



































































#### 8.4.5. Changing the activation point

By pressing the  key, you move from the 'base value' mode | 1 1 1  to the 'activation point' mode |  . Using keys  and  you can move the activation point in steps of one. This is done after the following system:


Press the  key, and at the previously displayed base value ,e.g. 100, the switching point is deleted, and afterwards the base value is raised by 1 to 101. If you press the  key, the base value, 100, is reduced by 1, and the new activation point has the position 99.

#### 8.4.6. Changing the deactivation point

Press the  key again, leave the 'activation point' mode |   and enter the 'deactivation point' mode |  . CamCon first searches for the deactivation point of the current cam (e.g.: |  |  ). Using keys  and  you can change this value in steps of one. This is done after the following system:

Press the  key, and at the previously displayed base value ,e.g. 100, the switching point is deleted, and afterwards the base value is raised by 1 to 101. If you press the  key, the base value, 100, is reduced by 1, and the new deactivation point has the position 99. Please note that it is not possible to decrease the deactivation point below the value of the activation point. Press the  key to return to the 'output selection' mode |  . \_ \_ \_ .

#### 8.4.7. Exit cam programming

No matter in which programming mode you are currently in, you can exit cam programming at any time by pressing the  key. You then return to the standard display.




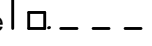

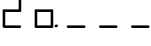

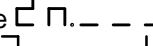



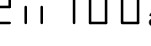






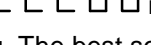
## 8.4.8. Examples for cam programming in programming mode 0


### 8.4.8.1. First cam programming


#### Task:

After a general deletion of the program memory and a successful system initialization, program a cam in program 0 on output 2, ranging from 100 to 200.



#### Solution:

1. Keep the  key pressed (for about 2 seconds), until you enter the 'program selection' mode .
2. Press the  key, you are now in the 'programming' mode .
3. Press the  key to select output 2 .
4. Press the  key to enter the 'cam search' mode .
5. Press the  key for the input of the base value .
6. Press the  key, and keep it pressed until  appears on the display.
7. If you let go of the  key too soon or too late, correct the value to 100 using keys  and .
8. Press the  key. The activation point is shown.
9. Press the  key to program the deactivation point of the cam.
10. Press the  key, and keep it pressed until  is displayed.

**ATTENTION!** The key may not be held too long. The best solution is to hold the  key pressed until 190 and move up to 200 in steps of one.

11. Press the  key. The standard display reappears.

#### NOTE:




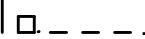

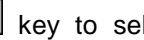












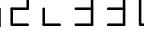
The programming of the (de)activation points is made "Online", meaning that if you keep the  key pressed too long, the cam itself is too long. You can correct this with the  key but the range that you move backwards to the desired deactivation point is deleted. Previously programmed cams in this range are then lost.


### 8.4.8.2. Programming additional cams on the same output


#### Task:

Program a cam in program 0 on output 2 from 300 to 330, in addition to the previously programmed cam (100 to 200).



#### Solution:

1. Keep the  key pressed (for about 2 seconds), until you enter the program selection mode .
2. Press the  key, and enter the programming mode .
3. Press the  key to select output 2 . The activation point of the previously programmed cam is displayed.
4. Press the  key to enter the cam search mode .
5. Press the  key to enter the base value .
6. Press the  key and keep it pressed until  is displayed.
7. If you let go of the  key too soon or too late, correct the value to 300 using keys  and .
8. Press the  key. The activation point is displayed.
9. Press the  key for the programming of the deactivation point.
10. Press the  key, and keep it pressed until  is displayed.

**ATTENTION!** The key may not be held too long. The best solution is to hold the  key pressed until 320 and move up to 330 in steps of one.

