

DIGIFLEX® DIGITAL SERVO DRIVES MODEL: DR101EE60A40NDC

FEATURES:

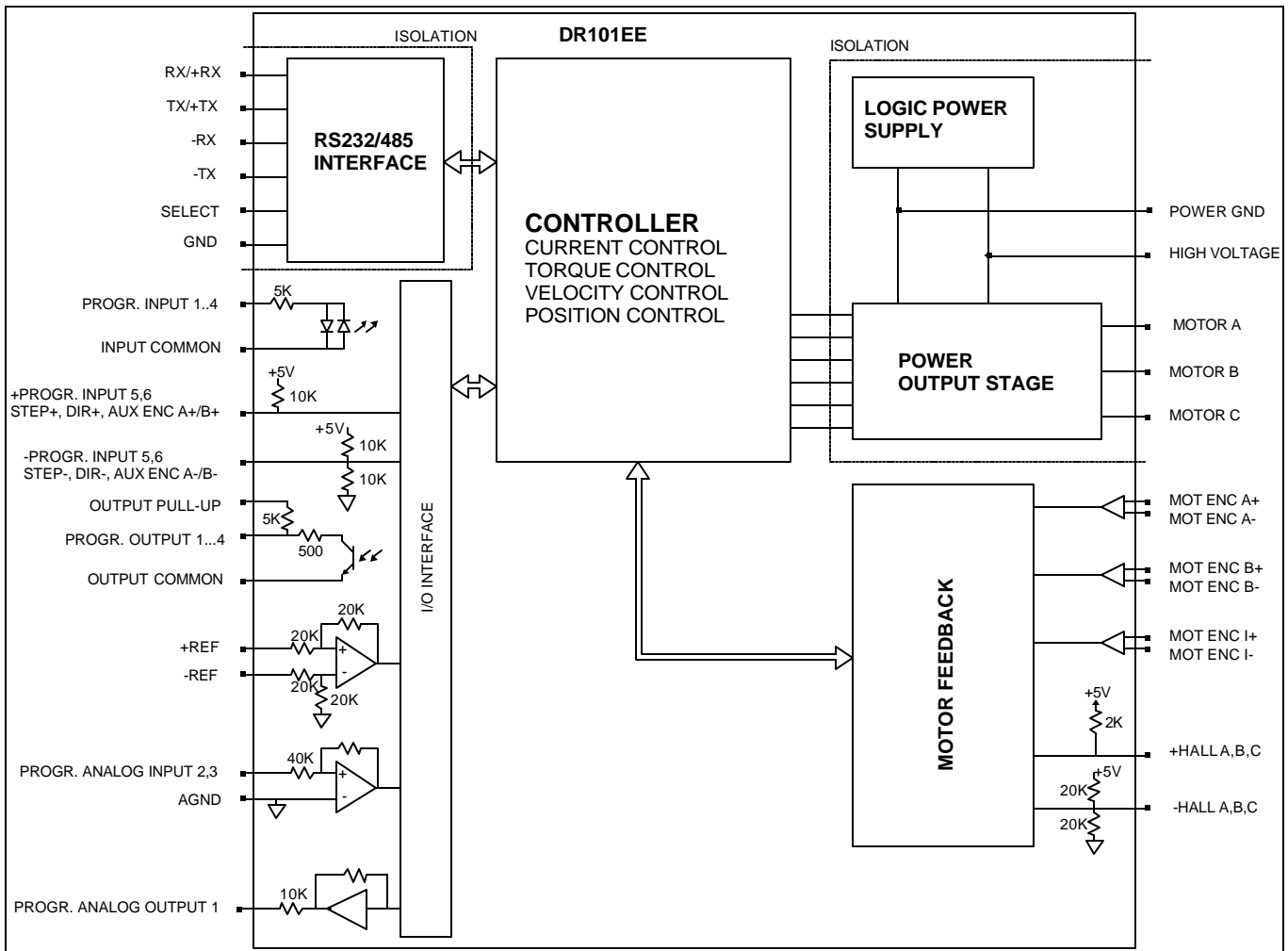
- Fully digital, state-of-the-art design
 - Space Vector Modulation and vector control technology
 - 20kHz Digital current loop with programmable gain settings
 - PIDF velocity loop with 100microsecond update rate
 - PID + FF position loop with 100 microsecond update rate
 - Hall sensor + encoder or encoder-only based commutation
 - Surface-mount technology
 - Small size, low cost, ease of use
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- Isolated RS232/485 interface for setup and networking
 - Windows© based setup software with built-in 8-channel digital scope
 - Operates in torque, velocity or position mode with programmable gain settings
 - Programmable profiling in all modes
 - Fully configurable current, voltage, velocity and position limits.
 - Step & direction mode for stepper replacement
 - Encoder following with programmable gear ratio
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- 4 isolated programmable digital inputs
 - 2 programmable differential inputs, configurable as step & direction, master encoder, or secondary encoder for dual loop operation
 - 4 isolated programmable digital outputs
 - 2 programmable analog inputs (10-bit)
 - 14-bit reference input or programmable analog input
 - 1 programmable analog output (10-bit)
 - Encoder output (from motor, optionally buffered)
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- Four quadrant regenerative operation
 - Bi-color LED status indicator
 - Extensive built-in protection against:
 - over-voltage (programmable)
 - under-voltage (programmable)
 - short-circuit: phase-phase, phase-ground
 - over-current
 - over-temperature



