



ELECTRO-CRAFT **PRO** SERIES

PRO Series Programmable Servo Drive

Product Datasheet for
PRO-A08V48



Compact drive solution for rotary or linear brushless, stepper or PMDC brush motors.

The ElectroCraft PRO Series Programmable Servo Drives are based on a new design concept offering a cost effective, compact and modular solution for the control of rotary or linear brushless, stepper or PMDC brush motors of powers up to 385W, with 48V nominal voltage. Designed to support both low and high-volume applications, the ElectroCraft PRO Series drive integrates advanced motor control and motion control func-

tionality in a single plug-in module or stand-alone drive. The PRO-A08V48 offers a flexible and modular solution in two form factors: PCB Mount (PE models) or built into a stand-alone package with pluggable connectors (SA models). With the comprehensive and flexible motion instruction set, the PRO-A08V48 is an intelligent drive that is programmable for many applications and levels of experience.

The drive can operate:

- As a single-axis motion controller, autonomously running the program residing in its non-volatile memory.
- As an intelligent slave executing motion sequences triggered by input lines.
- As a part of a multi-axis, distributed motion control solution in either stand-alone or slave configurations.
- As an intelligent slave executing motion sequences triggered by commands received via RS-232 or CAN bus communication.



The configuration, tuning and programming of the PRO-A08V48 drive is easy with ElectroCraft's powerful MotionPRO Suite user interface.

Features

- Fully digital servo drive suitable for the control of rotary or linear brushless, stepper or PMDC brush motors
- Very compact design
- Standard PCIe 4x mating connectors (PE Versions)
- Sinusoidal or trapezoidal (Hall-based) control of brushless motors
- Open or closed-loop control of 2-phase stepper motors
- Various modes of operation, including: torque, speed or position control; position or speed profiles, external analogue reference or sent via communication bus
- Comprehensive motion instruction set for the definition and execution of motion sequences
- CAN-Bus 2.0B up to 1 Mbit/s (CANopen (CiA 301v4.2 and 402v3.0) protocols)
- Single power supply: 11-48V; optional logic supply: 9-36V
- Digital and analogue I/Os:
 - 8 Digital inputs: 5-36V, NPN [Enable, 2 Limit switches, plus 5 general purpose]
 - 5 Digital outputs: 5-36V, 0.5A, 5 NPN open-collector [Ready, Error, plus 3 general purpose]
 - 2 Analogue inputs: 12-bit, 0-5V [Reference, Feedback or general-purpose]
- Standalone operation with stored motion sequences
- RS-232 serial communication
- Switching Frequency up to 100kHz
- Operating ambient temperature: 0-40°C
- Feedback devices supported:
 - Incremental quad encoder (single-ended, open collector and differential)
 - Analogue sine/cosine incremental encoder (differential 1Vpp)
 - Digital and linear Hall sensors
 - Support for absolute feedback (SSI, BiSS, ENDAT and resolver via additional extension module)
- Hardware protections: short-circuit (between motor phases and from motor phases to GND), over-voltage, under-voltage and I²t

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Specifications

| Flexibility – Control schemes supported by the PRO-A08V48x Drive | | | |
|--|----------------|---------------|------------------|
| Motor Types (rotary or linear) | Torque Control | Speed Control | Position Control |
| Brushless | ✓ | ✓ | ✓ |
| Stepper | ✓ | ✓ | ✓ |
| PMDC Brush | ✓ | ✓ | ✓ |

| Ordering Information | |
|----------------------|---|
| PRO-A08V48A-PE-CAN | PCB Mount Programmable Drive (48V, 8A, 385W, Enc., CAN) |
| PRO-A08V48A-SA-CAN | Stand-alone Programmable Drive (48V, 8A, 385W, Enc., CAN) |
| 2000694 | PRO-A08V48x-PE-CAN Evaluation Kit (PCB Mount, 48V, 8A, 385W, Enc., CAN) |
| 2000697 | PRO-A08V48x-SA-CAN Evaluation Kit (Stand-alone, 48V, 8A, 385W, Enc., CAN) |
| 500500 | MotionPRO Suite User Interface Software |

| Motor – sensor configurations | | | |
|-------------------------------|-----------|-------------------|------------|
| Motor Types | Brushless | Stepper (2-phase) | PMDC Brush |
| Incr. Encoder | ✓ | ✓ | ✓ |
| Incr. Encoder + Hall | ✓ | | |
| Analog Sin/Cos encoder | ✓ | | |
| Linear Halls | ✓ | | |
| Tacho | | | ✓ |
| Open-loop (no sensor) | | ✓ | |

