <Alt>, 4 * <Cursor right>, <Cursor down>). The NC screen remains active in the background.

By pressing the X of the application, the NC screen is exited like every application. The application within Com desktop which was active before the NC screen will now be active.

MTC200

With key <PROG>, the NC screen is sent to the background and the main menu is displayed. The NC screen remains active.

Since key <PROG> is only available on the BTV20, the main menu can also be called up with key combination <SHIFT>+<Alt>+<Ctrl>+<Q>.

TRANS200 The main menu can be called with key <F9> "Exit NC screen" or with <Ctrl>+<M> in TRANS200.

<F9> and <Ctrl>+<M> have different functions:

- <F9>: The NC screen is exited and the application which was active before the NC screen was called up becomes visible.
- <Ctrl>+<M>: Brings the main menu to the foreground without exiting the NC screen (like <PROG> in MTC200 or calling the main menu with the system menu).

3 Window Contents

3.1 Position Display

The position display is used to display axis data. The values which can be displayed are shown in Section Axis Data, p. 3-4. The order and number of the currently displayed values (column headers) can be diversified in the Options dialog box for the position display (see Section 4.3 Options Tab "Values (Columns)").

In the line of column headers (the line under the title "Position Display"),

- the first item is the number of the axis group ("2" in the example),
- the second item is the type of coordinate system ("W" for workpiece coordinate system in the example) and
- the third time is the basic programming unit (G71 = mm and G70 = inches).

The column headers follow in this line as further specifications.

The first column of the table contains the axis designations of axes in the lines below and the units of the line whose display is optional in the example (see description below).

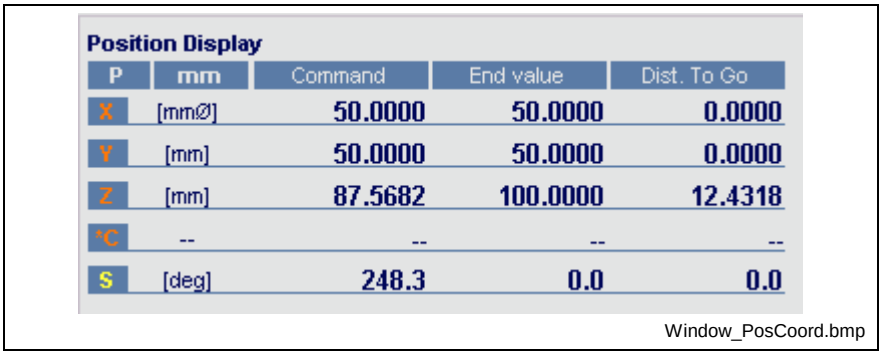


Fig. 3-1: Position display window

If position display is focussed with key <F8> "Active" as a window in NC screen, the special F key level of the position display is set:

Fig. 3-2: F key assignment for position display

F key	Function	Explanation
<F2>	Variant	A selection between two variants that are groups of column headers can be made. The default setting has the following values: Variant 1: Display of: command value, end value, distance to go. Variant 2: Display of all axis-specific values: command value, end value, distance to go, actual value, following error, velocity and torque (navigation with scroll bar).
<F3>	Axis group	Available only if an axis group selection is set in the options (see chapter Axis Groups, p. 3-5).
<F4>	M↔W	Switching between coordinate systems (workpiece/machine coordinates).
<F5>	Options	The Settings dialog box that is associated with the position display is called (see Section 4.1 General Information About Options).
<F7>	Zoom +	Calls up the zoom function (see chapter Zoom, p. 3-6).
<F8>	Active	Moves the focus to the next window.
<F9>	Back (<Esc>)	The window focus is lifted.

Fig. 3-3: Explanation of key assignment

Axis Identification

The axes agreed upon in NC axis parameters are assigned to an axis meaning. In addition, each axis has an axis designation which is shown in the position display.

Axis designation

The axis designation of an axis is the address with which it is addressed in the NC program and how it is usually represented in the windows of NC screens.

The letters X, Y, Z, A, B, C, U, V and W are permitted as axis designations. An index 1, 2 or 3 can be added to these letters for further differentiation.
Example: X2

Axis meaning

The axis meaning identifies the position of the axis in the coordinate system.

X, Y, Z linear main axes

A, B, C rotary main axes

U, V, W linear or rotary auxiliary axes

S; S2; S3 spindles

Example

The axis with designation C3 can have the meaning X in the orthogonal Cartesian coordinate system.

Axis reference

For axes that are not in the reference, the axis designation is represented with a red letter.

Unit per line

The Options dialog box for the position display can be used to set whether the unit for each line (axis) should be displayed separately. The unit is displayed in square brackets ([ ]). The unit of the first column determines the displayed value for each line.

Wildcard symbol "*" (MTC200)

Wildcard for the axis which has the meaning of the following axis in the coordinate system.

Example	*C

This axis is not active in this representation or not available in the displayed station.

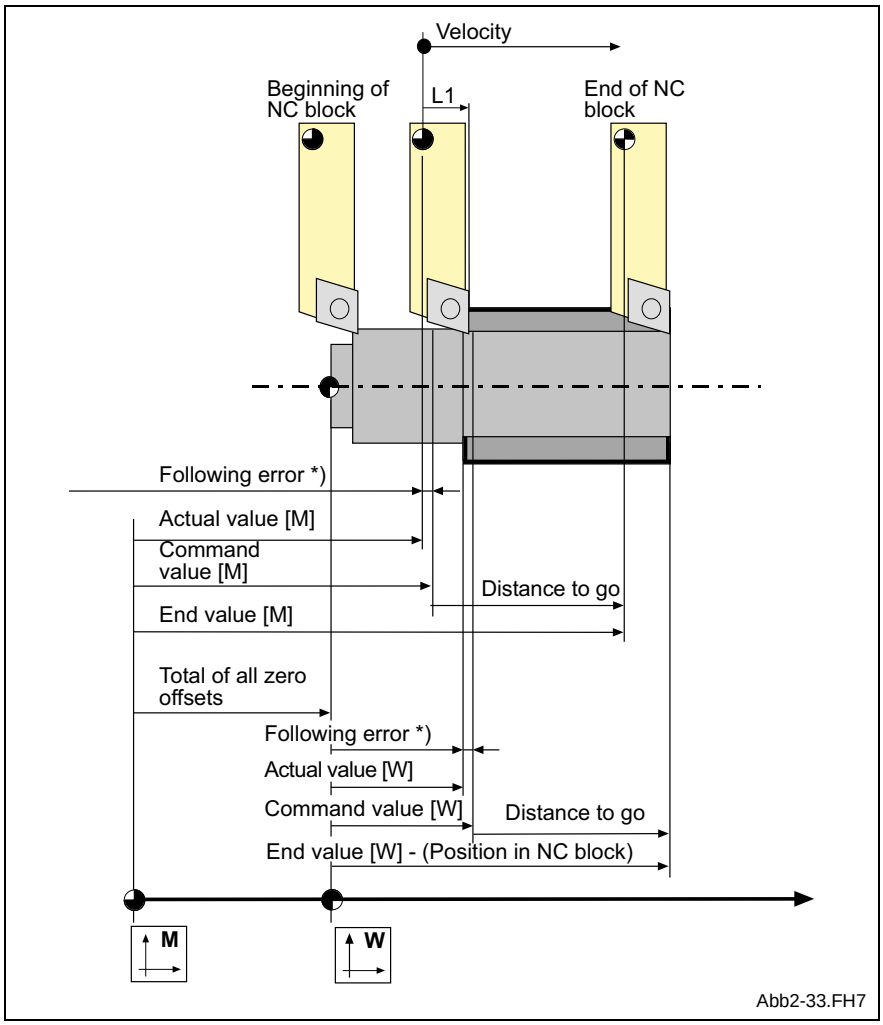
Examples for wildcards (MTC200)

The display with wildcards is used in the following cases:

1. Rotary axis-capable main spindle:
   On a lathe, an axis can be used sequentially as a main spindle (S1) or as a rotary axis (C1) with axis meaning S and C. If this axis is active as a main spindle, *C is displayed in the coordinate display and the current values are displayed under designation S1 in the spindle data. If a switch to rotary axis operation is made, C1 is displayed with the corresponding values and *S is displayed in the spindle data.
2. Transformation function G30/G31:
   During the transformation from Cartesian coordinates to polar coordinates, the inactive axes (fictional axes for G30 or real axes for G31) will be displayed with an * and their axis meaning.
3. Axis transfer GAX/FAX:
   If an axis X1 with axis meaning X is transferred to another station, it is displayed by the wildcard and the axis meaning *X in the station where it is currently not active. The axis data are displayed with designation X1 in the active station.

Axis Data

The selectable axis data in the machine and workpiece coordinate systems are represented in the following overview picture "Axis data".



*): The following error is the difference between the command position value and the actual position value.

Fig. 3-4: Overview of axis data

Machine / Workpiece Coordinates

Function

In the column header for axis designations, a symbol of the selected coordinate system ("M", "W") which refers to axis data is displayed in the position display.

Use key <F4> "M↔W" to change the coordinate system (workpiece / machine coordinates).

The axis data following error, velocities and distance to go are independent of the selected coordinate system.

The command value, actual value and end value refer to the machine zero point in the machine coordinate system and to the workpiece zero point within the workpiece coordinate system.

Display of ∅ symbol in G16

The display of coordinates which refer to diameter is only performed in the workpiece coordinate system. The ∅ symbol is attached to the measurement unit (e.g. [mm ∅]) and is therefore visible only if Unit per line is set in the Options.

Display Unit mm / inch

Function

In the column header of axis designations, a measurement unit symbol which specifies the data assignment selected in Options tab “View” can be displayed if desired (see Section 4.2 Options Tab "View").

There is a difference between the measurement unit determined in process parameter BOX.001 (base programming unit) and the displayed measurement unit.

G commands G70 and G71 do not influence the display.

Meaning of signs mm/inch in column header

- "mm"/"inch": Parameterized base unit and displayed measurement unit of data are identical.
- "→ inch": Base unit of controller is mm, displayed data in inches.
- "→ mm": Base unit of controller is inches, displayed data in mm.

The measuring unit can be converted in the Options dialog box (see Section 4.2 Options Tab "View").

Display reference

The displayed measurement unit refers only to one window. Settings for the other windows (e.g. spindle and feed) must be executed in the Options dialog box which corresponds to the individual window.

The distance indications always refer to the base unit in the displayed NC blocks.

Example

Symbol:	"→ inch"
Input:	@1 = 1
	The controller interprets the value filed in variable "@1" as 1 mm, as far as variable "@1" is to be processed as a distance measurement.

