

Description

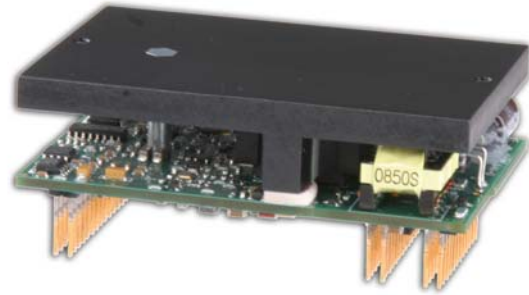
The DZCANTE-040L080 digital servo drive is designed to drive brushed and brushless servomotors from a compact form factor ideal for embedded applications. This fully digital drive operates in torque, velocity, or position mode and employs Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation compared to traditional PWM. The command source can be generated internally or can be supplied externally. In addition to motor control, this drive features dedicated and programmable digital and analog inputs and outputs to enhance interfacing with external controllers and devices.

The DZCANTE-040L080 features a single RS232 interface used for drive configuration and setup. Drive commissioning is accomplished using DriveWare available at www.a-m-c.com. The CANopen interface can be used for online operation in networked applications.

All drive and motor parameters are stored in non-volatile memory.

Power Range

| | |
|--------------------|-------------------------------|
| Peak Current | 40 A (28.3 A _{RMS}) |
| Continuous Current | 20 A (14.1 A _{RMS}) |
| Supply Voltage | 10 - 80 VDC |



Features

- ▲ Four Quadrant Regenerative Operation
- ▲ Space Vector Modulation (SVM) Technology
- ▲ Fully Digital State-of-the-art Design
- ▲ Programmable Gain Settings
- ▲ Fully Configurable Current, Voltage, Velocity and Position Limits
- ▲ PIDF Velocity Loop
- ▲ PID + FF Position Loop
- ▲ Compact Size, High Power Density
- ▲ 12-bit Analog to Digital Hardware

