



Haydon
Motion Solutions



An **AMETEK** Company

LINEAR MOTION CATALOG AND DESIGN GUIDE



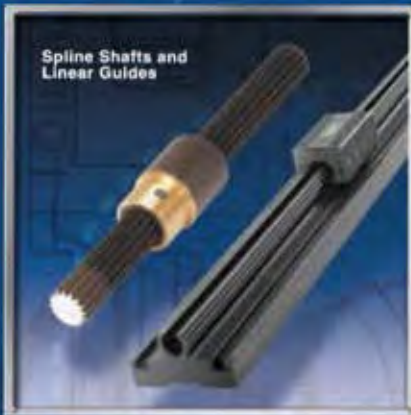
Lead screws
& Micro-
Lead screws



Anti-Backlash
Nuts



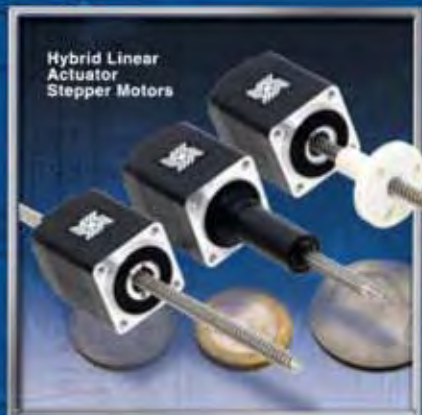
ScrewRail® Assemblies



Spline Shafts and
Linear Guides



Can-Stack
Linear
Actuator
Stepper
Motors



Hybrid Linear
Actuator
Stepper
Motors



IDEA™
Drive
Programmable
Drive



Motorized and
Unmotorized RGS®
Rapid Guide
Screws



LRS™ Motorized
and Unmotorized
Linear Rail
Systems

Motorized
LRS™ with
IDEA™ Drive

www.HaydonKerk.com

Experts in customization, innovative design and engineering

Haydon Kerk Motion Solutions has the experience, the people, technology, and world-wide facilities to design, engineer and manufacture technology-driven solutions for virtually any precision motion control application.

Need a prototype tomorrow?



Immediate availability of a standard selection of parts.

www.HaydonKerk.com



Haydon Kerk Motion Solutions provides a broad range of sophisticated, application-specific motion control products including precision lead screw/anti-backlash nut systems, linear rails and guides, linear actuator stepper motors and electronic drives, used in laboratory and medical instrumentation, semiconductor fabrication, military, aerospace and many other industries.

Whether an application requires a standard item, custom design, new product, or a more sophisticated complete assembly, Haydon Kerk Motion Solutions experienced engineering team will assist you.



Recognized as a leader in motor miniaturization, Haydon™ Products Division has been building electric motors and stepper motor based linear actuators for almost half a century. The company's manufacturing facility, located on ten acres in the heart of Connecticut, supports today's most efficient technology and manufacturing methods and is ISO 9001 certified. **Kerk® Products Division was established in 1976 and has grown to be one of the world's largest exclusive manufacturers of non-ball lead screws, linear rails, and actuator systems.** Our internationally acclaimed anti-backlash designs and materials provide high accuracy, unsurpassed repeatability, and long life in a full range of motion control applications.

Haydon Kerk Motion Solutions is headquartered in Waterbury, CT, with additional manufacturing operations in Hollis and Milford, NH, and Changzhou, China. Haydon Kerk also operates a European technical center in Coueron, France.

Haydon Kerk Motion Solutions linear motion products are used in much of today's sophisticated medical equipment, laboratory instrumentation, machinery automation, aerospace, analytical equipment, computer peripherals, semiconductor industries, and other applications that require precision motion.

Haydon Kerk Motion Solutions is part of **AMETEK®**, a leading global manufacturer of electronic instruments and electro-mechanical devices with annual sales of \$2.5 billion. The company has more than 80 manufacturing facilities and more than 80 sales and service centers in the U.S. and around the world.



We take pride in our expertise in customizing products for specific application needs.

