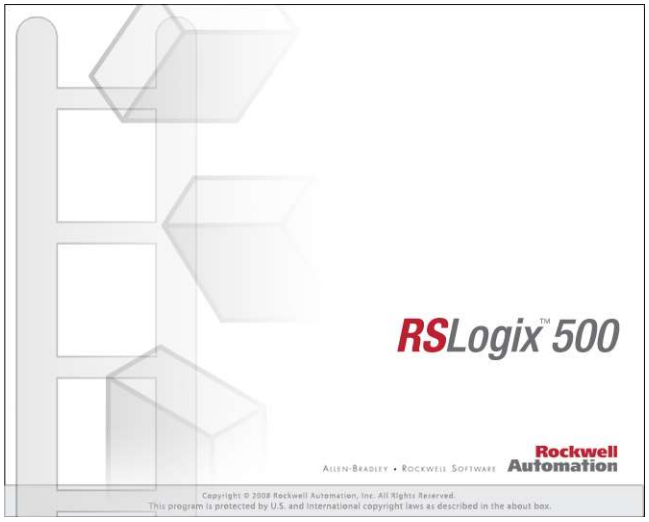
RSLogix Micro Project Report



Processor Information

Processor Type: Bul.1763 MicroLogix 1100 Series B

Processor Name: SIM_PLC

Total Memory Used: 223 Instruction Words Used - 79 Data Table Words Used

Total Memory Left: 6433 Instruction Words Left

Program Files: 6

Data Files: 9

Program ID: aaf4

I/O Configuration

0	Bul.1763	MicroLogix 1100 Series B
1	1762-IQ8	8-Input 10/30 VDC
2	1762-OW8	8-Output Relay
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: Yes
Dhcp Enable No
SNMP Enable: No
HTTP Enable: Yes
Auto Negotiate Enable: Yes
Port Speed Enable: 10/100 Mbps Full Duplex/Half Duplex
Contact:
Location:

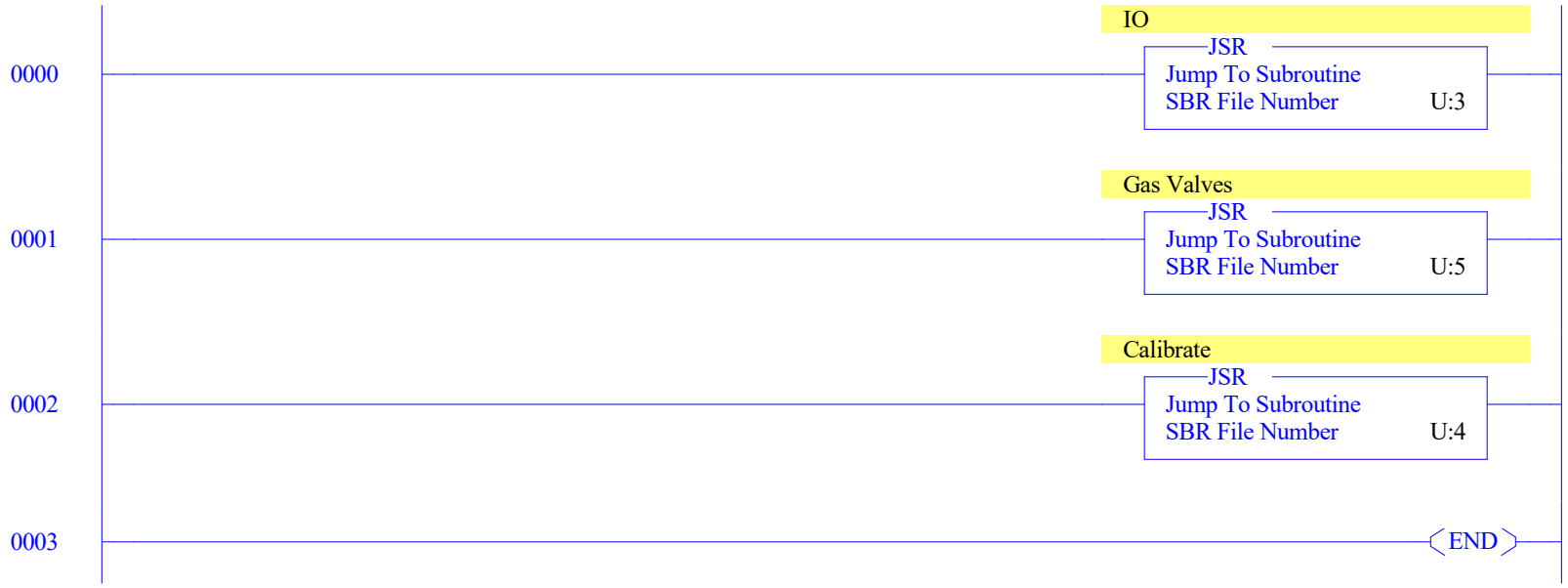
Program File List

Name	Number	Type	Rungs	Debug	Bytes
[SYSTEM]	0	SYS	0	No	0
	1	SYS	0	No	0
MAIN	2	LADDER	4	No	30
IO	3	LADDER	5	No	157
CALIBRATE	4	LADDER	12	No	419
GAS VALVES	5	LADDER	3	No	47

Data File List

Name	Number	Type	Scope	Debug	Words	Elements	Last
OUTPUT	0	O	Global	No	15	5	O:4
INPUT	1	I	Global	No	21	7	I:6
STATUS	2	S	Global	No	0	66	S:65
BINARY	3	B	Global	No	1	1	B3:0
TIMER	4	T	Global	No	12	4	T4:3
COUNTER	5	C	Global	No	3	1	C5:0
CONTROL	6	R	Global	No	3	1	R6:0
INTEGER	7	N	Global	No	14	14	N7:13
FLOAT	8	F	Global	No	10	5	F8:4

LAD 2 - MAIN --- Total Rungs in File = 4



0000

Calibrate Button Input
B3:0
0

B3:0
ONS
4

Calibrate BTN
CALIBRATE_BTN
B3:0
1

A loose wire connection on the sensor can result in issues like a value less than 0 being read. In some cases, a sensor can read values greater than the "input max". For these reasons, we have a GRT and LES blocks included in branches under the SCP block to keep these values within our scaling range and not have our program run into issues.

0001

Measured 02 Concentration (%)
MEAS_02_PRCNT

SCP
Scale w/Parameters
Input N7:0 0<
Input Min. N7:2 0<
Input Max. N7:3 16383<
Scaled Min. 0 0<
Scaled Max. 40 40<
Output N7:1 0<

O2 Sensor Input Signal

LES
Less Than (A<B)
Source A N7:0 0<
Source B N7:2 0<

Measured 02 Concentration (%)
MEAS_02_PRCNT

MOV
Move
Source 0 0<
Dest N7:1 0<

O2 Sensor Input Signal

GRT
Greater Than (A>B)
Source A N7:0 0<
Source B N7:3 16383<

Measured 02 Concentration (%)
MEAS_02_PRCNT

MOV
Move
Source 40 40<
Dest N7:1 0<

0002

0% Gas Valve Open
0_PRCNT_VALVE
B3:0
2

0% Gas Valve
O:2
0
1762-OW8

0003

30% Gas Valve Open
30_PRCNT_VALVE
B3:0
3

30% Gas Valve
O:2
1
1762-OW8

0004

END

The calibrate button triggers the valve with the 0% O2 gas to open. Once enough samples are taken of the 0% gas, the 30% O2 gas valve is opened and we take samples of that.

0000

Calibrate BTN
CALIBRATE_BTN
B3:0
1

0% Gas Valve Open
0_PRCNT_VALVE
B3:0
2

0% Gas Valve Open
0_PRCNT_VALVE
B3:0
2

0% Sampling Timer
T4:0
DN

0% Gas Valve Open
0_PRCNT_VALVE
B3:0
2

0001

30% Sampling Trigger
B3:0
5

30% Gas Valve Open
30_PRCNT_VALVE
B3:0
3

30% Gas Valve Open
30_PRCNT_VALVE
B3:0
3

30% Sampling Timer
T4:2
DN

These "sampling timers' are used to take samples for 30 seconds for each valve.

