

## Part Height Sorter Control

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Additional internal memory:

Symbol	Address	
STEP_1 to STEP_5	B20/1 to B20/5	Step-in-progress bits
DOWN_TMR	T4:1	Times lowering of measuring ram
EJECT_TMR	T4:2	Times eject pulse
LVDT_VAL	F8:1	LVDT measurement in mm
TMP_INT	N7:1	Needed to convert height into BCD
TMP_BCD	N9:1	BCD conversion result
HEIGHT_60	B3/21	Height in range of 56 - 64
HEIGHT_75	B3/22	Height in range of 71 - 79
HEIGHT_90	B3/23	Height in range of 86 - 94
HEIGHT_OTHER	B3/24	Height in range not covered above

Conversion formulas

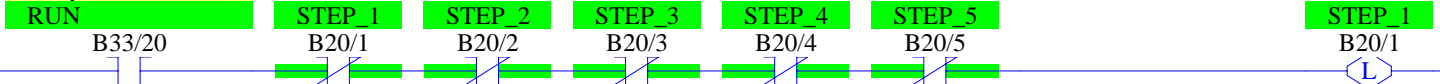
$$UX1\_VAL = ((UX1\_MEAS - 6241) / 24965) * (100 - 15) + 15$$

$$LVDT\_VAL = ((HGT\_MEAS - 6241) / 24965) * 100$$

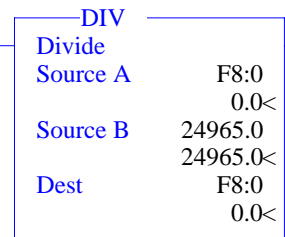
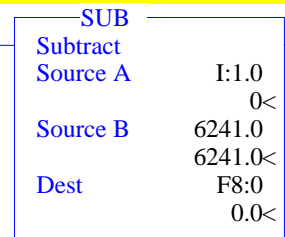
$$HGT\_VAL = 150 - LVDT\_VAL \quad (\text{calculated on transition from Step}_2 \text{ to Step}_3)$$

Initial start.

When on, allow  
station to run. When  
off, pause.

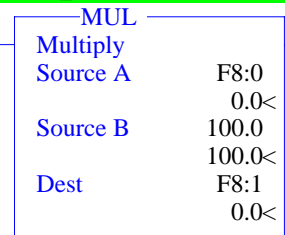


Conversion of LVDT reading to height in mm.



LVDT value converted  
to 0 - 100 mm

LVDT\_VAL



Conversion of distance reading to distance in cm.

**SUB**  
Subtract  
Source A I:1.1  
0<  
Source B 6241.0  
6241.0<  
Dest F8:0  
0.0<

**DIV**  
Divide  
Source A F8:0  
0.0<  
Source B 24965.0  
24965.0<  
Dest F8:0  
0.0<

**MUL**  
Multiply  
Source A F8:0  
0.0<  
Source B 85.0  
85.0<  
Dest F8:0  
0.0<

Distance, in cm  
**UX1\_VAL**

**ADD**  
Add  
Source A F8:0  
0.0<  
Source B 15.0  
15.0<  
Dest F8:51  
0.0<

Step 1. Wait for part in measure position.

**STEP\_1**

B20/1

Proximity sensor  
that is on when part  
is in position for  
height measurement

**PROX**

I:0/0

When on, allow  
station to run. When  
off, pause.

**RUN**

B33/20

**STEP\_1**

B20/1

(U)

**STEP\_2**

B20/2

(L)

0004

Step 2. Move Down. Measure height on transition.

STEP\_2

B20/2

When on, allow  
station to run. When  
off, pause.