The products described within this catalog may be protected by and are not limited to the following patents:

Haydon Kerk Motion Solutions Patents

UNITED STATES:

5,913,940
6,131,478
5,732,596
7,219,570
7,552,657
6,099,166
6,041,671
5,027,671
6,240,798
5,913,941
6,202,500
6,415,673 B1
6,467,362
6,422,101 B2
5,937,702
6,117,249
5,601,372

CANADA:

2,208,405
2,334,325
2,065,009
2,286,737

EUROPE:

0 965 008 B1
0 799 392 B1
1 084 355 B1
0 487 662 B1
0 975 466 B1

GERMANY:

69805970.0-08
69509125.5-08
69903426.4-08
69102978.4-08
69804085.6-08

JAPAN:

4193918
3689428
3222132
4222634

Tritex Corporation Patents

UNITED STATES:

5,465,020
5,798,592
5,910,192
6,121,561
6,146,280
6,150,789
6,211,591
6,222,294
6,362,547
6,531,798
6,603,229
6,756,705
6,774,517
6,932,319
7,296,342
7,752,736
D482,707
D497,620
D587731S
D587733S

CANADA:

2,399,069

EUROPE:

1,258,075 B1

GERMANY:

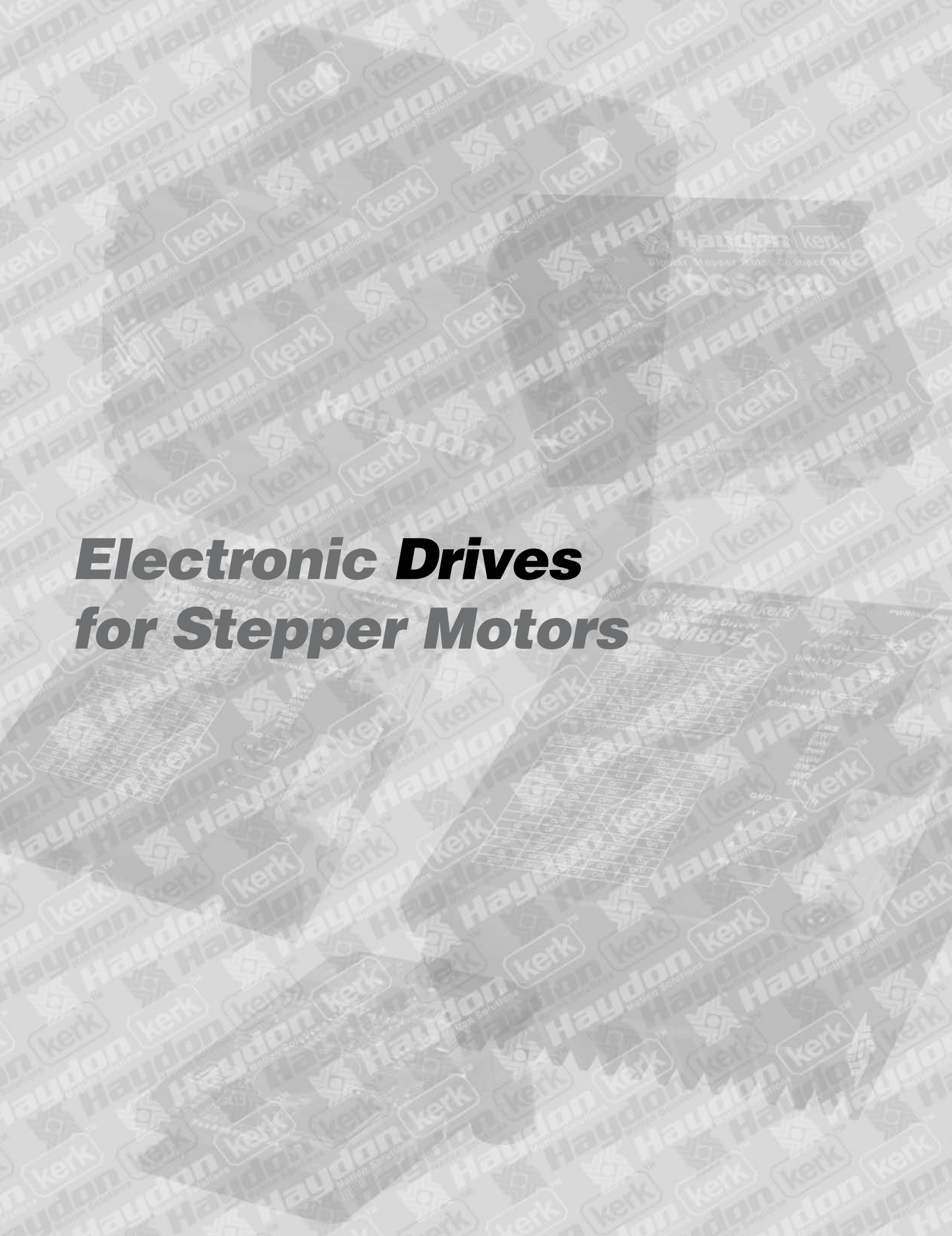
60,115,604 T2

Haydon Linear Motors Patents

CHINA:

ZL2003 3 0102644.4
ZL2003 3 0100458.1
ZL2003 3 0100459.6
ZL2003 3 0100461.3
ZL2003 3 0100462.8
ZL2003 3 0100460.9
ZL200520146961.X
ZL200620165777.4
ZL200620165778.9
ZL200720002487.2
ZL200620148077.4
ZL200620148076.X
ZL200620148078.9
ZL200720002541.3
ZL200720003439.5
ZL200720001050.7
ZL200720003438.0
ZL200720000093.3
ZL200720005554.6
ZL200720143014.4
ZL200830004565.2
ZL200920216042.3
ZL200920216043.8
ZL200920216040.4

Electronic Drives for Stepper Motors



The IDEA™ Drive is a state-of-the-art electronic drive and fully programmable control unit that uses an intuitive Graphic User Interface (GUI). The IDEA Drive can be easily integrated with a stepper motor linear actuator combining the motor, linear translation, and programming in a single compact package.



IDEA
PROGRAMMABLE DRIVE

IDEA Drive Features

RoHS Compliance	Yes
Programming Language	On-screen GUI (Graphic User Interface)
Input Voltage	+12 to +48 VDC
Communication Type	USB to Mini USB
Microstepping	Full, 1/2, 1/4, 1/8, 1/16, 1/32, 1/64
Electronically Configurable	Using easy-to-use, on-screen graphics
Auto-population of Drive Parameters	Uses software prompt for part number
Programmable Acceleration and Deceleration	Yes
Programmable Current Control	Run and hold, boost to accelerate/decelerate
Movement Profile Plotter	Included
Interactive Program Debug	Yes. Line by line or multiple line application
Program Storage	Flash. 85 KBytes
Multiple Program Files	Yes. Organized by program name
Units of Measure	Metric or English, software configurable
User Label and and Comment Fields	Unlimited
Branching Functions	Yes
Interrupt Functions	Yes
Counter	64 bit
General Purpose I/O Inputs, Opto-Isolated	4 (5-24 VDC, 4 mA max. per input)
General Purpose I/O Outputs, Opto-Isolated, Open Collector	4 (5-24 VDC, 200 mA max. per output, pull-up resistor required)



IDEA™ Drive software is simple to use with on-screen buttons and easy-to-understand programming guides.

The software program generates motion profiles directly into the system and also contains a “debug” utility allowing line-by-line execution of a motion program for easy troubleshooting.

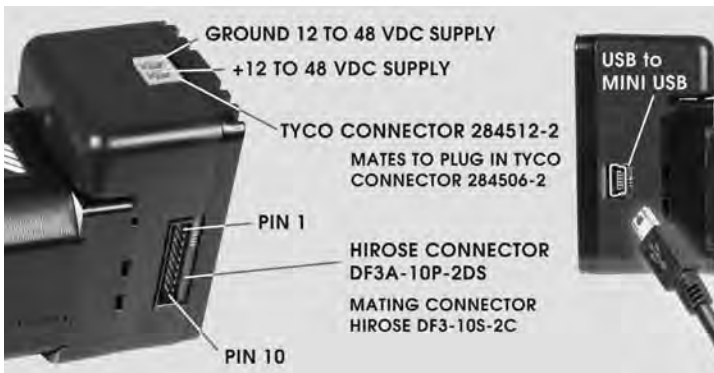
IDEA Drive		
Input	Output	Part Number
48 VDC Max.	2.6 A rms Max.	PCM4826
48 VDC Max.	0.6 A rms Max.	PCM4806

Conventional wire connectors are also available from Haydon Kerk Motion Solutions:	
Power Cable	Part Number 56-1348
USB to Mini USB	Part Number 56-1346
10 Wire I/O Cable*	Part Number 56-1352
Motor Connector Cable	Part Number 56-1453

