

Description

The DZRALTE-020L080 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 drive can be configured for a variety of external command signals. Commands can also be configured using the drive's built-in Motion Engine, an internal motion controller used with distributed motion applications. 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 DZRALTE-020L080 features a RS-232 interface for drive configuration and setup as well as a RS-485 interface for drive networking. Drive commissioning is accomplished using DriveWare® 7, available for download at www.a-m-c.com.

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

Power Range	
Peak Current	20 A (14.1 A _{RMS})
Continuous Current	12 A (12 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
- On-the-Fly Mode Switching
- On-the-Fly Gain Set Switching

MODES OF OPERATION

- Current
- Hall Velocity
- Position
- Velocity

COMMAND SOURCE

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

FEEDBACK SUPPORTED

- Halls
- Incremental Encoder
- ±10 VDC Position
- 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)

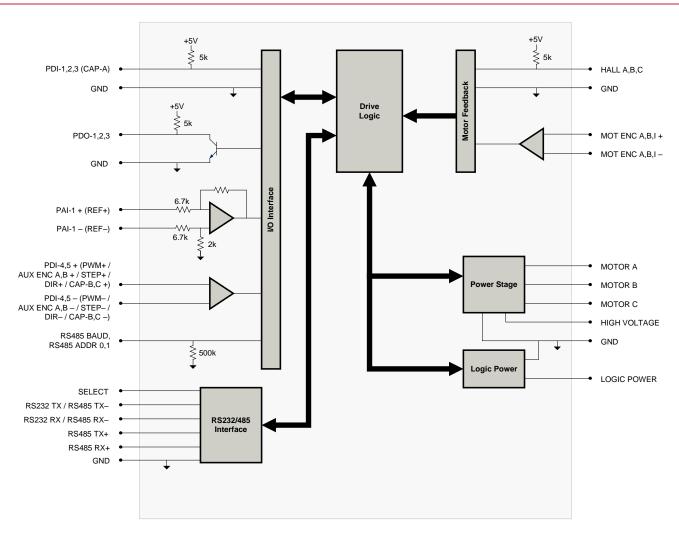
COMPLIANCES & AGENCY APPROVALS

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





BLOCK DIAGRAM



Information on Approvals and Compliances				
c FL °us	US and Canadian safety compliance with UL 508c, the industrial standard for power conversion electronics. UL registered under file number E140173. Note that machine components compliant with UL are considered UL registered as opposed to UL listed as would be the case for commercial products.			
((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.			
COMPLIANCE	RoHS (Reduction of Hazardous Substances) is intended to prevent hazardous substances such as lead from being manufactured in electrical and electronic equipment.			





