Record and Playback

Associated files:

- Record and Playback.qcp.
- Record and Playback.txt.

Overview

The SilverLode servo can duplicate motion in real time by recording and playing back a motion profile. The SilverLode servo has a maximum of 32Kbytes of memory, limiting the space available for recording long sequence of motion

It is assumed the reader is familiar with:

- Register Files (see App Note QCI-AN048 Register Files)
- Register File Array (see App Note QCI-AN048 Register Files)
- Indirect Addressing (see App Note QCI-AN048 Register Files)
- Position Input Mode (PIM) Command (see PIM in Command Reference)
- Analog Inputs (see Analog Inputs in User Manual or Application Note:QCI-AN023 Analog Inputs)

Record and Playback.qcp

It is assumed the SilverLode servo is attached to a QuickSilver Training Breakout (QCI-BO-T). Training Breakouts ground I/O #1, #3 and #5 through switches (closed switch = Low input). I/O #2 is wired to a LED (I/O #2 Low = LED on).

Record and Playback.qcp uses three programs: Init, Playback, and Record. These programs work together to record and playback motion profiles. A text file, Record and Playback.txt, associated with the Record and Playback program must reside in the same folder.

The program tracks command position and logs it into a Register File Array. The recording phase is limited by the array elements defined in the Record and Playback.txt, in this case 700 rows.

I/O #1 and #3 Select Record or Playback as follows
I/O# 1 LOW == Record
I/O# 3 LOW == Playback
Both I/O #1 and #3 must be high between choices.

The LED (I/O #2) has the following states:
On for recording
Blinking for waiting for user to select record or playback
Off for playing back.

Init Program

The Init program initializes several registers used in indirect addressing and the Position Input Mode (PIM) command. It then waits for the user to select which mode to execute, record or playback.

To index each row of the Register File Array, the row address, total array size and size of each row is stored into Next Adr[26], Max Num Points[29] and Adr Inc[27] respectively.

Record Program

PIM: The Record program enables multi-tasking (EMT) so that the PIM command will be launched in the background and the rest of the program will continue to execute.

CONT REC: With PIM working in the background, the "Continue Recording" section repeats until either the array fills up or I/O #1 goes high.

The subroutine REC reads data coming from I/O #4 (analog #1) every 20msec. The data is stored into the Register File Array using indirect address.

STOP: Once recording is complete, the LED is turned off and the servo is commanded to stop. The total number of points recorded is stored to non-volatile memory and the Init program is run.

Playback Program

PIM: Like the Record program, multi-tasking is enabled. Next the registers are initialized for indirect address and finally PIM is launched in the background.

CONT PLAY: The "Continue Playing" section repeats until either all the points are played back or I/O #3 goes high.

The subroutine PLAY iterates through the Profile array every 20ms reading motion data from non-volatile memory and copying it into register 12. Register 12 is used by the PIM command for motion.

STOP: Once playback is complete, the servo is stopped and the Init program is run.

Record and Playback is a powerful feature incorporated by the SilverLode servo family. Please consult the command reference and the user manual for additional information on any commands encounter herein. Both documents can be seen at QuickSilver's website at www.QuickSilverControls.com under support - manuals.