Syed Nabeel Mehdi Mini-project 2 200226727

NC - Normally Close
NO - Normally Open

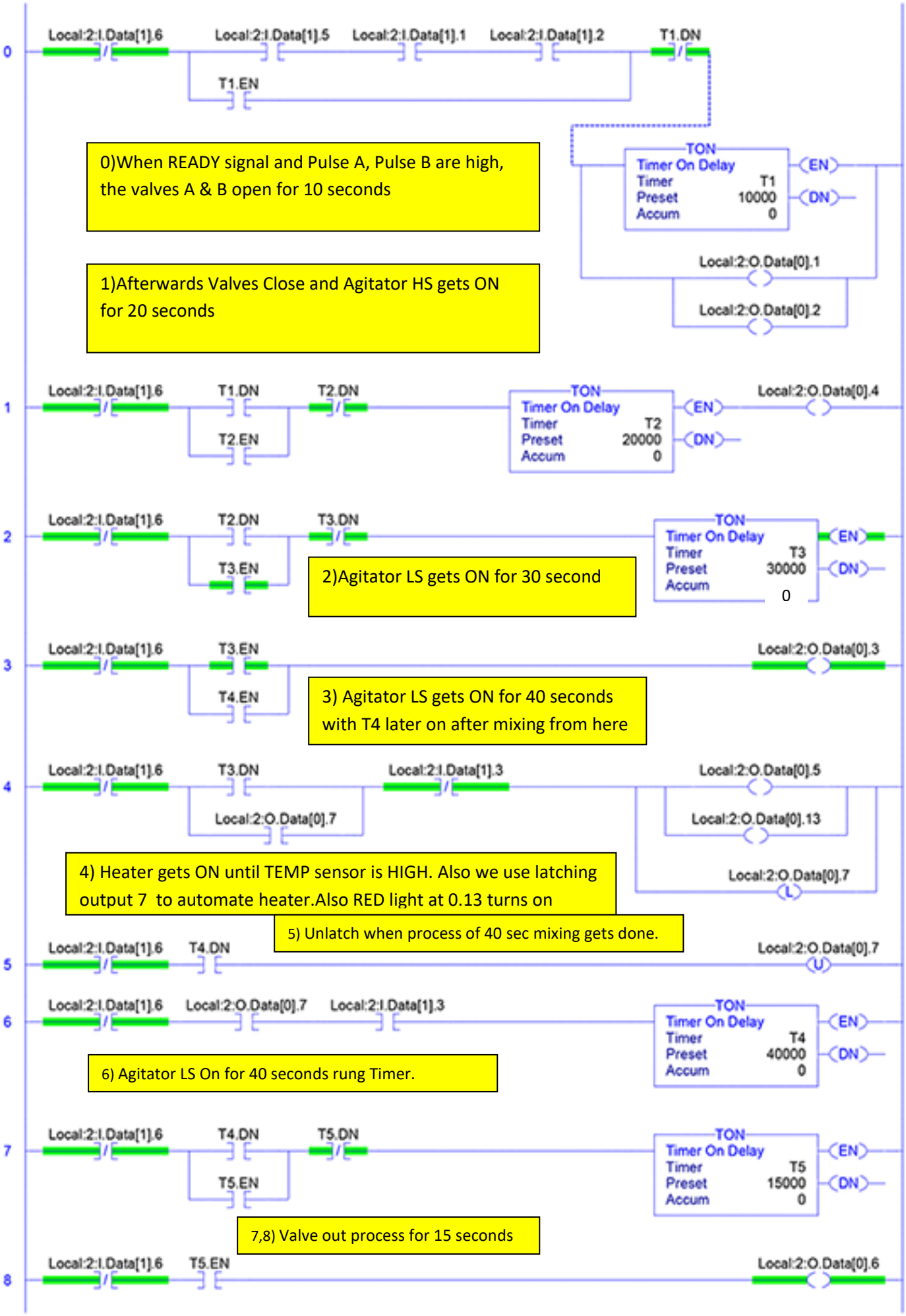
SIGNAL	INPUTS	LOCATION	TYPE	FUNCTION
Digital	PULSE_A	Local:2:I.Data[1].1	NO	When material A is ready, sensor HIGH, could be a proximity sensor inside Silo
Digital	PULSE_B	Local:2:I.Data[1].2	NO	When material B is ready, sensor HIGH, could be a proximity sensor inside Silo
Digital	TEMP	Local:2:I.Data[1].3	NO	A set temperature sensor which is HIGH if temperature within +/-5 of 100 degree C
Digital	PULSE_OUT	Local:2:I.Data[1].7	NO	Sensor become HIGH when dump process complete, we can use a proximity sensor
Digital	READY	Local:2:I.Data[1].5	NO	Sensor become HIGH when QA Tank is in position, we can use a proximity sensor
Digital	EMERGENCY	Local:2:I.Data[1].6	NC	emergency push button to stop all activities