11. Press the  key. The standard display reappears.

#### NOTE:




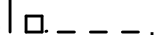

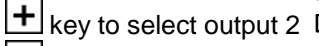

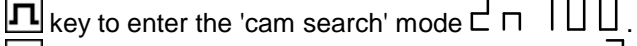

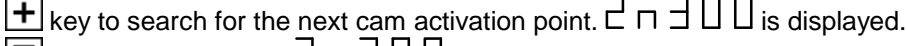

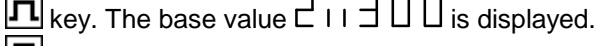

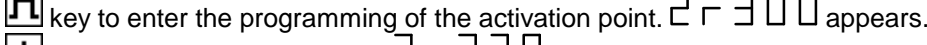

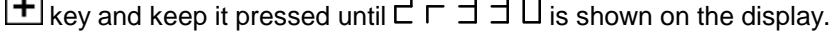
The programming of the (de)activation points is made "Online", meaning that if you keep the  key pressed too long, the cam itself is too long. You can correct this with the  key but the range that you move backwards to the desired deactivation point is deleted. Previously programmed cams in this range are then lost.


### 8.4.8.3. Deletion of a particular cam


**Task:**

Delete the cam from 300 to 330 in program 0 on output 2.

**Solution:**

1. Keep the  key pressed (for about 2 seconds), until you enter the 'program selection' mode .
2. Press the  key to enter the 'programming' mode .
3. Press the  key to select output 2 . The first cam activation point is displayed.
4. Press the  key to enter the 'cam search' mode .
5. Press the  key to search for the next cam activation point.  is displayed.
6. Press the  key. The base value  is displayed.
7. Press the  key to enter the programming of the activation point.  appears.
8. Press the  key and keep it pressed until  is shown on the display.

**ATTENTION!** The key may not be pressed too long. It is best to keep the  key pressed until 320 and then move to 330 in steps of one.

9. Press the  key to return to the standard display.


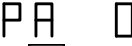



**NOTE:** The programmed cam is deleted by moving the cam activation point to the cam deactivation point. By moving the cam activation point beyond the deactivation point, you also delete that range after the cam (e.g. from 330 to 350). Cams programmed in this area are also deleted. Moving the wrong activation point now back to the originally desired position of 330, you create a new cam from 330 to 350 !




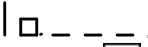


## 8.5. Cam programming in programming mode 1

### 8.5.1. Program selection



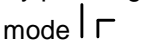


The cam programming and the program selection are initiated as follows:



Keep the  key pressed (for about 2 seconds), until the display shows e.g.: . This shows the currently selected program (in our example program 0). Using keys  and  you can now enter a program number in the range from 0 to 999. Confirm your chosen program number and leave the cam programming mode by pressing the  key.

### 8.5.2. Output selection



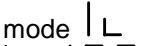



Press the  key during program selection. The display shows e.g. . This shows that no cams were programmed on output 1 in the output selection mode. Using keys  and  you can now select an output on which you want to program a cam.





### 8.5.3. Changing the activation point

By pressing the  key, you move from the 'output selection' mode  to the 'activation point' mode . Using keys  and  you can move the activation point in steps of one. This is done after the following system:


Press the  key, and at the previously displayed base value ,e.g. 100, the switching point is deleted, and afterwards the base value is raised by 1 to 101. If you press the  key, the base value, 100, is reduced by 1, and the new activation point has the position 99.

### 8.5.4. Changing the deactivation point

Press the  key again, leave the 'activation point' mode  and enter the 'deactivation point' mode . CamCon first searches for the deactivation point of the current cam (e.g.: ). Using keys  and  you can change this value in steps of one. This is done after the following system:

Press the  key, and at the previously displayed base value ,e.g. 100, the switching point is deleted, and afterwards the base value is raised by 1 to 101. If you press the  key, the base value, 100, is reduced by 1, and the new deactivation point has the position 99. Please note that it is not possible to decrease the deactivation point below the value of the activation point. Press the  key to return to the 'output selection' mode .

### 8.5.5. Exit cam programming

No matter in which programming mode you are currently in, you can exit cam programming at any time by pressing the  key. You then return to the standard display.




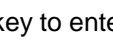

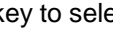

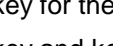

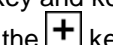





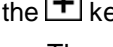




## 8.5.6. Examples for cam programming in programming mode 1

### 8.5.6.1. Cam programming

#### Task:

After a general deletion of the program memory and a successful system initialization, program a cam in program 0 on output 2, ranging from 100 to 200.

