

RSLogix Micro Project Report

Processor Information

Processor Type: Bul.1763 MicroLogix 1100 Series B

Processor Name: UNTITLED

Total Memory Used: 246 Instruction Words Used - 162 Data Table Words Used

Total Memory Left: 6410 Instruction Words Left

Program Files: 3

Data Files: 12

Program ID: 3bdb

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
	2	LADDER	5	No	709

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	24	24	B3:23
TIMER	4	T	Global	No	3	1	T4:0
COUNTER	5	C	Global	No	3	1	C5:0
CONTROL	6	R	Global	No	3	1	R6:0
INTEGER	7	N	Global	No	52	52	N7:51
FLOAT	8	F	Global	No	2	1	F8:0
	15	C	Global	No	3	1	C15:0
	18	F	Global	No	22	11	F18:10
LONG MATH	20	L	Global	No	20	10	L20:9

Perform divide and modulo operations on pulses; 10,000 pulses per rev(olution)

C.f. <https://www.plctalk.net/qanda/showthread.php?t=124447>

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Initialization

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1) Set S:2/14 so overflow does not cause major fault

2) Set Long mask to $0xFFFFC000 = -(2^{14}) = -16,384$

2.1) Use MOV -1 (0xFFFFFFFF) and AND so mask will be seen in hex

First Pass

overflow selected

S:1

S:2

15

14

long mask

MOV

Move
Source

-1

-1<

Dest

L20:3

0<

long mask

AND

Bitwise AND

Source A

L20:3

00000000h<

Source B

-16384

-16384<

Dest

L20:3

00000000h<

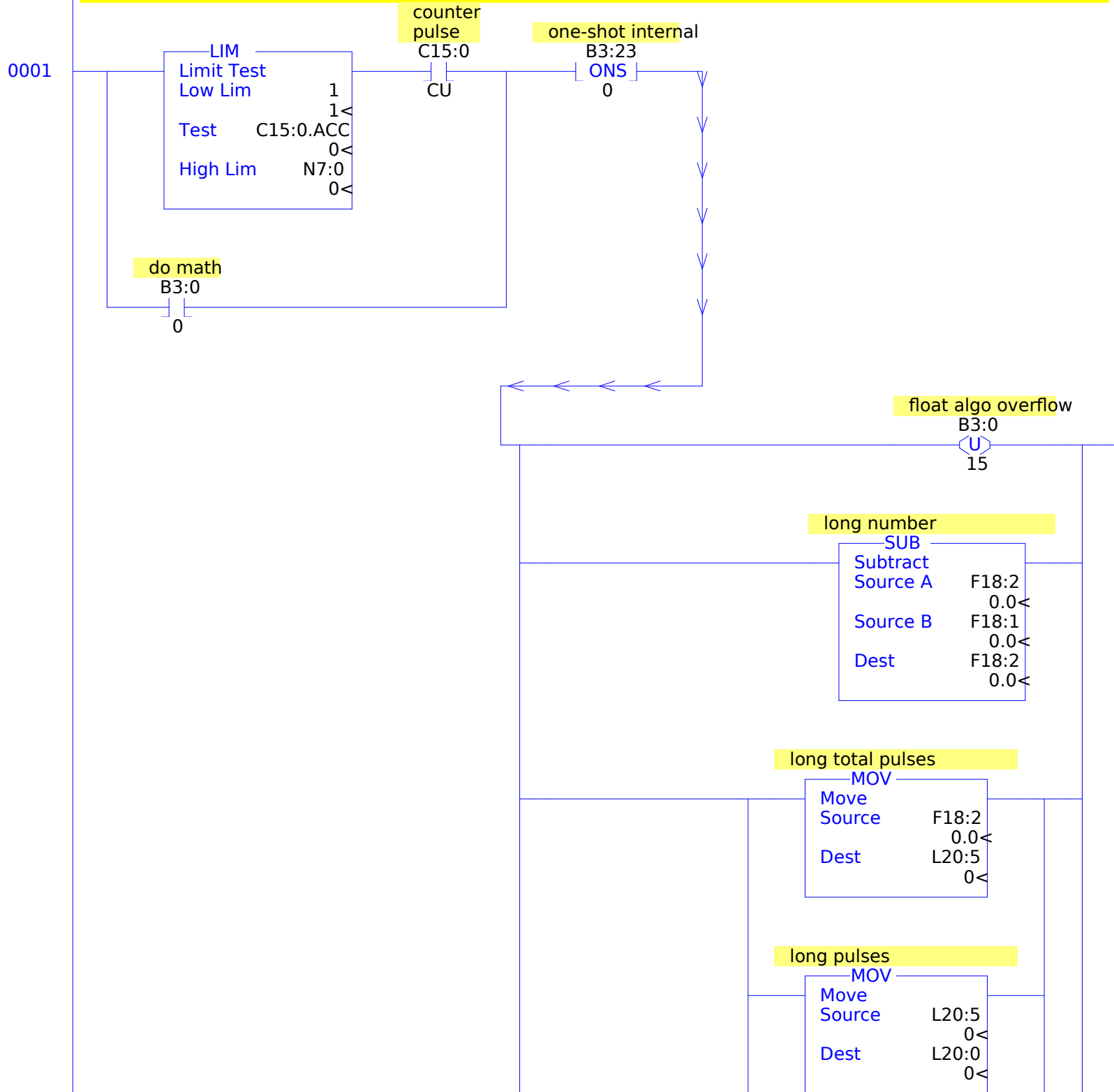
0000

Original floating-point algorithm by roxusa

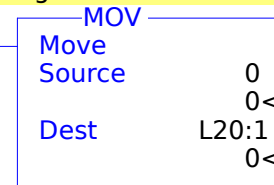
- Valid for pulse counts less than 16777215
- Which is one less than what can be entered; see Diagnostics rung

Non-functional changes made by drbitboy:

- Add [do integer math] bit
- Store delta pulses (F18:2) into Longs
- Clear manual [do math] bit
- Clear any overflow at end of rung



