

# Control Console

## Standard 26SE



## Operating Instructions



**Read this first!**

- Please **read** these operating instructions **before** starting up the coordinate measuring machine.
- For your own safety, please keep all relevant accompanying documents always ready at hand.

We reserve the right to make changes in the version and scope of delivery of the basic CMM and its options, the program packages and their respective documents.

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We reserve the right to revise this manual and perform technical modifications of the CMM and its components.

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**Carl Zeiss**  
Business Group  
Industrial Metrology Ltd.  
D-73446 Oberkochen

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# Foreword

## About these Operating Instructions

These Operating Instructions describe the functions of the Control Console.

The Operating Instructions are aimed at the manager responsible for the coordinate measuring machine and its operator.

## Symbols / hazard signs

Three special symbols that contain important information are used in this manual.

The symbols appear in the marginal column, the text information is next to the respective symbol.



### **Danger!**

In this case, special care is called for. The warning triangle and the text next to it indicate the risk of injury. Non-observance of this warning may cause personal injury.



### **Important!**

This symbol warns against situations which may lead to measuring errors, errors in the measuring run, collisions or damage to the measuring machine and to the workpiece.

**NOTE**

This symbol shows where to find additional useful information.

## For your orientation

In this manual, the following typographical means are used:

Example	Description
<i>not</i>	<ul style="list-style-type: none"> <li>– Words that should be emphasized are represented in <i>italics</i>.</li> <li>– The italicized print is sometimes used to mark a subheading, e.g. <i>Type of measurement</i>:</li> </ul>
<b>Protective circuit</b>	Words that should be especially emphasized are represented in <b>bold face</b> .
<b>no grease film</b>	<p>Words that should be especially emphasized in the <i>Notes</i> are represented in <b>bold face</b>. The blue bold face print is sometimes used to mark a listing, e.g.</p> <p><b>MAN:</b> ...</p> <p><b>AUTO:</b> ...</p>
<ul style="list-style-type: none"> <li>➤ "Measuring mode" on page ...</li> <li>➤ Page ...</li> </ul>	Referral to a text where additional information may be found.
<ol style="list-style-type: none"> <li>1 Removing stylus system.</li> <li>2 Covering the adapter plate receptacle.</li> </ol>	Instructions that have to be carried out in chronological sequence.
<ul style="list-style-type: none"> <li>• Place the work-piece ...</li> </ul>	Instructions
<ul style="list-style-type: none"> <li>• <b>Switch the drives off in order to ...</b></li> </ul>	Instructions in notational texts, e.g. hazard sign.
<ol style="list-style-type: none"> <li>1 Rotary switch for ...</li> <li>2 Metal plate with ...</li> </ol>	Description of position numbers of the graphics
<ol style="list-style-type: none"> <li><b>A</b> Adapter</li> <li><b>B</b> Probe</li> </ol>	Description of position numbers of the graphics

# Chapter

# 1

## Introduction

---

### **This chapter contains:**

Warranty . . . . .	1-2
Proper use . . . . .	1-3
Safety Devices . . . . .	1-4

## Warranty

The warranty becomes void in case of damage, improper use or modification of the control console.

### Seal label

A seal label is located on the lower side of the control console. This label must not be damaged.



1 Seal label; text beside the seal label: "Warranty void if seal broken." (= No warranty if the seal is damaged.)

The manufacturer cannot be held liable for any damage if the seal label is damaged.

### NOTE

The seal label varies according to the manufacturer and may look different than shown here.

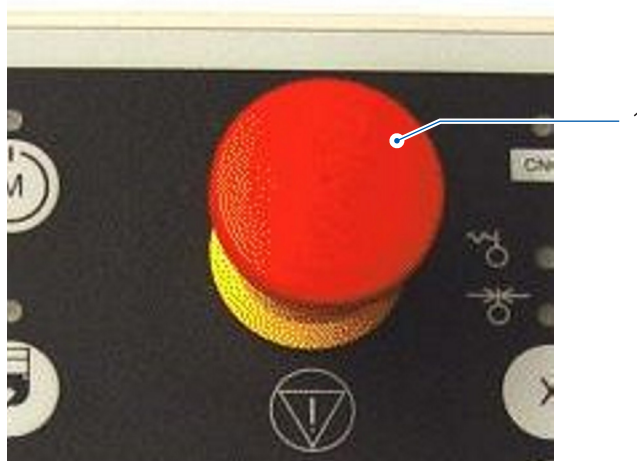


## Proper use

The control console exclusively serves the purpose of operating coordinate measuring machines equipped with a ZEISS control unit. Such control units are for example: C98, C99.

## Safety Devices

### EMERGENCY STOP button



1 EMERGENCY STOP button

The drives are switched off by means of the EMERGENCY STOP button. *Press* the button to switch the drives off. The button engages. No further travel movements are possible.

The button must be unlocked to switch the drives on again.

- Unlock the button by turning it.  
Then the button automatically releases and unlocks.

### Joystick lock

If no travel movement is carried out using the joysticks, the joysticks are then blocked after 60 seconds. After that, no further travel movement is possible.

#### NOTE

If the preset time of 60 seconds is changed, the validity of the EC declaration of conformity and the GS sign of approval become void.

Further information is to be found elsewhere ► [page 2-4](#).

# Chapter

# 2

## Functions

---

This chapter describes the functions of the control console.

### **This chapter contains:**

Overview . . . . .	2-2
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## Overview

### Control console functions

The control console has the following functions:

- EMERGENCY STOP button to switch the drives off
- Carrying out manual travel movements with the joysticks – in all three axes. Additional rotary axis (option)
- Indication functions: LED and display
  - LED, e.g. for the probing speed
  - Indication of coordinates on the display
  - Indication of status icons on the display
  - Display of the selected stylus on the display
- Regulator for setting the maximum travel speed with control knob
- Selection of the operating position
- Switching the drives on and off
- Switching to the axes of an articulating probe
- Software specific functions ► Operating instructions for the measuring software.
- Switching the control unit on (option)

If the control unit is integrated in the CMM, a button is provided on the left-hand side of the control console to switch the control unit on.

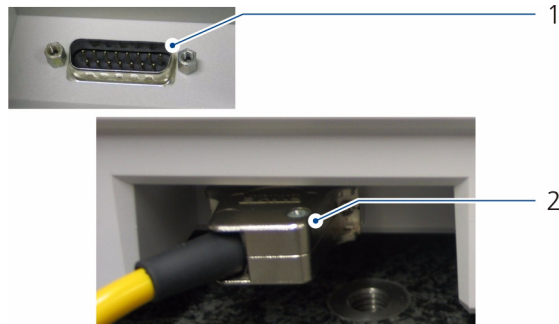


#### NOTE

The control console is connected parallel to the keyboard of the computer. Some keys have the same function as the keyboard, e.g., F1 to F12.

## Connection of the control console

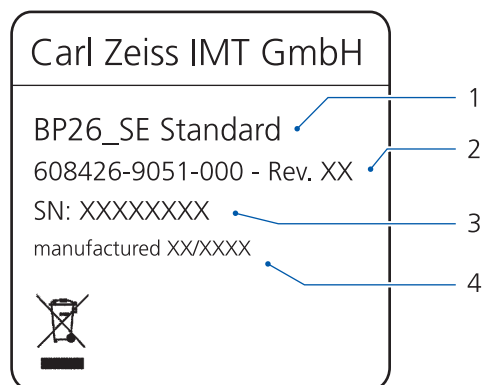
A connector is located on the rear side of the control console. Plug the cable supplied into this connector.