NOTE: SSI, EnDAT, BiSS encoders and Resolver feedback is possible with an additional feedback extension module

| Conditions | | | | | |
|----------------------------------|--------------------------|----------------|--------|--------------|-------|
| Operating | | Min. | Typ. | Max. | Units |
| Ambient Temperature ¹ | | 0 | | +40 | °C |
| Ambient Humidity | Non-condensing | 0 | | 90 | %Rh |
| Altitude / Pressure ² | Altitude (vs. sea level) | -0.1 | 0-2.5 | ² | Km |
| | Ambient Pressure | 0 ² | 0.75-1 | 10.0 | atm |
| Storage | | Min. | Typ. | Max. | Units |
| Ambient Temperature | | -40 | | +100 | °C |
| Ambient Humidity | Non-condensing | 0 | | 100 | %Rh |
| Ambient Pressure | | 0 | | 10.0 | atm |

¹ Operating temperature can be extended up to +65°C with reduced current and power ratings.
² PRO-A08V48 can be operated in vacuum (no altitude restriction), but at altitudes over 2,500m, current and power rating are reduced due to thermal dissipation efficiency.

Evaluation Kit:

The quickest way to get started with the PRO Series Drive.



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| Electrical Specifications | | | |
|------------------------------|--------------|---------|------|
| Maximum DC Supply Voltage | Motor | 48 | volt |
| | Logic | 36 | volt |
| Maximum continuous current | Peak of sine | 8 | amp |
| | RMS | 5.7 | amp |
| Peak current (2.4 sec. max.) | Peak of sine | 20 | amp |
| | RMS | 14.1 | amp |
| Nominal switching frequency | | 20 – 60 | kHz |

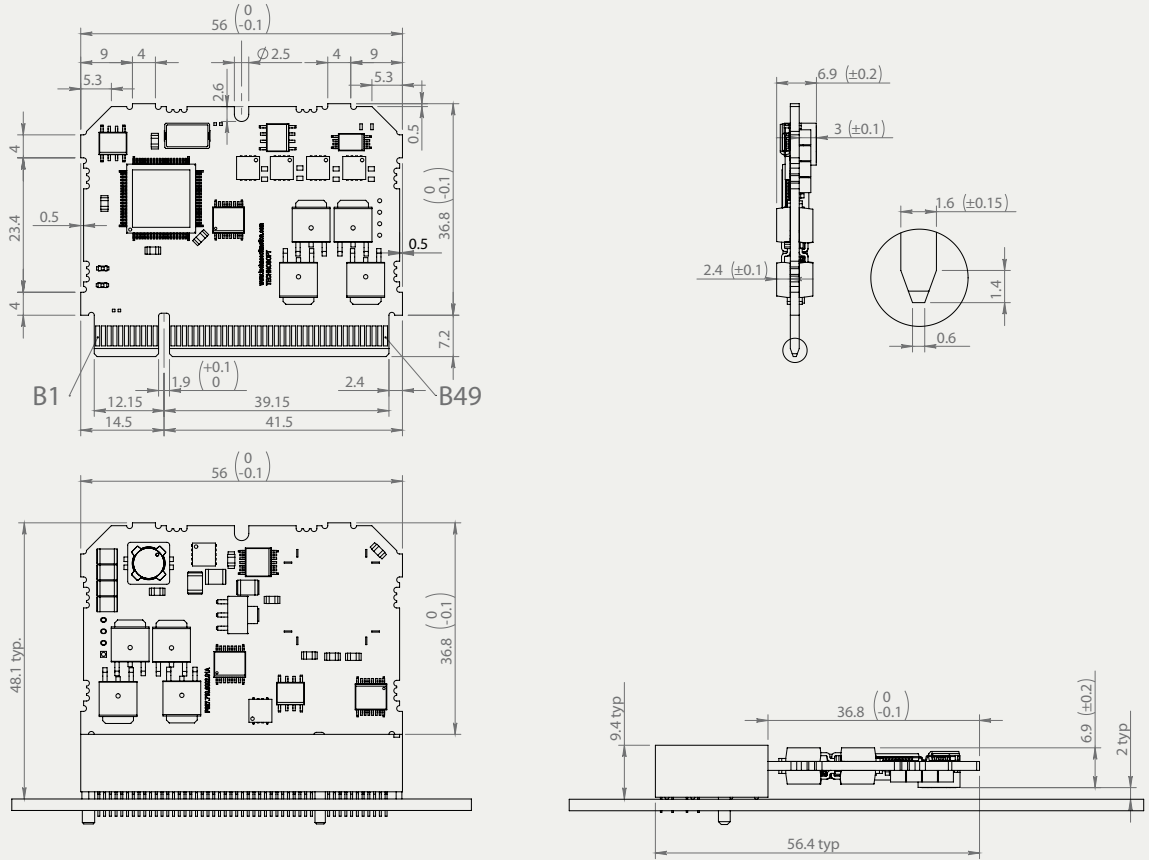
| Input | | | | | |
|---|--|------|------|------|-----------------|
| Logic Supply Input (+V _{LOG}) | | Min. | Typ. | Max. | Units |
| Supply Voltage | Nominal values | 9 | | 36 | V _{DC} |
| | Absolute maximum values, drive operating but outside guaranteed parameters | 8 | | 40 | V _{DC} |
| | Absolute maximum values, continuous | -0.6 | | 42 | V _{DC} |
| | Absolute maximum values, surge (duration ≤ 10ms) [†] | -1 | | +45 | V |
| Supply Current | +V _{LOG} = 7V | | 125 | 320 | mA |
| | +V _{LOG} = 12V | | 80 | 220 | |
| | +V _{LOG} = 24V | | 50 | 145 | |
| | +V _{LOG} = 40V | | 40 | 120 | |
| Motor Supply Input (+V _{MOT}) | | Min. | Typ. | Max. | Units |
| Supply Voltage | Nominal values | 11 | | 50 | V _{DC} |
| | Absolute maximum values, drive operating but outside guaranteed parameters | 9 | | 52 | V _{DC} |
| | Absolute maximum values, continuous | -0.6 | | 54 | V _{DC} |
| | Absolute maximum values, surge (duration ≤ 10ms) [†] | -1 | | +57 | V |
| Supply Current | Idle | | 1 | 5 | mA |
| | Operating | -20 | ±8 | +20 | A |
| | Absolute maximum value, short-circuit condition (duration ≤ 10ms) [†] | | | 26 | A |

