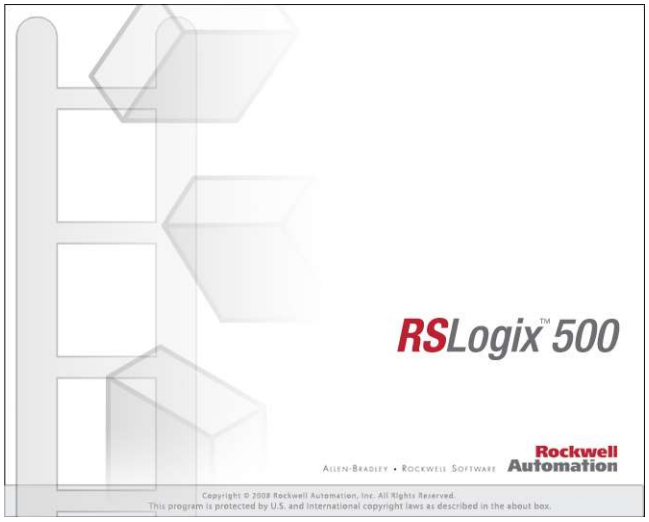
RSLogix Micro Project Report



Processor Information

Processor Type: Bul.1763 MicroLogix 1100 Series B

Processor Name: UNTITLED

Total Memory Used: 914 Instruction Words Used - 73 Data Table Words Used

Total Memory Left: 5742 Instruction Words Left

Program Files: 5

Data Files: 15

Program ID: 495a

I/O Configuration

0	Bul.1763	MicroLogix 1100 Series B
1		
2		
3		
4		

Channel Configuration

CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex Edit Resource/Owner Timeout: 60
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex Passthru Link ID: 1
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex Write Protected: No
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex Comms Servicing Selection: Yes
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex Message Servicing Selection: Yes
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex 1st AWA Append Character: \d
CHANNEL 0 (SYSTEM) - Driver: DF1 Full Duplex 2nd AWA Append Character: \a

Source ID: 1 (decimal)
Baud: 19200
Parity: NONE
Control Line : No Handshaking
Error Detection: CRC
Embedded Responses: Auto Detect
Duplicate Packet Detect: Yes
ACK Timeout(x20 ms): 50
NAK Retries: 3
ENQ Retries: 3

CHANNEL 1 (SYSTEM) - Driver: Ethernet
CHANNEL 1 (SYSTEM) - Driver: Ethernet Edit Resource/Owner Timeout: 60
CHANNEL 1 (SYSTEM) - Driver: Ethernet Passthru Link ID: 1
CHANNEL 1 (SYSTEM) - Driver: Ethernet Write Protected: No
CHANNEL 1 (SYSTEM) - Driver: Ethernet Comms Servicing Selection: Yes
CHANNEL 1 (SYSTEM) - Driver: Ethernet Message Servicing Selection: Yes

Hardware Address: 00:00:00:00:00:00
IP Address: 0.0.0.0
Subnet Mask: 0.0.0.0
Gateway Address: 0.0.0.0
Msg Connection Timeout (x 1mS): 15000
Msg Reply Timeout (x mS): 3000
Inactivity Timeout (x Min): 30
Bootp Enable: No
Dhcp Enable Yes
SNMP Enable: No
HTTP Enable: Yes
Auto Negotiate Enable: Yes
Port Speed Enable: 10/100 Mbps Full Duplex/Half Duplex
Contact:
Location:

Program File List

Name	Number	Type	Rungs	Debug	Bytes
[SYSTEM]	0	SYS	0	No	0
	1	SYS	0	No	0
MAIN	2	LADDER	12	No	576
PE_SIMUL8R	240	LADDER	10	No	308
REJSIMUL8R	250	LADDER	7	No	309

Data File List

Name	Number	Type	Scope	Debug	Words	Elements	Last
OUTPUT	0	O	Global	No	12	4	O:3
INPUT	1	I	Global	No	18	6	I:5
STATUS	2	S	Global	No	0	66	S:65
BINARY	3	B	Global	No	10	10	B3:9
TIMER	4	T	Global	No	6	2	T4:1
COUNTER	5	C	Global	No	6	2	C5:1
CONTROL	6	R	Global	No	3	1	R6:0
INTEGER	7	N	Global	No	1	1	N7:0
FLOAT	8	F	Global	No	2	1	F8:0
FIFO	99	N	Global	No	4	4	N99:3
INDEX	199	N	Global	No	1	1	N199:0
INTPESML8R	241	N	Global	No	3	3	N241:2
BITPESML8R	242	B	Global	No	2	2	B242:1
RNGSIMUL8R	251	L	Global	No	4	2	L251:1
BITSIMUL8R	252	B	Global	No	1	1	B252:0

Pass per-item reject status, determined at upstream event, to downstream event

Cf. https://www.plctalk.net/qanda/showthread.php?t=124552

Process
=======

Boxes on a conveyor; two PhotoEye stations (PE1; PE2)
Each box's status judged as [reject] or [okay] when it generates a rising edge at upstream PE1
When each box later generates a rising edge at downstream PE2:
- divert if box status from PE1 was [reject]
- do not divert if box status from PE1 was [okay]

Implementation summary
======================

Bit FIFO/BSR with bit=1 for [reject], bit=0 for [okay]
FIFO size >> number of boxes from PE1 to before PE2
Always push 0-valued bit (status [okay]) at front of FIFO
Keep track of count of boxes in index PAST_PE1_NOT_PE2
At PE2 rising edge
- Pop reject/okay bit
- Decrement index
At PE1 rising edge
- Overwrite FIFO[index] 1-valued bit if current judgment is reject
- Increment index
N.B. Assumptions
- Adequate space between boxes, so 1 rising edge per box at PE1 and at PE2
- No boxed added or subtracted between PE1 and PE2 (or coffee cup blocks PE)

