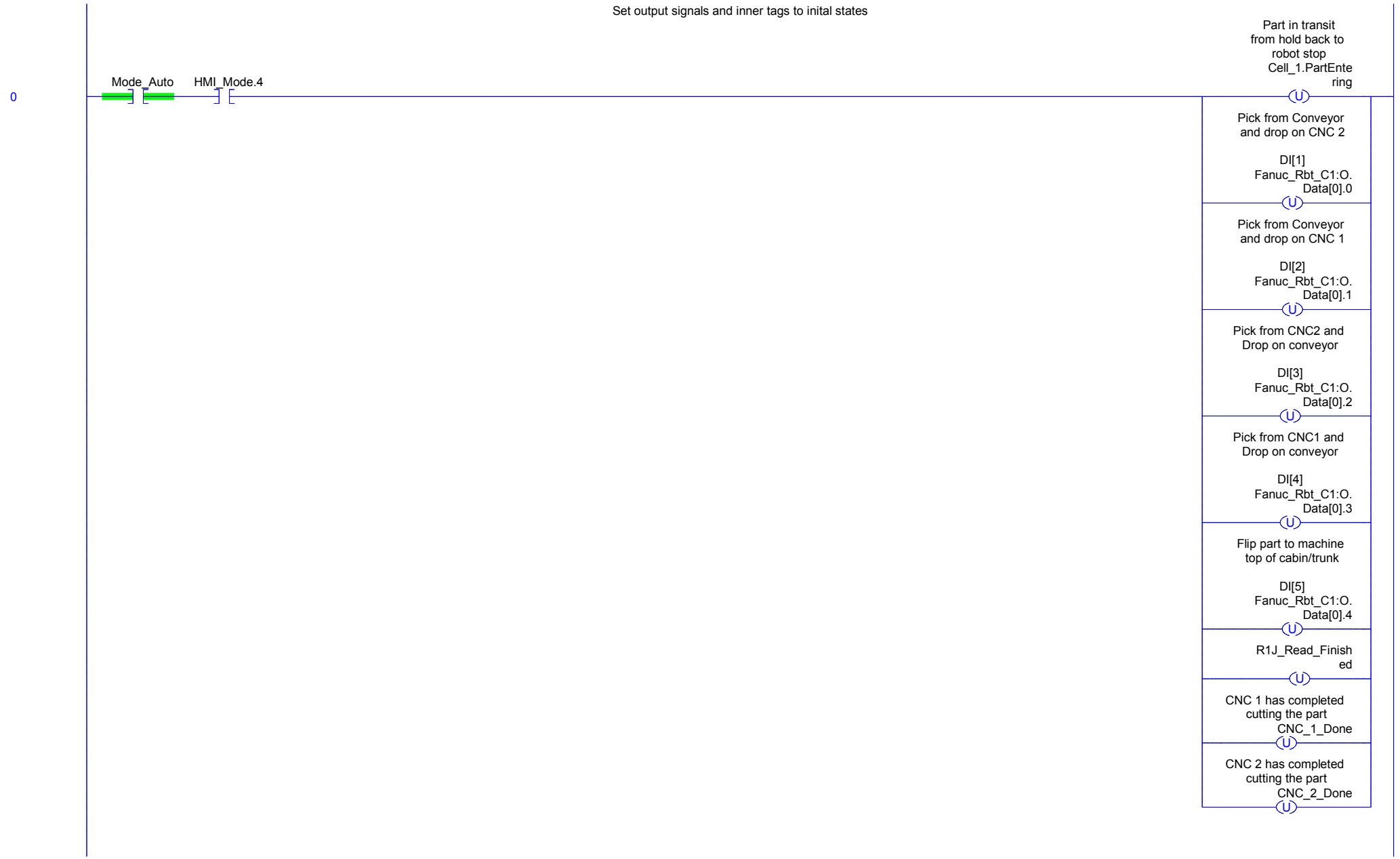

Set output signals and inner tags to inital states
0
Mode_Auto
HMI_Mode.4
Part in transit from hold back to robot stop Cell_1.PartEntering
Pick from Conveyor and drop on CNC 2
DI[1] Fanuc_Rbt_C1:O.Data[0].0
Pick from Conveyor and drop on CNC 1
DI[2] Fanuc_Rbt_C1:O.Data[0].1
Pick from CNC2 and Drop on conveyor
DI[3] Fanuc_Rbt_C1:O.Data[0].2
Pick from CNC1 and Drop on conveyor
DI[4] Fanuc_Rbt_C1:O.Data[0].3
Flip part to machine top of cabin/trunk
DI[5] Fanuc_Rbt_C1:O.Data[0].4
R1J_Read_Finished
CNC 1 has completed cutting the part CNC_1_Done
CNC 2 has completed cutting the part CNC_2_Done

Let all pallets (empty and full) through to Cell 1 Hold Back stopper.

