

# VXM Stepping Motor Controller

## Application Note # AN106

### Acceleration Units and Start Stop Speeds

The VXM's acceleration setting range is 1 to 127 with the units being 4000 steps/second<sup>2</sup>.

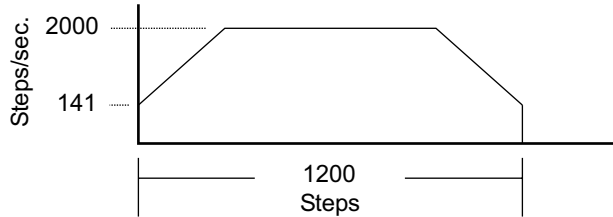
The VXM uses a start and stop speed derived from the acceleration value. The start/stop speed, also known as base speed, is an instantaneous speed the step motor can be commanded to change to without loss of synchronism.

Under high acceleration the motor will momentarily lag a small amount from its commanded position. Too high an acceleration setting will produce motor lag of more than 1 motor pole (7.2 degrees = 8 steps) resulting in loss of synchronism (motor stall.)

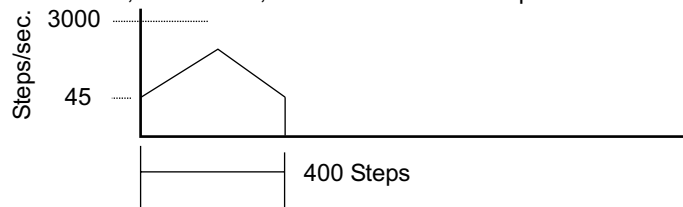
Refer to the table at the right for corresponding value for acceleration values and start/stop speeds.

The standard move produced from an Index is a trapezoidal profile. If the distance is too short to reach the set speed the move is a triangular profile. When an index distance is less then 3 steps the VXM runs at the start/stop speed or the set speed whichever is less (no acceleration or deceleration.) When the set speed is below start/stop the move will be run at the set speed (no acceleration or deceleration.)

When "I" = 1200, "S" = 2000, and "A" = 2 = 8000 steps/sec/sec:



When "I" = 400, "S" = 3000, and "A" = 1 = 4000 steps/sec/sec:



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"x" = value in AmMx command

x	Step/sec/sec	Start/Stop Speed	x	Step/sec/sec	Start/Stop Speed
1	4000	45	65	260000	1014
2	8000	141	66	264000	1022
3	12000	190	67	268000	1030
4	16000	228	68	272000	1037
5	20000	261	69	276000	1045
6	24000	290	70	280000	1051
7	28000	316	71	284000	1060
8	32000	341	72	288000	1068
9	36000	363	73	292000	1075
10	40000	385	74	296000	1083
11	44000	405	75	300000	1090
12	48000	424	76	304000	1098
13	52000	443	77	308000	1105
14	56000	461	78	312000	1112
15	60000	478	79	316000	1119
16	64000	494	80	320000	1126
17	68000	510	81	324000	1133
18	72000	525	82	328000	1141
19	76000	540	83	332000	1147
20	80000	551	84	336000	1154
21	84000	569	85	340000	1161
22	88000	583	86	344000	1168
23	92000	597	87	348000	1175
24	96000	610	88	352000	1182
25	100000	623	89	356000	1189
26	104000	636	90	360000	1195
27	108000	648	91	364000	1202
28	112000	660	92	368000	1208
29	116000	672	93	372000	1215
30	120000	684	94	376000	1222
31	124000	696	95	380000	1229
32	128000	707	96	384000	1235
33	132000	718	97	388000	1241
34	136000	730	98	392000	1248
35	140000	740	99	396000	1254
36	144000	751	100	400000	1261
37	148000	762	101	404000	1267
38	152000	772	102	408000	1273
39	156000	783	103	412000	1279
40	160000	793	104	416000	1285
41	164000	803	105	420000	1292
42	168000	813	106	424000	1298
43	172000	822	107	428000	1304
44	176000	832	108	432000	1310
45	180000	842	109	436000	1317
46	184000	851	110	440000	1323
47	188000	860	111	444000	1328
48	192000	870	112	448000	1335
49	196000	879	113	452000	1341
50	200000	888	114	456000	1346
51	204000	897	115	460000	1352
52	208000	906	116	464000	1358
53	212000	914	117	468000	1364
54	216000	923	118	472000	1370
55	220000	932	119	476000	1376
56	224000	941	120	480000	1382
57	228000	949	121	484000	1387
58	232000	957	122	488000	1394
59	236000	966	123	492000	1399
60	240000	974	124	496000	1405
61	244000	982	125	500000	1410
62	248000	990	126	504000	1416
63	252000	998	127	508000	1422
64	256000	1006			

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