0002

0% Gas Valve Open
0_PRCNT_VALVE
B3:0
2

0% Sampling Timer
TON
Timer On Delay
Timer T4:0
Time Base 1.0
Preset 30<
Accum 0<
EN
DN

Whilst the sampling timer is running we another timer to trigger adding a sample to the total sum of samples every second. This way we can calculated the average of our calibration samples (30 samples total). The total sums are reset back to zero after the averages are calculated for whenever another calibration is performed

0003

0% Sampling Timer
T4:0
EN

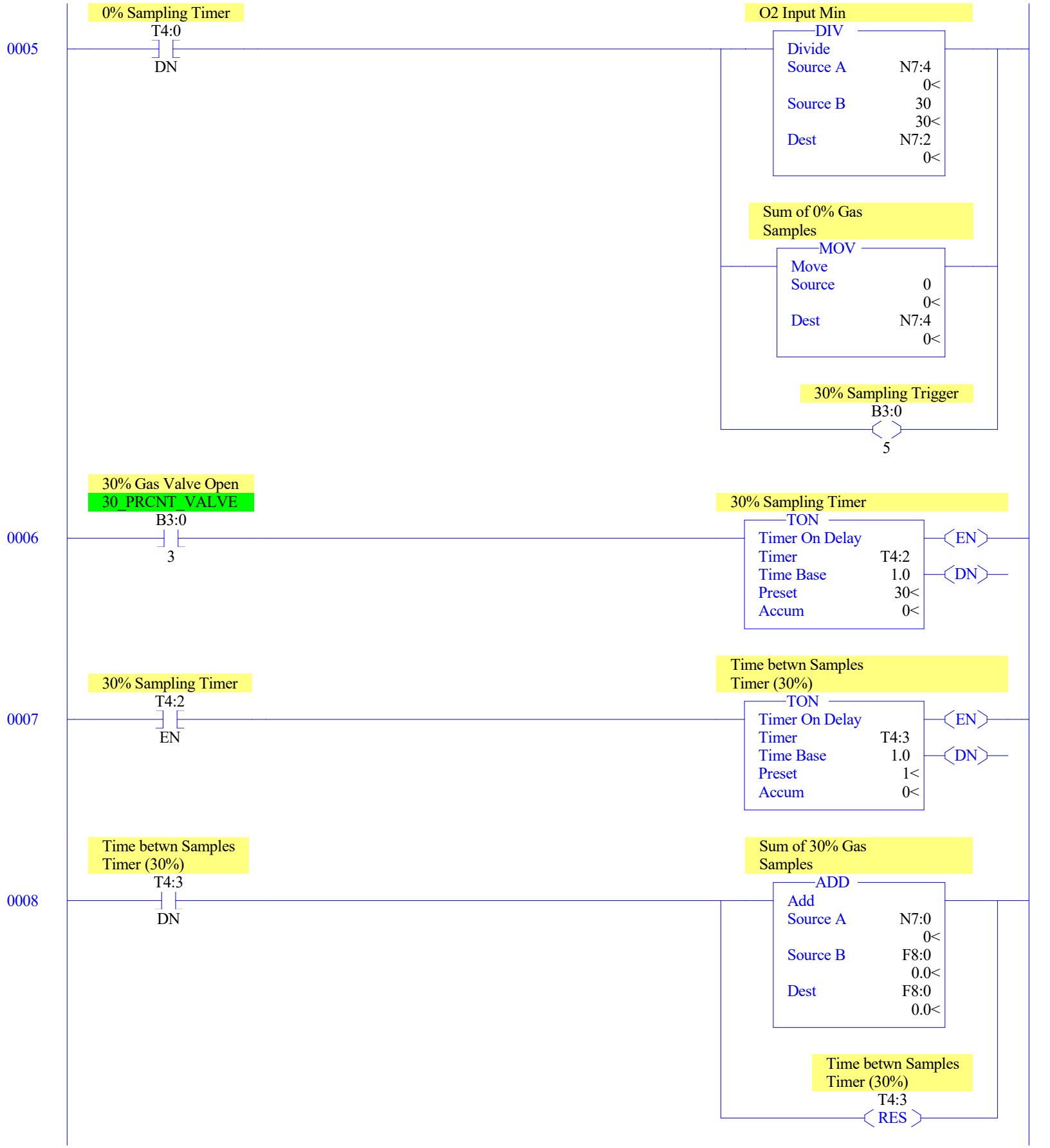
Time betwn Samples
Timer (0%)
TON
Timer On Delay
Timer T4:1
Time Base 1.0
Preset 1<
Accum 0<
EN
DN

