

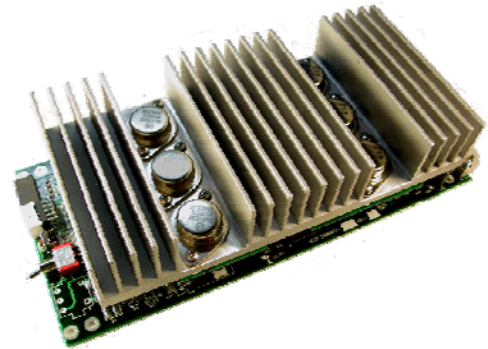
EUROCARD SERIES 57 LINEAR DC DRIVE SERVO AMPLIFIER

FEATURES

- High performance DSP based Linear Servo Amplifier controls DC brush motor torque and linear motor or voice coil force
- Linear operating mode does not emit EMI, has high servo stiffness, and no dead zone
- DSP platform provides programmable configuration, fault protection, self-test, calibration, and status reporting via RS232 port
- Current loop bandwidth and the transconductance, amps/volt scale factor, are adjustable
- Fault protection for amplifier SOA, over and under voltage, temperature, current overloads, and motor shorts
- Seven-segment LED display shows drive status
- Digital inputs for Enable/Reset, and (4) programmable for Brake, DIR, and \pm Travel Limits
- Operates with low inductance motors
- High and low supply voltage versions
- High and low power versions
- Operates from one low cost unregulated DC power supply with optional internal \pm 12V DC-DC converter

APPLICATIONS

- Linear stages, air bearings, and gantry systems
- Integrated circuit manufacturing and inspection
- High accuracy electronic assembly
- High accuracy measurement
- Active isolation systems
- Optical positioning and scanners



PRODUCT DESCRIPTION

This size 3U EUROCARD provides closed loop four quadrant torque or force control of DC brush rotary servo, torque motors, linear motors, and voice coil actuators.

Linear control of DC brush or linear motors is especially important for high performance position or velocity control systems. The pure DC form factor allows high current loop bandwidth.

The linear operating mode is highly advantageous for noise sensitive applications because it does not generate EMI. PWM switching noise is difficult to eliminate from sensitive sensors and transducers. This degrades velocity and position accuracy.

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Excessive power dissipation is the main reliability consideration for linear amplifier operation. This model uses a digital signal processor (DSP) to monitor the safe operating area (SOA) of the output devices to prevent them from overheating and failing.

EUROCARD SERIES 57 LINEAR DC DRIVE SERVO AMPLIFIER

GENERAL SPECIFICATIONS LOW VOLTAGE MODELS

ELTROL MODEL	6-900-048-57I	6-360-048-57J
POWER AMPLIFIER	Linear Mode Drive	Linear Mode Drive
PEAK OUTPUT POWER	900 watts ¹	360 watts ¹
PEAK OUTPUT CURRENT	25 amps ¹ (1 sec typ.)	10 amps ¹ (1 sec typ.)
CONT. OUTPUT CURRENT	Note 1	Note 1
MAX CONTROLLER DISSIPATION	200 watts ¹	150 watts ¹
OUTPUT VOLTAGE @ PEAK OUTPUT CURRENT	40V with 48V Nominal bus	41V with 48V Nominal bus
INPUT POWER BUS ⁵	24 to 60 VDC	24 to 60 VDC
INPUT ANALOG P.S. ²	+12 VDC/0.5AMPS MAX	+12 VDC/0.5AMPS MAX
INPUT ANALOG P.S. ²	-12 VDC/0.2AMPS MAX	-12 VDC/0.2AMPS MAX
INPUT LOGIC SUPPLY ²	5 VDC / 0.3 AMPS MAX	5 VDC / 0.3 AMPS MAX
OPERATING TEMPERATURE	0 TO 50 Degrees C ¹	0 TO 50 Degrees C ¹
CURRENT COMMAND S.F.	2.5 or 2 AMP/VOLT	1 or 0.5 AMP/VOLT
CURRENT LOOP BANDWIDTH	Adjustable 0.5 to 4 KHZ	Adjustable 0.5 to 4 KHZ
SIZE	100 W x 220 L x 56 H mm	100 W x 220 L x 45 H mm
WEIGHT	.87 kg (1.92 lb)	.69 kg (1.53 lb)

