



APPLICATION NOTE:

INTERFACING CLD LINEAR MOTOR MODEL

40202DXXT-LCE-CV

WITH A

KOLLMORGEN SERVOSTAR 620 SERVO DRIVE

USING HALL EFFECT INTERFACE

AN-0131 Rev A

Date: September 5, 2003

California Linear Devices, Inc.
2236 Rutherford Road, Ste. 119
Carlsbad, CA 92008
Ph: 760-603-8026, Toll Free: 877-474-2854
Fx: 760-603-0049 ©2001
e-mail: sales@calinear.com web-site: www.calinear.com

PAGE INTENTIONALLY LEFT BLANK

Table of Contents:

1. SAFETY:	5
2. WARNINGS, CAUTIONS AND NOTES:	5
3. SCOPE:	7
4. EQUIPMENT AND INTERCONNECTIONS:	8
4.1. Equipment:	8
4.2. Interconnections:	9
5. DRIVE SETTINGS:	10
5.1. Establish Communication:	10
5.2. Clear EEPROM:	10
5.3. Setup of Units:.....	10
5.4. Setup of Position:	10
5.4.1. Setup of Position Data:.....	11
5.5. Setup of Motor Data:.....	11
5.6. Setup of Velocity Data:	11
5.7. Setup of Feedback Data:.....	12
5.8. Setup of Current Loop Compensation Data:	12
5.9. Setup of Values in Terminal Screen:.....	12
5.10. Completion:	13
APPENDIX-A: (REVISION HISTORY)	14
APPENDIX-B: (MOTOR AND DRIVE WIRING DIAGRAM)	15

PAGE INTENTIONALLY LEFT BLANK

1. Safety:

The CLD motor is capable of producing high forces and velocities. Always follow appropriate safety precautions when installing and applying these motors. Equipment should be designed and utilized to prevent personnel from coming in contact with moving parts and electrical contacts that could potentially cause injury. Read all cautions, warnings and notes before attempting to operate these devices. Follow all applicable codes and standards when utilizing this equipment.

2. Warnings, Cautions and Notes:

The following conventions are used on the equipment and found in this manual. Please read all equipment labels and manuals before attempting to use CLD Linear Motors.



WARNING: Identifies information about practices or circumstances that can lead to personal injury, property damage, or loss of life if not correctly followed.

A WARNING identifies information that is critical for identifying and avoiding a hazard that could lead to serious personnel injury or equipment damage.



CAUTION: Identifies information about practices or circumstances that can lead to severe equipment damage.

A CAUTION identifies information that is critical to prevent permanent equipment damage.

NOTE: Identifies information that is critical for successful application and understanding of the product.

A NOTE identifies information that is critical for successful application and understanding of the product.

The following is a list of warnings and cautions that must be observed when working with California Linear Devices High Force Linear Motors.



WARNING: This equipment contains HIGH ENERGY PERMANENT MAGNETS. Do not attempt to disassemble. Serious damage to property or injury to person may result. Keep ferrous materials away from the motor.



WARNING: Improper Servo tuning can cause uncontrolled motion of the CLD motor. Do not allow the system to oscillate during the tuning process, and keep all persons and body parts away from moving equipment.



WARNING: Do not use drives powered by voltages greater than 240 VAC.



WARNING: Keep fingers and limbs clear of the motor and moving parts when power is applied to the motor.



WARNING: This system produces very high forces and rapid motion. Under no circumstances should it be operated when hands, fingers or clothing are in, on, or near the motor. Guards should be installed to prevent such items from coming into contact with the motor or other moving parts.



CAUTION: Only use Anderol 465. Other lubricants could break down prematurely and cause permanent damage to the motor and contaminate the bearings.

3. Scope:

This manual contains information regarding the interconnections and settings when using a ServoStar 620 with Hall Effect Interface and a CLD 40202D08T-LCE-CV. Power connections and other information regarding the ServoStar 600 and the CLD motors should be obtained from respective Users Manuals and Installation Manuals.

