ENGR480 Manufacturing Systems 2015-11-19

Driving Stepper Motors with DL06-CTRIO

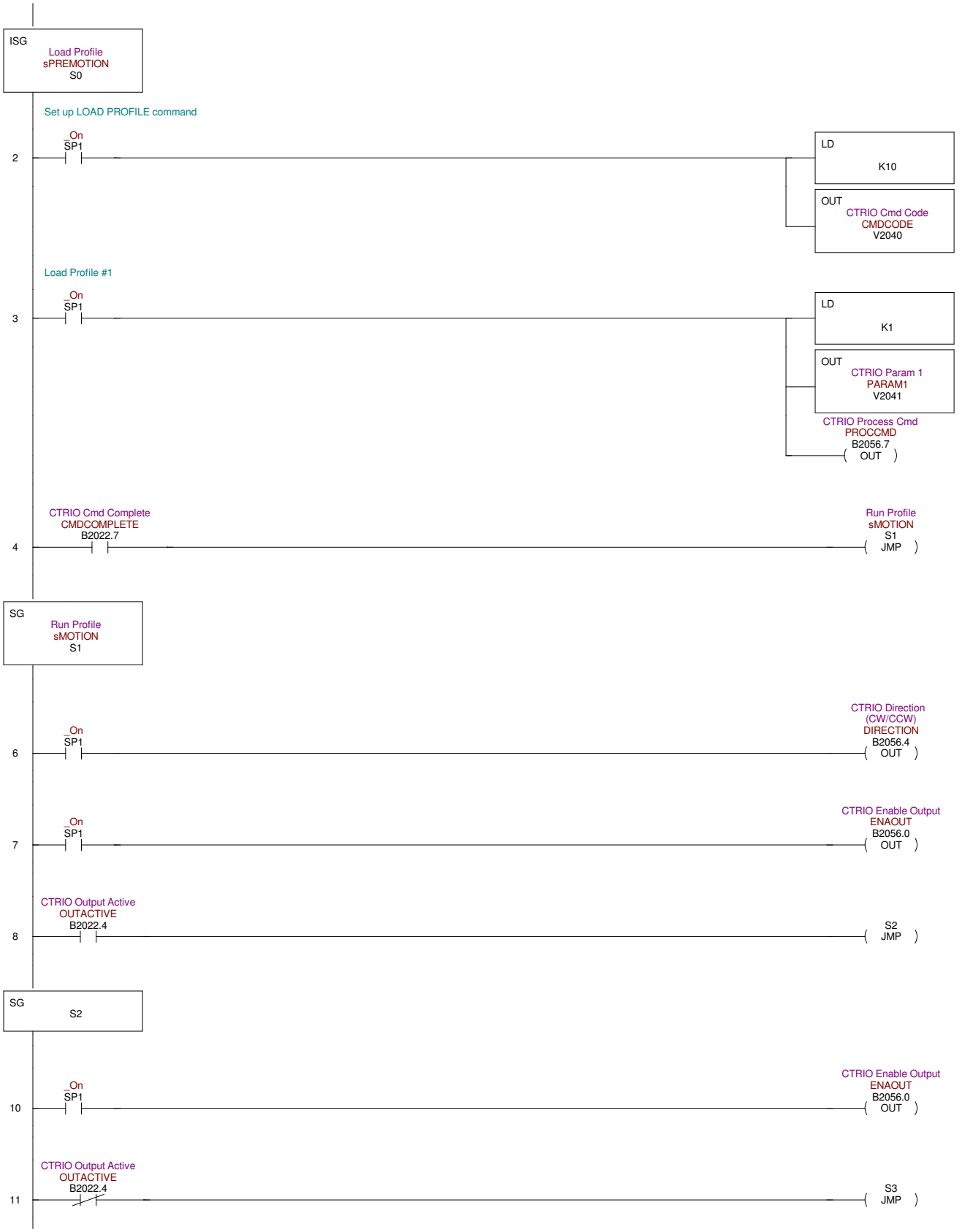
Manual is at http://www.automationdirect.com/static/manuals/hxctriom/hxctriom.pdf
Template logic is at:
http://wallawalla.edu/engr480 -> Programming Examples -> PIC -> working_stepper.zip