long revs



do integer math



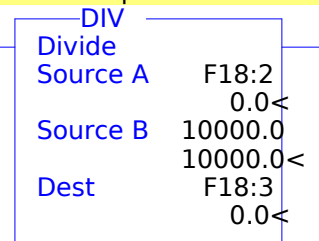
do math



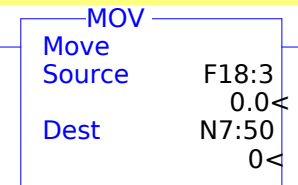
do math



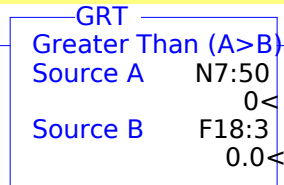
real revs quotient



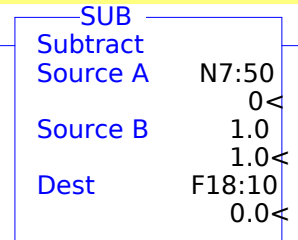
rounded revs



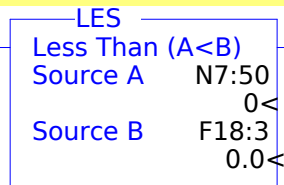
rounded revs



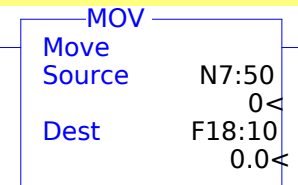
revs

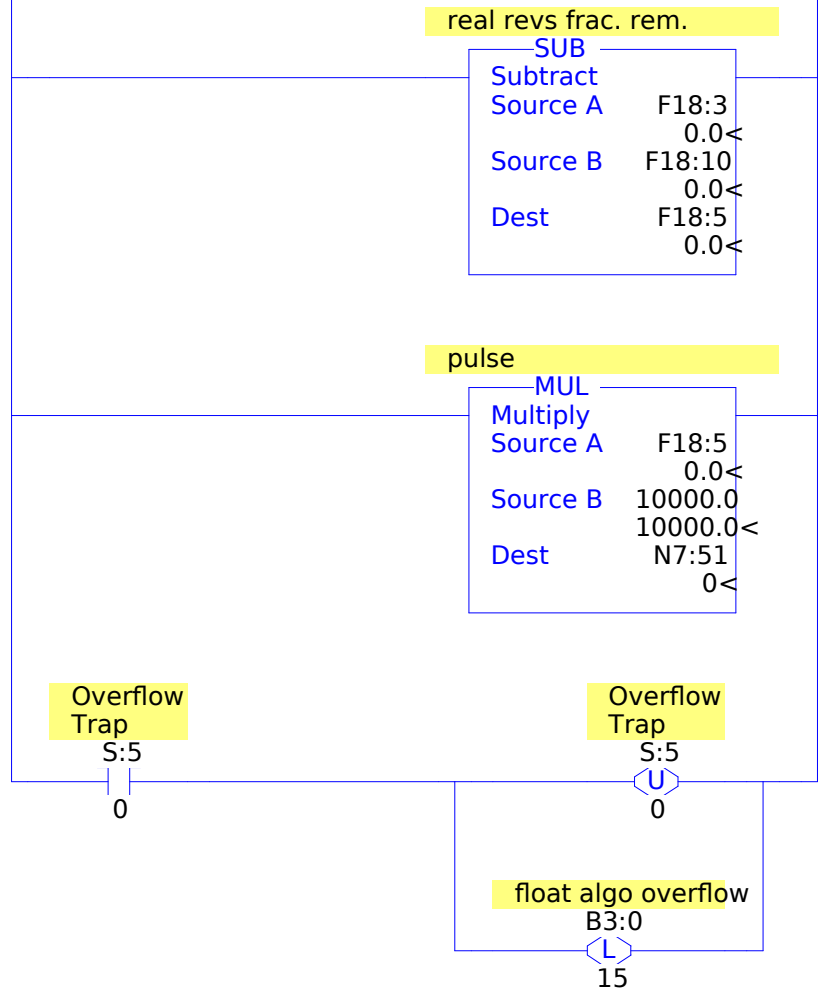


rounded revs



revs





Algorithm by drbitboy using Longs

- Valid for pulse counts up to 2G
- Although current REAL pulse count source precision is limited to 16M

Initial total pulses are in L20:5 and Long pulses (L20:0)