- 1 Socket in the control console
- 2 Connector of the connecting cable

## Type plate

The type plate is located on the rear side of the control console.



- 1 Type of the control console
- 2 Order number [ZEISS] and revision date
- 3 Serial number
- 4 Month of manufacture

# Operator's controls

## Overview



- 1 Control panel
- 2 EMERGENCY STOP button
- 3 Joystick for the X and Y axes and articulating movements of an articulating head; the joystick is equipped with a push button for setting intermediate positions
- 4 LED for the indication of the joystick locking and button for joystick unlocking
- 5 Display
- 6 Switch for switching the control unit (option) on; only with CMMs with integrated control unit
- 7 Joystick for the Z axis and the rotary table (optional); the joystick is equipped with a push-button for enabling the rotary table (if provided)
- 8 Control knob for speed adjustment

## Joysticks

Deflect the joystick in the direction required to move the stylus system towards the workpiece.

## Joystick lock



If the joysticks are not activated within a certain period of time, they will be blocked. In this case, no further travel movement is possible.



The locking is indicated by the lighting LED located above the key shown here. This key is located below the left-hand and right-hand joystick. Furthermore, an acoustic signal sounds off as soon as the joystick is deflected.

### Deactivating the lock

To deactivate the lock, press the key below the left or right joystick. Alternatively, you can press the «Shift» key. Then the LED goes off.

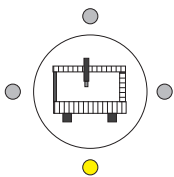
### Locking the joysticks

You can also lock the joysticks immediately. To do so, you must press both keys at the same time.

### Operating position

The travel movements in X and Y depend on the operating position. As standard, forward travel movements of the joysticks are set for the operation from the front.

If you want to operate the CMM from the side or from the rear side of the CMM, you can change the assignment of the travel movements using the key shown here. The LEDs next to the key indicate the operating position at the CMM.



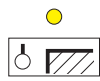
Position of the LED	Operating position at the CMM
Bottom	Front side
Left	Left-hand side
Top	Rear side
Right	Right-hand side

Press one or several times the key to select the operating position.

### Probing speed

The travel speed increases with increasing deflection of the joystick. At the beginning and end of the deflection range, the speed is proportional to the deflection of the joystick. At approximately half way of the full deflection, there is an area in which the travel speed is constant. This speed is the probing speed.

To avoid malfunctions during the probing or the measuring, the probing should be carried out at a constant speed. For this reason, it is recommended to travel the last millimeter before the probing at probing speed.



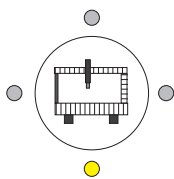
When the probing speed is reached, the LED above the symbol shown here lights up > page 2-10

### Travel movement with the right-hand joystick

#### Travel movement in X and Y



The right-hand joystick is used for standard travel movements in the X and Y axes. In addition, it is possible to perform the articulating movements on an articulating head > page 2-7.

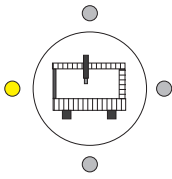


In the following evaluation, it is assumed that you operate the CMM from the front. In this case, the LED below the key shown here must light up. If another LED lights up, you must press the key until the LED below the key lights up.

In principle, you must make sure that the CMM axes move in the same direction as the deflection of the joysticks.

Axis	Action	Right joystick
X	-X	<ul style="list-style-type: none"> <li>Deflect to the left. The ram moves to the left.</li> </ul>
	+X	<ul style="list-style-type: none"> <li>Deflect to the right. The ram moves to the right.</li> </ul>
Y	-Y	<ul style="list-style-type: none"> <li>Deflect to the front. The bridge moves towards the operator.</li> </ul>
	+Y	<ul style="list-style-type: none"> <li>Deflect to the rear. The bridge moves away from the operator.</li> </ul>





If you operate the CMM from the side or from the rear, you can reverse the axis assignment of the joysticks using the key shown here.

Example: You operate the CMM from the left side.

- Press the key until the left-hand LED lights up.  
Then the movement directions for the X and Y axes are interchanged. This means: If you pull the joystick, the CMM moves in the negative X direction. If you deflect the joystick to the left, the CMM moves in the positive Y direction.

### **Travel movement of the articulating axes of an articulating probe.**



To do so, you must press the key shown here. An LED located above the key lights up if the articulating movement function is activated.

If you perform again travel movements in the X and Y axes, then you must press again the button shown here.

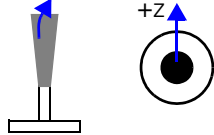
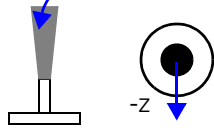
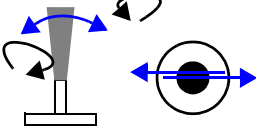
### **Travel movement with the left-hand joystick**

#### **Travel movements in Z and R**



- Movement in the Z axis  
Deflect the joystick to the rear or to the front.

- Rotary movement of a rotary table  
Keep the push button on the joystick pressed and deflect the joystick to the left or to the right. If no rotary table is available, the deflections have no effect.

Direction	Action	Left joystick
Z axis	+Z	<ul style="list-style-type: none"> <li>• Deflect to the rear. The ram moves upwards.</li> </ul> 
	-Z	<ul style="list-style-type: none"> <li>• Deflect to the front. The ram moves downwards.</li> </ul> 
Direction of rotation of the rotary table (optional)	<ul style="list-style-type: none"> <li>• Prior to the deflection, press the button on the joystick and keep it pressed. You can change this presetting in the menu under »Console settings« &gt; page 2-25.</li> </ul>	
	<ul style="list-style-type: none"> <li>• Deflect to the left. The rotary table turns clockwise.</li> </ul> 	
	<ul style="list-style-type: none"> <li>• Deflect to the right. The rotary table turns counterclockwise.</li> </ul>	

**Setting of intermediate positions**

To prevent collisions during a CNC program run, intermediate positions must be set. Intermediate positions are set with the push button on the joystick.

All travel movements from one probing point to the next must be defined by the CNC program. The program should always indicate only one direction to be traveled in. When the direction of movement changes, then an intermediate position must be set.

To ensure a swift measuring run, intermediate positions should only be set when they are absolutely necessary. The following applies:

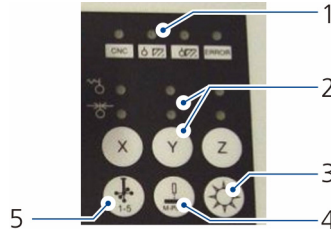
- It is sufficient to set one intermediate position before probing.
- No intermediate position must be set immediately after the probing. An intermediate position is not again required until the travel direction changes.