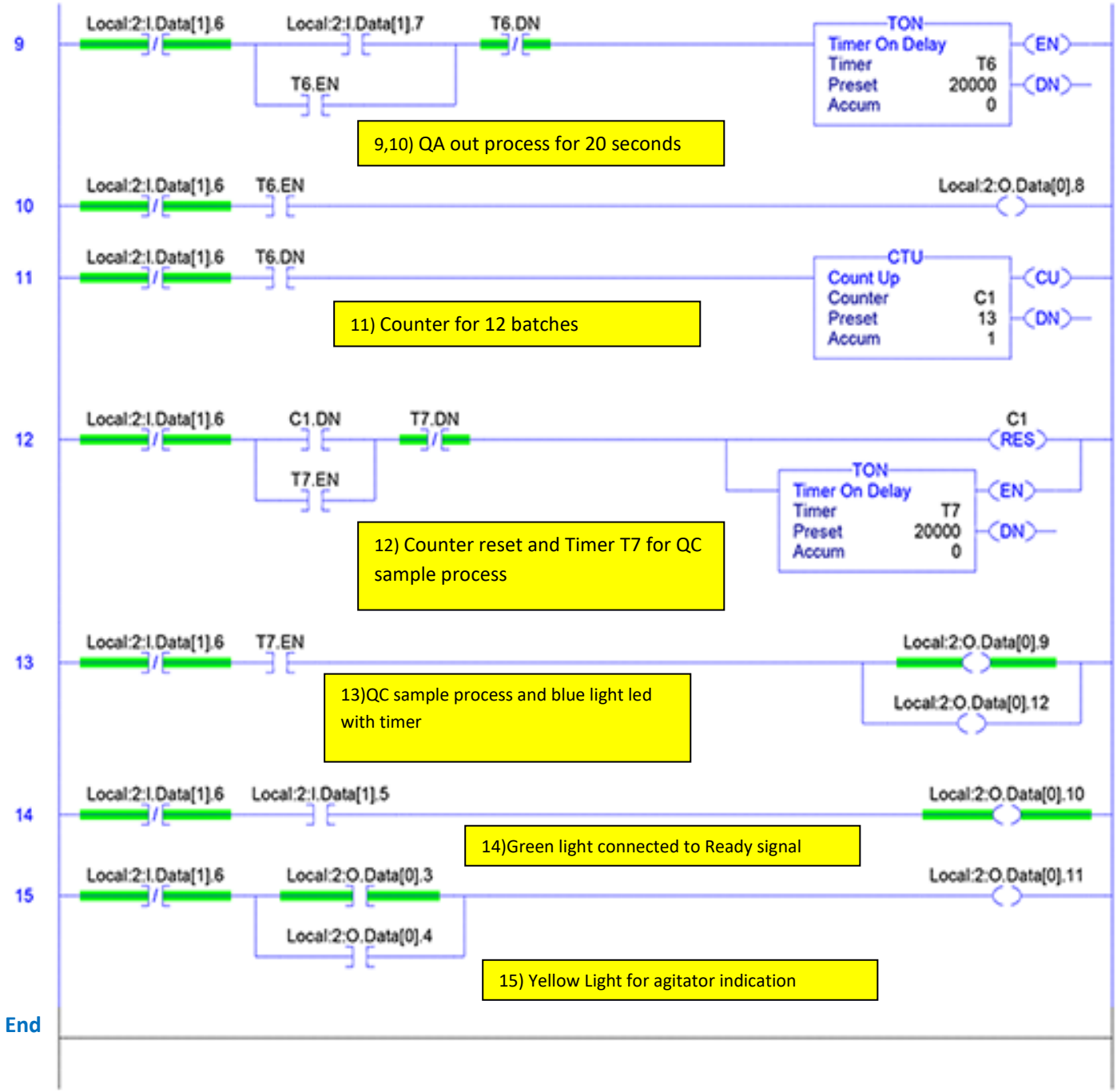
SIGNAL	OUTPUTS	LOCATION		FUNCTION
Digital	VALVE_A	Local:2:O.Data[0].1		It opens and release ingredient A to mixer
Digital	VALVE_B	Local:2:O.Data[0].2		It opens and release ingredient B to mixer
Digital	AGIT_ON_LS	Local:2:O.Data[0].3		Agitator for low speed 200 rpm
Digital	AGIT_ON_HS	Local:2:O.Data[0].4		Agitator for high speed 500 rpm
Digital	HEATER	Local:2:O.Data[0].5		Heater to control temperature
Digital	VALVE_OUT	Local:2:O.Data[0].6		It opens to release material to the tank
Digital	QA_OUT	Local:2:O.Data[0].8		QA goes away process
Digital	QC_SAMPLE	Local:2:O.Data[0].9		sample process executed after 12 samples
Digital	GL1	Local:2:O.Data[0].10		Green LED turns ON when READY signal is HIGH
Digital	YL2	Local:2:O.Data[0].11		Yellow LED turns ON when any agitator is running
Digital	BL4	Local:2:O.Data[0].12		Blue LED turns ON when QC sample process running
Digital	RL3	Local:2:O.Data[0].13		RED LED light is ON when HEATER is running