MODES OF OPERATION

- Current
- Position
- Velocity

COMMAND SOURCE

- ±10 V Analog
- PWM and Direction
- Encoder Following
- Over the Network

FEEDBACK SUPPORTED

- Halls
- Incremental Encoder
- Auxiliary Incremental Encoder

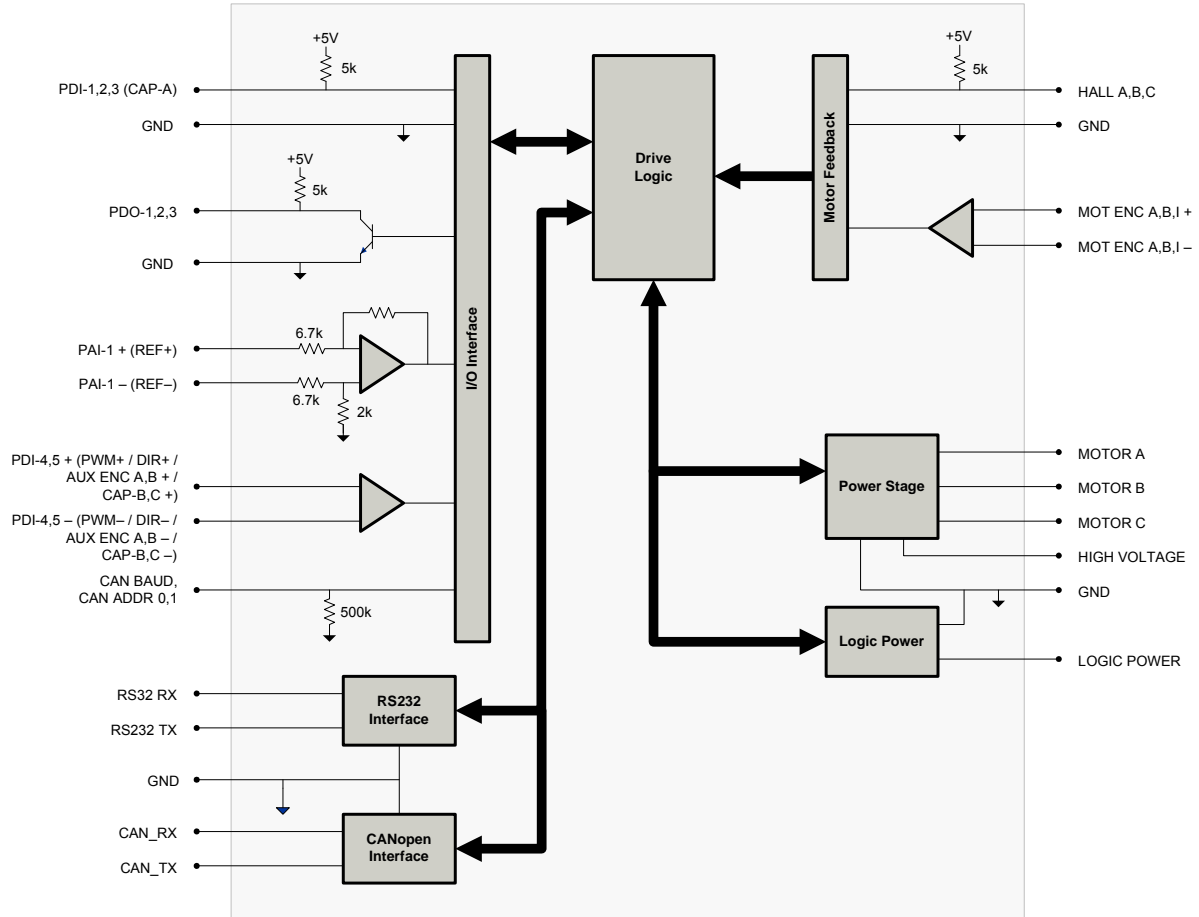
INPUTS/OUTPUTS

- 2 High Speed Captures
- 1 Programmable Analog Input (12-bit Resolution)
- 2 Programmable Digital Inputs (Differential)
- 3 Programmable Digital Inputs (Single-Ended)
- 3 Programmable Digital Outputs (Single-Ended)



COMPLIANCES & AGENCY APPROVALS

- CE Class A (LVD)
- CE Class A (EMC)
- RoHS

BLOCK DIAGRAM



Information on Approvals and Compliances

| | |
|---|---|
|  | <p>Compliant with European CE for both the Class A EMC Directive 2004/108/EC on Electromagnetic Compatibility (specifically EN 61000-6-4:2007 and EN 61000-6-2:2005) and LVD requirements of directive 2006/95/EC (specifically EN 60204-1:2006), a low voltage directive to protect users from electrical shock.</p> |
|  | <p>RoHS (Reduction of Hazardous Substances) is intended to prevent hazardous substances such as lead from being manufactured in electrical and electronic equipment.</p> |

SPECIFICATIONS

| Power Specifications | | |
|---|----------|---|
| Description | Units | Value |
| DC Supply Voltage Range ¹ | VDC | 10 - 80 |
| DC Bus Over Voltage Limit | VDC | 88 |
| DC Bus Under Voltage Limit | VDC | 8 |
| Logic Supply Voltage | VDC | 5 (+/- 5%) |
| Maximum Peak Output Current ² | A (Arms) | 40 (28.3) |
| Maximum Continuous Output Current | A (Arms) | 20 (14.1) |
| Maximum Continuous Output Power | W | 1520 |
| Maximum Power Dissipation at Continuous Current | W | 80 |
| Internal Bus Capacitance ¹ | µF | 141 |
| Minimum Load Inductance (Line-To-Line) ³ | µH | 250 |
| Switching Frequency | kHz | 20 |
| Maximum Output PWM Duty Cycle | % | 85 |
| Control Specifications | | |
| Description | Units | Value |
| Communication Interfaces | - | CANopen (RS-232 for configuration) |
| Command Sources | - | ±10 V Analog, Encoder Following, Over the Network, PWM and Direction |
| Feedback Supported | - | Auxiliary Incremental Encoder, Halls, Incremental Encoder |
| Commutation Methods | - | Sinusoidal, Trapezoidal |
| Modes of Operation | - | Current, Position, Velocity |
| Motors Supported | - | Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) |
| Hardware Protection | - | 40+ Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage |
| Programmable Digital Inputs/Outputs (PDIs/PDOs) | - | 5/3 |
| Programmable Analog Inputs/Outputs (PAIs/PAOs) | - | 1/0 |
| Primary I/O Logic Level | - | 5V TTL |
| Current Loop Sample Time | µs | 50 |
| Velocity Loop Sample Time | µs | 100 |
| Position Loop Sample Time | µs | 100 |
| Maximum Encoder Frequency | MHz | 20 (5 pre-quadrature) |
| Mechanical Specifications | | |
| Description | Units | Value |
| Agency Approvals | - | CE Class A (EMC), CE Class A (LVD), RoHS |
| Size (H x W x D) | mm (in) | 76.2 x 50.8 x 22.9 (3.0 x 2.0 x 0.9) |
| Weight | g (oz) | 123.9 (4.4) |
| Heatsink (Base) Temperature Range ⁴ | °C (°F) | 0 - 75 (32 - 167) |
| Storage Temperature Range | °C (°F) | -40 - 85 (-40 - 185) |
| Cooling System | - | Natural Convection |
| Form Factor | - | PCB Mounted |
| P1 Connector | - | 30-pin, 2.54 mm spaced, dual-row header |
| P2 Connector | - | 24-pin, 2.54 mm spaced, dual-row header |
| P3 Connector | - | 24-pin, 2.54 mm spaced, dual-row header |