Axis Groups

- The axis groups are valid per process (MTC200) and/or per control (TRANS200).
- It is possible to operate without axis groups or with axis groups in the position display.
- For selection, use toggle button "Axis group" which is in the Options dialog box on the "Axes (lines)" tab.
  The default setting is "without axis groups".
- The number of the axis group is indicated in the left column header of the position display during operation "with axis groups". Otherwise no axis group number is displayed.

Without axis groups

- The axes are listed in the order of the axis meaning. The order cannot be modified by the user.
- All axes which are available in the process are displayed. (If, for example, an axis is added in the process parameters, it is also visible in the position display.)

With axis groups

- Axis group 1 is available by default.
- During the first startup of the NC screen or during the creation of the axis group, the axes which are available in the system will be listed in the order of axis meaning.
- The order and the number of axes to display can be modified for each axis group by the user. Options dialog box, tab "Axes (lines)"
- If, for example, an axis is added in the process parameters, it is not automatically contained in an axis group. The user must add the axis to the desired axis group. Options dialog box, tab "Axes (lines)"
- Designation: No. 1 to 8 with no gaps.
- The user can add axis groups. (Options dialog box, tab "Axes (lines)", button "New axis group"). The new axis group is added according to the largest axis group.
- The user can delete axis groups (Options dialog box, tab "Axes (lines)", button "Delete axis group"); the largest axis group is deleted!
- Axis group 1 cannot be deleted.
- If more than one axis group is available, the axis group can be selected with key <F3>"Axis group" during active position display.

During startup of the NC screen, the last selected axis group is used in the position display.

Zoom

The currently set position display is displayed as a single window of an NC screen in the zoom function. All statements for the position display (see Section 3.1 Position Display), including the possibility of selecting axis groups, are valid. The starting screen is shown again with <F7> 'Zoom -' while the basic setting of the NC screen is shown with <F9> "Exit Zoom".

Fig. 3-5: NC screen for zoom

⇒ see Section 4.2 Options Tab "View".

3.2 Spindle and Feed Display

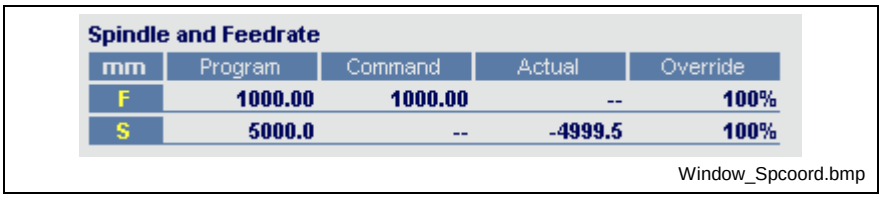


Fig. 3-6: Window for spindle and feed display

Feed Data

Description of all column headers that can be selected in the Options dialog box.

Column designation	Column meaning	FI command	Comment
Program	Programmed value	PFR	
Command value	See Fig. 3-8: Command value column for feed with G71	AFR	
Actual value	-	-	No output in this column.
Max	Maximum feed	MFR	
Override	Current override	AFO (%)	
Max.Ovr.	Maximum override	MFO (%)	
Gear level	-	-	No output in this column.
Position	-	-	No output in this column.
M Code	-	-	No output in this column.

Fig. 3-7: Feed values

Meaning of values in column Command value

The meaning of values in column "Command value" depends on the active G Code and is displayed in the following table. The feed values result from the product of the programmed value and the override. The units [inch]/[rot.] or [inch]/[min] are used with the selected base programming unit 'inch' (G70).

Active G code	Group	F value	Unit	Note	Storage type
G4	16	Waiting time	[s]	Hold time in seconds	Blockwise
G63	7	Feed per rotation	[mm]/[rot.]	Tapping G63	Modal
G64	7	Feed per rotation	[mm]/[rot.]	Tapping G64	Modal
G65	7	Feed per rotation	[mm]/[rot.]	Tapping G65	Modal
G95 without G0	7	Feed per rotation	[mm]/[rot.]	Feed per rotation G63	Modal
G95 with G0	7	Feed per minute	[mm]/[min]	Normal feed programming (rapid traverse velocity)	Modal
G94	7	Feed per minute	[mm]/[min]	Normal feed programming	Modal

Fig. 3-8: Command value column for feed with G71

Spindle Data

Description of all spindle data column headers which are selectable in the Options dialog box for all spindles of the process.

Column designation	Column meaning	FI command	Comment
Program	Programmed spindle speed	ASD / 3rd value	
Actual value	Current spindle speed (axis velocity)	ASD / 2nd value	
Command value	-	-	No output in this column.
Max	Maximum spindle speed	ASD / 4th value	
Override	Current spindle override	ASD / 6th value (%)	
Max.Ovr.	Maximum spindle override	ASD / 7th value (%)	
Gear level	Gear level	ASD / 9th value	Only MTC200
M Code	Spindle-related M commands	AMF complete text	
Position	Spindle location	APO1 / value	

Fig. 3-9: Spindle data for all spindles of process

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the 'Spindle and feed' window is focussed.

⇒ See Section Options Tab "View Active NC Program", p. 4-3.

3.3 Active NC Program Display

Window_NCBlock.bmp

Fig. 3-10: Window for NC program display of MTC200

Display of a segment of the active NC program as it is executed in the controller. The active block is marked with a green bar. Depending on the setting, 1-4 NC blocks are displayed before or after the active block.

The first line under the optionally displayed window header "Active NC Program" displays the following:

- MTC200: active NC program memory ("A" in the example).
- Active NC program number (in example "01" in the example).
- Program designation (in example "Prg with Home" in the example).

The blocks of the active NC program are available, as they are executed in the controller, in the following lines (the compiled blocks for MTC200).

In the above example, the active NC block is displayed first with no block before it because there is too little space.

The number of NC blocks which are displayed before and after the active block can be set in the Options.

The F-key bar contains only keys <F5> "Options", <F7> Zoom, <F8> "Active" and <F9> "Back" when window "NC program display" is focussed.

Using Zoom <F7>, the NC block display is displayed as the sole window in the NC screen.

⇒ See Section Options Tab "View Active NC Program", p. 4-3.

3.4 Active M Codes Display

Window_M-Codes.bmp

Fig. 3-11: Window for M Code display

All M Code groups can be displayed. Every M Code group is displayed in a separate field (for the structure of M function groups, see the documentation "NC programming instructions").

Structure of M Code groups

The display is structured as follows:

- In line 1: Groups 2, 5, 8, 11 (only if spindle 1 exists)
- Next line: Groups 3, 6, 9, 12 (only if spindle 2 exists)
- Next line: Groups 4, 7, 10, 13 (only if spindle 3 exists)
- Next line: Groups 1,14,15, 16 (are always displayed)

This means if no spindle is defined, only M Code groups 1, 14, 15,16 are displayed (one line).

Syntax	Description
Mxx	M Code xx is active
- -	No M Code of the M Code group is active

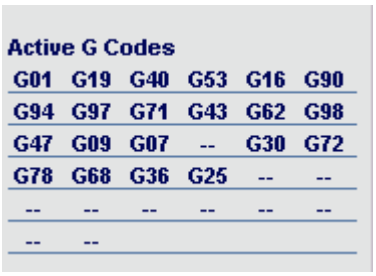
Fig. 3-12: Meaning of M Code entries

Note: In the Options dialog box for M Codes, it is possible to display the M Code groups which are assigned to a spindle (1-3) even if no spindle is assigned to the process. This is reasonable if, for example, the spindles can only be triggered by the PLC and therefore are unknown to the process.

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the "Active M Codes" window is focussed.

⇒ See Section Options Tab "View Active NC Program", p. 4-3.

3.5 Active G Codes Display



Window_G-Codes.bmp

Fig. 3-13: Window for G Code display

Each of the 32 G Code groups (22 are currently in use) is displayed in a separate field (for the structure of G Code groups, see the documentation "NC programming instructions").

Syntax	Description
Gxx	G Code xx is active
- -	No C Code of the G Code group is active

Fig. 3-14: Meaning of G Code entries

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the "Active G Codes" window is focussed.

⇒ see Section 4.2 Options Tab "View".

3.6 Feed Display (MTC200)

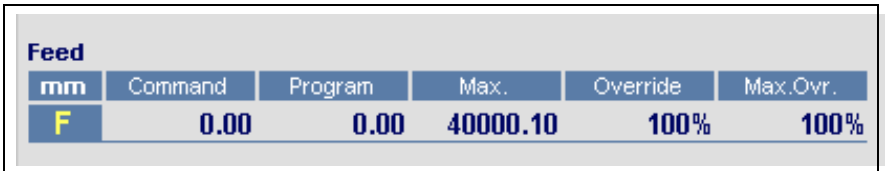


Fig. 3-15: Window for feed display

Column designation	Column meaning	FI command	Comment
Program	Programmed value	PFR / value	
Command value	See Fig. 3-8: Command value column for feed with G71	AFR / value	
Max	Maximum feed	MFR / value	
Override	Current override	AFO / value (%)	
Max.Ovr.	Maximum override	MFO / value (%)	

Fig. 3-16: Feed values

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the "Feed" window is focussed.

⇒ see Section 4.3 Options Tab "Values (Columns)".

3.7 Tool Display (MTC200)

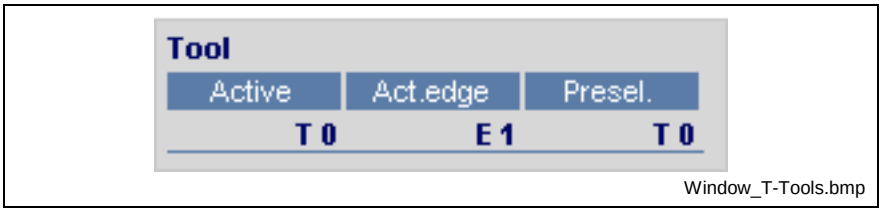


Fig. 3-17: Window for tool display

Column headers:

- Active : T number of active tool.
- Act.edge: Tool edge number of active tool.
- Presel.: T number of preselected tool.

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the "Feed" window is focussed.

⇒ see Section 4.3 Options Tab "Values (Columns)".

3.8 MDI Block Input (MTC200)

In the "MDI block input" window, individual NC blocks can be transferred to the NC and be processed with Start. Calling up MDI block input is protected by User Management.

Note: MDI operation requires the prerequisites (interlocks) to be fulfilled in the PLC program. Operating modes "Setup" or "MDI" are required.

