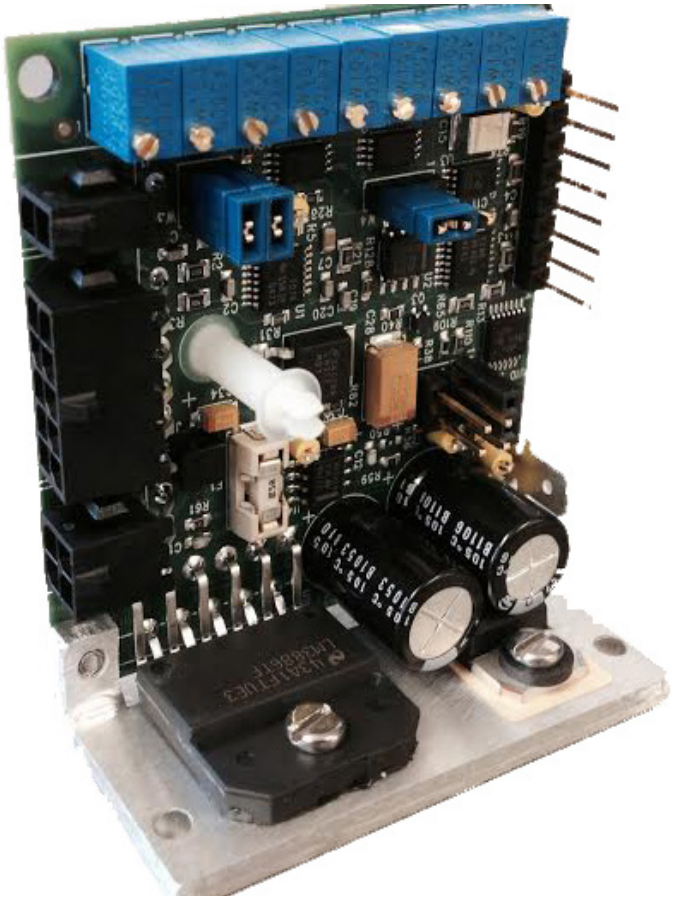
NUTFIELD TECHNOLOGY

91-0043-1
User Manual

QD-2000
Servo Amplifier

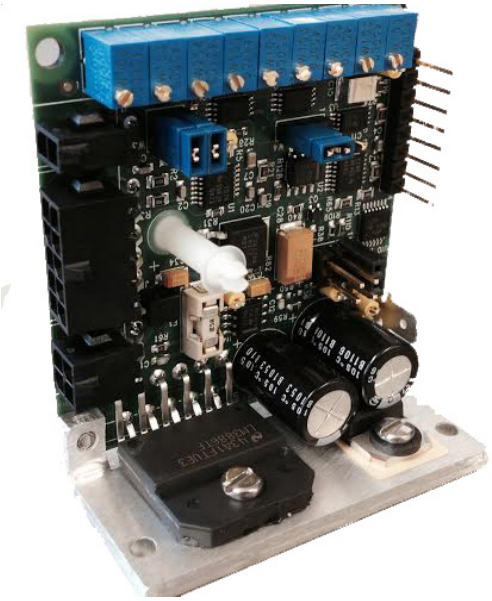


1 Wall Street, Suite 115, Hudson NH 03051 // 603-893-5200
www.nutfieldtech.com

Nutfield Technology's QD-2000 is a high performance, single channel class 0 servo amplifier packed with a variety of features in a very compact form factor. Internal voltages are generated by precision references and regulators operating from standard +/- 15V power supplies.

Diagnostic signals are readily available for monitoring:

- Motor Velocity
- Motor Position
- Position Error
- Coil Current
- AGC Voltage
- Ready Status



The following safety circuits are also included:

- Low Voltage Detect
- AGC Range Limit
- Remote Enable

Electrical Connections

Command

Apply a differential waveform signal to this connector within the range of +/- 10V. The input impedance is 100K ohms. If a single-ended signal is preferred, pin 1 or 2 may be grounded. To change direction of motion without rewiring, refer to configuration jumper W3.

