Command:CUSTOMA (CCA)

MS2000 Syntax

Shortcut	CCA
Format	CCA X=n Y=m Z=o
Remembered	X automatically saved (see note), Y and Z require SS Z

Tiger Syntax

Shortcut	CCA
Format	[Addr#]CCA X=n Y=m Z=o
Type	Card-Addressed
Remembered	X automatically saved (see note), Y and Z require [Addr#]SS Z

> **Note:** For the Tiger programmable logic card this command is used differently, see the Tiger Programmable Logic Card (TGPLC) documentation and ignore this page.

X parameter

X sets the configuration flags according to the table below for builds with STNDRD_XY and/or STNDRD_Z axis profiles. Configuration flags are changed one at a time for each execution of the CCA command. The changes will not take effect until the controller is power cycled or reset via the RESET command.

> **Important:** The controller should be reset immediately after setting any desired **CCA X** flags, either toggle the physical power switch or send the **RESET** command.
>
> **Note:** The X parameter is saved automatically, you do not need to send the **SS Z** command.
>
> **Warning!** Executing a **SS Z** command before resetting can cause the firmware to get confused. *See notes below.*

Set CCA X=# and reset the controller before changing any settings that require SS Z to be saved.

1. Set CCA X=# flags
2. Reset the controller
3. Change other settings
4. Save settings with SS Z

CCA X=	Description	Display	MS-2000 Specific Comments	TG-1000 Specific Comments
1	XY Linear Encoders Used	L	Use DIP SW 3 (See Note 1)	
2	XY Rotary Encoders Used	R	Use DIP SW 3 (See Note 1)	
3	Z Linear Encoders Used	L	Use DIP SW 6 (See Note 1)	
4	Z Rotary Encoders Used	R	Use DIP SW 6 (See Note 1)	
5	XY Leadscrew Coarse Pitch (6.35 mm - Standard)	B	Firmware Default	
6	XY Leadscrew Fine Pitch (1.59 mm)	A		
7	XY Leadscrew Super Coarse (12.7 mm)	C		
8	XY Leadscrew Ultra Fine (0.635 mm)	U	0.635 Leadscrew post 9.0e , 0.317mm pre 9.0e	
15	XY GTS Motor/Fine Pitch (1.59 mm)	a		
16	XY GTS Motor/Coarse Pitch (6.35 mm)	b		
17	XY GTS Motor/Super Coarse (12.7 mm)	c		
18	XY Leadscrew Ultra Coarse (25.4 mm)	D		
28	XY SISKIYOU Motor/Leadscrew	S		
41	XY Leadscrew Medium (3.18 mm)	M		was CCA X=65 Apr21-Sep22
42	XY Maxon Direct-Drive (1.59 mm)	x		Not Implemented
43	XY Maxon Direct-Drive (3.18 mm)	e		Not Implemented
44	XY Maxon Direct-Drive (6.35 mm)	X		Not Implemented
48	XY LS25 Fine Pitch (1.59 mm)	G	Version 9.2l+	
56	XY LS25 Coarse Pitch (6.35 mm)	H	Version 9.2m+	
59	XY LS25 Extra-fine Pitch (0.635 mm)	g	Version 9.2n+	
58	XY Leadscrew Ultra Coarse (25.4 mm) with 76:1 Gear motor	E	Version 9.2l+	
21	XY Linear Encoder 10 nm resolution	1	Firmware default	
22	XY Linear Encoder 20 nm resolution	2		
51	XY Linear Encoder 5nm resolution	K	Version 9.0e+	
52	XY Linear Encoder 2.5nm resolution	L	Version 9.0e+	
30	XY Limit Polarity - Normally Open	o	Firmware default	
31	XY Limit Polarity - Normally Closed	c		
9	Z Scope Drive 100 um/rev.	1	Firmware default	
10	Z Scope Drive 200 um/rev.	2		
19	Z Scope Drive 400 um/rev.	4		
11	Z Leadscrew Coarse Pitch	B		
12	Z Leadscrew Fine Pitch	A		
13	Z Leadscrew Super Coarse Pitch	C		
14	Z Leadscrew Ultra Fine Pitch	U		
47	Z Leadscrew Ultra Coarse	D		

CCA X=	Description	Display	MS-2000 Specific Comments	TG-1000 Specific Comments
29	Z SISKIYOU Motor/Leadscrew	S		
49	Z LS25 Fine Pitch (1.59 mm)	G	Version 9.2l+	
57	Z LS25 Coarse Pitch (6.35 mm)	H	Version 9.2m+	
64	Z LS25 Ultra Fine Pitch (0.635 mm)	g	Version 9.2o+	
26	ZF Linear Encoder 10 nm resolution	1	Leadscrew devices only. LE resolution is 50nm on scope drives.	
27	ZF Linear Encoder 20 nm resolution	2		
53	ZF Linear Encoder 5nm resolution	K	Version 9.0h+	
54	ZF Linear Encoder 2.5nm resolution	L	Version 9.0h+	
55	ZF Linear Encoder 50nm resolution	5	Version 9.2f+	
32	ZF Limit Polarity - Normally Open	o	Firmware default	
33	ZF Limit Polarity - Normally Closed	c		
34	Piezo Range 50 um	f or Pf		
65	Piezo Range 70 um	g or Pg	Not Implemented	
23	Piezo Range 100 um	1 or P1		
35	Piezo Range 150 um	S or PS	Firmware default	
24	Piezo Range 200 um	2 or P2		
36	Piezo Range 300 um	3 or P3		
25	Piezo Range 350 um	t or P4		
37	Piezo Range 500 um	5 or P5		
66	Piezo Range 1000 um	W	Experimental	Not Implemented
20	Reserved for LX-4000 LE Flag			
26	Reserved for Tracer Enable			
70	The joystick and knob are always enabled, and the device assignments cannot be changed. The JOYSTICK command has no effect.	J	Version 9.0f and later.	Not Implemented
71	The joystick and knob can be disabled, and the device assignments can be changed. The JOYSTICK command works normally.	j	Firmware default. Version 9.0f and later.	Not Implemented
	Fixed Profile	F		Place holder profile
	MicroMirror 6 degrees	U6		TG-1000 only
	MicroMirror 8 degrees	U8		TG-1000 only
	MicroMirror 10 degrees	UA		TG-1000 only

Note 1: Applies to LX-4000 systems only. On MS-2000 and MS-4000 systems, use DIP Switch #3 for XY linear encoders and DIP Switch #6 for Z-axis linear encoders instead of this CCA setting.

