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1. INTRODUCTION

This document details the Factory Acceptance Testing(SAT) migration existing SLC to ControlLogix PLC of TBL Lorry. This SAT automation system for the PLC Hardware communicate to, TAS via Kepware OPC redundant server. Testing is expected to take confirmation with the actual hardware.

1.1. Glossary of Terms & Acronyms Used In This Manual

Term or Acronym	Context	Meaning
N/A	Not application	The test or check that not applicable to specify items
PLC	Control system	Programmable Logic Control
HMI	Control system	Human Machine Interface
PSU	Control system	Power Supply Unit
TAS	Control system	Terminal Automation System
OPC	Communication protocol	Open Platform Communications
SAT		

1.2. SAT Location

The SAT Location will be at :Thai Lube Base Public Company Limited. Chonburi plant, Thailand

1.3. Procedure for Non-Conformities

After the test and verification of each item then it shall be marked as completed. If any malfunction is detected, the test sequence shall be repeated. If the malfunction cannot be reproduced, the error shall be investigated after the completion of the SAT - with an entry to be made into the SAT Configuration query file. If the error can be reproduced, the test will be continued and the error logged on the punch-list sheets. Where possible the fault will be corrected prior to being re-tested on the next day or prior to the completion of the SAT. If this is not possible, a further entry shall be made into the SAT Configuration query file. Rockwell will rectify and re-test these defects after the SAT has been completed.

Appendix B contains a sample punch-list sheet and SAT Configuration query file documents.

Once the SAT has been successfully completed, the nominated customer and Rockwell representatives shall sign the SAT Completion Certificate. At this point the SAT shall be deemed to be complete and commissioning contingent upon any defects noted in the SAT Configuration query index being rectified.

1.4. SAT Objectives

The objectives of the SAT are to establish the control systems commissioned on site for plant operations.

1.5. Existing System Configuration

The existing TBL Lorry Loading is SLC connect with TAS system via Ethernet

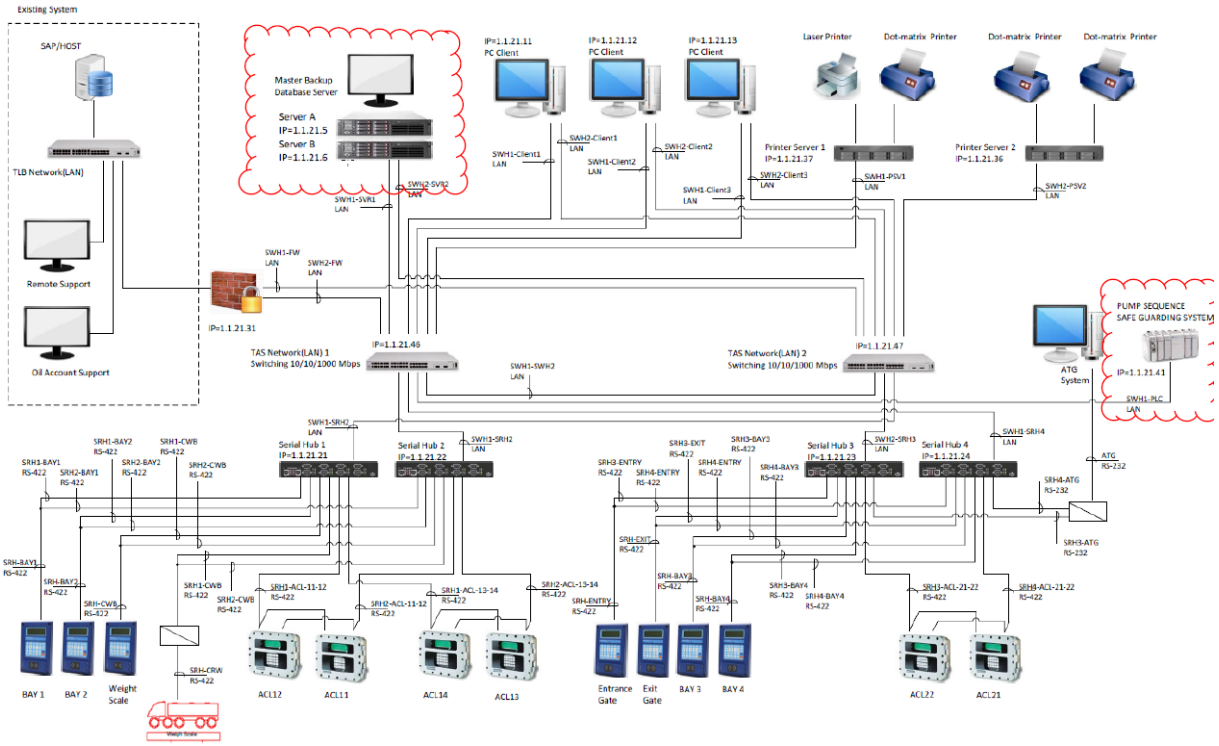

Figure 1 Existing TLB LORRY Loading PLC

1.6. System Configuration for SAT

The listed below is real hardware plan to replace existing system, after completed SAT these hardware will perform same as the existing system, BOM are listed below.

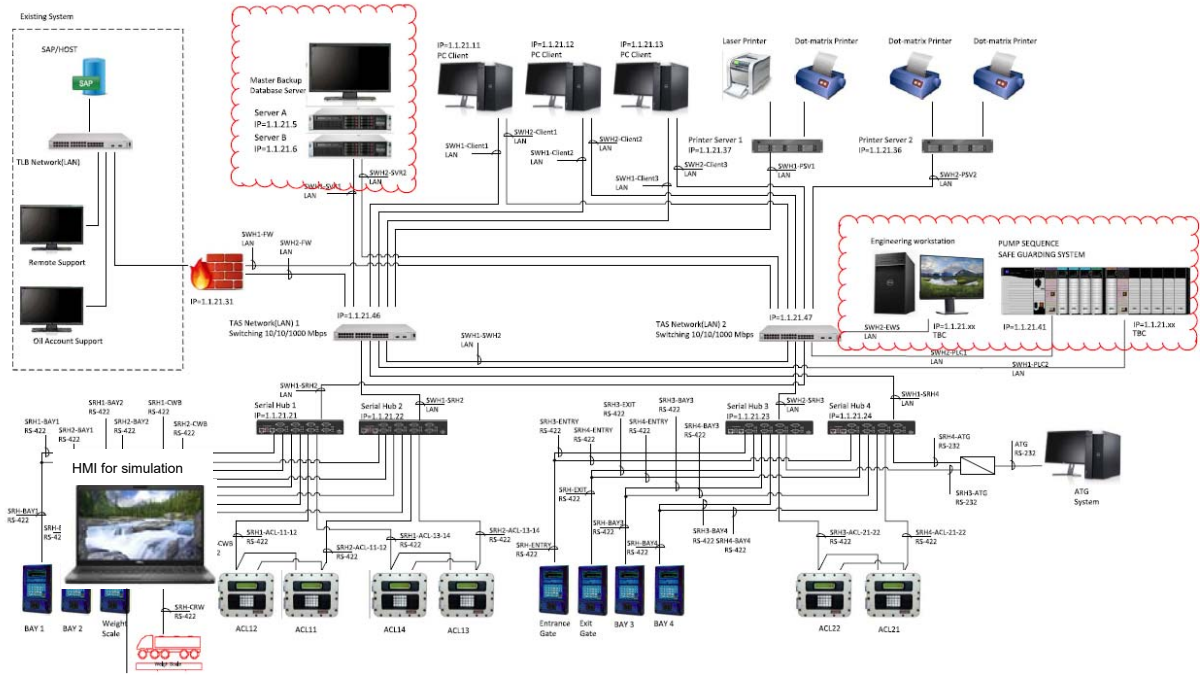

Figure 2 System Configuration for SAT

Rockwell Hardware

Item	Catalog no	Description	Quantity	Unit	Pass/Fail or Data
1	1756-A13	ControlLogix 13 Slots Chassis	1	Set	
2	1756-PB72	ControlLogix 24V DC Power Supply	1	Set	
3	1756-L71	ControlLogix 2 MB Controller	1	Set	
4	1756-EN2T	CLX HI-CAP ENET/IP MODULE - TP	2	Set	
5	1756-IB32	ControlLogix 32 Pt 12/24V DC D/I Module	3	Set	
6	1756-TBCH	ControlLogix 36 Pin Screw Terminal Block	5	Set	
7	1756-OV32E	ControlLogix 32 Point D/O Module	2	Set	
8	1756-IF8I	ControlLogix 8 Point Analog Input	1	Set	
9	1756-N2	ControlLogix Empty Slot Cover	4	Set	
10	1492-IFM40F	Connection Products	5	Set	
11	1492-CABLE025Z	Digital Cable Connection Products	5	Set	
12	1492-AIFM8S-3	Analog Interface Module	1	Set	
13	1492-ACABLE025YA	Analog Cable Connection Products	1	Set	

Software

Item	Catalog no	Description	Quantity	Unit	Pass/Fail or Data
1	KWM-ABSTE0-RCP	KepServerEx Allen-Bradley OPC Suite Support Recapture	2	License	
2	KWM-MDBUS0-RCP	KepServerEx Modbus Suite Support Recapture	2	License	
3	9324-RLD600ENM	MEDIA - Studio 5000 Full Edition, English	1	License	
4	9701-VWSTENM	MEDIA - FactoryTalk View Studio for FactoryTalk View Enterprise (ENGLISH)	1	License	

3rd Party Hardware

Item	Catalog no	Description	Quantity	Unit	Pass/Fail or Data
1	Dell Precision T3630 CTO	Computer Work station DELL	1	Set	

1.7. Punch Lists and Change Control

Separate Punch Lists shall be maintained for the Hardware tests. If a fault is found whilst testing the procedure shall be as follows:

(a) Take the next available number from the punch list index and add a short description of the fault.

(b) Take a fault log sheet and add the number plus a detailed description of the fault, date and sign. Attach marked up copies of drawings or graphics as required to make the problem clear.

I Place the completed log sheet in the tray marked ‘COMPLETED’.

(d) At the end of each day all log sheets raised during the day will be reviewed so that they are clearly understood by RA and it will be decided if they are to be fixed that evening or not.

I Once faults are fixed RA will complete the log sheet and place the sheet in the tray marked ‘FOR RETEST’. The customer person who raised the log will re-test the item and complete the log sheet and place in the tray marked ‘COMPLETE FOR FILE’.

(f) RA will update the Punch List index based upon the completed log sheets on a daily basis so that progress can be tracked.

ALL changes during SAT will be controlled in this way and there shall be no un-authorised changes to the system after sign off of tests

All tests will have two levels of sign off by the customer. The tester shall sign for completion of every test. Overall completion of the test shall be signed off by one of the nominated authorised signatories

1.8. Nominated Person

At the commencement of the SAT, the names and positions of the RA personnel conducting the tests and the customer (or nominated) representatives attending will be entered in the spaces below. This identifies the persons authorised to sign off the satisfactory completion of each test, final acceptance of the SAT, and any qualifications thereto.

