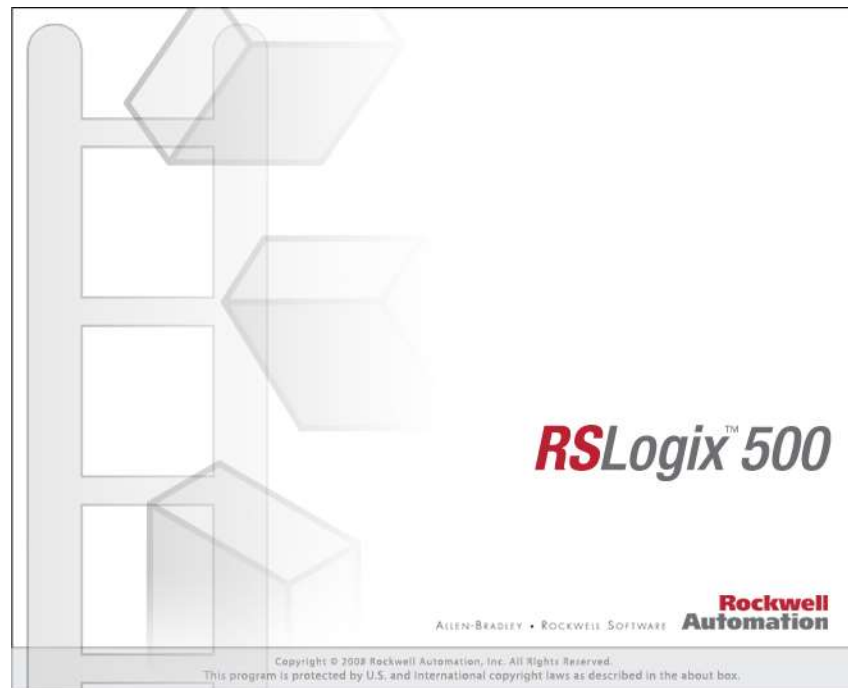


RSLogix Micro Project Report



Processor Information

Processor Type: Bul.1763 MicroLogix 1100 Series B

Processor Name: UNTITLED

Total Memory Used: 1642 Instruction Words Used - 2431 Data Table Words Used

Total Memory Left: 5014 Instruction Words Left

Program Files: 11

Data Files: 17

Program ID: 3c54

I/O Configuration

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

Channel Configuration

CHANNEL 0 (SYSTEM) - Driver: Modbus RTU Master

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

Baud: 19200
Parity: NONE
Control Line : No Handshaking
InterCharacter Timeout(x1 ms): 0
Pre Transmit Delay(x1 ms): 0

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: 00:0F:73:01:72:04
IP Address: 192.168.1.112
Subnet Mask: 255.255.255.0
Gateway Address: 192.168.1.1
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	3	No	96
LOADCELLIN	4	LADDER	5	No	96
TRAINING	5	LADDER	9	No	216
SCANHISTOG	250	LADDER	4	No	247
ADD_IRANK6	251	LADDER	7	No	486
CALC_PEAKS	252	LADDER	6	No	191
RNK6NEWVAL	253	LADDER	6	No	243
RNK6BUBBLE	254	LADDER	6	No	316
RESETRANK6	255	LADDER	5	No	229

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	3	3	B3:2
TIMER	4	T	Global	No	6	2	T4:1
COUNTER	5	C	Global	No	3	1	C5:0
CONTROL	6	R	Global	No	3	1	R6:0
INTEGER	7	N	Global	No	66	66	N7:65
FLOAT	8	F	Global	No	2	1	F8:0
SCAN_TIMES	248	L	Global	No	512	256	L248:255
RNK6FLOATS	249	F	Global	No	512	256	F249:255
RNK6_INTS	250	N	Global	No	256	256	N250:255
RNK6COUNTS	251	N	Global	No	7	7	N251:6
RNK6BINS	252	N	Global	No	7	7	N252:6
COUNT_I	253	N	Global	No	256	256	N253:255
RANK6_I	254	N	Global	No	256	256	N254:255
SUM_I	255	F	Global	No	512	256	F255:255

0000

Load cell control - cf. <https://www.plctalk.net/qanda/showthread.php?t=133372>

Call training routine, which will usually return immediately

TRAINING

JSR

Jump To Subroutine
SBR File Number

U:5

When training is inactive, continue getting load cell data every 100ms*

- 1) If a new load cell value is available, start a 100ms timer
 - 1.1) When that timer expires, latch a 1 into SEND_LOAD_CELL_DATUM to trigger the next load cell value
 - 2) Call routine LOADCELLIN
 - 3) Copy load cell data to itself so it will be displayed here
- * This ensures external source of data will exhaust its data and reset EMULATE_LOADCELLDATA

0001

TRAINING IS INACTIVE

SEND_LOAD_CELL_DATUM

B3:0

5

B3:0

0

LOAD_CELL_SAMPLING2

TON

Timer On Delay

Timer T4:1

Time Base 0.001

Preset 100<

Accum 91<

<EN>

<DN>

LOAD_CELL_SAMPLING2/DN

T4:1

DN

SEND_LOAD_CELL_DATUM

B3:0

0

LOAD_CELL_SAMPLING2

T4:1

<RES>

READ_LOAD_CELL_DATA

JSR

Jump To Subroutine
SBR File Number

U:4

LOAD_CELL_INPUT

MOV

Move

Source F8:0

0.0<

Dest F8:0

0.0<

LAD 2 - MAIN --- Total Rungs in File = 3

0002

⌞END⌟

Notional input map routine

- 1) scale the input load cell data from an analog input card channel when requested i.e.when SEND_LOAD_CELL_DATUM becomes 1, and
- 2) indicate that value is ready by unlatching SEND_LOAD_CELL_DATUM to 0
- 3) Also implement logic to allow using emulated data from an external source i.e. the Python script [emulate_load_cell.py]
- 3.1) Where the external source will
- 3.1.1) BOTH watch for SEND_LOAD_CELL_DATUM becoming 1,
- 3.1.2) AND control the unlatching of SEND_LOAD_CELL_DATUM to 0

If SEND_LOAD_CELL_DATA is 0 i.e. not 1, then return and do nothing

SEND_LOAD_CELL_DATUM

B3:0
0

RET
Return

If execution got to here, then the process is requesting the next load cell datum (SEND_LOAD_CELL_DATUM is 1)

- If the data are not being emulated from an external source, then copy the raw data from the analog input channel into the raw data buffer, LOAD_CELL_INPUT
- If the data are being emulated from an external source, then that source will write a value the raw data buffer directly before unlatching SEND_LOAD_CELL_DATUM

EMULATE_LOADCELLDATA

B3:0
3

#LOAD_CELL_RAW_INPUT

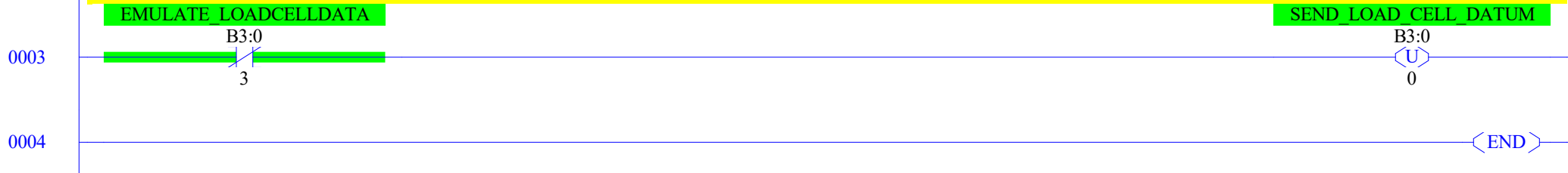
CPW
Copy Word
Source #I:0.0
Dest #N7:1
Length 1