Example

```
CCA  X=6
:A
```

Sets to XY stage for 1.59mm pitch lead screws.

CCA X? Returns string representing current state of flags

A: XY:RA Z:RN Shows XY stage is rotary encoded, lead screw pitch A (1.59mm), and Z-drive is rotary encoded, 100µm/turn scope motor drive.

A: XY:RAj Z:RN Shows XY stage is rotary encoded, lead screw pitch A (1.59mm), JOYSTICK command works normally for all axes, and Z-drive is rotary encoded, 100µm/turn scope motor drive. Version 8.8i and all later 8.8x; version 9.0f and later.

XY:F or Z:F indicate that the XY or Z settings are Fixed by the firmware build and cannot be changed using the CCA command.

A listing of the valid CCA X configuration flags is displayed for firmware builds where sufficient space is available.

```
 A: XY:RBJ Z:RN PF:2

5  XY B PITCH 4/in
6  XY A PITCH 16/in
7  XY C PITCH 2/in
8  XY 0 PITCH 80/in
18 XY D PITCH 1/in
21 XY 1 XYLE 10nm
22 XY 2 XYLE 20nm

9  Z N SCOPE 100u/T
10 Z Z SCOPE 200u/T
11 Z B PITCH 4/in
12 Z A PITCH 16/in
13 Z C PITCH 2/in
14 Z U PITCH 80/in
19 Z H SCOPE 100u/T 25nm

23 P 1 100um RANGE
24 P 2 200um RANGE
```

Y parameter

Y sets number of move repetitions. Default value is zero. That is, a MOVE command causes the system to initiate one move to the given position. If m > 0, then the move will be initiated more than once as a means to achieve fine adjustment and a more stable landing. This parameter is saved in non-volatile memory by the SS Z command. Requires MOVETASK firmware module which is standard for XY builds but not most others.

Example

```
CCA Y=3
:A
```

All moves will be initiated four times.

Z parameter

Z sets system configuration flags according to following table. Parameter changes must be saved in non-volatile memory by the ''SS Z'' command.

CCA Z=	Description	Display	MS2K Comment	TG-1000
1	X axis movement direction is positive (default).	+	Firmware Default	
2	X axis movement direction is negative.	-		
3	Y axis movement is positive (default) (Note: In the MS-4000, the default direction value for the Y axis is -1)	+	Firmware Default	
4	Y axis movement is negative.	-		
5	Z axis movement is positive	+	Firmware Default	
6	Z axis movement is negative.	-		
7	F axis movement is positive.	+		
8	F axis movement is negative.	-		
9	Disengage clutch	D		
10	Engage clutch	E		
11	Enable LCD display	O		Not Implemented
12	Disable LCD display	F		Not Implemented
13	CLOCKED DEVICES on 1st axis take shortest path	S		Applied to both axes until 3.10
14	CLOCKED DEVICES on 1st axis do not take shortest path	L		Applied to both axes until 3.10
15	Disable ADEPT piezo self test on startup	N	MS-2000 9.2d required.	
16	Enable ADEPT piezo self test on startup	C	Firmware Default, MS-2000 v9.2d required.	Firmware Default
17	CLOCKED DEVICES on 2nd axis take shortest path	S	Works in 9.2m and above	
18	CLOCKED DEVICES on 2nd axis do not take shortest path	L	Works in 9.2m and above	
20	The joystick and knob are always enabled, and the device assignments cannot be changed. The JOYSTICK command has no effect..	j	MS-2000 v9.0f required.	Not Implemented
21	The joystick and knob can be disabled, and the device assignments can be changed. The JOYSTICK command works normally.	J	Firmware Default, MS-2000 v9.0f required.	Implemented by default
22	Reverses joystick polarity of the card's first axis	r	TG-1000 only, v3.05 required. Re-issue J command or restart after SS Z to take effect.	
23	Joystick polarity of card's first axis set to default	l	TG-1000 only, Firmware Default v3.05 required. Re-issue J command or restart after SS Z to take effect.	
24	Reverses joystick polarity of the card's second axis	r	TG-1000 only, v3.05 required. Re-issue J command or restart after SS Z to take effect.	

CCA Z=	Description	Display	MS2K Comment	TG-1000
25	Joystick polarity of card's second axis set to default	I	TG-1000 only, Firmware Default, v3.05 required. Re-issue J command or restart after SS Z to take effect.	
26	Enable Encoder E flag check _Expressed as error 110+ in dump buffer_		MS-2000 only, v9.2j required.	
27	Disable Encoder E flag check		MS-2000 only, Firmware Default, v9.2j required.	
28	Buttons are always enabled and cannot be disabled. The button functions cannot be changed. The BENABLE and BCUSTOM commands have no effect.	b	MS-2000 v9.55 required.	
29	Buttons can be disabled and button functions can be changed. The BENABLE and BCUSTOM commands work normally.	B	Firmware Default MS-2000 v9.55 required.	

Note: A few products have different axis names. When in doubt, call ASI.

commands, tiger, ms2000