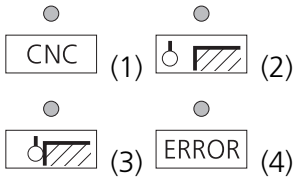
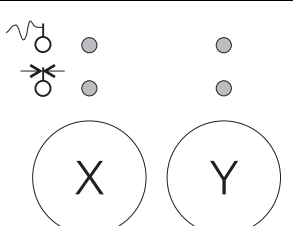
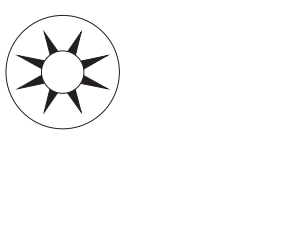


## Control panel



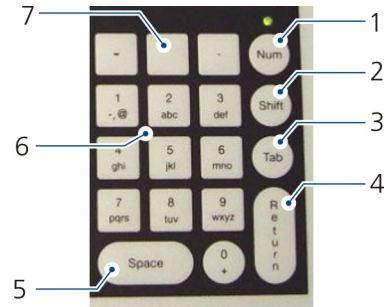
- 1 EMERGENCY STOP button
- 2 Status, measuring force, axis clamping stylus selection > [page 2-10](#)
- 3 Editing figures and text > [page 2-11](#)
- 4 Display, function keys and menu functions > [page 2-12](#)
- 5 Drives, axis switching, operating position, creep speed > [page 2-14](#)

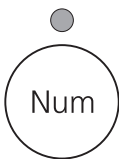

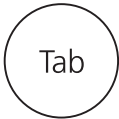
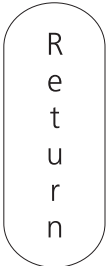

### Status, measuring force, axis clamping stylus selection

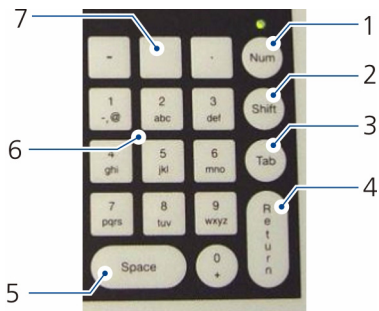


- |                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>1</b></p>    | <p>Status indication above the symbol:</p> <ul style="list-style-type: none"> <li>- CNC mode (1):<br/>The LED lights up when a CNC run is started.</li> <li>- Probing speed (2)<br/>The LED lights up when the probing speed is reached.</li> <li>- Probing (3)<br/>The LED lights up if the probing was successful and a beep sounds. The indication lights up until the joystick is back into its initial position again.<br/>When a probing has not been successful, a multiple beep sounds off.</li> <li>- Error (4)<br/>The LED lights up when an error has occurred.</li> </ul> |
| <p><b>2</b></p>  | <p>The three keys X, Y and Z are provided for various manual operating modes; they have a different meaning for triggering and for measuring probes.<br/>Further information is to be found elsewhere<br/>▶ <i>page 2-20.</i></p>                                                                                                                                                                                                                                                                                                                                                     |
| <p><b>3</b></p>  | <p>Switching between the input mode and the replacement mode. The set mode can be recognized by the displayed cursor symbol:</p> <ul style="list-style-type: none"> <li>- Input mode: « » cursor symbol</li> <li>- Replacement mode: «_» cursor symbol</li> </ul> <p>Both modes are only important if you make menu entries.</p>                                                                                                                                                                                                                                                      |
| <p><b>4</b></p>  | <p>M point: Acceptance of a measuring point (3D point).</p>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| <p><b>5</b></p>  | <p>Stylus selection. The selected stylus is shown in the display by a circle which is not filled and in addition by a number.<br/>Further information ▶ <i>page 2-18.</i></p>                                                                                                                                                                                                                                                                                                                                                                                                         |

## Editing figures and text



- |          |                                                                                     |                                                                                                                                                                                                                                                     |
|----------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1</b> |    | Switching between numeric and text inputs.                                                                                                                                                                                                          |
| <b>2</b> |   | <p>«Shift» key:<br/>           Double function of a key by pressing the «Shift» key and another key at the same time.<br/>           In combination with «Return», it is possible to carry out additional special functions ► <i>page 2-19</i>.</p> |
| <b>3</b> |  | <p>«Tab» key:<br/>           Advances by four characters.</p>                                                                                                                                                                                       |
| <b>4</b> |  | <p>«Return» key:<br/>           Confirming an input.</p>                                                                                                                                                                                            |
| <b>5</b> |  | <p>«Space» key:<br/>           Blank.</p>                                                                                                                                                                                                           |

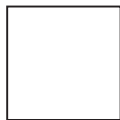


6

1 -,@	2 abc	3 def
...	...	...

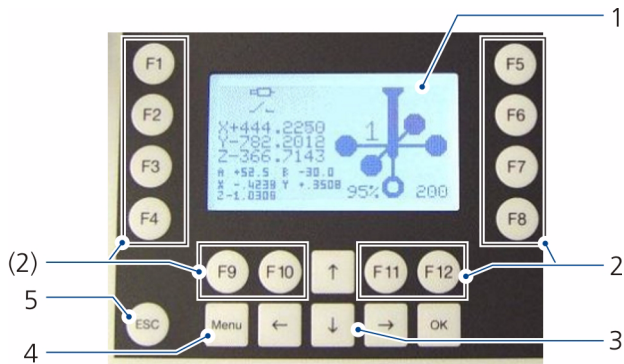
Input keys for figures and letters; switching via the «Num» key.

7



«Delete» key, two functions:  
 Either deleting the left character in the input mode or deleting the selected character in the replacement mode.  
 Switching between the input mode and the replacement mode via the sun symbol (key) ▶ page 2-10.

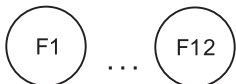
**Display, function keys and menu functions**



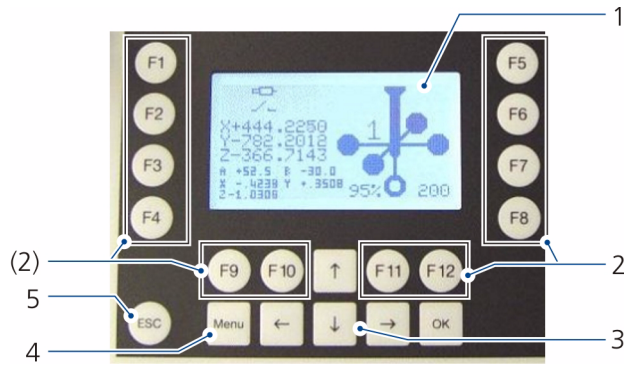
1

Display  
 Further information ▶ page 2-15.

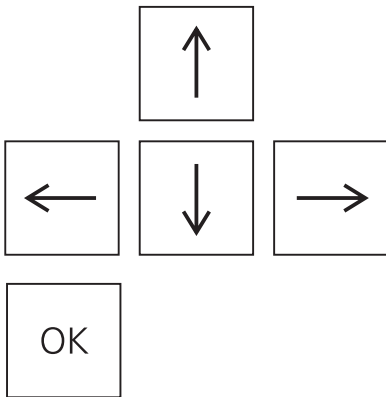
2



F1 to F12 function keys  
 Further information ▶ page 2-19.



3



Menu functions: Movement directions of the cursor in the display and «OK» key.  
Use «OK» to confirm entries.

4



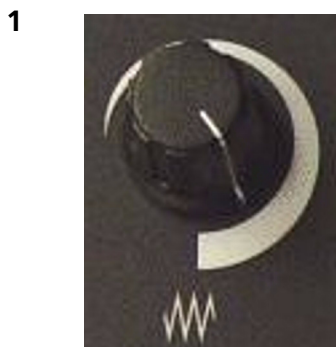
Key for menu call  
Further information ► *page 2-22.*

5



«Escape» key; cancellation of functions

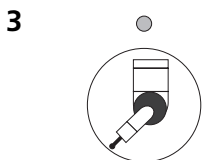
### Drives, axis switching, operating position, creep speed



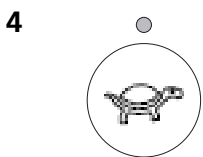
Control knob for speed adjustment.  
 By use of this regulator, the travel speed can be reduced continually down to zero. In addition, when values are 10% below the maximum speed, the LED above the «SLOW» key flashes (see below).  
 This function is only possible for CMMs with 16 bit control or larger.