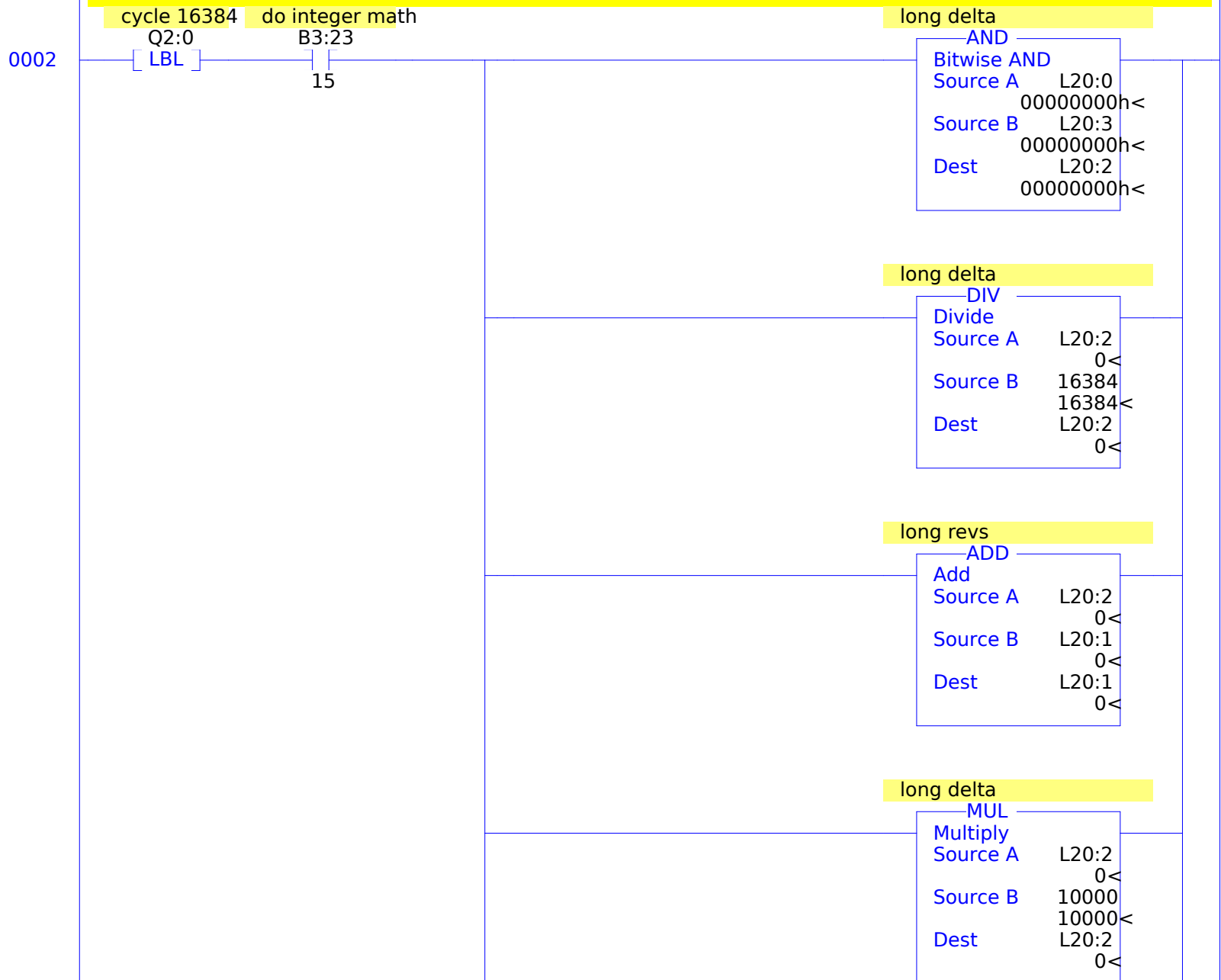
- Moved from F18:2 in rung 0001 above

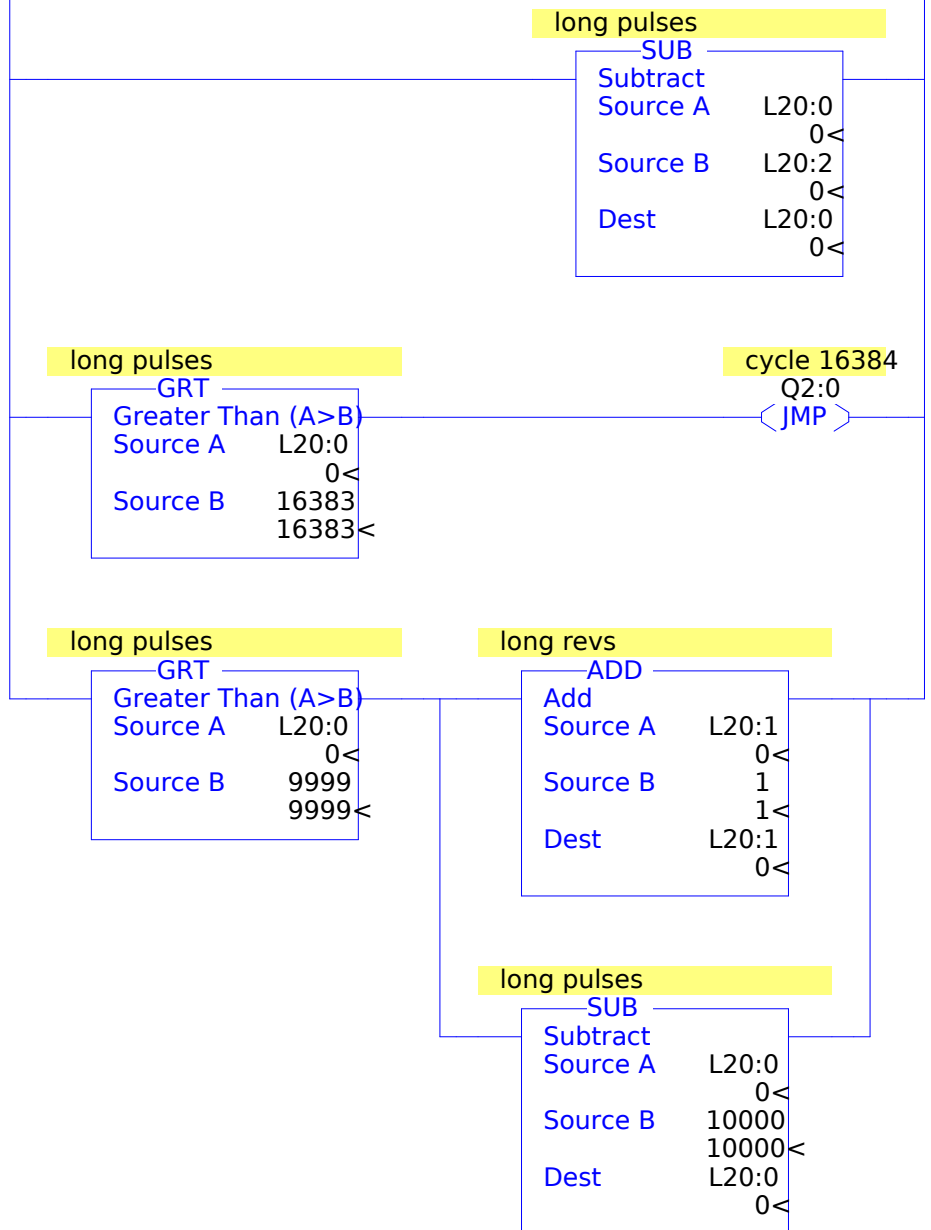
Summary

- Long pulses will be reduced to the remaining pulses = L20:5 MODULO 10000
- Long revs (L 20:1) will contain the number of 10kpulse revs

Implementation details

- Loop
 - Get truncated quotient Long delta = (Long pulses) / 16384
 - Add Long delta to Long revs (L20:1)
 - Subtract (10000 * (Long delta)) from Long pulses
 - Repeat loop as long as (Long pulses) value is greater than 16383,
- After looping is complete, if Long pulses value is greater than 99999
 - Add 1 to revs
 - Subtract 10000 from Long pulses





Diagnostics

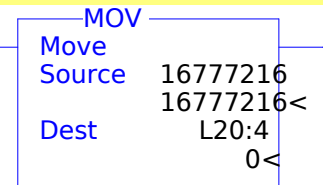
- 16M headroom shows all digits of F18:2 pulse count source F18:2
- [Algorithms agree] shows when floating-point and Long algorithm agree or not