Scale the raw input into float LOAD_CELL_INPUT

LOAD_CELL_INPUT

SCP
Scale w/Parameters
Input N7:1
0<
Input Min. 0.0
0.0<
Input Max. 4095.0
4095.0<
Scaled Min. 0.0
0.0<
Scaled Max. 1000.0
1000.0<
Output F8:0
0.0<

If the data are not being emulated from an external source, then unlatch SEND_LOAD_CELL_DATUM to 0
 If the data are being emulated from an external source, then that external source is responsible for unlatching SEND_LOAD_CELL_DATA
 N.B. the falling edge of SEND_LOAD_CELL_DATA will indicate to the calling routine that the new value is ready



Training routine - cf. <https://www.plctalk.net/qanda/showthread.php?t=133372>

Train PLC to sample load cell values and find the mean of the two most steady values using a histogram of the values sampled

Inputs and Outputs

- RESET_TRAINING
 - Discrete momentary (push button?). or controlled by external data emulator (emulate_load_cell.py)
 - When pressed, initializes training values
 - When released (falling edge), starts a training rung
- LOAD_CELL_INPUT
 - Analog float value that is loaded from load cell in response to a rising edge of Boolean SEND_LOAD_CELL_DATUM
- SEND_LOAD_CELL_DATUM (both output-ish and input-ish)
 - Output: written to as a 1 by this routine to indicate 100ms have expired and it is time for the next load cell value
 - Input: written to as a 0 by another entity to after putting a new value into LOAD_CELL_INPUT
 - This falling edge indicates a new LOAD_CELL_INPUT is ready
 - The other entity could be an I/O mapping routine, or the Python script [emulate_load_cell.py]