Drives ON / OFF



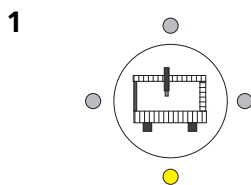
Switching to articulating head:  
 When the LED lights up, you can travel the axes of the articulating head by means of the joysticks.



Slow speed («SLOW» key):  
 In manual operation, you can decrease the travel speed by use of the «SLOW» key. In «SLOW» operation, the travel speed is limited to the optimal probing speed. When the «SLOW» operation is switched on, the LED above the key lights up.

**Clearing after a collision:**

- Keep the «SLOW» key pressed and move away from the workpiece using the joystick at the same time.

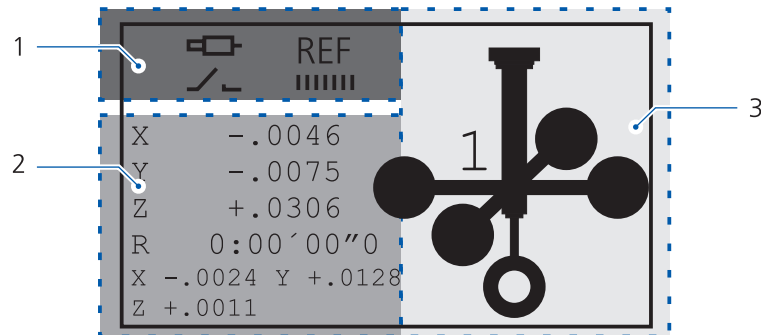


Switching the operating position:  
 By default, the LED below the key lights up. In this case, the CMM is operated from the front.  
 If you operate the CMM from the left, right or rear, you can set the operating position using this key.



## Display















The display depends on the equipment of the CMM and the status of individual components and processes. The display is divided into three areas:














- 1 Status display
- 2 Display of the coordinates of axes, rotary table position and probe
- 3 Display of the selected stylus

## Status display

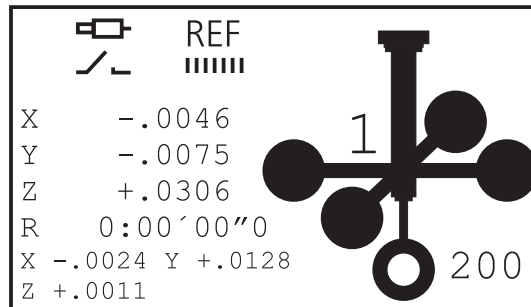
Symbol	Meaning
	Manual mode (MAN operating mode)
	Collision of the stylus shaft with the workpiece
	Probing in all directions
	Stop: «0» operating mode.
	Probing in the negative X direction (-X)
	Probing in the positive X direction (+X)
	Probing in the negative Y direction (-Y)
	Probing in the positive Y direction (+Y)

Symbol	Meaning
	Probing in the negative Z direction (-Z)
	Probing in the positive Z direction (+Z)
	Drives OFF
	Drives OFF: DAC too large
	Drives OFF: LAG error; lag distance (nominal-actual) is too large
	Cancellation of a CNC program: The data records are deleted, a new run can only be performed once «D90» has been entered. Restart the CNC program.
	Firmware update of the control console
	End position reached
	Column interlock (interlock): Collision. Measure: Clear the CMM.
	Column interlock (interlock): Pause.
	Open mechanical contact when probing with the trigger probe
	Counterbalancing of the probe
	Counterbalancing of the probe not possible
	<ul style="list-style-type: none"> <li>- EMERGENCY STOP button is locked.</li> <li>- EMERGENCY STOP circuit not closed.</li> </ul> Possible causes: End positions reached, compressed air not available or pressure too low

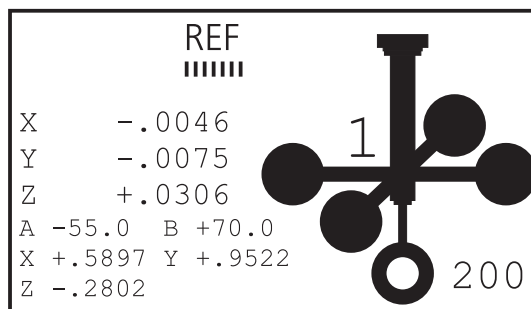
Symbol	Meaning
	Update of components
REF 	Reference point invalid
	Safety device active, e.g. light barrier
	Error during stylus change
	Error during path measurement: Defective scale or soiled scale. Measure: Perform a reference point travel.
R 	Error during path measurement of the rotary table position: Defective scale or soiled scale. Measure: Perform a reference point travel.
X 	Error during path measurement X axis: Defective scale or soiled scale. Measure: Perform a reference point travel.
Y 	Error during path measurement Y axis: Defective scale or soiled scale. Measure: Perform a reference point travel.
Z 	Error during path measurement Z axis: Defective scale or soiled scale. Measure: Perform a reference point travel.
	Pause
	<ul style="list-style-type: none"> <li>- Probe deflection</li> <li>- Faulty counterbalancing of the probe (with passive probes)</li> </ul>

### Examples of indications on the display

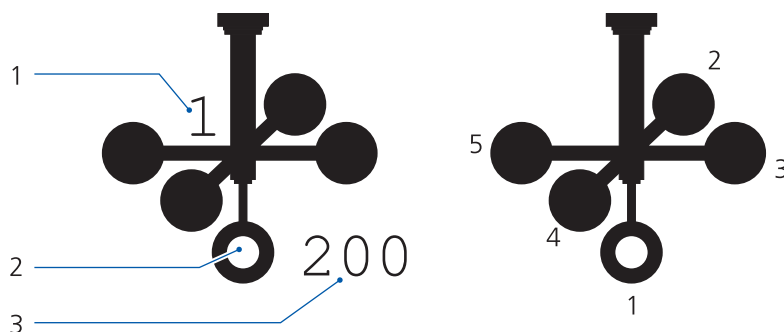
Standard display when using the rotary table and the VAST, VAST<sub>XT</sub> or DT probe:



Standard display when using the RDS articulating head with the VAST XXT probe:



### Display of the selected stylus



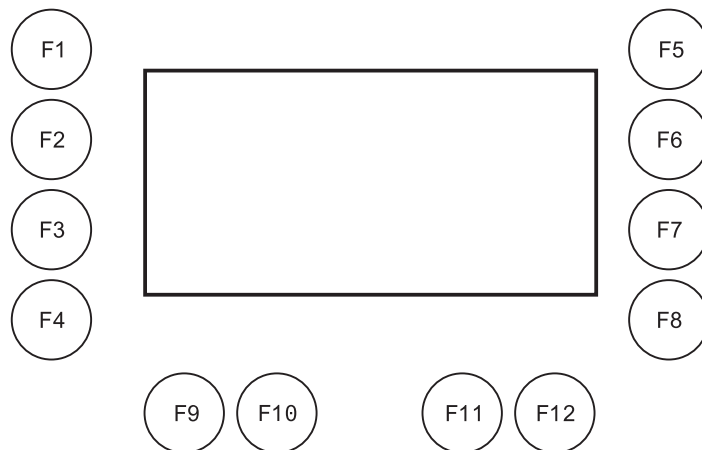
- 1 Number of the selected stylus
- 2 Selected stylus
- 3 In the case of active probes, such as VAST, VAST<sub>XT</sub> and DT, display of the measuring force in [N]; in the case of passive probes, such as VAST XXT, display of the nominal deflection in [μm]



Five different styli can be selected by pressing the key shown here. The selected stylus is identified by an empty circle. In addition, the number of the selected stylus is shown. When using a measuring probe, the measuring force is also displayed.