SPECIFICATIONS

Description Units Value DC Supply Voltage Range VDC 40 - 80 DC Bus Under Votage Limit VDC 8 DC Bus Under Votage Limit VDC 8 Logic Supply Voltage VDC 5 (+/- 5%) Maximum Peak Output Curner! A (Arma) 20 (14-1) Maximum Continuous Output Curner! A (Arma) 12 (12) Maximum Continuous Output Prover W 912 Maximum Continuous Output Prover W 48 Internal Bus Capacitance µF 94 Internal Bus Capacitance µF 44 Maximum Output PVM Duty Cycle % 20 Swetching Frequency % XB Description Control Specifications Value Communication Interfaces 2 RS -485/232 Communication Interfaces 2 RS -485/232 C	Power Specifications				
IC Bus Under Voltage Limit VDC 88 L0gic Supply Voltage VDC 5 (+/- 5%) Maximum Deak Output Curten³ A (Arms) 20 (4:1) Maximum Dontinuous Output Curten³ A (Arms) 12 (12) Maximum Dontinuous Output Power B W 912 Maximum Dontinuous Curten³ B W 48 Internal Bus Capacitance B W 48 Memimum Load Inductance (Line-To-Line)³ B Hz 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Maximum Output PVM Duty Oyde B M2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Mostrian Frequency BM2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Mostrian Frequency B M2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Maximum Output PVM Duty Oyde B M2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Mostrian Frequency B M2 8485/23 Communication Interfaces 9 R 5485/23 Communication Interfaces 9 8 4985/23 Communic	·				
BC Bus Under Voltage Limit VDC 8 Logic Supply Voltage VDC 5 (+/-5%) Maximum Paka Output Curren¹ A (Arms) 20 (14-1) Maximum Dontinuous Output Curren² A (Arms) 12 (12) Maximum Dontinuous Output Curren² M W 912 Maximum Dontinuous Output Duren² W W 912 Maximum Dower Dissipation at Continuous Current J W 48 Internal Bus Capacitance H J 250 (at 80 V supply); 150 (at 48 V supply); 40 (at 12 V supply) Minimum Load Inductance (Line 1-G-Line)² H M 20 Control Secription Value Control Secription Value Communication Interfaces P - Redback Secription Value Communication Interfaces P - Redback Supported P - Redback Secription Value Communication Interfaces P - Redback Supported P - Consect Secription Value Secription Motes of Operation P - Consect Secreption P - Consect Secreption Secreption P - Consect Secreption Secreption Secreption Secreption R - Consect Secreption Secreption Secreption Secreption Secreption Secreption Secr	DC Supply Voltage Range	VDC	10 - 80		
Logic Supply Voltage VDC 54 - 5% (b) Maximum Peak Output Curren¹ A (Arms) 20 (14-1) Maximum Continuous Output Curren² A (Arms) 12 (12) Maximum Continuous Output Power WW 912 Maximum Continuous Cutren² WW 48 Internal Bus Capacitance µF 44 4 Infinimum Load Inductance (Line-To-Line)² µH 2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Switching Frequency WHz 20 20 Maximum Output PVM Duty Oycle WHz 20 20 Poscription Value Value Communication Interfaces P. RS-485/23 Sequencing, Indexing, Jogging Communication Methods P. Sequencing, Indexing, Jogging Sequencing, Indexing, Jogging Sequencing, Indexing, Jogging Sequencing, Ind	DC Bus Over Voltage Limit	VDC	88		
Maximum Peak Output Current¹ A (Arms) 20 (14-1) Maximum Continuous Output Current² X (Arms) 12 (12) Maximum Power Dissipation at Continuous Output Power W 48 Maximum Dower Dissipation at Continuous Output Power W 48 Minimum Load Inductance (Line-To-Line)¹ µH 2 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Switching Frequency MHz 20 Control Specifications Control Specifications Assistance (January Power) MBz 20 Control Specifications Description Sequencing, Indexing, Jogging Command Sources S 48 54.85.232 Command Sources S 410 V Robalog, S 98 pand Direction, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging Readback Supported 1 - 2 810 V Robalog, S 98 pand Direction, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging Modes of Operation 1 - 2 Sinusoidal, Trapezoidal Notes of Operation Audition of Position, Audition of Position, Audition Interest (Position) Mo	DC Bus Under Voltage Limit	VDC	8		
Maximum Continuous Output Power A (Arms) 12 (12) Maximum Continuous Output Power W 912 Maximum Power Dissipation at Continuous Current W 48 Internal Bus Capacitance µ F 9 44 Intinum Load Inductance (Line-To-Line)¹ µ H 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Switching Frequency RHz 20 20 Control Specifications Description Sex 8-85232 Communication Interfaces S - 8 8-845232 Command Sources - 9 8-9 8-9 Command Sources - 9 8-9 8-9 Pediback Supported 2 10 V Arollog, SV Stand, Burging Indexine, Burging, Indexine, Jougne, Indexine, Jougne, Indexine, Jougne, Indexine, Journal, Burging, Indexine, Journal, Indexine, Journal, Indexine, Journal, Indexine, Journal, Properties of Supported - 2 40 V Correct Courtain, Lore Temperature (Protestor, Fulls, Incremental Encoder, Halls, Incremental Encoder, Hall	Logic Supply Voltage	VDC	5 (+/- 5%)		