#### Solution:




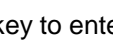

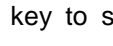

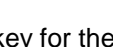

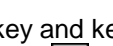




1. Keep the  key pressed (for about 2 seconds), until you enter the program selection mode .
2. Press the  key to enter the 'programming' mode |  . . . .
3. Press the  key to select output 2  . . . .
4. Press the  key for the programming of the activation point  . . . .
5. Press the  key and keep it pressed until  is displayed.
6. If you let go of the  key too soon or too late, correct the value to 100 using keys  and .
7. Press the  key for the programming of the deactivation point.
8. Press the  key and keep it pressed until  is displayed.
9. If you let go of the  key too soon or too late, correct the value to 200 using keys  and .
10. Press the  key. The standard display reappears.

### 8.5.6.2. Cam deletion

#### Task:

Delete the cam from 100 to 200 in Programm 0 on output 2.

#### Solution:

1. Keep the  key pressed (for about 2 seconds) until you are in the program selection mode .
2. Press the  key to enter the 'programming' mode |  . . . .
3. Press the  key to select output 2  . The cam activation point is found and displayed.
4. Press the  key for the programming of the activation point.  appears.
5. Press the  key and keep it pressed until  is displayed.
6. If you let go of the  key too early, move to 200 with the  key. If you let go of the  key too late, do not correct it ! The cam is already deleted. Moving the activation point backwards will create a new cam that will have to be deleted.
7. Press the  key to return to the standard display.

## 8.6. Outline of operations




### 8.6.1. Change of the output display

Press the **+** key | - || Display of the output channels I-X











### 8.6.2. Initialization of the system registers

		33	Standard display position/speed
Press the <b>-</b> key 4 times		33	User key for system registers
Press the <b>+</b> key 4 times		-	User key for system registers
Press the <b>F</b> key (about 2 sec)	S.	360	Encoder resolution physically
Press the <b>F</b> key	G.	360	Encoder resolution desired
Press the <b>F</b> key	h4.	0	Actual position hysteresis
Press the <b>F</b> key	r   c h	0	Encoder rotation direction change
Press the <b>F</b> key	0	123	Zero point correction
Press the <b>F</b> key	!! 0.	166	Speed factor
Press the <b>F</b> key		1000	Range adjustment of the speed display
Press the <b>F</b> key		100'	Accuracy of the speed display
Press the <b>F</b> key	dA u t	0	Display type
Press the <b>F</b> key	dE.	0	Input of the display type change
Press the <b>F</b> key	L	30	Encoder cable length of the SSI interface
Press the <b>F</b> key		04.	Cycle time
Press the <b>F</b> key	E	8	Number of inputs
Press the <b>F</b> key	A	32	Number of outputs
Press the <b>F</b> key	tA	24	Number of outputs with speed compensation
Press the <b>F</b> key	rL	0	Input for the keyboard lock
Press the <b>F</b> key	E9.	0	Input for error reset
Press the <b>F</b> key	E1.	0	Enable input for the outputs
Press the <b>F</b> key	!!	128	Number of inputs for the external program selection
Press the <b>F</b> key	!!E	1	Take over input for the external program selection
Press the <b>F</b> key	P.	0	Value for the actual position preset
Press the <b>F</b> key	PE.	0	Input for triggering the actual position preset
Press the <b>F</b> key	P r y r A		Storage of the actual position preset
Press the <b>F</b> key	SI	0	Security output
Press the <b>F</b> key	!! r	0	Rotation direction output
Press the <b>F</b> key	!! 0	0	Standstill output
Press the <b>F</b> key		044	Speed hysteresis
Press the <b>F</b> key	C - b u s		Communication protocol of the serial interface
Press the <b>F</b> key	G n r.	10	Device number
Press the <b>F</b> key	P t y p	0	Programming mode
Press the <b>F</b> key	A A u s.	1	Releasing the analog outputs
Press the <b>F</b> key		33	Return to the standard display







