Notes

1. If the drive is operated at a supply voltage over 60 VDC, an additional 33µF, 100V capacitor is required on the supply line close to the drive.
2. Capable of supplying drive rated peak current for 2 seconds with 10 second foldback to continuous value. Longer times are possible with lower current limits.
3. Lower inductance is acceptable for bus voltages well below maximum. Use external inductance to meet requirements.
4. Additional cooling and/or heatsink may be required to achieve rated performance.

PIN FUNCTIONS

| P1 - Signal Connector | | | | |
|-----------------------|--------------------------------------|---|-----|--|
| Pin | Name | Description / Notes | I/O | |
| 1 | CAN ADDR 0 | CAN Bus Address Selector | I | |
| 2 | CAN ADDR 1 | | I | |
| 3 | PAI-1 + (REF+) | Differential Programmable Analog Input or Reference Signal Input (12-bit Resolution) | I | |
| 4 | PAI-1 - (REF-) | | I | |
| 5 | GND | Ground | GND | |
| 6 | CAN BAUD | CAN bus bit rate selector. | I | |
| 7 | PDO-1 | Programmable Digital Output | O | |
| 8 | PDO-2 | Programmable Digital Output | O | |
| 9 | PDO-3 | Programmable Digital Output | O | |
| 10 | PDI-1 | Programmable Digital Input | I | |
| 11 | PDI-2 | Programmable Digital Input | I | |
| 12 | PDI-3 (CAP-A) | Programmable Digital Input or High Speed Capture | I | |
| 13 | RS232 RX | Receive Line (RS-232) | I | |
| 14 | CAN RX | CAN Receive Line (Requires External Transceiver) | I | |
| 15 | RS232 TX | Transmit Line (RS-232) | O | |
| 16 | CAN TX | CAN Transmit Line (Requires External Transceiver) | O | |
| 17 | PDI-4 + (PWM+ / AUX ENC A+ / CAP-B+) | Programmable Digital Input or PWM or Auxiliary Encoder or High Speed Capture (For Single-Ended Signals see DZ HW Installation Manual) | I | |
| 18 | PDI-4 - (PWM- / AUX ENC A- / CAP-B-) | | I | |
| 19 | PDI-5 + (DIR+ / AUX ENC B+ / CAP-C+) | Programmable Digital Input or Direction or Auxiliary Encoder or High Speed Capture (For Single-Ended Signals see DZ HW Installation Manual) | I | |
| 20 | PDI-5 - (DIR- / AUX ENC B- / CAP-C-) | | I | |
| 21 | GND | Ground | GND | |
| 22 | HALL A | Single-ended Commutation Sensor Input (For Differential Inputs See MC1XDZ01 Datasheet For Recommended Signal Conditioning) | I | |
| 23 | HALL B | | I | |
| 24 | HALL C | | I | |
| 25 | MOT ENC I+ | Differential Encoder Index Input (See MC1XDZ01 Datasheet For Recommended Signal Conditioning) | I | |
| 26 | MOT ENC I- | | I | |
| 27 | MOT ENC A+ | Differential Encoder A Channel Input (See MC1XDZ01 Datasheet For Recommended Signal Conditioning) | I | |
| 28 | MOT ENC A- | | I | |
| 29 | MOT ENC B+ | Differential Encoder B Channel Input (See MC1XDZ01 Datasheet For Recommended Signal Conditioning) | I | |
| 30 | MOT ENC B- | | I | |