Requirements for MDI

Operating mode "MDI" of the NC must be set for processing. The window is focussed (blue frame) with key <F8> "Active" (possibly repeatedly); afterwards, the availability for execution of blocks in the MDI operating mode is provided with key <F4> "MDI".

Process

Process of inputting an MDI block:

- The MDI block can be entered directly.
- Previously entered MDI blocks are temporarily stored on the desktop. Up to 20 MDI blocks. Using the <F2> and <F3> keys, these MDI blocks can be reselected.
  - <F2>
    Displays the block entered previously. If the key is pressed again in the first block of the temporary memory, the last block of the temporary memory is displayed again.
  - <F3>
    Displays the subsequent MDI block of the temporary memory. If the key is pressed again at the end of the temporary memory, the first block is displayed again.
  - After scrolling in the temporary memory, the current block is overwritten when a block is re-entered. Otherwise, the subsequent block is always overwritten during a re-entry.
- F-key <F4> "MDI block" or <Enter> loads the MDI block into the NC.
- The MDI block is processed by pressing the start key of the controller.

Note: The MACROS contained in the MDI block will be resolved before they are loaded into the NC (as is the case from the NC compiler before the download) if toggle button 'Compiler' in NC program editor / Extras / Compiler settings is also set. If a MACRO cannot be resolved because this switch was not set, a message box is displayed which contains an NC message but which does not indicate the unsolved MACRO.

The error messages displayed in message boxes during processing of MDI blocks are generated by the NC and merely displayed by the MDI window.

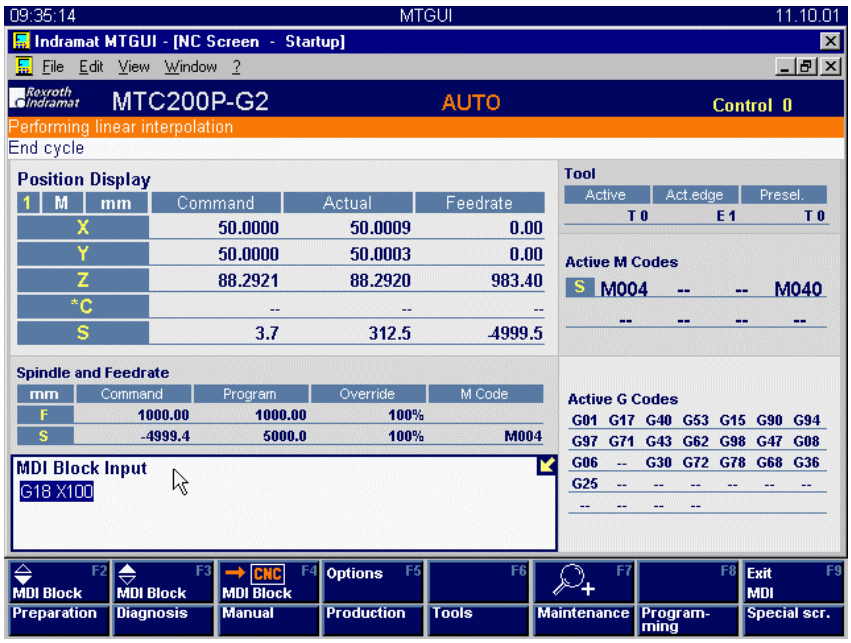
Activating MDI block input

The 2nd screen of the default configuration has a window for MDI block input (the screen is selected using <F2> "Select Screen").

In addition, the MDI window within the screen must be focussed:

- with key <F8> "Active" (see above) or
- by entering any character on the keyboard.
  The MDI window is then immediately in input mode.

If the MDI window is focussed, the related functions described above are available in the F key area.



NC-BildsMDI_gr.bmp

Fig. 3-18: MDI block input in input mode as a window of NC screen

⇒ see Section 4.2 Options Tab "View".

3.9 NC Program Status Display (MTC200)

Window_prognr.bmp

Fig. 3-19: Window for NC program status

Column designation	Column meaning	FI command
Active	Active NC program	APP
Presel.	Preselected NC program	SPP
NC record	Currently executed NC block	ASN

Fig. 3-20: Column designations for NC program status

The F key bar contains only keys <F5> "Options", <F8> "Active" and <F9> "Back" when the "NC program status" window is focussed.

⇒ see Section 4.3 Options Tab "Values (Columns)".

3.10 Active NC States (MTC200)

Window "Active NC States" provides information about certain NC states. It displays which offset page, D correction and angle unit are currently active.

Window_NCStati.bmp

Fig. 3-21: Window for active NC states

Note: Values that cannot be displayed, as is the case in offline operation or if the connection has been interrupted, are displayed by "—".

The F-key bar contains only keys <F8> "Active" and <F9> "Back" when the "Active NC States" window is focussed.

⇒ Currently, no options can be set using a tab.

4 Options Dialog Boxes

4.1 General Information About Options

The "Options" dialog box has a uniform structure for the following window contents:

- Position Display
- Spindle and Feed Display
- Active NC Program Display
- Active M Codes Display
- Active G Codes Display
- Tool Display (MTC200)
- Feed Display (MTC200)
- MDI Block Input (MTC200)
- NC Program Status Display (MTC200)

A register with a different number of tabs or pages (1-3) is displayed in a dialog box.

If the settings of one or more tabs are executed, the new setting can be transferred with the "OK" button or the old setting of a window can be kept with button "Cancel" (or <ESC>).

Call The corresponding window must be focussed and key <F5> "Options" must be pressed to call the Options dialog boxes. Calling Options is protected by User Management.

Operation The operator input can be executed with the mouse or the keyboard (tab, cursor keys).

4.2 Options Tab "View"

Tab "View" has the same structure for the following functions:

- Position Display
- Spindle and Feed Display
- Active G Codes Display
- Feed Display (MTC200)
- Tool Display (MTC200)
- MDI Block Input (MTC200)
- NC Program Status Display (MTC200)

The tabs for the individual functions differ in the number of displayed toggle buttons, but have the same functions.

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Validity of settings

The properties which are to be set in this tab are valid for the currently selected window (contents and window size), even in other screens. For example, the setting whether the header over the window "Position display" in standard screens 1 and 2 of the MTC200 should not be visible must be processed in one only of the screens.

Properties of tab "View":

- With toggle buttons "Header", "Coordinate system", "Measurement unit symbol" and "Unit per line", the corresponding elements can be set and reset in the windows.
- The character size in the window and the line distance of entries in the window can be influenced with the elements of combo boxes "Width/height" and "Min. font size".

Exception of validity

- With combo box "Unit", it is possible to select the display unit "mm", "inch" or "Base unit" (see Section Display Unit mm / inch, p. 3-6). The selected unit is valid for all window sizes of this content (e.g. also for zoom in the position display).

All changes will be immediately visible in section Preview.

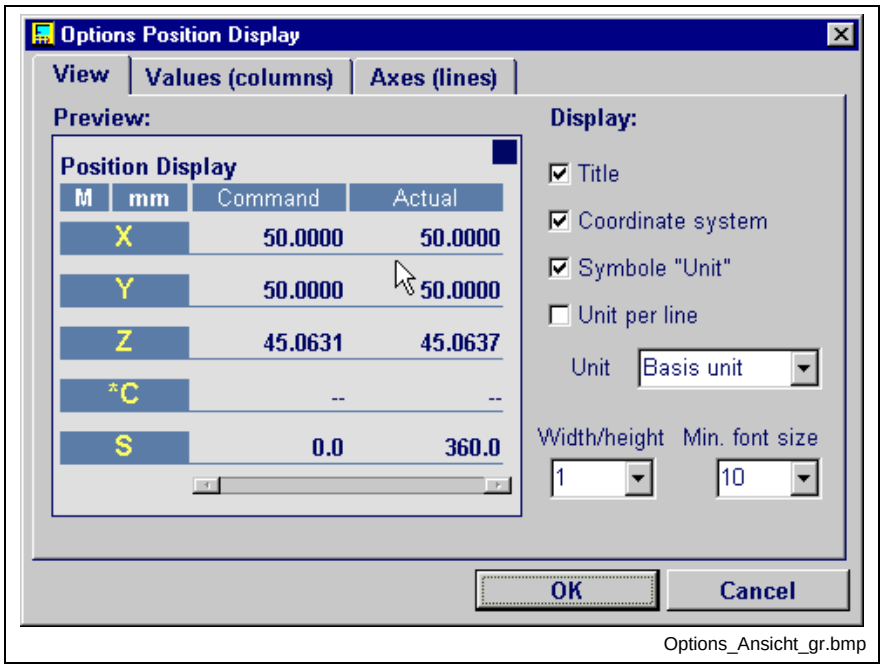


Fig. 4-1: Options Tab "View", with Position display as an example

Options Tab "View Active M Codes"

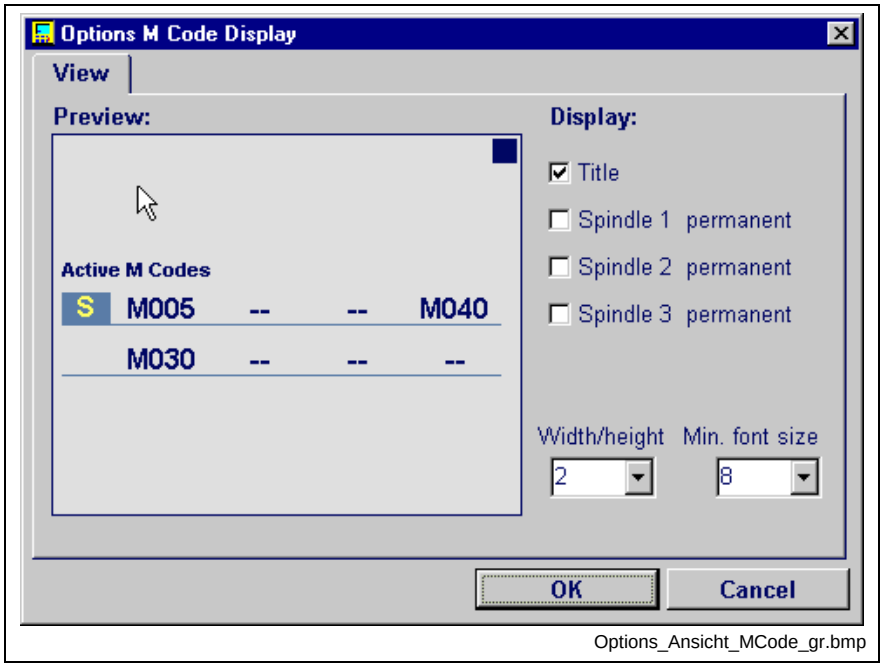


Fig. 4-2: Options, Active M Code display, tab "View"

In comparison with the general tab "View", spindle-related M Code groups can also be displayed by setting toggle button "Spindle n permanent" if this spindle is not defined in the NC process.