ADVANCED MOTION CONTROLS

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BLOCK DIAGRAM:



DESCRIPTION:

The DR101EE Series digital PWM servo drives are designed to drive brushed and brushless servomotors. These fully digital drives operate in torque, velocity, or position mode and employ Space Vector Modulation (SVM), which results in higher bus voltage utilization and reduced heat dissipation. The command source can be generated internally or can be supplied externally. In addition to motor control, these drives feature dedicated and programmable digital and analog inputs and outputs to enhance interfacing with external controllers and devices.

DR101EE Series drives feature a single, isolated RS232/485 interface, which is used for drive configuration and setup as well as online operation in networked applications. Drive commissioning can be accomplished through a fully graphical Windows® based application.

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

SPECIFICATIONS:

| POWER STAGE SPECIFICATIONS | DR101EE60A40NDC |
|---|-------------------------------|
| DC SUPPLY VOLTAGE | 60...400 VDC |
| PEAK CURRENT | 60A (42.4Arms) |
| MAXIMUM CONTINUOUS CURRENT | 30A (21.2Arms) |
| MINIMUM LOAD INDUCTANCE | 600 μ H |
| SWITCHING FREQUENCY | 20 kHz |
| HEATSINK (BASEPLATE) TEMPERATURE RANGE | 0 to 65 °C, disables at 65 °C |
| POWER DISSIPATION AT CONTINUOUS CURRENT | 600W |
| MIN. UNDER VOLTAGE SHUTDOWN | 60 VDC |
| MAX. OVER-VOLTAGE SHUTDOWN | 425 VDC |

| MECHANICAL SPECIFICATIONS | |
|--|---|
| POWER CONNECTOR: P1 | Screw terminals |
| MOTOR FEEDBACK CONNECTOR: CN3* | 15-pin high density female D-sub |
| I/O CONNECTOR: CN2* | 26-pin high density female D-sub |
| COMMUNICATIONS INTERFACE (RS232/485): CN1* | 9-pin female D-sub |
| SIZE | 9.24 x 6.31 x 3.99 inches 234.7 x 160.2 x 101.3 mm |
| WEIGHT | 5.8 lbs. 2.6 kg |

* Mating connectors are not included.

PIN FUNCTIONS:

P1 - Motor and Power Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|--------------|----------------|--------|
| P1 | 1 | MA | Motor phase A | O |
| | 2 | MB | Motor phase B | O |
| | 3 | MC | Motor phase C | O |
| | 4 | POWER GND | Power ground. | GNDPWR |
| | 5 | HIGH VOLTAGE | DC power input | I |

