Everything's possible.

Servo Drive Overview
ADVANCED Motion Controls has earned a reputation for being a flexible and affordable manufacturer of quality high performance and high power density servo drives. Camarillo California is home to our state-of-the-art 80,000 square foot facility that integrates Engineering, Manufacturing, Testing and Support in a single location. Using our standard product line as a starting point our customers know they can specify modifications and custom solutions to solve their specific problems. This frees our customers to design systems without the constraints imposed by other servo drive manufacturers.

Any Motor, Any Controller, Any Feedback!
Our core business is servo drives. We offer hundreds of standard models, and if we don’t have what you need we can work with you to create a custom solution that does. Our servo drives can be found all over the world in the highest performance applications, the harshest environments as well as working reliably in day to day operations throughout the world.

Finding the right ADVANCED Motion Controls’ servo drive for your application is easy. Enter key parameters into the Automated Servo Drive Selection Tool at www.a-m-c.com, and automatically receive a list of servo drives that meet your requirements. You can also browse through our Servo Drive Family Product Tables, or if you already know the model number, simply enter it into the Product Resource Center to find the appropriate datasheet, installation manual, and product drawing.

ADVANCED Motion Controls’ University Outreach program provides cost-reduced and free servo drives to future generations of engineers and motion control system designers for university and research applications. Hundreds of academic projects at educational institutions worldwide have taken advantage of University Outreach to achieve success with their motion control endeavor. To learn more about the opportunities available and to see past successful student projects visit: www.a-m-c.com/university/program-overview.html
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<td>15</td>
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<td>17</td>
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<td><strong>Extended Environment Servo Drives</strong></td>
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<tr>
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<td>DZX series - Extended Environment digital pcb mount</td>
<td>21</td>
</tr>
<tr>
<td>19</td>
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<td>26</td>
</tr>
<tr>
<td>23</td>
<td>Custom Servo Drive Capabilities</td>
<td>27</td>
</tr>
</tbody>
</table>
Whether by implementing innovative design techniques throughout our line of standard products, or by directly solving a specific customer’s application with a brand-new custom product, ADVANCED Motion Controls has the drive expertise to take on your servo system challenge.

**Technologies and Product Capabilities**

### Networks
- CANopen
- EtherCAT
- ETHERNET POWERLINK
- Modbus
- EtherCAT
- RS-485/232 SERIAL

### Motors
- Three Phase (Brushless)
  - Servo - BLDC, PMAC
  - AC Induction (Closed Loop Vector)
  - Closed Loop Stepper
- Single Phase
  - Brushed
  - Voice Coil
  - Inductive Load

### Feedback
- Absolute Encoder
  - EnDat®
  - Hiperface®
  - BiSS® C-Mode
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder
- Aux. Incremental Encoder
- Hall Sensors
- Resolver
- ±10VDC Position
- Tachometer
  - ±10VDC
  - ±60VDC

### Accessories
- Mounting Cards
- Filter Cards
- Power Supplies
- Shunt Regulators

### Applications and Industries
- Assembly Automation and General Factory Machinery
- Communications Control
- Electric Mobility and Mobile Robotics
- Entertainment
- Homeland Security and Defense
- Inspection Testing and Rapid Prototyping
- Lab Automation
- Machine Tool and Metalworking
- Material Handling and Conveyed Systems
- Medical
- Packaging
- Power Generation and Alternative Energy Sources
- Robotics (fixed)
- Semiconductor
- Simulators

We also have the ability to quickly produce custom DigiFlex® Performance™ drives utilizing many other common types of network communication.

- Feedback Technologies and Product Capabilities
- Motors
- Networks
- Applications and Industries
- Accessories

[Image of various products and applications]

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[www.a-m-c.com](http://www.a-m-c.com)
Click&Move® (C&M®) Software

Click&Move® is a Windows-based soft motion and automation solution that uses function blocks described under IEC 61131-3 as the programming method. Function block programming allows non-programmers to fully develop and implement motion control and automation programs in a GUI environment. Click&Move also includes a built in graphical HMI that displays the machine operation on screen.

- Standard PLCopen Function Blocks library for Motion Control is included
- New Function Blocks can also be created with an encapsulated user C++ program.

Click&Move® programs can run on Windows based PC’s, Motion Automation Control Cards (MACC), or on embedded ADVANCED Motion Controls’ servo drives, all at low cost to solve a variety of applications. Using the PC based approach provides for servo drive and I/O command update rates in the millisecond range.

Visit the Click&Move® Product Website

Motion Automation Control Card (MACC)

ADVANCED Motion Controls has designed a dedicated MACC with embedded Click&Move® programming capability. Key highlights are:

- Based on an ARM microprocessor operating with real-time Linux
- Stand-alone card with network connections, and can be optionally packaged in a standard DIN rail plastic case
- External I/O module connectivity
- Optional plug-in I/O module with dedicated and user-defined digital and analog I/O

The MACC serves as a general purpose motion/automation controller:

- Controlling a network of digital drives and I/Os
- Controlling servo drives with ±10V torque or velocity command inputs for lower cost/higher update rate solution
- Fully functional PLC utilizing C&M programmability and I/O modules

The C&M user program can be developed, compiled and tested on a PC and simply recompiled for the MACC platform. Once downloaded into the MACC, it can also be debugged via Ethernet UDP/IP. The program may also be controlled/monitored in real time via the UDP/IP connection by a PC with a client C&M application.

C&M user programs can also be distributed between the PC and the MACC; the fast, time critical portion of the application can run in the MACC while C&M’s HMI and slower portions run in the PC. Connections made via Ethernet.

The number of motion axes is only limited by the axis update rate. This axis update rate is influenced by the size and complexity of the C&M application program.
DigiFlex® Performance™ Digital Servo Drives

The family of DigiFlex® Performance™ digital servo drives provide a wide range of options for servo system solutions. DigiFlex® Performance™ (DP) drives deliver peak power output from 1.5 to 27.4kW, and support an array of feedback options. Driving three phase brushless (servo, closed loop vector, closed loop stepper) and single phase (brushed, voice coil, inductive load) motors with the ability to interface with both digital network commands and traditional ±10V analog commands, DP drives offer a versatile blend of cutting edge technology and proven results.