RA Personnel	
Name	**Responsibility**

Customer Authorised signatories for responsible SAT	
Name	**Responsibility**

2. SAT PROCEDURE

2.1. Overview

The SAT will consist of the following tests:

- PLC hardware check physical module
- Hardware functional test
- Loop Test
- OPC data test
- Function test and commissioning

2.2. Documentation

The following latest documentation will be the basis for the SAT:

- 800469957-TLB-0011-SAT and ISAT Procedure (this document)
- 800469957-TLB-004 IO Assignment list
- 800469957-TLB-005 OPC address mapping list
- 800469957-TLB-006 Instruments Loop Wiring Diagram
- 800469957-TLB-007 System Cabinet Mechanical Layout & Electrical Wiring Drawing
- 800469957-TLB-013 System Tie-in Procedure

2.3. SAT Equipment:

Sr. No.	Name	Cal. Certificate / Serial number	Qty	Unit	Pass/Fail or Data
1	ControlLogix (System)	-	1	Set	
2	PC Engineering Workstation	-	1	Set	
3	Fluke 789 Multimeter		1	Set	
4	Software for Engineering work station	-			
	- Studio 5000 software		1	License	
	- FTView Studio		1	License	
	- Microsoft office		1	License	
	- Symantec endpoint protection		1	License	

2.4. Acceptance Certificates

On the successful conclusion of the SAT, an Overall Acceptance Certificate will be signed by Thai Lube / and RA nominated persons. If any agreed remedial work is required to be completed before system despatch to site, the Certificate will be qualified in appropriate terms. In such event RA will give written confirmation to the Customer when such work has been carried out.

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3. PLC HARDWARE CHECK PHYSICAL MODULE

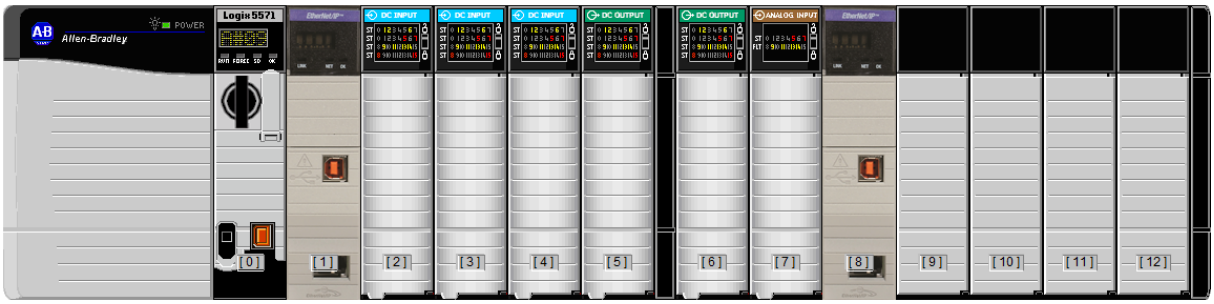
This is to certify that the subject system was duly inspected in accordance with the authorized factory inspection procedures agreed. Observations & action items in the form of Punch List are attached herewith. The system hardware was found to be in accordance with the specified project requirements. The system is cleared for despatch. The despatch clearance is hereby issued to Rockwell Automation to despatch system to site

3.1. Equipment Installation

3.1.1. Module in Controller Chassis Hardware Check

Check equipment are present as the BOM list.

VERIFY INSTALLATION OF			Record Serial No.	Firmware	MFG Date YYYY/MM/DD	Pass/Fail or Data
1	1756-A13	-	79629987	n/a	2020/07/08	
2	1756-PB72	-	79750220	n/a	2020/06/29	
3	1756-L71	Slot 0	79337960	32.011	2020/06/10	
4	1756-EN2T	Slot 1	79585584	11.002	2020/06/21	
5	1756-IB32	Slot 2	78782390	3.006	2020/05/14	
6	1756-IB32	Slot 3	78782392	3.006	2020/05/14	
7	1756-IB32	Slot 4	78782240	3.006	2020/05/14	
8	1756-OV32E	Slot 5	78664951	3.003	2020/05/07	
9	1756-OV32E	Slot 6	78664963	3.003	2020/05/07	
10	1756-IF8I	Slot 7	74349182	2.012	2019/10/23	
11	1756-EN2T	Slot 8	79585582	11.002	2020/06/21	
12	1756-N2	Slot 9				
13	1756-N2	Slot 10				
14	1756-N2	Slot 11				
15	1756-N2	Slot 12				



3.2. Hardware function test

After installation and power on checking all module functional

3.2.1. Hardware Status

	TASK	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	Local Chassis			
1	Power supply LED Power status Solid Green			
2	Processor 1756-L71 Slot#0 is OK LED Solid Green			
3	Ethernet module 1756-EN2T Slot#1 is OK LED Solid Green, LED LINK and NET flashing green			
4	1756-IB32 Slot#2 is OK LED Solid Green			
5	1756-IB32 Slot#3 is OK LED Solid Green			
6	1756-IB32 Slot#4 is OK LED Solid Green			
7	1756-OV32E Slot#5 is OK LED Solid Green			
8	1756-OV32E Slot#6 is OK LED Solid Green			
9	1756-IF8I Slot#7 is OK LED Solid Green			
10	Ethernet module 1756-EN2T Slot#8 is OK LED Solid Green, LED LINK and NET flashing green.			

3.2.2. Verify software diagnostic Status

Use Studio5000 software view the property each of module and record status

	Module info	Major fault	Minor fault	Internal state	Configurated	Owned	Module identity	Pass/Fail or Data
1	1756-IB32 Slot#2	None	None	Running	Configurated	Owned	Match	
2	1756-IB32 Slot#3	None	None	Running	Configurated	Owned	Match	
3	1756-IB32 Slot#4	None	None	Running	Configurated	Owned	Match	
4	1756-OV32E Slot#5	None	None	Running	Configurated	Owned	Match	
5	1756-OV32E Slot#6	None	None	Running	Configurated	Owned	Match	
6	1756-IF8I Slot#7	None	None	Running	Configurated	Owned	Match	

	Task	Configuration	Pass/Fail or Data
1	1756-EN2T ENET Slot#1	IP Address _____1.1.21.41_____ Subnet _____255.255.0.0_____	
2	1756-EN2T ENET Slot#8	IP Address _____1.1.21.42_____ Subnet _____255.255.0.0_____	

Check-list sign-off	
Tester (Name)	Signature and Date
Customer Approver (Name)	Signature and Date

4. PROGRAMMING VERIFICATION

4.1. Verify PLC program structure

	TASK	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
1	Verify program configuration correctly			
2	Verify I/O tag and format compatibility			
3	Verify program structure			
4	Verify main program ladder compatibility			
5	Verify communication mapping			

Check-list sign-off	
Tester (Name)	Signature and Date
Customer Approver (Name)	Signature and Date

5. IO TESTING

This is to This is migration project which we use existing wiring without any modification between terminals in cabinet and field device. We will testing input by energize from field device and record data on PLC, HMI and TAS. Testing output by command from PLC, HMI and DCS that will energize to field device and take record.

This testing will based on below documents. That will submit as master IO assignment after finish SAT

- 800469957-TLB-004 IO Assignment list
- 800469957-TLB-006 Instruments Loop Wiring Diagram

5.1. IO Module Testing

5.1.1. 1756-IB32 Slot #2 Testing (DI_S02)

Loop test signal from field device to each input channel. Observe LED status have to show on module and show on ladder logic.

	IO Address	PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
1	Local:2:I.Data.0	m_360L_HZ090						
2	Local:2:I.Data.1	m_360L_HZ091						
3	Local:2:I.Data.2	m_360L_HZ092						
4	Local:2:I.Data.3	m_360L_HZ093						
5	Local:2:I.Data.4	m_360L_HZ094						
6	Local:2:I.Data.5	m_360L_HZ051						
7	Local:2:I.Data.6	m_360L_HZ061						
8	Local:2:I.Data.7	m_360L_GZS091						
9	Local:2:I.Data.8	m_360L_GZS092						
10	Local:2:I.Data.9	m_360L_GZS057						
11	Local:2:I.Data.10	m_360L_GZS067						
12	Local:2:I.Data.11	m_LZS051_M101A						
13	Local:2:I.Data.12	m_LZS052_M101B						
14	Local:2:I.Data.13	m_GZS051_M101A						
15	Local:2:I.Data.14	m_GZS053_M101B						
16	Local:2:I.Data.15	m_GZS052_M101A						
17	Local:2:I.Data.16	m_GZS054_M101B						
18	Local:2:I.Data.17	m_GZS065_M101A						
19	Local:2:I.Data.18	m_GZS056_M101B						
20	Local:2:I.Data.19	m_LZS061_M102A						
21	Local:2:I.Data.20	m_LZS062_M102B						
22	Local:2:I.Data.21	m_GZS061_M102A						
23	Local:2:I.Data.22	m_GZS063_M102B						

IO Address		PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
24	Local:2:I.Data.23	m_GZS062_M102A						
25	Local:2:I.Data.24	m_GZS064_M102B						
26	Local:2:I.Data.25	m_GZS065_102A						
27	Local:2:I.Data.26	m_GZS066_102B						
28	Local:2:I.Data.27	m_LZS071_M103A						
29	Local:2:I.Data.28	m_LZS072_M103B						
30	Local:2:I.Data.29	m_GZS071_M103A						
31	Local:2:I.Data.30	m_GZS073_M103B						
32	Local:2:I.Data.31	m_GZS072_M103A						

5.1.2. 1756-IB32 Slot #3 Testing (DI_S03)

Loop test signal from field device to each input channel. Observe LED status have to show on module and show on ladder logic.

IO Address		PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
1	Local:3:I.Data.0	m_GZS074_M103B						
2	Local:3:I.Data.1	m_GZS075_M103A						
3	Local:3:I.Data.2	m_GZS076_M103B						
4	Local:3:I.Data.3	m_LZS081_M104A						
5	Local:3:I.Data.4	m_LZS082_M104B						
6	Local:3:I.Data.5	m_GZS081_M104A						
7	Local:3:I.Data.6	m_GZS083_M104B						
8	Local:3:I.Data.7	m_GZS082_M104A						
9	Local:3:I.Data.8	m_GZS084_M104B						
10	Local:3:I.Data.9	m_GZS077_M104A						
11	Local:3:I.Data.10	m_GZS078_M104B						
12	Local:3:I.Data.11	m_LZS031_M104						
13	Local:3:I.Data.12	m_GZS056_M104						
14	Local:3:I.Data.13	m_GZS058_M104						
15	Local:3:I.Data.14	m_UY121_M104						
16	Local:3:I.Data.15	m_LZS041_M105						
17	Local:3:I.Data.16	m_GZS066_M105						
18	Local:3:I.Data.17	m_GZS068_M105						
19	Local:3:I.Data.18	m_UY131_M105						
20	Local:3:I.Data.19	m_Card_Boxinput						
21	Local:3:I.Data.20	m_UPS_Failinput						
22	Local:3:I.Data.21	m_080L_GB023_P108						
23	Local:3:I.Data.22	m_360L_GB_010_P103						
24	Local:3:I.Data.23	~Spare Slot 3 Chn 23						
25	Local:3:I.Data.24	~Spare Slot 3 Chn 24						
26	Local:3:I.Data.25	m_GBS061_1						
27	Local:3:I.Data.26	m_GBS061_2						
28	Local:3:I.Data.27	m_GBS061_3						
29	Local:3:I.Data.28	m_24Vdc_PS1_Fail						
30	Local:3:I.Data.29	m_24Vdc_PS2_Fail						
31	Local:3:I.Data.30	~Spare Slot 3 Chn 30						
32	Local:3:I.Data.31	~Spare Slot 3 Chn 31						

5.1.3. 1756-IB32 Slot #4 Testing (DI_S04)

Loop test signal from field device to each input channel. Observe LED status have to show on module and show on ladder logic.