J2 Pins	
1	COMMAND (-)
2	COMMAND (+)

Motor

Attach the control cable from the motor to this connector. Note that amplifiers are individually tuned to specific motors. Look for a label or mark indicating the motor serial number on the amplifier.

Mismatching a drive and motor may cause permanent damage.

J2 PINS	
1	GROUND
2	GROUND (SHIELD)
3	AGC RETURN
4	DIODE COM
5	IA
6	MOTOR (+)
7	MOTOR (-)
8	GROUND (SHIELD)
9	AGC OUT
10	IB

Power

The QD-2000 is designed to accept +/-15V DC. Power supply requirements may vary somewhat depending on the application. Typically a supply capable of 3 amps is sufficient.

Note: Maximum operating power is +/- 18V DC.

J3 PINS	
1	COMMON (GND)
2	COMMON (GND)
3	NEGATIVE SUPPLY
4	POSITIVE SUPPLY

Diagnostic

This connector provides access to a number of signals that can be monitored. The outputs are not buffered, so take care to prevent injection of external noise or possibility of shorting signals. All outputs are analog in nature, with the exception of the ready signals as noted.

J4 PINS		
1	VELOCITY OUTPUT	Analog
2	POSITION OUTPUT	Analog (1V/V)
3	GROUND	
4	ERROR OUTPUT	Analog (1V/V)
5	CURRENT OUTPUT	Analog (1V/A)
6	AGC OUTPUT	Analog (DC)
7	READY OUTPUT	TTL compatible
8	REMOTE SHUTDOWN INPUT	TTL compatible

Ground Lug

A 0.187" spade lug is provided on the board for the easy coupling of two boards. Suggested for all XY applications, this connection is very effective at minimizing crosstalk between channels during moments of high acceleration and thus, high current demand from the power supplies. Make this connection with a short, heavy gauge wire.

Nutfield P/N 50-0150	

J6 PINS	
1	GROUND

Indicators

Two indicators are provided on the QD-2000:

D8 POWER GREEN LED Indicates the board is powered.

D4 FAULT RED LED Indicates a fault is detected; the amplifier is in protection mode.

Possible fault conditions are:
- Under Voltage - insufficient power supply voltage is present
- AGC Range - the position detector is malfunctioning or not connected
- Remote Shutdown - the amplifier has shutdown by remote signal

Configuration Jumpers

Direction

The direction of rotation can be changed easily.

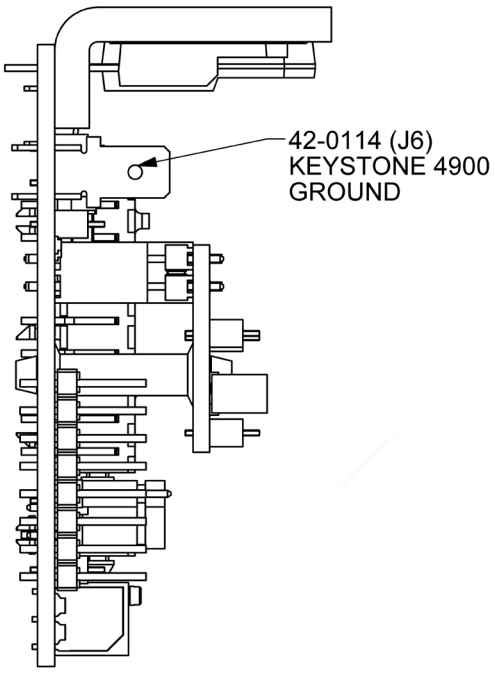
W3 Pins	
1-2, 3-4	STANDARD (CW)
1-3, 2-4	INVERTED (CCW)