| P2 and P3 - Power Connector | | | | |
|-----------------------------|-----------|--|-----|--|
| Pin | Name | Description / Notes | I/O | |
| 1a | LOGIC PWR | Logic Supply Input (P2 only; Reserved on P3) | I | |
| | 1b | RESERVED | - | |
| 2a | 2b | GND | GND | |
| 3a | 3b | GND | GND | |
| 4a | 4b | HIGH VOLTAGE | I | |
| 5a | 5b | HIGH VOLTAGE | I | |
| 6a | 6b | RESERVED | - | |
| 7a | 7b | MOTOR C | O | |
| 8a | 8b | MOTOR C | O | |
| 9a | 9b | MOTOR B | O | |
| 10a | 10b | MOTOR B | O | |
| 11a | 11b | MOTOR A | O | |
| 12a | 12b | MOTOR A | O | |

Pin Details
CAN ADDR 0 (P1-1)

This pin, CAN ADDR 0, as well as CAN ADDR 1, are used for CAN bus addressing. To set the CAN node address of a drive, use the formula

$$CANAddress = \frac{7 * Addr0}{3} + 8 * \frac{7 * Addr1}{3}$$

where *CANAddress* is the desired node address and *Addr0* and *Addr1* represent the voltage that should be applied to pins CAN ADDR 0 and CAN ADDR 1, respectively. The values for *Addr0* and *Addr1* are always integer multiples of 3/7 V within the range 0-3 V. Examples of the voltages required to set certain node addresses are given in the table below. Note that setting a CAN address of 0 will utilize the address stored in non-volatile memory.

| CAN ADDR 0 Value (V) | CAN ADDR 1 Value (V) | CAN ADDR Tolerance (V) | CAN Address (Node #) |
|----------------------|----------------------|------------------------|---------------------------------------|
| 0 | 0 | ±0.1 | Address stored in non-volatile memory |
| 3/7 (0.43) | 0 | ±0.1 | 1 |
| 6/7 (0.86) | 0 | ±0.1 | 2 |
| 9/7 (1.3) | 0 | ±0.1 | 3 |
| ... | ... | ±0.1 | ... |
| 18/7 (2.57) | 21/7 (3.0) | ±0.1 | 62 |
| 21/7 (3.0) | 21/7 (3.0) | ±0.1 | 63 |

CAN BAUD (P1-6)

The CAN bit rate is set by applying the appropriate voltage to the CAN BAUD pin as given in the table below.

| CAN BAUD Value (V) | CAN BAUD Tolerance (V) | CAN Bus Bit Rate (bits/s) |
|--------------------|------------------------|--|
| 0 | ±0.388 | Bit rate stored in non-volatile memory |
| 1 | ±0.388 | 500k |
| 2 | ±0.388 | 250k |
| 3 | ±0.388 | 125k |

MECHANICAL INFORMATION

P1 - Signal Connector

| | | |
|-----------------------|---------------------|---|
| Connector Information | | 30-pin, 2.54 mm spaced, dual-row header |
| Mating Connector | Details | Samtec: SSM-115-L-DV |
| | Included with Drive | No |

