

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.

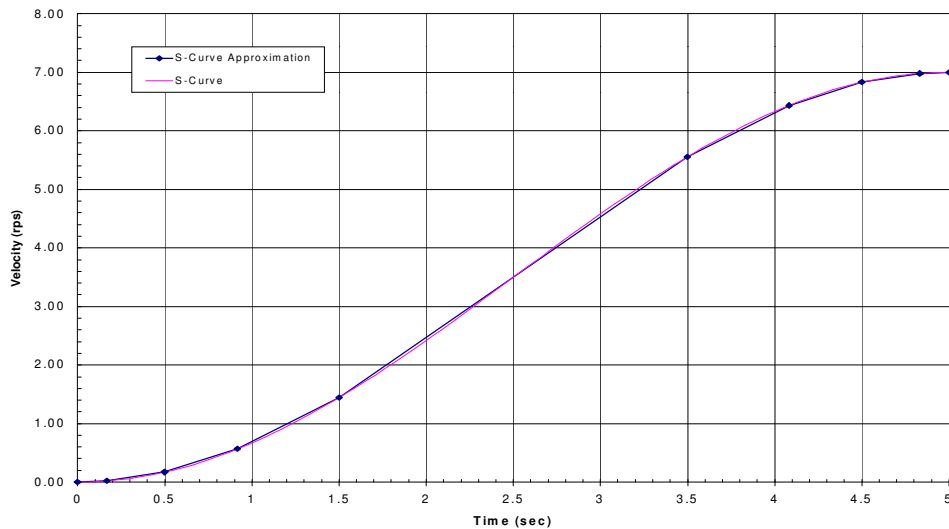


Figure 1 – Motion Profiles of a true S-Curve and 9 segment approximation

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.

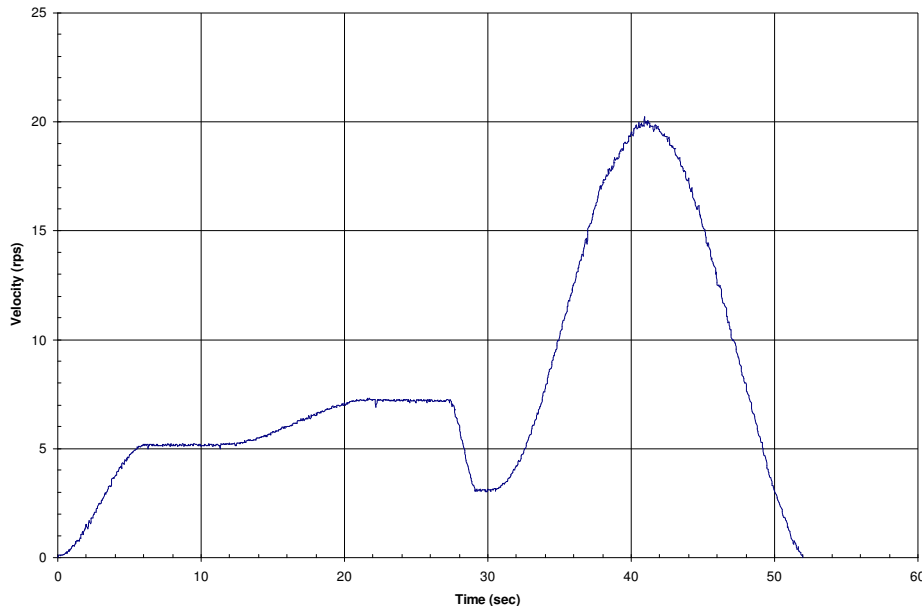


Figure 2 – Actual tiered SilverMax motion profile from the Profile Move with S-Curve Approximation.qcp

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 a 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.