First rung: respond to request to cancel training

0000

CANCEL TRAINING

B3:0

4

First Pass

S:1

15

RESET TRAINING

B3:0

1

TRAINING IS INACTIVE

B3:0

5

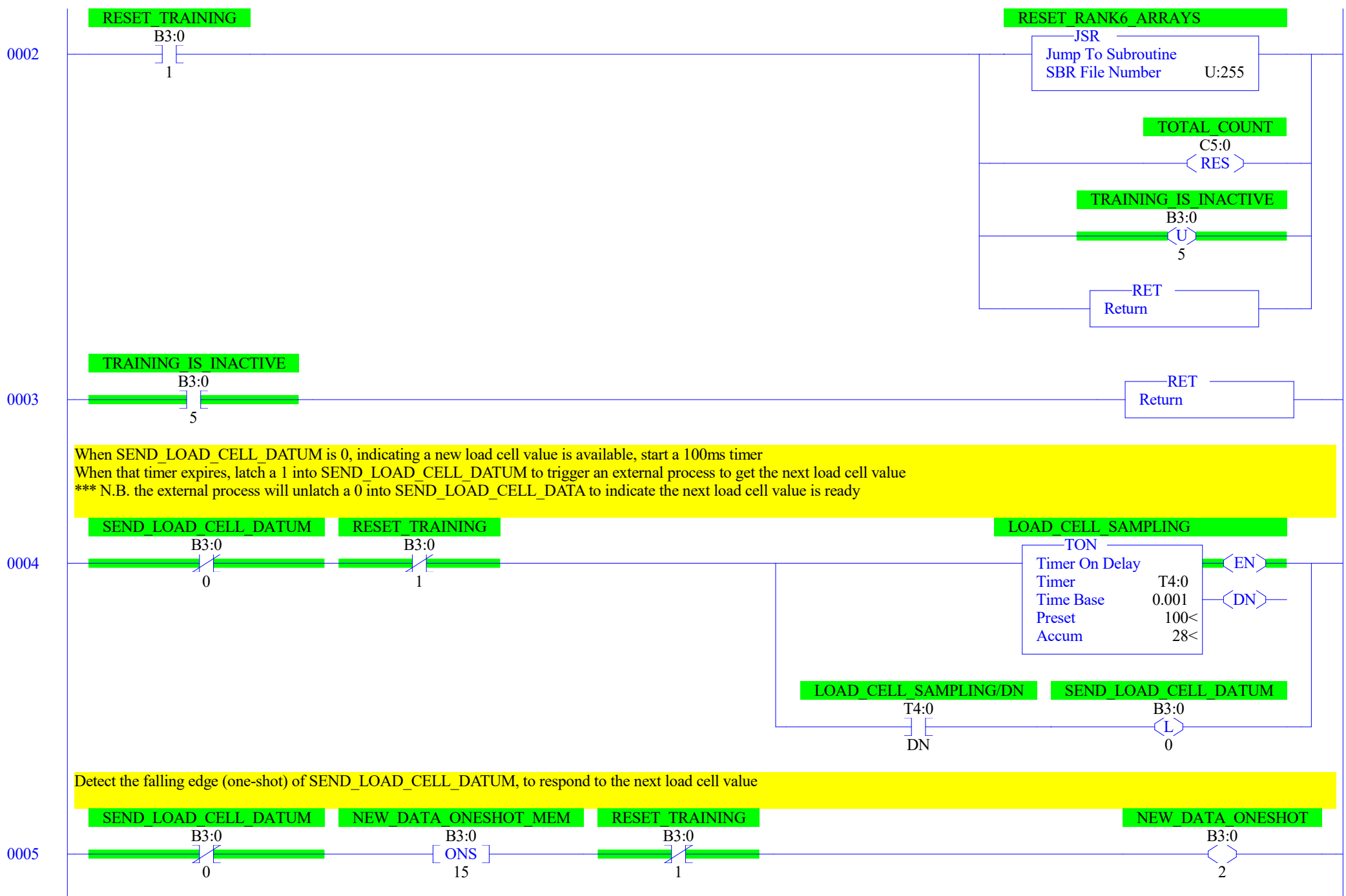
SCAN TIME HISTOGRAM

JSR

Jump To Subroutine
SBR File Number

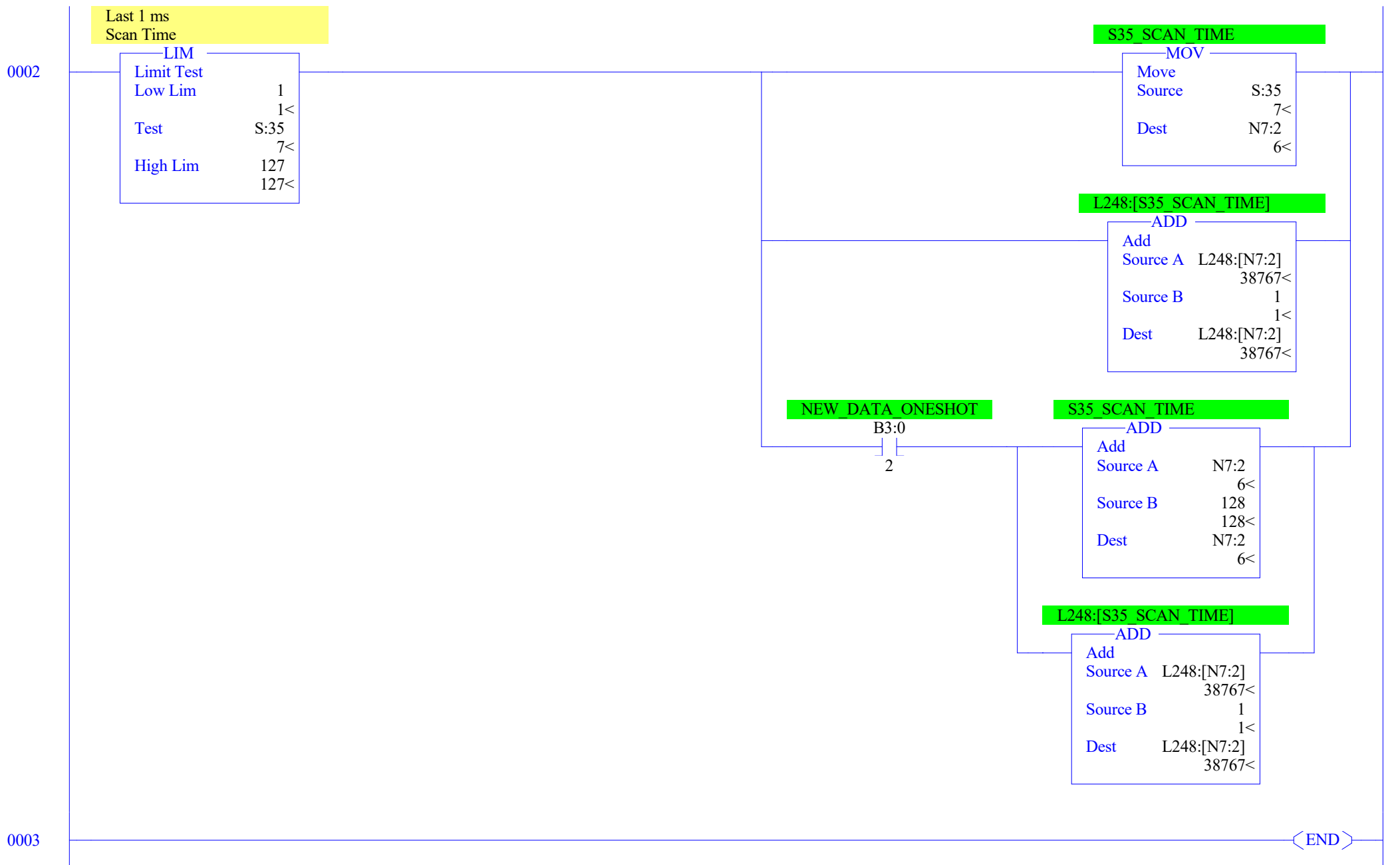
U:250

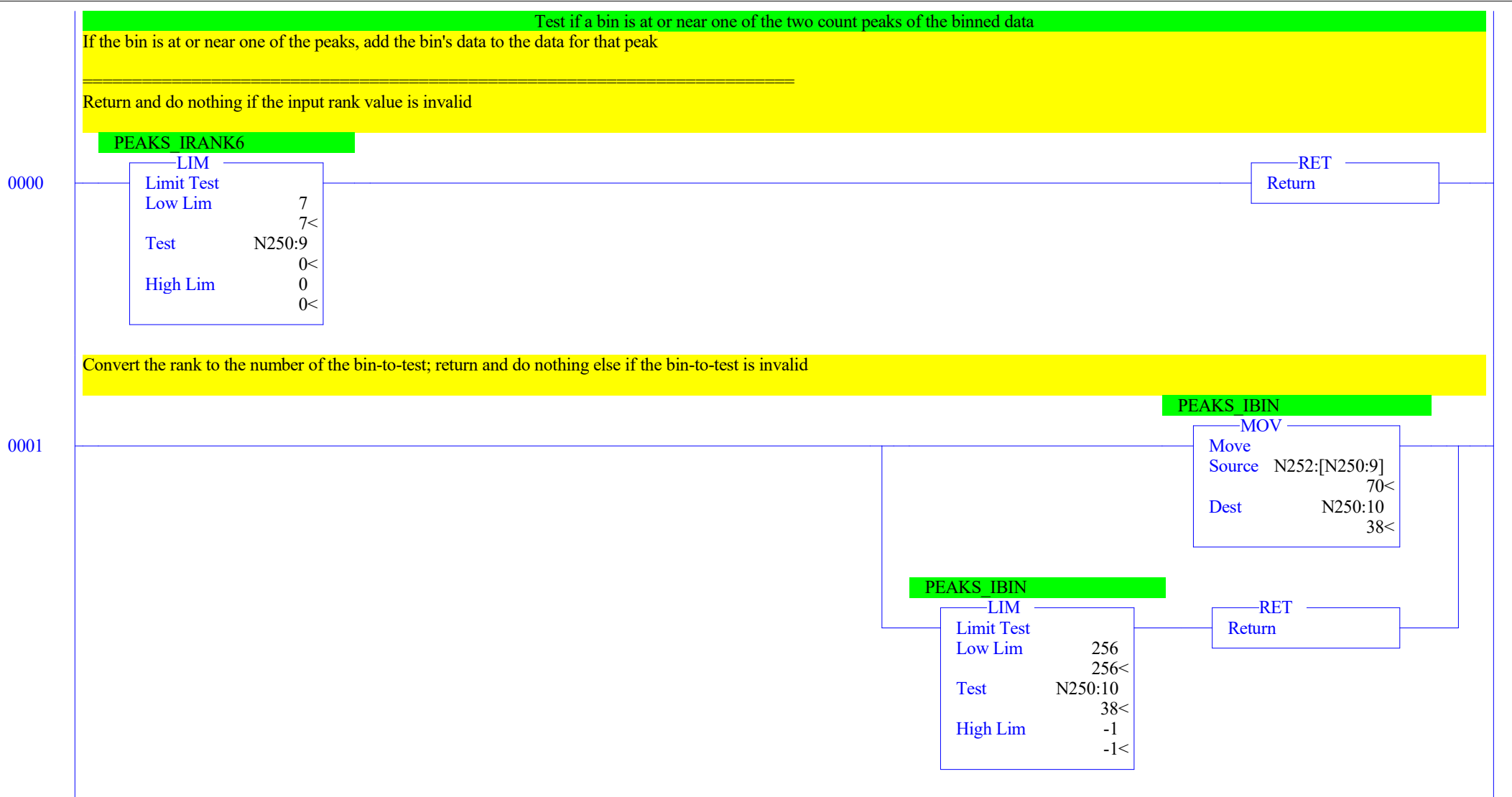
0001











If the first peak has not yet been determined, then
 - Set the first peak's low and high limits equal to the bin-to-test, so the bin will initialize the first peak
 - Clear all of the first and second peaks' data (values' sums; counts; means)

1ST PEAK LO LIMIT

LES

Less Than (A<B)

Source A N250:5
 66<
 Source B 0
 0<

#1ST PEAK LO LIMIT

FLL

Fill File

Source N250:10
 Dest #N250:5
 Length 2

#1ST PEAK VALUES SUM

FLL

Fill File

Source 0.0
 Dest #F249:0
 Length 6

0002

If the bin-to-test is in the first peak's [lo_limit:hi_limit] range, then add the bin's data to the first peak:

- 1) If the bin is equal to the low limit, then decrement the low limit by 1 bin to catch the next lower bin, if it is tested later
- 2) If the bin is equal to the high limit, then increment the high limit by 1 bin to catch the next higher bin, if it is tested later
- 3) Add the sum of the values in the bin-to-test to the first peak's values' sum
- 4) Add the count of the values in the bin-to-test to the first peak's counts
- 5) Return and do nothing else in this routine, because the bin-to-test is in the first peak, so it cannot be in the second peak

0003

PEAKS_IBIN

LIM

Limit Test	N250:5
Low Lim	66<
Test	N250:10
	38<
High Lim	N250:6
	70<

PEAKS_IBIN

EQU

Equal	
Source A	N250:10
	38<
Source B	N250:5
	66<

1ST_PEAK_LO_LIMIT

SUB

Subtract	
Source A	N250:5
	66<
Source B	1
	1<
Dest	N250:5
	66<

PEAKS_IBIN

EQU

Equal	
Source A	N250:10
	38<
Source B	N250:6
	70<

1ST_PEAK_HI_LIMIT

ADD

Add	
Source A	N250:6
	70<
Source B	1
	1<
Dest	N250:6
	70<

1ST_PEAK_VALUES_SUM

ADD

Add	
Source A	F249:0
	252297.8<
Source B	F255:[N250:10]
	5978.022<
Dest	F249:0
	252297.8<

