

T E C H N I C A L N O T E

Doc No.: TN30-24
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Version: 1.0
Subject: Simple Shift Register (FIFO) Example

This program example demonstrates a simple FIFO shift register. The term FIFO stands for "first in first out". This technique is useful when an event needs to be recorded and acted on at some later time. A typical example of this would be for product reject handling. Where product defects are detected at one machine station, the bad product is tracked though the machine as it indexes, and then ejected at some later station.

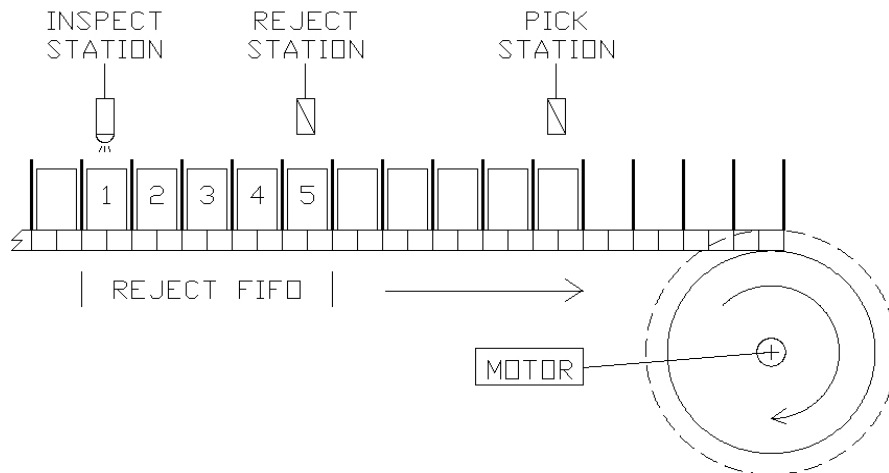


Fig. 1 - Machine line diagram.

The data input is a TRUE/FALSE condition from the inspection station that needs to be shifted through the register. In this example we are going to use five VR variables to store the data. Pointer variables are used to manipulate where the data is loaded and unloaded from the FIFO.

The program can be tested by using the MotionPerfect Digital I/O Status to force output 8 which simulates the inspection station sensor. The product reject output will be indicated by output 9. The FIFO shift data is displayed in the MotionPerfect Terminal 5 window.

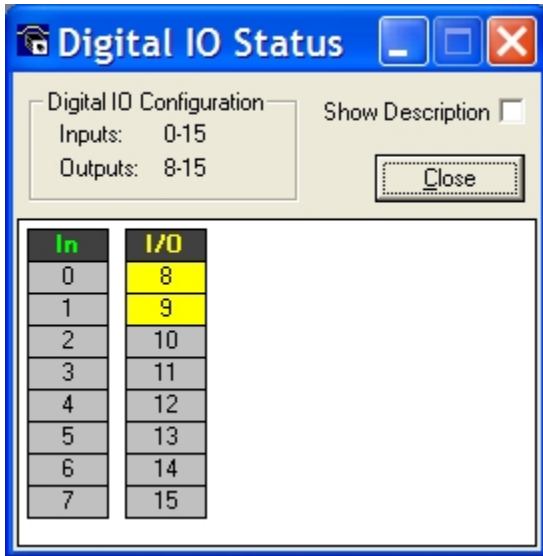


Fig. 2 - Digital I/O Status window.

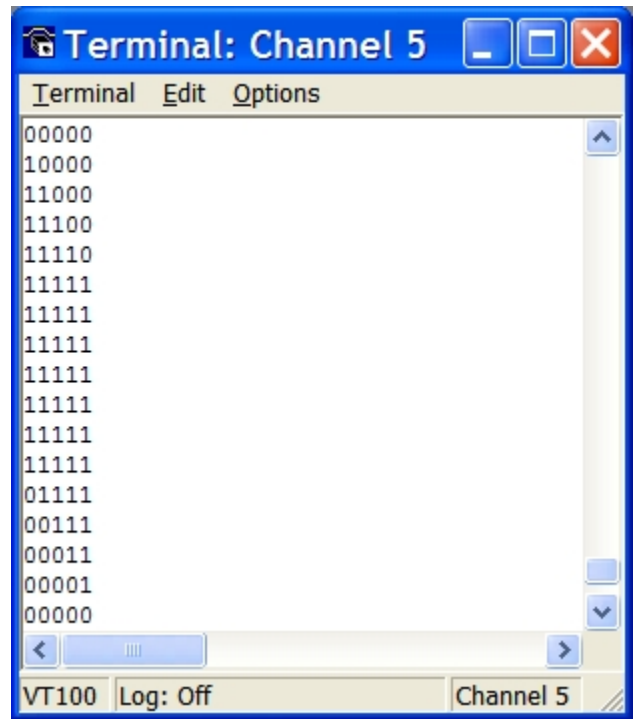


Fig. 3 - Program output display.

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'=====
' Filename: FIFO.BAS
' Revisions:
'   21Mar07 - Initial release. (AMS)
'-----
' Abstract:
' This program demonstrates a simple FIFO shift register.
'=====

'--Zero VR(0) thru VR(4) used to store the five register FIFO data.
VR(0)=0
VR(1)=0
VR(2)=0
VR(3)=0
VR(4)=0

'--Init some variables.
i_pointer=0 'input data VR pointer
o_pointer=1 'output data VR pointer
inspect_i=8 'input point for product inspection station

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reject_o=9 'output point for product reject station
dwell=500 'shift dwell time

OP(reject_o,OFF) 'force product reject output signal off

'--Main loop.
WHILE 1=1
  i_pointer = (i_pointer+1) MOD(5) 'increment FIFO input pointer
  o_pointer = (o_pointer+1) MOD(5) 'increment FIFO output pointer

  '--Check product inspection input to load FIFO.
  IF IN(inspect_i)=ON THEN
    VR(i_pointer)=1 'load 1 for rejected product
  ELSE
    VR(i_pointer)=0 'load 0 for good product
  ENDIF

  '--Check FIFO output pointer to fire product reject output.
  IF VR(o_pointer)=1 THEN OP(reject_o,ON)
  WA(dwell)
  OP(reject_o,OFF)

  GOSUB display_fifo
  WA(dwell)
WEND

display_fifo:
  pa=(i_pointer+4) MOD(5)
  pb=(i_pointer+3) MOD(5)
  pc=(i_pointer+2) MOD(5)
  pd=(i_pointer+1) MOD(5)
  PRINT #5,VR(i_pointer)[0];VR(pa)[0];VR(pb)[0];VR(pc)[0];VR(pd)[0]
RETURN
'=====

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