- Universal servo motor capability by means of automatic commutation adjustment
- Variety of feedback options - Absolute Encoder (EnDat®, Hiperface®, BiSS® C-Mode), 1Vp-p Sin/Cos Encoder, Incremental Encoder, Hall Sensors, Resolver, Tachometer
- Full tuning control of Position, Velocity, and Torque Loops
- Real-time oscilloscope for high-performance tuning
- Status panel for drive and system diagnostics
- I/O configuration for over 60 events and signals
- Dual loop feedback and control - increases stability and accuracy
- Stand-alone or network configuration
- Standard models in both Panel Mount, PCB Mount (Z-Drives), and Vehicle Mount (M/V™ Series Motor Controllers)
- Employs Space Vector Modulation, resulting in higher bus voltage utilization and reduced heat dissipation
- Extended Environment versions available (DZX series Z-Drives)
- Dedicated STO (Safe Torque Off) Inputs available on select models - suitable for use in safety-related systems according to:
  » EN 62061 / IEC 61508 SIL 3
  » EN ISO 13849-1 Category 3 / PL d

www.a-m-c.com

www.tuv.com

ID 0600000000

ADDITIONAL CONTENT AVAILABLE ON THE WEBSITE AT www.a-m-c.com
DriveWare® 7 is the powerful servo drive tuning and configuration software used to commission and troubleshoot all ADVANCED Motion Controls DigiFlex® Performance™ digital servo drives. All drive limits, control loops (current, velocity, and position), and event handling can be configured in DriveWare. Notable features include a fully functional multi-channel oscilloscope, function generator and user friendly layout and interface.
**Panel Mount Drives**  
DPC drives are enclosed by a metal cover and can be mounted on their spine or flat against the base. Part of the DigiFlex® Performance™ family.

**Communication**  
- CANopen Networking - CiA DS301/DSP402  
- RS232 Drive Commissioning

**Command Types**  
- Over the Network  
- ±10V Analog  
- PWM and Direction  
- Encoder Following  
- Sequencing/Indexing  
- Jogging

**Power Range**  
- 1.5 - 27.4 kW Peak Power Output  
- 0.8 - 13.7 kW Cont. Power Output

**Primary Feedback**  
- Absolute Encoder (EnDat® or Hiperface®)  
- 1Vp-p Sin/Cos Encoder  
- Incremental Encoder  
- Resolver

**Auxiliary Feedback**  
- Hall Sensors  
- Aux. Incremental Encoder  
- Tachometer

To build a model number, select a control module by feedback type, then combine with a power module that suits your system’s requirements. 24 VDC I/O Control Modules combine with AC Power Modules, and 5VTTL I/O Control Modules combine with DC Power Modules.

### 24 VDC I/O Control Modules

<table>
<thead>
<tr>
<th>Feedback</th>
<th>DPCANIA-</th>
<th>DPCANIE-</th>
<th>DPCANIR-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Encoder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1Vp-p Sin/Cos Encoder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### AC Power Modules

<table>
<thead>
<tr>
<th>Supply (VAC)</th>
<th>015S400</th>
<th>015A400</th>
<th>030A400</th>
<th>C060A400</th>
<th>C100A400</th>
<th>030A800</th>
<th>060A800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Current (A)</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>60</td>
<td>100</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>7.5</td>
<td>7.5</td>
<td>15</td>
<td>30</td>
<td>50</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>177 x 123 x 44</td>
<td>177 x 140 x 56</td>
<td>202 x 157 x 70</td>
<td>257 x 183 x 84</td>
<td>257 x 183 x 135</td>
<td>301 x 232 x 92</td>
<td>301 x 232 x 139</td>
</tr>
</tbody>
</table>

*Single Phase AC Only

### 5VTTL I/O Control Modules

<table>
<thead>
<tr>
<th>Feedback</th>
<th>DPCANTA-</th>
<th>DPCANTE-</th>
<th>DPCANTR-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Absolute Encoder</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1Vp-p Sin/Cos Encoder</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### DC Power Modules

<table>
<thead>
<tr>
<th>Supply (VDC)</th>
<th>020B080</th>
<th>040B080</th>
<th>060B080</th>
<th>015B200</th>
<th>025B200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak Current (A)</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>7.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>133 x 90 x 36</td>
<td>191 x 112 x 36</td>
<td>191 x 112 x 36</td>
<td>133 x 90 x 36</td>
<td>191 x 112 x 36</td>
</tr>
</tbody>
</table>
Z-Drives Plug-In Integration

DZC drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping. Part of the DigiFlex® Performance™ family.

Communication
- CANopen Networking - CiA DS301/DS402
- USB Drive Commissioning (DZCANTU)
- RS232 Drive Commissioning (DZCANTE)

Command Types
- Over the Network
- ±10V Analog
- PWM and Direction
- Encoder Following
- Sequencing/Indexing
- Jogging

Power Range
- 0.9 - 4.6 kW Peak Power Output
- 0.5 - 2.3 kW Cont. Power Output

Firmware Selectable Feedback (DZCANTU)
- Absolute Encoder (EnDat®, Hiperface®, or BiSS® C-Mode)
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder

Primary Feedback (DZCANTE)
- Incremental Encoder

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

To build a model number, choose a control module then combine with a power module to meet your system’s requirements. Note that only certain power modules can be combined with each respective control module.

### Control Module

<table>
<thead>
<tr>
<th>DZCANTU DC Power Modules</th>
<th>DZCANTE DC Power Modules</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Control Module</strong></td>
<td><strong>Control Module</strong></td>
</tr>
<tr>
<td>DZCANTU-</td>
<td>DZCANTE-</td>
</tr>
<tr>
<td>Feedback</td>
<td>Feedback</td>
</tr>
<tr>
<td>Absolute Encoder</td>
<td>Incremental Encoder</td>
</tr>
<tr>
<td>1Vp-p Sin/Cos Encoder</td>
<td></td>
</tr>
<tr>
<td>Incremental Encoder</td>
<td></td>
</tr>
</tbody>
</table>

### DZCANTU DC Power Modules

- **Supply (VDC)**

- **Peak Current (A)**
  - 020B080: 20, 040B080: 40, 020B200: 20

- **Cont. Current (A)**
  - 020B080: 10, 040B080: 20, 020B200: 10

- **Dimensions (mm)**
  - 90 x 64 x 20

### DZCANTE DC Power Modules

- **Supply (VDC)**
  - 012L080: 20-80, 020L080: 10-80, 040L080: 10-80, 060L080: 10-80, 010L200: 40-175, 025L200: 40-175

- **Peak Current (A)**

- **Cont. Current (A)**

- **Dimensions (mm)**
  - 64 x 51 x 18, 64 x 51 x 23, 76 x 51 x 23, 64 x 51 x 23, 76 x 51 x 23

Example: DZCANTU-020B080

Example: DZCANTE-040L080

ADVANCED Motion Controls offers mounting cards and mating connector kits to simplify the connections between DZC drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

### DZCANTU Mounting Cards**

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XDZPC01</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
</tbody>
</table>

**Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part number KC-MC1XDZP01.

### DZCANTE Mounting Cards†

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XDZC02</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
<tr>
<td>MC1XDZC02-QD</td>
<td>Vertical-entry quick-disconnect</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>MC1XDZC02-HP1</td>
<td>Side-entry screw terminal</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

†Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part number KC-MC1XDZC02.
Panel Mount Drives
DPE drives are enclosed by a metal cover and can be mounted on their spine or flat against the base. Part of the DigiFlex® Performance™ family.