1
Mode_Start
Mode_Semi
Sensor Pallet Stop RFID4 (Loop 1 Diverter Hold Back Stop)
PPX4 <Conv_N053:I.Data[3].2>
DeBounceC23DivHoldBack.TT
TON Timer On Delay Timer DeBounceC23DivHoldBack Preset 1000 Accum 0 EN DN

2
Mode_Auto
Mode_Semi
DeBounceC23DivHoldBack.TT
Retract Stop C23DivHoldBack.Ret (L)
Extend Stop C23DivHoldBack.Ext (U)

3
Mode_Auto
Mode_Semi
DeBounceC23DivHoldBack.TT
Retract Stop C23DivHoldBack.Ret (U)
Extend Stop C23DivHoldBack.Ext (L)

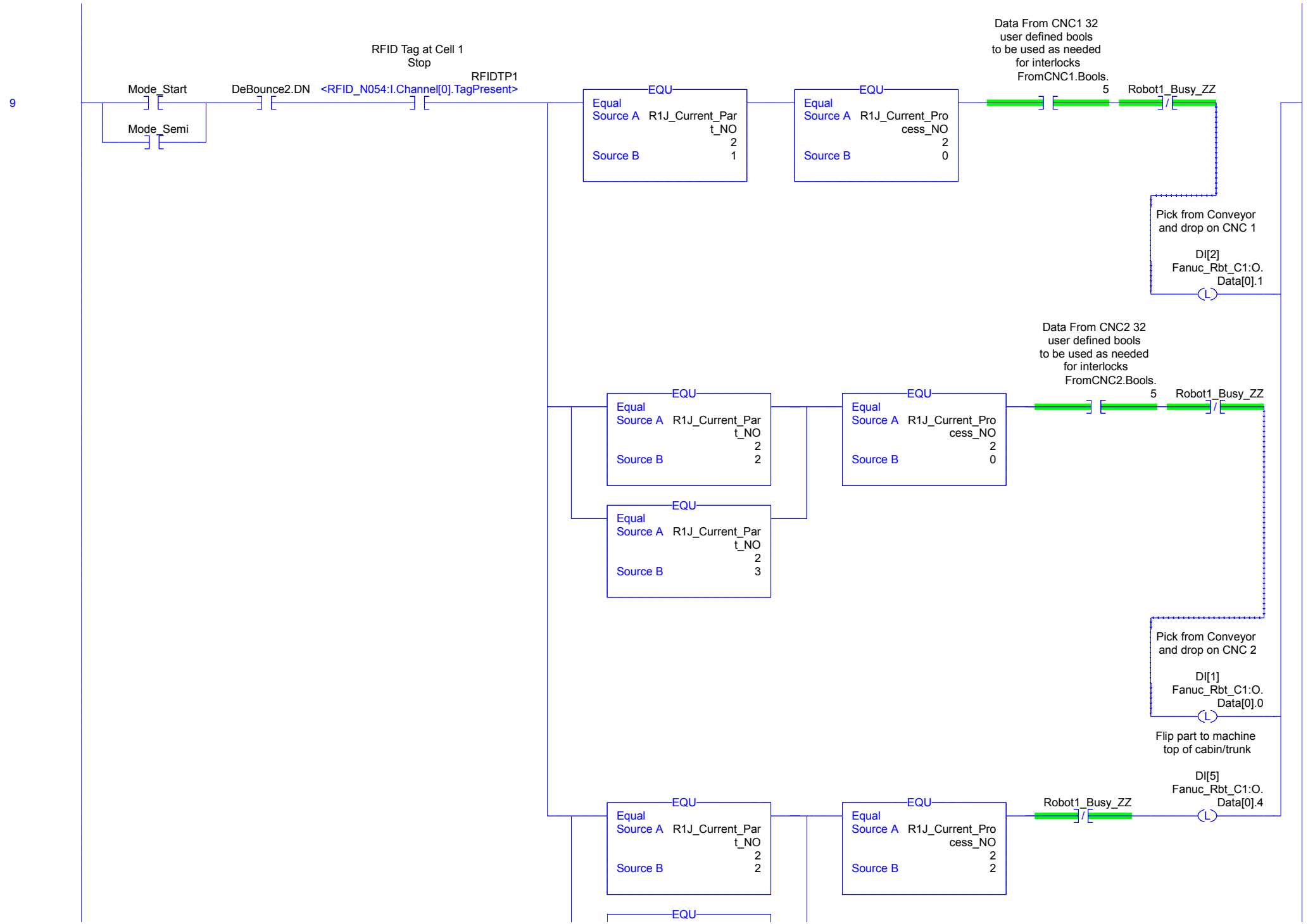
If there is a part at Cell 1 Hold Back Stop (which is sensed by the proximity sensor), and their is not a part in transit to enter cell 1 (which is determined by Cell_1.PartEntering boolean, which is set to true when the pallet leaves the hold back, and set to false when it is sensed by the proximity sensor in Cell 1), then begin the Debounce1 timer. The timer ensures that noice at PPX5 won't affect the program.