IO Address		PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
1	Local:4:I.Data.0	m_360L-P101A						
2	Local:4:I.Data.1	m_360L-P101B						
3	Local:4:I.Data.2	m_360L-P101C						
4	Local:4:I.Data.3	m_360L-P102A						
5	Local:4:I.Data.4	m_360L-P102B						
6	Local:4:I.Data.5	m_360L-P102C						
7	Local:4:I.Data.6	~Spare Slot 4 Chn 6						
8	Local:4:I.Data.7	~Spare Slot 4 Chn 7						
9	Local:4:I.Data.8	~Spare Slot 4 Chn 8						
10	Local:4:I.Data.9	~Spare Slot 4 Chn 9						
11	Local:4:I.Data.10	~Spare Slot 4 Chn 10						
12	Local:4:I.Data.11	~Spare Slot 4 Chn 11						
13	Local:4:I.Data.12	~Spare Slot 4 Chn 12						
14	Local:4:I.Data.13	~Spare Slot 4 Chn 13						
15	Local:4:I.Data.14	~Spare Slot 4 Chn 14						
16	Local:4:I.Data.15	~Spare Slot 4 Chn 15						
17	Local:4:I.Data.16	m_SL_P101AC						
18	Local:4:I.Data.17	m_SL_P101BC						
19	Local:4:I.Data.18	m_SL_P102AC						
20	Local:4:I.Data.19	m_SL_P102BC						
21	Local:4:I.Data.20	m_ACL11_Pump_Demand						
22	Local:4:I.Data.21	m_ACL12_Pump_Demand						
23	Local:4:I.Data.22	m_ACL13_Pump_Demand						
24	Local:4:I.Data.23	m_ACL14_Pump_Demand						
25	Local:4:I.Data.24	m_ACL21_Pump_Demand						
26	Local:4:I.Data.25	m_ACL22_Pump_Demand						
27	Local:4:I.Data.26	~Spare Slot 4 Chn 26						
28	Local:4:I.Data.27	~Spare Slot 4 Chn 27						
29	Local:4:I.Data.28	~Spare Slot 4 Chn 28						
30	Local:4:I.Data.29	~Spare Slot 4 Chn 29						
31	Local:4:I.Data.30	~Spare Slot 4 Chn 30						
32	Local:4:I.Data.31	~Spare Slot 4 Chn 31						

5.1.4. 1756-OV32E Slot #5 Testing (DO_S5)

Command output from PLC to each output channel. Observe LED status have to show on module and power will energized to field device.

	IO Address	PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
1	Local:5:O.Data.0	m_Card_Reader_BAY1						
2	Local:5:O.Data.1	~ Spare Slot 5 Chn 1						
3	Local:5:O.Data.2	m_Card_Reader_EntryGate						
4	Local:5:O.Data.3	m_Card_Reader_ExitGate						
5	Local:5:O.Data.4	m_Card_Reader_WeighBridge						
6	Local:5:O.Data.5	m_Card_Reader_Bay3						
7	Local:5:O.Data.6	m_Card_Reader_Bay4						
8	Local:5:O.Data.7	m_Card_Reader_Bay2						
9	Local:5:O.Data.8	~Spare Slot 5 Chn 8						
10	Local:5:O.Data.9	~Spare Slot 5 Chn 9						
11	Local:5:O.Data.10	m_P101A_Start						
12	Local:5:O.Data.11	m_P101A_Stop						
13	Local:5:O.Data.12	m_P101B_Start						
14	Local:5:O.Data.13	m_P101B_Stop						
15	Local:5:O.Data.14	m_P101C_Start						
16	Local:5:O.Data.15	m_P101C_Stop						
17	Local:5:O.Data.16	m_P102A_Start						
18	Local:5:O.Data.17	m_P102A_Stop						
19	Local:5:O.Data.18	m_P102B_Start						
20	Local:5:O.Data.19	m_P102B_Stop						
21	Local:5:O.Data.20	m_P102C_Start						
22	Local:5:O.Data.21	m_P102C_Stop						
23	Local:5:O.Data.22	m_360L-XA-019A						
24	Local:5:O.Data.23	~Spare Slot 5 Chn 23						
25	Local:5:O.Data.24	m_Entry_Gate_Control						
26	Local:5:O.Data.25	m_Exit_Gate_Control						
27	Local:5:O.Data.26	m_VFC_UY_120						
28	Local:5:O.Data.27	m_VFC_UY_130						
29	Local:5:O.Data.28	m_ACL11_Permissive						
30	Local:5:O.Data.29	m_ACL12_Permissive						
31	Local:5:O.Data.30	m_ACL13_Permissive						
32	Local:5:O.Data.31	m_ACL14_Permissive						

5.1.5. 1756- OV32E Slot #6 Testing (DO_S6)

Command output from PLC to each output channel. Observe LED status have to show on module and power will energized to field device.

IO Address		PLC Tag	Verify force function	LED activate correctly	Logic activate correctly	PLC tag assign correctly	Corrective Action Required	Retest Pass/Fail
1	Local:6:O.Data.0	m_ACL21_Permissive						
2	Local:6:O.Data.1	m_ACL22_Permissive						
3	Local:6:O.Data.2	m_ACL11_Alarm						
4	Local:6:O.Data.3	m_ACL12_Alarm						
5	Local:6:O.Data.4	m_ACL13_Alarm						
6	Local:6:O.Data.5	m_ACL14_Alarm						
7	Local:6:O.Data.6	m_ACL21_Alarm						
8	Local:6:O.Data.7	m_ACL22_Alarm						
9	Local:6:O.Data.8	m_ACL11_Rem_Start						
10	Local:6:O.Data.9	m_ACL12_Rem_Start						
11	Local:6:O.Data.10	m_ACL13_Rem_Start						
12	Local:6:O.Data.11	m_ACL14_Rem_Start						
13	Local:6:O.Data.12	m_ACL21_Rem_Start						
14	Local:6:O.Data.13	m_ACL22_Rem_Start						
15	Local:6:O.Data.14	m_360L-US-100-2_Stop						
16	Local:6:O.Data.15	m_360L-US-100-2_Start						
17	Local:6:O.Data.16	~Spare Slot 6 Chn 16						
18	Local:6:O.Data.17	m_Weight_Bridge_Comm						
19	Local:6:O.Data.18	m_From_ATG_Comm						
20	Local:6:O.Data.19	Weigh Bridge2 Lamp On						
21	Local:6:O.Data.20	Weigh Bridge1 Lamp On						
22	Local:6:O.Data.21	~Spare Slot 6 Chn 21						
23	Local:6:O.Data.22	~Spare Slot 6 Chn 22						
24	Local:6:O.Data.23	~Spare Slot 6 Chn 23						
25	Local:6:O.Data.24	~Spare Slot 6 Chn 24						
26	Local:6:O.Data.25	~Spare Slot 6 Chn 25						
27	Local:6:O.Data.26	~Spare Slot 6 Chn 26						
28	Local:6:O.Data.27	~Spare Slot 6 Chn 27						
29	Local:6:O.Data.28	~Spare Slot 6 Chn 28						
30	Local:6:O.Data.29	~Spare Slot 6 Chn 29						
31	Local:6:O.Data.30	~Spare Slot 6 Chn 30						
32	Local:6:O.Data.31	~Spare Slot 6 Chn 31						

5.1.6. 1756-IF8I Slot #7 Testing (AI_S07)

Loop test signal from field device to each input channel. And then read value have shown in PLC IO address. The module maybe configuration each channel different.

	IO Address	OPC TAG	Sim (mA)	Record Value	Verify force function	AI function block configuration correctly	AI tag assignment correctly	Engineering unit/conversion correctly	Corrective Action Required	Retest Pass/Fail
1	Local:7:I.Ch[0].Data Configuration : 4-20mA Scaling : 4000-20000	m_360L_LT001	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
2	Local:7:I.Ch[1].Data Configuration : 4-20mA Scaling : 4000-20000	m_360L_TT055	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
3	Local:7:I.Ch[2].Data Configuration : 4-20mA Scaling : 4000-20000	m_360L_TT056	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
4	Local:7:I.Ch[3].Data Configuration : 4-20mA Scaling : 4000-20000	~Spare Slot 7 Chn 3	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							

IO Address		OPC TAG	Sim (mA)	Record Value	Verify force function	AI function block configuration correctly	AI tag assignment correctly	Engineering unit/conversion correctly	Corrective Action Required	Retest Pass/Fail
5	Local:7:I.Ch[4].Data Configuration : 4-20mA Scaling : 4000-20000	~Spare Slot 7 Chn 4	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
6	Local:7:I.Ch[5].Data Configuration : 4-20mA Scaling : 4000-20000	~Spare Slot 7 Chn 5	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
7	Local:7:I.Ch[6].Data Configuration : 4-20mA Scaling : 4000-20000	~Spare Slot 7 Chn 6	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							
8	Local:7:I.Ch[7].Data Configuration : 4-20mA Scaling : 4000-20000	~Spare Slot 7 Chn 7	4 mA							
			8 mA							
			12 mA							
			16 mA							
			20 mA							

Check-list sign-off	
Tester (Name)	Signature and Date
Customer Approver (Name)	Signature and Date

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6. OPC DATATEST

This is to certify that the subject system was duly inspected in accordance with the authorized factory inspection procedures agreed. Observations & action items in the form of Punch List are attached herewith. The system hardware and software was found to be in accordance with the specified project requirements. The system is cleared for despatch. The despatch clearance is hereby issued to Rockwell Automation to despatch system to site.

The test will use Simulator to Send/Receive data, OPC data testing procedure shall be as follows:

(a) The configuration of parameter and execute function have in ladder program.