Initialization
==========

Set diverted state to zero
- Alternate: detect diverter state
Set FIFO and index to zero
- Better would be operator input of PAST_PE1_NOT_PE2 index
  - Could also be used for resynchronization
  - Could also set default reject/divert for any boxes past PE1 rising edge

0000

First Pass
S:1
15

DIVERTED
B3:1
U
2

#FIFO_BITS_00_15
FLL
Fill File
Source 0
Dest #N99:0
Length 4

PAST_PE1_NOT_PE2
MOV
Move
Source 0
0<
Dest N199:0
0<

Call simulator subroutines
- Both subroutines do nothing if bit RUN_SIMUL8R (B3:1/15) is 0

0001

First Pass
S:1
15

RUN_SIMUL8R
B3:1
15

Reject Simulator
JSR
Jump To Subroutine
SBR File Number U:250

PhotoEye Simulator
JSR
Jump To Subroutine
SBR File Number U:240

Ensure 0 bit is available to push onto FIFO

0002

ALWAYS_ZERO
B3:0
15

ALWAYS_ZERO
B3:0
U
15

Detect rising edges of PE1 and PE2 inputs
- Also unlatch override test bits

0003

PHOTOEYE_1
I:0
0
Bul.1763

PE1_OVERRIDE
B3:2
0

PE1_STORAGE
OSR
One Shot Rising
Storage Bit B3:0/0
Output Bit B3:1/0

PE1_OVERRIDE
B3:2
0

PE1_OVERRIDE
B3:2
U
0

0004

PHOTOEYE_2
I:0
1
Bul.1763

PE2_OVERRIDE
B3:2
1

PE2_STORAGE
OSR
One Shot Rising
Storage Bit B3:0/1
Output Bit B3:1/1

PE2_OVERRIDE
B3:2
1

PE2_OVERRIDE
B3:2
U
1

Copy current [reject at PE1] input OR override state to local bit
- N.B. Override may be controlled by simulator subroutines