⇒ See Section 3.4 Active M Codes Display.

Options Tab "View Active NC Program"

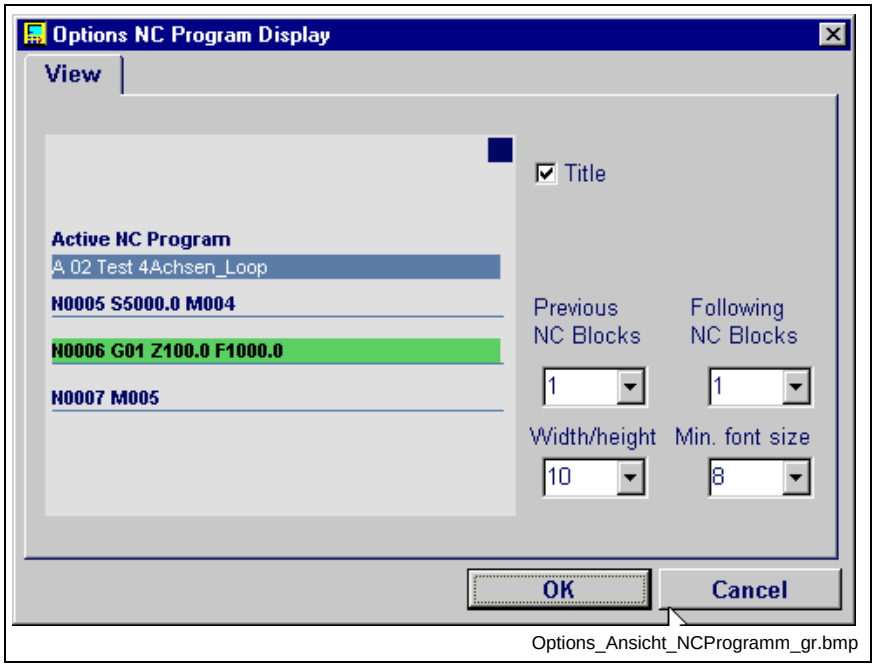


Fig. 4-3: Options tab "View active NC program"

The difference from the general tab "View" is the combo boxes:

1. "Leading NC blocks"
   with which the number (0 to 4) of NC blocks before the active NC block is set.
2. "Following NC blocks"
   with which the number (1 to 4) of NC blocks after the active NC block is set.

⇒ See Section 3.3 Active NC Program Display.

4.3 Options Tab "Values (Columns)"

This tab is used for the functions:

- Position Display
- Spindle and Feed Display
- Feed Display (MTC200)
- Tool Display (MTC200)

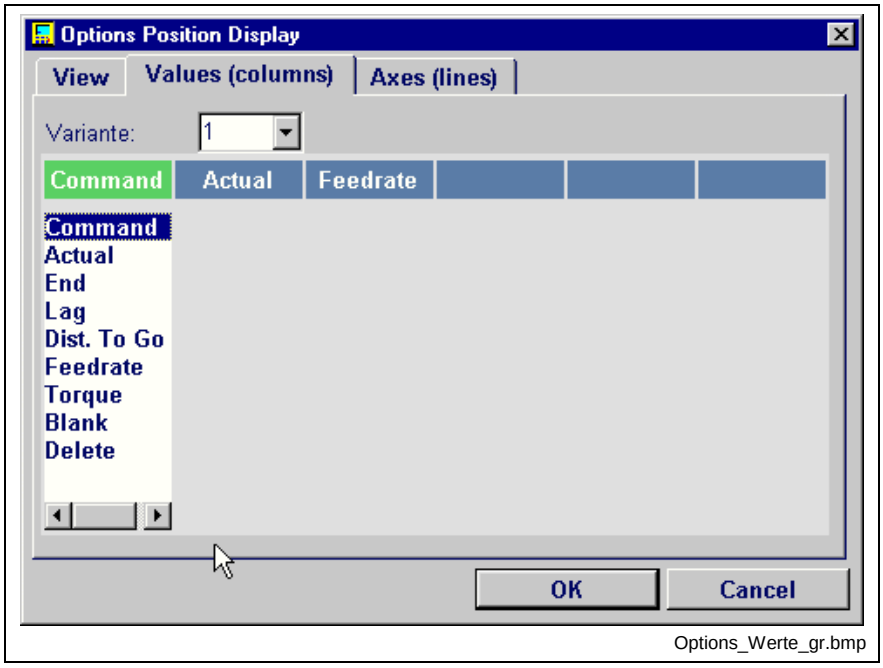


Fig. 4-4: Options Tab "Values (columns)", with Position display as an example

Contents of this tab:

- Selection of column headers from a permitted choice. The table of permitted column headers is included in the corresponding active column (marked green).
- Change column headers.
- Inserting empty columns ("empty").
- Deleting column headers and thus changing the column number ("Delete").
- Settings for variants 1 and 2 (only with position display) can be processed.
- Selection is made using the mouse or <CursorLeft>, <CursorRight>, <CursorUp> or <CursorDown>.

4.4 Options Tab "Axes (Lines)"

The tab is valid for function "Position display".

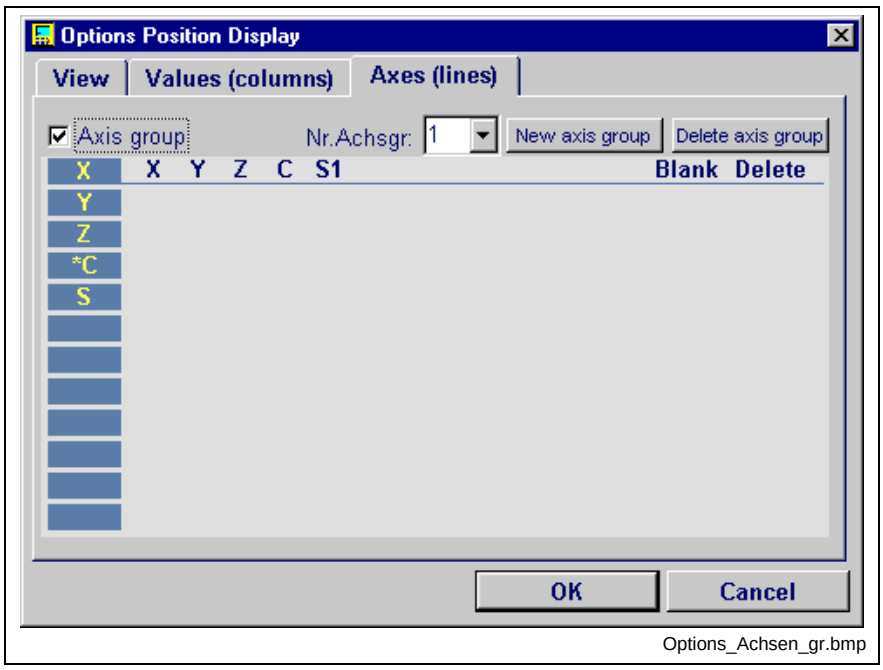


Fig. 4-5: Options tab "Axes (lines)", with Position display as an example

All axes (the axis designation) of the current process are represented in the horizontal and all axes which are selected for the process of this axis group are represented in the vertical. All axes which are available in the process are entered as the standard configuration (see Section Axis Groups, p. 3-6).

Note: The settings of this tab are valid for the position display in all screens.

Contents of this tab:

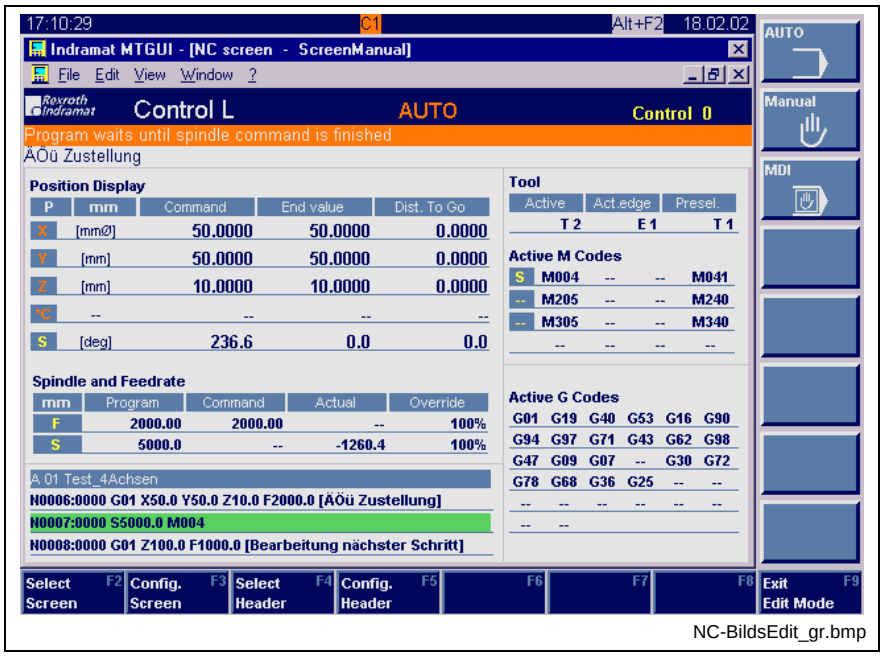
- By setting toggle button "Axis group", the creation of axis groups can be switched on.
- Axis groups make it possible to change the order of axes or to delete the axes from the display matrix. They are thus no longer displayed.
- A new axis group is created (up to 8 are possible) by pressing the button "New axis group". All axes of the process are always contained in a new axis group in the order of axis meaning.
- By pressing the button "Delete axis group", the last axis group is deleted (axis group 1 cannot be deleted).

5 Configuration of NC Screen and Header (MTC200)

5.1 General Information About Configuration

In the edit mode, the contents of the window in the NC screen and in the header can be adjusted by selecting previously manufactured elements from a catalog.

To carry out configuration, shortcut <Ctrl>+<Alt>+<E> is used to switch to the edit mode. To achieve this, the F key area is offered with functions about configuration of the window in the NC screen and the header. Calling the edit mode is protected by User Management.