Communication
- EtherCAT® Networking - (CoE - based on DSP-402 device profile. ETG.1000.6 / ETG.6010)
- USB Drive Commissioning

Command Types
- Over the Network
- ±10V Analog
- Encoder Following
- Sequencing/Indexing
- Jogging

Power Range
- 1.5 - 27.4 kW Peak Power Output
- 0.8 - 13.7 kW Cont. Power Output

Firmware Selectable
Primary Feedback
- Absolute Encoder (EnDat®, Hiperface®, or BiSS® C-Mode)
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

To build a model number, combine the DPEANIU control module with a power module to meet your system's requirements.

DPEANIU-015S400
DPEANIU-020B080

Examples:
DPEANIU-015S400
DPEANIU-020B080
**Z-Drives Plug-In Integration**

DZE/DZS drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping. Part of the DigiFlex® Performance™ family.

**Communication**
- EtherCAT® Networking - (CoE - based on DSP-402 device profile. ETG.1000.6 / ETG.6010)
- ‘DxM™’ Technology
- USB Drive Commissioning

To build a model number, select a control module based on the EtherCAT® node type and combine with a power module to meet your system's requirements.

---

### Control Modules

<table>
<thead>
<tr>
<th>Node Type</th>
<th>Feedback</th>
<th>DZEANTU-</th>
<th>DZSANTU-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Node</td>
<td>Absolute Encoder</td>
<td>1Vp-p Sin/Cos Encoder</td>
<td>1Vp-p Sin/Cos Encoder</td>
</tr>
<tr>
<td>Sub-Node</td>
<td>Incremental Encoder</td>
<td>Incremental Encoder</td>
<td>Incremental Encoder</td>
</tr>
</tbody>
</table>

### DC Power Module

<table>
<thead>
<tr>
<th></th>
<th>020B080</th>
<th>040B080</th>
<th>020B200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>20-80</td>
<td>20-80</td>
<td>40-175</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>20</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>90 x 64 x 20</td>
<td>90 x 64 x 20</td>
<td>90 x 64 x 20</td>
</tr>
</tbody>
</table>

**Examples:**
- DZEANTU-020B080
- DZSANTU-020B080

---

**Firmware Selectable Feedback**
- Absolute Encoder (EnDat®, Hiperface®, or BiSS® C-Mode)
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder

**Auxiliary Feedback**
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

---

**Command Types**
- Over the Network
- ±10V Analog
- Encoder Following
- Sequencing/Indexing
- Jogging

**Power Range**
- 1.5 - 3.3kW Peak Power Output
- 0.8 - 1.6kW Cont. Power Output

**Universal Feedback**
These drives support all the listed feedback devices simply by changing the drive firmware. The appropriate firmware can be uploaded to the drive through DriveWare® and is included with the software download.

DZE drives can be used as a stand-alone EtherCAT® node in a single-axis setup or as part of a larger multi-axis EtherCAT® network. DZS drives must be used as sub-nodes in a ‘DxM’ configuration with a DZE node.

---

**Mounting Cards**

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current*</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XDZPE01</td>
<td>1 Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
<tr>
<td>MC4XDZP01</td>
<td>4 Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
</tbody>
</table>

*Per Axis

---

**Mating Connector Kit**
Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part numbers KC-MC1XDZPE01 for the MC1XDZPE01 and KC-MC4XDZP01 for the MC4XDZP01.
DPP series - POWERLINK, Modbus TCP or Ethernet panel mount

Panel Mount Drives
DPP drives are enclosed by a metal cover and can be mounted on their spine or flat against the base. Part of the DigiFlex® Performance™ family.

Communication
- Ethernet POWERLINK, Modbus TCP or Ethernet Networking
- USB Drive Commissioning

Command Types
- Over the Network
- ±10V Analog
- Encoder Following
- Sequencing/Indexing
- Jogging

Power Range
- 1.5 - 27.4 kW Peak Power Output
- 0.8 - 13.7 kW Cont. Power Output

Firmware Selectable

Primary Feedback
- Absolute Encoder (EnDat®, Hiperface®, or BiSS® C-Mode)
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

To build a model number, combine the DPEANIU control module with a power module to meet your system’s requirements.

**24 VDC I/O Control Module**

<table>
<thead>
<tr>
<th>Feedback</th>
<th>DPPANIU-</th>
<th>Universal Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute Encoder</td>
<td>DPP drives support all the listed feedback devices simply by changing the drive firmware. The appropriate firmware can be uploaded to the drive through DriveWare® and is included with the software download.</td>
</tr>
<tr>
<td></td>
<td>1Vp-p Sin/Cos Encoder</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Incremental Encoder</td>
<td></td>
</tr>
</tbody>
</table>

**AC Power Modules**

<table>
<thead>
<tr>
<th></th>
<th>015S400</th>
<th>030A400</th>
<th>C060A400</th>
<th>C100A400</th>
<th>030A800</th>
<th>060A800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VAC)</td>
<td>100-240*</td>
<td>100-240</td>
<td>200-240</td>
<td>200-240</td>
<td>200-480</td>
<td>200-480</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>15</td>
<td>30</td>
<td>60</td>
<td>100</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>7.5</td>
<td>15</td>
<td>30</td>
<td>50</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>177 x 123 x 44</td>
<td>202 x 157 x 70</td>
<td>257 x 183 x 84</td>
<td>257 x 183 x 135</td>
<td>301 x 232 x 92</td>
<td>301 x 232 x 139</td>
</tr>
</tbody>
</table>

*Single Phase AC Only

**DC Power Module**

<table>
<thead>
<tr>
<th></th>
<th>020B080</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>20-80</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>20</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>10</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>167 x 90 x 36</td>
</tr>
</tbody>
</table>

Examples:
- DPPANIU-015S400
- DPPANIU-020B080
DZP series - POWERLINK, Modbus TCP or Ethernet pcb mount

Z-Drives Plug-In Integration
DZP drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping. Part of the DigiFlex® Performance™ family.

Command Types
- Over the Network
- ±10V Analog
- Encoder Following
- Sequencing/Indexing
- Jogging

Power Range
- 1.5 - 3.3kW Peak Power Output
- 0.8 - 1.6kW Cont. Power Output

Firmware Selectable Feedback
- Absolute Encoder (EnDat®, Hiperface®, or BISS® C-Mode)
- 1Vp-p Sin/Cos Encoder
- Incremental Encoder

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

Communication
- Ethernet POWERLINK, Modbus TCP or Ethernet Networking
- USB Drive Commissioning

To build a model number, combine a power module to meet your system’s requirements with the DZPANTU control module.

Control Modules

<table>
<thead>
<tr>
<th>DZPANTU-</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Absolute Encoder</td>
</tr>
<tr>
<td></td>
<td>1Vp-p Sin/Cos Encoder</td>
</tr>
<tr>
<td></td>
<td>Incremental Encoder</td>
</tr>
</tbody>
</table>

Universal Feedback
DZP drives support all the listed feedback devices simply by changing the drive firmware. The appropriate firmware can be uploaded to the drive through DriveWare® and is included with the software download.