The stylus number is switched further from 1 to 5 in ascending order. Afterward, the first stylus is selected again.

## Function keys

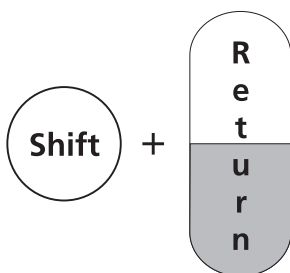


Basically, these keys have the same function as they do on the keyboard. With some keys, software specific functions can be carried out  
 ➤ Operating instructions for the measuring software.

### Additional functions

By using the **Shift** and **Return** keys, additional functions can be carried out with the keys F1 to F12. To do so, press the «Shift» key and the lower part of the «Return» key at the same time. You can then press the desired function key, e.g. F1.

After a key combination has been pressed, an acoustic signal sounds off. The function is carried out after approximately one second.



### Important!

To be able to carry out the additional functions **F9** and **F10**, certain requirements have to be fulfilled. Otherwise, the coordinate measuring machine may become damaged. For this reason, F9 and F10 may

only be carried out by a **ZEISS service engineer** or other specially trained personnel.



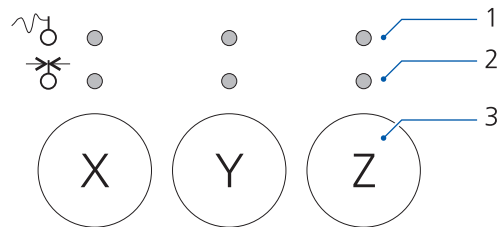
**Important!**

When you carry out the additional functions of F2 and F3 , then you must **hold tight the stylus system** immediately thereafter. This is important because the stylus system disengages and falls or could fall down and damage itself or other components.

Shift + Return + ...

F1	Mount stylus system manually into the probe.
F2	Release the stylus system. <b>Important!</b> The stylus system falls down immediately. Hold onto the stylus system firmly with one hand.
F3	Correct the position of the stylus system. <b>Important!</b> The stylus system can fall down when so doing. Hold onto the stylus system firmly with one hand.
F4	Counterbalancing of the measuring probe. This function is only available when a measuring probe is used.
F5	Switching to the automatic mode.
F6	Switching to the manual mode.
F7	Switching scanning function on.
F8	Switching scanning function off.
F9	Special function for ZEISS service engineer only.
F10	Special function for ZEISS service engineer only.
F11	Start of the reference point travel with older control units
F12	Start of the reference point travel with the C99 control unit

## Probing functions



- 1 LED for measuring force
- 2 LED for clamping
- 3 Keys for carrying out an action

These three keys are provided for various manual operating modes; they have a different meaning for triggering and for measuring probes.

### NOTE

Before these keys can be activated, the CMM must be switched to manual operation (MAN operating mode). This operating mode can be switched on with Shift + Return + F6..

After executing the function, the CMM must be switched back to the AUTO operating mode– with Shift + Return + F5 to avoid malfunctions later on in the measuring run.

## Measuring probing system

### Clamping

Using the **X**, **Y**, **Z** keys, the three axes can be clamped in the measuring probe, e.g., during self-centering probing operations. The LED above the key lights up for the clamped axis.

By selecting once again, the probe axes can be unclamped again; the LED no longer lights up.

### Measuring force

In connection with **Shift**, the measuring force can be specified for a determined axis direction. When so doing, the Shift key has to be pressed simultaneously with the desired direction key. When the measuring force is switched on, the respective LED lights up in the upper row as an indicator.

## Trigger probing system

For a CMM that is intended for manual operation (e.g., C400 or Eclipse), the drives can be separated from the machine axes by using these keys.

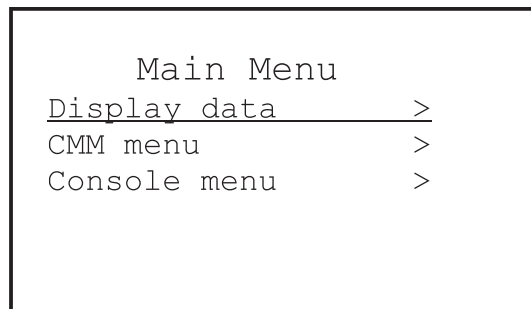
When the axis drives are released for manual operation, the LED there above lights up. By pressing once again, the drives are connected again; the LED no longer lights up.

The upper LEDs are not used for trigger probing systems.

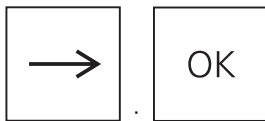
## Menu



Control console settings can be changed by experienced users. By pressing the key shown here, the following menu is displayed by default:

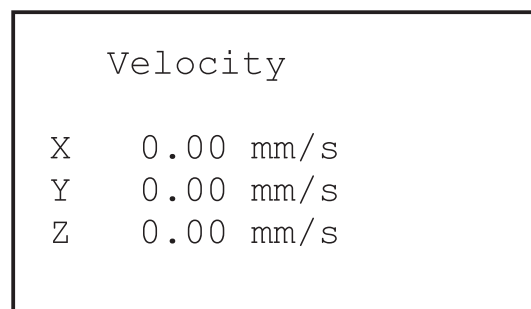


### Navigation in the menu structure



You have to use the arrow keys to navigate in the menu. Use the vertical arrow keys to select a menu item within the menu. The function selected in the menu is underlined. Use the horizontal arrow keys to switch to another menu level. The «>» symbol is used to refer to following submenus. Press «OK» to carry out a function.

Example: If you execute «Velocity D18» with «OK», then the following display appears:



Values can be displayed in most cases. In certain cases, functions, e.g. reference point travel, can also be carried out.



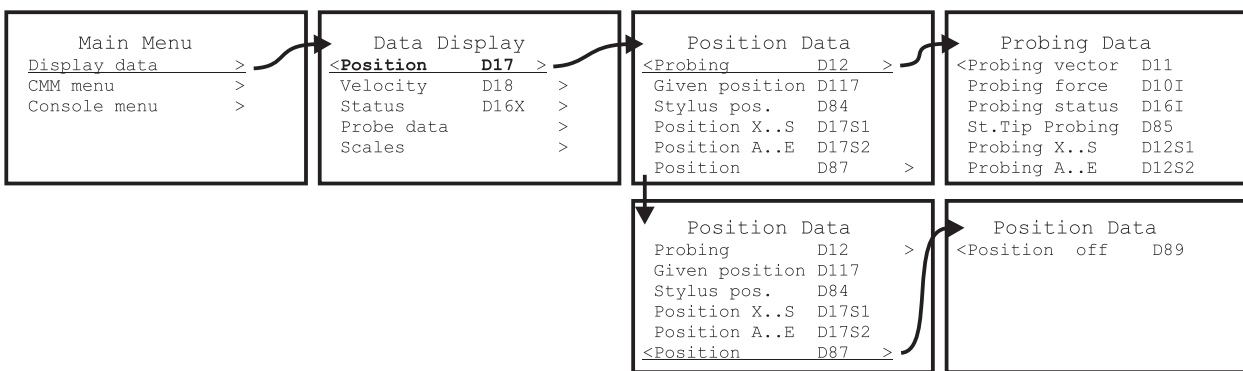
The meaning of the menu items is explained in a separate chapter  
 ➤ page 2-26.

