

MCS2

POSITIONER TYPES





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1 *POSITIONER TYPES*

1.1 Introduction

This document describes the SmarAct positioner naming scheme. It lists all currently available positioner types for the MCS2 controller system and gives a cross reference between the sensor types of the MCS1 controller to the positioner types of the MCS2 controller.

1.2 Positioner Naming Scheme

This section describes the naming scheme for SmarAct positioners. A positioner serial number specifies all mechanical and electrical characteristics of a positioner. It also contains a running number which makes it possible to doubtless identify each SmarAct positioner.

Positioner-Type:		S L ... T 1 S S																							
Serial-Number:		S L C 23 : 30 : 3 U R N C 1 T 1 S S															- XXXX								
Order-Code:		S	L	C	23	:	30	:	3	U	R	N	C	1	T	1	S	S	-	O	W	6	P		
Drive																							Surface		
G None																							N Nature		
S Stick-Slip-Drive																							P Polished		
M Magnetic-Drive																							S Sandblasted		
D Dual-Piezo-Drive																							K Nickel plated		
Type of Motion																							B Black anodized		
L Linear																							L Blue anodized		
R Rotary																							M Mixed surfaces		
G Goniometer																									
T Tip-Tilt																							Baseplate-Type		
I Iris-Diaphragm																							[*] Standard		
H High-Load-Table																							W Pretension from side		
																							R Round		
																							E Customized		
																							# Width in mm		
Guideway / Bearing																							Mounting-Ears		
T None																							Reference-Type + Details		
B Ball bearing																							Sensor-Type + Details		
C 3-parts crossed-rollers																							X No Sensor		
S 4-parts crossed-rollers																							S S-Sensor		
L Recirculating ball																							L L-Sensor		
V Recirculating ball (HV)																							M M-Sensor		
M 4-point bearing (rot.)																							I I-Sensor		
P 3-parts bearing (rot.)																							P Pico-Scale		
N Crossed-rollers (rot.)																									
G 4-parts crossed-rollers (Gon.)																							Piezo- / Motor-Type		
Dimension I																							Temperature		
xx e.g. width in mm (linear)																							[*] Room-temperature		
Dimension II																							C Cryogenic		
xx e.g. length in mm (linear)																									
Force Torque																							Magnetism		
0 Passive Passive																							[*] Ferromagnetic		
1 - > 0,5 Ncm																							N Non-magnetic		
2 > 2 N -																									
3 > 3,5 N > 3 Ncm																							Cable-Type		
5 > 5,5 N > 5 Ncm																							[*] Without cable		
7 > 7,5 N > 7 Ncm																							R PTF in shield		
10 > 10,5 N > 10 Ncm																							W PTF in shield, white jacket		
20 - > 20 Ncm																							B PTF in shield, black jacket		
																							K Kapton, braided		
Pressure																									
A Ambient																									
F Fine vacuum																									
H High vacuum																									
U Ultrahigh vacuum																									

* Field is omitted

1.3 Positioner Types Tables

The positioner type is derived from the order code as described in section 1.2 Positioner Naming Scheme. All software irrelevant fields (mainly mechanical characteristics) are represented by '...' in the positioner type.

For positioners that are equipped with the SmarAct positioner ID system the positioner type is automatically detected and configured when the positioner is attached to a channel. For positioners that are *not* equipped with the ID system the type must be configured manually for each channel of the MCS2 controller.

Please refer to the *MCS2 Programmers Guide* document for more information on the positioner type configuration.

The following tables list all currently available positioner types with their corresponding type codes.

1.3.1 Piezo Driven Stick-Slip Positioners

For piezo driven stick-slip positioners the type must be configured manually to the channel. Each channel stores the positioner type setting to non-volatile memory. Consequently, there is no need to configure the positioner type for each session. Only when changing the physical setup (switching positioners etc.) the channel must be reconfigured (and calibrated) again.