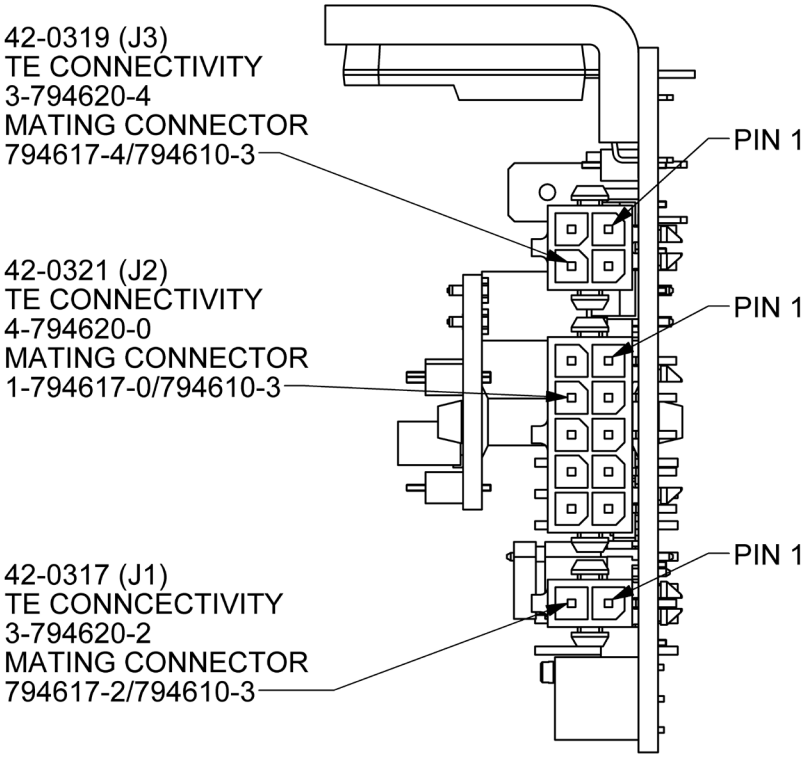
Slew Rate Limit

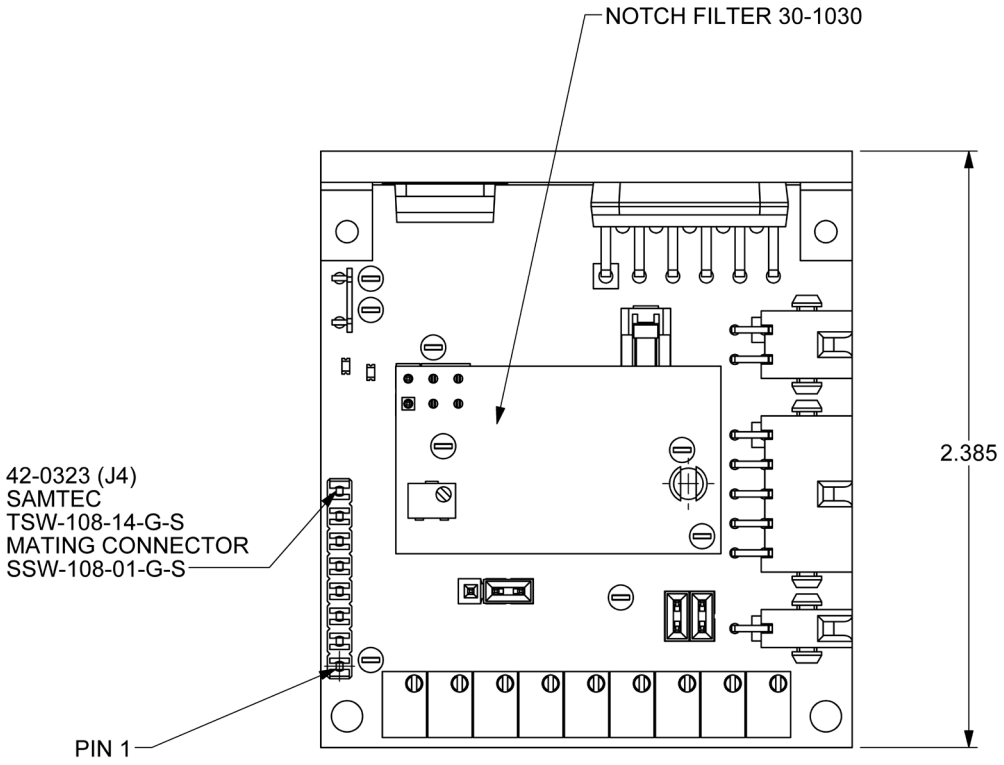
The Slew Rate Limit is a special circuit that limits the rate, (volts per second), at which the amplifier tries to respond to a given command. Primarily used to prevent unstructured (large jump) moves from reaching the motor, it can also control the performance during certain types of move profiles. The circuit may be disengaged if necessary. The slew rate is adjustable and set at the factory to meet customer's specifications.