0005

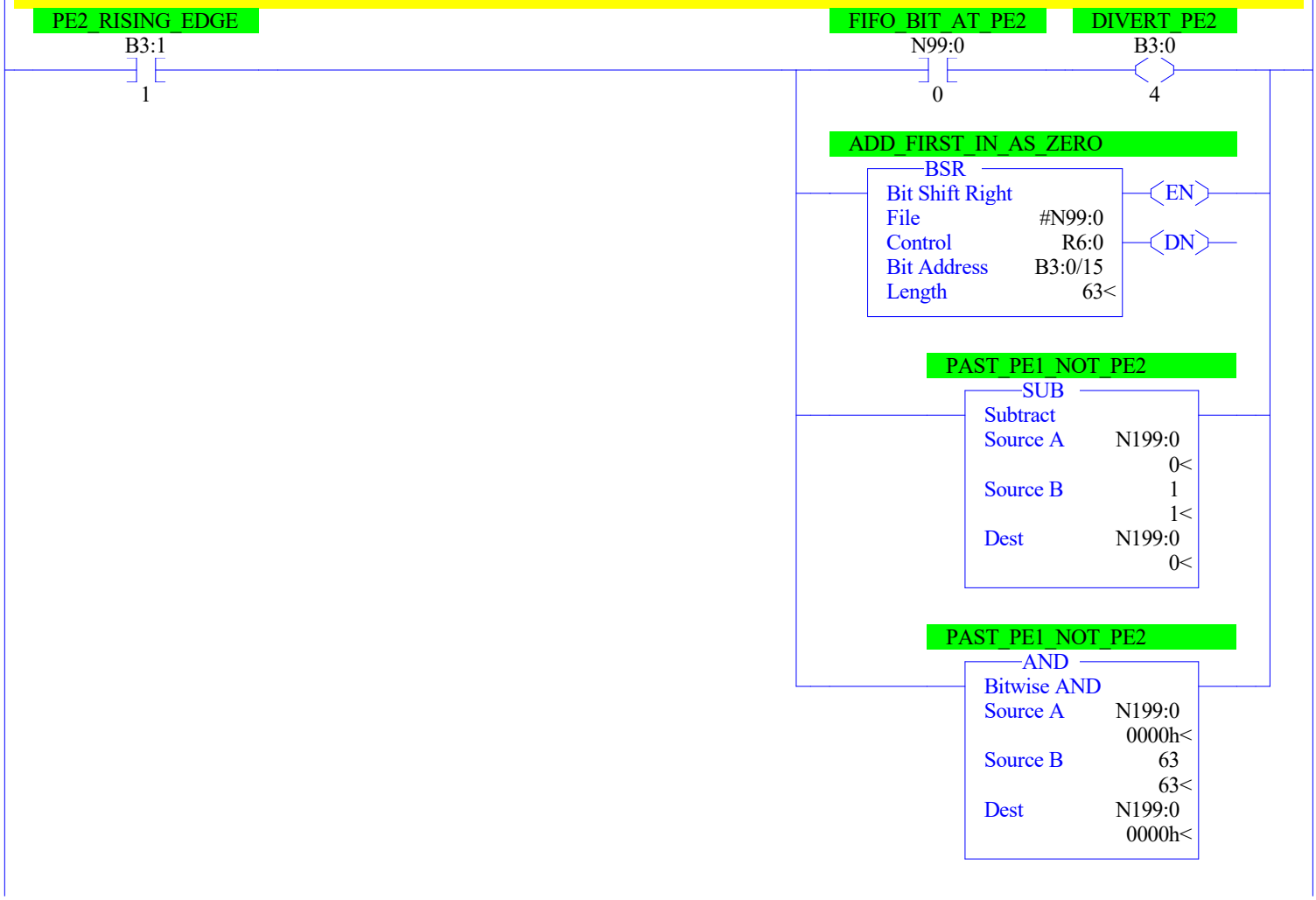
REJECT_AT_PE1
I:0
2
Bul.1763

REJECT_PE1_OVERRIDE
B3:2
3

REJECT_NEXT_PE1
B3:0
3

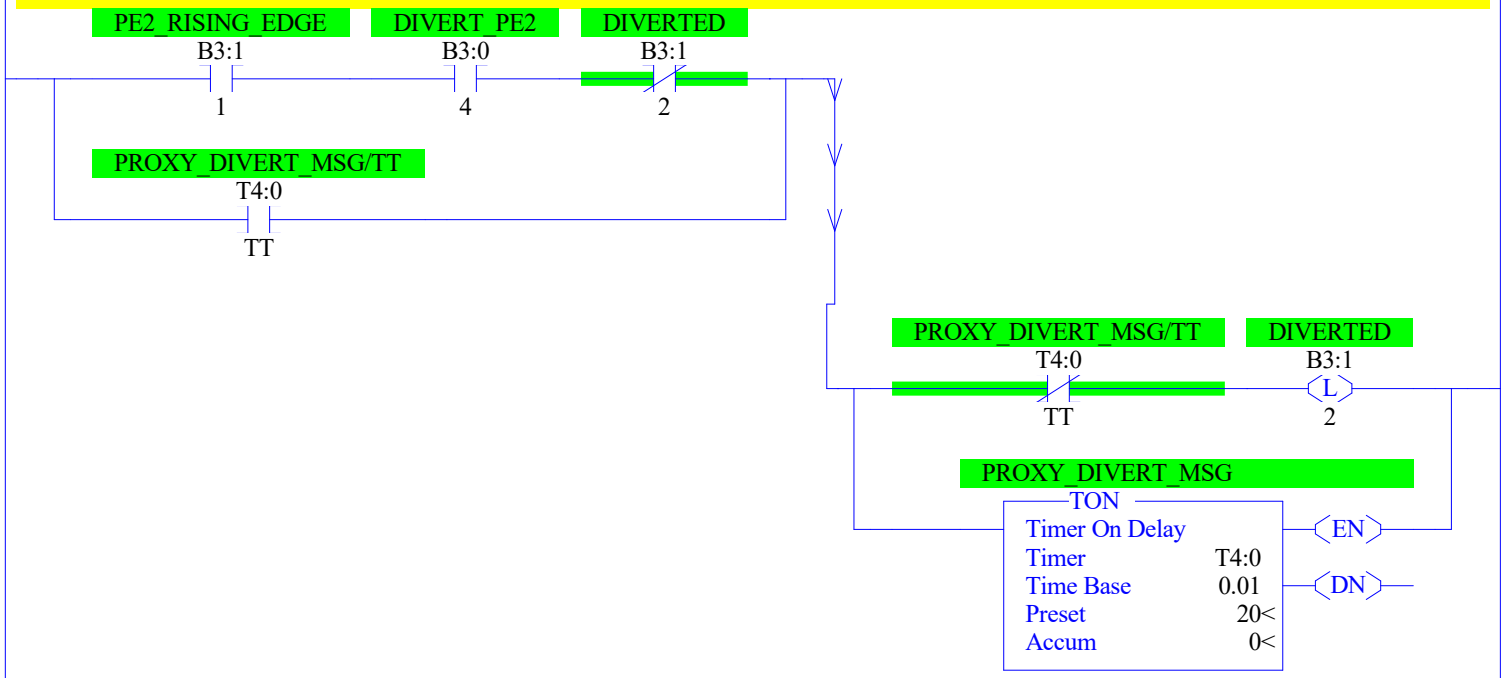
Act on PE2 rising edge Part I
- Pop bit off of FIFO, put in DIVERT_PE2
- Push zero-valued bit ALWAYS_ZERO onto FIFO
- Decrement index (PAST_PE1_NOT_PE2)
 - I.e. box is leaving [PE1:PE2) range