Maximum Continuous Output Power W 912 Maximum Power Dissipation at Continuous Current W 48 Internal Bus Capacitance μP 94 Minimum Load Inductance (Line-To-Line) ¹ μP 250 (at 80 V supply); 150 (at 48 V supply); 76 (at 24 V supply); 40 (at 12 V supply) Switching Frequency MHz 20 Control Specifications Description Units Value Communication Interfaces 5. RS-485/232 Communication Interfaces - RS-485/232 Communication Interfaces - RS-485/232 Communication Interfaces - RS-485/232 Communication Interfaces - - 10 V Analog, 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Encoder Following, Over the Network, PWM and Direction, Encoder Following, Over the Network, PWM and Direction, Protection Communication Methods - - 10 V Position, Availarly Incremental Encoder Hollowing, Over the Network, PWM and Direction, Protection, Protection Following, Over the Network, PWM and Direction, Protection Following, Over the Network, PWM and Direction, Protection Following, Over the Network, PWM and Direction, Protection, Protection, Protection, Protection, Protection, Protection, Protection, Protection, Protectio	Maximum Peak Output Current ¹	A (Arms)	20 (14.1)		
Maximum Power Dissipation at Continuous Current W 48 Internal Bus Capacitance μF 94 Infilimum Load Inductance (Ine-To-Ling)¹ μH 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Switching Frequency kHz 20 Control Specifications Description Waits Value Communication Interfaces PS-485/232 Value Command Sources 8-485/232 Value Command Sources 2-10 VA Panlog, 95 VStep and Direction, Encoder Following, Over the Network, PVM and Direction, Sequencing, Indexing, Jogging Feedback Supported 2-2 \$10 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Commutation Methods 2-3 Sinuscript, Hall Valocity, Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Motors Supported 2-4 Closed Loop Vector, Single Phase (Brushed, Voice Coll, Inductive Load), Trine Phase (Brushed) Mackadar Protection 2-5 40+c Configurable Function, Single Phase (Brushed, Voice Coll, Inductive Load), Trine Phase (Brushed) Programmable Digital Inputs/Outputs (PDIs/PDS) 2-5	Maximum Continuous Output Current ²	A (Arms)	12 (12)		
Internal Bus Capacitance μF 94 Minimum Load Inductance (Line-To-Line)* μH 200 Switching Frequency kHz 20 Maximum Output PWM Duty Cycle % 92 Common Specifications Description Common Specifications Communication Interfaces 8. RS-485/232 Value Command Sources -2. 8. RS-485/232 Value Command Sources -3. 8. 485-232 Value Feedback Supported -3. 4.0 VDC Position Auingri, Jogging Positions, Valoring Interferental Encoder, Halls, Incremental Encoder Commutation Methods -3. 5. inuscidal, Trapezoidal Modes of Operation -3. 1.0 VDC Position Auingri, Incremental Encoder, Halls, Incremental Encoder Modes of Operation -3. 4.0 VDC Position, Valority, Position, Velocity Modes of Operation -3. 4.0 VELORITY, Position, Velocity Modes of Operation -3. 4.0 VELORITY, Position, Velocity Modes of Operation -3. 5.3 Programmable D	Maximum Continuous Output Power	W	912		
Minimum Load Inductance (Line-To-Line)¹ μH 250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply) Switching Frequency kHz 2 Control Specifications Units Value Description Security Supply: 7 (at 24 V supply); 40 (at 12 V supply); 40 (at 12 V supply) Communication Interfaces 5 Security Value Command Sources 5 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Supported 6 Secure (at 10 V An Dato), 5V Step and Direction, Encoder Following, Over the Network, PWM and Da	Maximum Power Dissipation at Continuous Current	W	48		
Switching Frequency kHz 20 Maximum Output PVM Duty Cycle % 9 Control Specifications Description Units Value Communication Interfaces R-8485/232 Command Sources 2-0 410 VA Paslog, SV Step and Direction, Encoder Following, Over the Network, PWM and Direction, Encoder Sulpowing, Over the Network, PWM and Direction, Encoder Sulpowing, Over the Network, PWM and Direction, Encoder Sulpowing, Over the Network, PWM and Direction, Encoder Following, Over the Network, PWM and Direction, Encoder Followi	Internal Bus Capacitance	μF	94		
