

S-Curve Profiles Using PMV

Associated QuickControl™ program file: QCI-AN021 S-Curve Profiles Using PMV.qcp

Associated MS Excel spreadsheet: QCI-AN021 S-Curve Profiles Using PMV.xls

The Profile Move (PMV) command allows the user to create custom motion profiles that can fit almost any shape. Since S-Curve Factor (SCF) does not work with the PMV command, a segmented approximation allows the user to achieve S-Curve like motion profiles. Figure 1 shows a true S-Curve profile and a 9 segment S-Curve approximation overlaid on top.

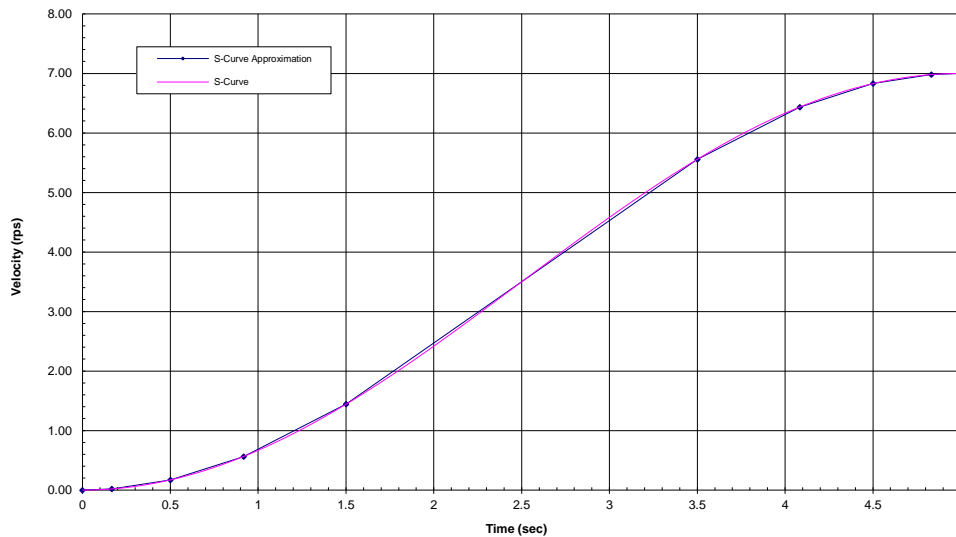


Figure 1 – Motion Profiles of a true S-Curve and 9 segment approximation

Using the S-Curve Approximation Worksheet that accompanies this document, a user can create smooth tiered motion profiles similar to those shown in Figure 2. The worksheet generates the necessary delays and acceleration/deceleration values to include in your program.

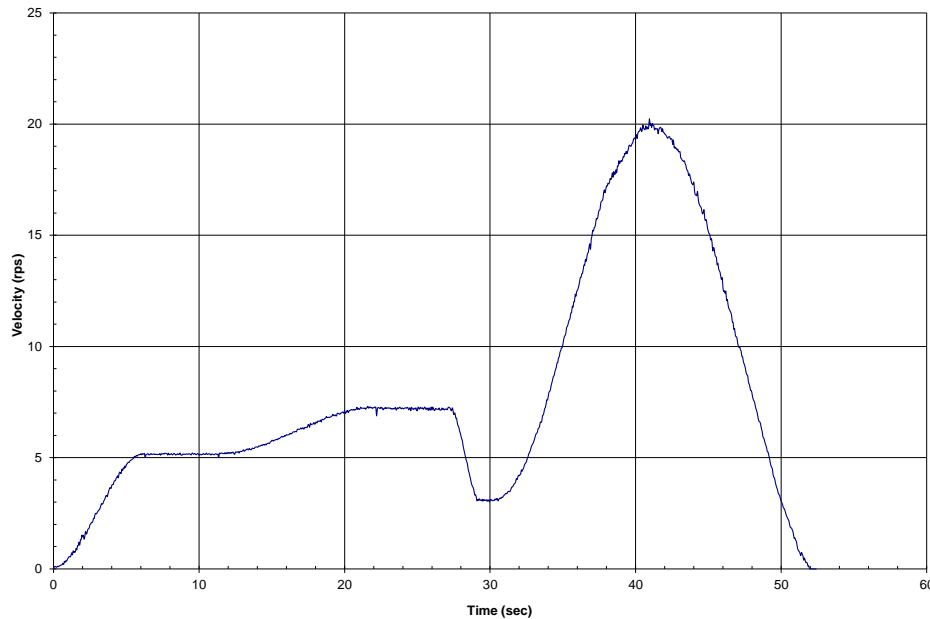


Figure 2 – Actual tiered SilverMax motion profile from the Profile Move with S-Curve Approximation.qcp

The following steps show the basic program format for creating a Profile Move with S-Curve like acceleration.

- Step 1. Enable Multi-Tasking (EMT). This allows the motor to servo other commands while a motion is in progress.
- Step 2. Using the Write Register, Program Mode (WRP) command, write the initial PMV parameters to Data Registers 20 through 23. The first acceleration value is extracted from the S-Curve Approximation Worksheet and written into register 21. The final velocity value, register 22, is the desired final velocity. The deceleration value, register 23, is an consistent value that can be changed at a later time.
- Step 3. Begin the Profile Move.
- Step 4. Set a Delay (DLY) for xxxx msecs. This delay value is obtained from the Approximation Worksheet.
- Step 5. WRP: User Register 21 with xxxx rps/s. This acceleration value is extracted from the Approximation Worksheet.
- Step X. Repeat steps 4 and 5 until the desired profile calculated from the Approximation Worksheet is complete.