CLD: Users Manual Advanced High Force Linear Motors Models-4020_C, 4020_D, 5020_C & 5020_D (UM102)

[http://www.calinear.com/support/Users Manual 4k & 5k rev A Types \(C&D\).pdf](http://www.calinear.com/support/Users Manual 4k & 5k rev A Types (C&D).pdf)

CLD: Users Manual Linear Encoder Options LCA, LCB, LCC, LCD, & LCE (UM103)

<http://www.calinear.com/support/Users%20Manual%20-%20Linear%20Encoder%20Rev%20A.pdf>

Kollmorgen: 601/620 Installation Manual:

ftp://ftp.kollmorgen.com/dist/techdocs/manuals/push/servostar_600/600install.pdf

Kollmorgen: Software Setup Manual:

ftp://ftp.kollmorgen.com/dist/techdocs/manuals/push/servostar_600/setupsoftware.pdf

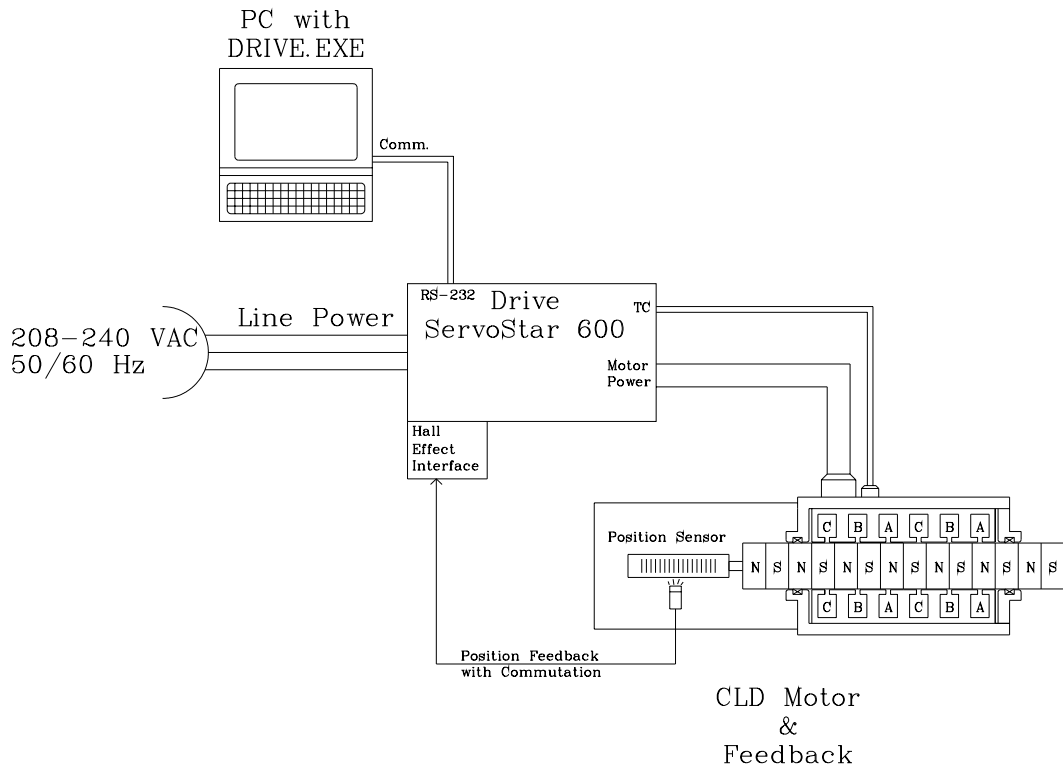


Fig 3-1

ServoStar 600 with Hall Effect Interface
and CLD motor and LCE encoder

4. Equipment and Interconnections:

The following equipment and interconnections were used.