GENERAL SPECIFICATIONS HIGH VOLTAGE MODELS

ELTROL MODEL	6-1400-080-57K	6-700-080-57L
POWER AMPLIFIER	Linear Mode Drive	Linear Mode Drive
PEAK OUTPUT POWER	1400 watts ¹	700 watts ¹
PEAK OUTPUT CURRENT	20 amps ¹ (1 sec typ.)	10 amps ¹ (1 sec typ.)
CONT. OUTPUT CURRENT	Note 1	Note 1
MAX CONTROLLER DISSIPATION	200 watts ¹	150 watts ¹
OUTPUT VOLTAGE @ PEAK OUTPUT CURRENT	73V with 80V Nominal bus	73V with 80V Nominal bus
INPUT POWER BUS ⁵	50 to 85 VDC	50 to 85 VDC
INPUT ANALOG P.S. ²	+12 VDC/0.5AMPS MAX	+12 VDC/0.5AMPS MAX
INPUT ANALOG P.S. ²	-12 VDC/0.2AMPS MAX	-12 VDC/0.2AMPS MAX
INPUT LOGIC SUPPLY ²	5 VDC / 0.3 AMPS MAX	5 VDC / 0.3 AMPS MAX
OPERATING TEMPERATURE	0 TO 50 Degrees C ¹	0 TO 50 Degrees C ¹
CURRENT COMMAND S.F.	2.5 or 2 AMP/VOLT	1 or 0.5 AMP/VOLT
CURRENT LOOP BANDWIDTH	Adjustable 0.5 to 4 KHZ	Adjustable 0.5 to 4 KHZ
SIZE	100 W x 220 L x 56 H mm	100 W x 220 L x 45 H mm
WEIGHT	.87 kg (1.92 lb)	.69 kg (1.53 lb)

EUROCARD SERIES 57 LINEAR DC DRIVE SERVO AMPLIFIER

GENERAL SPECIFICATIONS

OPERATING CONTROL SIGNALS and INDICATORS

Input analog control signal	± 10 Volts differential
Peak current limit	Adjustable
Drive Enable/Reset	5V logic
Programmable digital inputs (4):	5V logic
Direction Logic	
(+) Travel Limit	
(-) Travel Limit	
Brake ³	
Amplifier Status indicator	Seven Segment LED

AUXILIARY OUTPUTS

Motor current monitor	Analog Signal
Drive status 4 outputs	Digital

SERIAL I/O

RS232
I2C

FAULT PROTECTION CIRCUITS

Safe Operating Protection
Short circuit
Over temperature⁴
Over current⁴
Over / under voltage

Notes:

1. Depends on ambient operating temperature, motor winding resistance, and heat sink airflow. See note 4. For the rated maximum controller power dissipation, forced convection cooling with a minimum airflow of 200 CFM is required. Derate at 1.7 watts/degree C for ambient greater than 30 degrees C. Maximum controller dissipation occurs when the power out is minimum (motor stalled). It can be calculated as follows:

$$P_d = P_{in} - P_{mtr}$$

$$P_{in} = (V_s)(I_o)$$

$$P_{mtr} = (I_o)^2(R_t)$$

EUROCARD SERIES 57 LINEAR DC DRIVE SERVO AMPLIFIER

GENERAL SPECIFICATIONS

Notes: continued

Where

P_d is controller dissipation in watts

P_{in} is input power

P_{mtr} is motor dissipation in watts

V_s is supply voltage

I_o is output current in amps

R_t is motor terminal-to-terminal resistance in ohms.

Consult factory for assistance.

2. Optional internal DC – DC converter is available for applications requiring only one power supply to the amplifier.
3. Actuating brake at high motor speeds may damage the controller or motor. Consult factory for details.
4. Over temperature or over current protection is determined from the DSP monitoring of amplifier operating heat sink temperature and output device power dissipation magnitude versus time. When power device junction over temperature protection is activated, the amplifier output will be disabled. A fault report is available via the RS232 port.
5. The user should protect the Amplifier and any external circuits from a catastrophic failure by fusing the input power connections to the amplifier. See Application Note Supplementary Fuse Protection.

EUROCARD SERIES 57 LINEAR DC DRIVE SERVO AMPLIFIER

EXTERNAL SIGNALS AND INTERCONNECTIONS

EDGE CONNECTOR J1 IS A 48 POLE DIN 41612 SERIES F
(REF EPT P/N 109-40064) or (FCI P/N 5159009486394111)