**NOTE**

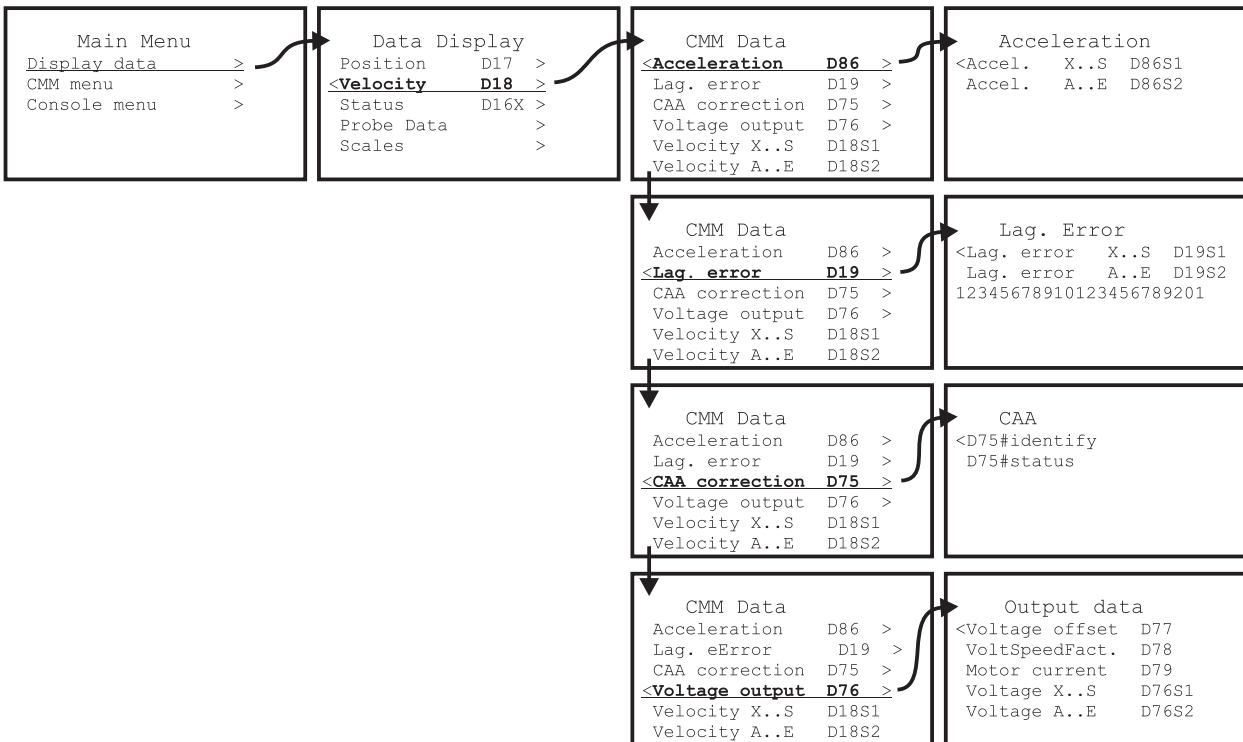
The menu structure described in the following text refers to the C99 control unit. Other menu items are valid for other (older) control units (e.g. C90 and C98).