DC Power Module

<table>
<thead>
<tr>
<th></th>
<th>020B080</th>
<th>040B080</th>
<th>020B200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>20-80</td>
<td>20-80</td>
<td>40-175</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>20</td>
<td>40</td>
<td>20</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>10</td>
<td>20</td>
<td>10</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>90 x 64 x 20</td>
<td>90 x 64 x 20</td>
<td>90 x 64 x 20</td>
</tr>
</tbody>
</table>

Examples: DZPANTU-020B080

ADVANCED Motion Controls offers mounting cards to simplify the connections between DZP drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

Mounting Cards

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XDZPE01</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
</tbody>
</table>

Mating Connector Kit
Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part numbers KC-MC1XDZP01.
Panel Mount Drives
DPR drives are enclosed by a metal cover and can be mounted on their spine or flat against the base. Part of the DigiFlex® Performance™ family.

Communication
- RS485/232 or Modbus RTU Networking
- RS232 Drive Commissioning

Command Types
- Over the Network (All)
- ±10V Analog (All)
- 24V Step and Direction (DPRAHIE)
- 5V Step and Direction (DPRALTx)
- PWM and Direction (All)
- Encoder Following (All)
- Sequencing/Indexing (All)
- Jogging (All)

Primary Feedback
- Incremental Encoder
- Resolver

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

Power Range
- 1.5 - 27.4 kW Peak Power Output
- 0.8 - 13.7 kW Cont. Power Output

To build a model number, select a control module by command (see Command Types above) and feedback type, then combine with a power module that suits your system’s requirements. 24 VDC I/O Control Modules combine with AC Power Modules, and 5VTTL Control Modules combine with DC Power Modules.

---

**AC Power Modules**

<table>
<thead>
<tr>
<th>Feedback</th>
<th>DPRAHIE-</th>
<th>DPRANIE-</th>
<th>DPRANIR-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Example:</td>
<td>DPRAHIE-030A400</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>015S400</th>
<th>015A400</th>
<th>030A400</th>
<th>C060A400</th>
<th>C100A400</th>
<th>030A800</th>
<th>060A800</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VAC)</td>
<td>100-240*</td>
<td>100-240</td>
<td>100-240</td>
<td>200-240</td>
<td>200-240</td>
<td>200-480</td>
<td>200-480</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>15</td>
<td>15</td>
<td>30</td>
<td>60</td>
<td>100</td>
<td>30</td>
<td>60</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>7.5</td>
<td>7.5</td>
<td>15</td>
<td>30</td>
<td>50</td>
<td>15</td>
<td>30</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>177 x 123 x 44</td>
<td>177 x 140 x 56</td>
<td>202 x 157 x 70</td>
<td>257 x 183 x 84</td>
<td>257 x 183 x 135</td>
<td>301 x 232 x 92</td>
<td>301 x 232 x 139</td>
</tr>
</tbody>
</table>

*Single Phase AC Only

---

**DC Power Modules**

<table>
<thead>
<tr>
<th></th>
<th>020B080</th>
<th>040B080</th>
<th>060B080</th>
<th>015B200</th>
<th>025B200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>20-80</td>
<td>20-80</td>
<td>20-80</td>
<td>40-190</td>
<td>20-190</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>15</td>
<td>25</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>10</td>
<td>20</td>
<td>30</td>
<td>7.5</td>
<td>12.5</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>133 x 90 x 36</td>
<td>191 x 112 x 36</td>
<td>191 x 112 x 36</td>
<td>133 x 90 x 36</td>
<td>191 x 112 x 36</td>
</tr>
</tbody>
</table>
DZR series - RS485/232 or Modbus RTU pcb mount

Z-Drives Plug-In Integration
DZR drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping. Part of the DigiFlex® Performance™ family.

Communication
- RS485/232 or Modbus RTU Networking
- RS232 Drive Commissioning

Command Types
- Over the Network
- ±10V Analog
- 5V Step and Direction
- PWM and Direction
- Encoder Following
- Sequencing/Indexing
- Jogging

Primary Feedback
- Incremental Encoder

Power Range
- 0.9 - 4.6 kW Peak Power Output
- 0.5 - 2.3 kW Cont. Power Output

Auxiliary Feedback
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

RS-485/232 Serial

To build a model number, combine a power module to meet your system’s requirements with the DZRALTE control module.

### Control Module

<table>
<thead>
<tr>
<th>Feedback</th>
<th>DZRALTE- Incremental Encoder</th>
</tr>
</thead>
</table>

### DC Power Modules

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply (VDC)</th>
<th>Peak Current (A)</th>
<th>Cont. Current (A)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>012L080</td>
<td>20-80</td>
<td>12</td>
<td>6</td>
<td>64 x 51 x 18</td>
</tr>
<tr>
<td>020L080</td>
<td>10-80</td>
<td>20</td>
<td>12</td>
<td>64 x 51 x 23</td>
</tr>
<tr>
<td>040L080</td>
<td>10-80</td>
<td>40</td>
<td>20</td>
<td>76 x 51 x 23</td>
</tr>
<tr>
<td>060L080</td>
<td>10-80</td>
<td>60</td>
<td>30</td>
<td>76 x 51 x 23</td>
</tr>
<tr>
<td>010L200</td>
<td>40-175</td>
<td>10</td>
<td>5</td>
<td>64 x 51 x 23</td>
</tr>
<tr>
<td>025L200</td>
<td>40-175</td>
<td>25</td>
<td>12.5</td>
<td>76 x 51 x 23</td>
</tr>
</tbody>
</table>

### Example:
DZRALTE-040L080

ADVANCED Motion Controls offers mounting cards and mating connector kits to simplify the connections between DZR drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

### Mounting Cards

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
<tr>
<td>1</td>
<td>Vertical-entry quick-disconnect</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>1</td>
<td>Side-entry screw terminal</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

### Mating Connector Kit
Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part number KC-MC1XDZ02.
Analog Servo Drives

ADVANCED Motion Controls’ family of Analog Servo Drives provide unparalleled benefits in both simplicity and performance. Drive setup and operation is more straightforward than digital drives, while achieving higher bandwidth and faster response times at a lower cost. Analog drive technology has been a staple of servo system solutions since day one, and our years of experience in building the highest quality products has created a solid and continuously improving selection of analog drives. A variety of command options, including ±10V analog, PWM and Direction, dual Sine wave, and specialized electric vehicle commands make the ADVANCED Motion Controls’ family of analog drives your best choice for proven servo solutions.