0006



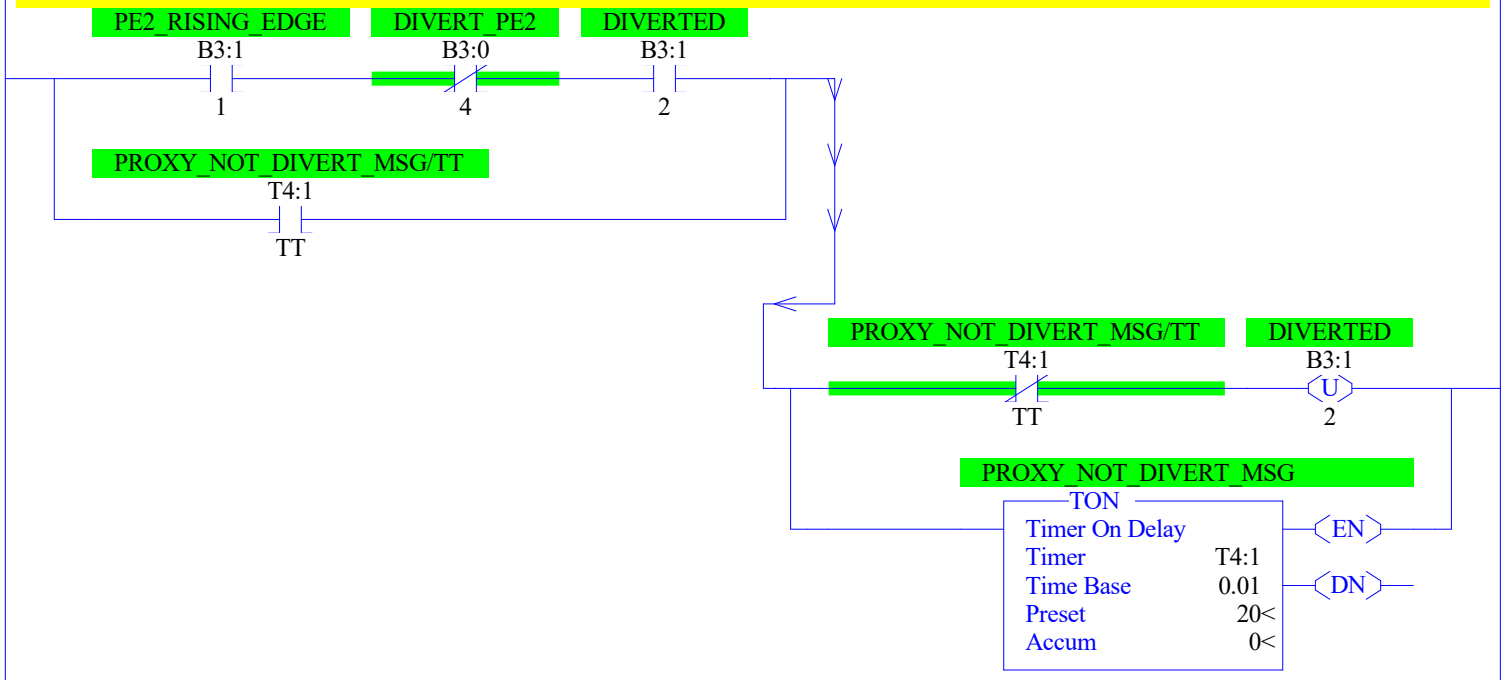
Act on PE2 rising edge Part IIa
- Changing from not-diverted to divert
- Latch diverted state
- Start timer as proxy for sending MSG to activate diverter

0007



Act on PE2 rising edge Part IIb
- Changing from diverted to not-diverted
- Unlatch diverted state
- Start timer as proxy for sending MSG to deactivate diverter

0008



Act on PE1 rising edget
- Latch bit FIFO[index] to 1 if current judgment is [reject]
- Increment index
 - I.e. box is entering [PE1:PE2) range

0009

PE1_RISING_EDGE
B3:1
0

REJECT_NEXT_PE1
B3:0
3

FIFO_BIT_AT_PE1
N99:0
L
[N199:0]

PAST_PE1_NOT_PE2
ADD
Add
Source A N199:0 0<
Source B 1 1<
Dest N199:0 0<

PAST_PE1_NOT_PE2
AND
Bitwise AND
Source A N199:0 0000h<
Source B 63 63<
Dest N199:0 0000h<

Toggle output O:0/0 when any MSG proxy is active
- O:0/0 is relay on MicroLogix 1100, so a click will be available as auditory feedback

0010

PROXY_DIVERT_MSG/TT
T4:0
TT

PROXY_NOT_DIVERT_MSG/EN
T4:1
EN

O:0
0
Bul.1763

0011

END

PhotoEye simulator

Simulate PhotoEye (PE) activity
==========

Trigger PE events via PE1_OVERRIDE and PE2_OVERRIDE

Implementation summary
==========

When box count in [PE1:PE2) range is small, generate PE1 events at a higher rate than PE2 events
When box count is large, do the opposite

Initialization
==========

Select lower bit (13 in S:4) for PE1 events

0000

First Pass
S:1
15

PE1_BIT_NUMBER
MOV
Move
Source 13
13<
Dest N241:0
0<

Do not execute this subroutine if simulation is disabled
==========

Return from this subroutine early if RUN_SIMUL8R bit is 0

0001

RUN_SIMUL8R
B3:1
15

RET
Return

Set bit number for PE1 events
==========

Trigger is state change of bit 13 (~0.8s) for PE1 to be faster so box count increases
Trigger is state change of bit 15 (~3.3s) for PE2 to be faster so box count decreases

