

LADDER TO SHOW BCD CONVERSION EXAMPLE FOR M-CODES FROM A MACHINE TOOL TO A PLC

M-CODES ARE OFTEN OUTPUT FROM MACHINE TOOLS IN BCD AND STRAIGHT M-CODE OUT. USUALLY BCD MUST BE USED BECAUSE IT PROVIDES FOR MANY MORE M-CODES AND FEWER WIRES ARE REQUIRED TO GO INTO PLC. LADDER MAY BE DOWNLOADED INTO PLC AS IT IS AND TOGGLE THE BITS TO SHOW BCD FUNCTIONALITY. HOWEVER IF A VALUE OF 9 IS EXCEEDED OR TOO MANY BITS ARE TURNED ON WITHIN THE 4 BITS AN ERROR WILL OCCUR BECAUSE YOU CAN NOT HAVE SUCH A CONDITION IN BCD.

M-CODES TURN ON OR RUN EXTERNAL DEVICES LIKE SOLENOIDS, CYLINDERS, TOOL BREAKAGE UNITS AND MORE.

HERE ARE SOME OF THE MOST COMMON NEEDS FOR M-CODES

CLAMP FIXTURE-COULD BE MULTIPLE SEQUENCED CLAMPS

UNCLAMP FIXTURE-

PART PRESENT ON AND OFF

INDEXER START

INDEXER DEGREE CALL

CLAMP CHECK ON AND OFF

DUMY BIT USED FOR
COMMENTS ABOVE

DUMMY BIT

B3:54

B3:54

0

1

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ENTER THE INPUT ADDRESSES FOR THE BCD OUTPUT FROM MACHINE TOOL.

LEAVE THE B3:51/0 BIT IF YOU ARE NOT USING THAT PARTICULAR BCD BIT. OTHERWISE REPLACE THIS BIT WITH THE INPUT ADDRESS FROM THE MACHINE TOOLS BCD OUTPUT TO CORRESPOND WITH THE OUTPUTS DESCRIPTION. NOT ALL BCD BITS ARE NEEDED, THEY ARE ONLY THERE INCASE YOU HAVE M-CODE NUMBER PREFERENCES.

Explanation

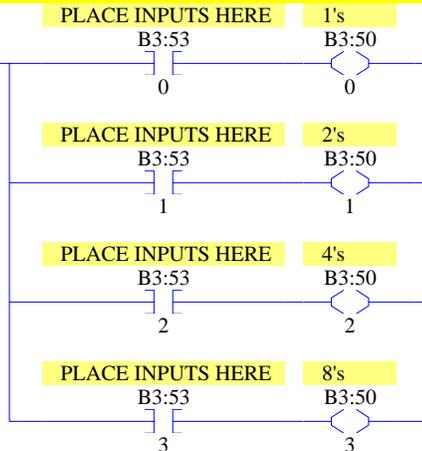
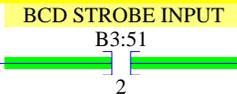
FIRST 4 BITS(B3:50/0-B3:50/3) ARE FOR THE 1'S PLACE- EXAMPLE FOR THE NUMBER 143 OR M143. THE NUMBER 3 IS IN THE ONES PLACE.
 SECOND 4 BITS(B3:50/4-B3:50/8) ARE FOR THE 10'S PLACE- EXAMPLE FOR THE NUMBER 143 OR M143. THE NUMBER 4 IS IN THE 10'S PLACE.
 THE NEXT 4 BITS(B3:50/8-B3:50/12) ARE FOR THE 100'S PLACE- EXAMPLE FOR THE NUMBER 143 OR M143. THE NUMBER 1 IS IN THE 100'S PLACE.

Example

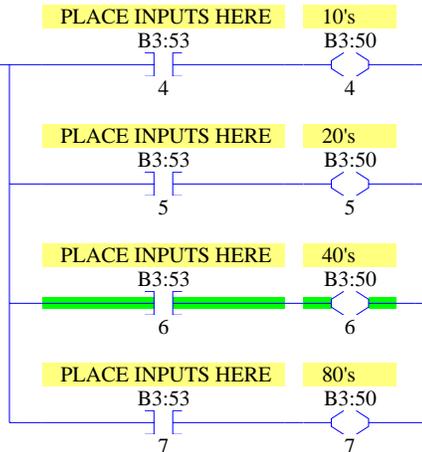
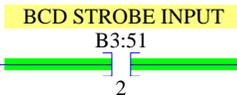
For M-code M143-
 start with the ones digit.
 Figure out how to make 3, where B3:50/0(1's) + B3:50/1(2's) equals 3. Both these bits should turn on.
 Second digit is 4 or 40's- Turn on the 40's bit
 next the hundreds can be turned on by the input applied to the hundreds