- Built-in hardware protection - Over Current, Over Voltage, Over Temperature, Short Circuit
- DIP Switches and Potentiometers for loop tuning, current limit adjustments, and drive configuration
- Standard models for both brushed and brushless motor varieties
- Velocity feedback provided by incremental encoder, Hall Sensors, or tachometer
- Analog Position Loop control available
- Optical Isolation between high and low power signals standard on most models
- Current, Velocity, and Fault Monitor analog output signals
- Status LEDs for power and drive status
- Standard models in both Panel Mount, PCB Mount (Z-Drives), and Vehicle Mount (M/V™ Series Motor Controllers)
- Four quadrant regenerative operation
- Extended Environment versions available (AZX series Z-Drives)
**ANALOG SERVO DRIVES**

**Input Command Signals**

- **±10 V Analog**
  
  - Controller Output
  - Servo Drive Input
  
  » Single-ended or differential ±10V analog input command used to adjust the motor current, voltage or speed.

- **PWM & Direction**
  
  - Controller Output
  - Servo Drive Input
  
  » Torque Mode PWM - The PWM signal is converted to an analog voltage in the drive used as the command signal into the current loop (similar to current mode in other products). The input duty-cycle controls the drive’s output current.

- **Dual Sine Wave**
  
  - Controller Output
  - Servo Drive Input
  
  » Two sinusoidal command signals that correspond to the motor phase current that control the commutation and torque to the motor.
**Panel Mount Drives**
These analog brushless drives are enclosed by a metal cover and can be mounted on their spine or flat against the base.

**Command Types**
- ±10V Analog

**Primary Feedback**
- Hall Sensors
- Incremental Encoder
- Tachometer

**Modes of Operation**
- Current
- Encoder Velocity
- Hall Velocity
- Duty Cycle (Open Loop)

**Power Range**
- 1.1 - 35.4kW Peak Power Output
- 0.6 - 17.7kW Cont. Power Output

To select a model number, choose a model that matches your system’s power requirements with the desired mode of operation. Consult the drive datasheet for additional ordering options.

### DC Power Models

<table>
<thead>
<tr>
<th>Supply (VAC)</th>
<th>Supply (VDC)</th>
<th>Peak Current (A)</th>
<th>Cont. Current (A)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B15A8</td>
<td>20-80</td>
<td>15</td>
<td>7.5</td>
<td>129 x 76 x 25</td>
</tr>
<tr>
<td>BE15A8</td>
<td>20-80</td>
<td>15</td>
<td>7.5</td>
<td>129 x 76 x 25</td>
</tr>
<tr>
<td>B30A8</td>
<td>20-80</td>
<td>30</td>
<td>15</td>
<td>187 x 112 x 25</td>
</tr>
<tr>
<td>BE30A8</td>
<td>20-80</td>
<td>30</td>
<td>15</td>
<td>187 x 112 x 25</td>
</tr>
<tr>
<td>B25A20</td>
<td>40-190</td>
<td>25</td>
<td>12.5</td>
<td>187 x 112 x 25</td>
</tr>
<tr>
<td>BE25A20</td>
<td>40-190</td>
<td>25</td>
<td>12.5</td>
<td>187 x 112 x 25</td>
</tr>
<tr>
<td>B30A40</td>
<td>60-400</td>
<td>30</td>
<td>15</td>
<td>203 x 143 x 41</td>
</tr>
<tr>
<td>B40A40</td>
<td>60-400</td>
<td>40</td>
<td>20</td>
<td>235 x 159 x 64</td>
</tr>
</tbody>
</table>

### AC or DC Power Models

<table>
<thead>
<tr>
<th>Supply (VAC)</th>
<th>Supply (VDC)</th>
<th>Peak Current (A)</th>
<th>Cont. Current (A)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>B25A20AC</td>
<td>30-125</td>
<td>25</td>
<td>12.5</td>
<td>187 x 107 x 62</td>
</tr>
<tr>
<td>BE25A20AC</td>
<td>30-125</td>
<td>25</td>
<td>12.5</td>
<td>187 x 107 x 62</td>
</tr>
<tr>
<td>B30A40AC</td>
<td>45-265</td>
<td>30</td>
<td>15</td>
<td>203 x 166 x 103</td>
</tr>
<tr>
<td>B40A40AC</td>
<td>45-265</td>
<td>40</td>
<td>20</td>
<td>235 x 164 x 114</td>
</tr>
<tr>
<td>B060A400AC</td>
<td>200-240</td>
<td>60</td>
<td>30</td>
<td>257 x 183 x 84</td>
</tr>
<tr>
<td>B100A400AC</td>
<td>200-240</td>
<td>100</td>
<td>50</td>
<td>257 x 183 x 135</td>
</tr>
</tbody>
</table>

### Modes of Operation

<table>
<thead>
<tr>
<th>Current</th>
<th>Velocity</th>
<th>Duty Cycle</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hall</td>
<td>Encoder</td>
<td>Tach</td>
</tr>
</tbody>
</table>

- ✓: Available
- : Not Available
AZ series - Brushless/Brushed pcb mount

Z-Drives Plug-In Integration
AZ drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping.

Command Types
- ±10V Analog
- PWM and Direction (Torque Mode)

To build a model number, select a control module based on the desired mode of operation, then combine with a power module to meet your system’s requirements.

Modes of Operation
- Current
- Encoder Velocity
- Hall Velocity
- Duty Cycle (Open Loop)
- Torque Mode PWM

Power Range
- 0.3 - 4.6kW Peak Power Output
- 0.2 - 2.3kW Cont. Power Output

Primary Feedback
- Hall Sensors
- Incremental Encoder
- Tachometer

Potentiometers
- Loop Gain
- Offset

AZ Control Modules

<table>
<thead>
<tr>
<th>Operating Mode</th>
<th>AZB...</th>
<th>AZBE...</th>
<th>AZBH...</th>
<th>AZBDC...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Encoder Velocity</td>
<td>Current</td>
<td>Duty Cycle</td>
<td>Hall Velocity</td>
<td>Duty Cycle</td>
</tr>
<tr>
<td>Duty Cycle Torque Mode PWM</td>
<td></td>
<td></td>
<td>Torque Mode PWM</td>
<td></td>
</tr>
</tbody>
</table>

Examples:
AZB20A8
AZBE40A8
AZBDC6A8
AZB10A4IC

Combining to form model number

AZ Control Modules

<table>
<thead>
<tr>
<th>DC Power Modules†</th>
<th>10A4</th>
<th>10A4IC*</th>
<th>6A8</th>
<th>12A8</th>
<th>20A8</th>
<th>40A8</th>
<th>60A8</th>
<th>10A20</th>
<th>25A20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>10-36</td>
<td>10-36</td>
<td>20-80</td>
<td>20-80</td>
<td>10-80</td>
<td>10-80</td>
<td>10-80</td>
<td>40-175</td>
<td>40-175</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>10</td>
<td>10</td>
<td>6</td>
<td>12</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>10</td>
<td>25</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>5</td>
<td>5</td>
<td>3</td>
<td>6</td>
<td>12</td>
<td>20</td>
<td>30</td>
<td>6</td>
<td>12.5</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>38 x 38 x 7</td>
<td>38 x 38 x 17</td>
<td>64 x 51 x 17</td>
<td>64 x 51 x 17</td>
<td>64 x 51 x 23</td>
<td>76 x 51 x 23</td>
<td>76 x 51 x 23</td>
<td>64 x 51 x 23</td>
<td>76 x 51 x 23</td>
</tr>
</tbody>
</table>

†10A4 and 10A4IC power modules only compatible with AZB and AZBDC control modules.
*AZB10A4IC model is a drive and interface card assembly. Interface card is soldered to the drive and features quick-disconnect connectors.