0004

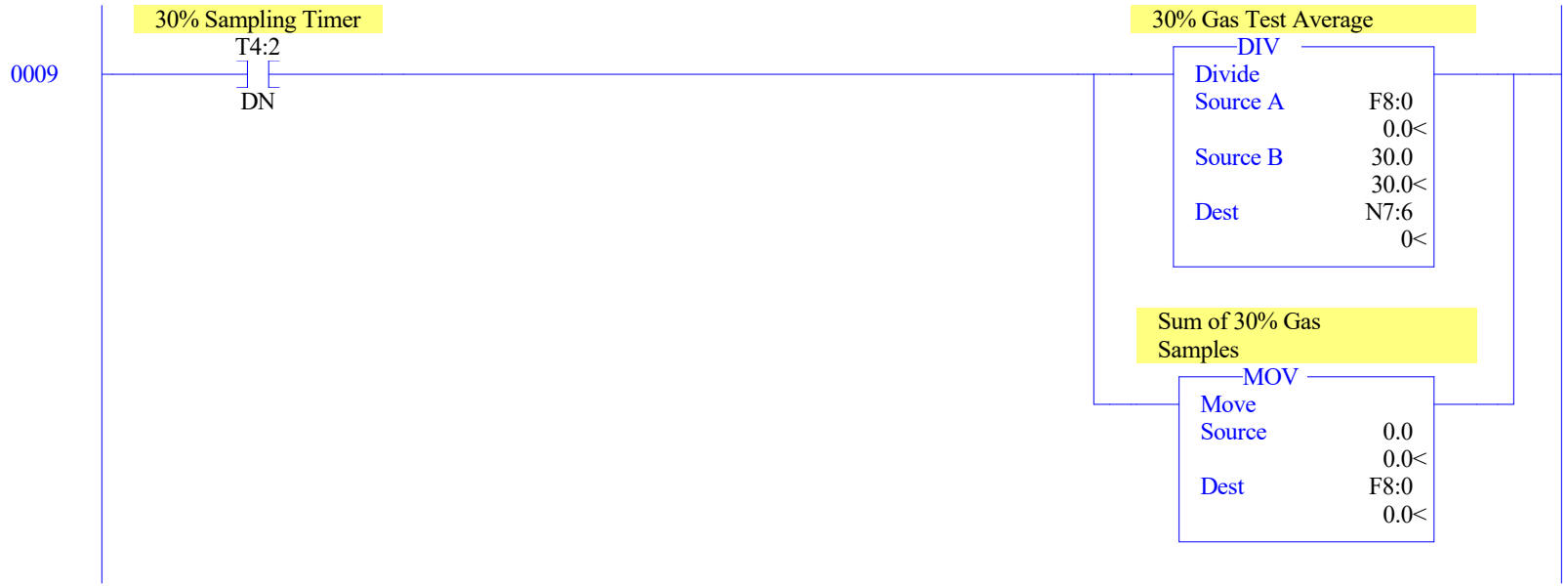
Time betwn Samples
Timer (0%)
T4:1
DN

Sum of 0% Gas
Samples
ADD
Add
Source A N7:0
0<
Source B N7:4
0<
Dest N7:4
0<

Time betwn Samples
Timer (0%)
T4:1
RES


0% Sampling Timer
T4:0
DN
0005
O2 Input Min
DIV
Divide
Source A N7:4 0<
Source B 30 30<
Dest N7:2 0<
Sum of 0% Gas Samples
MOV
Move
Source 0 0<
Dest N7:4 0<
30% Sampling Trigger
B3:0
5
30% Gas Valve Open
30_PRCNT_VALVE
B3:0
3
0006
30% Sampling Timer
TON
Timer On Delay
Timer T4:2
Time Base 1.0
Preset 30<
Accum 0<
EN
DN
30% Sampling Timer
T4:2
EN
0007
Time betwn Samples Timer (30%)
TON
Timer On Delay
Timer T4:3
Time Base 1.0
Preset 1<
Accum 0<
EN
DN
Time betwn Samples Timer (30%)
T4:3
DN
0008
Sum of 30% Gas Samples
ADD
Add
Source A N7:0 0<
Source B F8:0 0.0<
Dest F8:0 0.0<
Time betwn Samples Timer (30%)