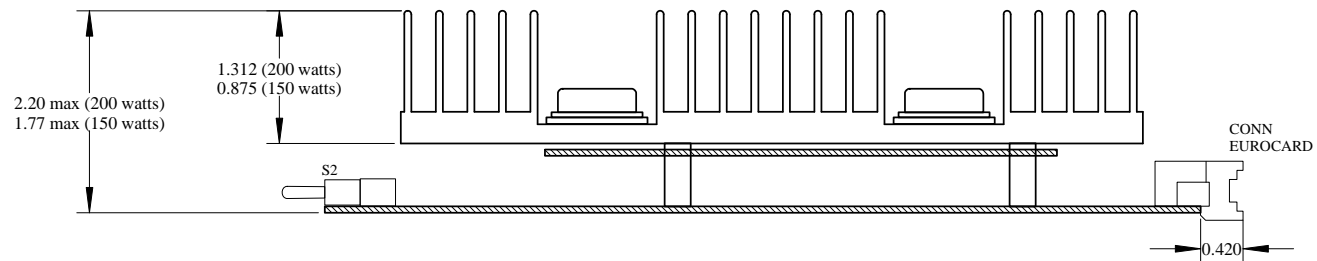
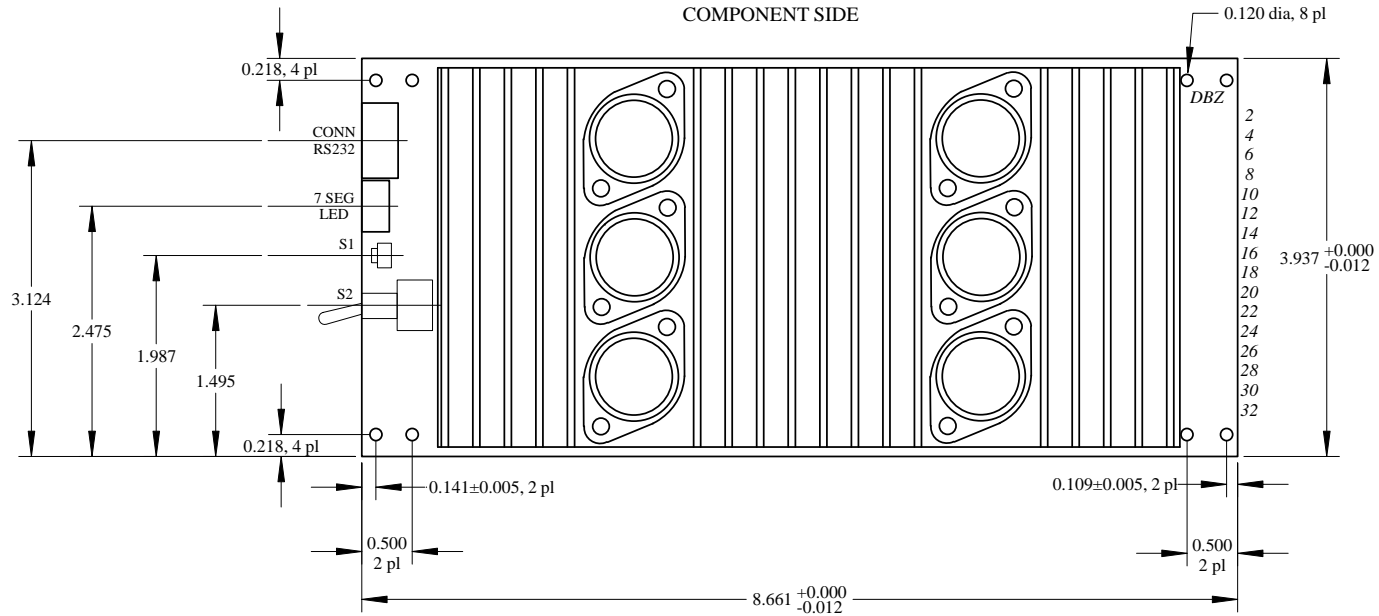
TERMINAL	SIGNAL NAME	DESCRIPTION
J1-2D, B, Z	MTR (+)	OUTPUT TO MOTOR (+) TERMINAL
J1-4D, B, Z	VDC POWER BUS RETURN	POWER SUPPLY RETURN
J1-6D, B, Z	NC	NO CONNECTION
J1-8D, B, Z	VDC POWER BUS IN	POWER SUPPLY INPUT, <10>
J1-10D, B, Z	MTR (-)	OUTPUT TO MOTOR (-) TERMINAL
J1-12D	DS1	DRIVE STATUS CODE <7>
J1-12B	DS2	DRIVE STATUS CODE <7>
J1-12Z	MTR SHIELD	MOTOR SHIELD GND
J1-14D	(+) LIMIT	LOGIC 1= (+) LIMIT, <1>, <3>
J1-14B	MTR CUR	MOTOR CURRENT MONITOR, SF=SEE FUNC DIAG
J1-14Z	DS4	DRIVE STATUS CODE <7>
J1-16D	BRAKE CMD	LOGIC 1= BRAKE, <1>, <5>
J1-16B	ENABLE/RESET	LOGIC 0=ENABLE, <1>, <2>
J1-16Z	Vcc OUT	5VDC OUT
J1-18D	(-) LIMIT	LOGIC 1= (-) LIMIT, <1>, <4>
J1-18B	NC	NO CONNECTION
J1-18Z	NC	NO CONNECTION
J1-20D	+12VDC IN	12 V POWER SUPPLY INPUT <9>
J1-20B	DS3	DRIVE STATUS CODE <7>
J1-20Z	DRIVE FAULT	LOGIC 1= FAULT <8>
J1-22D	DIR LOGIC	INPUT FROM MOTION CONTRL, LOGIC 1=(+) DIRECTION<1>
J1-22B	(-) 12VDC IN	(-) 12 V POWER SUPPLY INPUT <9>
J1-22Z	NC	RESERVED
J1-24D	NC	NO CONNECTION
J1-24B	NC	NO CONNECTION
J1-24Z	NC	RESERVED
J1-26D	A COMMAND (+)	DIFFERENTIAL ANALOG \pm 10V A INPUT COMMAND, <6>
J1-26B	A COMMAND (-)	DIFFERENTIAL ANALOG \pm 10V A INPUT COMMAND, <6>
J1-26Z	NC	RESERVED
J1-28D	\pm 12V RTN	\pm 12V POWER SUPPLY RETURN
J1-28B	NC	NO CONNECTION
J1-28Z	NC	NO CONNECTION
J1-30D, B	Vcc RTN	5VDC RTN
J1-30Z	NC	NO CONNECTION
J1-32D	POWER DEVICE TEMP FAULT	JUNCTION TEMPERATURE FAULT, LOGIC 1=CC FAULT <7>
J1-32B	AMP TEMPERATURE FAULT	LOGIC 1=HEAT SINK TEMPERATURE FAULT <7>
J1-32Z	+5VDC IN	5 V POWER SUPPLY INPUT <9>