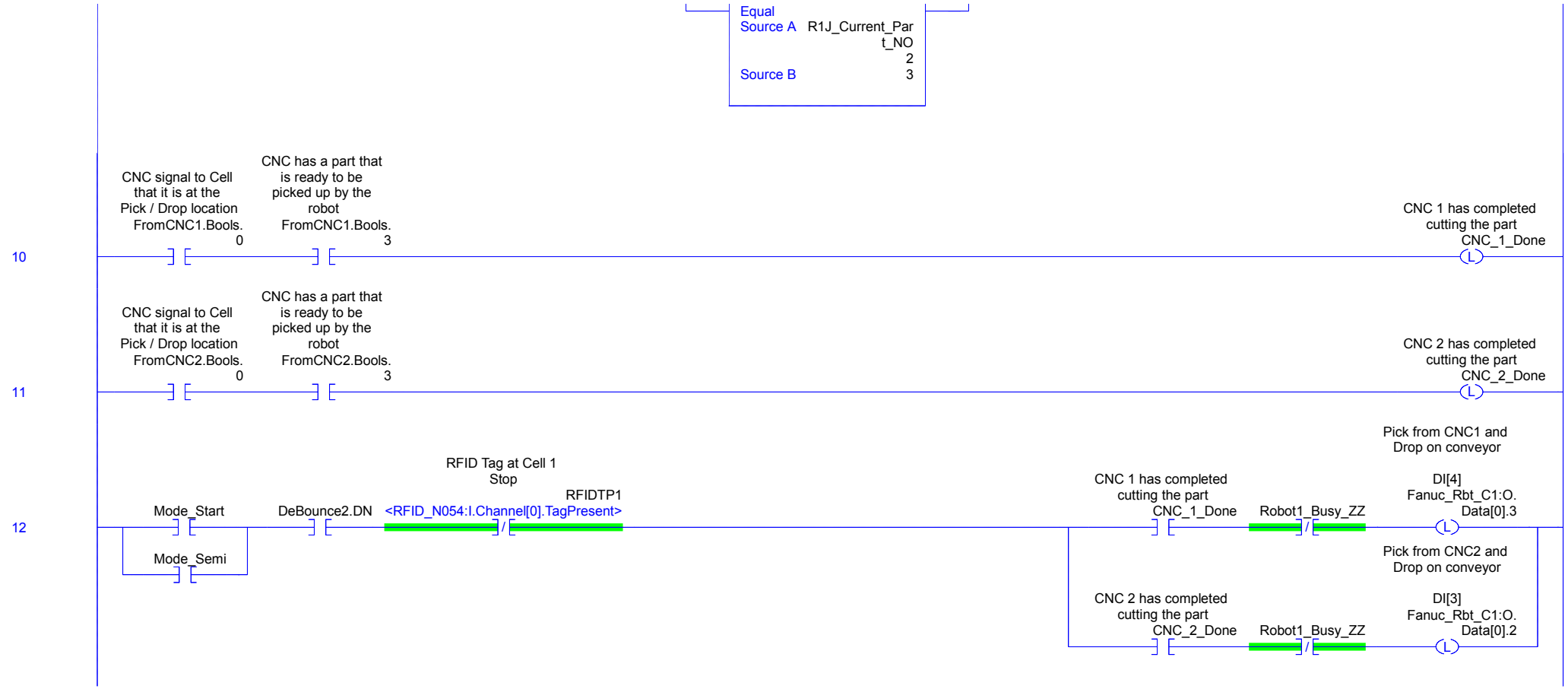
4
Mode_Start
Mode_Semi
Sensor Pallet Stop (Cell 1 Hold Back)
PPX5 <Main_N043:I.Data[3].0>
RFID Tag at Cell 1 Stop
RFIDTP1 <RFID_N054:I.Channel[0].TagPresent>
R1J_Read_Finished
Part in transit from hold back to robot stop Cell_1.PartEntering
RFID Tag at Cell 1 Stop
RFIDTP1 <RFID_N054:I.Channel[0].TagPresent>
TON Timer On Delay Timer DeBounce1 Preset 250 Accum 0 EN DN