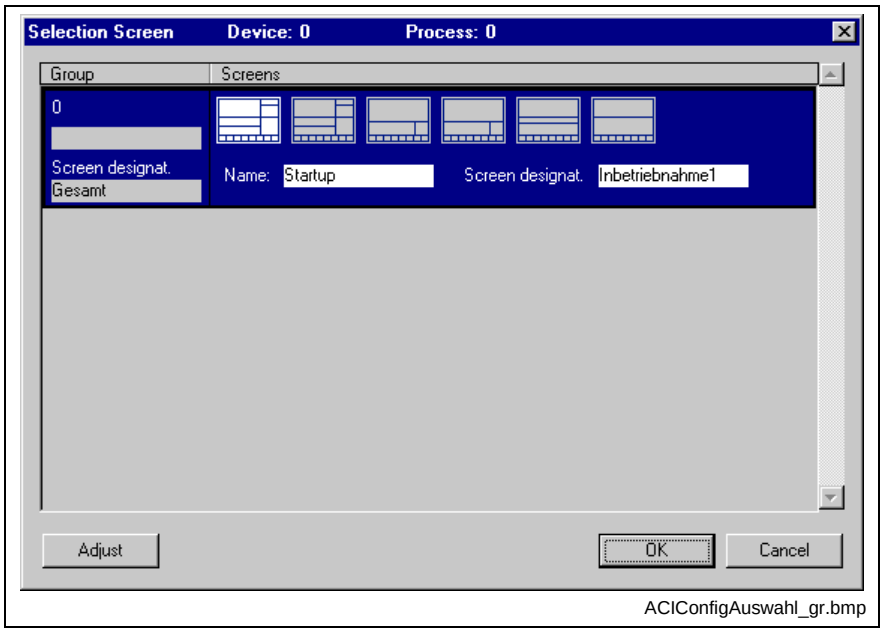


NC-BildsEdit_gr.bmp

Fig. 5-1: F key area for configuration of NC screen and header

5.2 Select Screen <F2>

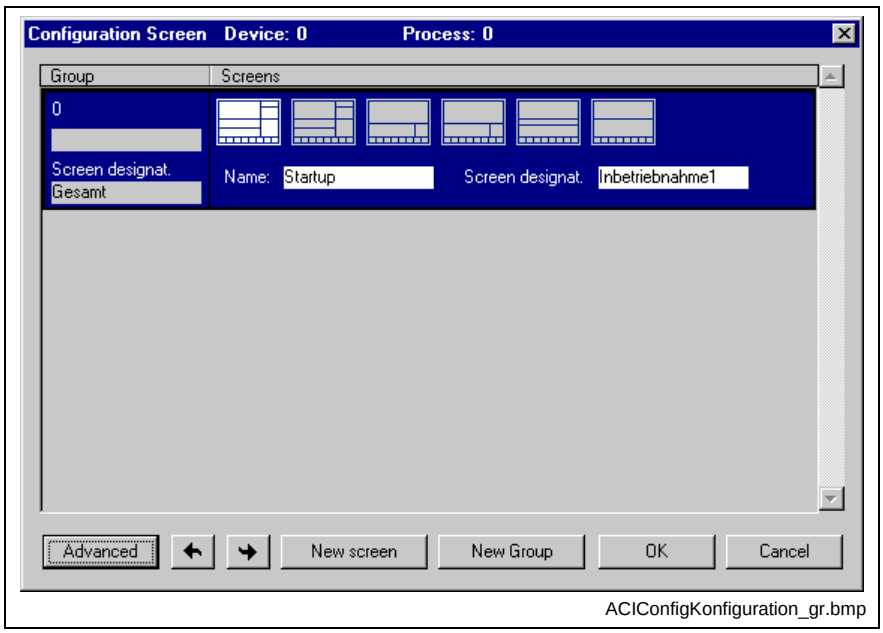
Button <F2> can be pressed to open a selection dialog box for NC screens with which not only screens from the current screen group can be selected, but the screen group (if present) can also be switched in the same process. At first, the dialog box is in the selection mode.



ACIConfigAuswahl_gr.bmp

Fig. 5-2: Selecting screens

Editing NC screens and creating new NC screens is currently not possible. Pressing button “Adjust” opens the expanded mode. "Editing" means assigning screen names, screen IDs and assigning M key files and levels to screens. This dialog box is described in detail in section 5.6 NC Screen Configurator (MTC200).



ACIConfigKonfiguration_gr.bmp

Fig. 5-3: Dialog box for editing and creating new screens

5.3 Configuration of Screen

Changing the window contents in the screen

The configuration is made for the currently selected screen.

The focus (orange frame) is set to a window of the NC screen with key <F3> "Config. screen". A new F key level is displayed.

Use key <F8>"Active" to set the focus to the required window of the screen.

When key <F2> "Config. Window" is pressed, the following elements can be selected and can be displayed in the window:

- Position display
- Spindle and feed rate
- Feed
- Active M codes
- Active G codes
- Tool
- NC program status
- Active NC program
- MDI block input
- D corrections
- NC variable
- NC events
- Offsets
- Active NC states

It is not possible to assign the same elements to two windows in one screen. Therefore only the elements for selection are offered that are not yet displayed on the screen.

The window contents automatically adjust to the size given in the basic screen. Scroll bars are displayed if the available space is insufficient. Controlling the scroll bars requires focusing of the window (see Section <F8> "Active", p. 2-2).

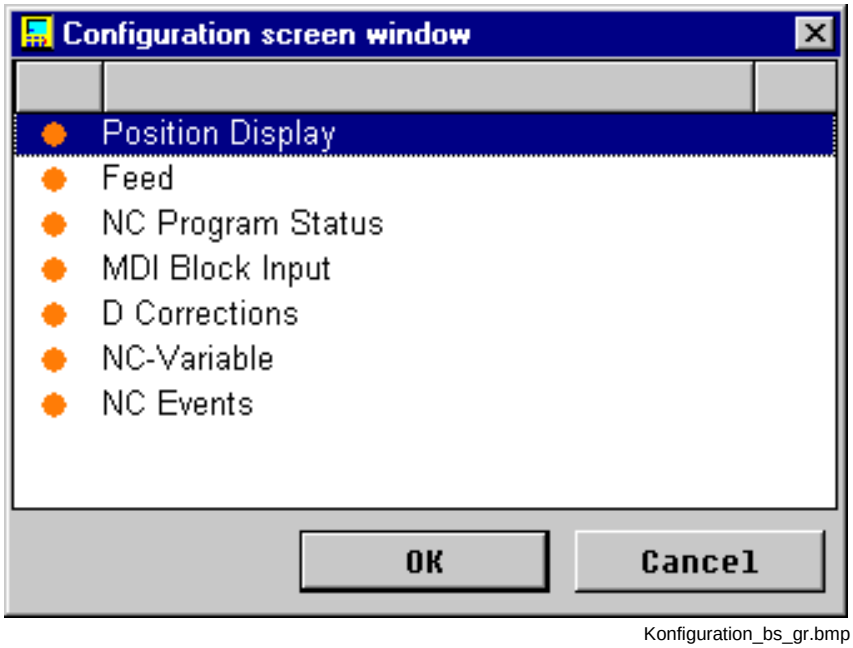


Fig. 5-4: Configuration window

5.4 Select Header

Use key <F4> "Select Header" in the NC interface to choose between two different header types. They differ in the window layout.

Different elements can be assigned to the individual header windows; see Section 5.5 Configuration Header.

5.5 Configuration Header

The configuration is made for the currently selected header. Using <F5> "Config. Header", the focus (green frame) is set to the 1st window of the header. Another F key level is displayed.

Use key <F8>"Active" to set the focus to the required window in the header.

When key <F2> "Config. Window" is pressed, the following elements can be selected and can be displayed in the window:

- Logo
- Control name
- Module name
- Process name
- Controller address and process number
- Operation mode
- Operation submode
- Machine operation mode
- Module operation mode
- NC diagnosis
- NC message
- Logo for data source
- LEDs
- ProVi diagnosis (warnings)
- Control address
- Empty

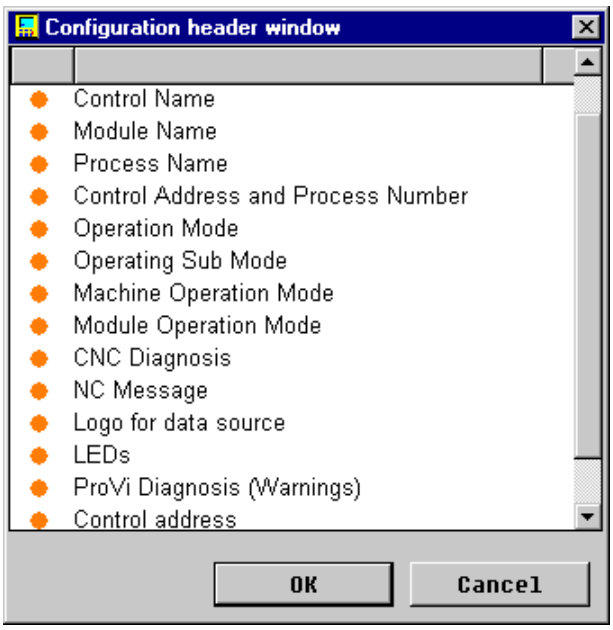


Fig. 5-5: Configuration of header

5.6 NC Screen Configurator (MTC200)

Overview of NC Screen Configurator

Scope of functions

The NC screen configurator allows new screens and new screen groups to be created and existing screen masks to be edited. This possibility exists for the current process or for the template section, and thus for all processes.

Pro file in which configuration is stored

The settings of the NC screens are stored in profile
"MTC_NC_ACI.PRF".

If the interface is reinstalled, the file is copied to path
"...\MTGUI\BasicData\Resource\".

The current version of the file is located in path
"...\Project_00\CustomData\Resuorce".

The first time that the NC screen is accessed, a copy of the file is generated there from path
"...\OEMData\Resource"

– or – if there is no such file there, from path
"...\BasicData\Resource".

The result of the NC screen configurator is stored in the file in
"...\Project_00\CustomData\Resuorce"
(unless the template is modified) and will not be overwritten during an update installation.

The following hierarchy is maintained:

- "...\BasicData\Resource"
  File with Indramat default settings.
- "...\OEMData\Resource"
  File with modified OEM templates.
- "...\CustomData\Resource"
  File with current settings due to the application of the configurator and the call of <F2> "Config. Screen" in the edit mode.

Template contains preset NC screens

The default settings of the NC screens are contained in the section of the template in Pro file (sections [Place_ALL_...]). The first time that the NC screen is called for a process, a copy of this template, with the concrete process data, is created. All changes to this template mean that they are in effect in all processes.

