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SL-1 Basic Commands

Frequent commands:

Command	Description *Not implemented yet
G90	Absolute coordinates
G91	Relative Coordinates
G60	Exact stop
G64	Continuous-path-mode
G0 X Y Z	Move at maximum speed
G1 X Y Z F	Move at defended speed (F)
G2 X Y Z I J K F	Rotate clockwise around centre with defined speed (F)
G3 X Y Z I J K F	Rotate anti-clockwise around centre with defined speed (F)
G4 F	Delay (F) in seconds
M0	Wait for command
M2	*End of main program with return to beginning of program
M30	End of program
M55	Move laser mirror to home
M56	Move laser mirror to Channel 1
R0	Arithmetic parameter
R1...R99	Arithmetic parameters
;	Everything in the block after semicolon will be commented

System and subsystems related commands:

M50		Laser Beam ON
M51		Laser Beam OFF
H1=	(15.10 – 105.10)	Set Laser Power (%)
M60		Powder Calibration ON
M61		Powder Calibration OFF
M62		Powder Mixer ON
M63		Powder Mixer OFF
M64		Carrier Gas ON
M65		Carrier Gas OFF
M66		Powder Feed ON
M67		Powder Feed OFF
H2=	(0.0 – 10.0)	Set Powder Flow Value (RPM)

System and subsystems related commands:

M68		Wire Retraction ON
M69		Wire Retraction OFF
M70		IMC Program 1
M71		IMC Program 2
M72		IMC Process ON
M73		IMC Process OFF
H3=	(0 – 1)	IMC Variable Control*
M74		Exhaustion ON*
M75		Exhaustion OFF*
M76		Cross-jet ON
M77		Cross-jet OFF
M78		Gas 1 ON
M79		Gas 1 OFF
M80		Gas 2 ON*
M81		Gas 2 OFF*
M82		Laser Modulation Signal 1 ON
M83		Laser Modulation Signal 1 OFF
M84		Laser Modulation Signal 2 ON
M85		Laser Modulation Signal 2 OFF
M86		Laser Modulation Signal 3 ON
M87		Laser Modulation Signal 3 OFF
M88		Laser Pointer ON
M89		Laser Pointer OFF
M90		*
M91		*

Subprogram specific commands:

PROC NAME	Define subprogram name
M17	End subprogram
RET	End subprogram

Operators/mathematical functions: (simplified)

+	Addition
-	Subtraction
*	Multiplication
/	Division
Sin()	Sine
COS()	Cosine
TAN()	Tangent
ASIN()	Arcsine
ACOS()	Arccosine
ATAN2()	Arctangent2
SQRT()	Square root
ABS()	Absolute number

Operators/mathematical functions: (simplified)

POT()	Elevate to 2nd power (square)
TRUNC()	Truncate to integer
ROUND()	Round to integer
LN()	Natural logarithm
EXP()	Exponential function

Comparison and logic operators:

==	Equal to
!=	*Not equal to
<>	Not equal to
>	Greater than
<	Less than
>=	Greater than or equal to
<=	Less than or equal to
AND	AND
OR	OR
NOT	Negation
XOR	Exclusive OR

Data types:

INT	Integers with sign
REAL	Real numbers
BOOL	Boolean values: TRUE (1) and FALSE (0)
CHAR	ASCII character specified by the code
STRING	Character string, number of characters in [...], max. of 200 characters

Flow statements and other commands:

name: ... REPEAT name P=__	Establishes a loop inside “name:” and “REPEAT name” to be repeated P+1 times. Zero is an invalid assignment for P

IF (*condition*)
...
ELSE
...
ENDIF
	Standard conditional programming. Command “ELSE” is optional

Flow statements and other commands:

WHILE (*condition*)
...
ENDWHILE
	Standard conditional programming

DEF (*data type*) name = ___	Defines variable with type restrictions