(b) For Ethernet communication. Connect RJ45 connector to port 1 of 1756-EN2T

(c) Open KEPSERVER EX and setup parameter to connect the PLC Ethernet module

(d) Test read/write OPC data following data mapping from 800469957-TLB-005 OPC address mapping list. Online RSlogix5000 to controller simulation and see data in OPC Data appear in program KEPSERVER EX

6.1. OPC Data

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
1	24 Vdc Power1 fail			
2	24 Vdc Power2 fail			
3	360L-US-100-2 Slop Pump Start			
4	360L-US-100-2 Slop Pump Stop			
5	ACL11 (Pump Demand)			
6	ACL11 (Alarm)			
7	ACL12 (Alarm)			
8	ACL12 (Pump Demand)			
9	ACL13 (Pump Demand)			
10	ACL13 (Alarm)			
11	ACL14 (Alarm)			
12	ACL14 (Pump Demand)			
13	ACL21 (Alarm)			
14	ACL21 (Pump Demand)			
15	ACL22 (Alarm)			
16	ACL22 (Pump Demand)			
17	ALARM HIGH LEVEL SLOP BASE OIL			
18	ALARM HIGH TEMP BITUMEN			
19	ALARM HIGH TEMP SLOP BITUMEN			
20	ALARM HIGHHIGH LEVEL SLOP BASE OIL			

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
21	ALARM HIGHHIGH TEMP BITUMEN			
22	ALARM HIGHHIGH TEMP SLOP BITUMEN			
23	ALARM LOW LEVEL SLOP BASE OIL			
24	ALARM LOW TEMP BITUMEN			
25	ALARM LOW TEMP SLOP BITUMEN			
26	ALARM LOWLOW LEVEL SLOP BASE OIL			
27	ALARM LOWLOW TEMP BITUMEN			
28	ALARM LOWLOW TEMP SLOP BITUMEN			
29	Arm A Down (GZS052,M-101A)			
30	Arm A Down (GZS062,M-102A)			
31	Arm A Down (GZS072,M-103A)			
32	Arm A Down (GZS082,M-104A)			
33	Arm A Side (GZS051,M-101A)			
34	Arm A Side (GZS061,M-102A)			
35	Arm A Side (GZS071,M-103A)			
36	Arm A Side (GZS081,M-104A)			
37	Arm B Down (GZS054,M-101B)			
38	Arm B Down (GZS064,M-102B)			
39	Arm B Down (GZS074,M-103B			
40	Arm B Down (GZS084,M-104B)			
41	Arm B Side (GZS053,M-101B)			
42	Arm B Side (GZS063,M-102B)			
43	Arm B Side (GZS073,M-103B)			
44	Arm B Side (GZS083,M-104B)			
45	Arm Down (GZS058,M -104)			
46	Arm Down (GZS068,M -105)			
47	Arm Side (GZS056,M- 104)			
48	Arm Side (GZS066,M- 105)			
49	Ball Valve Open SideA(101A)			
50	Ball Valve Open SideA(101B)			
51	Ball Valve Open SideA(102A)			
52	Ball Valve Open SideA(102B)			
53	Ball Valve Open SideA(103A)			

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
54	Ball Valve Open SideA(103B)			
55	Ball Valve Open SideA(104A)			
56	Ball Valve Open SideA(104B)			
57	Card Box input			
58	ChangeOver ATG Communication			
59	ChangeOver CardReader Bay1			
60	ChangeOver CardReader Bay2			
61	ChangeOver CardReader Bay3			
62	ChangeOver CardReader Bay4			
63	ChangeOver CardReader Entrance Gate			
64	ChangeOver CardReader Exit Gate			
65	ChangeOver CardReader WieghBridge			
66	ChangeOver WeightBrigedComm			
67	EarthA (GantryA) Bit (BAY3)			
68	EarthA (GantryA) PD (BAY1)			
69	EarthA (GantryB) Bit (BAY4)			
70	EarthA (GantryB) PD (BAY2)			
71	Entry Gate Control (O/P)			
72	ESD ControlRoom S/D			
73	ESD GantryA S/D Bit (BAY3)			
74	ESD GantryA S/D PD (BAY1)			
75	ESD GantryB S/D Bit (BAY4)			
76	ESD GantryB S/D PD (BAY2)			
77	ESD Gatehouse S/D			
78	ESD_SP_ALL			
79	ESD_SP_Bay1,2			
80	ESD_SP_Bay3,4			
81	Exit Gate Control (O/P)			
82	FCV Limit Switch I/O (UY121,M-104)			
83	FCV Limit Switch I/O (UY131,M-105)			
84	FIRE DETECT S/D			
85	Infra Red1 (Weight Bridge)			
86	Infra Red2 (Weight Bridge)			

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
87	Infra Red3 (Weight Bridge)			
88	LEVEL SLOP BASE OIL			
89	Overspill (LZS031,M-104)			
90	Overspill (LZS041,M-105)			
91	Overspill A (LZS051,M-101A)			
92	Overspill A (LZS061,M-102A)			
93	Overspill A (LZS071,M-103A)			
94	Overspill A (LZS081,M-104A)			
95	Overspill B (LZS052,M-101B)			
96	Overspill B (LZS062,M-102B)			
97	Overspill B (LZS072,M-103B)			
98	Overspill B (LZS082,M-104B)			
99	Permissive(to ACL11) A			
100	Permissive(to ACL11) B			
101	Permissive(to ACL12) A			
102	Permissive(to ACL12) B			
103	Permissive(to ACL13) A			
104	Permissive(to ACL13) B			
105	Permissive(to ACL14) A			
106	Permissive(to ACL14) B			
107	Permissive(to ACL21) A			
108	Permissive(to ACL22) B			
109	Pump P101A (Running)			
110	Pump P101A (Start fail)			
111	Pump P101B (Running)			
112	Pump P101B (Start fail)			
113	Pump P101C (Running)			
114	Pump P101C (Start fail)			
115	Pump P102A (Running)			
116	Pump P102A (Start fail)			
117	Pump P102B (Running)			
118	Pump P102B (Start fail)			
119	Pump P102C (Running)			

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
120	Pump P102C (Start fail)			
121	Remote ST ACL11			
122	Remote ST ACL12			
123	Remote ST ACL13			
124	Remote ST ACL14			
125	Remote ST ACL21			
126	Remote ST ACL22			
127	SCALE MAX LEVEL SLOP BASE OIL			
128	SCALE MAX TEMP BITUMEN			
129	SCALE MAX TEMP SLOP BITUMEN			
130	SCALE MIN LEVEL SLOP BASE OIL			
131	SCALE MIN TEMP BITUMEN			
132	SCALE MIN TEMP SLOP BITUMEN			
133	SELECT P101A/C			
134	SELECT P101B/C			
135	SELECT P102A/C			
136	SELECT P102B/C			
137	SET HIGH LEVEL SLOP BASE OIL			
138	SET HIGH TEMP BITUMEN			
139	SET HIGH TEMP SLOP BITUMEN			
140	SET HIGHHIGH LEVEL SLOP BASE OIL			
141	SET HIGHHIGH TEMP BITUMEN			
142	SET HIGHHIGH TEMP SLOP BITUMEN			
143	SET LOW LEVEL SLOP BASE OIL			
144	SET LOW TEMP BITUMEN			
145	SET LOW TEMP SLOP BITUMEN			
146	SET LOWLOW LEVEL SLOP BASE OIL			
147	SET LOWLOW TEMP BITUMEN			
148	SET LOWLOW TEMP SLOP BITUMEN			
149	Slop Oil Status input (P103) Base Oil			
150	Slop Pump Status input (P108) Bitumen			
151	System Alarm(ACL)			
152	TEMP BITUMEN			

	OPC Tag	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
153	TEMP SLOP BITUMEN			
154	TIG SP P101A			
155	TIG SP P101B			
156	TIG SP P101C			
157	TIG SP P102A			
158	TIG SP P102B			
159	TIG SP P102C			
160	TIG ST P101A			
161	TIG ST P101B			
162	TIG ST P101C			
163	TIG ST P102A			
164	TIG ST P102B			
165	TIG ST P102C			
166	UPS Fail input			
167	WeighBridgeLamp1 ON			
168	WeighBridgeLamp2 ON			
169	WeighBridgeTest Lamp			
170	WipeCardWeighBridge (Pass)			

6.2. OPC Redundant function test

	TASK	Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
1	Disconnected RJ45 connector from 1756-EN2T Slot1 OPC communication status still Good quality			
2	Disconnected RJ45 connector from 1756-EN2T Slot8 OPC communication status still Good quality			

Check-list sign-off	
Tester (Name)	Signature and Date
Customer Approver (Name)	Signature and Date

7. TAS FUNCTION TEST

7.1. Create a Ticket (DO)

Creation product ticket from the TAS system is used as the default information to create order.

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS	PLC TAG			
Create DO	TAS system create DO DO No: Product detail:				

Note :

7.2. Create Load

The product and quantity obtained from the tickets creation. The system will (DO) arrange the compartment for the truck and check the vehicle information and permission for driver and card (Black List, Expiration Date) before creating a settlement and printing a filly guide. Then after the payment is created successfully, Driver can use the fill rate to create a filling invoice and payout.

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS	PLC TAG			
Create Load	TAS system create DO DO No: Product detail:				

Note :

7.3. Tap the Entrance Gate

The driver must tap the card on card reader(Entrance Gate) before truck through to loading area for receive the product, The system will check the load status. Incase the entrance card is not reached when touching the card, the Gate Barrier will not open. Tapping the card at the entrance is as follows:

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Entrance Gate	Entry Gate Control (O/P)	c_Entry_Gate_Control Local:5:O.Data.24			

Note :

7.4. Tap Weight in Card

The driver must tap the card on the balance card reader to record the weight in before truck through to the loading area to receive the product. when tapping card a light status will show as follows:

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Weight Bridge	WipeCardWeighBridge (Pass)	c_WipeCardWeighBridge_Pass			
	Infrared1 (Weight Bridge)	Local:3:I.Data.25 c_GBS061_1			
	Infrared2 (Weight Bridge)	Local:3:I.Data.26 c_GBS061_2			
	Infrared3 (Weight Bridge)	Local:3:I.Data.27 c_GBS061_3			
	WeighBridgeLamp1 ON	c_WeighBridgeLamp1On Local:6:O.Data.19			
	WeighBridgeLamp2 ON	c_WeighBridgeLamp2On Local:6:O.Data.20			

Note :

7.5. Tap the Card at the Bay

The driver must tap the card at the payer card reader to begin the process of receiving the product according to the refill instructions. Tapping a card at the bay is as follows:

a) The driver takes the truck to the pay plant as specified in the refill instructions.
b) The driver connects the ground line and puts the proboscis into the vehicle's inlet.
c) The driver taps the card at the payer card reader. Interlock Inspection System