When Mode_Auto and Dry_Cycle are activated, and the DeBounce1 timer is done, and the Cell 1 Hold Back Stop is extended, and there is not a pallet at the pallet stop in Cell 1, and there is not a part in transit to cell 1, then begin the timer RelC1HoldBack, and allow this timer to completly run.

5
Mode_Start
Mode_Semi
DeBounce1.DN
Cell 1 Hold Back Stop Extended Manifold_N058:1 :O.Pt00Data
Sensor Palet Stop RFID1 (Cell 1 Fanuc Robot Stop) PPX1 <C1_N011:I.Data[6].7>
Part in transit from hold back to robot stop Cell_1.PartEntering
RelC1HoldBack.TT
TON Timer On Delay Timer RelC1HoldBack Preset 700 Accum 0 EN DN

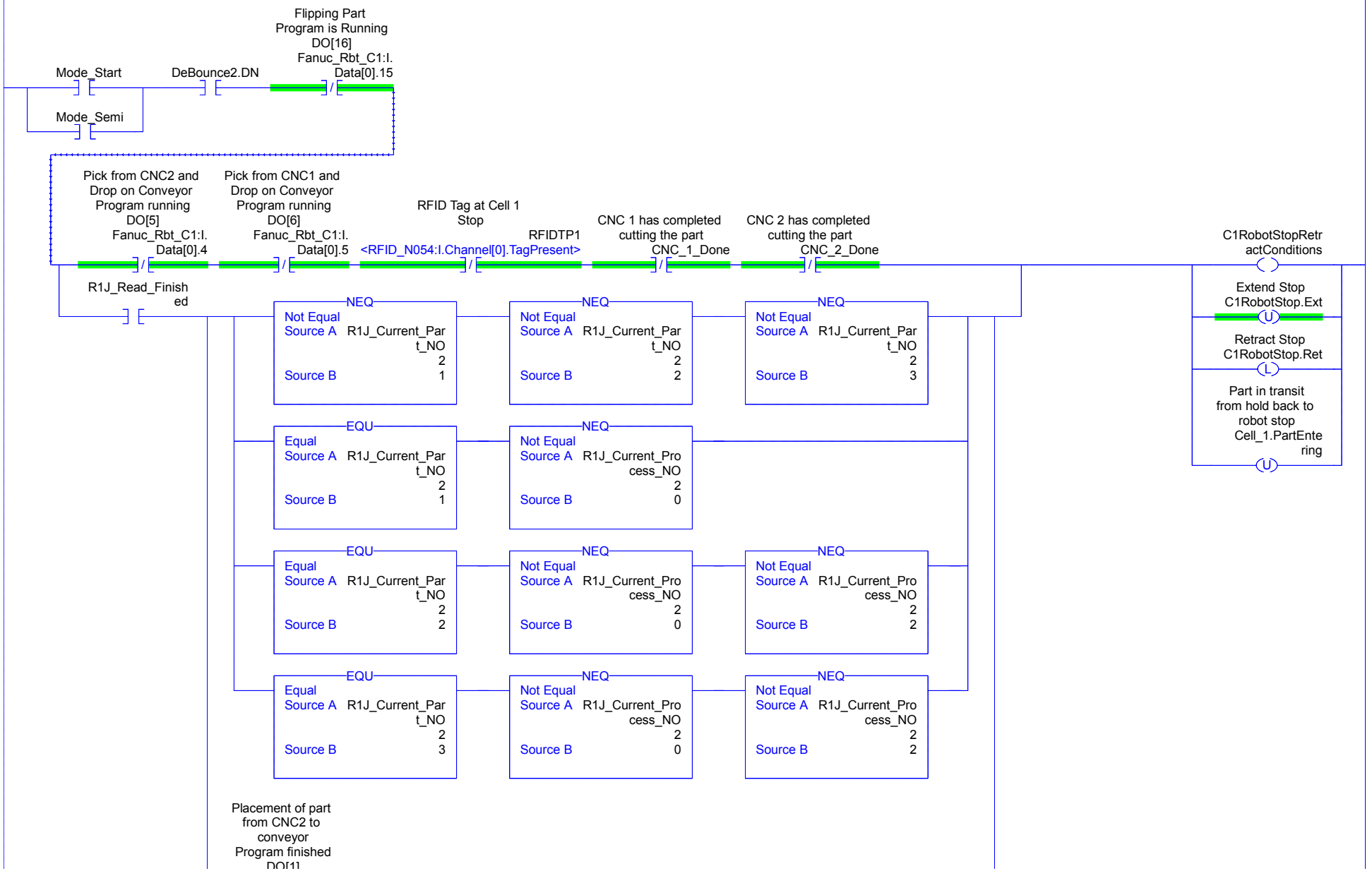
6
Mode_Auto
Mode_Semi
RelC1HoldBack.T
T
Retract Stop
C1HoldBack.Ret
L
Extend Stop
C1HoldBack.Ext
U
Part in transit from hold back to robot stop
Cell_1.PartEntering
L
7
Mode_Auto
Mode_Semi
RelC1HoldBack.T
T
/
Retract Stop
C1HoldBack.Ret
U
Extend Stop
C1HoldBack.Ext
L
When the pallet arrives at Cell 1 Fanuc Robot Stop, begin the DeBounce2 timer.
8
Mode_Start
Mode_Semi
Sensor Palet Stop RFID1 (Cell 1 Fanuc Robot Stop)
PPX1
<C1_N011:I.Data[6].7>
TON
Timer On Delay
Timer DeBounce2
Preset 250
Accum 0
EN
DN