*Cable required only if the actuator is linked to an external switch

TABLE COMMON FOR EACH PRODUCT CONFIGURATION

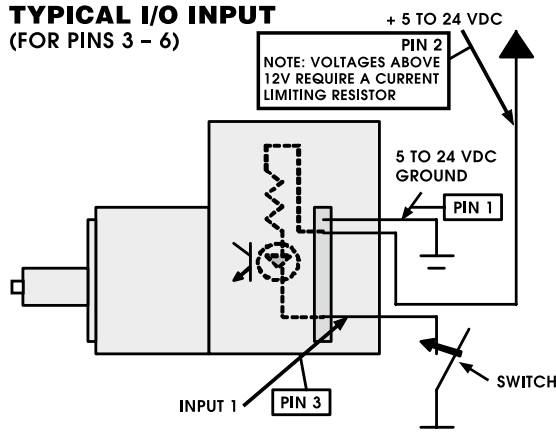
PIN POSITION	DESCRIPTION	NOTES
PIN 1	GROUND I/O SUPPLY	5 TO 24 VDC
PIN 2	+ I/O SUPPLY	5 TO 24 VDC
PIN 3	INPUT 1	
PIN 4	INPUT 2	
PIN 5	INPUT 3	
PIN 6	INPUT 4	
PIN 7	OUTPUT 1	
PIN 8	OUTPUT 2	
PIN 9	OUTPUT 3	
PIN 10	OUTPUT 4	



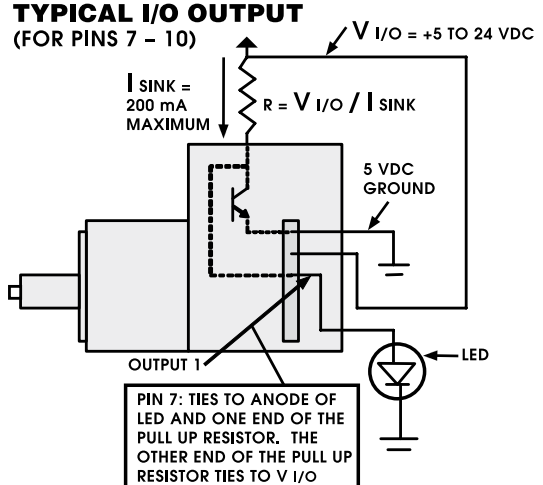
Computer Connection

- ❑ Communications: USB to mini USB (drive side)
- ❑ Power Supply Connector: Drive Side: Tyco 284512-2
Mating: Tyco 284506-2
- ❑ Digital I/O Connector:
Drive Side: HIROSE DF3A-10P-2DS
Mating: HIROSE DF3-10S-2C

TYPICAL I/O INPUT (FOR PINS 3 - 6)



TYPICAL I/O OUTPUT (FOR PINS 7 - 10)



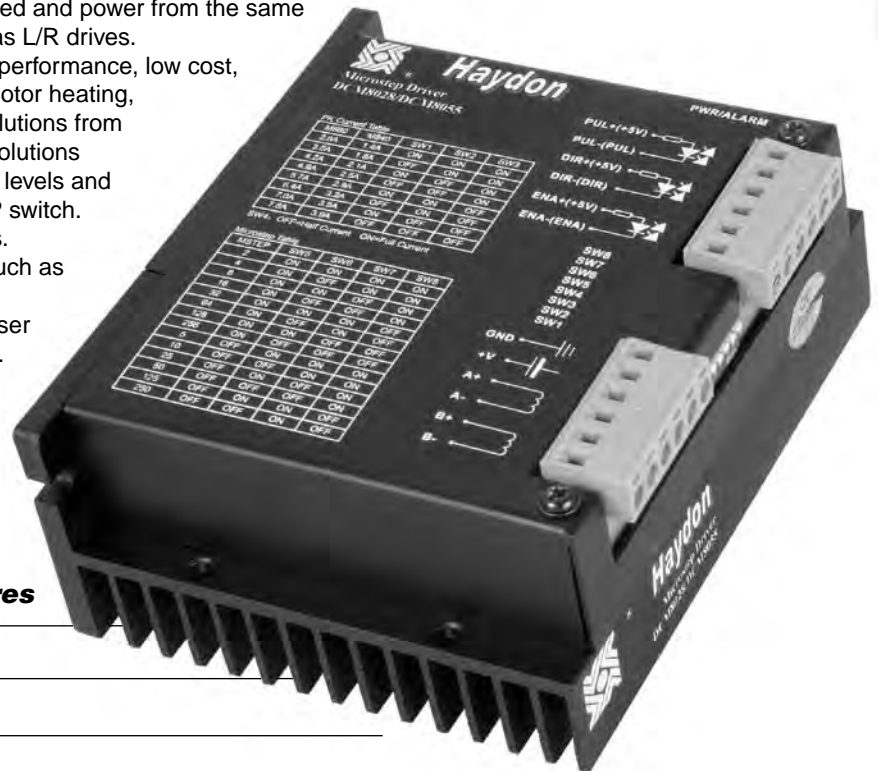
Haydon Kerk Motion Solutions, Inc. has designed an advanced series of drivers to efficiently operate motors to their peak performance. With several options to select from, we can help you set up a system that will power-up any application.