LAD 251 - ADD_IRANK6 --- Total Rungs in File = 7

1ST PEAK COUNTS SUM

ADD

Add	
Source A	F249:1 931.0<
Source B	N253:[N250:10] 39<
Dest	F249:1 931.0<

RET
Return

If the second peak has not yet been determined, then
 - Set the second peak's low and high limits equal to the bin-to-test, so the bin will initialize the second peak
 - Clear the second peaks' data (values' sums; counts; means)

2ND PEAK LO LIMIT

LES

Less Than (A<B)	
Source A	N250:7 44<
Source B	0 0<

#2ND PEAK LO LIMIT

FLL

Fill File	
Source	N250:10
Dest	#N250:7
Length	2

#2ND PEAK VALUES SUM

FLL

Fill File	
Source	0.0
Dest	#F249:3
Length	3

0004

If the bin-to-test is in the second peak's [lo_limit:hi_limit] range, then add the bin's data to the second peak:

- 1) If the bin is equal to the low limit, then decrement the low limit by 1 bin to catch the next lower bin, if it is tested later
- 2) If the bin is equal to the high limit, then increment the high limit by 1 bin to catch the next higher bin, if it is tested later
- 3) Add the sum of the values in the bin-to-test to the second peak's values' sum
- 4) Add the count of the values in the bin-to-test to the second peak's counts
- 5) The return is superfluous since this was originally the last rung in this routine, but this leaves open the possibility to add more peaks

0005

PEAKS_IBIN

LIM

Limit Test	N250:7
Low Lim	44<
Test	N250:10
	38<
High Lim	N250:8
	47<

PEAKS_IBIN

EQU

Equal	
Source A	N250:10
	38<
Source B	N250:7
	44<

2ND PEAK LO LIMIT

SUB

Subtract	
Source A	N250:7
	44<
Source B	1
	1<
Dest	N250:7
	44<

PEAKS_IBIN

EQU

Equal	
Source A	N250:10
	38<
Source B	N250:8
	47<

2ND PEAK HI LIMIT

ADD

Add	
Source A	N250:8
	47<
Source B	1
	1<
Dest	N250:8
	47<

2ND PEAK VALUES_SUM

ADD

Add	
Source A	F249:3
	106421.1<
Source B	F255:[N250:10]
	5978.022<
Dest	F249:3
	106421.1<

LAD 251 - ADD_IRANK6 --- Total Rungs in File = 7

0006

2ND PEAK COUNTS SUM

ADD

Add	
Source A	F249:4 579.0<
Source B	N253:[N250:10] 39<
Dest	F249:4 579.0<

RET

Return

<END>

0000

Calculate two means at, or near the two highest-count peaks in the Ran6 bins

Initialize both peaks' bin limits to -1

#1ST PEAK LO LIMIT

FLL

Fill File	
Source	-1
Dest	#N250:5
Length	4

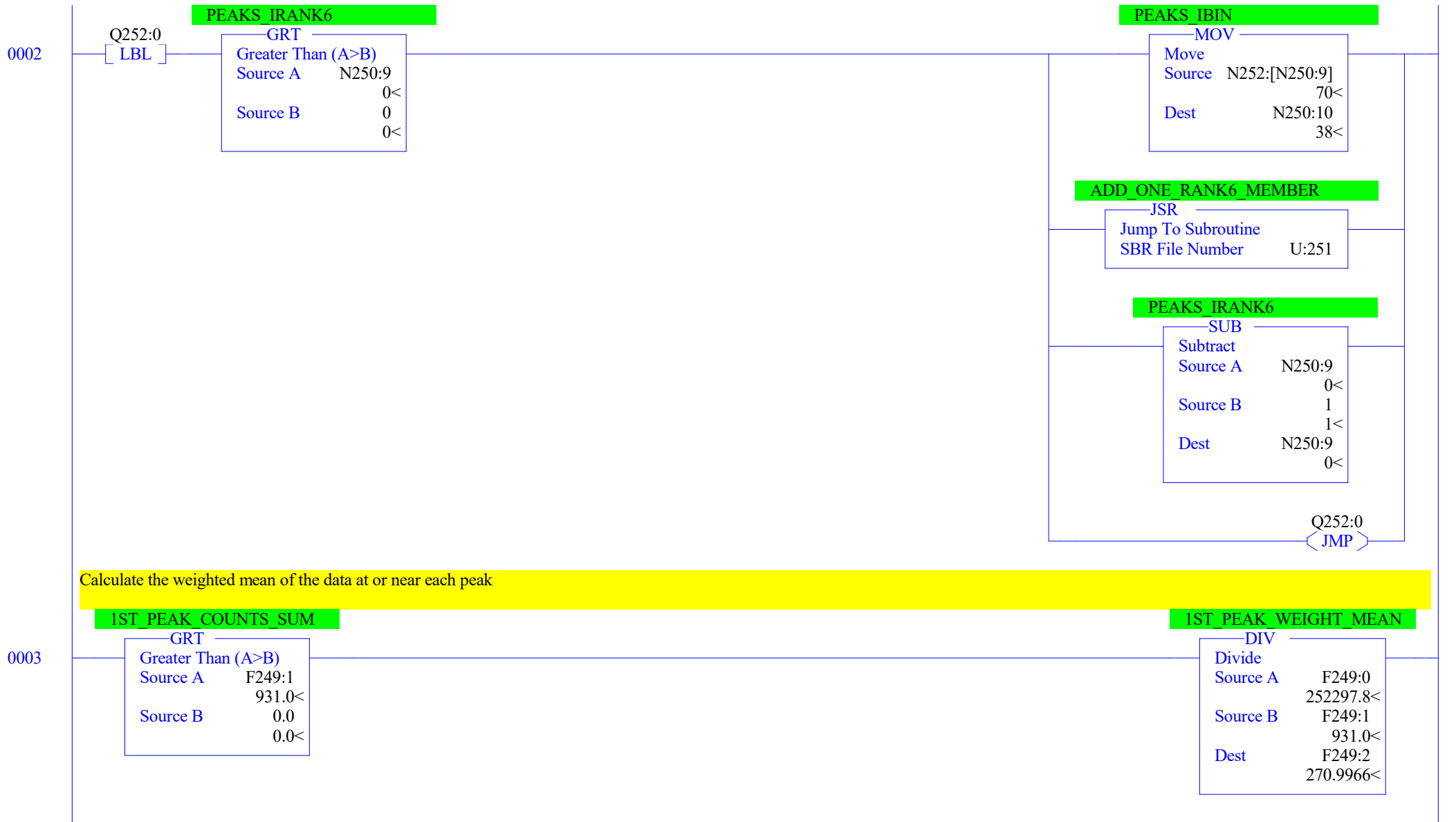
Loop through the Rank6 count-sorted arrays from the highest-count bin in element 6 to the lowest-count bin in element 1
 - Call the ADD_ONE_RANK6_MEMBER to determine if each such bin is at, or near one of the two peaks of the histogram
 N.B. Element 0 is ignored, as it is the nominal location for all bins that are not in the top six