Maximum Output PVM Duty Cycle % 9 Communication Interfaces Communication Interfaces 1 RS-485/232 Communication Interfaces - 8 R5-485/232 **10 V Analogs, 5V Step and Direction, Encoder Following, Over the Network, PVM and Direction, Sequencing, Indexing, Jogging Feedback Supported - **10 V Poolsion, Auxiliary Incremental Encoder Communication Methods - **10 V DC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Motes of Operation - **10 V DC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Motes of Operation - **10 V DC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Motes of Operation - **Current, Hall Velocity, Position, Velocity Moters Supported - **Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushed, Voice Coil, Inductive	Minimum Load Inductance (Line-To-Line)3	μH	250 (at 80 V supply); 150 (at 48 V supply); 75 (at 24 V supply); 40 (at 12 V supply)		
Control Specifications Description Units Value Communication Interfaces 1 RS-485/232 Command Sources -3 810 V Analog, 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging Feedback Supported -4 10 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Communitation Methods -5 Sinusoidal, Trapezoidal Modes of Operation -6 Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Motors Supported -6 Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection -6 Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Programmable Digital Inputs/Outputs (PAIs/PAOs) -6 40- Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Primary I/O Logic Level -5 5/3 Primary I/O Logic Level μs 50 Current Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Maximum Enc	Switching Frequency	kHz	20		
Description Units Value Communication Interfaces - RS-485/282 Command Sources - 10 V Analog, 5V Step and Direction, Encoder Following, Over the Network, PVM and Direction, Sequencing, Indexing, Jogging Feedback Supported - 10 VCD Forbion, Auxiliary Incremental Encoder, Halls, Incremental Encoder Commutation Methods - 2 Sinusoidal, Trapezoidal Modes of Operation - 3 Closed Lope Voctor, Snigle Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - 3 Closed Lope Voctor, Snigle Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Programmable Digital Inputs/Outputs (PDIs/PDOs) - 3 Sinusoidal, Trapezoidal Programmable Digital Inputs/Outputs (PDIs/PDOs) - 5 Sinusoidal, Trapezoidal Primary I/O Logic Level - 5 Sinusoidal, Trapezoidal Primary I/O Logic Level - 5 Sinusoidal, Trapezoidal Primary I/O Logic Level - 5 Sinusoidal, Trapezoida	Maximum Output PWM Duty Cycle	%	92		
Communication Interfaces - RS-485/232 Command Sources - 410 V Analog, SV Step and Direction, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging Feedback Supported - 410 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Communitation Methods - Sinusoidal, Trapezoidal Modes of Operation - Current, Hall Velocity, Position, Velocity Motors Supported - Current, Hall Velocity, Position, Velocity Motors Supported - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - 5/3 Programmable Analog Inputs/Outputs (PDIs/PDOs) - 5/3 Pro		Control	Specifications		
Command Sources ±10 V Analog, 5V Step and Direction, Encoder Following, Over the Network, PWM and Direction, Sequencing, Indexing, Jogging Procedured Commutation Methods - Sinusoidal, Trapezoidal Modes of Operation - Current, Hall Velocity, 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 Analog 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 100 Maximum Encoder Frequency Met 20 (5 pre-quadrature) Mechanis Secifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL	Description	Units	Value		
Command Sources - Sequencing, Indexing, Jogging Feedback Supported - 4 10 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder Commutation Methods - Sinusoidal, Trapezoidal Modes of Operation - Current, Hall Velocity, Position, Velocity Motors Supported - Configurable Functions, Over Current, Over Temperature (Drive & Motor), Over Voltage, Short Circuit (Phase-Phase & Phase-Ground), Under Voltage Programmable Digital Inputs/Outputs (PDIs/PDOs) - S/3 Programmable Analog Inputs/Outputs (PAIs/PAOs) - 1/0 Primary I/O Logic Level - 5 5V TTL Current Loop Sample Time µs 50 Velocity Loop Sample Time µs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mesharias Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 6.3.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 10-75 (32 - 167) Heatsink (Base) Temperature Range ⁴ ° C (*F) 0-75 (32 - 167) Storage Temperature Range ⁴ ° C (*F) 0-75 (32 - 167)	Communication Interfaces	-	RS-485/232		