Micro Stepping Drives #DCM8028 & DCM8055

Haydon Kerk Motion Solutions High Performance Micro Stepping Chopper Drives based on some of the most advanced technology in the world today. Providing a cost effective solution for production volume requirements, the small size allows designers to use these Drives in limited space and they are also easily integrated with other electronic systems. Design time is reduced because incorporating these Drives is far simpler than developing a custom drive circuit. They are suitable for driving 2-phase step motors (maximum current ratings of 2.8 A and 5.5 A rms per phase). These specially designed Drives deliver optimum performance throughout a greater speed range. By using an advanced bipolar constant-current chopping technique, and a maximum input voltage of 80 VDC, they can produce more speed and power from the same motor, compared with traditional technologies such as L/R drives.

The DCM8028 and DCM8055 feature high performance, low cost, compact size, mixed decay current control for less motor heating, automatic idle-current reduction and micro step resolutions from 1/2 step to 1/256. There are fourteen micro step resolutions selectable in decimal and binary. The output current levels and micro step resolutions are easily set via the 8 bit DIP switch. These Drives are suitable for 4, 6, and 8 lead motors.

Ideal for a wide range of stepping motors such as low voltage linear motors, used in various kinds of machines, such as X-Y tables, labeling machines, laser cutters, engraving machines, and pick-place devices. These Drives are particularly useful in motor applications requiring low noise, low vibration, high speed and high precision requirements.



DRIVES FOR STEPPER MOTORS

Drive DCM8028/DCM8055 Drive Features

- User friendly Chopper Drive
- Ideal for a wide range of stepping motors
- Suitable for 4, 6, 8 lead motors
- Inaudible 20 khz chopping frequency
- TTL compatible and optically isolated input signals
- 14 selectable microstep resolutions in decimal and binary
- Current up to 5.5 A rms/phase
- Automatic idle current reduction
- 4 5/16" x 4" x 1 1/8" (11.0 cm x 10.2 cm x 2.9 cm)
- Up to 80 VDC input voltage. For Europe the maximum input voltage must be limited to 70 VDC (CE Regulations)

Bipolar Chopper Drive #DCS4020

The Haydon™ DCS4020 Chopper Drive by Haydon Kerk Motion Solutions, Inc. delivers optimum performance throughout a greater speed range. This new technology drive has been designed for easy set up and use. The Haydon DCS4020 is ideal for development projects where a single power supply is all that is necessary to easily run the motor. The motor current is set using an on-board potentiometer and no external current setting resistors are required.

The DCS4020 is also feature-packed. The Driver provides all the basic motor controls including full or half-stepping of bipolar steppers, directional control, and output enable control. An oscillator circuit is standard on the drive with an on-board speed control potentiometer. In addition, external input/output signals allow complete remote control of all drive functions. All electrical connectors have removable plugs incorporating screw type terminals.



Bipolar Chopper Drive #DCS4020 Features

- On-board or external step pulse clock
- On-board or external single step switch
- On-board or external step rate control potentiometer
- On-board or external direction control
- On-board or external full step / half step control
- On-board or external outputs enable control
- On-board current control potentiometer

Bipolar Chopper Drive #DCS4020 Technical Data

Size:	4.47-in x 3.38-in x 1.31-in (113.54 mm x 85.85 mm x 33.27 mm)
Power Requirement:	Single unregulated, providing +20 VDC to +40 VDC
Output Current:	Fully adjustable from 66 mA rms/Ø to 2 A rms/Ø continuous duty
Continuous rating:	2 A rms/Ø
Peak, non-repetitive rating:	3 A/Ø
Chopper Frequency:	~20 KHz
Onboard Oscillating Range:	<10 pulses/sec. to >2,000 pulses/sec.
Stepping:	Full step/Half step capability
I.C.s:	S.T. Micro: L297 (control I.C.) and L298 (4A dual full wave bridge)