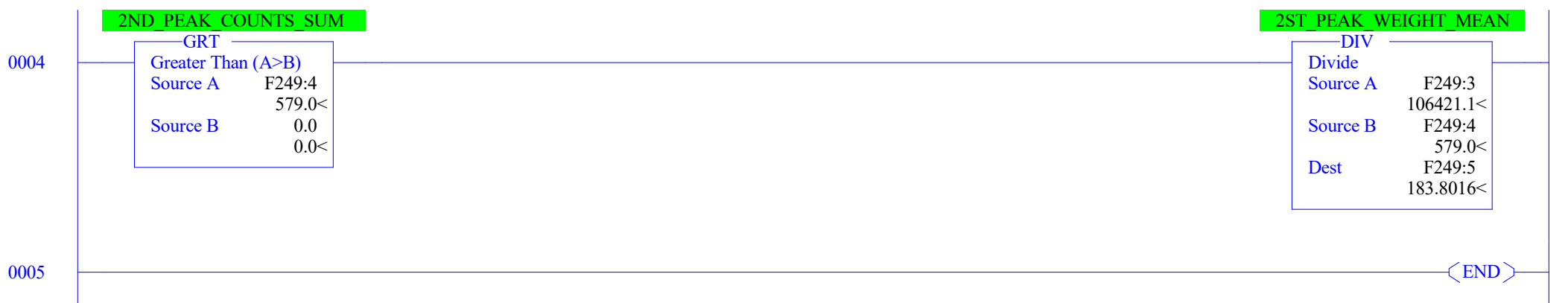
PEAKS IRANK6

MOV

Move	
Source	6
	6<
Dest	N250:9
	0<

0001





Add a new measured value into the Rank6 arrays

Convert the load cell newly-measured float value to an integer,
shift that integer two bits to the right to get INEWBIN,
which is the bin number, of bins 4 units wide, of the new value
- If that bin number is outside the range [0:255], then return and do nothing else in this routine

0000

INEWBIN

MOV

Move
Source F8:0
0.0<
Dest N250:0
46<

INEWBIN

AND

Bitwise AND
Source A N250:0
002Eh<
Source B -4
-4<
Dest N250:0
002Eh<

INEWBIN

DIV

Divide
Source A N250:0
46<
Source B 4
4<
Dest N250:0
46<

INEWBIN

LIM

Limit Test
Low Lim 256
256<
Test N250:0
46<
High Lim -1
-1<

RET

Return

0001

Increment the count array element at that bin number by 1;
Increment the sum array element at that bin number by the new float value

COUNT_INEBIN

—ADD—

Add	
Source A	N253:[N250:0] 345<
Source B	1 1<
Dest	N253:[N250:0] 345<

SUM_IBINS

—ADD—

Add	
Source A	F255:[N250:0] 63675.77<
Source B	F8:0 0.0<
Dest	F255:[N250:0] 63675.77<

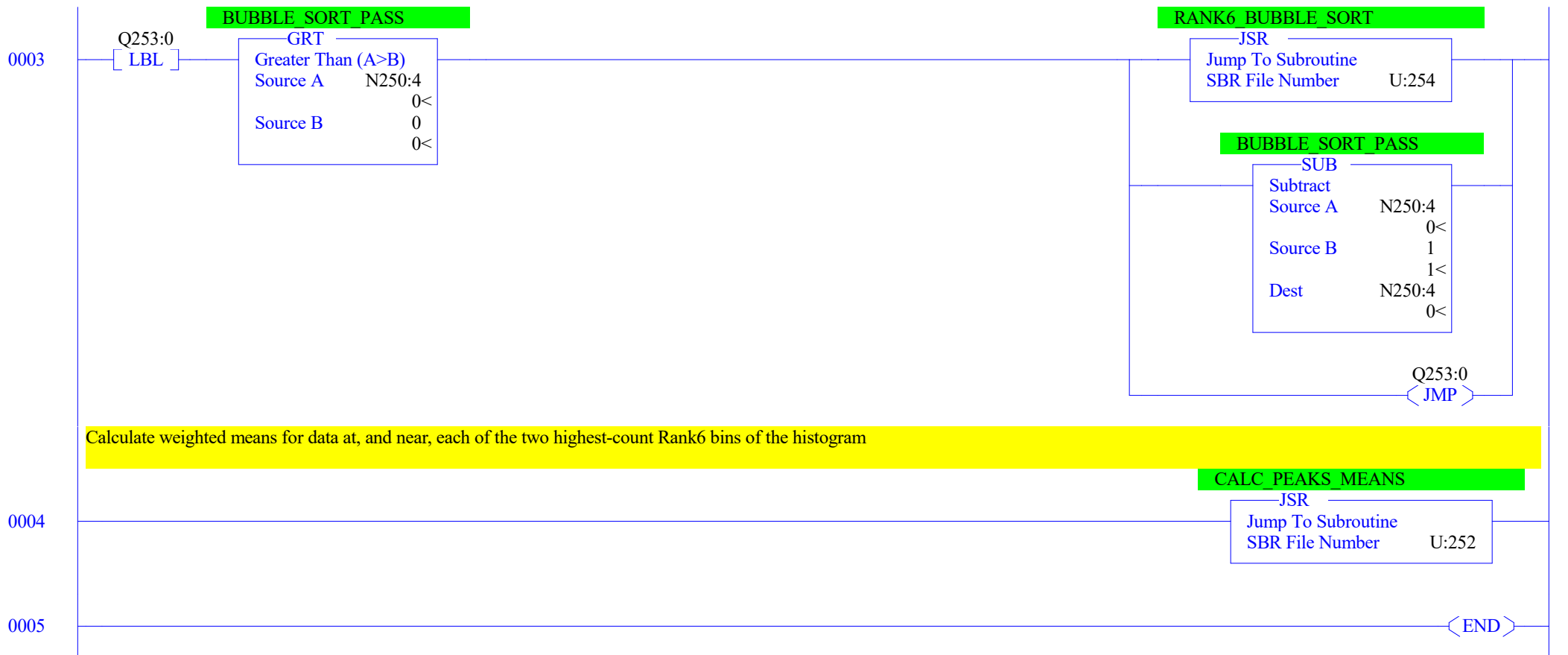
Run six passes of the Rank6 bubble sort routine to place
- the count of that bin in the correct element of the sorted-by-count six-element array RNK6COUNTS[1:6], and
- the bin number in the count-sorted element of RNK6BINS[1:6]

BUBBLE_SORT_PASS

—MOV—

Move	
Source	6 6<
Dest	N250:4 0<

0002



Bubble sort of values with the six highest counts in the Rank6 arrays

Called once every time a new measurement value is read*, so the count of that values bin has incremented by 1

- It is assumed that all other bins have not changed, so the new bin is the only one that may need to be moved within the count-sorted Rank6 arrays
- It is assumed that the new bin count has increased (by 1), so it will only bubble up in the Rank6 arrays
 - and for each rank into which it bubbles up, the previous at in that rank will drop down

* Falling edge of SEND_LOAD_CELL_DATUM

Get current rank of the new bin from the Rank6 bins array

Place the updated count of the new bin in the ranked position of that bin in the Rank6 counts array

RANK6 OF INEWBIN

MOV

Move
Source N254:[N250:0] 5<
Dest N250:1 5<

N251:[RANK6 OF INEWBIN]

MOV

Move
Source N253:[N250:0] 345<
Dest N251:[N250:1] 345<

If the new bin is already at the top (i.e. at element 6) of the count-sorted ranking, return and do nothing else here, because the count has just increased and it cannot bubble up past the top

RANK6 INEWBIN

GRT

Greater Than (A>B)
Source A N254:[N250:0] 5<
Source B 5 5<

RET

Return

Calculate the next rank up from, i.e. one more than, the previous rank of the new bin
Return and do nothing if the count of the new bin is less than or equal to the count of that next bin up
- i.e. the new bin does not need to bubble up

0002

RANK6 OF NEXT BIN UP

ADD

Add	
Source A	N250:1
	5<
Source B	1
	1<
Dest	N250:2
	6<

N251:[RANK6 OF INEBIN]