Commutation Methods - Sinusoidal, Trapezoidal Modes of Operation - Current, Hall Velocity, Position, Velocity Motors Supported - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Hardware Protection - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless) Programmable Digital Inputs/Outputs (PDIs/PDOs) - 5/3 Programmable Analog Inputs/Outputs (PDIs/PDOs) - 5/3 Programmable Analog Inputs/Outputs (PAIs/PAOs) - 1/0 Primary I/O Logic Level - 5 V TTL Current Loop Sample Time μs 100 Velocity Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Value Units Value Agency Approvals - C Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (5 x 2.0 x 2.0 x 9.9	Command Sources	-			
Modes of Operation - Current, Hall Velocity, Position, Velocity Motors Supported - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushles) Hardware Protection - A0+ 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 - 5 VTTL Current Loop Sample Time μs 50 Velocity Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 106 (3.7) Heatsink (Base) Temperature Range ⁴ °C (°F) -40 - 85 (-40 - 185) Storage Temperature Range °C (°F) -40 - 85 (-40 - 185) Colling System Natural Convection	Feedback Supported	-	±10 VDC Position, Auxiliary Incremental Encoder, Halls, Incremental Encoder		
Motors Supported - Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushles) 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 100 Velocity Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) Heatsink (Base) Temperature Range¹ °C (°F) 0 -75 (32 - 167) Storage Temperature Range¹ °C (°F) -40 - 85 (-40 - 185) Cooling System - PCB Mounted PCB Mounted P1 Connector - PCB Mounted	Commutation Methods	-	Sinusoidal, Trapezoidal		
Hardware Protection	Modes of Operation	-	Current, Hall Velocity, Position, Velocity		
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 Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, ROHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) Heatsink (Base) Temperature Range ⁴ °C (°F) 0 - 75 (32 - 167) Storage Temperature Range °C (°F) 4-0 - 85 (-40 - 185) Cooling System - Natural Convection Form Factor - PCB Mounted P1 Connector - 90-pin, 2.54 mm spaced, dual-row header	Motors Supported	-	Closed Loop Vector, Single Phase (Brushed, Voice Coil, Inductive Load), Three Phase (Brushless)		
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 Units Value Agency Approvals CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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 - Natural Convection P1 Connector - 30-pin, 2.54 mm spaced, dual-row header	Hardware Protection	-			
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 Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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	Programmable Digital Inputs/Outputs (PDIs/PDOs)	-	5/3		
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 Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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	Programmable Analog Inputs/Outputs (PAIs/PAOs)	-	1/0		
Velocity Loop Sample Time μs 100 Position Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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	Primary I/O Logic Level	-	5V TTL		
Position Loop Sample Time μs 100 Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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	Current Loop Sample Time	μs	50		
Maximum Encoder Frequency MHz 20 (5 pre-quadrature) Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) Heatsink (Base) Temperature Range4 °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	Velocity Loop Sample Time	μs	100		
Mechanical Specifications Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) 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	Position Loop Sample Time	μs	100		
Description Units Value Agency Approvals - CE Class A (EMC), CE Class A (LVD), cUL, RoHS, UL Size (H x W x D) mm (in) 63.5 x 50.8 x 22.9 (2.5 x 2.0 x 0.9) Weight g (oz) 105 (3.7) Heatsink (Base) Temperature Range⁴ °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	Maximum Encoder Frequency	MHz	20 (5 pre-quadrature)		
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Cooling System - Natural Convection Form Factor - PCB Mounted P1 Connector - 30-pin, 2.54 mm spaced, dual-row header	Heatsink (Base) Temperature Range ⁴	°C (°F)	` '		
Form Factor - PCB Mounted P1 Connector - 30-pin, 2.54 mm spaced, dual-row header	Storage Temperature Range	°C (°F)	-40 - 85 (-40 - 185)		
P1 Connector - 30-pin, 2.54 mm spaced, dual-row header	Cooling System				
	Form Factor	-	PCB Mounted		
P2 Connector - 24-pin, 2.54 mm spaced, dual-row header	P1 Connector	P1 Connector - 30-pin, 2.54 mm spaced, dual-row header			
	P2 Connector	-	24-pin, 2.54 mm spaced, dual-row header		