0002

PAST_PE1_NOT_PE2
EQU
Equal
Source A N199:0
0<
Source B 0
0<

PE1_BIT_NUMBER
MOV
Move
Source 13
13<
Dest N241:0
0<

PAST_PE1_NOT_PE2
GRT
Greater Than (A>B)
Source A N199:0
0<
Source B 23
23<

PE1_BIT_NUMBER
MOV
Move
Source 15
15<
Dest N241:0
0<

Set bit number for PE2 to complement of bit number for PE1 set above

0003

PE2_BIT_NUMBER
SUB
Subtract
Source A 28
28<
Source B N241:0
0<
Dest N241:1
0<

Copy free-running timer value to local word
So bits of word can be examined

0004

S4_TIME_BASE

MOV
Move
Source S:4 0<
Dest N241:2 0<

Get the bits for PE1 and PE2

0005

S4_TIME_BASE/[PE1_BIT_NUMBER] N241:2 [N241:0]
PE1_BIT B242:0 0

S4_TIME_BASE/[PE2_BIT_NUMBER] N241:2 [N241:1]
PE2_BIT B242:0 1

Latch PE1_OVERRIDE to 1 when PE1 bit changes

0006

PE1_BIT B242:0 0
PE1_OSR_STORAGE B242:0 ONS 12
PE1_OVERRIDE B3:2 L 0

PE1_BIT B242:0 0
PE1_OSF_STORAGE B242:0 ONS 13
PE1_OVERRIDE B3:2 L 0

Latch PE2_OVERRIDE to 1 when PE2 bit changes, but only if box count is positive

0007

PE2_BIT B242:0 1
PE2_OSR_STORAGE B242:0 ONS 14
PAST_PE1_NOT_PE2
GRT Greater Than (A>B) Source A N199:0 0< Source B 0 0<
PE2_OVERRIDE B3:2 L 1

PE2_BIT B242:0 1
PE2_OSF_STORAGE B242:0 ONS 15
PAST_PE1_NOT_PE2
GRT Greater Than (A>B) Source A N199:0 0< Source B 0 0<
PE2_OVERRIDE B3:2 L 1

Return to main routine

0008

RET Return

0009

END

Rejection simulator

Latch or unlatch bit REJECT_PE1_OVERRIDE (B3:2/3) to model a box rejection process

Implementation summary

This model creates alternating periods of random lengths
At the transition between periods, bit REJECT_PE1_OVERRIDE is toggled
Bit RNG_REJECT stores the last value latched into REJECT_PE1_OVERRIDE

Initialization

Reset scan time variables
Unlatch RNG_REJECT

0000

First Pass
S:1
15

TARGET_SCAN_TIME
MOV
Move
Source 0
0<
Dest L251:0
0<

ACCUMULATE_SCAN_TIME
MOV
Move
Source 0
0<
Dest L251:1
0<

RNG_REJECT
B252:0
U
1

Do not execute this subroutine if simulation is disabled

Return from this subroutine early if RUN_SIMUL8R bit is 0
- Also clear internal bit RNG_REJECT and external bit REJECT_PE1_OVERRIDE

0001

RUN_SIMUL8R
B3:1
15

OFF_SIMUL8R_ONS_STO
B252:0
ONS
14

RNG_REJECT
B252:0
U
1

REJECT_PE1_OVERRIDE
B3:2
U
3

RET
Return

Manage random periods Part 1

Increment accumulated time from last scan (status word S:35)

0002

ACCUMULATE_SCAN_TIME

ADD

Add	
Source A	L251:1 0<
Source B	S:35 0<
Dest	L251:1 0<

Manage random periods Part 2

The current oeriod is complete: the target scan time is less than or equal to the accumulated scan time in thiis period

1) Set one-shot bit so RNG_REJECT and PE1_REJECT_OVERRIDE can be toggled
2) Generate random time for next period: TARGET_SCAN_TIME (L251:0)
   - Random value from 0 to 32,767
   - Represents period durations from 0 to 3.2767s (3,276,700us = 32,767 100us tick)
3) Reset accumulated time to zero: ACCUMULATE_SCAN_TIME (L251:1)
   - Will be increased by S:35 in previous rung once per scan.

0003

TARGET_SCAN_TIME

LEQ
Less Than or Eql (A<=B)
Source A L251:0 0<
Source B L251:1 0<

RNG_ONESHOT
B252:0
0

TARGET_SCAN_TIME

MUL
Multiply
Source A L251:0 0<
Source B 20077 20077<
Dest L251:0 0<

TARGET_SCAN_TIME

ADD
Add
Source A L251:0 0<
Source B 12345 12345<
Dest L251:0 0<

TARGET_SCAN_TIME

AND
Bitwise AND
Source A L251:0 00000000h<
Source B 32767 32767<
Dest L251:0 00000000h<