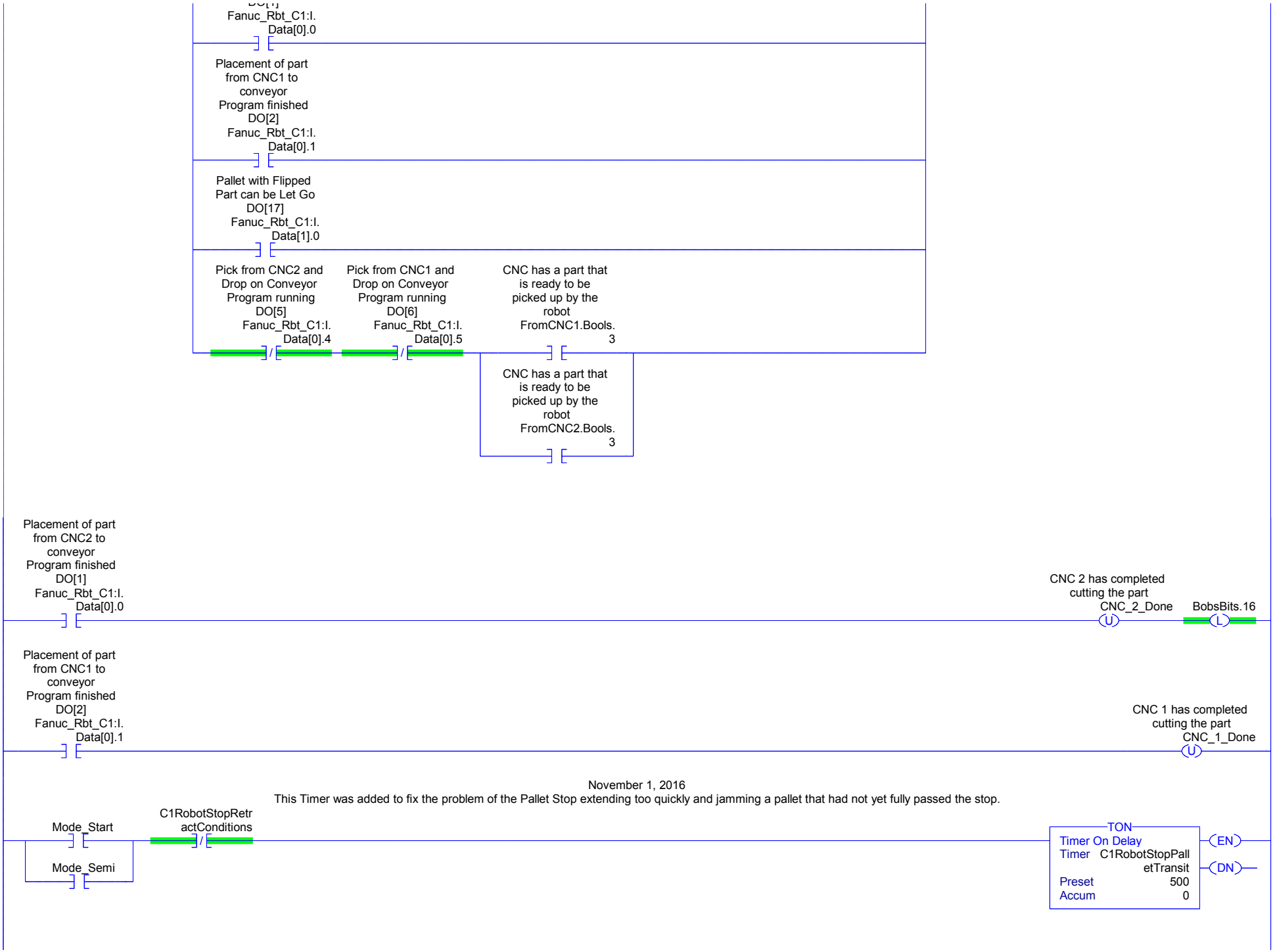

9
RFID Tag at Cell 1
Stop
Mode_Start
Mode_Semi
DeBounce2.DN
<RFID_N054:I.Channel[0].TagPresent>
RFIDTP1
EQU
Equal
Source A R1J_Current_Part_NO
2
Source B 1
EQU
Equal
Source A R1J_Current_Process_NO
2
Source B 0
Data From CNC1 32 user defined bools to be used as needed for interlocks FromCNC1.Bools.
5
Robot1_Busy_ZZ
Pick from Conveyor and drop on CNC 1
DI[2] Fanuc_Rbt_C1:O.Data[0].1
L
EQU
Equal
Source A R1J_Current_Part_NO
2
Source B 2
EQU
Equal
Source A R1J_Current_Process_NO
2
Source B 0
Data From CNC2 32 user defined bools to be used as needed for interlocks FromCNC2.Bools.
5
Robot1_Busy_ZZ
EQU
Equal
Source A R1J_Current_Part_NO
2
Source B 3
Pick from Conveyor and drop on CNC 2
DI[1] Fanuc_Rbt_C1:O.Data[0].0
L
Flip part to machine top of cabin/trunk
DI[5] Fanuc_Rbt_C1:O.Data[0].4
L
EQU
Equal
Source A R1J_Current_Part_NO
2
Source B 2
EQU
Equal
Source A R1J_Current_Process_NO
2
Source B 2
Robot1_Busy_ZZ
EQU


Equal
Source A R1J_Current_Part_NO
2
Source B 3
10
CNC signal to Cell that it is at the Pick / Drop location FromCNC1.Bools. 0
CNC has a part that is ready to be picked up by the robot FromCNC1.Bools. 3
CNC 1 has completed cutting the part CNC_1_Done
11
CNC signal to Cell that it is at the Pick / Drop location FromCNC2.Bools. 0
CNC has a part that is ready to be picked up by the robot FromCNC2.Bools. 3
CNC 2 has completed cutting the part CNC_2_Done
12
Mode_Start
Mode_Semi
DeBounce2.DN
RFID Tag at Cell 1 Stop
RFIDTP1
<RFID_N054:I.Channel[0].TagPresent>
CNC 1 has completed cutting the part CNC_1_Done
Robot1_Busy_ZZ
Pick from CNC1 and Drop on conveyor
DI[4] Fanuc_Rbt_C1:O.Data[0].3
CNC 2 has completed cutting the part CNC_2_Done
Robot1_Busy_ZZ
Pick from CNC2 and Drop on conveyor
DI[3] Fanuc_Rbt_C1:O.Data[0].2