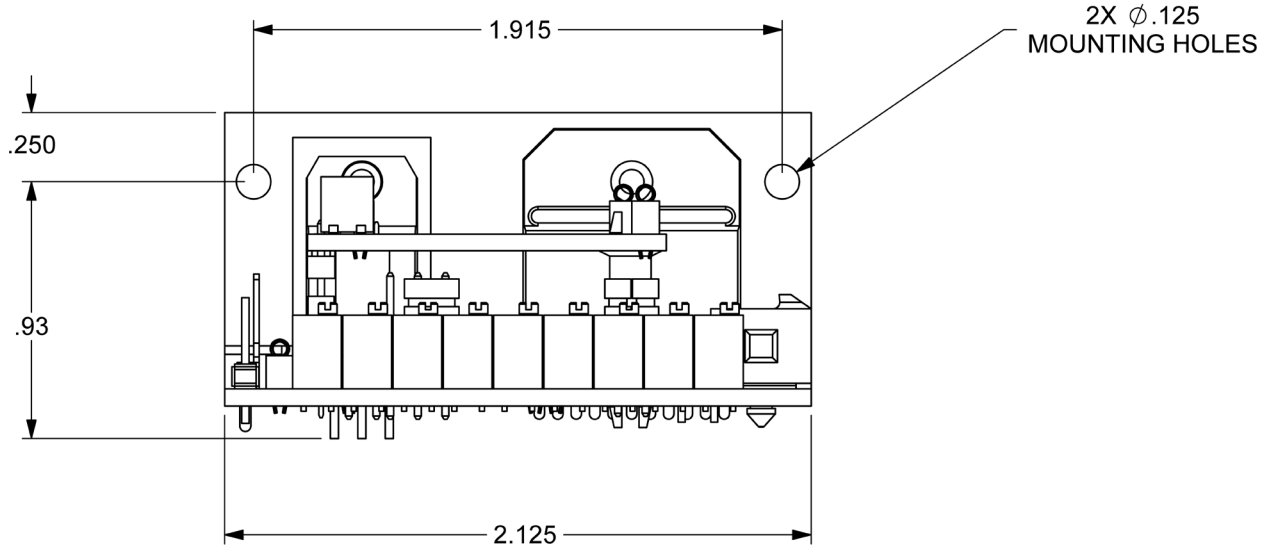
W3 Pins	
1-2	DISABLED
2-3	ENABLED

BOARD OUTLINES

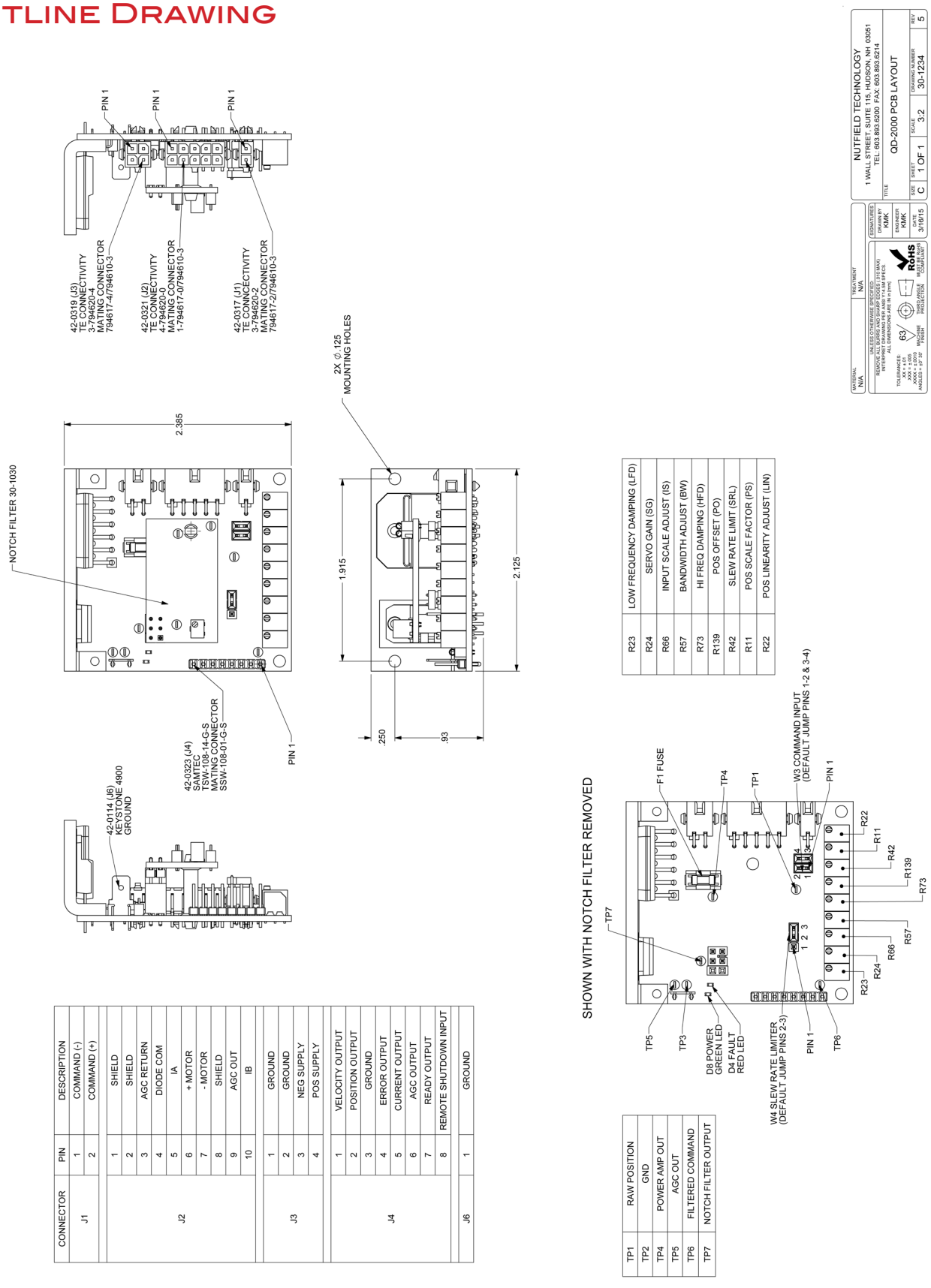





NOTCH FILTER 30-1030
42-0323 (J4)
SAMTEC
TSW-108-14-G-S
MATING CONNECTOR
SSW-108-01-G-S
PIN 1
2.385


1.915
2X ∅.125
MOUNTING HOLES
.250
.93
2.125

OUTLINE DRAWING



R23	LOW FREQUENCY DAMPING (LFD)
R24	SERVO GAIN (SG)
R66	INPUT SCALE ADJUST (IS)
R57	BANDWIDTH ADJUST (BW)
R73	HI FREQ DAMPING (HFD)
R139	POS OFFSET (PO)
R42	SLEW RATE LIMIT (SRL)
R11	POS SCALE FACTOR (PS)
R22	POS LINEARITY ADJUST (LIN)

CONNECTOR	PIN	DESCRIPTION
J1	1	COMMAND (-)
	2	COMMAND (+)
J2	1	SHIELD
	2	SHIELD
	3	AGC RETURN
	4	DIODE COM
	5	IA
	6	+ MOTOR
	7	- MOTOR
	8	SHIELD
	9	AGC OUT
	10	IB
J3	1	GROUND
	2	GROUND
	3	NEG SUPPLY
	4	POS SUPPLY
J4	1	VELOCITY OUTPUT
	2	POSITION OUTPUT
	3	GROUND
	4	ERROR OUTPUT
	5	CURRENT OUTPUT
	6	AGC OUTPUT
	7	READY OUTPUT
	8	REMOTE SHUTDOWN INPUT
J6	1	GROUND

TP1	RAW POSITION
TP2	GND
TP4	POWER AMP OUT
TP5	AGC OUT
TP6	FILTERED COMMAND
TP7	NOTCH FILTER OUTPUT