RUN

B33/20

Time extension of  
measuring ram, 2 sec

DOWN\_TMR

TON  
Timer On Delay  
Timer T4:1  
Time Base 0.01  
Preset 200<  
Accum 0<

EN

DN

Time extension of  
measuring ram, 2 sec

DOWN\_TMR/DN

T4:1/DN

STEP\_2

B20/2

U

STEP\_3

B20/3

L

Part height, in mm  
(REAL)

HGT\_VAL

SUB

Subtract  
Source A 150.0  
150.0<  
Source B F8:1  
0.0<  
Dest F8:50  
0.0<

Needed to convert  
height into BCD

TMP\_INT

MOV

Move  
Source F8:50  
0.0<  
Dest N7:1  
0<

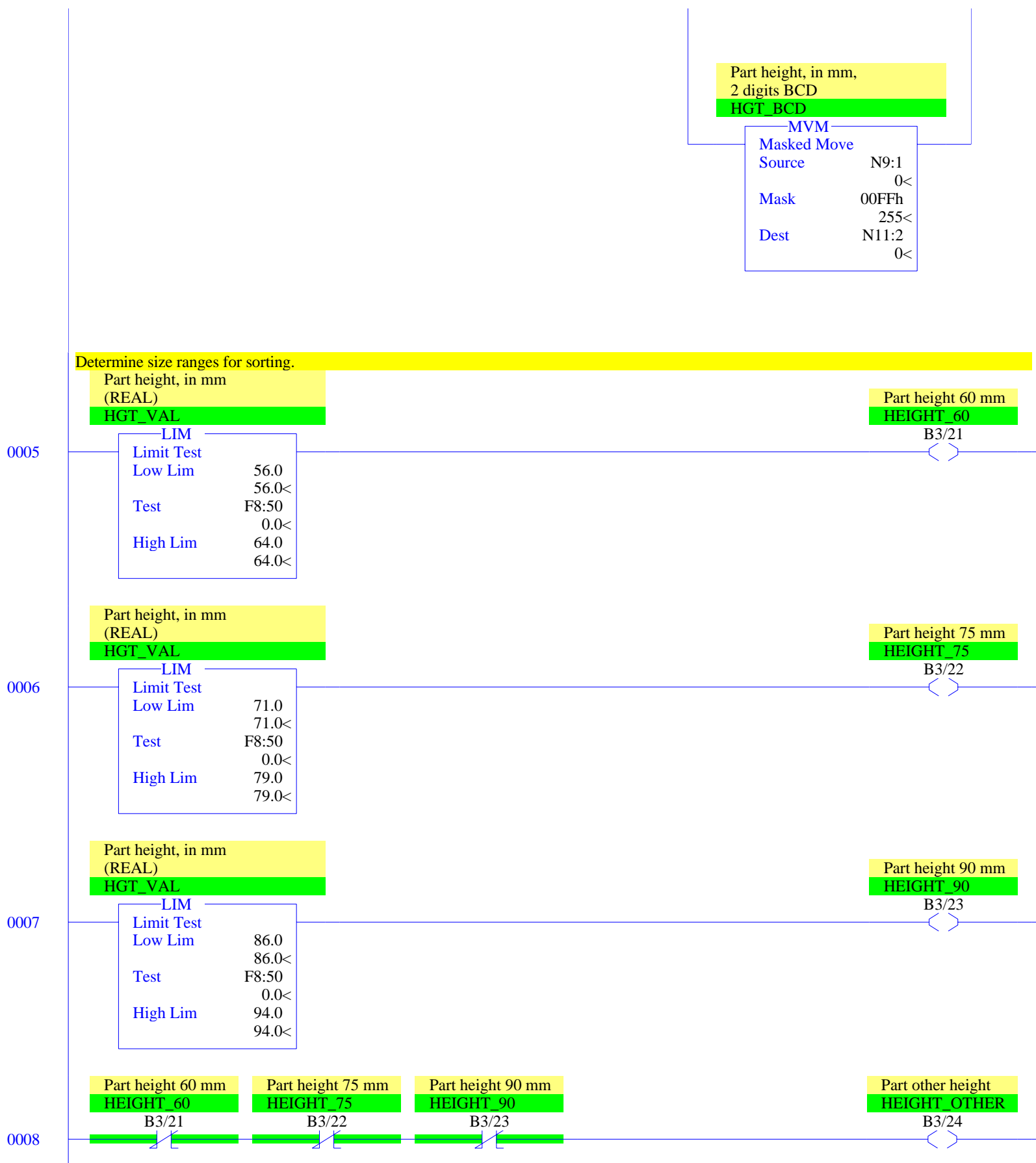
Needed to convert  
height into BCD

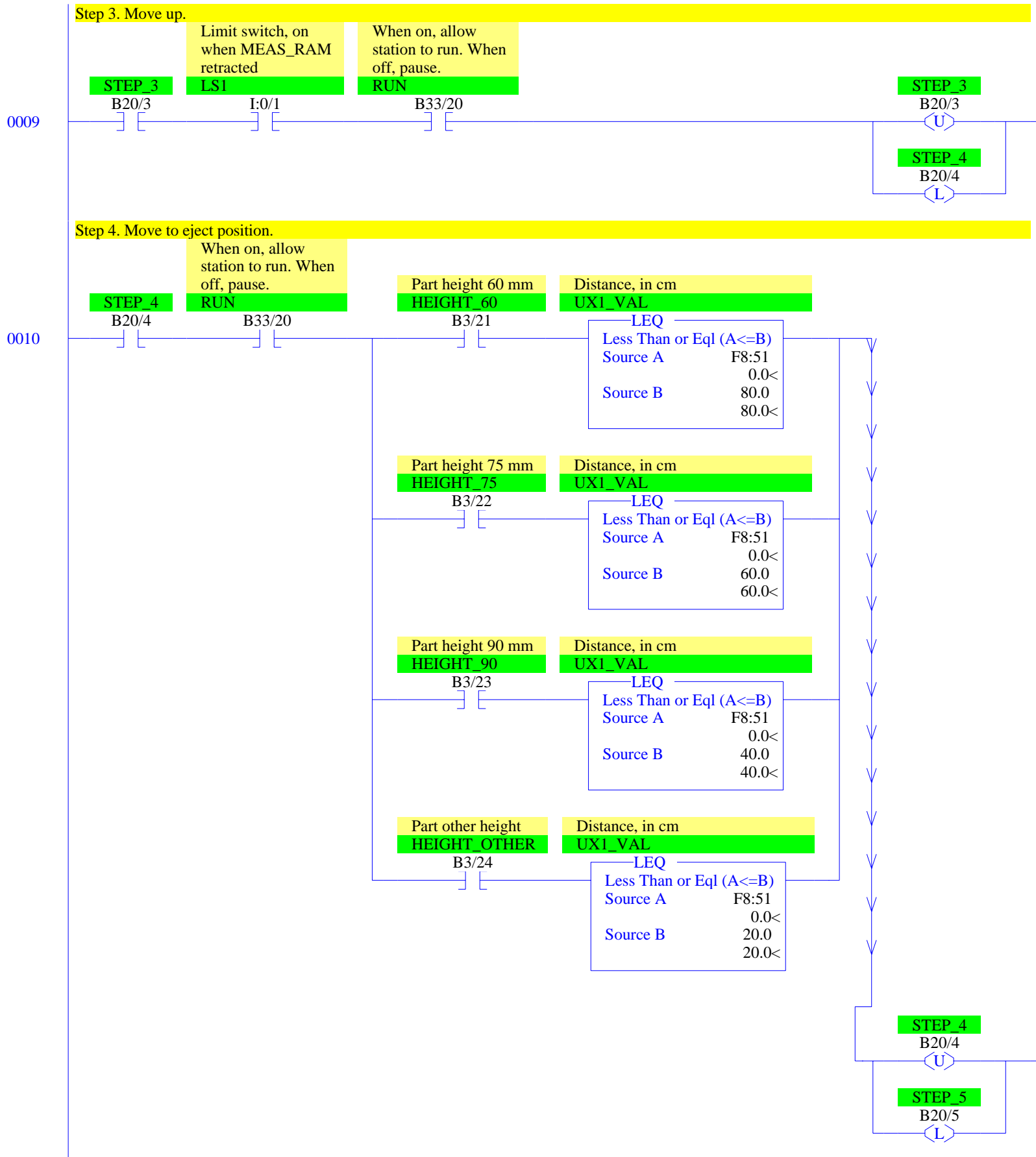
TMP\_INT

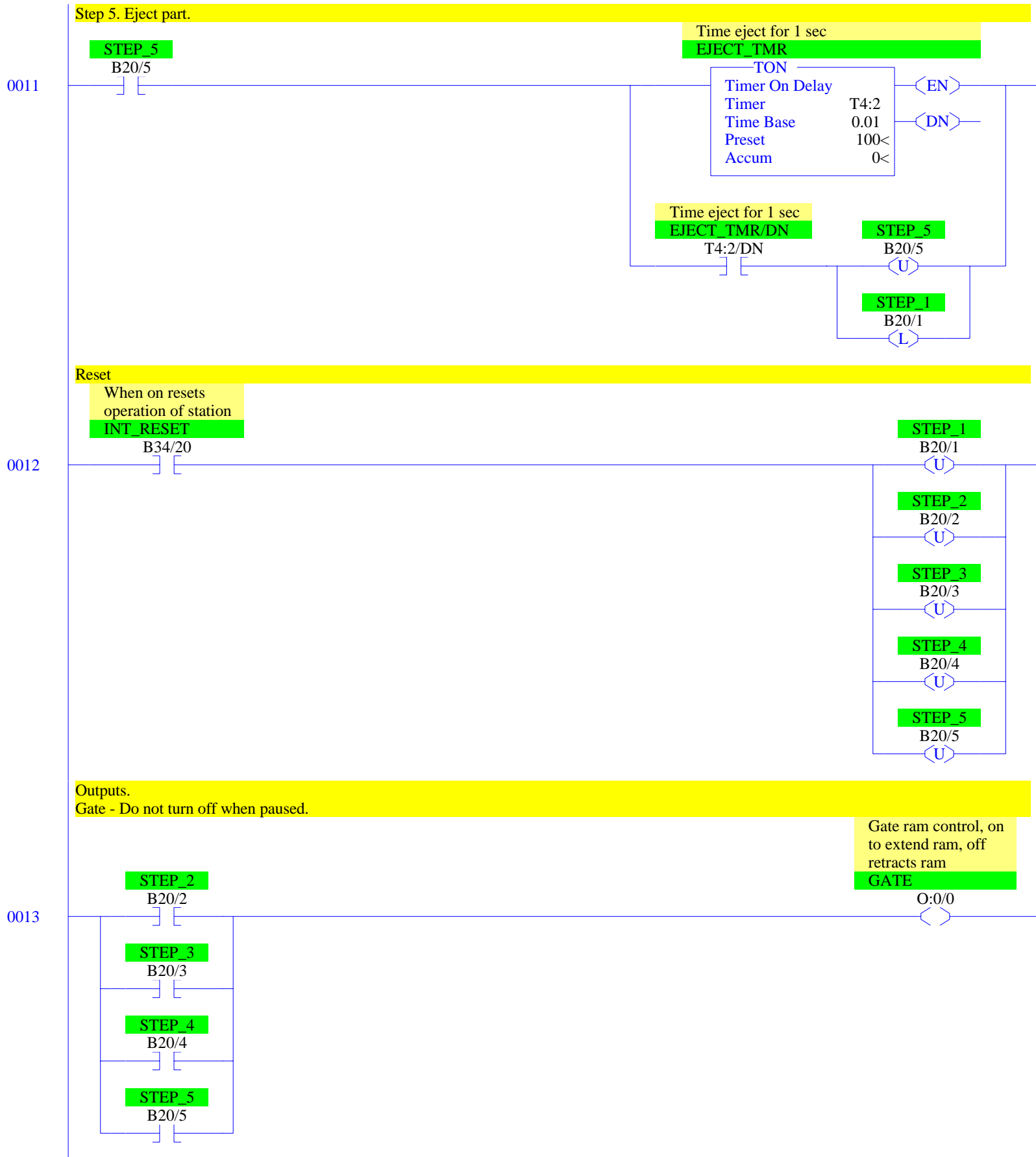
TOD

To BCD  
Source N7:1  
0<  
Dest N9:1  
0000h<

Part height, in mm,  
2 digits BCD









## RSLogix 500 Cross Reference Report - Sorted by Address

O:0/0	- {GATE} Gate ram control, on to extend ram, off retracts ram OTE - File #2 - 13
O:0/1	- {MEAS_RAM} Measuring ram control, on to extend ram, off retracts ram OTE - File #2 - 14