LEQ

Less Than or Eql (A<=B)	
Source A	N251:[N250:1]
	345<
Source B	N251:[N250:2]
	563<

RET

Return

To here, the bins and counts of [the new bin] and [the next bin up] will swap positions in the Rank6 arrays:

- The next bin up will drop down one in the rankings, ...
- Get the index of the next bin up from the Rank6 bins array
- If that index is non-negative, then then move the new bin's current rank to the next bin up's rank in the RANK6_I array
- Put the next bin up into its new ranked position in the Rank6 bins array
- Put the next bin up's count into its new position in the Rank6 counts array

0003

INEXT_BIN_UP

MOV

Move
Source N252:[N250:2]
67<
Dest N250:3
68<

INEXT_BIN_UP

GRT

Greater Than (A>B)
Source A N250:3
68<
Source B -1
-1<

N254:[INEXT_BIN_UP]

MOV

Move
Source N250:1
5<
Dest N254:[N250:3]
4<

N252:[RANK6 OF INEWBIN]

MOV

Move
Source N252:[N250:2]
67<
Dest N252:[N250:1]
46<

N251:[RANK6 OF INEWBIN]

MOV

Move
Source N251:[N250:2]
563<
Dest N251:[N250:1]
345<

- ... And the new bin will bubble up one in the rankings.

- MOVE next bin up's former rank to the new bin's rank in the RANK6_I array
- Put the new bin into its new ranked position, i.e. the previous position of the next bin up, in the Rank6 bins array
- Put the new bin's count into its new position in the Rank6 counts array

RANK6_INEWBIN

MOV

Move
Source N250:2
6<
Dest N254:[N250:0]
5<

N252:[RANK6 OF NEXT BIN UP]

MOV

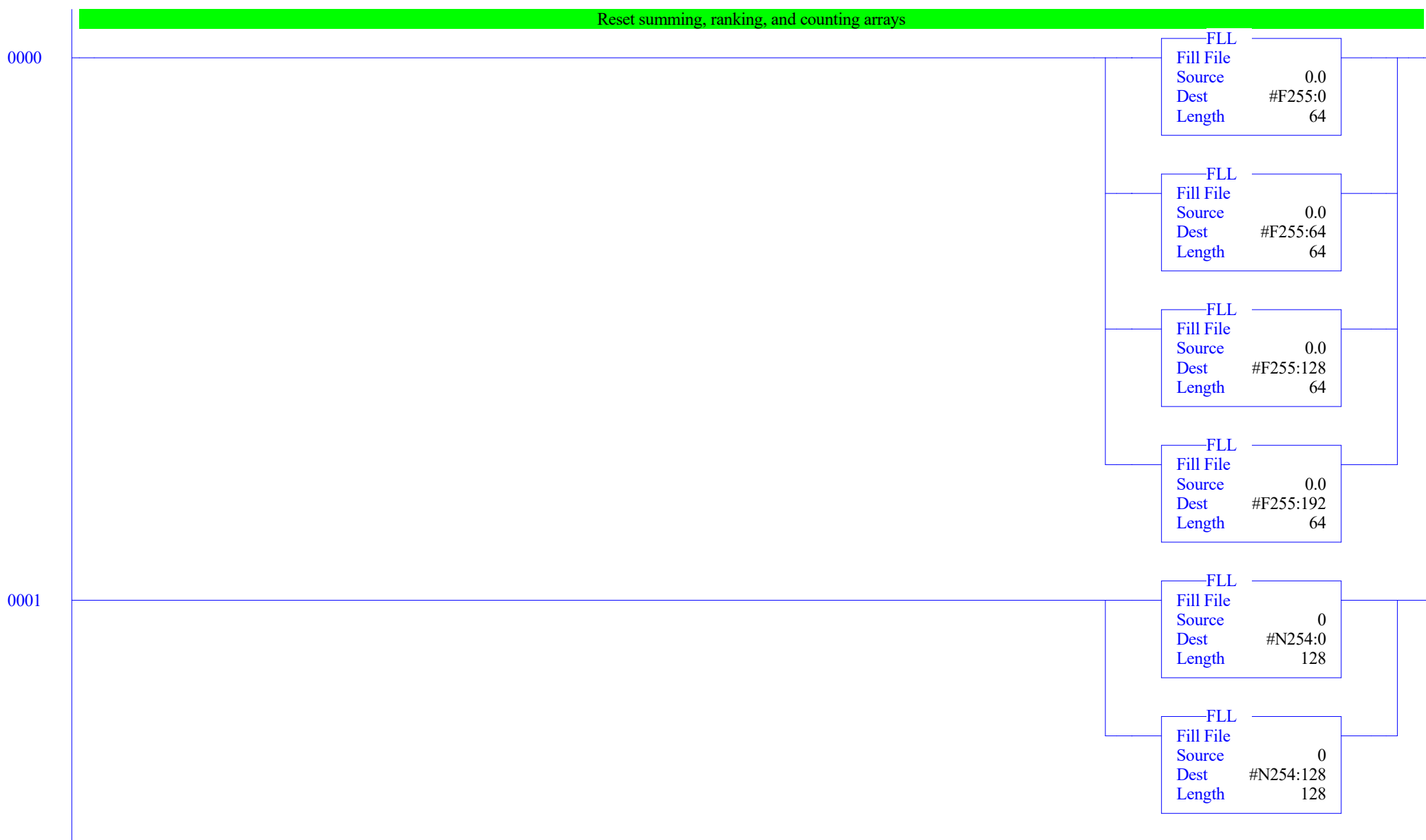
Move
Source N250:0
46<
Dest N252:[N250:2]
67<

N251:[RANK6 OF NEXT BIN UP]

MOV

Move
Source N253:[N250:0]
345<
Dest N251:[N250:2]
563<

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	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	

Page 1 (Radix Binary) Tuesday, July 05, 2022 - 09:08:20

Main

Processor Mode S:1/0 - S:1/4 = Remote Run
On Power up Go To Run (Mode Behavior) S:1/12 = 0
First Pass S:1/15 = No
Free Running Clock S:4 = 1011-1011-1101-0110

Proc

OS Catalog Number S:57 = 1100 User Program Type S:63 = 8108h
OS Series S:58 = B 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 = 73
Watchdog (x10 ms) S:3 (high byte) = 10
Last 100 uSec Scan Time S:35 = 7
Scan Toggle Bit S:33/9 = 0

Math

Math Overflow Selected S:2/14 = 1 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 = 1
Sign Bit S:0/3 = 0

Chan 0

Processor Mode S:1/0- S:1/4 = Remote Run
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 = True

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 = 1

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	1	0	0	0	0	0	0	0	0	0	1	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		

Data File T4 -- TIMER

Offset	EN	TT	DN	BASE	PRE	ACC	(Symbol)	Description
T4:0	1	1	0	.001 sec	100	28	(LOAD_CELL_SAMPLING)	
T4:1	1	1	0	.001 sec	100	91	(LOAD_CELL_SAMPLING2)	

Data File C5 -- COUNTER

Offset	CU	CD	DN	OV	UN	UA	PRE	ACC	(Symbol)	Description
C5:0	0	0	1	0	0	0	100	1873	(TOTAL_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	16	0		

Data File N7 (dec) -- INTEGER

Offset	0	1	2	3	4	5	6	7	8	9
N7:0	0	0	6	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	0	0	0	0	0	0	0	0
N7:60	0	0	0	0	0	0				