**Menu structure under »Display data«**

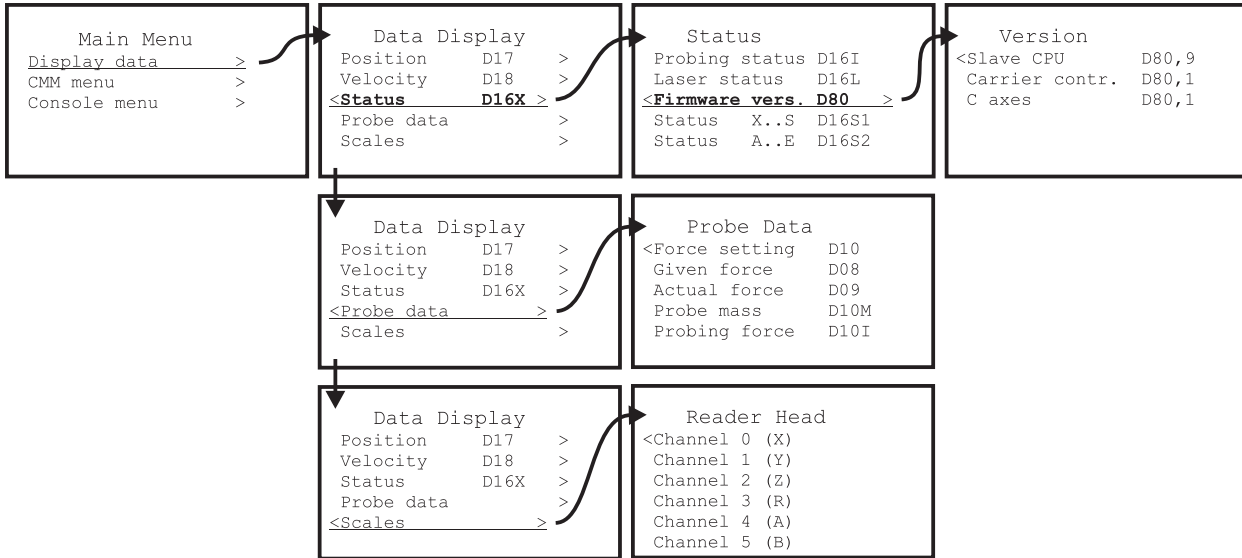
**Display of positions**



**Speed**

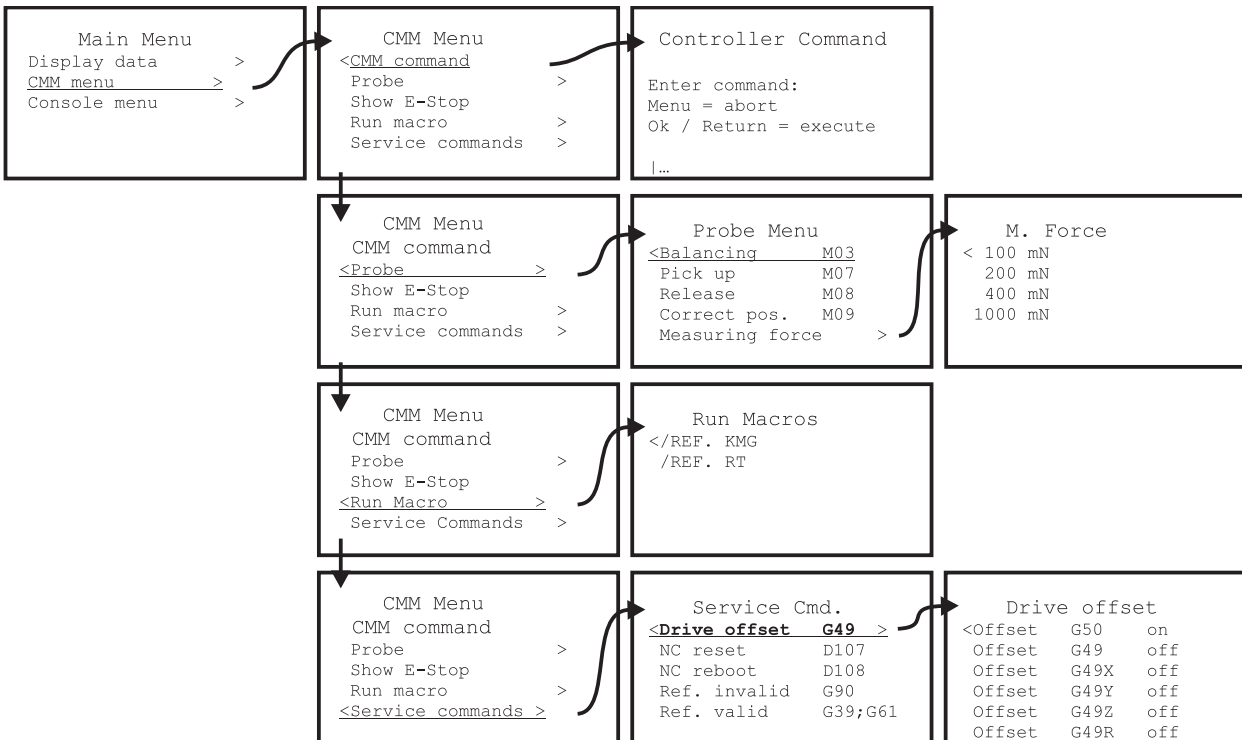


Status, probe, scale



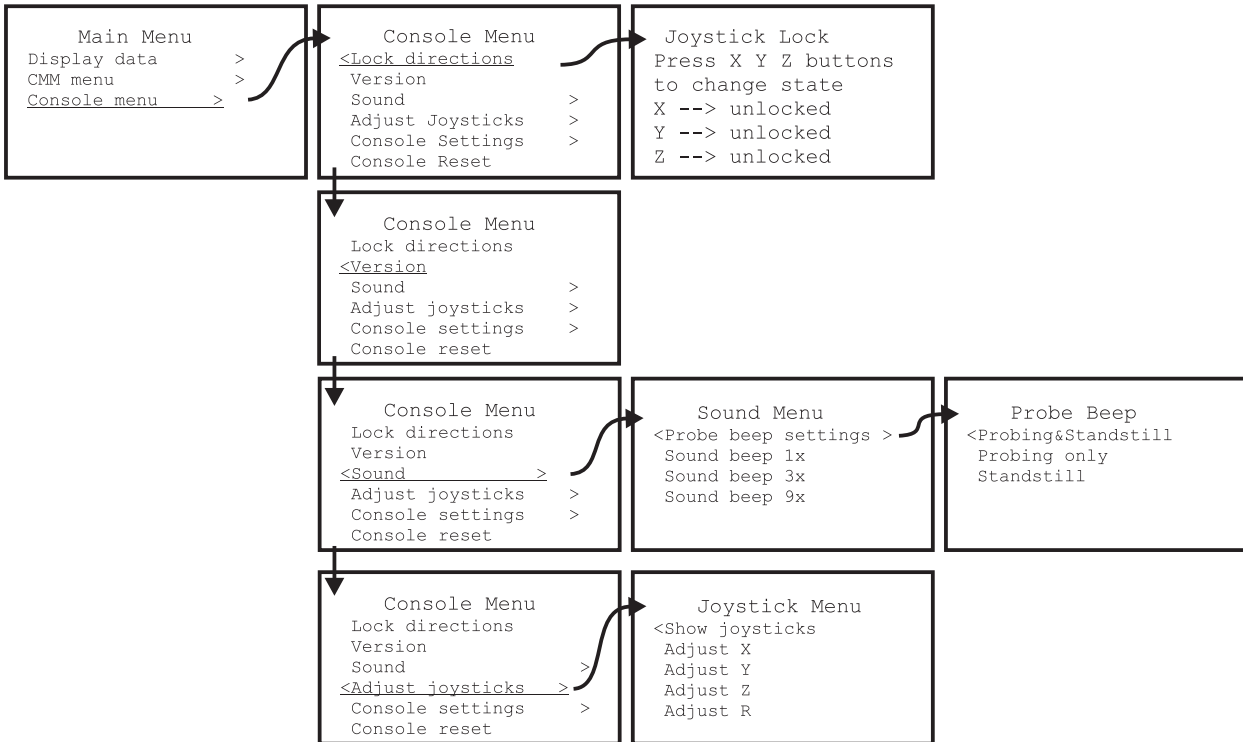
Menu structure under »CMM menu«

Entry of commands, probe, macros, service commands

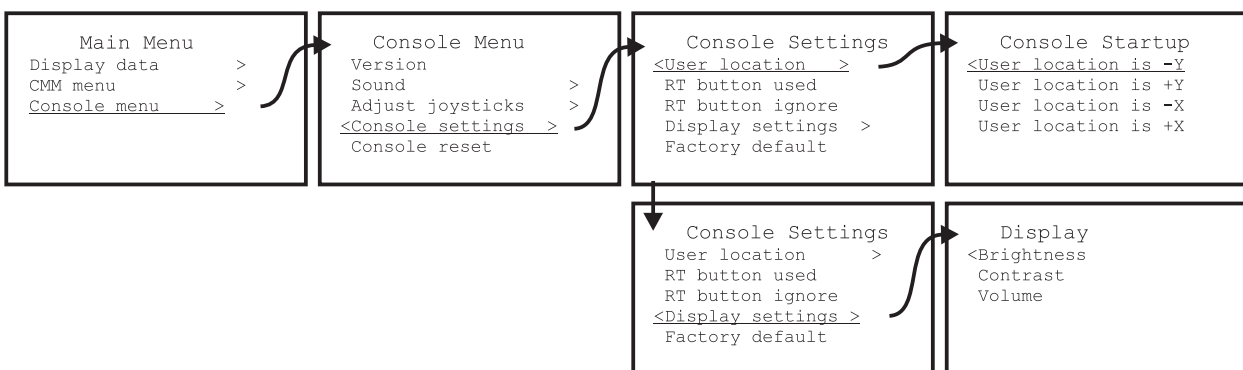


### Menu structure under »Console menu«

#### Clamping of the axes, version, beep, deflection of the joysticks



#### Control console settings



**Meaning of the menu items**

<b>Menu / level</b>		<b>Menu item / Command / submenu</b>		<b>Meaning</b>
Acceleration	4	Accel. A..E	D86S2	Current acceleration of the A, B, C, D and E CMM axes
Acceleration	4	Accel. X..S	D86S1	Current acceleration of the X, Y, Z, R and S CMM axes
CAA	4	D75#identify		Query of the loaded update files
CAA	4	D75#status		Status of the loaded update files
CMM Data	3	Acceleration	D86	Acceleration
CMM Data	3	CAA correction	D75	CAA update
CMM Data	3	CMM Data		CMM data
CMM Data	3	Lag. error	D19	Error during data transmission
CMM Data	3	Velocity A..E	D18S2	Current speed of the A, B, C, D and E CMM axes
CMM Data	3	Velocity X..S	D18S1	Current speed of the X, Y, Z, R and S CMM axes
CMM Data	3	Voltage output	D76	Control voltage (DAC)
CMM Menu	2	CMM command		Direct input of commands
CMM Menu	2	Probe		Functions for the mounting of a stylus system
CMM Menu	2	Run Macro		Execution of macros
CMM Menu	2	Service Commands		Service functions
CMM Menu	2	Show E-Stop		
Console Menu	2	Adjust joysticks		Joystick settings
Console Menu	2	Console reset		Reset of the control console
Console Menu	2	Console settings		Control console settings
Console Menu	2	Lock directions		Clamping of a selected axis
Console Menu	2	Sound		Setting of the beeps
Console Menu	2	Version		Version
Console Settings	3	Display settings		Settings of the display
Console Settings	3	Factory default		Reset to default settings
Console Settings	3	RT button ignore		The rotary table can be moved without pressing the push button on the joystick
Console Settings	3	RT button used		The push button in the left joystick must be pressed to move the rotary table