O:0/2	- {CONV_2} Short conveyor motor control, on to run conveyor belt OTE - File #2 - 15
O:0/3	- {CONV_3} Eject conveyor motor control, on to run conveyor belt OTE - File #2 - 16
O:0/4	- {EJECT1} On to operate cylinder to eject part onto OUTCONV1 OTE - File #2 - 17
O:0/5	- {EJECT2} On to operate cylinder to eject part onto OUTCONV2 OTE - File #2 - 18
O:0/6	- {EJECT3} On to operate cylinder to eject part onto OUTCONV3 OTE - File #2 - 19
O:0/7	- {EJECT4} On to operate cylinder to eject part onto OUTCONV4 OTE - File #2 - 20
I:0/0	- {PROX} Proximity sensor that is on when part is in position for height measurement XIC - File #2 - 3
I:0/1	- {LS1} Limit switch, on when MEAS_RAM retracted XIC - File #2 - 9
I:1.0	- {HGT_MEAS} LVDT length measurement, represents 0-100 mm SUB - File #2 - 1
I:1.1	- {UX1_MEAS} Distance sensor raw measurement, represents 15 - 100 cm SUB - File #2 - 2
B3/21	- {HEIGHT_60} Part height 60 mm OTE - File #2 - 5 XIC - File #2 - 10, 17 XIO - File #2 - 8
B3/22	- {HEIGHT_75} Part height 75 mm OTE - File #2 - 6 XIC - File #2 - 10, 18 XIO - File #2 - 8
B3/23	- {HEIGHT_90} Part height 90 mm OTE - File #2 - 7 XIC - File #2 - 10, 19 XIO - File #2 - 8
B3/24	- {HEIGHT_OTHER} Part other height OTE - File #2 - 8 XIC - File #2 - 10, 20
T4:1	- {DOWN_TMR} Time extension of measuring ram, 2 sec TON - File #2 - 4
T4:1/DN	- XIC - File #2 - 4
T4:2	- {EJECT_TMR} Time eject for 1 sec TON - File #2 - 11
T4:2/DN	- XIC - File #2 - 11
N7:1	- {TMP_INT} Needed to convert height into BCD TOD - File #2 - 4 MOV - File #2 - 4
F8:0	- ADD - File #2 - 2 SUB - File #2 - 1, 2 MUL - File #2 - 1, 2 DIV - File #2 - 1, 2
F8:1	- {LVDT_VAL} LVDT value converted to 0 - 100 mm SUB - File #2 - 4 MUL - File #2 - 1
F8:50	- {HGT_VAL} Part height, in mm (REAL) MOV - File #2 - 4 SUB - File #2 - 4 LIM - File #2 - 5, 6, 7