The screens are divided into groups that can be called separately.

The following can be edited:

- Name of screen/group
- Screen designation of screen/group
- Assignment of M keys

In addition, the following functions are available:

- Creating and deleting screens and groups.
- Duplicating screens/groups.
- Transferring the M key assignment to other screens.
- Changing the sequence of screens/groups.

The following is not possible:

- (This is possible in the edit mode of the NC screen (see Section 5.3 Configuration of Screen).)
- Subsequent modification of the screen layout.

There are three different ways to use the configurator:

1. selecting a screen,
2. editing screens, and
3. editing the template.

General Information About NC Screen Configurator

General information about screen names
The screen name is a text that appears for designating the NC screen in the header line of the COM desktop (e.g. "Operate" in [NC screen – Operate]). The name can be assigned as a fixed text regardless of the language or as a token (text No.) that depends on the language.

General information about screen designations
Optionally, screen designations (screen IDs) can be assigned to groups and screens. This screen designation is required to call a certain NC screen using the PLC or M keys.

Screen ID for calling an NC screen using PLC

In order to call a screen using the PLC, the corresponding screen designation in the configurator must be linked to a screen number (see the documentation "HMI_Kap03_Configuration / Configuration of HMI Screens", section "Configuration of F keys").

The screen designations must be unique over all devices and processes. Multiple assignment of a screen designation is not possible.

This mode is called by the NC screen in the edit mode using <F2> "Select Screen". It is possible to select any screen (even one from another group, but in the same process). When the dialog box is closed using "OK", the selected NC screen is then displayed (see Fig. 5-2: Selecting screens).

Editing screens is currently not possible. Pressing button “Adjust” opens the "Editing screens" mode.

Editing screens
This mode is called by the screen configurator. This mode allows new screens and groups to be created and settings of existing screens and groups to be changed.

Editing the template
In this mode, it is possible to edit the screens in the template. The settings made in the edit mode are deleted. The settings made here are copied for the current process the first time that the NC basic screen is opened.

Operation
Operation is executed using the keyboard and, optionally, using the mouse. You can change between the buttons using the <Tab> key.

The cursor keys and the <PageUp>, <PageDown>, <Pos1> and <End> keys are used to change the group or the screen.

Basic Functions for Editing Screens

Creating a new group (1)
The "New group" button can be used to open the dialog box for creating a new group.

The name and the screen designation of the group are specified in the following dialog box.

The name can be specified in two different ways.

- Specifying the token and language file. The token is a number with a maximum of 4 digits that is specified in the language file. The corresponding text is displayed in the field "Text".
- If no token / language file is specified, the text can be specified directly.

Assigning a name and screen designation is optional.

The screen designation is required to call a group using the PLC.

Creating a new screen
The "New screen" button can be used to open the dialog box for creating a new screen. At first, a predefined layout is selected. The name is assigned a standard designation.

To specify the name and screen designation, see (1).

Deleting screens/groups.
- If a screen or group is to be deleted, it is selected and can then be deleted with the <Del> key.
- In addition, the option Screen/Group → Delete can be selected using the context menu.

Changing the order
The order can be changed using the two buttons with arrows. The arrows indicate the direction in which the marked group/screen is shifted.

Additional Functions in the Context Menu

General information about the context menu
The context menu is opened using the right mouse button or button "Advanced". The menu is divided into the "Screen" and "Group" areas.

Copy
Function "Copy" can be used to save the screen/group to an internal buffer memory. This is saved after configuration is exited; it is available again at the next start.

Paste
Function "Paste" can be used to paste the screen/group located in the buffer memory at the end of the selected group.

Delete
Menu item "Delete" can be used to delete the selected screen/group.

Name / screen designation
The name and screen designation of an existing screen/group can be entered or modified here.

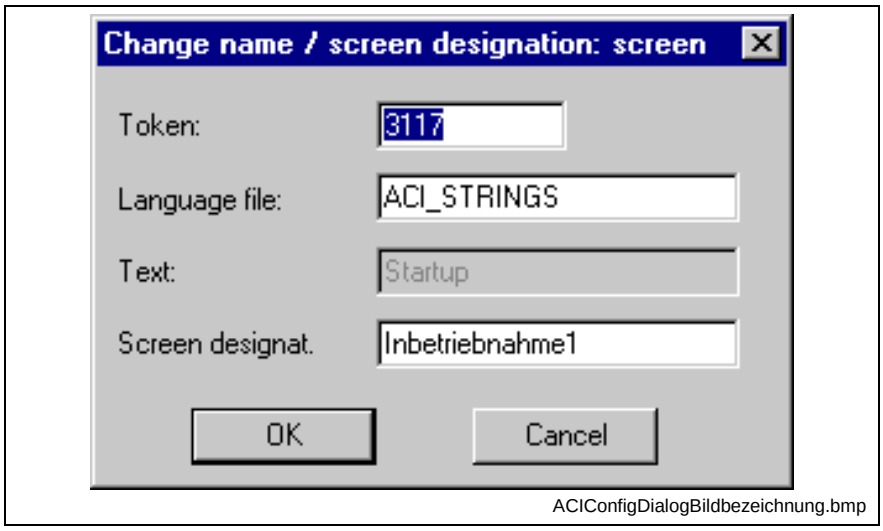


Fig. 5-6: Dialog box for entering/modifying the screen designation

Also see "Creating a New Group".

Copy M keys
This option is available only for screens.

An existing M key assignment of a screen (M key file and level) is copied to the buffer memory.

Paste M keys
Screen:
The existing M key assignment from the buffer memory is transferred to the selected screen.

Group:
The existing M key assignment from the buffer memory is transferred to every screen of the selected group.

Select M keys
Screen:
The M key assignment for the selected screen can be specified.

Screen:
The M key assignment for an entire group can be specified. The selection is carried out on each screen.

Dialog Boxes

Create new screen

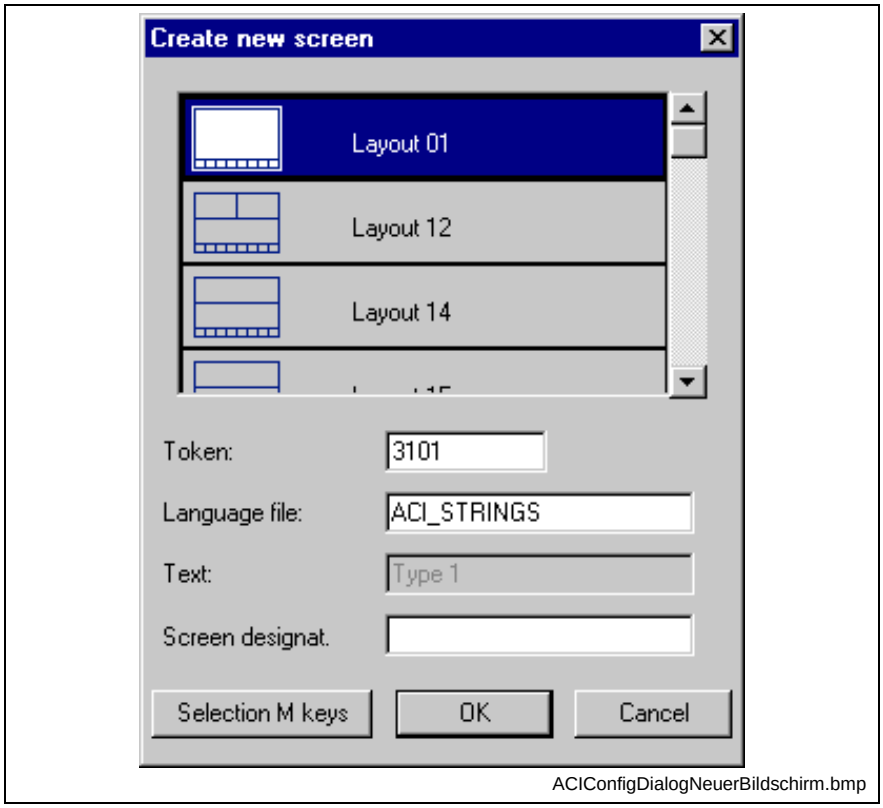


Fig. 5-7: Dialog box for creating new screen

This dialog box is called using the "New screen" button. A new screen is specified here.

One of the predefined layouts is selected and a name and screen designation are then assigned.

Create new group

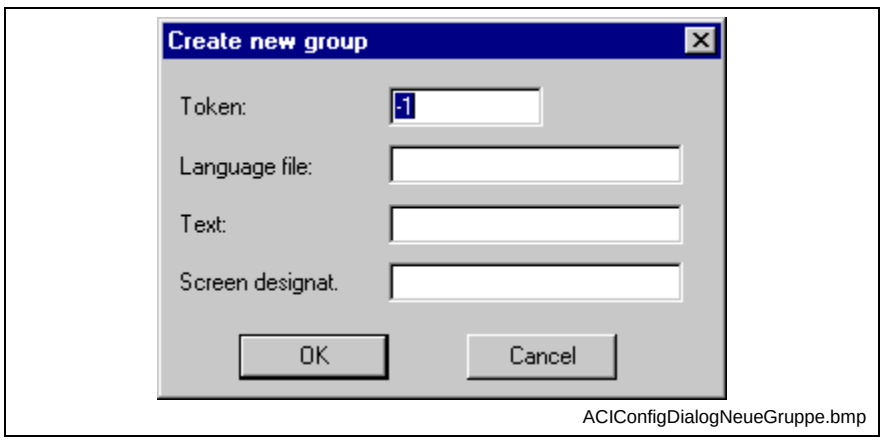


Fig. 5-8: Dialog box for creating new group

The name of a group can be specified using the 3 entry fields "Token", "Language file" and "Text".

There are two possibilities.

- Direct entry of a name:
  The name of the group is entered in the field "Text". The token must then have the value –1.
- Assignment of a predefined name using a language file:
  Here, a token (four-digit number) and the corresponding language file are specified. When language files are used, the name is also displayed in the set language when the language is changed. The selected name is displayed in the field "Text".

In the field "Screen designation", a unique cross-process designation is assigned to the group; using this, the group can be called using the PLC. Assignment is optional.

Change name screen designation
To change the name or screen designation, see "Create new group".