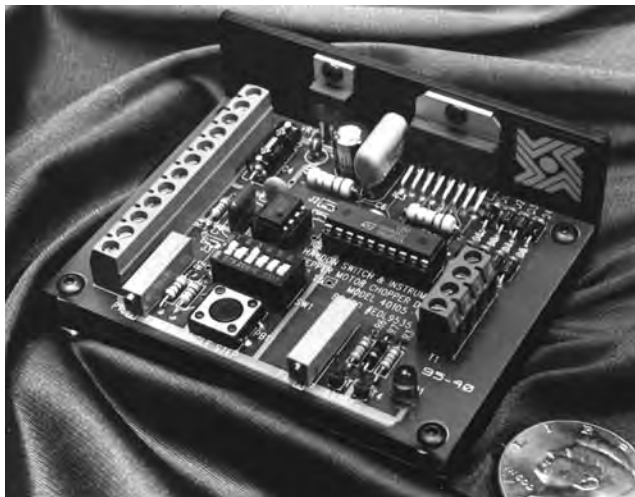


Bipolar Chopper Drive #40105

A chopper drive is a power-efficient method of current driving a stepping motor to obtain higher stepping rates. Torque, likewise, is maintained which otherwise would have diminished due to the effects of counter E.M.F. and increased coil impedance.

Haydon Kerk Motion Solutions, Inc. bipolar chopper drive (Part No. 40105) has been designed for easy set-up and use. Just connect a single power supply and a motor and its ready to run! Motor current is set using an on-board potentiometer. No external current setting resistors are required. This feature-packed drive provides all basic motor controls, including full or half stepping of bipolar steppers and direction control. An oscillator circuit is standard on the drive with an on-board speed control potentiometer. In addition, external input/output signals allow complete remote control of all drive functions.

The average input power rating of the motor must be adhered to, otherwise overheating will result. It is permissible to operate at 2X rated current (4X power) utilizing a 25% duty cycle.



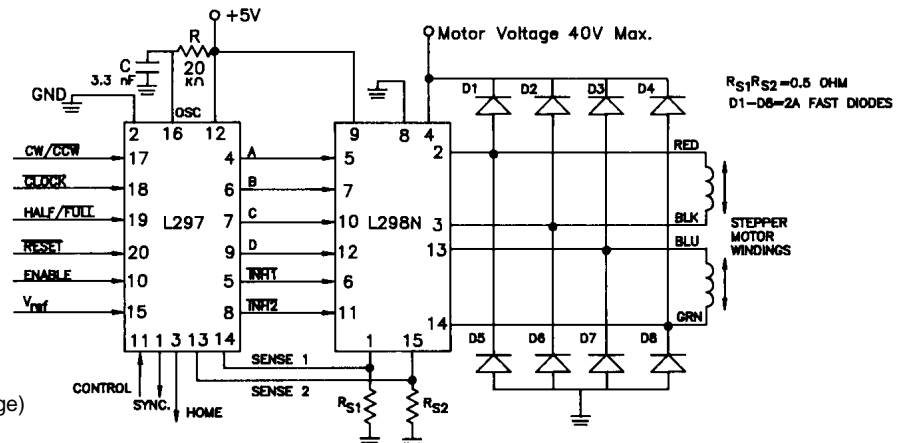
Chopper Drive #40105 Features

- On board or external step pulse clock
- On board or external single step switch
- On board or external step rate control potentiometer
- On board or external direction control
- On board or external full step/half step control
- On board or external outputs enable control
- On board output current control potentiometer
- External reset control
- External chopper synchronous output

Chopper Drive #40105 Technical Data

Size:	3.75-in x 2.95-in x 1.5-in (95.3 mm x 74.9 mm x 38.1 mm)
Power Requirement:	Single unregulated, providing +20 VDC to +40 VDC
Output Current:	Fully adjustable from 66 mA rms/Ø to 3 A rms/Ø
Continuous rating:	2 A rms/Ø
Peak, non-repetitive rating:	3 A/Ø
Chopper Frequency:	~20 KHz
Onboard Oscillating Range:	<10 pulses/sec. to >2,000 pulses/sec.
Stepping:	Full step/Half step capability