7.5.1. Tap the Card at the Bay (PRODUCT BASE OIL 150N, BAY 1, METER 11)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS051,M-101A)	Local:2:I.Data.13 c_GZS051_M101A			
	EarthA (GantryA) PD (BAY1)	Local:2:I.Data.7 c_360L_GZS091			
	Arm A Down (GZS052,M-101A)	Local:2:I.Data.15 c_GZS052_M101A			
	Overspill A (LZS051,M-101A)	Local:2:I.Data.11 c_LZS051_M101A			
	Ball Valve Open SideA(101A)	Local:2:I.Data.17 c_GZS055_M101A			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY1)	Local:2:I.Data.3 c_360L_HZ093			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 c_360L_HZ092			
	Permissive(to ACL11) A	c_Permissive_to_ACL11_A			
Command start and waiting feedback from Pump	Remote ST ACL11 (NOT USE)	c_ACL11_Rem_Start Local:6:O.Data.8			
	Pump P101A (Running)	Local:4:I.Data.0 c_360L_P101A			

7.5.2. Tap the Card at the Bay (PRODUCT BASE OIL 150N, BAY 2, METER 11)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS053,M-101B)	Local:2:I.Data.14 c_GZS053_M101B			
	EarthA (GantryA) PD (BAY2)	Local:2:I.Data.8 c_360L_GZS092			
	Arm A Down (GZS054,M-101B)	Local:2:I.Data.16 c_GZS054_M101B			
	Overspill B (LZS052,M-101B)	Local:2:I.Data.12 c_LZS052_M101B			
	Ball Valve Open SideA(101B)	Local:2:I.Data.18 c_GZS056_M101B			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY2)	Local:2:I.Data.4 c_360L_HZ094			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 c_360L_HZ092			
	Permissive(to ACL11) B	c_Permissive_to_ACL11_B			
Command start and waiting feedback from Pump	Remote ST ACL11 (NOT USE)	c_ACL11_Rem_Start Local:6:O.Data.8			
	Pump P101A (Running)	Local:4:I.Data.0 c_360L_P101A			

7.5.3. Tap the Card at the Bay (PRODUCT BASE OIL 500SN, BAY 1, METER 12)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS061,M-102A)	Local:2:I.Data.21 c_GZS061_M102A			
	EarthA (GantryA) PD (BAY1)	Local:2:I.Data.7 c_360L_GZS091			
	Arm A Down (GZS062,M-102A)	Local:2:I.Data.23 c_GZS062_M102A			
	Overspill A (LZS061,M-102A)	Local:2:I.Data.19 c_LZS061_M102A			
	Ball Valve Open SideA(102A)	Local:2:I.Data.25 c_GZS065_M102A			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY1)	Local:2:I.Data.3 c_360L_HZ093			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 c_360L_HZ092			
	Permissive(to ACL12) A	c_Permissive_to_ACL12_A			
Command start and waiting feedback from Pump	Remote ST ACL12 (NOT USE)	c_ACL12_Rem_Start Local:6:O.Data.9			
	Pump P101B (Running)	Local:4:I.Data.1 c_360L_P101B			

7.5.4. Tap the Card at the Bay (PRODUCT BASE OIL 500SN, BAY 2, METER 12)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS063,M-102B)	Local:2:I.Data.22 c_GZS063_M102B			
	EarthA (GantryA) PD (BAY2)	Local:2:I.Data.8 c_360L_GZS092			
	Arm A Down (GZS064,M-102B)	Local:2:I.Data.24 c_GZS064_M102B			
	Overspill B (LZS062,M-102B)	Local:2:I.Data.20 c_LZS062_M102B			
	Ball Valve Open SideA(102B)	Local:2:I.Data.26 c_GZS066_M102B			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY2)	Local:2:I.Data.4 c_360L_HZ094			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 c_360L_HZ092			
	Permissive(to ACL12) B	c_Permissive_to_ACL12_B			
Command start and waiting feedback from Pump	Remote ST ACL12 (NOT USE)	c_ACL12_Rem_Start Local:6:O.Data.9			
	Pump P101B (Running)	Local:4:I.Data.1 c_360L_P101B			

7.5.5. Tap the Card at the Bay (PRODUCT BASE OIL 500N, BAY 1, METER 13)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS071,M-103A)	Local:2:I.Data.29 c_GZS071_M103A			
	EarthA (GantryA) PD (BAY1)	Local:2:I.Data.7 c_360L_GZS091			
	Arm A Down (GZS072,M-103A)	Local:2:I.Data.31 c_GZS072_M103A			
	Overspill A (LZS071,M-103A)	Local:2:I.Data.27 c_LZS071_M103A			
	Ball Valve Open SideA(103A)	Local:3:I.Data.1 c_GZS075_M103A			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY1)	Local:2:I.Data.3 c_360L_HZ093			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 C_360L_HZ092			
	Permissive(to ACL13) A	c_Permissive_to_ACL13_A			
Command start and waiting feedback from Pump	Remote ST ACL13 (NOT USE)	c_ACL13_Rem_Start Local:6:O.Data.10			
	Pump P102A (Running)	Local:4:I.Data.3 c_360L_P102A			

7.5.6. Tap the Card at the Bay (PRODUCT BASE OIL 500N, BAY 2, METER 13)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm B Side (GZS073,M-103B)	Local:2:I.Data.30 c_GZS073_M103B			
	EarthA (GantryA) PD (BAY2)	Local:2:I.Data.8 c_360L_GZS092			
	Arm A Down (GZS074,M-103B)	Local:3:I.Data.0 c_GZS074_M103B			
	Overspill B (LZS072,M-103B)	Local:2:I.Data.28 c_LZS072_M103B			
	Ball Valve Open SideB(103B)	Local:3:I.Data.2 c_GZS076_M103B			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY2)	Local:2:I.Data.4 c_360L_HZ094			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 C_360L_HZ092			
	Permissive(to ACL13) B	c_Permissive_to_ACL13_B			
Command start and waiting feedback from Pump	Remote ST ACL13 (NOT USE)	c_ACL13_Rem_Start Local:6:O.Data.10			
	Pump P102A (Running)	Local:4:I.Data.3 c_360L_P102A			

7.5.7. Tap the Card at the Bay (PRODUCT BASE OIL 150BS, BAY 1, METER 14)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm A Side (GZS081,M-104A)	Local:3:I.Data.5 c_GZS081_M104A			
	EarthA (GantryA) PD (BAY1)	Local:2:I.Data.7 c_360L_GZS091			
	Arm A Down (GZS082,M-104A)	Local:3:I.Data.7 c_GZS082_M104A			
	Overspill A (LZS081,M-104A)	Local:3:I.Data.1 c_LZS081_M104A			
	Ball Valve Open SideA(104A)	Local:3:I.Data.9 c_GZS085_M104A			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY1)	Local:2:I.Data.3 c_360L_HZ093			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 C_360L_HZ092			
	Permissive(to ACL14) A	c_Permissive_to_ACL14_A			
Command start and waiting feedback from Pump	Remote ST ACL14 (NOT USE)	c_ACL14_Rem_Start Local:6:O.Data.11			
	Pump P102B (Running)	Local:4:I.Data.4 c_360L_P102B			

7.5.8. Tap the Card at the Bay (PRODUCT BASE OIL 150BS, BAY 2, METER 14)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm B Side (GZS083,M-104B)	Local:3:I.Data.6 c_GZS083_M104B			
	EarthA (GantryA) PD (BAY2)	Local:2:I.Data.8 c_360L_GZS092			
	Arm A Down (GZS084,M-104B)	Local:3:I.Data.8 c_GZS084_M104B			
	Overspill B (LZS082,M-104B)	Local:3:I.Data.4 c_LZS082_M104B			
	Ball Valve Open SideB(104B)	Local:3:I.Data.10 c_GZS086_M104B			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryA S/D PD (BAY2)	Local:2:I.Data.4 c_360L_HZ094			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 C_360L_HZ092			
	Permissive(to ACL14) B	c_Permissive_to_ACL14_B			
Command start and waiting feedback from Pump	Remote ST ACL14 (NOT USE)	c_ACL14_Rem_Start Local:6:O.Data.11			
	Pump P102B (Running)	Local:4:I.Data.4 c_360L_P102B			

7.5.9. Tap the Card at the Bay (PRODUCT BITUMEN 60/70, BAY 3, METER 21)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm Side (GZS056,M-104)	Local:3:I.Data.12 c_GZS056_M104			
	EarthA (GantryB) Bit (BAY3)	Local:2:I.Data.9 c_360L_GZS057			
	Arm Down (GZS058,M -104)	Local:3:I.Data.13 c_GZS058_M104			
	Overspill (LZS031,M-104)	Local:3:I.Data.11 c_LZS031_M104			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryB S/D Bit (BAY3)	Local:2:I.Data.5 f_360L_HZ051			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 C_360L_HZ092			
	Permissive(to ACL21) B	c_Permissive_to_ACL21_B			
Command start	Remote ST ACL21 (NOT USE)	c_ACL22_Rem_Start Local:6:O.Data.12			

7.5.10. Tap the Card at the Bay (PRODUCT BITUMEN 60/70, BAY 4, METER 22)

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Bay and confirmed permissive from PLC	Arm Side (GZS066,M-105)	Local:3:I.Data.16 c_GZS066_M105			
	EarthA (GantryB) Bit (BAY4)	Local:2:I.Data.10 c_360L_GZS067			
	Arm Down (GZS068,M -105)	Local:3:I.Data.17 c_GZS068_M105			
	Overspill (LZS041,M-105)	Local:3:I.Data.15 c_LZS041_M105			
	ESD ControlRoom S/D	Local:2:I.Data.1 c_360L_HZ091			
	ESD GantryB S/D Bit (BAY4)	Local:2:I.Data.6 c_360L_HZ061			
	FIRE DETECT S/D	Local:2:I.Data.0 c_360L_HZ090			
	ESD Gatehouse S/D	Local:2:I.Data.2 c_360L_HZ092			
	Permissive(to ACL22) B	Local:2:I.Data.2 c_Permissive_to_ACL21_B			
Command start	Remote ST ACL22 (NOT USE)	c_ACL22_Rem_Start Local:6:O.Data.13			

Note :

7.6. Tap Weight out card

The driver must tap the card on the balance card reader to record the weight out before taking the vehicle to the exit for finish receiving the product. Tapping a heavy weight card is as follows:

a) The driver puts the truck on the scale in the correct position according to the type of vehicle.
b) The driver taps the truck card at the card reader.
c) Monitoring System
- If you tap Pass Time Recording, Heavy Weight
- In case of failing to touch the card The system displays a warning message, the driver contacts the staff for further examination and correction.

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at Weight Bridge	WipeCardWeighBridge (Pass)	c_WipeCardWeighBridge_Pass			
	Infrared1 (Weight Bridge)	Local:3:I.Data.25 c_GBS061_1			
	Infrared2 (Weight Bridge)	Local:3:I.Data.26 c_GBS061_2			
	Infrared3 (Weight Bridge)	Local:3:I.Data.27 c_GBS061_3			
	WeighBridgeLamp1 ON	c_WeighBridgeLamp1On Local:6:O.Data.19			
	WeighBridgeLamp2 ON	c_WeighBridgeLamp2On Local:6:O.Data.20			

Note :

7.7. Verify report

Step test	Action Report	Pass/Fail or Data
Ref. 7.2	Advice Note Report	
Ref. 7.5 or 7.8	Delivery Receipt Report	

Note :

7.8. Tap weight out card

The driver must tap the card on the balance card reader to record the weight out before taking the vehicle to the exit to finish receiving the product. Tapping a heavy weight card is as follows:

a) The driver puts the car on the scale in the correct position according to the type of vehicle.
b) The driver taps the car card at the card reader.
c) Monitoring System
- If you tap Pass Time Recording, Heavy Weight and Print Delivery Report
- In case of failing to touch the card The system displays a warning message, the driver contacts the staff for further examination and correction.