NOTICE

When using positioners with **M- or L-sensor** on *at least one* channel of a specific driver module *all* positioner types of *this* module must be set to a **M- or L-sensor** type too to configure the correct sensor supply voltage. This rule applies even if the other channels of the driver module are unused, respectively no positioners are connected.

Table 1.1 – Piezo Driven Stick-Slip Positioner Types

Positioner Type	Type Code	Actuator	Sensor	Reference
SL...S1SS	300	Linear positioner, single piezo element	S	single mark
SL...D1SS	301	Linear positioner, double piezo element	S	single mark
SL...S1SC1	303	Linear positioner, single piezo element	S	DC marks
SL...D1SC1	304	Linear positioner, double piezo element	S	DC marks
SL...D1SC2	307	Linear positioner, double piezo element	S	DC marks (alternating)

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Positioner Type	Type Code	Actuator	Sensor	Reference
SR...S1S5S	309	Small rotary positioner	S	single mark
SR...S1S6S	312	Rotary positioner	S	single mark
SR...D1S6S	313	Rotary positioner, double piezo element	S	single mark
SR...D1S7S	316	Rotary positioner, double piezo element	S	single mark
SR...T1S8S	320	Large rotary positioner	S	single mark
SG...D1S1S	325	Goniometer, 60.5mm radius, double piezo element	S	single mark
SG...D1S2S	328	Goniometer, 77.5mm radius, double piezo element	S	single mark
SL...S1LE	342	Linear positioner, single piezo element	L	endstop
SL...D1LE	343	Linear positioner, double piezo element	L	endstop
SL...S1LS	345	Linear positioner, single piezo element	L	single mark
SL...D1LS	346	Linear positioner, double piezo element	L	single mark
SL...S1LC1	348	Linear positioner, single piezo element	L	DC marks
SL...D1LC1	349	Linear positioner, double piezo element	L	DC marks
SR...S1L2S	354	Rotary positioner	L	single mark
SR...D1L2S	355	Rotary positioner, double piezo element	L	single mark
SL...S1ME	357	Linear positioner, single piezo element	M	endstop
SL...D1ME	358	Linear positioner, double piezo element	M	endstop
SL...S1P1E	360	Linear positioner, single piezo element	P	endstop
SL...D1P1E	361	Linear positioner, double piezo element	P	endstop
SG...S1M1E	363	Goniometer, 60.5mm radius, single piezo element	M	endstop

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Table 1.1 – Continued from previous page

Positioner Type	Type Code	Actuator	Sensor	Reference
SG...S1M2E	366	Goniometer, 77.5mm radius, single piezo element	M	endstop
SG...D1L1S	381	Goniometer, 60.5mm radius, double piezo element	L	single mark
SG...D1L2S	383	Goniometer, 77.5mm radius, double piezo element	L	single mark
SG...D1L1E	387	Goniometer, 60.5mm radius, double piezo element	L	endstop
SG...D1L2E	389	Goniometer, 77.5mm radius, double piezo element	L	endstop
SH...A1SS	395	High load table, single piezo element	S	single mark
SH...H1SS	402	High load table, double wedge, single piezo element	S	single mark
SL...S5SS	500	Linear positioner, single piezo element ¹	S	single mark
SL...D5SS	501	Linear positioner, double piezo element ¹	S	single mark
SL...T5SS	502	Linear positioner, triple piezo element ¹	S	single mark
SL...S5SC1	503	Linear positioner, single piezo element ¹	S	DC marks
SL...D5SC1	504	Linear positioner, double piezo element ¹	S	DC marks
SL...T5SC1	505	Linear positioner, triple piezo element ¹	S	DC marks
SL...T5SC2	508	Linear positioner, double piezo element ¹	S	DC marks (alternating)
SR...S5S5S	509	Small rotary positioner ¹	S	single mark
SR...S5S6S	512	Rotary positioner ¹	S	single mark
SR...D5S6S	513	Rotary positioner, double piezo element ¹	S	single mark
SR...T5S6S	514	Rotary positioner, triple piezo element ¹	S	single mark
SR...D5S7S	516	Rotary positioner, double piezo element ¹	S	single mark
SR...D5S8S	519	Large rotary positioner, double piezo element ¹	S	single mark