Data File F8 -- FLOAT

Offset	0	1	2	3	4
F8:0	0				

Data File L248 (dec) -- SCAN_TIMES

Offset	0	1	2	3	4
L248:0	0	0	0	0	0
L248:5	0	38767	92330	46761	14472
L248:10	24269	23135	18152	10832	5463
L248:15	4244	4354	3832	2332	1206
L248:20	604	479	475	398	293
L248:25	294	287	202	151	107
L248:30	57	77	95	77	37
L248:35	9	8	21	22	16
L248:40	11	4	2	2	2
L248:45	1	7	47	108	242
L248:50	176	118	77	100	137
L248:55	176	168	98	54	28
L248:60	7	18	9	8	7
L248:65	11	10	9	1	1
L248:70	1	1	2	1	0
L248:75	0	0	0	0	0
L248:80	0	0	0	0	0
L248:85	0	0	0	0	0
L248:90	0	0	0	0	0
L248:95	0	0	0	0	0
L248:100	0	0	0	0	0
L248:105	0	0	0	0	0
L248:110	0	0	0	0	0
L248:115	0	0	0	0	0
L248:120	0	0	0	0	0
L248:125	0	0	0	0	0
L248:130	0	0	0	0	0
L248:135	0	0	0	0	0
L248:140	0	0	0	0	0
L248:145	0	0	0	0	0
L248:150	0	0	0	0	0
L248:155	0	0	0	0	19
L248:160	49	59	31	6	6
L248:165	21	22	16	11	4
L248:170	2	2	2	1	7
L248:175	47	108	242	176	118
L248:180	77	100	137	176	168
L248:185	98	54	28	7	18
L248:190	9	8	7	11	10
L248:195	9	1	1	1	1
L248:200	2	1	0	0	0
L248:205	0	0	0	0	0
L248:210	0	0	0	0	0
L248:215	0	0	0	0	0
L248:220	0	0	0	0	0
L248:225	0	0	0	0	0
L248:230	0	0	0	0	0
L248:235	0	0	0	0	0
L248:240	0	0	0	0	0
L248:245	0	0	0	0	0

Data File L248 (dec) -- SCAN_TIMES

Offset	0	1	2	3	4
L248:250	0	0	0	0	0
L248:255	0				

Offset	0	1	2	3	4
F249:0	252297.8	931	270.9966	106421.1	579
F249:5	183.8016	0	0	0	0
F249:10	0	0	0	0	0
F249:15	0	0	0	0	0
F249:20	0	0	0	0	0
F249:25	0	0	0	0	0
F249:30	0	0	0	0	0
F249:35	0	0	0	0	0
F249:40	0	0	0	0	0
F249:45	0	0	0	0	0
F249:50	0	0	0	0	0
F249:55	0	0	0	0	0
F249:60	0	0	0	0	0
F249:65	0	0	0	0	0
F249:70	0	0	0	0	0
F249:75	0	0	0	0	0
F249:80	0	0	0	0	0
F249:85	0	0	0	0	0
F249:90	0	0	0	0	0
F249:95	0	0	0	0	0
F249:100	0	0	0	0	0
F249:105	0	0	0	0	0
F249:110	0	0	0	0	0
F249:115	0	0	0	0	0
F249:120	0	0	0	0	0
F249:125	0	0	0	0	0
F249:130	0	0	0	0	0
F249:135	0	0	0	0	0
F249:140	0	0	0	0	0
F249:145	0	0	0	0	0
F249:150	0	0	0	0	0
F249:155	0	0	0	0	0
F249:160	0	0	0	0	0
F249:165	0	0	0	0	0
F249:170	0	0	0	0	0
F249:175	0	0	0	0	0
F249:180	0	0	0	0	0
F249:185	0	0	0	0	0
F249:190	0	0	0	0	0
F249:195	0	0	0	0	0
F249:200	0	0	0	0	0
F249:205	0	0	0	0	0
F249:210	0	0	0	0	0
F249:215	0	0	0	0	0
F249:220	0	0	0	0	0
F249:225	0	0	0	0	0
F249:230	0	0	0	0	0
F249:235	0	0	0	0	0
F249:240	0	0	0	0	0
F249:245	0	0	0	0	0

Data File F249 -- RNK6FLOATS

Offset	0	1	2	3	4
F249:250	0	0	0	0	0
F249:255	0				

Data File N250 (dec) -- RNK6_INTS

Offset	0	1	2	3	4	5	6	7	8	9
N250:0	46	5	6	68	0	66	70	44	47	0
N250:10	38	0	0	0	0	0	0	0	0	0
N250:20	0	0	0	0	0	0	0	0	0	0
N250:30	0	0	0	0	0	0	0	0	0	0
N250:40	0	0	0	0	0	0	0	0	0	0
N250:50	0	0	0	0	0	0	0	0	0	0
N250:60	0	0	0	0	0	0	0	0	0	0
N250:70	0	0	0	0	0	0	0	0	0	0
N250:80	0	0	0	0	0	0	0	0	0	0
N250:90	0	0	0	0	0	0	0	0	0	0
N250:100	0	0	0	0	0	0	0	0	0	0
N250:110	0	0	0	0	0	0	0	0	0	0
N250:120	0	0	0	0	0	0	0	0	0	0
N250:130	0	0	0	0	0	0	0	0	0	0
N250:140	0	0	0	0	0	0	0	0	0	0
N250:150	0	0	0	0	0	0	0	0	0	0
N250:160	0	0	0	0	0	0	0	0	0	0
N250:170	0	0	0	0	0	0	0	0	0	0
N250:180	0	0	0	0	0	0	0	0	0	0
N250:190	0	0	0	0	0	0	0	0	0	0
N250:200	0	0	0	0	0	0	0	0	0	0
N250:210	0	0	0	0	0	0	0	0	0	0
N250:220	0	0	0	0	0	0	0	0	0	0
N250:230	0	0	0	0	0	0	0	0	0	0
N250:240	0	0	0	0	0	0	0	0	0	0
N250:250	0	0	0	0	0	0				

Offset	0	1	2	3	4	5	6	7	8	9
N251:0	19	39	39	234	329	345	563			

Offset	0	1	2	3	4	5	6	7	8	9
N252:0	70	38	69	45	68	46	67			

Data File N253 (dec) -- COUNT_I

Offset	0	1	2	3	4	5	6	7	8	9
N253:0	0	0	0	0	0	0	0	0	0	0
N253:10	0	0	0	0	0	0	0	0	0	0
N253:20	0	0	0	0	0	0	0	0	5	4
N253:30	7	6	9	23	18	10	4	12	39	9
N253:40	5	1	3	3	19	234	345	15	6	2
N253:50	4	2	7	5	4	4	3	3	2	1
N253:60	5	6	4	7	4	10	19	563	329	39
N253:70	34	4	0	1	2	1	2	0	3	4
N253:80	1	1	0	0	1	0	0	0	1	0
N253:90	1	1	0	1	0	0	1	0	0	1
N253:100	0	1	0	0	1	2	0	2	2	2
N253:110	1	2	0	0	0	0	0	0	0	0
N253:120	0	0	0	0	0	0	0	0	0	0
N253:130	0	0	0	0	0	0	0	0	0	0
N253:140	0	0	0	0	0	0	0	0	0	0
N253:150	0	0	0	0	0	0	0	0	0	0
N253:160	0	0	0	0	0	0	0	0	0	0
N253:170	0	0	0	0	0	0	0	0	0	0
N253:180	0	0	0	0	0	0	0	0	0	0
N253:190	0	0	0	0	0	0	0	0	0	0
N253:200	0	0	0	0	0	0	0	0	0	0
N253:210	0	0	0	0	0	0	0	0	0	0
N253:220	0	0	0	0	0	0	0	0	0	0
N253:230	0	0	0	0	0	0	0	0	0	0
N253:240	0	0	0	0	0	0	0	0	0	0
N253:250	0	0	0	0	0	0				