### 8.6.3. Speed compensation programming

		3 3	Standard display
Press the  key (about 2 sec)	1	0	Speed compensation for output 1
Press the  key and so on...	2	0	Switching forward to output 2
Press the  key		3 3	Return to the standard display

### 8.6.4. Cam programming

		3 3	Standard display
Press the  key (about 2 sec)	P A	0	Program selection
Press the  key	1 0	0	Output selection
Press the  key	1 0	0	Cam search for activation point (only mode 0)
Press the  key	1 1	0	Basic value position (only mode 0)
Press the  key	1 0	0	Move activation point
Press the  key	1 2	0	Search for and move deactivation point
Press the  key	1 0	0	Output selection
Press the  key	2 3	0	Select next output
Press the  key	1 0	0	Select previous output
Press the  key		3 3	Return to the standard display

### 8.6.5. Display the unit configuration

		33	Standard display position/speed
Hold the  key (2 sec)		10.0 1.4	Software version (Date 10.01.94 or 04)
Press the  key	F.	148	Number of free cams
Press the  key	E.	999	Maximum possible speed compensation in ms
Press the  key	r.	327	Size of the RAM in kByte
Press the  key	S.	27	Size of the serial EPROM in kByte
Press the  key	E.	07	Size of the parallel EEPROM in kByte
Press the  key	S.	360	Encoder resolution physically
Press the  key	G.	360	Encoder resolution desired.
Press the  key	h4.	0	Actual position hysteresis
Press the  key	r	1c h 0	Encoder rotation direction change
Press the  key	u	0.166	Speed factor
Press the  key		1000	Range adjustment of the speed display
Press the  key		1001	Accuracy of the speed display
Press the  key	d.A u t o		Display type
Press the  key	dE.	0	Input for the display change
Press the  key	L	30	Encoder cable length of the SSI interface
Press the  key		1824.	Cycle time in $\mu$ s
Press the  key	E	8	Number of inputs
Press the  key	A	32	Number of outputs
Press the  key	E A	24	Number of outputs with speed compensation
Press the  key	r L	0	Input for the keyboard lock
Press the  key	E9.	0	Input for error reset
Press the  key	E1.	0	Enable input for the outputs
Press the  key	11	128	Number of inputs for the external program selection
Press the  key	11E	1	Take over input for the external program selection
Press the  key	P.	0	Value for the actual position preset
Press the  key	PE.	0	Input for triggering the actual position preset
Press the  key	P r y. r A		Storage of the actual position preset
Press the  key	S1	0	Security output
Press the  key	u r	0	Rotation direction output
Press the  key	u	0	Standstill output
Press the  key		0H4	Speed hysteresis
Press the  key	C - b u s		Communication protocol of the serial interface
Press the  key	G r.	10	Unit number
Press the  key	o P.	0	Options
Press the  key	P t y P 0		Programming mode
Press the  key	A A U S.	1	Releasing the analog outputs
Press the  key		33	Return to the standard display

## 9. Troubleshooting

...

### 9.1. Problem: The display remains dark after activation

**Possible cause:**

The wiring is probably not correct.

**Solution:**


Check the wiring.

### 9.2. Problem: The display shows: EE.Err

**Possible cause:**

The EEPROM's data was erased or damaged by malfunctions. One of the present data storage medias (EEPROM or EPROM) was renewed or is defect.

**Solution:**


By pressing the  key, all data is erased. During the deletion process the display shows CLEAR. Please contact your customer's service.

### 9.3. Problem: The display shows: I.Err 1

**Possible cause:**

The encoder is connected incorrectly.

**Solution:**


Check the wiring to the encoder, concerning the manual. When the error is corrected, press the  key to clear the error message.

### 9.4. Problem: The display shows: I.Err 2

**Possible cause:**

The encoder is not connected or connected incorrectly

**Solution:**


Check the wiring to the encoder or the input of the encoders resolution. Regard also the encoder's manual. When the error is corrected, press the  key to clear the error message.

### 9.5. Problem: The display shows: I.Err 3

**Possible cause:**

The encoder resolution of the connected encoder is not the encoder resolution set at the device.