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Table 1.1 – Continued from previous page

Positioner Type	Type Code	Actuator	Sensor	Reference
SR...T5S8S	520	Large rotary positioner, triple piezo element ¹	S	single mark
SG...T5S1S	526	Goniometer, 60.5mm radius, triple piezo element ¹	S	single mark
SG...T5S2S	529	Goniometer, 77.5mm radius, triple piezo element ¹	S	single mark
SG...T5S3S	532	Goniometer, 93.5mm radius, triple piezo element ¹	S	single mark
SL...S5LE	542	Linear positioner, single piezo element ¹	L	endstop
SL...D5LE	543	Linear positioner, double piezo element ¹	L	endstop
SL...T5LE	544	Linear positioner, triple piezo element ¹	L	endstop
SL...S5LS	545	Linear positioner, single piezo element ¹	L	single mark
SL...D5LS	546	Linear positioner, double piezo element ¹	L	single mark
SL...T5LS	547	Linear positioner, triple piezo element ¹	L	single mark
SL...S5LC1	548	Linear positioner, single piezo element ¹	L	DC marks
SL...D5LC1	549	Linear positioner, double piezo element ¹	L	DC marks
SL...T5LC1	550	Linear positioner, triple piezo element ¹	L	DC marks
SR...S5L2S	554	Rotary positioner ¹	L	single mark
SR...D5L2S	555	Rotary positioner, double piezo element ¹	L	single mark
SL...D5P1E	561	Linear positioner, double piezo element ¹	P	endstop
SL...T5P1E	562	Linear positioner, triple piezo element ¹	P	endstop
SG...T5L1S	582	Goniometer, 60.5mm radius, triple piezo element ¹	L	single mark
SG...T5L2S	584	Goniometer, 77.5mm radius, triple piezo element ¹	L	single mark

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Table 1.1 – Continued from previous page

Positioner Type	Type Code	Actuator	Sensor	Reference
SG...T5L1E	588	Goniometer, 60.5mm radius, triple piezo element ¹	L	endstop
SG...T5L2E	590	Goniometer, 77.5mm radius, triple piezo element ¹	L	endstop
SG...T5L1C1	597	Goniometer, 60.5mm radius, triple piezo element ¹	L	DC marks
SG...T5L2C1	599	Goniometer, 77.5mm radius, triple piezo element ¹	L	DC marks
SR...T5L3S	605	Rotary positioner, triple piezo element ¹	L	single mark
SH...H5LS	606	High load table, double wedge, triple piezo element ¹	L	single mark

1.3.2 Dual-Piezo Hybrid Positioners

Dual-piezo hybrid positioners consist of a stick-slip piezo actuator and a stacked piezo scanner in one positioner. These types are supported by the stick-slip piezo driver module of the MCS2. The type must be configured manually to the channel. Each channel stores the positioner type setting to non-volatile memory. Consequently, there is no need to configure the positioner type for each session. Only when changing the physical setup (switching positioners etc.) the channel must be reconfigured (and calibrated) again.

Table 1.2 – Dual Piezo Hybrid Positioner Types

Positioner Type	Type Code	Actuator	Sensor	Reference
DL...D1SS	4000	Linear positioner, stick-slip actuator with double piezo element, piezo scanner (Type 1)	S	single mark
DL...D1SC1	4001	Linear positioner, stick-slip actuator with double piezo element, piezo scanner (Type 1)	S	DC marks
DL...D2SS	4002	Linear positioner, stick-slip actuator with double piezo element, piezo scanner (Type 2)	S	single mark
DL...D2SC1	4003	Linear positioner, stick-slip actuator with double piezo element, piezo scanner (Type 2)	S	DC marks

¹Positioner with production date 05-2019 and later.