Notes

- 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. Continuous A_{rms} value attainable when RMS Charge-Based Limiting is used. Lower inductance is acceptable for bus voltages well below maximum. Use external inductance to meet requirements. 1.
- 2.
- Additional cooling and/or heatsink may be required to achieve rated performance.





PIN FUNCTIONS

		P1 - Signal Connector	
Pin	Name	Description / Notes	1/0
1	RS485 ADDR 0	RS-485 Network Address Selector	
2	RS485 ADDR 1	The location had been delected	
3	PAI-1 + (REF+)	Differential Programmable Analog Input or Reference Signal Input (12-bit Resolution)	I
4	PAI-1 - (REF-)	Differential Programmable Analog input of Reference Signal input (12-bit Resolution)	
5	GND	Ground	GND
6	RS485 BAUD	RS-485 Baud Rate Selector	I
7	PDO-1	Programmable Digital Output	0
8	PDO-2	Programmable Digital Output	0
9	PDO-3	Programmable Digital Output	0
10	PDI-1	Programmable Digital Input	I
11	PDI-2	Programmable Digital Input	ı
12	PDI-3 (CAP-A)	Programmable Digital Input or High Speed Capture	I
13	RS232 RX / RS485 RX-	Receive Line (RS-232 or RS-485)	I
14	RS485 RX+	Receive Line (RS-485)	1
15	RS232 TX / RS485 TX-	Transmit Line (RS-232 or RS-485)	0
16	RS485 TX+	Transmit Line (RS-485)	0
17	PDI-4 + (PWM+ / STEP+ / AUX ENC A+ / CAP-B+)	Programmable Digital Input or PWM or Step+ or Auxiliary Encoder or High Speed Capture	
18	PDI-4 - (PWM- / STEP- / AUX ENC A- / CAP-B-)	(For Single-Ended Signals see DZ HW Installation Manual)	I
19	PDI-5 + (DIR+ / AUX ENC B+ / CAP-C+)	Programmable Digital Input or Direction or Auxiliary Encoder or High Speed Capture (For	- 1
20	PDI-5 - (DIR- / AUX ENC B- / CAP-C-)	Single-Ended Signals see DZ HW Installation Manual)	- 1
21	GND	Ground	GND
22	HALL A		I
23	HALL B	Single-ended Commutation Sensor Input (For Differential Inputs See MC1XDZ01 Datasheet	I
24	HALL C	For Recommended Signal Conditioning)	
25	MOT ENC I+	Differential Encoder Index Input (See MC1XDZ01 Datasheet For Recommended Signal Conditioning)	
26	MOT ENC I-		
27	MOT ENC A+	Differential Encoder A Channel Input (See MC1XDZ01 Datasheet For Recommended	I
28	MOT ENC A-	Signal Conditioning)	
29	MOT ENC B+	Differential Encoder B Channel Input (See MC1XDZ01 Datasheet For Recommended	Ī
30 MOT ENC B- Signal Conditioning)			

			P2 - Power Connector	
Р	in	Name	Description / Notes	1/0
1a		LOGIC PWR	Logic Supply Input	1
	1b	RESERVED	Reserved	-
2a	2b	GND	Ground	GND
3a	3b	GND	Glouliu	GND
4a	4b	HIGH VOLTAGE	DC Dower Input 2A Continuous Current Reting Per Rin	I
5a	5b	HIGH VOLTAGE	DO Power Input. SA Continuous Current Rating Per Pin.	I
6a	6b	RESERVED	Reserved	-
7a	7b	MOTOR C		0
8a	8b	MOTOR C		0
9a	9b	MOTOR B	Motor Phase Outputs. Current output distributed equally across 4 pins per motor phase, 3A	0
10a	10b	MOTOR B	Reserved Ground DC Power Input. 3A Continuous Current Rating Per Pin. Reserved	0
11a	11b	MOTOR A		0
12a	12b	MOTOR A		

Pin Details

RS485 ADDR 0 (P1-1)

This pin, RS485 ADDR 0, as well as RS485 ADDR 1, are used for RS-485 network addressing. To set the address of a drive, use the formula

$$RS485Address = \frac{7*Addr0}{3} + 8*\frac{7*Addr1}{3},$$

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Toll Free Phone (877) SERV098 where *RS485Address* is the desired node address and *Addr0* and *Addr1* represent the voltage that should be applied to refres (877) SERV099 RS485 ADDR 0 and RS485 ADDR 1, respectively. The values for *Addr0* and *Addr1* are always integer multiples of 3/7s withinate.com



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 drive address of 0 will utilize the address stored in non-volatile memory.

RS485 ADDR 0 Value (V)	RS485 ADDR 1 Value (V)	RS485 ADDR Tolerance (V)	RS485 Address (Address #)
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

RS485 BAUD (P1-6)

The RS-485 baud rate is set by applying the appropriate voltage to the RS485 BAUD pin as given in the table below.

RS485 BAUD Value (V)		RS485 BAUD Tolerance (V)	RS485 Baud Rate (bits/s)		
0		±0.388	Bit rate stored in non-volatile memory		
	1	±0.388	9.6k		
2 3		±0.388	38.4k		
		±0.388	115.2k		