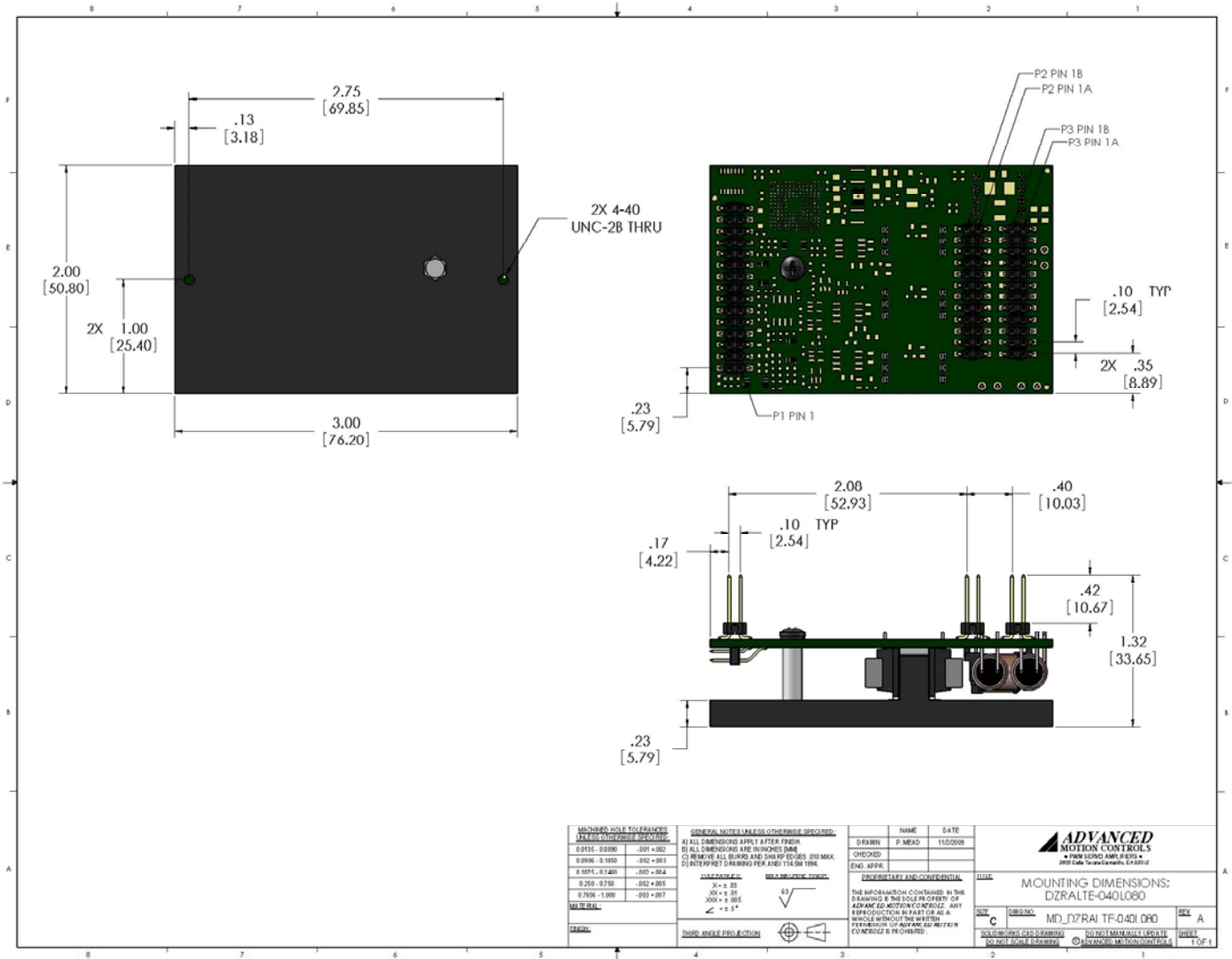
P2 - Power Connector

| | | |
|-----------------------|---------------------|---|
| Connector Information | | 24-pin, 2.54 mm spaced, dual-row header |
| Mating Connector | Details | Samtec: BCS-112-L-D-PE |
| | Included with Drive | No |

P3 - Power Connector

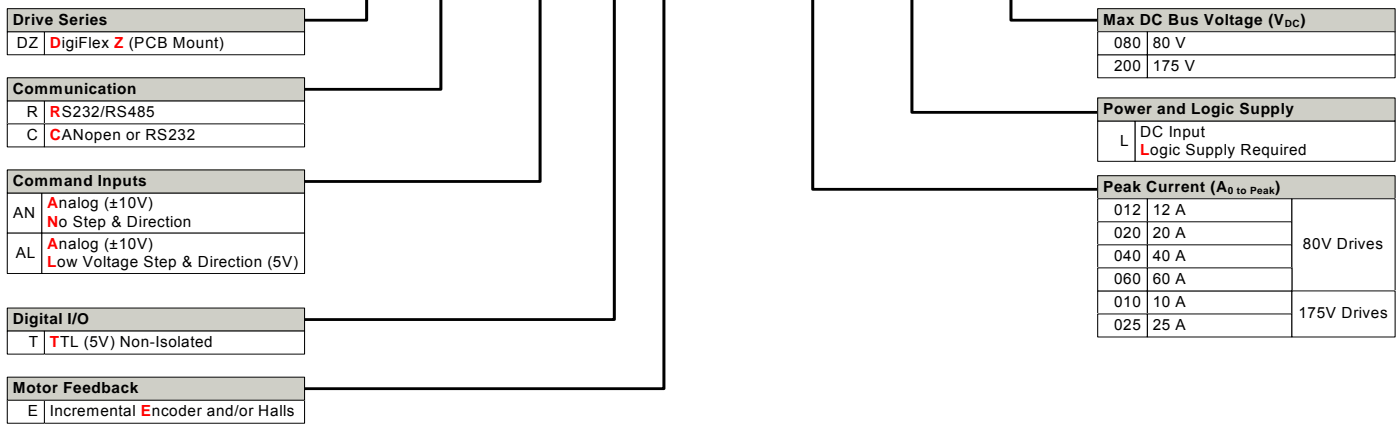
| | | |
|-----------------------|---------------------|---|
| Connector Information | | 24-pin, 2.54 mm spaced, dual-row header |
| Mating Connector | Details | Samtec: BCS-112-L-D-PE |
| | Included with Drive | No |