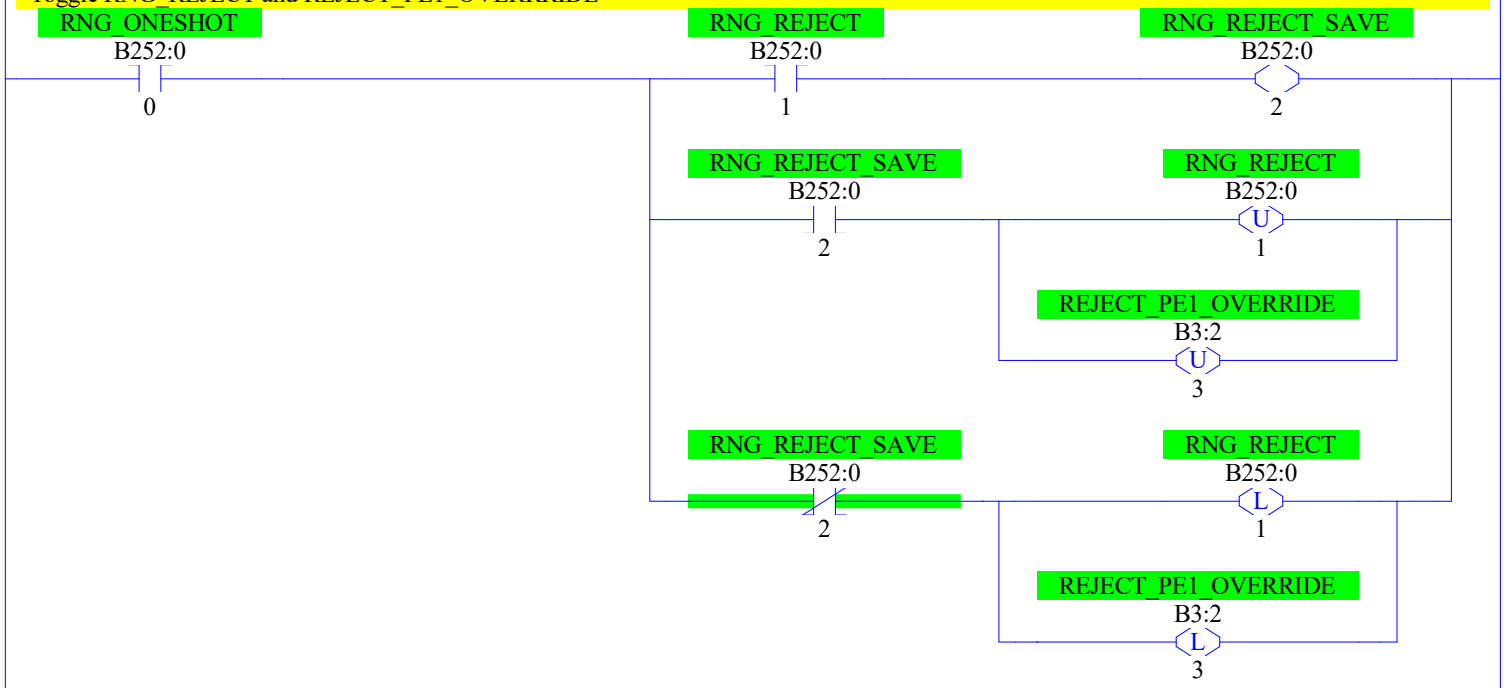
ACCUMULATE_SCAN_TIME

MOV
Move
Source 0 0<
Dest L251:1 0<

Toggle REJECT_PE1_OVERRIDE

On transition from one period to the next, RNG_ONESHOT will be 1
- Save RNG_REJECT state to RNG_REJECT_SAVE in preparation for following branches
- Toggle RNG_REJECT and REJECT_PE1_OVERRRIDE

0004



Return to main routine

0005

0006

Data File O0 (bin) -- OUTPUT

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
O:0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
O:0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
O:0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
O:0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B

Data File I1 (bin) -- INPUT

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0		
I:0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
I:0.1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
I:0.2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
I:0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B
I:0.4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B-Analog
I:0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B-Analog

Main

Processor Mode S:1/0 - S:1/4 = Remote Program Mode
On Power up Go To Run (Mode Behavior) S:1/12 = 0
First Pass S:1/15 = No
Free Running Clock S:4 = 0000-0000-0000-0000

Proc

OS Catalog Number S:57 = 1100
OS Series S:58 = A
OS FRS S:59 =
Processor Catalog Number S:60 =
Processor Series S:61 = A
Processor FRN S:62 =
User Program Type S:63 = 8001h
Compiler Revision Number S:64 =

Scan Times

Maximum (x10 ms) S:22 = 0
Watchdog (x10 ms) S:3 (high byte) = 10
Last 100 uSec Scan Time S:35 = 0
Scan Toggle Bit S:33/9 = 0

Math

Math Overflow Selected S:2/14 = 0
Overflow Trap S:5/0 = 0
Carry S:0/0 = 0
Overflow S:0/1 = 0
Zero Bit S:0/2 = 0
Sign Bit S:0/3 = 0
Math Register (lo word) S:13 = 0
Math Register (high word) S:14-S:13 = 0
Math Register (32 Bit) S:14-S:13 = 0

Chan 0

Processor Mode S:1/0- S:1/4 = Remote Program Mode
Node Address S:15 (low byte) = 0
Baud Rate S:15 (high byte) = ?
Channel Mode S:33/3 = 0
Comms Active S:33/4 = 0
Incoming Cmd Pending S:33/0 = 0
Msg Reply Pending S:33/1 = 0
Outgoing Msg Cmd Pending S:33/2 = 0

Debug

Suspend Code S:7 = 0
Suspend File S:8 = 0

Errors

Fault Override At Power Up S:1/8 = 0
Startup Protection Fault S:1/9 = 0
Major Error Halt S:1/13 = 0
Overflow Trap S:5/0 = 0
Control Register Error S:5/2 = 0
Major Error Executing User Fault Rtn. S:5/3 = 0
Battery Low S:5/11 = 0
Input Filter Selection Modified S:5/13 = 0
ASCII String Manipulation error S:5/15 = 0
Fault Routine S:29 = 0
Major Error S:6 = 0h
Error Description:

Protection

Deny Future Access S:1/14 = No
Data File Overwrite Protection Lost S:36/10 = False

Mem Module

Memory Module Loaded On Boot S:5/8 = 0
Password Mismatch S:5/9 = 0
Load Memory Module On Memory Error S:1/10 = 0
Load Memory Module Always S:1/11 = 0
On Power up Go To Run (Mode Behavior) S:1/12 = 0
Program Compare S:2/9 = 0
Data File Overwrite Protection Lost S:36/10 = 0

Forces

Forces Enabled S:1/5 = Yes
Forces Installed S:1/6 = No

Data File B3 (bin) -- BINARY

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(Symbol) Description
B3:0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
B3:9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Data File T4 -- TIMER

Offset	EN	TT	DN	BASE	PRE	ACC	(Symbol) Description
T4:0	0	0	0	.01 sec	20	0	(PROXY DIVERT MSG)
T4:1	0	0	0	.01 sec	20	0	(PROXY_NOT_DIVERT_MSG)