October 11, 2016
This rung evaluates all possible conditions for retraction of the Cell 1 Robot Stop. The conditions are:
If the part has been dropped to the conveyer (has written process number and checked), or both CNC1 and CNC2 running (both busy now), or the pallet is empty and both CNCs are not done, or the process is not 0, or CNC2 is not idle and Part A is in cell, or CNC1 is not idle and part B or C is in cell.
November 1, 2016
Added DeBounce2 timer done condition to ensure PartEntering tag is unlatched. Changed tags to match RFID_1_JW.
November 5, 2016
Fixed Error: RFID 3 tags were being used instead of RFID 1
November 9, 2016
Added Robot2_DroppedP1 and P2 FALSE conditions in front of some rungs to avoid releasing a pallet early while the robot is dropping a part from a CNC to the conveyor.

13




Fanuc_Rbt_C1:I.
Data[0].0
Placement of part from CNC1 to conveyor Program finished
DO[2]
Fanuc_Rbt_C1:I.
Data[0].1
Pallet with Flipped Part can be Let Go
DO[17]
Fanuc_Rbt_C1:I.
Data[1].0
Pick from CNC2 and Drop on Conveyor Program running
DO[5]
Fanuc_Rbt_C1:I.
Data[0].4
Pick from CNC1 and Drop on Conveyor Program running
DO[6]
Fanuc_Rbt_C1:I.
Data[0].5
CNC has a part that is ready to be picked up by the robot
FromCNC1.Bools.
3
CNC has a part that is ready to be picked up by the robot
FromCNC2.Bools.
3
14
Placement of part from CNC2 to conveyor Program finished
DO[1]
Fanuc_Rbt_C1:I.
Data[0].0
CNC 2 has completed cutting the part
CNC_2_Done
BobsBits.16
15
Placement of part from CNC1 to conveyor Program finished
DO[2]
Fanuc_Rbt_C1:I.
Data[0].1
CNC 1 has completed cutting the part
CNC_1_Done
November 1, 2016
This Timer was added to fix the problem of the Pallet Stop extending too quickly and jamming a pallet that had not yet fully passed the stop.
16
Mode_Start
Mode_Semi
C1RobotStopRetr
actConditions
TON
Timer On Delay
Timer C1RobotStopPall
etTransit
Preset 500
Accum 0
EN
DN

October 11, 2016
If the above Retraction conditions are all false, then extend the stop.
November 1, 2016
Timer added.

