Programmable Limit Switch (PLS)
Associated files:
- PLS Demo.qcp
- PLS – PLT ON OFF.qcp

Required Software
SilverDust Firmware (not available on SilverNugget):
- SilverDust MG – Rev 15-10
- SilverDust IG & IGB – Rev 15-11

QuickControl
- Rev 4.3 Service Release 3

Overview
The PLS command allows user to construct a data table up to any number of pre-defined of trigger points. The pre-defined trigger points will be stored in the user registers in terms of position in counts. The flexibility of the command also enables user to choose the I/O to trigger and the modulo point where the cycle repeats.

The controller’s interrupt cycle compares the current position with the positions in the data table every 120 uSec (microseconds). When the transition point is reached, the state of the I/O will transition automatically.

Command PLS Parameters & Data Table
The PLS command has four parameters.

1) The first parameter is the IO line number to be triggered. Output 2 in this example.

2) The second parameter is the initial state of the output, which is High(1) in this case.

3) The third parameter is the base register or starting register of the data table where the predefined trigger points are located.

4) The last parameter is the number of desired trigger points. The number of registers needed is the number of trigger points + 2. If the starting register is 30, then registers 30, 31, 32, 33, 34 and 35 must be reserved for this operation. Any changes in those registers while the PLS command is active will produce undesirable results at the output stage.
Data Table
For the above example, the following data table is constructed:

Example 1:

Register 30 – Reserved
Register 31 – Modulo Value
Register 32 – First Transition Point
Register 33 – Second Transition Point
Register 34 – Third Transition Point
Register 35 – Last Transition Point

<table>
<thead>
<tr>
<th>Register #</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Register 30</td>
<td>NA</td>
</tr>
<tr>
<td>Register 31</td>
<td>16000</td>
</tr>
<tr>
<td>Register 32</td>
<td>1000</td>
</tr>
<tr>
<td>Register 33</td>
<td>4000</td>
</tr>
<tr>
<td>Register 34</td>
<td>5000</td>
</tr>
<tr>
<td>Register 35</td>
<td>7000</td>
</tr>
</tbody>
</table>

Timing Diagram for 1 Cycle

Note: The number of triggers can be any arbitrary value up to the amount of free registers available.
**Flexibility:** Registers 31-35 can be modified on the fly to change the location of trigger points as well as the modulo value. The new value will take effect next servo cycle. The delay will be one servo cycle = 120 uSec.

**Caution:** PLS is a mode command. The command is active until a stop command or an all halt command issue. I/O trigger will still occur if the shaft rotated manually by user during driver motor disable period. An alternative to turning off I/O triggering is the PLT command. See PLT description below.
Programmable Limit Trigger (PLT)

Programmable Limit Trigger (PLT) allows enabling/disabling I/O triggering set up by PLS. PLT also provides additional flexibility by changing the number of trigger points without resetting the modulo counter. For example, if the application requires 4 triggers from 10000 – 20000 counts and only 2 triggers from 20000-30000 counts. Please note that in order to use PLT, prior PLS command setup is required.

1) Select the same or a different I/O to trigger. Set "IO Line #" to 0 to turn off triggering.

2) Select the same or different initial state.

3) Select the same or different number of trigger points. The starting base register remains the same.

See “PLS – PLT ON OFF.qcp” for example.