<b>Menu / level</b>	<b>Menu item / Command / submenu</b>	<b>Meaning</b>
Console Settings 3	User location	Operating position
Console Startup 4	User location is +X	The operating side is on the right side of the CMM
Console Startup 4	User location is +Y	The operating side is on the rear side of the CMM
Console Startup 4	User location is -X	The operating side is on the left side of the CMM
Console Startup 4	User location is -Y	The operating side is on the front side of the CMM
Data Display 2	Position D17	Current position of the CMM
Data Display 2	Probe data	Probe data, e.g. measuring force
Data Display 2	Scales	Linear scales for the axes; accuracy testing
Data Display 2	Status D16X	Status
Display 4	Brightness	Brightness
Display 4	Contrast	Contrast
Display 4	Volume	Volume
Display Data 2	Velocity D18	Current speed of the CMM
Drive offset 4	Offset off G49	Position control loop has not been switched on
Drive offset 4	Offset off G49X	Position control loop has not been switched on
Drive offset 4	Offset off G49Y	Position control loop has not been switched on
Drive offset 4	Offset off G49Z	Position control loop has not been switched on
Drive offset 4	Offset off G49R	Position control loop has not been switched on
Drive offset 4	Offset on G50	Position control loop switched on
Joystick Lock 3	Press X Y Z buttons to change state. X ---> unlocked Y---> unlocked Z ---> unlocked	Press the X, Y, Z button to lock the travel movement with the joystick in one or several axes
Joysticks Menu 3	Adjust R	Setting of the deflection angle of the joystick for the R axis
Joysticks Menu 3	Adjust X	Setting of the deflection angle of the joystick for the X axis

<b>Menu / level</b>		<b>Menu item / Command / submenu</b>		<b>Meaning</b>
Joysticks Menu	3	Adjust Y		Setting of the deflection angle of the joystick for the Y axis
Joysticks Menu	3	Adjust Z		Setting of the deflection angle of the joystick for the Z axis
Joysticks Menu	3	Show joysticks		Deflection angle of the joysticks
Lag. Error	4	Lag. error A..E	D19S1	Lag distance of the A, B, C, D and E axes (difference between the nominal and actual value)
Lag. Error	4	Lag. error X..S	D19S1	Lag distance of the X, Y, Z, R and S axes (difference between the nominal and actual value)
Main Menu	1	CMM menu		Settings for the CMM
Main Menu	1	Console menu		Control console settings
Main Menu	1	Display data		Display of values
Output data	4	Motor current	D79	Motor current of the axis drives
Output data	4	Voltage A..E	D76S2	Control voltage for the A, B, C, D and E axes
Output data	4	Voltage offset	D77	Offset of the control voltage (DAC)
Output data	4	Voltage X..S	D76S1	Control voltage for the X, Y, Z, R and S axes
Output data	4	VoltSpeedFact.	D78	Voltage speed factor
Position Data	3	Given position	D117	Query of the nominal value
Position Data	3	Position	D87	Request of actual values for position
Position Data	3	Position A..E	D17S2	Position of the A, B, C, D and E CMM axes
Position Data	3	Position Data		Display of coordinates
Position Data	4	Position off	D89	Stop of the request of actual values
Position Data	3	Position X..S	D17S1	Position of the X, Y, Z, R and S CMM axes
Position Data	3	Probing	D12	Coordinates during probing
Position Data	3	Stylus Pos.	D84	Position of the stylus tip, e.g. reference sphere
Probe Beep	4	Probing only		One beep: Only during probing
Probe Beep	4	Probing&Standstill		Two beeps: During probing and measuring point recording

<b>Menu / level</b>		<b>Menu item / Command / submenu</b>		<b>Meaning</b>
Probe Beep	4	Standstill only		One beep: Only during measuring point recording
Probe Data	3	Force setting	D10	Actually active measuring force
Probe Data	3	Given force	D08	Presetting of the measuring force
Probe Data	3	Nominal force	D09	Nominal value of the measuring force
Probe Data	3	Probe mass	D10M	Mass of the stylus system. Only valid for actively measuring probing systems, e.g. VAST
Probe Data	3	Probing force	D10I	Measuring force at the moment of the measuring point recording
Probe Menu	3	Balancing	M03	Counterbalancing of the axes
Probe Menu	3	Correct pos.	M09	Correction of the stylus
Probe Menu	3	Measuring force		Presetting of the measuring force
Probe Menu	3	Pick up probe	M07	Insertion of the stylus
Probe Menu	3	Release probe	M08	Release of the stylus
Probing Data	4	Probing A..E	D12S2	Coordinates for the A, B, C, D and E axes during probing
Probing Data	4	Probing force	D10I	Antastkraft
Probing Data	4	Probing status	D16I	Display of the probing status in the HEX code
Probing Data	4	Probing vector	D11	Probing direction
Probing Data	4	Probing X..S	D12S1	Coordinates for the X, Y, Z, R and S axes during probing
Probing Data	4	St. Tip probing	D85	Calculation of the CMM and probe coordinates
Reader Head	3	Channel 0 (X)		Checking the stylus system for the X axis
Reader Head	3	Channel 1 (Y)		Checking the stylus system for the Y axis
Reader Head	3	Channel 2 (Z)		Checking the stylus system for the Z axis
Reader Head	3	Channel 3 (R)		Checking the stylus system for the R axis
Reader Head	3	Channel 4 (A)		Checking the stylus system for the A axis
Reader Head	3	Channel 5 (B)		Checking the stylus system for the B axis

<b>Menu / level</b>		<b>Menu item / Command / submenu</b>		<b>Meaning</b>
Reader Head	3	Reader Head		Read head
Run Macros	3	/REF. CMM		CMM reference point travel
Run Macros	3	/REF. RT		Rotary table reference point travel
Service Cmd.	3	Drive offset	G49	Position control loop off
Service Cmd.	3	NC reboot	D108	Cold start
Service Cmd.	3	NC reset	D107	Warm start
Service Cmd.	3	Ref. invalid	G90	Setting the counter in the specified axes to the indicated value
Service Cmd.	3	Ref. valid	G39;G61	The software end positions in the specified axes are switched off
Sound Menu	3	Probe beep settings		Number of beeps during probing
Sound Menu	3	Sound beep 1x		Test function
Sound Menu	3	Sound beep 3x		Test function
Sound Menu	3	Sound beep 9x		Test function
Status	3	Firmware vers.	D80	Firmware version
Status	3	Probing status	D16L	Probing status (HEX code)
Status	3	Status A..E	D16S2	Status of the A, B, C, D and E axes (HEX code)
Status	3	Status X..S	D16S1	Status of the X, Y, Z, R and S axes
Status	3	Laser status	D16L	Laser status (HEX code), e.g. LPT
Version	4	C axes	D80,1	Identification record of the C axis, e.g. for DSE
Version	4	Carrier contr.	D80,1	Identification record of the probe holder, e.g. RDS
Version	4	Slave CPU	D80,9	Identification record of the CPU



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