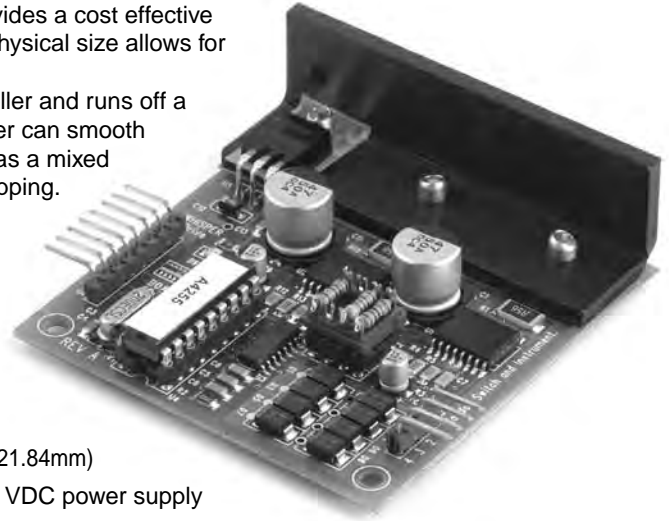
I.C.s:
S.T. Micro: L297 (control I.C.)
and L298 (4A dual full wave bridge)



Whisper™ Drive #44103

A compact, microstepping drive for bipolar stepper motors that provides a cost effective solution for production volumes. Its ease of integration and small physical size allows for quick integration into your design.

The Whisper incorporates micro-stepping technology, a controller and runs off a single power supply. With eight microsteps per full step, the Whisper can smooth out cogging often associated with Can-stack steppers. The drive has a mixed current decay mode for reduced resonance and improved microstepping. Microstepping also reduces audible noise in the motor.



Whisper Drive #44103 Technical Data

Size (approx.):	2.65-in x 2.55-in x .86-in (67.31mm x 64.77mm x 21.84mm)
Power Requirement:	Regulated, 24 VDC to 28 VDC power supply
Output Current:	Up to 1 A rms/Ø
Recommended Motor Coil Voltage:	Bipolar, 5 VDC
Required External Step Pulse Range:	Up to 8000 PPS for 1000 full steps/sec.
Stepping:	Up to 8 microsteps per full step

Whisper Drive #44103 Features

- Bipolar chopper/constant current technology
- Automatic mixed current decay
- Selectable step; Full, 1/2, 1/4, 1/8 step
- Use single power supply for motor and drive
- Output enable/disable control
- Physically compact



Immediate availability of a standard selection of parts.



Technical capabilities that provide solutions to challenging motion control problems

Linear motion control technologies that fuse design, materials and engineering principles to meet just about any linear motion challenge requiring a custom solution. A pioneer in miniature linear actuator stepper motors with unmatched performance-to-size ratios, patented technologies and millions of configuration options.

- Systems design
- On-site moldmaking
- Assembly
- Electronic drives
- Engineering
- Precision machining
- Wiring
- Programmable drive software
- Manufacturing
- Finishing
- Testing
- World-wide technical assistance

Leadscrew and Nut Assemblies

NTG and ZBA Anti-Backlash nuts with uncoated and Kerkote[®] and Black Ice[™] PFE coated leadscrews

Spline Shafts

Rails and Bushings

ScrewRail[™] Linear Actuator

Can-Stack Linear Actuator Stepper Motors

Available diameters from 15 mm (0.6-in) to 46 mm (1.6-in)

G4 Can-Stack Stepper Motors

Available diameters from 20 mm (0.8-in) to 36 mm (1.4-in)

Hybrid Linear Actuator Stepper Motors

Available from 21 mm (0.8-in) to 87 mm (3.4-in) square

Can-Stack Rotary Stepper Motors

Pancake Stepper Motors

Motor Drives

Dual Motion Linear/Rotary Stepper Motors

Linear Rails and Slides

RGW06 Linear Guide motorized with Size 17 Double Stack Hybrid

RGS[®] Rapid Guide Screw Linear Guides

LRS[™] Linear Rail System slides

Linear Guide Series

IDEA[™] DRIVE state-of-the-art, programmable drive with easy to use on-screen graphics, GUI software.

IDEA Drive USB to mini-USB connection

IDEA Drive Size 17 Hybrid

IDEA Drive Motorized RGS[®]

IDEA Drive Motorized LRS[™]

IDEA Drive Motorized Spline



**Engineering and Manufacturing of
Customized Linear Motion Solutions**

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Haydon
Motion Solutions

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24 HOUR
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