Data File N254 (dec) -- RANK6_I

Offset	0	1	2	3	4	5	6	7	8	9
N254:0	0	0	0	0	0	0	0	0	0	0
N254:10	0	0	0	0	0	0	0	0	0	0
N254:20	0	0	0	0	0	0	0	0	0	0
N254:30	0	0	0	0	0	0	0	0	1	0
N254:40	0	0	0	0	0	3	5	0	0	0
N254:50	0	0	0	0	0	0	0	0	0	0
N254:60	0	0	0	0	0	0	0	6	4	2
N254:70	0	0	0	0	0	0	0	0	0	0
N254:80	0	0	0	0	0	0	0	0	0	0
N254:90	0	0	0	0	0	0	0	0	0	0
N254:100	0	0	0	0	0	0	0	0	0	0
N254:110	0	0	0	0	0	0	0	0	0	0
N254:120	0	0	0	0	0	0	0	0	0	0
N254:130	0	0	0	0	0	0	0	0	0	0
N254:140	0	0	0	0	0	0	0	0	0	0
N254:150	0	0	0	0	0	0	0	0	0	0
N254:160	0	0	0	0	0	0	0	0	0	0
N254:170	0	0	0	0	0	0	0	0	0	0
N254:180	0	0	0	0	0	0	0	0	0	0
N254:190	0	0	0	0	0	0	0	0	0	0
N254:200	0	0	0	0	0	0	0	0	0	0
N254:210	0	0	0	0	0	0	0	0	0	0
N254:220	0	0	0	0	0	0	0	0	0	0
N254:230	0	0	0	0	0	0	0	0	0	0
N254:240	0	0	0	0	0	0	0	0	0	0
N254:250	0	0	0	0	0	0				

Data File F255 -- SUM_I

Offset	0	1	2	3	4
F255:0	0	0	0	0	0
F255:5	0	0	0	0	0
F255:10	0	0	0	0	0
F255:15	0	0	0	0	0
F255:20	0	0	0	0	0
F255:25	0	0	0	572.8938	468.8645
F255:30	849.0842	749.6947	1161.416	3073.26	2471.795
F255:35	1410.745	586.3248	1799.267	5978.022	1417.582
F255:40	803.4188	164.1026	506.2271	522.3444	3364.103
F255:45	42745.34	63675.77	2842.735	1157.753	394.1392
F255:50	803.663	409.5238	1466.178	1068.62	867.3993
F255:55	884.7375	676.1905	688.4005	468.8645	237.1184
F255:60	1205.861	1475.214	994.3834	1772.161	1028.083
F255:65	2613.187	5060.317	151760.3	89690.55	10846.88
F255:70	9528.692	1146.276	0	295.2381	594.3834
F255:75	300.6105	608.7912	0	938.7057	1269.841
F255:80	320.1465	325.0305	0	0	338.4615
F255:85	0	0	0	351.6483	0
F255:90	361.4164	364.3468	0	373.138	0
F255:95	0	386.0806	0	0	395.6044
F255:100	0	405.8608	0	0	417.3382
F255:105	843.7119	0	859.3407	867.6434	874.9695
F255:110	441.514	888.6447	0	0	0
F255:115	0	0	0	0	0
F255:120	0	0	0	0	0
F255:125	0	0	0	0	0
F255:130	0	0	0	0	0
F255:135	0	0	0	0	0
F255:140	0	0	0	0	0
F255:145	0	0	0	0	0
F255:150	0	0	0	0	0
F255:155	0	0	0	0	0
F255:160	0	0	0	0	0
F255:165	0	0	0	0	0
F255:170	0	0	0	0	0
F255:175	0	0	0	0	0
F255:180	0	0	0	0	0
F255:185	0	0	0	0	0
F255:190	0	0	0	0	0
F255:195	0	0	0	0	0
F255:200	0	0	0	0	0
F255:205	0	0	0	0	0
F255:210	0	0	0	0	0
F255:215	0	0	0	0	0
F255:220	0	0	0	0	0
F255:225	0	0	0	0	0
F255:230	0	0	0	0	0
F255:235	0	0	0	0	0
F255:240	0	0	0	0	0
F255:245	0	0	0	0	0

Data File F255 -- SUM_I

Offset	0	1	2	3	4
F255:250	0	0	0	0	0
F255:255	0				

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
B3:0/0	SEND_LOAD_CELL_DATUM	Global					
B3:0/1	RESET_TRAINING	Global					
B3:0/2	NEW_DATA_ONESHOT	Global					
B3:0/3	EMULATE_LOADCELLDATA	Global					
B3:0/4	CANCEL_TRAINING	Global					
B3:0/5	TRAINING_IS_INACTIVE	Global					
B3:0/6	TRAINING_FINISHED	Global					
B3:0/13	TRAINING_FINISH_ONSM	Global					
B3:0/14	RESET_FALLING_ONS_M	Global					
B3:0/15	NEW_DATA_ONESHOT_MEM	Global					
C5:0	TOTAL_COUNT	Global					
C5:1							
F8:0	LOAD_CELL_INPUT	Global					
F8:1	FILTERED_DATA	Global					
F8:2	FILTER_PARAMETER	Global					
F8:3	TEMPORARY_FLOAT	Global					
F8:4	DATA_DIFFERENCE	Global					
F8:5	FILTERED_DATA_LOW	Global					
F8:6	FILTERED_DATA_HIGH	Global					
F8:7	FILTERED_DATA_THIRD	Global					
F249:0	1ST_PEAK_VALUES_SUM	Global					
F249:1	1ST_PEAK_COUNTS_SUM	Global					
F249:2	1ST_PEAK_WEIGHT_MEAN	Global					
F249:3	2ND_PEAK_VALUES_SUM	Global					
F249:4	2ND_PEAK_COUNTS_SUM	Global					
F249:5	2ST_PEAK_WEIGHT_MEAN	Global					
F255:[N250:0]	_SUM_IBINS	Global					
N7:0	PASS_NUMBER	Global					
N7:1	LOAD_CELL_RAW_INPUT	Global					
N7:2	S35_SCAN_TIME	Global					
N250:0	INEWBIN	Global					
N250:1	RANK6_OF_INEBIN	Global					
N250:2	RANK6_OF_NEXT_BIN_UP	Global					
N250:3	INEXT_BIN_UP	Global					
N250:4	BUBBLE_SORT_PASS	Global					
N250:5	1ST_PEAK_LO_LIMIT	Global					
N250:6	1ST_PEAK_HI_LIMIT	Global					
N250:7	2ND_PEAK_LO_LIMIT	Global					
N250:8	2ND_PEAK_HI_LIMIT	Global					
N250:9	PEAKS_IRANK6	Global					
N250:10	PEAKS_IBIN	Global					
N251:0	RANK6_COUNTS_ARRAY	Global					
N252:0	RANK6_BINS_ARRAY	Global					
N253:[N250:0]	_COUNT_INEBIN	Global					
N254:[N250:0]	_RANK6_INEBIN	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				

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
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				
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				
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				

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
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,F1				
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				
T4:0	LOAD_CELL_SAMPLING	Global					
T4:1	LOAD_CELL_SAMPLING2	Global					

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV	BLW
U:3	FILTER_DATA	Global					
U:4	READ_LOAD_CELL_DATA	Global					
U:5	TRAINING	Global					
U:250	SCAN_TIME HISTOGRAM	Global					
U:251	ADD ONE RANK6 MEMBER	Global					
U:252	CALC_PEAKS_MEANS	Global					
U:253	RANK6_ADD_NEW_VALUE	Global					
U:254	RANK6_BUBBLE_SORT	Global					
U:255	RESET_RANK6_ARRAYS	Global					

Address	Instruction	Description
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Symbol Group Database

Group_Name	Description
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