Step test	Action		Pass/Fail or Data	Corrective Action Required	Retest Pass/Fail
	TAS (OPC TAG)	PLC TAG			
Activate card reader at exit Gate	Exit Gate Control (O/P)	c_Exit_Gate_Control Local:5:O.Data.25			

Note :

Check-list sign-off	
Tester (Name)	Signature and Date
Customer Approver (Name)	Signature and Date

8. SIGN-OFF CERTIFICATE

This is to certify that the subject system was duly inspected in accordance with the authorized factory inspection procedures agreed. Observations & action items in the form of Punch List are attached herewith. The system hardware and software was found to be in accordance with the specified project requirements. The system is cleared for despatch. The despatch clearance is hereby issued to Rockwell Automation to despatch system to site.

Rockwell Automation Representative	Signature and Date
Thai Lube Base Public Company Limited Representative	**Signature and Date**

APPENDIX A - DOCUMENTATION

Reference documents		
#	Document	D code / ID code
[1]	System Configuration Drawing or System Architecture & Network Diagram	R1420004-3600L-IC-SMD-0001
[2]	I/O Assignment list	R1420004-3600L-IC-LST-0001
[3]	OPC address mapping list	R1420004-3600L-IC-LST-0002

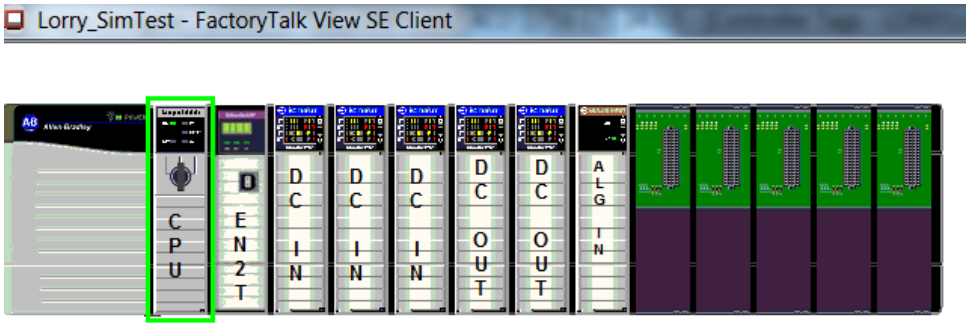
APPENDIX B - SAT PUNCH LIST

Log No	Description	Date	Signed	Retested and OK Signed	Comments
1					
2					
3					
4					
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					
17					
18					
19					

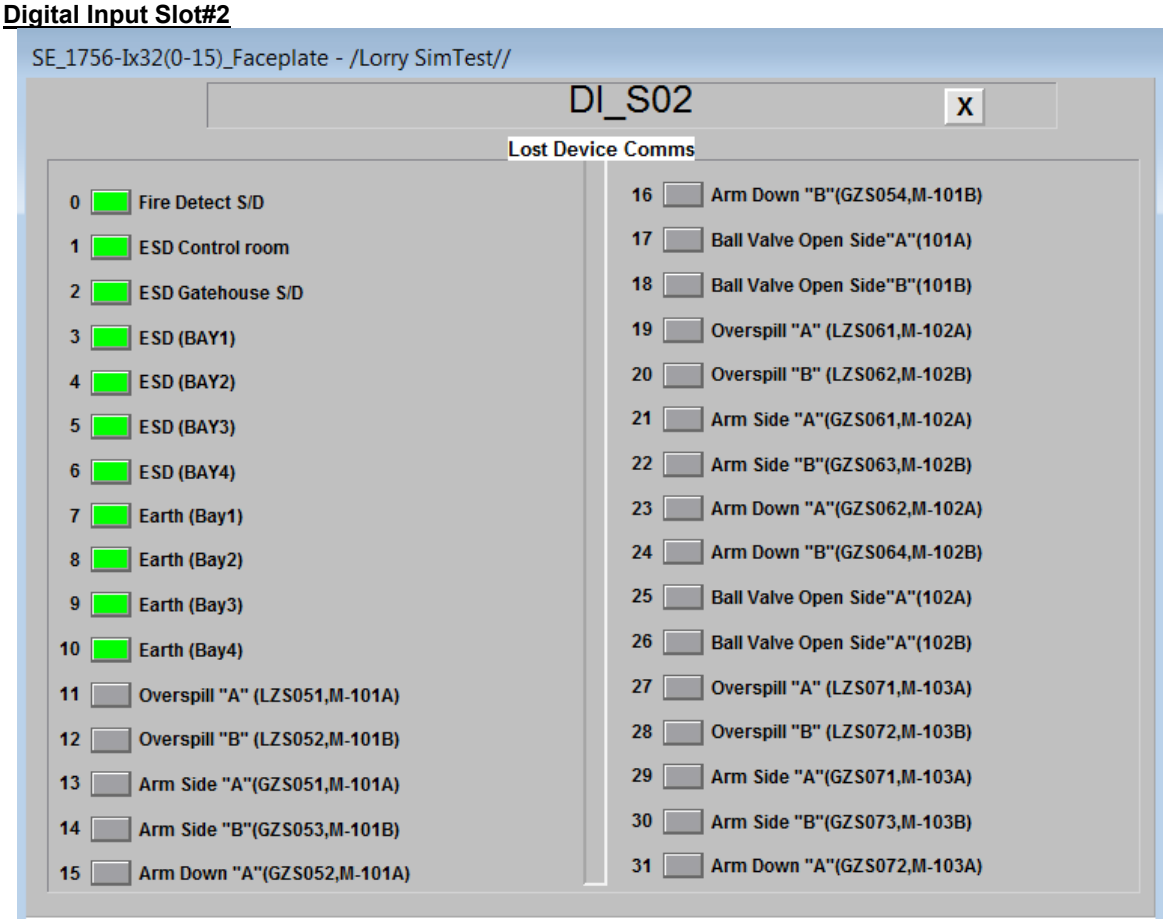
Log No	Description	Date	Signed	Retested and OK Signed	Comments
20					
21					
22					
23					
24					
25					
26					
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					