4.1. Equipment:

The equipment used in this are listed in Table #1

Table 1: Equipment and P/N list

<u>Description:</u>	<u>Part Number</u>	<u>Manufacturer</u>
CLD 40202D Motor	40202D08T-LCE-CV	California Linear Devices
ServoStar 620 Drive	620-AS	Kollmorgen
Hall Effect Interface	Hall/600	Kollmorgen
Feedback Sensor Cable	FSC-EC-10	California Linear Devices
Temperature Sensor Cable	TSC-01-10	California Linear Devices
Motor Power Cable	MPC-60-10-3	California Linear Devices

4.2. Interconnections:

Fig. 4.1 depicts the interconnections between a ServoStar 600 with Hall Effect Interface and a CLD motor 40202D08T-LCE-CV.

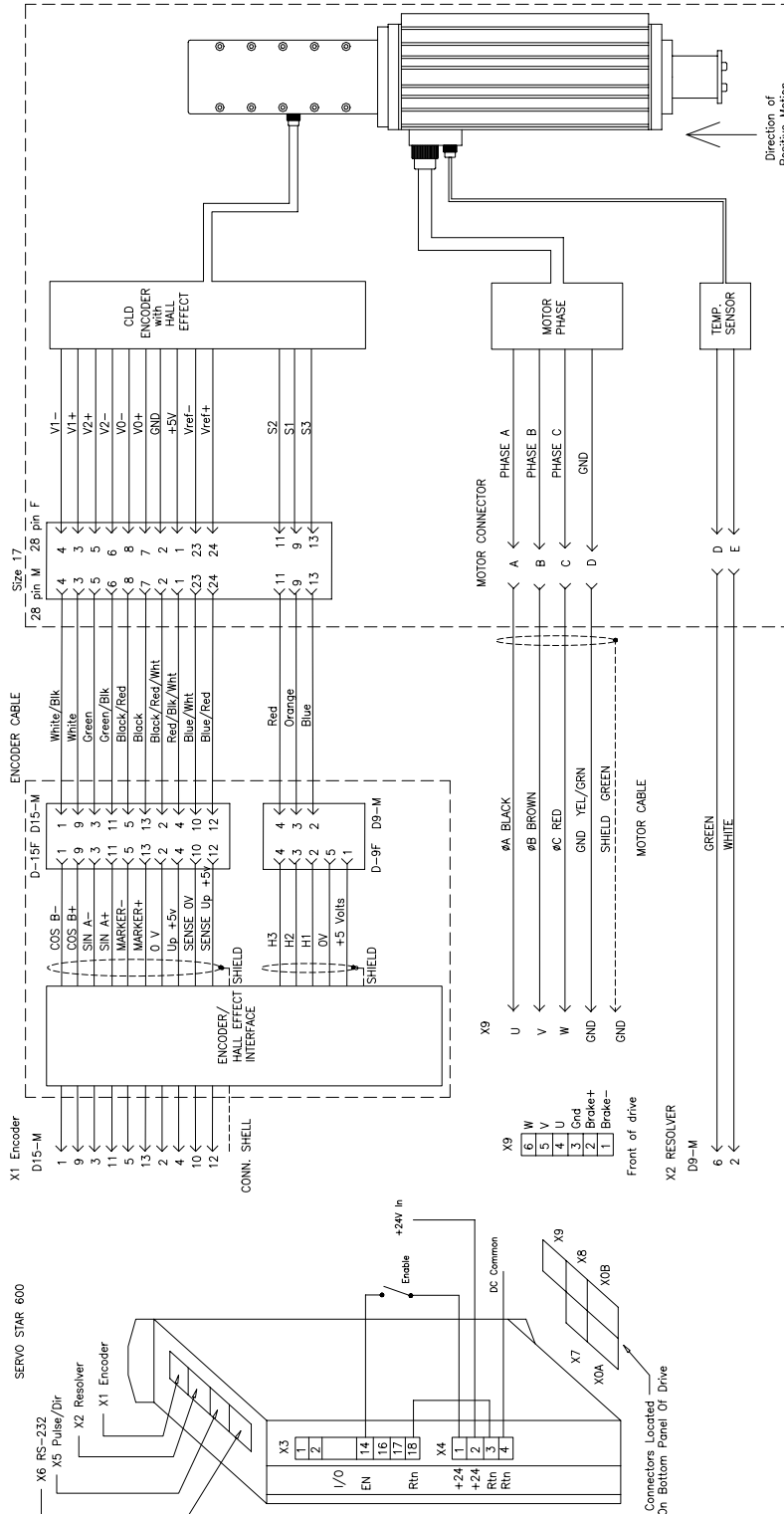


Fig. 4.1
ServoStar 620 with Hall Effect Interface
and CLD 40202D08T-LCE-CV

5. Drive Settings:

The system is set up using Kollmorgen's Drive.exe software loaded into a PC. The PC with the Kollmorgen software will communicate with the ServoStar 600 drive. When setting the parameters apply only the 24-volt power to the drive.