F8:51	- {UX1_VAL} Distance, in cm ADD - File #2 - 2 LEQ - File #2 - 10
N9:1	- {TMP_BCD} TOD - File #2 - 4 MVM - File #2 - 4
N11:2	- {HGT_BCD} Part height, in mm, 2 digits BCD

## RSLogix 500 Cross Reference Report - Sorted by Address

B20/1	MVM - File #2 - 4
	- {STEP_1}
	OTL - File #2 - 0, 11
	OTU - File #2 - 3, 12
	XIC - File #2 - 3, 15
	XIO - File #2 - 0
B20/2	- {STEP_2}
	OTL - File #2 - 3
	OTU - File #2 - 4, 12
	XIC - File #2 - 4, 13, 14
	XIO - File #2 - 0
B20/3	- {STEP_3}
	OTL - File #2 - 4
	OTU - File #2 - 9, 12
	XIC - File #2 - 9, 13
	XIO - File #2 - 0
B20/4	- {STEP_4}
	OTL - File #2 - 9
	OTU - File #2 - 10, 12
	XIC - File #2 - 10, 13, 15, 16
	XIO - File #2 - 0
B20/5	- {STEP_5}
	OTL - File #2 - 10
	OTU - File #2 - 11, 12
	XIC - File #2 - 11, 13, 17, 18, 19, 20
	XIO - File #2 - 0
B33/20	- {RUN} When on, allow station to run. When off, pause.
	XIC - File #2 - 0, 3, 4, 9, 10, 14, 15, 16
B34/20	- {INT_RESET} When on resets operation of station
	XIC - File #2 - 12