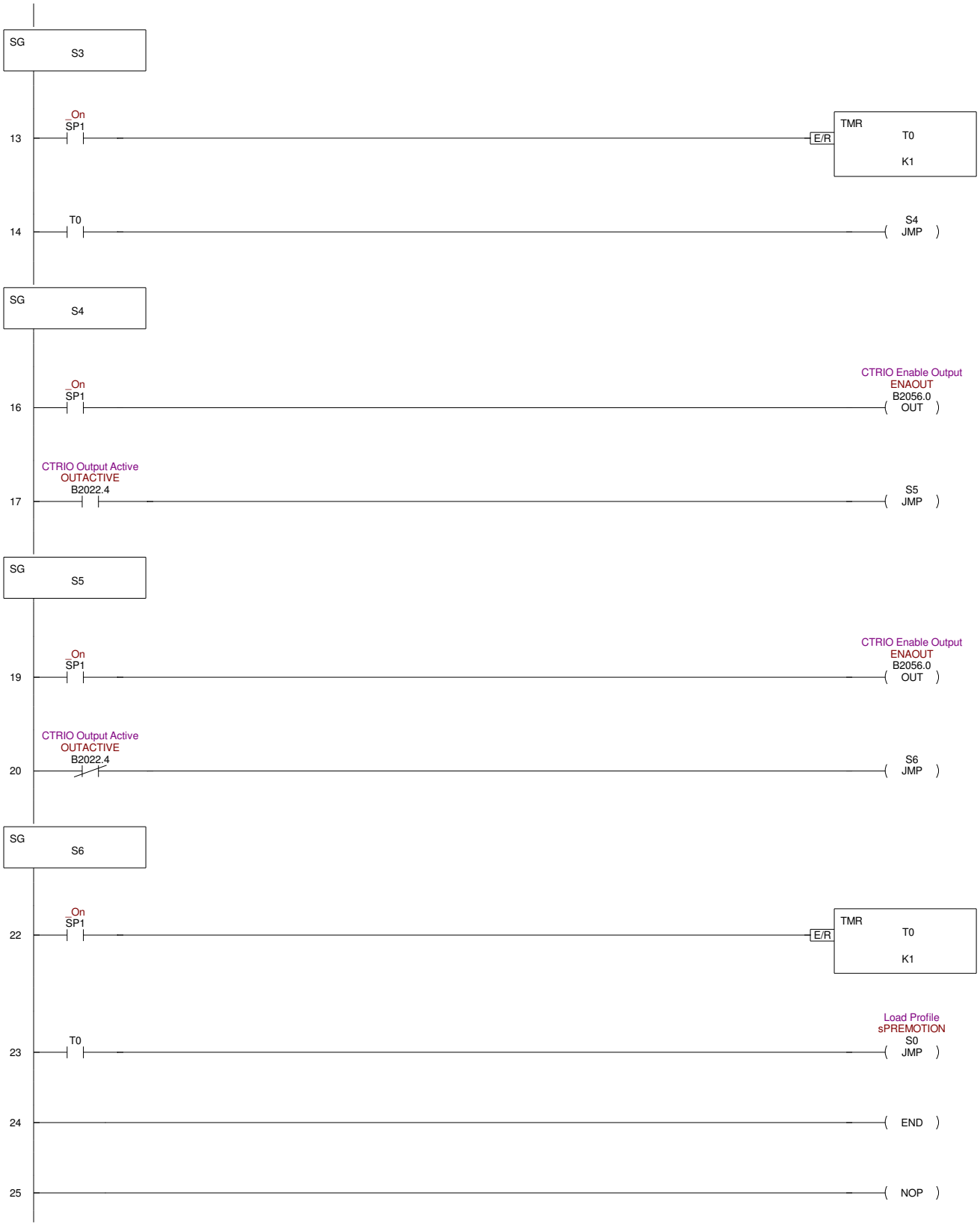
Steps to using the CTRIO or CTRIO2 module to control step motors:

1. Wire the CTRIO or CTRIO2 module to the STP-MTR-4035 motor amplifier
    a) Y0 to STEP-
    b) Y1 to DIR-
    c) YC to ground
    d) STEP+ to 2200ohm resistor which connects to +24V
    e) DIR+ to another 2200ohm resistor which connects to +24V

2. Run CTRIO Workbench - Directsoft PLC (from Windows Start menu or DSLaunch6)
    a) Do "Config I/O", set to Pulse Step/Direction
    b) Do "I/O Map"
        1) Check "Enable Write to PLC"
        2) Use V2000 as address for inputs
        3) Check "Enable Read from PLC"
        4) Use V2030 as address for outputs
    c) Create "Pulse Profiles"
        1) Add a profile
            - usually trapezoidal or S-curve for position, or dynamic velocity
            - set up appropriate values for acceleration, velocity, and number of pulses.
            - name your profile
        2) Add additional profiles as needed
    d) Click "Write Module" (if "Write Module" is grayed out, click "Goto PROGRAM")
    e) Click "Goto RUN"

3. Setup your PLC logic (project "working_stepper" is a good template to use)
    a) Write "Load table" command (K10) to V2040.
    b) Load profile table number into V2041.
    c) Wait for command done bit to go true (B2022.7).
    c) Set direction bit (B2056.4) to 0 or 1 as appropriate.
    d) Set output enable bit (B2056.0) to 1. Your motor should turn.
    e) Wait until output active bit (B2022.4) goes inactive (motion complete).
    f) If you are going to do another motion profile immediately, delay briefly (10ms works).


ISG
Load Profile
sPREMOTION
S0
Set up LOAD PROFILE command
2
_On
SP1
LD
K10
OUT
CTRIO Cmd Code
CMDCODE
V2040
Load Profile #1
3
_On
SP1
LD
K1
OUT
CTRIO Param 1
PARAM1
V2041
CTRIO Process Cmd
PROCCMD
B2056.7
OUT
4
CTRIO Cmd Complete
CMDCOMPLETE
B2022.7
Run Profile
sMOTION
S1
JMP
SG
Run Profile
sMOTION
S1
6
_On
SP1
CTRIO Direction
(CW/CCW)
DIRECTION
B2056.4
OUT
7
_On
SP1
CTRIO Enable Output
ENAOUT
B2056.0
OUT
8
CTRIO Output Active
OUTACTIVE
B2022.4
S2
JMP
SG
S2
10
_On
SP1
CTRIO Enable Output
ENAOUT
B2056.0
OUT
11
CTRIO Output Active
OUTACTIVE
B2022.4
S3
JMP


SG
S3
13
_On
SP1
E/R
TMR
T0
K1
14
T0
S4
JMP
SG
S4
16
_On
SP1
CTRIO Enable Output
ENAOUT
B2056.0
OUT
17
CTRIO Output Active
OUTACTIVE
B2022.4
S5
JMP
SG
S5
19
_On
SP1
CTRIO Enable Output
ENAOUT
B2056.0
OUT
20
CTRIO Output Active
OUTACTIVE
B2022.4
S6
JMP
SG
S6
22
_On
SP1
E/R
TMR
T0
K1
23
T0
Load Profile
sPREMOTION
S0
JMP
24
END
25
NOP