3-Phase BLDC Motor Controller with Integrated Power Drive

Model: PW-8256XNX Series

The PW-8256XNX series is a high performance DSP based family of self-contained, programmable, turnkey motor controllers designed to precisely control the torque and speed of 3-phase BLDC motors, with maximum reliability.

Key Features

**Performance**
- Multiple Voltage/Current Ratings Available: 100V/30A, 200V/10A, and 400V/5A
- Up to 95% Duty Cycle Operation
- 7% Linearity, 3% Current Regulating Accuracy
- -40°C to +105°C Operation

**Programmability**
- Easy-to-Use GUI or Directly via Control Interfaces:
  - Torque and Speed Control Modes
  - PI Gain Values and Capability to Tune Motor/Load Parameters and Closed Loop Bandwidth
  - PWM Frequency: 10KHz - 40KHz
  - Acceleration/Deceleration and Soft Start
  - Digital or Analog Speed or Current Input Command
  - Sinusoidal Field Oriented Control (FOC) or Trapezoidal Commutation
  - On-board Short-circuit, Over-current, Over-voltage, Over-speed, and Over-temperature Protection

**Functionality**
- Hall Effect or Sensorless Feedback
- CANbus and RS-422/RS-485 Control Interfaces

**Applications**
- Pump Control
- Electric Actuators
- Electric Valve Control
- Fuel Pumps
- Industrial Robotics
- Antenna / Camera Position Control
- Gun Turrets
- Unmanned Vehicle Electric Drives and Thrusters
- Missile Fin Control
- Fans
- Ammunition Loaders

Benefits
- Compact 3.3" x 3.25" x 0.5" (83.8 x 82.6 x 12.7 mm)
- Integrated Single-Module Solution Reduces In-House Development Risk and Time-to-Market
- Complementary Four-quadrant Drive
  - Supports Driving and Braking in Both Directions
  - Minimizes Power Dissipation
  - Provides Holding Torque for High Accuracy Positioning for Critical Applications
- Programmability Allows One Motor Controller to be Used with a Variety of Motors Across Multiple Application Platforms, Saving Inventory and Operations Costs
- High MTBF Provides High System Reliability
- Evaluation Board Available for Faster Time-to-Market

Contact Factory for:
- Encoder and Resolver Feedback Interfaces
- 600V and 1200V Devices
- Position Control
- EMI Filter

Need a Custom Solution?
DDC can customize designs for all products, ranging from simple modifications of standard products to fully customized solutions for commercial, military, aerospace, and industrial applications.

For more information: www.ddc-web.com/PW-8256XNX

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## Overview

The PW-8256XNX series is a family of completely self-contained and versatile high performance motor controllers designed to control a wide variety of brushless DC motors and loads. These modules are fully configurable through a Graphical User Interface (GUI) operating on a Windows® platform, and provide torque (current) and speed (voltage) control using sensorless algorithms or Hall Effect feedback.

The PW-8256XNX operates from an analog or digital input command to control motor speed or torque. The motor current and back EMF may be internally sensed and processed to control speed and torque using field oriented control for sinusoidal commutation. Alternatively, the controller can provide trapezoidal commutation based on Hall sensor feedback.

These 3-phase controllers provide true four-quadrant control through zero current. The Pulse Width Modulation (PWM) switching frequency is also programmable, making them suitable for operation with a wide variety of BLDC motors and operating requirements. The PW-8256XNX devices can accept single-ended or differential analog command signals, or may be controlled digitally through their CANbus or RS-422/485 interfaces. All control loops’ tuning parameters are user programmable to optimize system performance based on motor and load characteristics. The GUI can also be used to run the motor/system, thereby saving setup, test and evaluation time.

The PW-8256XNX series is available mounted to an evaluation card for quick lab testing.

## Ordering Information

<table>
<thead>
<tr>
<th>PW-82560N3000 - E 00</th>
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</thead>
<tbody>
<tr>
<td>Reliability Grade:</td>
<td>0 = Standard DDC Processing</td>
</tr>
<tr>
<td>Operating Temperature Range:</td>
<td>E = -40°C to +105°C</td>
</tr>
<tr>
<td>Power Input Adaptor Option:</td>
<td>0 = None</td>
</tr>
<tr>
<td></td>
<td>2 = Bus Capacitor &amp; Cables (200V, 400V)</td>
</tr>
<tr>
<td></td>
<td>3 = Bus Powered &amp; Bus Capacitor, with Cables (100V only)</td>
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<tr>
<td>Control Interface (all versions include analog input):</td>
<td>0 = CANbus and RS-422/485</td>
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<tr>
<td>Commutation Feedback, Position Feedback:</td>
<td>0 = Sensorless and Hall, none</td>
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<tr>
<td>Current Rating:</td>
<td>0 = 10A (200V)</td>
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<tr>
<td></td>
<td>3 = 30A (100V)</td>
</tr>
<tr>
<td></td>
<td>V = 5A (400V)</td>
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<tr>
<td>Form Factor:</td>
<td>N = Open Frame</td>
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<tr>
<td></td>
<td>E = Open Frame, With Evaluation Card</td>
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<tr>
<td>Rated Voltage:</td>
<td>0 = 100V (30A)</td>
</tr>
<tr>
<td></td>
<td>2 = 200V (10A)</td>
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<tr>
<td></td>
<td>4 = 400V (5A)</td>
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<tr>
<td>DDC Brushless DC Motor Controllers</td>
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## Software GUI

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