Selection M key assignment

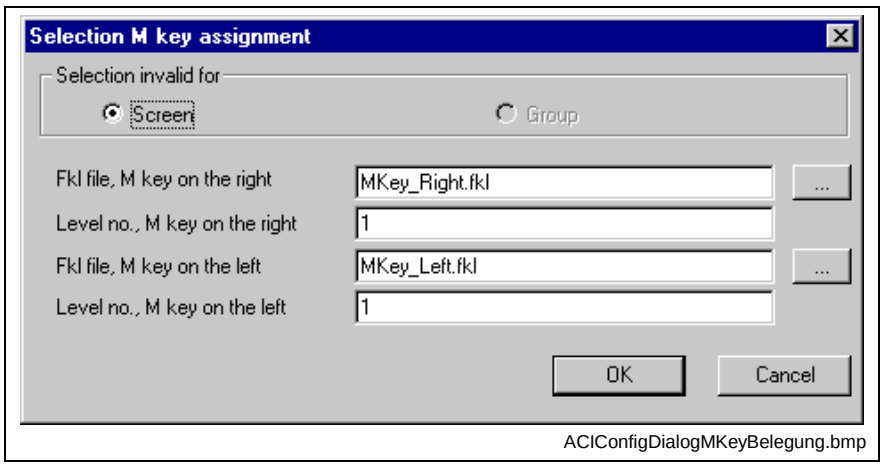


Fig. 5-9: Dialog box: Selection M key assignment

The upper portion of the dialog box (field "Selection valid for") indicates whether the settings are valid for only one screen or for all screens of the group.

The file and the level are specified/displayed for both the right and left M key rows.

Using the two buttons on the right side, a dialog box for selecting/creating M key assignments can be called (see the documentation: "HMI_Chap03_Configuration / Configuration of HMI screens", section "Configuration of M keys").

Notes Regarding the Editing of Templates

Pay attention to the following when editing the template:

- No screen designations are assigned because the template is the foundation for all processes.
- Any previously edited settings in the current profile in path
  "...\CustomData\Resource\"
  are deleted.
- The edited file is stored in "...\OEMData\Resource\".

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8 Service & Support

8.1 Helpdesk

Unser Kundendienst-Helpdesk im Hauptwerk Lohr am Main steht Ihnen mit Rat und Tat zur Seite. Sie erreichen uns

- telefonisch: **+49 (0) 9352 40 50 60**
  über Service Call Entry Center Mo-Fr 07:00-18:00
- per Fax: **+49 (0) 9352 40 49 41**
- per e-Mail: **service@indramat.de**

Our service helpdesk at our headquarters in Lohr am Main, Germany can assist you in all kinds of inquiries. Contact us

- by phone: **+49 (0) 9352 40 50 60**
  via Service Call Entry Center Mo-Fr 7:00 am - 6:00 pm
- by fax: **+49 (0) 9352 40 49 41**
- by e-mail: **service@indramat.de**

8.2 Service-Hotline

Außerhalb der Helpdesk-Zeiten ist der Service direkt ansprechbar unter

+49 (0) 171 333 88 26
oder **+49 (0) 172 660 04 06**

After helpdesk hours, contact our service department directly at

+49 (0) 171 333 88 26
or **+49 (0) 172 660 04 06**

8.3 Internet

Unter **www.indramat.de** finden Sie ergänzende Hinweise zu Service, Reparatur und Training sowie die **aktuellen** Adressen *) unserer auf den folgenden Seiten aufgeführten Vertriebs- und Servicebüros.

Verkaufsniederlassungen
Niederlassungen mit Kundendienst

Außerhalb Deutschlands nehmen Sie bitte zuerst Kontakt mit unserem für Sie nächstgelegenen Ansprechpartner auf.

*) http://www.indramat.de/de/kontakt/adressen
Die Angaben in der vorliegenden Dokumentation können seit Drucklegung überholt sein.

At **www.indramat.de** you may find additional notes about service, repairs and training in the Internet, as well as the **actual** addresses *) of our sales- and service facilities figuring on the following pages.

sales agencies
offices providing service

Please contact our sales / service office in your area first.

*) http://www.indramat.de/en/kontakt/adressen
Data in the present documentation may have become obsolete since printing.

8.4 Vor der Kontaktaufnahme... - Before contacting us...

Wir können Ihnen schnell und effizient helfen wenn Sie folgende Informationen bereithalten:

detaillierte Beschreibung der Störung und der Umstände.

Angaben auf dem Typenschild der betreffenden Produkte, insbesondere Typenschlüssel und Seriennummern.

Tel.-/Faxnummern und e-Mail-Adresse, unter denen Sie für Rückfragen zu erreichen sind.

For quick and efficient help, please have the following information ready:

1. Detailed description of the failure and circumstances.
2. Information on the type plate of the affected products, especially type codes and serial numbers.
3. Your phone/fax numbers and e-mail address, so we can contact you in case of questions.

8.5 Kundenbetreuungsstellen - Sales & Service Facilities

Deutschland – Germany

vom Ausland: (0) nach Landeskennziffer weglassen!
from abroad: don't dial (0) after country code!

Vertriebsgebiet Mitte Germany Centre	**SERVICE**	**SERVICE**	**SERVICE**
Rexroth Indramat GmbH Bgm.-Dr.-Nebel-Str. 2 / Postf. 1357 97816 Lohr am Main / 97803 Lohr **Kompetenz-Zentrum Europa** Tel.: +49 (0)9352 40-0 Fax: +49 (0)9352 40-4885	**CALL ENTRY CENTER** **MO – FR** **von 07:00 - 18:00 Uhr** **from 7 am – 6 pm** **Tel. +49 (0) 9352 40 50 60** service@indramat.de	**HOTLINE** **MO – FR** **von 17:00 - 07:00 Uhr** **from 5 pm - 7 am** + SA / SO **Tel.: +49 (0)172 660 04 06** **oder / or** **Tel.: +49 (0)171 333 88 26**	**ERSATZTEILE / SPARES** verlängerte Ansprechzeit - extended office time - ♦ nur an Werktagen - only on working days - ♦ von 07:00 - 18:00 Uhr - from 7 am - 6 pm - **Tel. +49 (0) 9352 40 42 22**
Vertriebsgebiet Süd Germany South	Vertriebsgebiet West Germany West	Gebiet Südwest Germany South-West	Gebiet Südwest Germany South-West
Rexroth Indramat GmbH Landshuter Allee 8-10 80637 München Tel.: +49 (0)89 127 14-0 Fax: +49 (0)89 127 14-490	Bosch Rexroth AG Regionalzentrum West Borsigstrasse 15 40880 Ratingen Tel.: +49 (0)2102 409-0 Fax: +49 (0)2102 409-406	Bosch Rexroth AG Service-Regionalzentrum Süd-West Fellbacherstr.115 70736 Fellbach Tel.: +49 (0)711 54041–0 Fax: +49 (0)711 54041–147	Bosch Rexroth AG Regionalzentrum Südwest Ringstrasse 70 / Postfach 1144 70736 Fellbach / 70701 Fellbach Tel.: +49 (0)711 57 61–100 Fax: +49 (0)711 57 61–125
Vertriebsgebiet Nord Germany North	Vertriebsgebiet Mitte Germany Centre	Vertriebsgebiet Ost Germany East	Vertriebsgebiet Ost Germany East
Bosch Rexroth AG Walsroder Str. 93 30853 Langenhagen Tel.: +49 (0) 511 72 66 57-0 Service: +49 (0) 511 72 66 57-256 Fax: +49 (0) 511 72 66 57-93 Service: +49 (0) 511 72 66 57-95	Bosch Rexroth AG Regionalzentrum Mitte Waldecker Straße 13 64546 Mörfelden-Walldorf Tel.: +49 (0) 61 05 702-3 Fax: +49 (0) 61 05 702-444	Bosch Rexroth AG Beckerstraße 31 09120 Chemnitz Tel.: +49 (0)371 35 55-0 Fax: +49 (0)371 35 55-333	Bosch Rexroth AG Regionalzentrum Ost Walter-Köhn-Str. 4d 04356 Leipzig Tel.: +49 (0)341 25 61-0 Fax: +49 (0)341 25 61-111

Europa (West) - Europe (West)

vom Ausland: (0) nach Landeskennziffer weglassen, Italien: 0 nach Landeskennziffer mitwählen
from abroad: don't dial (0) after country code, Italy: dial 0 after country code