HARDWARE SETTINGS

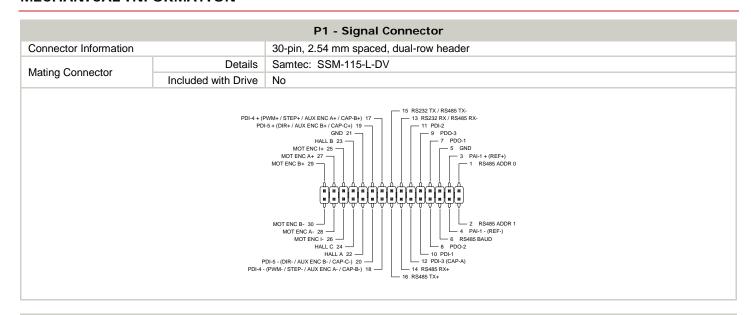
Jumper Settings

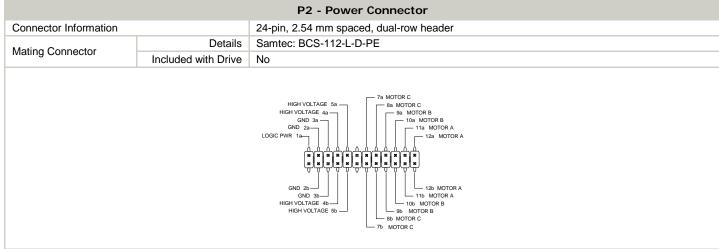
Jumper	mper Description		Configuration		
	Header Jumper	Not Installed	Pins 1-2	Pins 2-3	
J1	Reserved.	-	-	N/A	
J2	Reserved.	-	-	N/A	
J3	RS-485 selection. Install this jumper (2mm) to select RS-485 communication. This jumper is located on a 6-pin header between the PCB and heatsink. It consists of the two pins closest to the corner of the PCB.	RS-232	RS-485	N/A	





MECHANICAL INFORMATION

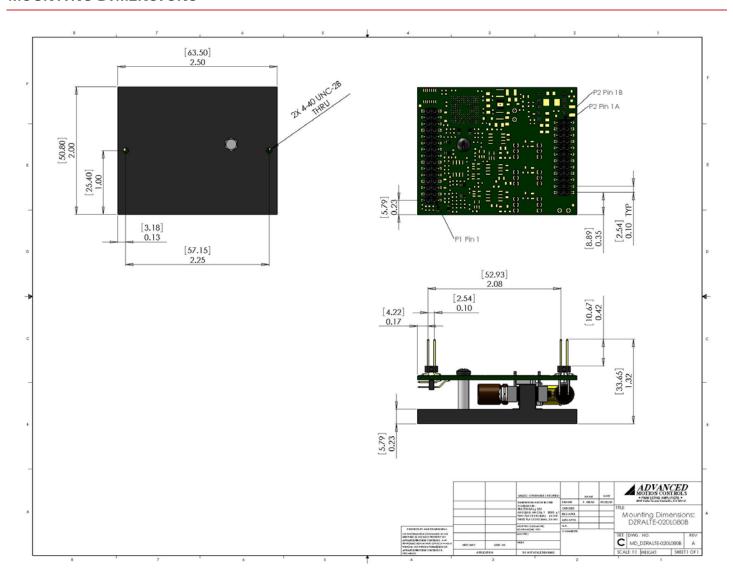








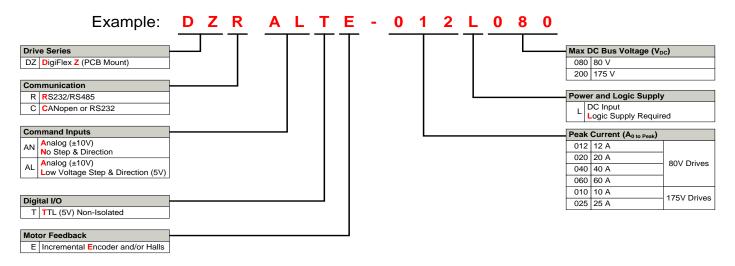
MOUNTING DIMENSIONS







PART NUMBERING INFORMATION



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

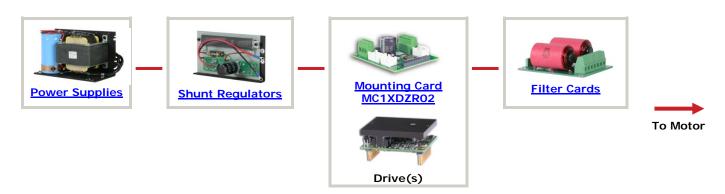
- Optimized Footprint
- Private Label Software
- ▲ OEM Specified Connectors
- No Outer Case
- ▲ Increased Current Resolution
- ✓ Increased Temperature Range
- Integrated System I/O

- 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.



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