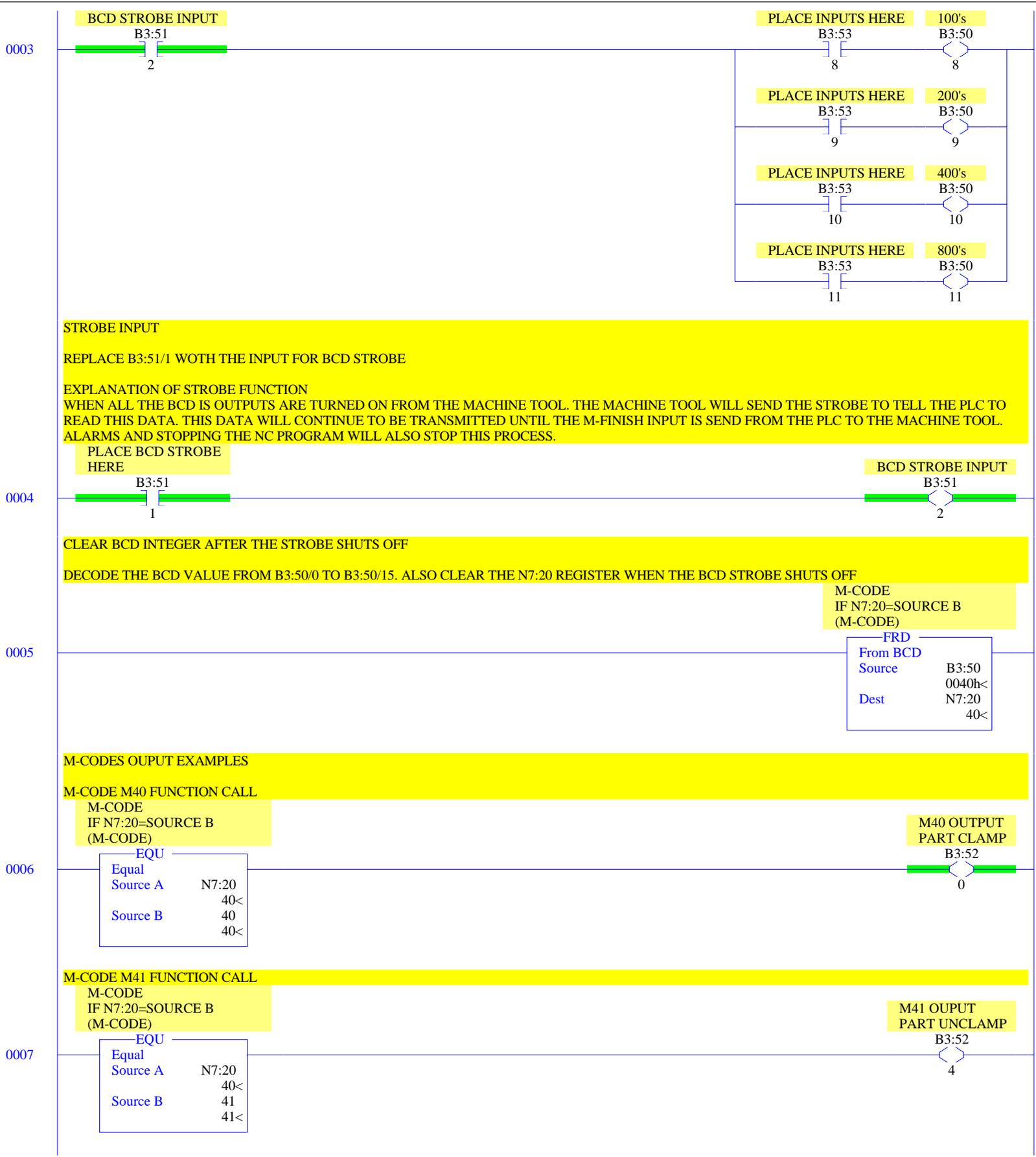
FOR MOST INTERFACES A MINIMUM OF THE 40'S BIT, 1'S,2'S,4'S BIT ARE USED. BY ONLY UAING THESE FOUR BITS, MCODES M40,M41,M42,M43,M44,M45,M46,M47 CAN BE USED. IN MOST APPLICATIONS THIS IS MORE THEN ENOUGH M-CODES FOR AUTOMATION.

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MFINISH OUTPUT EXAMPLE

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M40 OUTPUT
PART CLAMP

PRESSURE SWITCH
CLAMP CONFIRMATION
(EXAMPLE)

M-FINISH OUTPUT
(CHANGE THIS TO THE
OUTPUT ADDRESS
O:?!/?)

B3:52
0

B3:52
1

B3:52
2

NEXT M-CODE OUTPUT/
CONFIRM COMPLETION

B3:52
3

NEXT M-CODE OUTPUT/
CONFIRM COMPLETION

B3:52
3

CLEAR BCD INTEGER AFTER THE STROBE SHUTS OFF

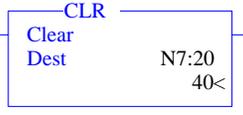
DECODE THE BCD VALUE FROM B3:50/0 TO B3:50/15. ALSO CLEAR THE N7:20 REGISTER WHEN THE BCD STROBE SHUTS OFF

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BCD STROBE INPUT

B3:51
2

M-CODE
IF N7:20=SOURCE B
(M-CODE)



LADDER SEQUENTIAL FUNCTIONALITY

FIRE M-CODE THROUGH MACHINE TOOL OR TURN ON BCD INPUT BITS THROUGH PLC
TURN ON STROBE
READ M-CODE INTEGER AND TURN ON CORRESPONDING OUTPUT FOR THAT M-CODE
WAIT FOR A CONFIRMATION BEFORE FINISHING THE M-CODE
START PROCESS OVER

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END