ADVANCED Motion Controls offers mounting cards to simplify the connections between AZ drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

Mounting Cards

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XAZ01</td>
<td>Vertical-entry quick-disconnect</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>MC1XAZ01-HR</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>60</td>
</tr>
<tr>
<td>MC1XAZ02</td>
<td>Side-entry screw terminal</td>
<td>36</td>
<td>10</td>
</tr>
</tbody>
</table>
### Brushed panel mount

**Panel Mount Drives**
These analog brushed drives are enclosed by a metal cover and can be mounted on their spine or flat against the base.

**Command Types**
- ±10V Analog

**Potentiometers**
- Loop Gain
- Current Limit
- Reference Gain
- Offset/Test Signal

**Power Range**
- 0.6 - 38kW Peak Power Output
- 0.3 - 19kW Cont. Power Output

**Primary Feedback**
- Tachometer

**Modes of Operation**
- Current
- Voltage
- IR Compensation
- Velocity

To select a model number, choose a model that matches your system’s power requirements.

### Brushed ±10V Analog Command Models

<table>
<thead>
<tr>
<th>Model</th>
<th>Supply (VAC)</th>
<th>Supply (VDC)</th>
<th>Peak Current (A)</th>
<th>Cont. Current (A)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>12A8</td>
<td>20-80</td>
<td>12</td>
<td>6</td>
<td>129 x 76 x 25</td>
<td></td>
</tr>
<tr>
<td>25A8</td>
<td>20-80</td>
<td>25</td>
<td>12.5</td>
<td>129 x 76 x 25</td>
<td></td>
</tr>
<tr>
<td>30A8</td>
<td>20-80</td>
<td>30</td>
<td>15</td>
<td>187 x 112 x 25</td>
<td></td>
</tr>
<tr>
<td>50A8</td>
<td>20-80</td>
<td>50</td>
<td>25</td>
<td>187 x 112 x 25</td>
<td></td>
</tr>
<tr>
<td>120A10</td>
<td>20-80</td>
<td>120</td>
<td>60</td>
<td>254 x 130 x 49</td>
<td></td>
</tr>
<tr>
<td>20A20</td>
<td>40-190</td>
<td>20</td>
<td>10</td>
<td>129 x 76 x 25</td>
<td></td>
</tr>
<tr>
<td>100A40</td>
<td>80-400</td>
<td>100</td>
<td>50</td>
<td>235 x 183 x 92</td>
<td></td>
</tr>
</tbody>
</table>

### Modes of Operation

<table>
<thead>
<tr>
<th>Current</th>
<th>Velocity (Tach)</th>
<th>Voltage</th>
<th>IR Comp</th>
</tr>
</thead>
<tbody>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
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<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
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</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
S series - Sinusoidal commutation drives

Panel Mount Drives
These sinusoidal drives are enclosed by a metal cover and can be mounted on their spine or flat against the base.

Power Range
- 1.2 - 38kW Peak Power Output
- 0.6 - 19kW Cont. Power Output

Mode of Operation
- Current

Command Types
- 120° Sine

S series drives are the only analog drives offered by ADVANCED Motion Controls with sinusoidal commutation (all digital DigiFlex® Performance™ models use sinusoidal commutation). S series drives require two specialized sinusoidal command signals from an external controller that correspond to the motor phase currents and control the commutation and torque to the motor.

To select a model number, choose a model that matches your system’s power requirements.

### ‘S’ Series Models

<table>
<thead>
<tr>
<th>Supply (VAC)</th>
<th>Supply (VDC)</th>
<th>Peak Current (A)</th>
<th>Cont. Current (A)</th>
<th>Dimensions (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>S16A8</td>
<td>-</td>
<td>16</td>
<td>8</td>
<td>129 x 78 x 39</td>
</tr>
<tr>
<td>SX25A20</td>
<td>-</td>
<td>25</td>
<td>12.5</td>
<td>187 x 112 x 37</td>
</tr>
<tr>
<td>S30A40</td>
<td>-</td>
<td>30</td>
<td>15</td>
<td>203 x 143 x 41</td>
</tr>
<tr>
<td>S30A40AC</td>
<td>45-270</td>
<td>30</td>
<td>15</td>
<td>203 x 166 x 103</td>
</tr>
<tr>
<td>S60A40</td>
<td>-</td>
<td>60</td>
<td>30</td>
<td>235 x 160 x 89</td>
</tr>
<tr>
<td>S60A40AC</td>
<td>45-270</td>
<td>60</td>
<td>30</td>
<td>235 x 162 x 155</td>
</tr>
<tr>
<td>S100A40</td>
<td>-</td>
<td>100</td>
<td>50</td>
<td>271 x 234 x 92</td>
</tr>
</tbody>
</table>

All motor feedback is returned to the controller, which tracks the motor rotor position and outputs the correct signals to the drive in order to maintain the proper phase angle.
ADVANCED Motion Controls’ Extended Environment products are designed to operate under harsh thermal and mechanical extremes. An expanded thermal operating range allows these drives to function in both hot and cold ambient environments, and enhanced protection against shock and vibration provides additional system ruggedness. Extended Environment drives also afford benefits for applications in more docile conditions. The superior thermal capabilities reduce or eliminate the need for cooling systems such as external heat sinks and fans, enabling system designs to be more compact and to improve overall reliability.

- Ambient operating temperatures ranging from -40°C to 85°C (-45°F to 185°F)
- Over Temperature heat sink protection up to 105°C (221°F)
- Thermal rise cycling in about 2 minutes
- Shock up to 15g’s at 11ms
- Vibration up to 30grms on all 3 axes

- Standard models in PCB Mount (Z-Drives) form factor - Panel Mount models available as custom designs
- Designed to assist system compliance toward:
  - MIL-STD-810F: temperature, thermal shock, humidity, altitude, shock & vibration
  - MIL-STD-1275D: characterization of 28VDC systems
  - MIL-STD-461E: control of electromagnetic interference
  - MIL-STD-704F: aircraft power characteristics
  - MIL-HDBK-217: reliability predictions
- Tested to meet above standards upon customer request

DZX series
- DigiFlex® Performance™ Z-Drives
- User selected I/O and Event Handling
- Configurable limits & gains
- Distributed network control
- Comprehensive diagnostics

AZX series
- Analog Z-Drives
- Highest bandwidth possible
- Dedicated operating modes
- Highest operating temperature
- Simplest installed platform
Extended Environment Servo Drives

-40°C AZX/DZX Series

-50°C and lower! Custom Drives

+75°C DZX Series

+85°C AZX Series

+100°C and higher! Custom Drives
**Z-Drives Plug-In Integration**
DZX drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping. Part of the DigiFlex® Performance™ family.