1.3.3 Electromagnetic Driven Positioners

SmarAct brushless permanent magnet positioners are equipped with the SmarAct positioner ID system. The positioner type is automatically detected and configured when the positioner is attached to a channel. Note that the channel must be calibrated once again after the positioner type was changed by the automatic detection (e.g. after switching positioners etc.).

Table 1.3 – Electromagnetic Driven Positioner Types

Positioner Type	Type Code	Actuator	Sensor	Reference
ML...T1SS	3000	Linear positioner, 1N maximum continuous force	S	single mark
ML...T1SC1	3001	Linear positioner, 1N maximum continuous force	S	DC marks
ML...T2SS	3002	Linear positioner, 2N maximum continuous force	S	single mark
ML...T2SC1	3003	Linear positioner, 2N maximum continuous force	S	DC marks
ML...T3SS	3004	Linear positioner, 7.5N maximum continuous force	S	single mark
ML...T3SC1	3005	Linear positioner, 7.5N maximum continuous force	S	DC marks

1.4 Stick-Slip Positioner Types Cross Reference

The following table acts as a cross reference between the sensor types of the MCS1 controller to the positioner types of the MCS2 controller.

Table 1.4 – Cross Reference

MCS2 Positioner Type	MCS2 Type Code	MCS1 Symbol	MCS1 Type Code	Positioner Series
SL...S1SS	300	S	1	SLCxxxxs SLSxxxxs
SL...D1SS	301	SD	21	SLCxxxxds SLSxxxxds SLLxxs
SL...T1SS	302	SP	5	SLCxxxrs
SL...S1SC1	303	SC	6	SLCxxxsc SLSxxxsc
SL...D1SC1	304	SCD	24	SLCxxxds SLSxxxds
SL...D1SC2	307	SC500	18	SLLxxsc
SR...S1S5S	309	SR20	8	SR2013s SR1612s
SR...S1S6S	312	SR	2	SR36xxs SR3511s SR5714s SR7021s SR2812s SR7012s SR4513s SR5018s
SR...D1S6S	313	SR2	23	SR36xxds SR3511ds SR5714ds SR7021ds SR2812ds
SR...T1S7S	316	SR77	20	SR7021xxsn, su, sun
SR...T1S8S	320	SR120	37	SR120xxs
SG...D1S1S	325	G605DS	48	SGO60.5s SGO60.5ds
SG...D1S2S	328	G775DS	49	SGO77.5s SGO77.5ds
SL...S1LE	342	LE	43	SLCxxxle SLSxxxle

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Table 1.4 – Continued from previous page

MCS2 Positioner Type	MCS2 Type Code	MCS1 Symbol	MCS1 Type Code	Positioner Series
SL...D1LE	343	LED	44	SLCxxxxdle SLSxxxxdle
SL...S1LS	345	L	41	SLCxxxxl SLSxxxxl
SL...D1LS	346	LD	42	SLCxxxxdl SLSxxxxdl
SL...S1LC1	348	LC	38	SLCxxxxlc SLSxxxxlc
SL...D1LC1	349	LCD	40	SLCxxxxdlc SLSxxxxdlc
SR...S1L2S	354	LR	39	SR4011l SR4513l
SR...D1L2S	355	-	-	SR4011dl SR4513dl
SL...S1ME	357	M	9	SLCxxxxm
SL...D1ME	358	MD	32	SLCxxxxdme
SG...S1M1E	363	GD	11	SGO60.5m
SG...S1M2E	366	GE	12	SGO77.5m
SG...D1L1S	381	G605L	50	SGO60.5l
SG...D1L2S	383	G775L	51	SGO77.5l
SG...D1L1E	387	G605LE	53	SGO60.5le
SG...D1L2E	389	G775LE	54	SGO77.5le
SG...D1L1C1	396	G605LC	57	SGO60.5lc
SG...D1L2C1	398	G775LC	58	SGO77.5lc
SG...D1L2E	389	G775LE	54	SGO77.5l

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