**Solution:**


Check the input of the encoder resolution and the set cable length. Regard also the encoder's manual. When the error is corrected, press the  key to clear the error message.

### 9.6. Problem: The display shows: I.Err 5

**Possible cause:**

Measuring system control has triggered. The CamCon detected an inadmissible step of the actual value. The measuring system is possibly wrong.

**Solution:**

Test the input of the measuring system's preset and the set cable length, or increase the admissible actual value steps. See also chapter "8.2.5. Measuring system control" on page 13 and regard the measuring system's manual. When the error is corrected, press the  key to clear the error message.

### 9.7. Problem: An error happens during operation.


The display shows: I.Err 1, I.Err 2, I.Err 3 or I.Err 5.

#### Possible cause:

The encoder's connection cable or the encoder itself is defect. A cable without shielding or twin wiring was used. Also the position of the connection cable, e.g. next to a strong electro-magnetic interference point (e.g. high-voltage cable, motor-cable) can cause an I-Error.

#### Solution:

Check the encoder's wiring or the change the encoder device. Build up covers or lay the connection-cable elsewhere. Please also regard the encoders manual.

When the error is corrected, press the  key to clear the error message.

### 9.8. Problem : The display shows: A-Err

#### Possible cause:

Your outputs are overloaded or have short circuited. Check the wiring and connected power, as well as possible inductive loads that are operated without a free wheel or a deletion unit.

The number of entered inputs is not correct.


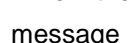
At an external interface module (e.g. DC91/IO or DC16/IO) the power supply failed.

#### Solution:

Check the wiring and the connection-cable as well as possible inductive loads, which are run without a free wheel or a deletion unit.

See chapter 8.2.15. Number of outputs on page 16.

See chapter 8.2.14. Number of inputs on page 16.

When the error is corrected, press the  key to clear the error message. During this time the message  appears for a short time. CamCon tries to reset the outputs during this time.

**Attention:** *Unfavourable cable routing can lead to the deactivation of the outputs, since it builds up a potential that is redirected into the outputs at the closing of a contact. With induced loads the outputs have to be switched with a freewheeling diode. Covers or inductivities very close to the device inside the switchboard have to be switched with a deletion unit as do those that are wired to or influence the wiring of the device.*



### 9.9. Problem: Outputs do not react

#### Possible cause:

An error message is displayed.

No power supply is connected to the outputs.

The enable input is not active.

The control - inputs of the CamCon are locked by an S5 or an S5L1 respective 3964r interface.

#### Solution:

Check the displayed error-message.

Connect the power supply.

Enable the Outputs with the enable input, see also chapter 8.2.19. Enable input on page 16

Un-lock the control-inputs.

See also the S5-L1-coupling's manual.

#### **9.10. Problem : The display shows: t1.Err**

**Possible cause:**

Every change in the system setting influences the available memory. Your changes of the system parameters (e.g. increasing the encoder resolution) have shifted an already programmed speed compensation above the memory range. At every further pressing of a key, the display shows output numbers concerned.

**Solution:**

This error can be recovered by changing the corresponding speed compensation or increasing the cycle time.

Please also regard chapter 8.6.5. Display the unit configuration on page 29.

#### **9.11. Problem : The display shows: E.Full**

**Possible cause:**

Too little memory in the EEPROM available for cam programming

**Solution:**

Please contact your customer service. Also, read the chapter 8.6.5. Display the unit configuration on page 29.



## 10. Technical data

Display .....	5 digit 7-seg. display + 16 LED for output states
Inputs .....	6 x 24V high active about 5KOhm.
Number of the displayed CamCon.....	via the inputs binary coded
Interface.....	RS485 up to 1000m.
Supply voltage.....	24V DC $\pm 20\%$
Current absorbtion .....	50mA.
Connections for:	
Interface.....	via D-SuB 9
Voltage supply.....	via plug block pins
Dimensions .....	(see chapter 2. Dimensions on page 5)
Arbeitstemperatur .....	0°C ... + 55° C
Normencasement after DIN 43700.....	72 x 48 x 82.5mm (LxHxD)
Weight.....	about 150g

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