Data File C5 -- COUNTER

Offset	CU	CD	DN	OV	UN	UA	PRE	ACC	(Symbol) Description
C5:0	0	0	0	0	0	0	100	0	(PE1 OVERRIDE COUNT)
C5:1	0	0	0	0	0	0	100	0	(PE2_OVERRIDE_COUNT)

Data File R6 -- CONTROL

Offset	EN	EU	DN	EM	ER	UL	IN	FD	LEN	POS	(Symbol) Description
R6:0	0	0	0	0	0	0	0	0	63	0	(ADD_FIRST_IN_AS_ZERO)

Data File N7 (dec) -- INTEGER

Offset	0	1	2	3	4	5	6	7	8	9
N7:0	0									

Data File F8 -- FLOAT

Offset	0	1	2	3	4
F8:0	0				

Data File N99 (dec) -- FIFO

Offset	0	1	2	3	4	5	6	7	8	9
N99:0	0	0	0	0						

Data File N199 (dec) -- INDEX

Offset	0	1	2	3	4	5	6	7	8	9
N199:0	0									

Data File N241 (dec) -- INTPESML8R

Offset	0	1	2	3	4	5	6	7	8	9
N241:0	0	0	0							

Data File B242 (bin) -- BITPESML8R

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(Symbol)	Description
B242:0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B242:1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Data File L251 (dec) -- RNGSIMUL8R

Offset	0	1	2	3	4
L251:0	0	0			

Data File B252 (bin) -- BITSIMUL8R

Offset	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0	(Symbol) Description
B252:0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code
B3:0/0	PE1_STORAGE	Global			
B3:0/1	PE2_STORAGE	Global			
B3:0/2	DIVERTED_STORE	Global			
B3:0/3	REJECT_NEXT_PE1	Global			
B3:0/4	DIVERT_PE2	Global			
B3:0/15	ALWAYS_ZERO	Global			
B3:1/0	PE1_RISING_EDGE	Global			
B3:1/1	PE2_RISING_EDGE	Global			
B3:1/2	DIVERTED	Global			
B3:1/15	RUN_SIMUL8R	Global			
B3:2/0	PE1_OVERRIDE	Global			
B3:2/1	PE2_OVERRIDE	Global			
B3:2/3	REJECT_PE1_OVERRIDE	Global			
B242:0/0	PE1_BIT	Global			
B242:0/1	PE2_BIT	Global			
B242:0/12	PE1_OSR_STORAGE	Global			
B242:0/13	PE1_OSF_STORAGE	Global			
B242:0/14	PE2_OSR_STORAGE	Global			
B242:0/15	PE2_OSF_STORAGE	Global			
B242:1/12	PE1_OSR	Global			
B242:1/13	PE1_OSF	Global			
B242:1/14	PE2_OSR	Global			
B242:1/15	PE2_OSF	Global			
B252:0/0	RNG_ONESHOT	Global			
B252:0/1	RNG_REJECT	Global			
B252:0/2	RNG_REJECT_SAVE	Global			
B252:0/14	OFF_SIMUL8R_ONS_STO	Global			
C5:0	PE1_OVERRIDE_COUNT	Global			
C5:1	PE2_OVERRIDE_COUNT	Global			
I:0/0	PHOTOEYE_1	Global			
I:0/1	PHOTOEYE_2	Global			
I:0/2	REJECT_AT_PE1	Global			
L99:0	FIRST_32	Global			
L99:0/0	NEXT_PE2_DIVERT_BIT	Global			
L99:0/[N199:0]	NEXT_PE1_REJECT_BIT	Global			
L99:1	SECOND_32	Global			
L99:2	ZERO_BIT_SOURCE	Global			
L251:0	TARGET_SCAN_TIME	Global			
L251:1	ACCUMULATE_SCAN_TIME	Global			
N99:0	FIFO_BITS_00_15	Global			
N99:0/0	FIFO_BIT_AT_PE2	Global			
N99:0/[N199:0]	FIFO_BIT_AT_PE1	Global			
N99:1	FIFO_BITS_16_31	Global			
N99:2	FIFO_BITS_32_47	Global			
N99:3	FIFO_BITS_48_63	Global			
N199:0	PAST_PE1_NOT_PE2	Global			
N241:0	PE1_BIT_NUMBER	Global			
N241:1	PE2_BIT_NUMBER	Global			
N241:2	S4_TIME_BASE	Global			
N250:8					
N250:9					
R6:0	ADD_FIRST_IN_AS_ZERO	Global			
S:0			Arithmetic Flags		
S:0/0			Processor Arithmetic Carry Flag		
S:0/1			Processor Arithmetic Underflow/ Overflow Flag		
S:0/2			Processor Arithmetic Zero Flag		
S:0/3			Processor Arithmetic Sign Flag		
S:1			Processor Mode Status/ Control		
S:1/0			Processor Mode Bit 0		
S:1/1			Processor Mode Bit 1		
S:1/2			Processor Mode Bit 2		
S:1/3			Processor Mode Bit 3		
S:1/4			Processor Mode Bit 4		
S:1/5			Forces Enabled		
S:1/6			Forces Present		
S:1/7			Comms Active		
S:1/8			Fault Override at Powerup		
S:1/9			Startup Protection Fault		
S:1/10			Load Memory Module on Memory Error		
S:1/11			Load Memory Module Always		
S:1/12			Load Memory Module and RUN		
S:1/13			Major Error Halted		
S:1/14			Access Denied		
S:1/15			First Pass		
S:2/0			STI Pending		
S:2/1			STI Enabled		
S:2/2			STI Executing		
S:2/3			Index Addressing File Range		
S:2/4			Saved with Debug Single Step		
S:2/5			DH-485 Incoming Command Pending		
S:2/6			DH-485 Message Reply Pending		
S:2/7			DH-485 Outgoing Message Command Pending		
S:2/15			Comms Servicing Selection		
S:3			Current Scan Time/ Watchdog Scan Time		