Austria - Österreich	Austria – Österreich	Belgium - Belgien	Denmark - Dänemark
Bosch Rexroth GmbH Bereich Indramat Stachegasse 13 1120 Wien Tel.: +43 (0)1 985 25 40 Fax: +43 (0)1 985 25 40-93	Bosch Rexroth G.m.b.H. Gesch.ber. Rexroth Indramat Industriepark 18 4061 Pasching Tel.: +43 (0)7221 605-0 Fax: +43 (0)7221 605-21	Bosch Rexroth AG Electric Drives & Controls Industrielaan 8 1740 Ternat Tel.: +32 (0)2 5830719 - service: +32 (0)2 5830717 Fax: +32 (0)2 5830731 indramat@boschrexroth.be	BEC A/S Zinkvej 6 8900 Randers Tel.: +45 (0)87 11 90 60 Fax: +45 (0)87 11 90 61
Great Britain – Großbritannien	**Finland - Finnland**	**France - Frankreich**	**France - Frankreich**
Bosch Rexroth Ltd. Rexroth Indramat Division Broadway Lane, South Cerney Cirencester, Glos GL7 5UH Tel.: +44 (0)1285 863000 Fax: +44 (0)1285 863030 sales@boschrexroth.co.uk service@boschrexroth.co.uk	Bosch Rexroth Oy Rexroth Indramat division Ansatie 6 017 40 Vantaa Tel.: +358 (0)9 84 91-11 Fax: +358 (0)9 84 91-13 60	Bosch Rexroth S.A. Division Rexroth Indramat Avenue de la Trentaine BP. 74 77503 Chelles Cedex Tel.: +33 (0)164 72-70 00 Fax: +33 (0)164 72-63 00 **Hotline:** +33 (0)608 33 43 28	Bosch Rexroth S.A. Division Rexroth Indramat 1270, Avenue de Lardenne 31100 Toulouse Tel.: +33 (0)5 61 49 95 19 Fax: +33 (0)5 61 31 00 41
France - Frankreich	**Italy - Italien**	**Italy - Italien**	**Italy - Italien**
Bosch Rexroth S.A. Division Rexroth Indramat 91, Bd. Irène Joliot-Curie 69634 Vénissieux – Cedex Tel.: +33 (0)4 78 78 53 65 Fax: +33 (0)4 78 78 53 62	Bosch Rexroth S.p.A. Via G. Di Vittoria, 1 20063 Cernusco S/N.MI Tel.: +39 02 92 365 1 +39 02 92 365 326 Fax: +39 02 92 365 500 +39 02 92 365 516378	Bosch Rexroth S.p.A. Via Paolo Veronesi, 250 10148 Torino Tel.: +39 011 224 88 11 Fax: +39 011 224 88 30	Bosch Rexroth S.p.A. Via del Progresso, 16 (Zona Ind.) 35020 Padova Tel.: +39 049 8 70 13 70 Fax: +39 049 8 70 13 77
Italy - Italien	**Italy - Italien**	**Netherlands – Niederlande/Holland**	**Netherlands - Niederlande/Holland**
Bosch Rexroth S.p.A. Via Mascia, 1 80053 Castellamare di Stabia NA Tel.: +39 081 8 71 57 00 Fax: +39 081 8 71 68 85	Bosch Rexroth S.p.A. Viale Oriani, 38/A 40137 Bologna Tel.: +39 051 34 14 14 Fax: +39 051 34 14 22	Bosch Rexroth B.V. Kruisbroeksestraat 1 (P.O. Box 32) 5281 RV Boxtel Tel.: +31 (0)411 65 19 51 Fax: +31 (0)411 65 14 83 indramat@hydraudyne.nl	Bosch Rexroth Services B.V. Kruisbroeksestraat 1 (P.O. Box 32) 5281 RV Boxtel Tel.: +31 (0)411 65 19 51 Fax: +31 (0)411 67 78 14
Norway - Norwegen	**Spain - Spanien**	**Spain – Spanien**	**Sweden - Schweden**
Bosch Rexroth AS Rexroth Indramat Division Berghagan 1 or: Box 3007 1405 Ski-Langhus 1402 Ski Tel.: +47 (0)64 86 41 00 Fax: +47 (0)64 86 90 62 jul.ruud@rexroth.no	Bosch Rexroth S.A. Divisiòn Rexroth Indramat Centro Industrial Santiga Obradors s/n 08130 Santa Perpetua de Mogoda Barcelona Tel.: +34 9 37 47 94 00 Fax: +34 9 37 47 94 01	Goimendi S.A. División Rexroth Indramat Parque Empresarial Zuatzu C/ Francisco Grandmontagne no.2 20018 San Sebastian Tel.: +34 9 43 31 84 21 - service: +34 9 43 31 84 56 Fax: +34 9 43 31 84 27 - service: +34 9 43 31 84 60 sat.indramat@goimendi.es	Rexroth Mecman Svenska AB Rexroth Indramat Division - Varuvägen 7 (Service: Konsumentvägen 4, Älfsjö) 125 81 Stockholm Tel.: +46 (0)8 727 92 00 Fax: +46 (0)8 647 32 77
Sweden - Schweden	**Switzerland West - Schweiz West**	**Switzerland East - Schweiz Ost**	
Rexroth Mecman Svenska AB Indramat Support Ekvändan 7 254 67 Helsingborg Tel.: +46 (0) 42 38 88 -50 Fax: +46 (0) 42 38 88 -74	Bosch Rexroth Suisse SA Département Rexroth Indramat Rue du village 1 1020 Renens Tel.: +41 (0)21 632 84 20 Fax: +41 (0)21 632 84 21	Bosch Rexroth Schweiz AG Geschäftsbereich Indramat Hemrietstrasse 2 8863 Buttikon Tel. +41 (0) 55 46 46 111 Fax +41 (0) 55 46 46 222	

Europa (Ost) - Europe (East)

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Czech Republic - Tschechien Bosch -Rexroth, spol.s.r.o. Hviezdoslavova 5 627 00 Brno Tel.: +420 (0)5 48 126 358 Fax: +420 (0)5 48 126 112	Czech Republic - Tschechien DEL a.s. Strojírenská 38 591 01 Zdar nad Sázavou Tel.: +420 616 64 3144 Fax: +420 616 62 1657	Hungary - Ungarn Bosch Rexroth Kft. Angol utca 34 1149 Budapest Tel.: +36 (1) 364 00 02 Fax: +36 (1) 383 19 80	Poland – Polen Bosch Rexroth Sp.zo.o. ul. Staszica 1 05-800 Pruszków Tel.: +48 22 738 18 00 – service: +48 22 738 18 46 Fax: +48 22 758 87 35 – service: +48 22 738 18 42
Poland – Polen Bosch Rexroth Sp.zo.o. Biuro Poznan ul. Dabrowskiego 81/85 60-529 Poznan Tel.: +48 061 847 64 62 /-63 Fax: +48 061 847 64 02	Rumania - Rumänien Bosch Rexroth Sp.zo.o. Str. Drobety nr. 4-10, app. 14 70258 Bucuresti, Sector 2 Tel.: +40 (0)1 210 48 25 +40 (0)1 210 29 50 Fax: +40 (0)1 210 29 52	Russia - Russland Bosch Rexroth OOO Wjatskaja ul. 27/15 127015 Moskau Tel.: +7-095-785 74 78 +7-095 785 74 79 Fax: +7 095 785 74 77 laura.kanina@boschrexroth.ru	Russia - Russland ELMIS 10, Internationalnaya 246640 Gomel, Belarus Tel.: +375/ 232 53 42 70 +375/ 232 53 21 69 Fax: +375/ 232 53 37 69 elmis_ltd@yahoo.com
Turkey - Türkei Bosch Rexroth Otomasyon San & Tic. A..S. Fevzi Cakmak Cad No. 3 34630 Sefaköy Istanbul Tel.: +90 212 541 60 70 Fax: +90 212 599 34 07	Slowenia - Slowenien DOMEL Otoki 21 64 228 Zelezniki Tel.: +386 5 5117 152 Fax: +386 5 5117 225 brane.ozebek@domel.si		

Africa, Asia, Australia – incl. Pacific Rim

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Japan Bosch Rexroth Automation Corp. Service Center Japan Yutakagaoka 1810, Meito-ku, NAGOYA 465-0035, Japan Tel.: +81 52 777 88 41 +81 52 777 88 53 +81 52 777 88 79 Fax: +81 52 777 89 01	Japan Bosch Rexroth Automation Corp. Rexroth Indramat Division 1F, I.R. Building Nakamachidai 4-26-44, Tsuzuki-ku YOKOHAMA 224-0041, Japan Tel.: +81 45 942 72 10 Fax: +81 45 942 03 41	Korea Bosch Rexroth-Korea Ltd. Electric Drives and Controls Bongwoo Bldg. 7FL, 31-7, 1Ga Jangchoong-dong, Jung-gu Seoul, 100-391 Tel.: +82 234 061 813 Fax: +82 222 641 295	Korea Bosch Rexroth-Korea Ltd. 1515-14 Dadae-Dong, Saha-Ku Rexroth Indramat Division Pusan Metropolitan City, 604-050 Tel.: +82 51 26 00 741 Fax: +82 51 26 00 747 gyhan@rexrothkorea.co.kr
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Thailand NC Advance Technology Co. Ltd. 59/76 Moo 9 Ramintra road 34 Tharang, Bangkhen, Bangkok 10230 Tel.: +66 2 943 70 62 +66 2 943 71 21 Fax: +66 2 509 23 62 sonkawin@hotmail.com			

Nordamerika – North America

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USA East Region –Ost Bosch Rexroth Corporation Rexroth Indramat Division Charlotte Regional Sales Office 14001 South Lakes Drive Charlotte, North Carolina 28273 Tel.: +1 704 5 83 97 62 +1 704 5 83 14 86	USA Northeast Region – Nordost Bosch Rexroth Corporation Rexroth Indramat Division Northeastern Technical Center 99 Rainbow Road East Granby, Connecticut 06026 Tel.: +1 860 8 44 83 77 Fax: +1 860 8 44 85 95	USA West Region – West Bosch Rexroth Corporation 7901 Stoneridge Drive, Suite 220 Pleasant Hill, California 94588 Tel.: +1 925 227 10 84 Fax: +1 925 227 10 81	
Canada East - Kanada Ost Bosch Rexroth Canada Corporation Burlington Division 3426 Mainway Drive Burlington, Ontario Canada L7M 1A8 Tel.: +1 905 335 55 11 Fax: +1 905 335-41 84 michael.moro@boschrexroth.ca	Canada West - Kanada West Bosch Rexroth Canada Corporation 5345 Goring St. Burnaby, British Columbia Canada V7J 1R1 Tel. +1 604 205-5777 Fax +1 604 205-6944 david.gunby@boschrexroth.ca	Mexico Bosch Rexroth Mexico S.A. de C.V. Calle Neptuno 72 Unidad Ind. Vallejo 07700 Mexico, D.F. Tel.: +52 5 754 17 11 +52 5 754 36 84 +52 5 754 12 60 Fax: +52 5 754 50 73 +52 5 752 59 43	Mexico Bosch Rexroth S.A. de C.V. Calle Argentina No 3913 Fracc. las Torres 64930 Monterrey, N.L. Tel.: +52 8 333 88 34...36 +52 8 349 80 91...93 Fax: +52 8 346 78 71 mario.quiroga@boschrexroth.com.mx

Südamerika – South America

Argentina - Argentinien Bosch Rexroth S.A.I.C. "The Drive & Control Company" Acassusso 48 41/47 1605 Munro Provincia de Buenos Aires Tel.: +54 11 4756 01 40 Fax: +54 11 4756 01 36 victor.jabif@boschrexroth.com.ar	Argentina - Argentinien NAKASE Servicio Tecnico CNC Calle 49, No. 5764/66 B1653AOX Villa Balester Provincia de Buenos Aires Tel.: +54 11 4768 36 43 Fax: +54 11 4768 24 13 nakase@usa.net nakase@nakase.com gerencia@nakase.com (Service)	Brazil - Brasilien Bosch Rexroth Ltda. Av. Tégula, 888 Ponte Alta, Atibaia SP CEP 12942-440 Tel.: +55 11 4414 56 92 +55 11 4414 56 84 Fax sales: +55 11 4414 57 07 Fax serv.: +55 11 4414 56 86 alexandre.wittwer@rexroth.com.br	Brazil - Brasilien Bosch Rexroth Ltda. R. Dr.Humberto Pinheiro Vieira, 100 Distrito Industrial [Caixa Postal 1273] 89220-390 Joinville - SC Tel./Fax: +55 47 473 58 33 Mobil: +55 47 9974 6645 prochnow@zaz.com.br
Columbia - Kolumbien Reflutec de Colombia Ltda. Calle 37 No. 22-31 Santafé de Bogotá, D.C. Colombia Tel.: +57 1 368 82 67 +57 1 368 02 59 Fax: +57 1 268 97 37 reflutec@neutel.com.co			

Notes

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