**Communication**
- CANopen - CiA DS301/DSP402 (DZXCANTE)
- RS485/232 or Modbus Networking (DZXRALTE)
- RS232 Drive Commissioning

**Command Types**
- Over the Network
- ±10V Analog
- 5V Step and Direction
- PWM and Direction
- Encoder Following
- Sequencing/Indexing
- Jogging

**Power Range**
- 0.6 - 3kW Peak Power Output
- 0.3 - 1.5kW Cont. Power Output

**Extended Environment**
- -40ºC to +75ºC Ambient Operating Range
- Shock up to 15g’s
- Designed to Environmental Engineering Considerations as defined in MIL-STD-810F

**Primary Feedback**
- Incremental Encoder

**Auxiliary Feedback**
- Hall Sensors
- Aux. Incremental Encoder
- Tachometer

To build a model number, select a control module based on network communication type, then combine with a power module to meet your system’s requirements.

---

**DZX Control Modules**

<table>
<thead>
<tr>
<th>DZXCANTE-</th>
<th>DZXRALTE-</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network</td>
<td>CANopen</td>
</tr>
</tbody>
</table>

**DC Power Modules**

<table>
<thead>
<tr>
<th>DZXCANTE-040L080</th>
<th>008L080</th>
<th>015L080</th>
<th>040L080</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>10-80</td>
<td>10-80</td>
<td>10-80</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>8</td>
<td>15</td>
<td>40</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>4</td>
<td>7.5</td>
<td>20</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>64 x 51 x 24</td>
<td>64 x 51 x 24</td>
<td>76 x 51 x 23</td>
</tr>
</tbody>
</table>

**ADVANCED Motion Controls** offers mounting cards to simplify the connections between DZX drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

**Mounting Cards**

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XDZxx02</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>40</td>
</tr>
<tr>
<td>MC1XDZxx02-QD</td>
<td>Vertical-entry quick-disconnect</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>MC1XDZxx02-HP1</td>
<td>Side-entry screw terminal</td>
<td>80</td>
<td>60</td>
</tr>
</tbody>
</table>

*M Replace “x” in the model number with “C” for DZXCANTE drives or “R” for DZXRALTE drives

---

**Mating Connector Kit**
Mating connector housing and socket contacts can be ordered as a kit using ADVANCED Motion Controls’ part number KC-MC1XDZ02.
**AZX series - Extended Environment analog pcb mount**

**Z-Drives Plug-In Integration**
AZX drives are packaged in a lightweight and compact form factor designed to be embedded directly into a PCB - no wires required! Inverted baseplate mounting also allows for direct wired connector access. A common footprint is used for the different power modules in the series to simplify prototyping.

**Command Types**
- ±10V Analog
- PWM and Direction (Torque Mode)

**Modes of Operation**
- Current
- Encoder Velocity
- Hall Velocity
- Duty Cycle (Open Loop)
- Torque Mode PWM

**Extended Environment**
- -40ºC to +85ºC Ambient Operating Range
- Shock up to 15g’s
- Designed to Environmental Engineering Considerations as defined in MIL-STD-810F

**Primary Feedback**
- Hall Sensors
- Incremental Encoder
- Tachometer

**Potentiometers**
- Loop Gain
- Offset

**Power Range**
- 0.6 - 3.0kW Peak Power Output
- 0.3 - 1.5kW Cont. Power Output

To build a model number, select a control module based on the desired mode of operation, then combine with a power module to meet your system’s requirements.

---

<table>
<thead>
<tr>
<th>AZX Control Modules</th>
<th>AZXB...</th>
<th>AZXBE...</th>
<th>AZXBH...</th>
<th>AZXBDC...</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Operating Mode</strong></td>
<td>Current</td>
<td>Encoder Velocity</td>
<td>Hall Velocity</td>
<td>Duty Cycle</td>
</tr>
<tr>
<td><strong>DC Power Modules</strong></td>
<td>8A8</td>
<td>15A8</td>
<td>25A8</td>
<td>40A8</td>
</tr>
<tr>
<td><strong>Supply (VDC)</strong></td>
<td>10-80</td>
<td>10-80</td>
<td>10-80</td>
<td>10-80</td>
</tr>
<tr>
<td><strong>Peak Current (A)</strong></td>
<td>8</td>
<td>15</td>
<td>25</td>
<td>40</td>
</tr>
<tr>
<td><strong>Cont. Current (A)</strong></td>
<td>4</td>
<td>7.5</td>
<td>12.5</td>
<td>20</td>
</tr>
<tr>
<td><strong>Dimensions (mm)</strong></td>
<td>64 x 51 x 23</td>
<td>64 x 51 x 23</td>
<td>76 x 51 x 23</td>
<td>76 x 51 x 23</td>
</tr>
</tbody>
</table>

---

ADVANCED Motion Controls offers mounting cards to simplify the connections between AZX drives and external system hardware (motors, feedback devices, controllers). These mounting cards are ideal for the prototyping and development stages as well as implementation into the final system design.

**Mounting Cards**

<table>
<thead>
<tr>
<th>Axes</th>
<th>Motor/Power Connector</th>
<th>Max Voltage</th>
<th>Max Peak Current</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC1XAZ01</td>
<td>Vertical-entry quick-disconnect</td>
<td>175</td>
<td>25</td>
</tr>
<tr>
<td>MC1XAZ01-HR</td>
<td>Side-entry screw terminal</td>
<td>175</td>
<td>60</td>
</tr>
</tbody>
</table>
M/V™ Series Vehicle Mount Motor Controllers

ADVANCED Motion Controls’ family of M/V™ series vehicle mount motor controllers are fully functional, four-quadrant servo drives purpose designed and built to operate today’s modern mobile electric vehicular platforms. Available in both analog and digital versions and packaged in a compact and rugged IP65 case, M/V series motor controllers provide high power from battery supplies for either permanent magnet brushed or brushless motors. Whether for traction / propulsion, steering, lifting, or any other electrically driven actuation, the unmatched power density, high efficiency, low weight, built-in regen, and cool thermal operation of M/V series motor controllers provide optimum performance for mobile electric vehicular applications.