do integer math

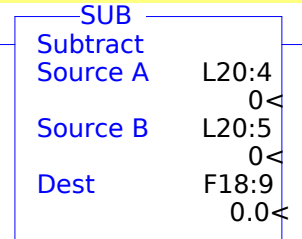
B3:23

15

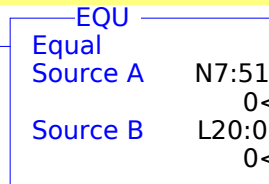
16M



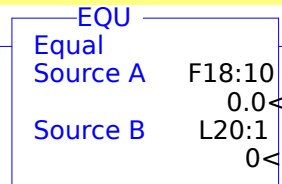
16M headroom



pulse



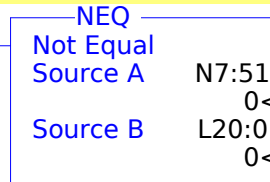
revs



Algorithms agree



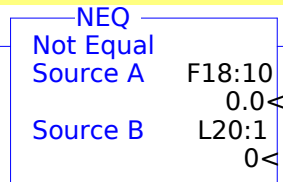
pulse



Algorithms agree



revs



END

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	Bul.1763	MicroLogix 1100 Series B
O:0.1	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	Bul.1763	MicroLogix 1100 Series B
O:0.3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B

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	Bul.1763	MicroLogix 1100 Series B
I:0.1	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	Bul.1763	MicroLogix 1100 Series B
I:0.3	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	Bul.1763	MicroLogix 1100 Series B-Analog Inp 0
I:0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	Bul.1763	MicroLogix 1100 Series B-Analog Inp 1

Data File S2 (hex) -- STATUS

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

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

Chan 0

Processor Mode S:1/0- S:1/4 = Remote Program Mode
Node Address S:15 (low byte) = 0 Outgoing Msg Cmd Pending S:33/2 = 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

Debug

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

Errors

Fault Override At Power Up S:1/8 = 0 Fault Routine S:29 = 0
Startup Protection Fault S:1/9 = 0 Major Error S:6 = 0h
Major Error Halt S:1/13 = 0
Overflow Trap S:5/0 = 0 Error Description:
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

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

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		
B3:10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:20	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:21	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		
B3:23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		

Offset	EN	TT	DN	BASE	PRE	ACC	(Symbol)	Description
T4:0	0	0	0	.01 sec	0	0		

Data File C5 -- COUNTER

Offset	CU	CD	DN	OV	UN	UA	PRE	ACC	(Symbol)	Description
C5:0	0	0	0	0	0	0	0	0		

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

Data File N7 (dec) -- INTEGER

Offset	0	1	2	3	4	5	6	7	8	9
N7:0	0	0	0	0	0	0	0	0	0	0
N7:10	0	0	0	0	0	0	0	0	0	0
N7:20	0	0	0	0	0	0	0	0	0	0
N7:30	0	0	0	0	0	0	0	0	0	0
N7:40	0	0	0	0	0	0	0	0	0	0
N7:50	0	0								

Data File F8 -- FLOAT

Offset	0	1	2	3	4
F8:0	0				

Offset	CU	CD	DN	OV	UN	UA	PRE	ACC	(Symbol)	Description
C15:0	0	0	0	0	0	0	0	0		

Data File F18

Offset	0	1	2	3	4
F18:0	0	0	0	0	0
F18:5	0	0	0	0	0
F18:10	0				

Data File L20 (dec) -- LONG MATH

Offset	0	1	2	3	4
L20:0	0	0	0	0	0
L20:5	0	0	0	0	0

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
B3:0/0			do math				
B3:0/15			float algo overflow				
B3:23/0			one-shot internal				
B3:23/14			Algorithms agree				
B3:23/15			do integer math				
C15:0/CU			counter pulse				
F18:1			drop amount				
F18:2			long number				
F18:3			real revs quotient				
F18:5			real revs frac. rem.				
F18:9			16M headroom				
F18:10			revs				
L20:0			long pulses				
L20:1			long revs				
L20:2			long delta				
L20:3			long mask				
L20:4			16M				
L20:5			long total pulses				
N7:0			Bundle Preset				
N7:50			rounded revs				
N7:51			pulse				
Q2:0			cycle 16384				
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:2/14			overflow selected				
S:2/15			Comms Servicing Selection				
S:3			Current Scan Time/ Watchdog Scan Time				
S:4			Time Base				
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				

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
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,FI				
S:35			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				
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				

Instruction Comment Database

Address	Instruction	Description
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Symbol Group Database

Group_Name	Description
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