SIGNAL	INTERNAL	LOCATION		FUNCTION
DIGITAL	RELAY	Local:2:O.Data[0].7		It is a latching output to automate the heater with TEMP sensor during process
	TIMERS	**PRE SET TIME**		**CONTROL**
	T1	10000 ms (10 sec)		Ingredients A, B amount with T1.DN, T1.EN
	T2	20000 ms (20 sec)		Agitator High Speed timing with T2.DN, T2.EN
	T3	30000 ms (30 sec)		Agitator Low Speed timing with T3.DN, T3.EN
	T4	40000 ms (40 sec)		After heating Agitator Low Speed with T4.DN, T4.EN
	T5	15000 ms (15 sec)		Valve out with T5.DN, T5.EN
	T6	20000 ms (20 sec)		QA Out process with T6.DN, T6.EN
	T7	20000 ms (20 sec)		QC sample process with T7.DN, T7.EN

	COUNTER	Setting		Control
	C1	PRE- 13, ACC-1		It counts up the batches and then resets at 13th one

	ASSUMPTIONS			
	1) Ready Signal is turned OFF when the agitating process starts			
	2) LS Agitating used for 40 seconds after heating 3) Valve A & B open at same time for 10 seconds after both pulse A & B are high			


0
Local:2:I.Data[1].6
Local:2:I.Data[1].5
Local:2:I.Data[1].1
Local:2:I.Data[1].2
T1.DN
T1.EN
TON
Timer On Delay
Timer T1
Preset 10000
Accum 0
EN
DN
Local:2:O.Data[0].1
Local:2:O.Data[0].2
0)When READY signal and Pulse A, Pulse B are high, the valves A & B open for 10 seconds
1)Afterwards Valves Close and Agitator HS gets ON for 20 seconds
1
Local:2:I.Data[1].6
T1.DN
T2.DN
T2.EN
TON
Timer On Delay
Timer T2
Preset 20000
Accum 0
EN
DN
Local:2:O.Data[0].4
2
Local:2:I.Data[1].6
T2.DN
T3.DN
T3.EN
TON
Timer On Delay
Timer T3
Preset 30000
Accum 0
EN
DN
2)Agitator LS gets ON for 30 second
3
Local:2:I.Data[1].6
T3.EN
T4.EN
Local:2:O.Data[0].3
3) Agitator LS gets ON for 40 seconds with T4 later on after mixing from here
4
Local:2:I.Data[1].6
T3.DN
Local:2:I.Data[1].3
Local:2:O.Data[0].7
Local:2:O.Data[0].5
Local:2:O.Data[0].13
Local:2:O.Data[0].7
L
4) Heater gets ON until TEMP sensor is HIGH. Also we use latching output 7 to automate heater.Also RED light at 0.13 turns on
5) Unlatch when process of 40 sec mixing gets done.
5
Local:2:I.Data[1].6
T4.DN
Local:2:O.Data[0].7
U
6
Local:2:I.Data[1].6
Local:2:O.Data[0].7
Local:2:I.Data[1].3
TON
Timer On Delay
Timer T4
Preset 40000
Accum 0
EN
DN
6) Agitator LS On for 40 seconds rung Timer.
7
Local:2:I.Data[1].6
T4.DN
T5.DN
T5.EN
TON
Timer On Delay
Timer T5
Preset 15000
Accum 0
EN
DN
7,8) Valve out process for 15 seconds
8
Local:2:I.Data[1].6
T5.EN
Local:2:O.Data[0].6


9
Local:2:I.Data[1].6
Local:2:I.Data[1].7
T6.DN
T6.EN
TON
Timer On Delay
Timer T6
Preset 20000
Accum 0
EN
DN
9,10) QA out process for 20 seconds
10
Local:2:I.Data[1].6
T6.EN
Local:2:O.Data[0].8
11
Local:2:I.Data[1].6
T6.DN
CTU
Count Up
Counter C1
Preset 13
Accum 1
CU
DN
11) Counter for 12 batches
12
Local:2:I.Data[1].6
C1.DN
T7.DN
T7.EN
C1
RES
TON
Timer On Delay
Timer T7
Preset 20000
Accum 0
EN
DN
12) Counter reset and Timer T7 for QC sample process
13
Local:2:I.Data[1].6
T7.EN
Local:2:O.Data[0].9
Local:2:O.Data[0].12
13)QC sample process and blue light led with timer
14
Local:2:I.Data[1].6
Local:2:I.Data[1].5
Local:2:O.Data[0].10
14)Green light connected to Ready signal
15
Local:2:I.Data[1].6
Local:2:O.Data[0].3
Local:2:O.Data[0].4
Local:2:O.Data[0].11
15) Yellow Light for agitator indication
End