T4:3
RES

LAD 4 - CALIBRATE --- Total Rungs in File = 12



When calibrating the sensor, the 0% average is our new input min. The new input max is determined by the following formula:

Input Max = ((Max_Concentration ÷ Calibration_Concentration) * (Calibration_Average - Zero_Calibration_Average)) + Zero_Calibration_Average

where:
Max_Concentration = 40%
Calibration_Concentration = 30%
Calibration_Average = Average from 30% valve samples
Zero_Calibration_Average = Average from 0% valve samples

0010

30% Sampling Timer
T4:2
DN

Temp Calc
DIV
Divide
Source A F8:1 40.0<
Source B F8:2 30.0<
Dest F8:3 0.0<

Temp Calc
SUB
Subtract
Source A N7:6 0<
Source B N7:2 0<
Dest N7:8 0<

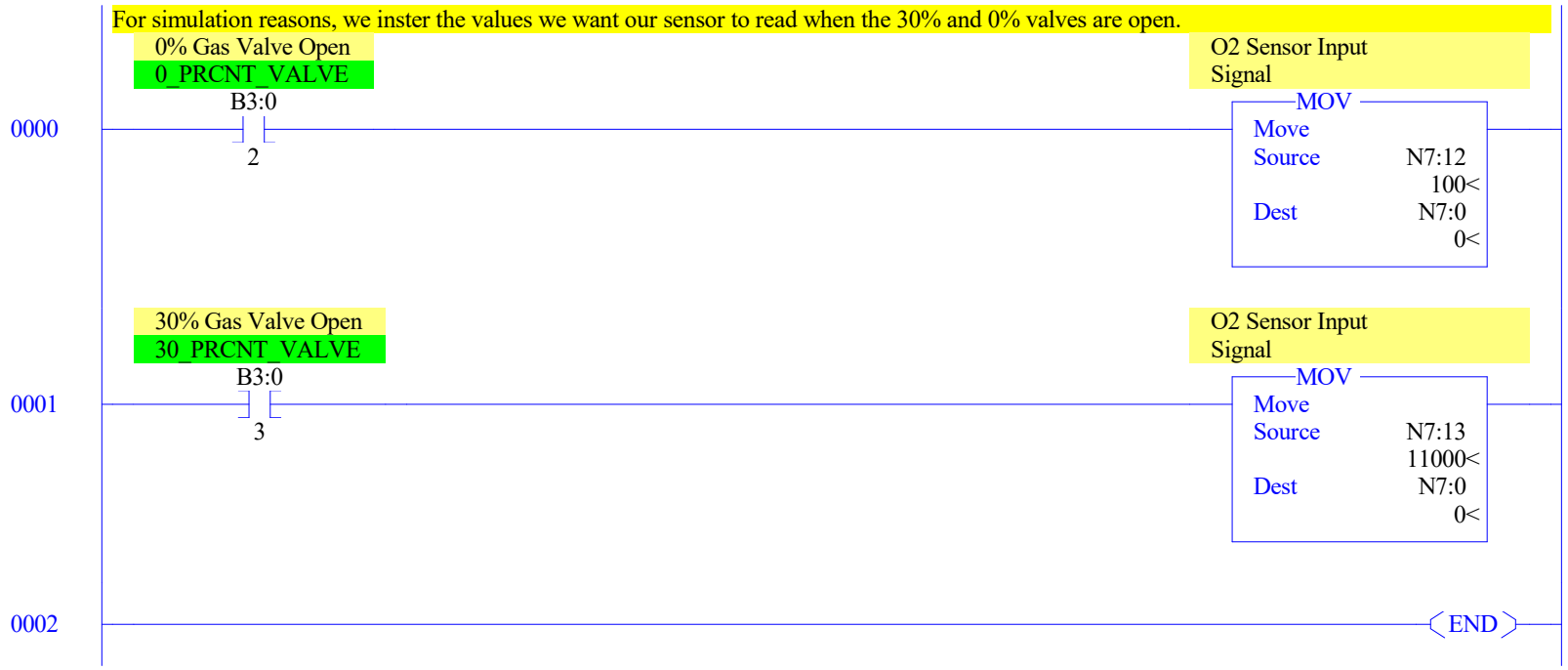
Temp Calc
MUL
Multiply
Source A F8:3 0.0<
Source B N7:8 0<
Dest F8:4 0.0<