APPENDIX C – HMI FOR MONITOR AND SIMULATION

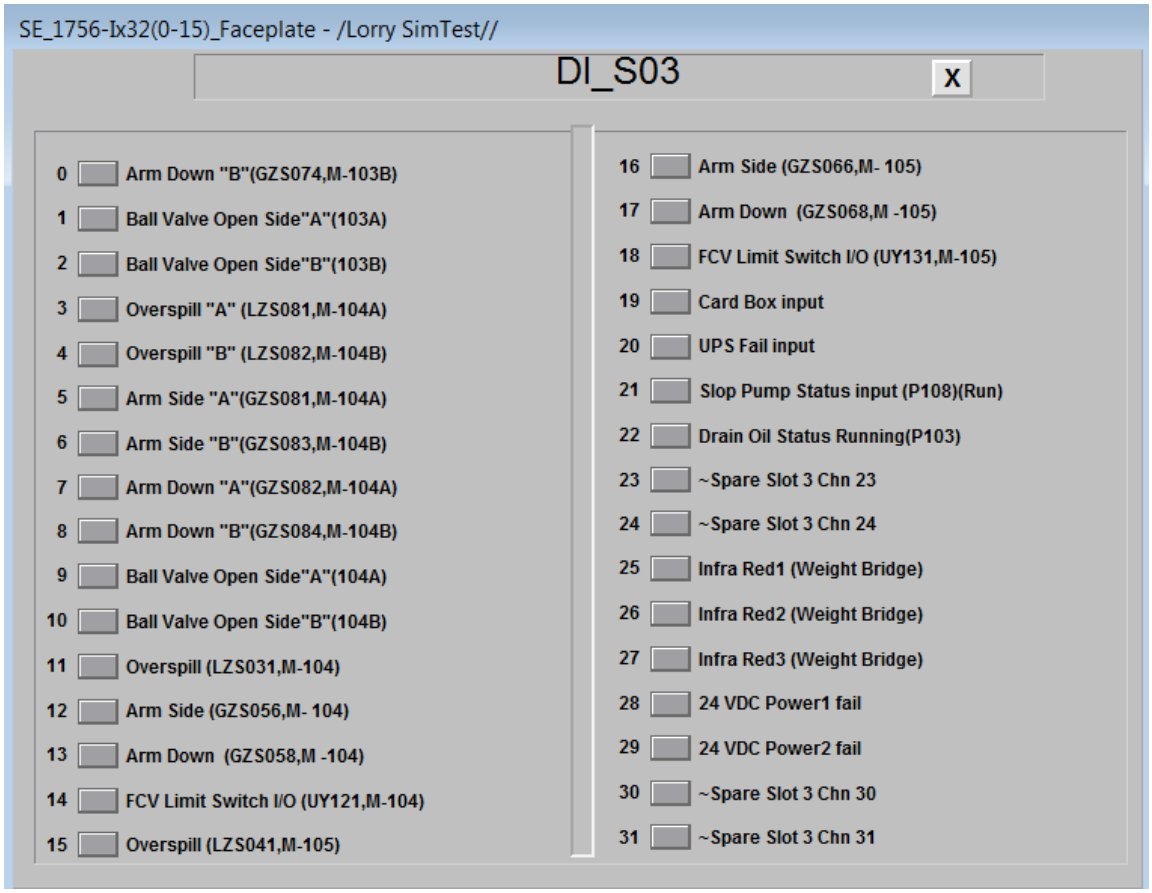
Main screen



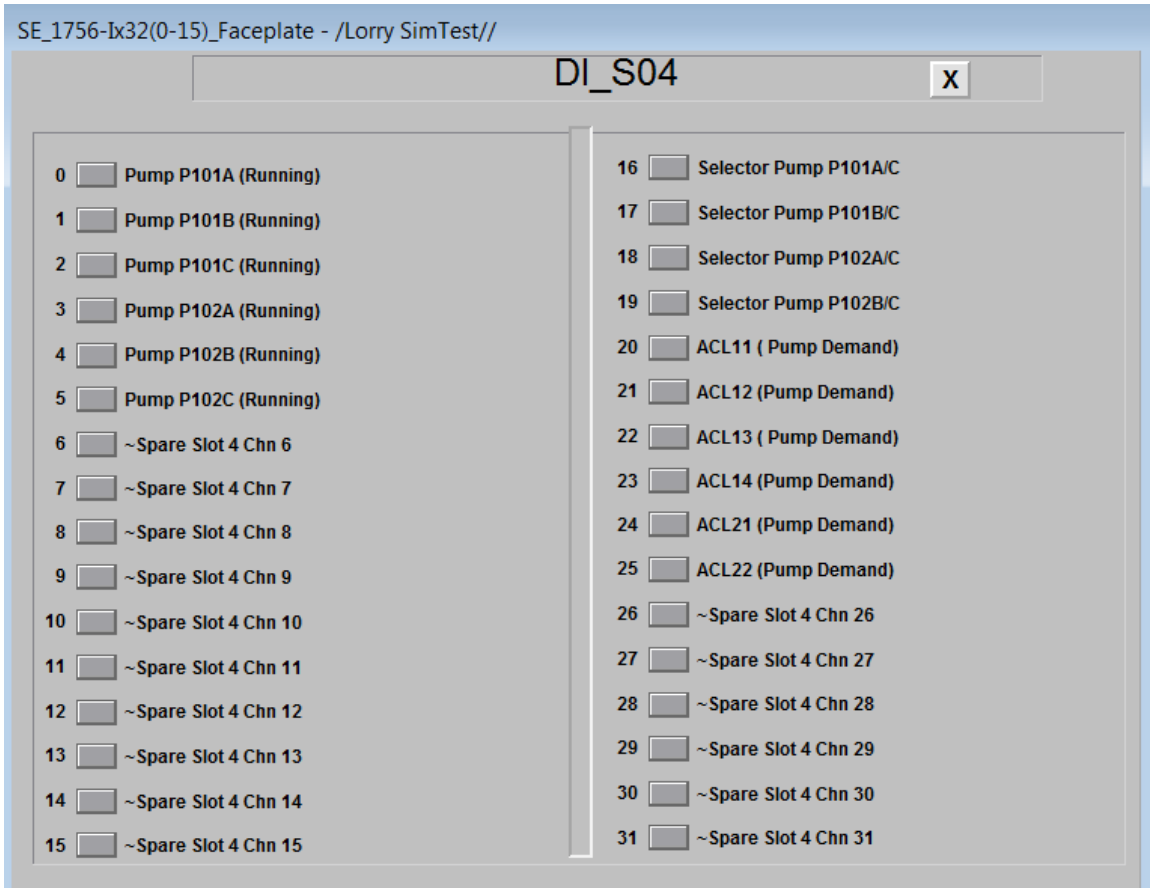
Digital Input Slot#2



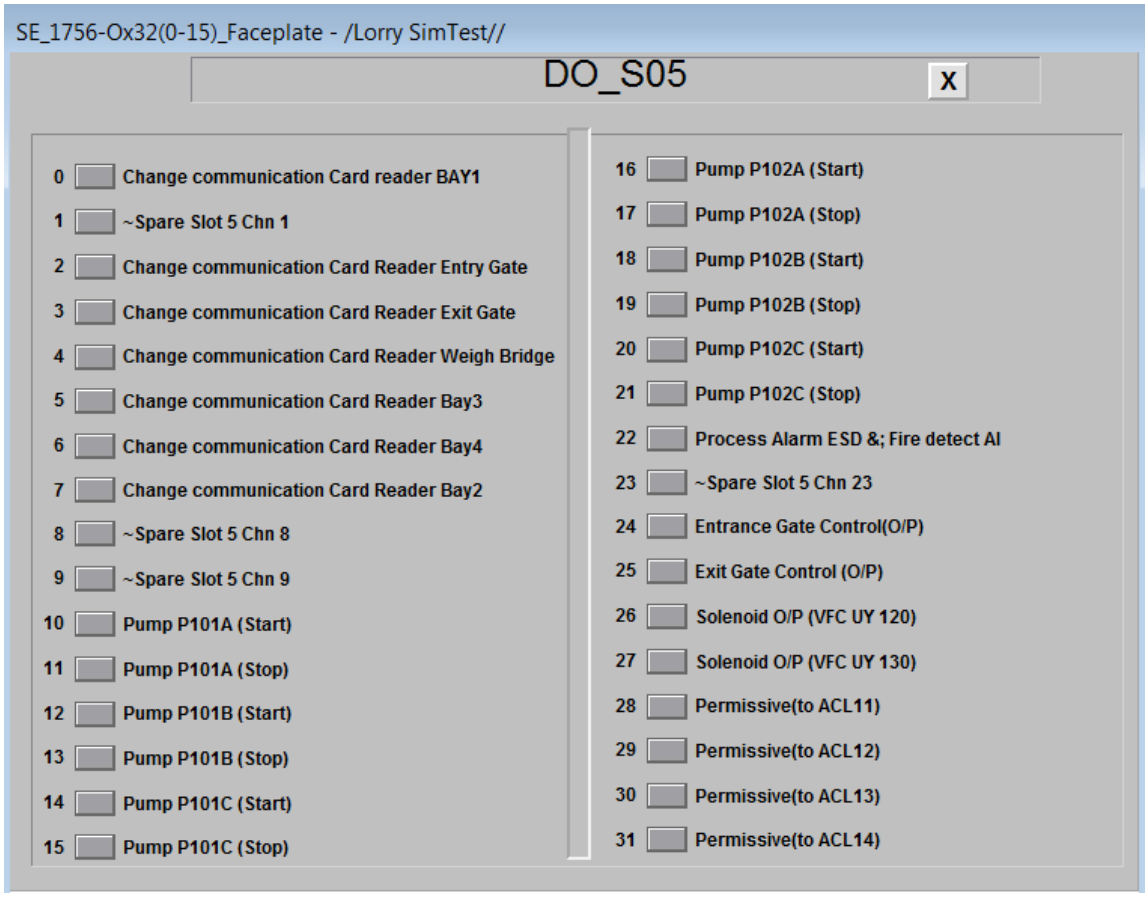
Digital Input Slot#3



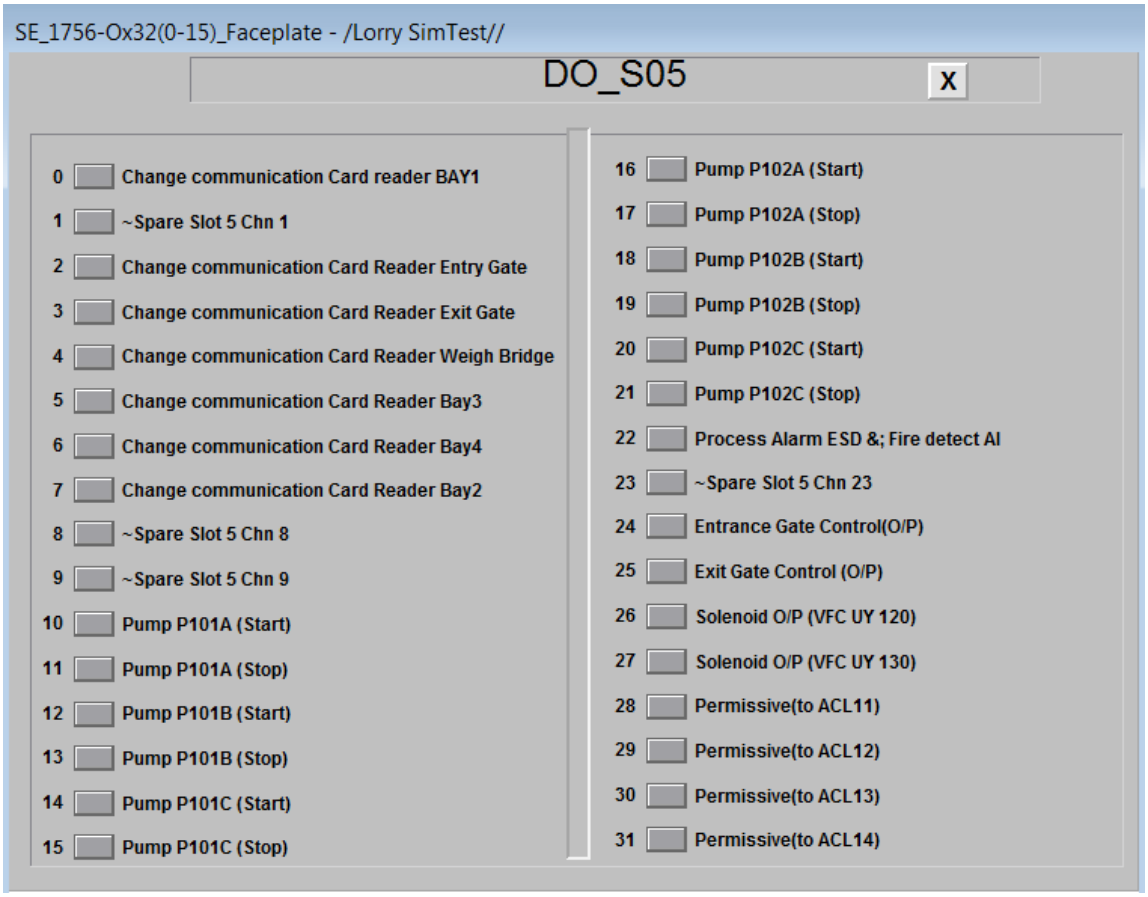
Digital Input Slot#4



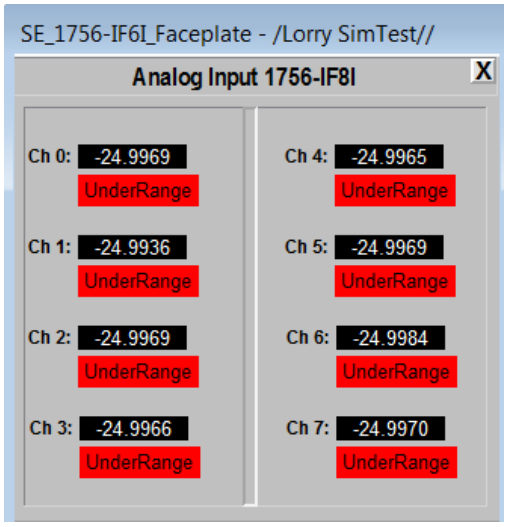
Digital Output Slot#5

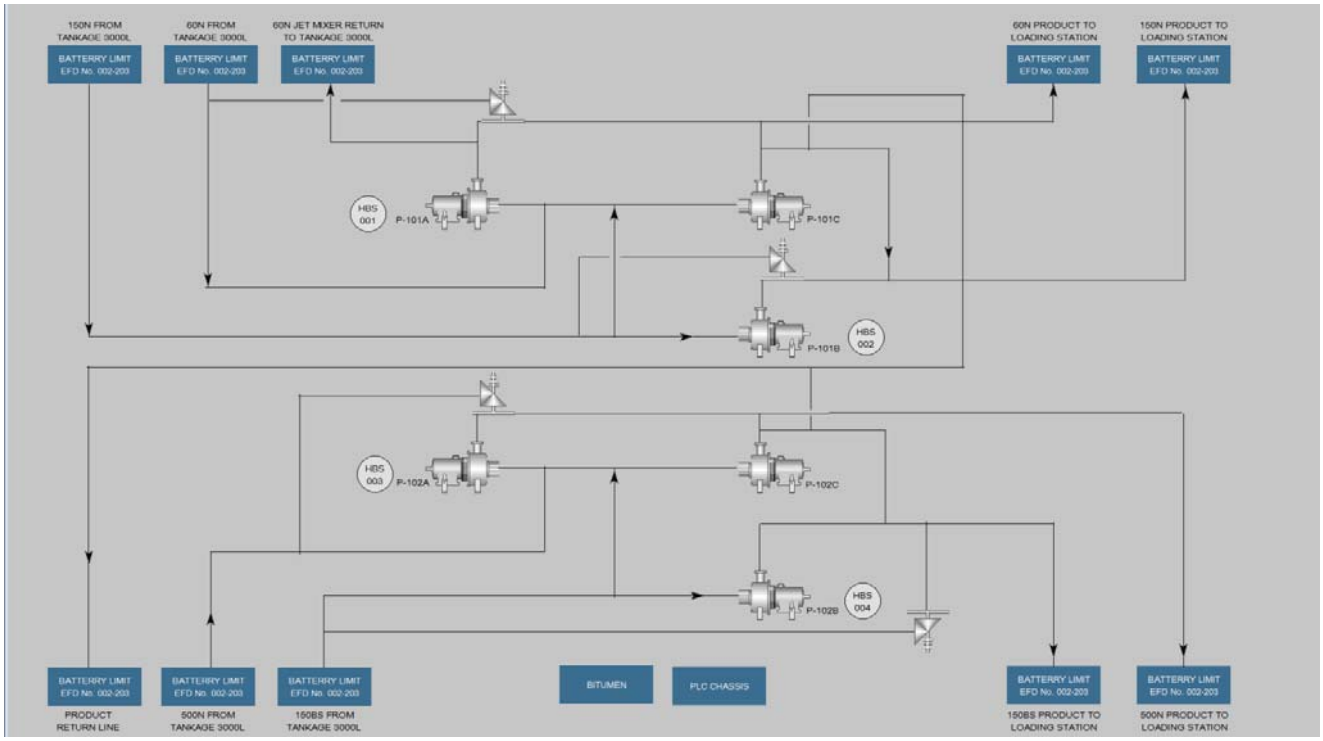


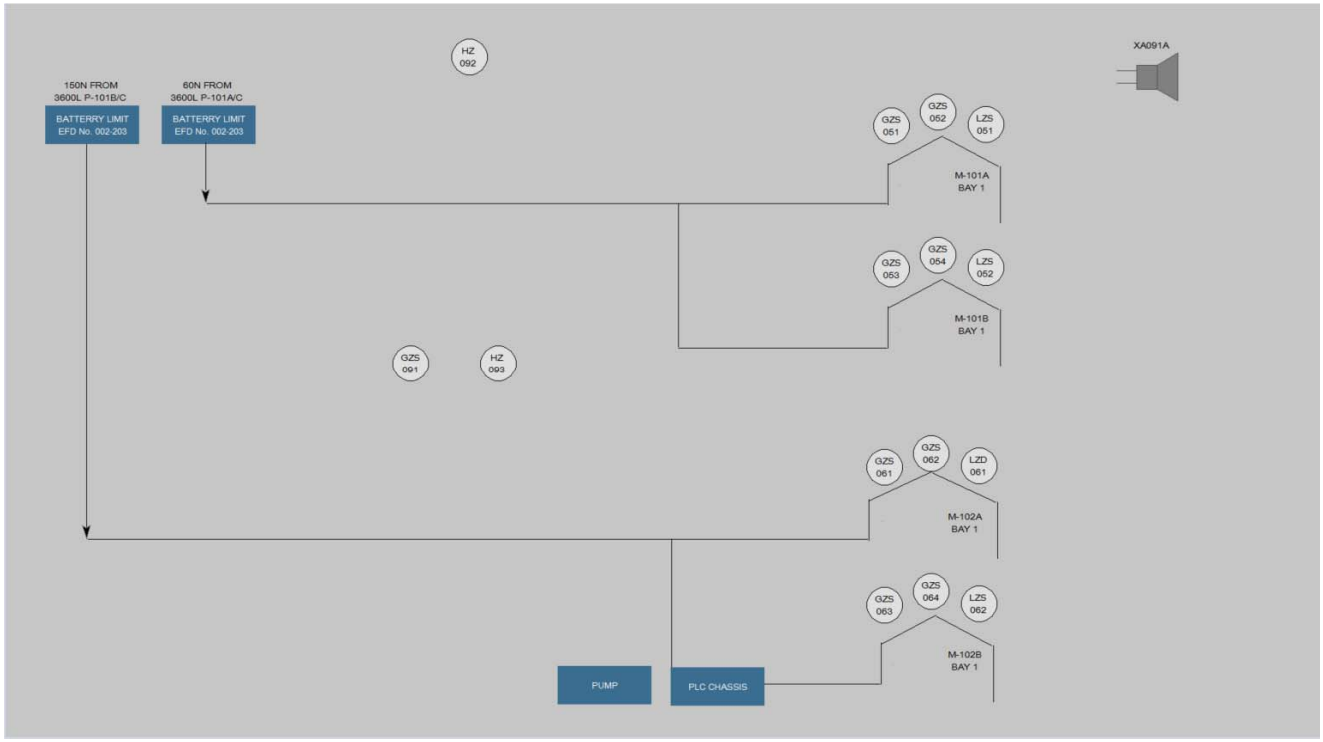
Digital Output Slot#6



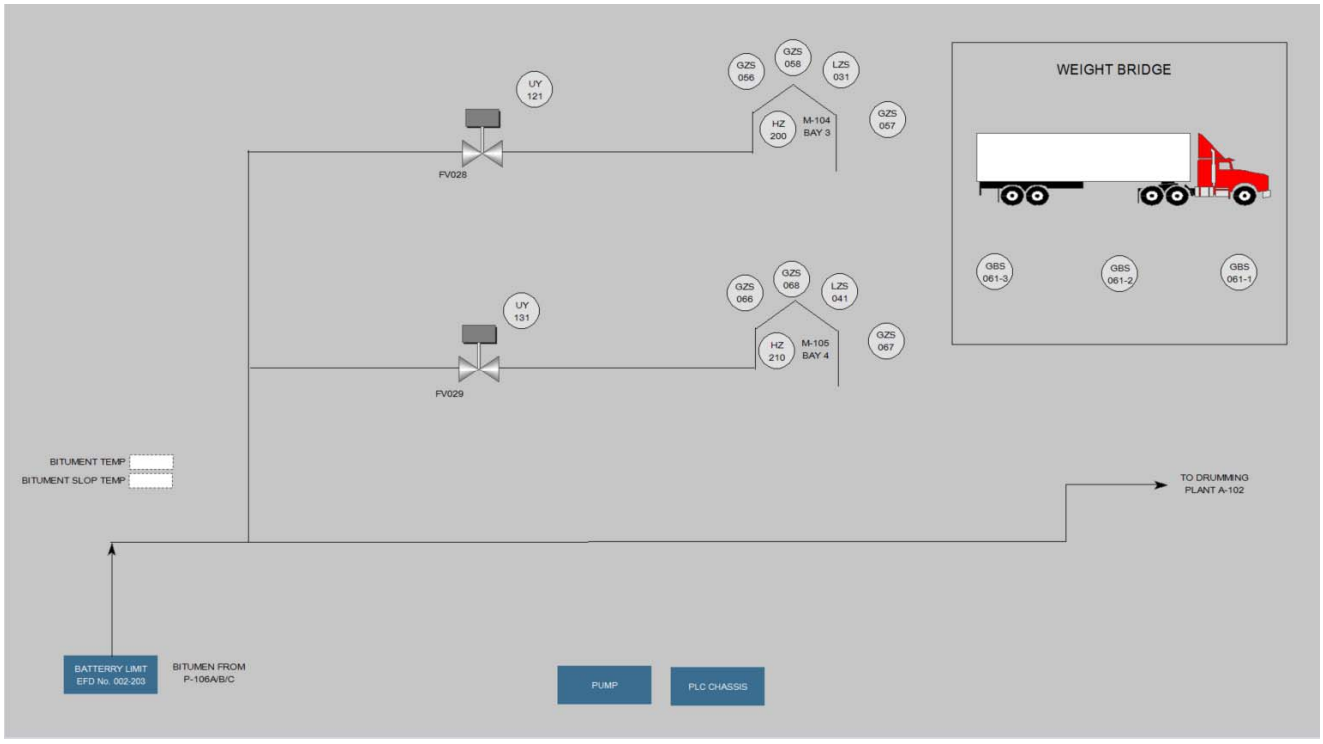
Analog Input Slot#7




150N FROM TANKAGE 3000L
60N FROM TANKAGE 3000L
60N JET MIXER RETURN TO TANKAGE 3000L
60N PRODUCT TO LOADING STATION
150N PRODUCT TO LOADING STATION
BATTERY LIMIT EFD No. 002-203
HBS 001
P-101A
P-101C
P-101B
HBS 002
HBS 003
P-102A
P-102C
P-102B
HBS 004
BITUMEN
PLC CHASSIS
PRODUCT RETURN LINE
500N FROM TANKAGE 3000L
150BS FROM TANKAGE 3000L
150BS PRODUCT TO LOADING STATION