NOTES:

- <1> OPTICALLY ISOLATED INPUT WITH INTERNAL 332 OHM PULL-UP RESISTOR TO 5VDC. SEE FUNCTIONAL DIAGRAM.
- <2> SWITCH S1 ON PCB IS IN SERIES WITH THIS LOGIC INPUT CMD. INSTALLATION OF JUMPER JP1 WILL DISABLE THE EXTERNAL CMD.
- <3> (+) LIMIT IS THE TRAVEL LIMIT THE MOTOR WILL DRIVE TOWARD WHEN THE DIRECTION SIGNAL IS A LOGIC 1. INSTALLATION OF JUMPER JP3 WILL DISABLE THIS FEATURE.
- <4> (-) LIMIT IS THE TRAVEL LIMIT THE MOTOR WILL DRIVE TOWARD WHEN THE DIRECTION SIGNAL IS A LOGIC 0. INSTALLATION OF JUMPER JP2 WILL DISABLE THIS FEATURE.
- <5> WHEN ACTIVE, THE MOTOR WINDINGS ARE SHORTED TOGETHER. IF THE BRAKE FEATURE IS NOT REQUIRED, INSTALL JUMPER JP4. CAUTION: BRAKE CMD AT HIGH SPEED MAY DAMAGE MOTOR AND/OR CONTROLLER. CONSULT FACTORY FOR ASSISTANCE.
- <6> COMMAND POLARITY DETERMINES DIRECTION OF MOTION, SIGNAL AND SIGNAL RETURN CAN BE EXCHANGED. SEE <3>, <4>.
- <7> OUTPUT FROM DIGITAL PROCESSOR. SEE DRIVE STATUS CODE TABLE. 0=TTL LOW, Z=HIGH IMPEDANCE.
LIMIT SINK CURRENT TO \leq 1ma. JUNCTION TEMP >120C, HEAT SINK >70C
- <8> OUTPUT FROM OPTO ISOLATOR. SEE FUNCTIONAL DIAGRAM.
- <9> NOR REQUIRED WHEN OPTIONAL DC-DC CONVERTER IS ORDERED.
- <10> SEE APPLICATION NOTE SUPPLEMENTARY FUSE PROTECTION.

EUROCARD SERIES 57 LINEAR SINE DRIVE SERVO AMPLIFIER

MOUNTING DIMENSIONS



- NOTES:
1. ALL DIMENSIONS SPECIFIED IN INCHES
 2. ALL DIMENSIONS ARE +/- .002 UNLESS OTHERWISE SPECIFIED
 3. DO NOT SCALE

ELTROL CORPORATION	
CARLSBAD, CA	
Title	
SERIES 57 DATA SHEET OUTLINE	
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