O2 Input Max
ADD
Add
Source A F8:4 0.0<
Source B N7:2 0<
Dest N7:3 16383<

0011

END

LAD 5 - GAS VALVES - O2 Concentration Values to be read by O2 Sensor --- Total Rungs in File = 3



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
O:2.0									0	0	0	0	0	0	0	0	1762-OW8 - 8-Output Relay

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
I:1.0									0	0	0	0	0	0	0	0	1762-IQ8 - 8-Input 10/30 VDC	

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	

Data File T4 -- TIMER

Offset	EN	TT	DN	BASE	PRE	ACC	(Symbol) Description
T4:0	0	0	0	1.0 sec	30	0	0% Sampling Timer
T4:1	0	0	0	1.0 sec	1	0	Time betwn Samples Timer (0%)
T4:2	0	0	0	1.0 sec	30	0	30% Sampling Timer
T4:3	0	0	0	1.0 sec	1	0	Time betwn Samples Timer (30%)

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	

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	0	0		

Data File N7 (dec) -- INTEGER

Offset	0	1	2	3	4	5	6	7	8	9
N7:0	0	0	0	16383	0	0	0	0	0	0
N7:10	0	0	100	11000						

O2 SENSOR CALIBRATION

Data File F8 -- FLOAT

Offset	0	1	2	3	4
F8:0	0	40	30	0	0

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV
B3:0/0			Calibrate Button Input			
B3:0/1	CALIBRATE_BTN	Global	Calibrate BTN			
B3:0/2	0_PRCNT_VALVE	Global	0% Gas Valve Open			
B3:0/3	30_PRCNT_VALVE	Global	30% Gas Valve Open			
B3:0/4						
B3:0/5			30% Sampling Trigger			
B3:0/6						
B3:0/7						
B3:0/8						
B3:0/9						
B6:0/6						
C5:0						
F8:0			Sum of 30% Gas Samples			
F8:1			Max Concentration			
F8:2			Calibration Concentration			
F8:3			Temp Calc			
F8:4			Temp Calc			
N7:0			O2 Sensor Input Signal			
N7:1	MEAS_02_PRCNT	Global	Measured 02 Concentration (%)			
N7:2			O2 Input Min			
N7:3			O2 Input Max			
N7:4			Sum of 0% Gas Samples			
N7:5						
N7:6			30% Gas Test Average			
N7:7						
N7:8			Temp Calc			
N7:9						
N7:10						
N7:11						
N7:12			Custom 0% O2 Sensor Reading			
N7:13			Custom 30% O2 Sensor Reading			
O:2/0			0% Gas Valve			
O:2/1			30% Gas Valve			
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			
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			

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV
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 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			

Address/Symbol Database

Address	Symbol	Scope	Description	Sym Group	Dev. Code	ABV
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			0% Sampling Timer			
T4:0/DN						
T4:0/EN						
T4:1			Time betwn Samples Timer (0%)			
T4:1/DN						
T4:2			30% Sampling Timer			
T4:2/0						
T4:2/DN						
T4:2/EN						
T4:3			Time betwn Samples Timer (30%)			
T4:3/DN						
U:3			IO			
U:4			Calibrate			
U:5			Gas Valves			

Instruction Comment Database

Address	Instruction	Description

Symbol Group Database

Group_Name	Description