17

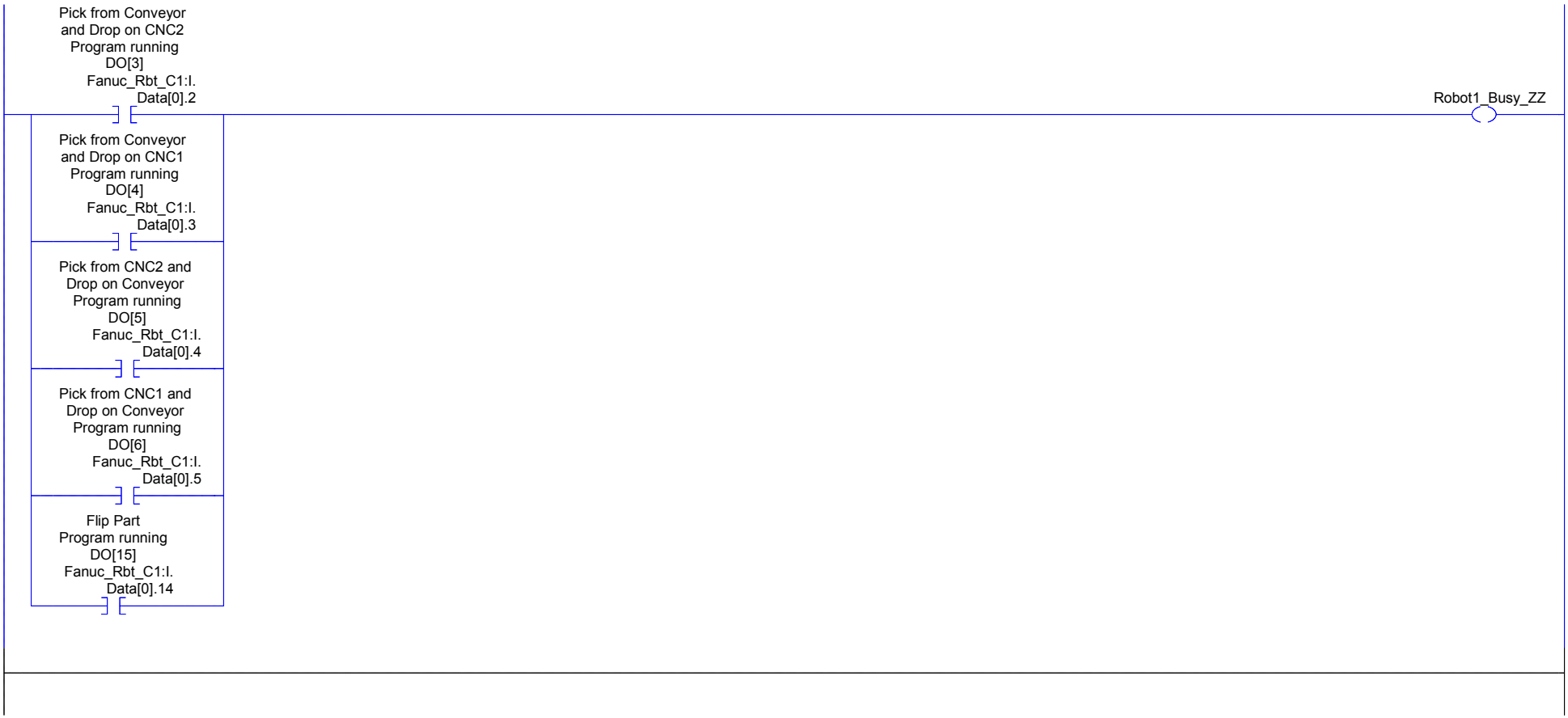
Mode_Start
Mode_Semi
C1RobotStopRetractConditions
C1RobotStopPalletTransit.DN
Retract Stop C1RobotStop.Ret
Extend Stop C1RobotStop.Ext
R1J_Write_Pass

If the C1RobotStop is retract and there is no RFID tags, unlatch the Robot1DroppedPart.
November 1, 2016
Removed RFID Tag not present condition (Stop was extending before part exited RFID field of view)
November 9, 2016
Changed from the retract condition to a Tag Not Present condition to ensure DroppedPart is unlatched even if the robot continues sending DO[11] after the pallet stop is extended again.

18

Mode_Start
Mode_Semi
DeBounce2.DN
RFID Tag at Cell 1 Stop
RFIDTP1
<RFID_N054:I.Channel[0].TagPresent>
Pick from Conveyor and drop on CNC 2
DI[1] Fanuc_Rbt_C1:O.Data[0].0
Pick from Conveyor and drop on CNC 1
DI[2] Fanuc_Rbt_C1:O.Data[0].1
Pick from CNC2 and Drop on conveyor
DI[3] Fanuc_Rbt_C1:O.Data[0].2
Pick from CNC1 and Drop on conveyor
DI[4] Fanuc_Rbt_C1:O.Data[0].3
Flip part to machine top of cabin/trunk
DI[5] Fanuc_Rbt_C1:O.Data[0].4

19


Pick from Conveyor and Drop on CNC2 Program running DO[3] Fanuc_Rbt_C1:I. Data[0].2
Robot1_Busy_ZZ
Pick from Conveyor and Drop on CNC1 Program running DO[4] Fanuc_Rbt_C1:I. Data[0].3
Pick from CNC2 and Drop on Conveyor Program running DO[5] Fanuc_Rbt_C1:I. Data[0].4
Pick from CNC1 and Drop on Conveyor Program running DO[6] Fanuc_Rbt_C1:I. Data[0].5
Flip Part Program running DO[15] Fanuc_Rbt_C1:I. Data[0].14

(End)