MOUNTING DIMENSIONS



PART NUMBERING INFORMATION

Example: **D Z R A L T E - 0 1 2 L 0 8 0**



DigiFlex® Performance™ series of products are available in many configurations. Note that not all possible part number combinations are offered as standard drives. All models listed in the selection tables of the website are readily available, standard product offerings.

ADVANCED Motion Controls also has the capability to promptly develop and deliver specified products for OEMs with volume requests. Our Applications and Engineering Departments will work closely with your design team through all stages of development in order to provide the best servo drive solution for your system. Equipped with on-site manufacturing for quick-turn customs capabilities, ADVANCED Motion Controls utilizes our years of engineering and manufacturing expertise to decrease your costs and time-to-market while increasing system quality and reliability.

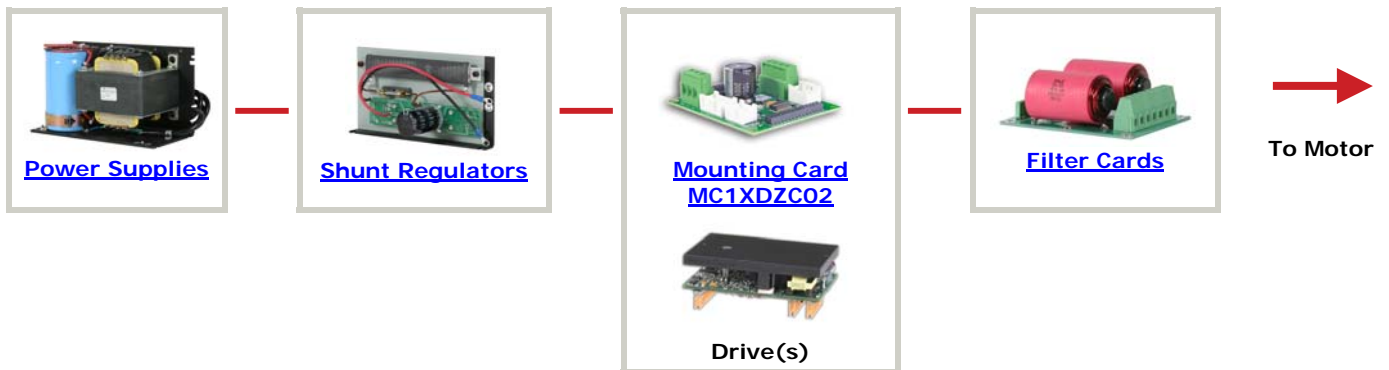
Examples of Customized Products

- ▲ Optimized Footprint
 - ▲ Private Label Software
 - ▲ OEM Specified Connectors
 - ▲ No Outer Case
 - ▲ Increased Current Resolution
 - ▲ Increased Temperature Range
 - ▲ Custom Control Interface
 - ▲ Integrated System I/O
- ▲ Tailored Project File
 - ▲ Silkscreen Branding
 - ▲ Optimized Base Plate
 - ▲ Increased Current Limits
 - ▲ Increased Voltage Range
 - ▲ Conformal Coating
 - ▲ Multi-Axis Configurations
 - ▲ Reduced Profile Size and Weight

Feel free to contact Applications Engineering for further information and details.

Available Accessories

ADVANCED Motion Controls offers a variety of accessories designed to facilitate drive integration into a servo system. Visit www.a-m-c.com to see which accessories will assist with your application design and implementation.



All specifications in this document are subject to change without written notice. Actual product may differ from pictures provided in this document.