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code
S:4			Time Base		
S:4/[N241:0]					
S:5/0			Overflow Trap		
S:5/2			Control Register Error		
S:5/3			Major Err Detected Executing UserFault Routine		
S:5/4			M0-M1 Referenced on Disabled Slot		
S:5/8			Memory Module Boot		
S:5/9			Memory Module Password Mismatch		
S:5/10			STI Overflow		
S:5/11			Battery Low		
S:6			Major Error Fault Code		
S:7			Suspend Code		
S:8			Suspend File		
S:9			Active Nodes		
S:10			Active Nodes		
S:11			I/O Slot Enables		
S:12			I/O Slot Enables		
S:13			Math Register		
S:14			Math Register		
S:15			Node Address/ Baud Rate		
S:16			Debug Single Step Rung		
S:17			Debug Single Step File		
S:18			Debug Single Step Breakpoint Rung		
S:19			Debug Single Step Breakpoint File		
S:20			Debug Fault/ Powerdown Rung		
S:21			Debug Fault/ Powerdown File		
S:22			Maximum Observed Scan Time		
S:23			Average Scan Time		
S:24			Index Register		
S:25			I/O Interrupt Pending		
S:26			I/O Interrupt Pending		
S:27			I/O Interrupt Enabled		
S:28			I/O Interrupt Enabled		
S:29			User Fault Routine File Number		
S:30			STI Setpoint		
S:31			STI File Number		
S:32			I/O Interrupt Executing		
S:33			Extended Proc Status Control Word		
S:33/0			Incoming Command Pending		
S:33/1			Message Reply Pending		
S:33/2			Outgoing Message Command Pending		
S:33/3			Selection Status User/DF1		
S:33/4			Communicat Active		
S:33/5			Communicat Servicing Selection		
S:33/6			Message Servicing Selection Channel 0		
S:33/7			Message Servicing Selection Channel 1		
S:33/8			Interrupt Latency Control Flag		
S:33/9			Scan Toggle Flag		
S:33/10			Discrete Input Interrupt Reconfigur Flag		
S:33/11			Online Edit Status		
S:33/12			Online Edit Status		
S:33/13			Scan Time Timebase Selection		
S:33/14			DTR Control Bit		
S:33/15			DTR Force Bit		
S:34			Pass-thru Disabled		
S:34/0			Pass-Thru Disabled Flag		
S:34/1			DH+ Active Node Table Enable Flag		
S:34/2			Floating Point Math Flag Disable,Fl		
S:35	LAST_SCAN_100US	Global	Last 1 ms Scan Time		
S:36			Extended Minor Error Bits		
S:36/8			DII Lost		
S:36/9			STI Lost		
S:36/10			Memory Module Data File Overwrite Protection		
S:37			Clock Calendar Year		
S:38			Clock Calendar Month		
S:39			Clock Calendar Day		
S:40			Clock Calendar Hours		
S:41			Clock Calendar Minutes		
S:42			Clock Calendar Seconds		
S:43			STI Interrupt Time		
S:44			I/O Event Interrupt Time		
S:45			DII Interrupt Time		
S:46			Discrete Input Interrupt- File Number		
S:47			Discrete Input Interrupt- Slot Number		
S:48			Discrete Input Interrupt- Bit Mask		
S:49			Discrete Input Interrupt- Compare Value		
S:50			Processor Catalog Number		
S:51			Discrete Input Interrupt- Return Number		
S:52			Discrete Input Interrupt- Accumulat		
S:53			Reserved/ Clock Calendar Day of the Week		
S:55			Last DII Scan Time		
S:56			Maximum Observed DII Scan Time		
S:57			Operating System Catalog Number		
S:58			Operating System Series		

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code
S:59			Operating System FRN		
S:61			Processor Series		
S:62			Processor Revision		
S:63			User Program Type		
S:64			User Program Functional Index		
S:65			User RAM Size		
S:66			Flash EEPROM Size		
S:67			Channel 0 Active Nodes		
S:68			Channel 0 Active Nodes		
S:69			Channel 0 Active Nodes		
S:70			Channel 0 Active Nodes		
S:71			Channel 0 Active Nodes		
S:72			Channel 0 Active Nodes		
S:73			Channel 0 Active Nodes		
S:74			Channel 0 Active Nodes		
S:75			Channel 0 Active Nodes		
S:76			Channel 0 Active Nodes		
S:77			Channel 0 Active Nodes		
S:78			Channel 0 Active Nodes		
S:79			Channel 0 Active Nodes		
S:80			Channel 0 Active Nodes		
S:81			Channel 0 Active Nodes		
S:82			Channel 0 Active Nodes		
S:83			DH+ Active Nodes		
S:84			DH+ Active Nodes		
S:85			DH+ Active Nodes		
S:86			DH+ Active Nodes		
T4:0	PROXY_DIVERT_MSG	Global			
T4:1	PROXY_NOT_DIVERT_MSG	Global			
U:240			PhotoEye Simulator		
U:250			Reject Simulator		

Instruction Comment Database

Address	Instruction	Description

Symbol Group Database

Group_Name	Description