5.1. Establish Communication:

Apply 24-volt power to the drive as depicted in Fig. 4.1 then establish communication with the drive using the Drive.exe software. Select the pushbutton at the bottom of the amplifier window as soon as the Drive window appears.

5.2. Clear EEPROM:

The EEPROM should be cleared before the system is loaded with new motor parameters. Select pushbutton at the top of the Drive window.

5.3. Setup of Units:

Select the pushbutton in the Drive window. A Basic Setup window will appear. Set the following values into the drive:

Acceleration	ms ⁻² >VLIM
Velocity	mm/s
Position	mm

Click the pushbutton and select "YES" to save to EEPROM. After information has been saved click the pushbutton and return to the drive window.

5.4. Setup of Position:

Select the pushbutton on the Drive window. A Position window will appear.

Select [PI] from the Mode grouping. Select [Standard Feedback] from the Position Feedback grouping.
--

5.4.1. Setup of Position Data:

Select the pushbutton on the Position window. A Position Data window will appear. Set the following values in the Position Data window.

Resolution =	234	mm
	10	Revolutions

Select the pushbutton then the pushbutton. The Position Data window will disappear.

Select the then the pushbutton. The Position window will disappear.

5.5. Setup of Motor Data:

Select the Motor pushbutton on the Drive window. A Motor window will appear. Set the following values in the Motor window.

Motor Type	Synchronous	
Motor Unit	mm/sec	
No. of Poles	2	
I ₀	20	A
I _{0max}	40	A
L	5.1	mH
Max. Speed (n max)	1150	mm/s
Holding Break	Without	

Select the pushbutton then the pushbutton. The Motor window will disappear.

5.6. Setup of Velocity Data:

Select the pushbutton on the Drive window. A Speed window will appear. Set the following values in the Speed window.

Speed Limit	3000	mm/s
Rotary Direction	Positive	
Overspeed	3600	mm/s
KP	1	
Tn	12	
PID-T2	1	
PI-Plus	1	

Select the pushbutton then the pushbutton. The Speed window will disappear.

Select the icon then “Restart” when prompted.

5.7. Setup of Feedback Data:

Select the Feedback pushbutton in the Drive window. A Feedback window will appear. Set the following values in the Feedback window.

Feedback Type	11 SinCos w Hall
Enclines	585
Bandwidth	800
Velocity Observer	ON 16 kHz VL
Acceleration Feedforward	1

Select the pushbutton then the pushbutton. The Feedback window will disappear.

5.8. Setup of Current Loop Compensation Data:

Select the pushbutton on the Drive window. A Current window will appear. Set the following values in the current window.

Irms	10	A
Ipeak	20	A
Kp	1	
Tn	0.6	

Select the pushbutton then the pushbutton. The Current window will disappear.

5.9. Setup of Values in Terminal Screen:

Select the Icon at the top of the Drive window. A Terminal window will appear. Enter the following information into the terminal.

MLGP=	0.6
MLGC=	0.8
MLGD=	0.8
REFIP=	10

Select the pushbutton then the pushbutton. The Terminal window will disappear.

5.10. Completion:

You have now set up the drive with the motor parameters. Reference Kollmorgen Application Notes and Manuals to proceed and run the system under control.

Kollmorgen Application Notes:

<http://www.motionvillage.com/products/drives/servostar600.htm#info>

Appendix-A: (Revision History)

<i>ECO #</i>	<i>Revision</i>	<i>Change</i>	<i>Date</i>
0123	A	Initial Release	9/5/03