CN3 - Motor Feedback Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|------------|--|------|
| CN3 | 1 | +Hall A | Commutation sensor inputs. Internal 2K pull-up to +5VDC. Can be used with single ended or differential Hall sensors. | I |
| | 2 | +Hall B | | I |
| | 3 | +Hall C | | I |
| | 4 | MOT ENC A+ | Differential Encoder Input. For single ended encoder signals, leave the A-terminal open. | I |
| | 5 | MOT ENC A- | | I |
| | 6 | MOT ENC B+ | Differential Encoder Input. For single ended encoder signals, leave the B-terminal open. | I |
| | 7 | MOT ENC B- | | I |
| | 8 | MOT ENC I+ | Differential Encoder Input. For single ended encoder signals, leave the I-terminal open. | I |
| | 9 | MOT ENC I- | | I |
| | 10 | -Hall A* | See CN3-1. Leave open in case of single ended Hall sensors. | I |
| | 11 | -Hall B* | See CN3-2. Leave open in case of single ended Hall sensors. | I |
| | 12 | SGND | Signal ground | SGND |
| | 13 | +5V OUT | +5V @ 250mA max. Short-circuit protected. | O |
| | 14 | PAI3 | Programmable analog input, single ended, 10-bit | I |
| | 15 | -Hall C* | See CN3-3. Leave open in case of single ended Hall sensors. | I |

CN2 – I/O Connector:

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|---------------|---|------|
| CN2 | 1 | PDO1 | Isolated programmable digital output, 24V @ 50mA max. Referenced to pin 8, Output Common. | O |
| | 2 | OUTPUT COMMON | Digital output common. | OGND |
| | 3 | PDO2 | Isolated programmable digital output, 24V @ 50mA max. Referenced to pin 8, Output Common. | O |

| | | | |
|----|--------------------|--|------|
| 4 | +REF | Differential reference signal input, 14-bit resolution. Can also be used as programmable analog input 1. | I |
| 5 | -REF | | I |
| 6 | PAI2 | Programmable analog input | I |
| 7 | PAO1 | Programmable analog output | O |
| 8 | OUTPUT PULL-UP | Digital output pull-up via 5K resistor. | I |
| 9 | -PDI6 | Programmable Input (see CN2-18) or Direction- or Aux Enc B- | I |
| 10 | PDO3 | Isolated programmable digital output, 24V @ 50mA max. Referenced to pin 8, Output Common. | O |
| 11 | PDI1 | Isolated programmable digital input, 24V @ 5mA max. Referenced to pin 15, Input Common. | I |
| 12 | PDI2 | Isolated programmable digital input, 24V @ 5mA max. Referenced to pin 15, Input Common. | I |
| 13 | PDI3 | Isolated programmable digital input, 24V @ 5mA max. Referenced to pin 15, Input Common. | I |
| 14 | PDO4 | Isolated programmable digital output, 24V @ 50mA max. Referenced to pin 8, Output Common. | O |
| 15 | Input Common | Digital input common. Can also be used to pull-up digital inputs. | IGND |
| 16 | AGND | Analog ground | AGND |
| 17 | +PDI5 | Programmable differential digital input, or Step+ or Aux Enc A+ | I |
| 18 | +PDI6 | Programmable, differential digital input or Direction+ or Aux Enc B+ | I |
| 19 | PDI4 | Isolated programmable digital input, 24V @ 5mA max. Referenced to pin 15, Input Common. | I |
| 20 | Encoder Channel A+ | Encoder Output (from connector CN3), not buffered | O |
| 21 | Encoder Channel A- | | O |
| 22 | Encoder Channel B+ | Encoder Output (from connector CN3), not buffered | O |
| 23 | Encoder Channel B- | | O |
| 24 | Encoder Channel I+ | Encoder Output (from connector CN3), not buffered | O |
| 25 | Encoder Channel I- | | O |
| 26 | -PDI5 | Programmable Input (See CN2-17) or Step- or Aux Enc A- | I |

CN1 - Communications Interface (RS232/485):

| CONNECTOR | PIN | NAME | DESCRIPTION | I/O |
|-----------|-----|--------|--|-----|
| CN1 | 1 | SELECT | RS232/485 selection. Pull to ground (CN1-5) for RS485. | I |
| | 2 | TX/+TX | RS232: Transmit; RS485: +TX | O |
| | 3 | RX/+RX | RS232: Receive; RS485: +RX | I |

| | | | | |
|--|---|------|---------------|------|
| | 4 | N/C | Not connected | |
| | 5 | SGND | Signal ground | SGND |
| | 6 | -TX | RS485: -TX | O |
| | 7 | N/C | Not connected | |
| | 8 | -RX | RS485: -RX | I |
| | 9 | N/C | Not connected | |

ORDERING INFORMATION:

Standard model: DR101EE60A40NDCX

X indicates the current revision letter.

