

Serial Parsing State Machine

1 Description

This Mealy state machine converts a string containing a character indicating the function, and a positive or negative integer indicating the argument to that function. It does this by parsing a single character at a time. The character must be a valid character, and the integer can be preceded by a '+' or '-' to indicate its sign.

2 Inputs

Character(s)	Input Class	Token Name	Value
S	Function	TOKEN_S	Word (function pointer)
V	Function	TOKEN_V	Word (function pointer)
D	Function	TOKEN_D	Word (function pointer)
T	Function	TOKEN_T	Word (function pointer)
E	Function	TOKEN_E	Word (function pointer)
F	Function	TOKEN_F	Word (function pointer)
O	Function	TOKEN_O	Word (function pointer)
B	Function	TOKEN_B	Word (function pointer)
X	Function	TOKEN_X	Word (function pointer)
+	Sign	TOKEN_POS	+1
-	Sign	TOKEN_NEG	-1
0-9	Digit	TOKEN_DIGIT	0-9
[SPACE], [TAB]	Space	TOKEN_SPACE	0
\0, [CTRL+M]	End of Command	TOKEN_EOC	0
All others	Invalid	TOKEN_INVALID	Character

3 Outputs and Actions

Actions	Description
DoNOP	Does nothing.
DoSetSpeed	Sets the speed to the specified speed.
DoSetRelSpeed	Changes the speed by adding on the specified interval.
DoSetDirection	Change the direction relative to the current direction.
DoRotateTurAngle	Rotate the turret angle relative to its current angle, or set the absolute turret angle.
DoSetTurAngle	Set the turret elevation angle.
DoFireLaser	Turn the laser on.
DoLaserOff	Turn the laser off.
DoSetBaudRate	Set the baud rate to the specified baud rate.
DoInsane	Do the insane dance!
DoSign	Indicate whether or not the argument is signed.
SetupArg	Setup the argument to the action functions.
LogError	Log that a parsing error occurred.

4 States

State	Description
Initial	Idle, waiting for more input.
SetSpeed	Setting the RoboTrike speed.
SetRelSpeed	Changing the speed of the RoboTrike relative to its current speed.
SetDirection	Changing direction of the RoboTrike relative to current direction.
RotateTurAngle	Rotating the turret left or right.
SetTurAngle	Raising or lowering the turret to a specific elevation.
FireLaser	Turning the laser on.
LaserOff	Turning the laser off.
BaudRate	Changing the baud rate of the serial channel.
Insane	RoboTrike in insane mode.
Error	When any errors occur.