500N PRODUCT TO LOADING STATION


HZ 092
XA091A
150N FROM 3600L P-101B/C
60N FROM 3600L P-101A/C
BATTERY LIMIT EFD No. 002-203
GZS 051
GZS 052
LZS 051
M-101A BAY 1
GZS 053
GZS 054
LZS 052
M-101B BAY 1
GZS 091
HZ 093
GZS 061
GZS 062
LZD 061
M-102A BAY 1
GZS 063
GZS 064
LZS 062
M-102B BAY 1
PUMP
PLC CHASSIS


XA091A
GZS 071
GZS 072
LZS 071
M-103A BAY 2
GZS 073
GZS 074
LZS 072
M-103B BAY 2
HZ 094
GZS 092
GZS 081
GZS 082
LZS 081
M-104A BAY 2
GZS 083
GZS 084
LZS 082
M-104B BAY 2
BATTERRY LIMIT EFD No. 002-203
500N FROM 3600L P-102A/C
BATTERRY LIMIT EFD No. 002-203
150BS FROM 3600L P-102B/C
PUMP
PLC CHASSIS


UY 121
FV028
GZS 056
GZS 058
LZS 031
HZ 200
M-104 BAY 3
GZS 057
WEIGHT BRIDGE
GBS 061-3
GBS 061-2
GBS 061-1
UY 131
FV029
GZS 066
GZS 068
LZS 041
HZ 210
M-105 BAY 4
GZS 067
BITUMENT TEMP
BITUMENT SLOP TEMP
TO DRUMMING PLANT A-102
BATTERRY LIMIT EFD No. 002-203
BITUMEN FROM P-106A/B/C
PUMP
PLC CHASSIS