- Analog (AVB, AB) and Digital (DVC) models provide solutions for a wide range of command, configuration, and network options
- Selectable throttle command inputs: 0-5V or 0-5kΩ
- Standard and vehicle-specific I/O for over 60 events and signals
- Compact, Rugged, Vehicle Mount Design - IP65 Rating
- Watertight I/O, signal, and feedback connector
- Watertight access panel for drive configuration and setup
- Selectable modes of operation
- DVC models configurable through DriveWare® 7, offering the same capabilities range of DigiFlex® Performance™ digital servo drives
- AVB and AB models configurable through DIP Switches and potentiometers
- Dedicated STO (Safe Torque Off) Inputs available on select models - suitable for use in safety-related systems according to:
  - IEC 61508 SIL 3
  - EN ISO 13849-1 Category 3 / PL d

20-54 VDC
250 A peak
150 A cont

40-175 VDC
400 A peak
100 A cont

40-175 VDC
400 A peak
100 A cont
M/V™ SERIES MOTOR CONTROLLERS

M/V series motor controllers feature unique programmable and dedicated inputs and outputs designed with mobile electric vehicular applications in mind.

- Key Switch / Main Contactor Operation
- Electromagnetic Holding Brake Output
- Speed Limit Input
- Reduced Speed Reverse
- Forward / Reverse Inputs
- "Push" (Neutral) Input
- Horn / Reverse Alarm

Vehicle Specific I/O

Throttle Command Inputs

M/V series motor controllers are configurable for a variety of different throttle command types common in electric vehicular applications. Each command type is user-selectable as standard single-ended, inverse single-ended, wigwag, or inverse wigwag.

- **0-5V Analog Voltage**
  On DVC and AVB models, an external 0 - 5 volt supply provides the command input source.

- **5kΩ Potentiometer**
  On DVC and AVB models, an external 5kΩ potentiometer can be used in either a 3-wire or 2-wire configuration to provide the command source.

- **±10V Analog**
  On DVC and AB models, an external or on-board ±10 volt supply provides the command input source.
Vehicle Mount Drives
M/V™ drives are packaged in an IP65 ruggedized enclosure designed for mounting in electric vehicles. DVC drives are part of the DigiFlex® Performance™ family.

Communication
- CANopen Networking - CiA DS301/DSP402
- USB Drive Commissioning

Power Range
- 12.8 - 15.2 kW Peak Power Output
- 7.7 - 9.5 kW Cont. Power Output

Vehicle Throttle Commands
On DVC models, the command input type is selected through DriveWare:
- Wigwag/Single-Ended Command Input
- 3-Wire / 2-Wire External Potentiometer Command Source
- Standard / Inverted Inputs
- Reduced Speed Reverse

Command Types
- Over the Network
- ±10V Analog
- Sequencing/Indexing
- Jogging

Electric Mobility and Vehicle I/O
- Electromagnetic Holding Brake Output
- Forward and Reverse Inputs
- Push Brake Release Input
- Speed Limit Pot Input
- Reduced Speed Reverse Input
- Safe Torque Off Inputs

To build a model number combine the DVC control module with a power module to meet your system’s requirements.

M/V™ Digital Control Module
Combine to form model number

DVC...

Network
CANopen

DC Power Modules

Examples: DVC250A060

<table>
<thead>
<tr>
<th></th>
<th>250A060</th>
<th>200A100</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply (VDC)</td>
<td>20-54</td>
<td>20-80</td>
</tr>
<tr>
<td>Peak Current (A)</td>
<td>250</td>
<td>200</td>
</tr>
<tr>
<td>Cont. Current (A)</td>
<td>150</td>
<td>125</td>
</tr>
<tr>
<td>Dimensions (mm)</td>
<td>203 x 140 x 60</td>
<td>203 x 140 x 60</td>
</tr>
</tbody>
</table>

Vehicle Throttle Commands

Mating Connector Kit
Mating connector housing, socket contacts, and seal plugs can be ordered as a kit using ADVANCED Motion Controls’ part number KC-35AMPSEAL01.

Safe Torque Off
DVC models feature dedicated Safe Torque Off (STO) inputs that prevent any current-generating energy from reaching the motor. Functional Safety STO meets requirements of the following standards:
- EN ISO 13849-1
- EN IEC 61800-5-2
- EN 62061
- IEC 61508
- Category 3 / PL d
- STO (SIL 3)
- SIL CL 3
- SIL 3

Primary Feedback
- Incremental Encoder

Auxiliary Feedback
- Hall Sensors
- Tachometer
AVB/AB series - vehicle mount analog motor controllers

**Vehicle Mount Drives**
M/V™ drives are packaged in an IP65 ruggedized enclosure designed for mounting in electric vehicles.

**Command Types**
- ±10V Analog
- 0-5kΩ Potentiometer
- 0-5V Analog

**Power Range**
- 12.8 - 20.8 kW Peak Power Output
- 7.7 - 16.6 kW Cont. Power Output

To build a model number, select a control module based on the application category, then combine with a power module to meet your system's requirements.

**Potentiometers**
- Loop Gain
- Current Limit
- Reference Gain
- Offset/Test Signal
- Ramp Time
- Deadband

**Power Range**
- 12.8 - 20.8 kW Peak Power Output
- 7.7 - 16.6 kW Cont. Power Output

**Electric Mobility and Vehicle I/O**
- Electromagnetic Holding Brake Output
- Forward and Reverse Inputs
- Push Brake Release Inputs
- Speed Limit Pot Input
- KeySwitch Master Input

**Modes of Operation**
- Current
- Voltage
- Duty Cycle (Open Loop)
- IR Compensation
- Velocity
- Hall Velocity

**Vehicle Throttle Commands**
On AVB models, DIP switches are used to select the command input type:
- Wigwag/Single-Ended Command Input
- 3-Wire / 2-Wire External Potentiometer Command Source
- Standard / Inverted Inputs
- Half Speed Reverse

**Mating Connector Kit**
Mating connector housing, socket contacts, and seal plugs can be ordered as a kit using ADVANCED Motion Controls' part number KC-23AMPSEAL01.
ADVANCED Motion Controls 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 engineering and manufacturing for quick-turn customs capabilities, ADVANCED Motion Controls utilizes our years of expertise to decrease your costs and time-to-market while increasing system quality and reliability.

Examples of Customized Products and Options
- 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

Two on-site full SMT production lines, and four on-site engineering labs will design and support OEM solutions as if they were standard products!
Custom products are built on the same equipment and with the same people as if they were production units, enabling rapid development and fast delivery, as well as making it easy to make changes before the product is released to production.

An ISO 9001:2008 certified online documentation workflow insures accuracy and consistency throughout design, manufacturing, testing, and support of all products.

Advantages to a custom solution with ADVANCED Motion Controls:

- Reduce project development time and cost
- Simplify integration of motor, controller, power supply, feedback
- Precisely match sizing requirements

Feel free to contact our Applications Engineering department for more information on custom solutions!
Partnering with ADVANCED Motion Controls

» Superior performance and product offering
» Fast delivery to meet your needs
» Worldwide factory trained technical and sales support
» Engineering support available to you on-site
» Close collaboration with, and an extension of, your engineering team
» Diverse industrial experiences and knowledge allows us to improve your systems
» Proud of providing you with the most optimized solutions
» Passionate about your success

Providing motion control solutions to OEMs is our focus...