| Output | | | | | |
|---|--|------------------|------|------|-------|
| Motor Outputs (A/A+, B/A-, C/B+, BR/B-) | | Min. | Typ. | Max. | Units |
| Nominal output current, continuous | DC brushed, steppers and BLDC motors with Hall-based trapezoidal control | | | 8 | A |
| | Brushless motors with sinusoidal control (sinusoidal amplitude RMS value) | | | 8 | |
| | Brushless motors with sinusoidal control (sinusoidal effective RMS value) | | | 5.66 | |
| Motor output current, peak | maximum 2.5s | -20 | | +20 | A |
| Short-circuit protection threshold | measurement range | | ±26 | ±30 | A |
| Short-circuit protection delay | | 5 | 10 | | µs |
| On-state voltage drop | Nominal output current; including typical mating connector contact resistance | | ±0.3 | ±0.5 | V |
| Off-state leakage current | | | ±0.5 | ±1 | mA |
| Motor inductance (phase to phase) | Recommended value, for current ripple max. ±5% of full range; +V _{MOT} = 36 V | F _{RWM} | | | µH |
| | | 20 kHz | 250 | | |
| | | 40 kHz | 120 | | |
| | 60 kHz | 90 | | | |

Dimensions

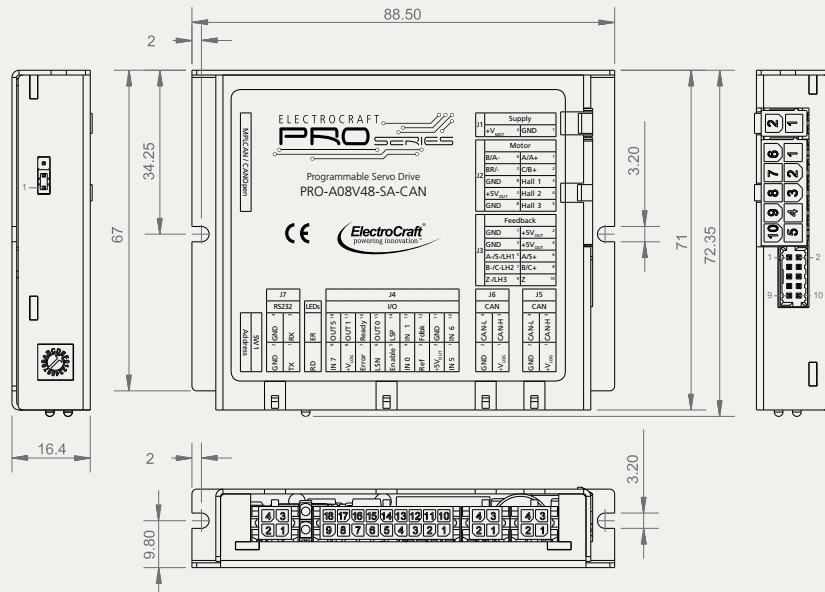
PCB Mount
PRO-A08V48x-PE-CAN

Height: 48.1 mm
Width: 6.9 mm
Length: 56 mm



Stand-alone
PRO-A08V48x-SA-CAN

Height: 16.3 mm
Width: 55 mm
Length: 80 mm



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