ElectroCraft®
powering innovation™

ELECTROCRAFT PRO SERIES

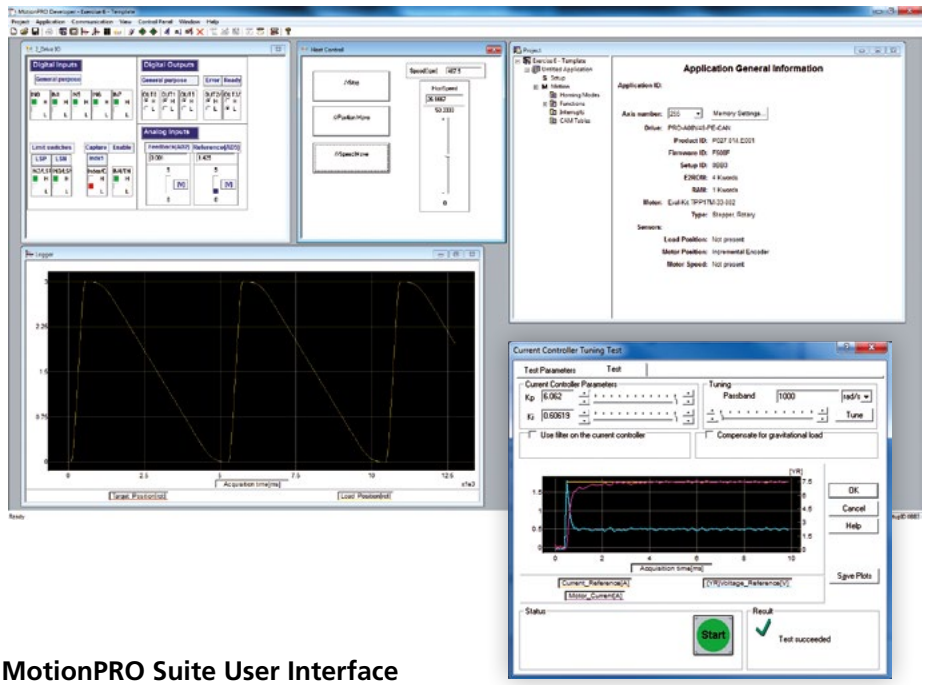
PRO Series Programmable Servo Drive

Product Datasheet for

PRO-A10V80
PRO-A20V80

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 1600W, with 80V nominal voltage. Designed to support both low and high-volume applications, the ElectroCraft PRO Series drive integrates advanced motor control and motion control functionality in to a single Panel Mount.



MotionPRO Suite User Interface

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 standalone or slave configurations.
- As an intelligent slave executing motion sequences triggered by commands received via RS-232, EtherCAT or CAN bus communication.

The configuration, tuning and programming of the PRO-Ax0V80 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
- 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
- EtherCAT (CoE) in conformance with CiA402 device profile
- RS-232 serial communication
- CAN-Bus 2.0B up to 1 Mbit/s CANopen (CiA 301v4.2 and 402v3.0) protocols
- Dual power supply: 12-80V; logic supply: 12-36V
- Digital and analogue I/Os:
  - 4 Digital inputs: 5-36V, NPN [Enable, 2 Limit switches, plus 2 general purpose]
  - 4 Digital outputs: 5-36V, NPN or PNP [Ready, Error, plus 2 general purpose]
  - 2 Analogue inputs: 12-bit, 0-5V and ±10V [Reference, Feedback or general-purpose]
- Standalone operation with stored motion sequences
- Hardware protections: short-circuit (between motor phases and from motor phases to GND), over-voltage, under-voltage and I^2t
- Switching Frequency up to 60kHz
- 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 Hall sensors or sensorless communication
  - Support for absolute feedback (SSI, BiSS, EnDAT and resolver)
  - Dual encoder input supported for dual loop control

Specifications

Flexibility – Control schemes supported by the PRO-A04V36x Drive

Motor Types (rotary or linear)	Torque Control	Speed Control	Position Control
Brushless	✓	✓	✓
Stepper	✓	✓	✓
PMDC Brush	✓	✓	✓

Ordering Information

PRO-A10V80A-SA-CAN	Stand-alone Programmable Drive (80V, 10A, 800W, Enc., CAN)
PRO-A10V80A-SA-CAT	Stand-alone Programmable Drive (80V, 10A, 800W, Enc., CAT)
PRO-A20V80A-SA-CAN	Stand-alone Programmable Drive (80V, 20A, 1600W, Enc., CAN)
PRO-A20V80A-SA-CAT	Stand-alone Programmable Drive (80V, 20A, 1600W, Enc., CAT)
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		+85	°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-Ax0V80 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.
[3] For all values, PRO-A10V80 (PRO-A20V80)

Evaluation Kit:

The quickest way to get started with the PRO Series Drive

Electrical Specifications

Maximum DC Supply Voltage	Motor	80	volt
	Logic	36	volt
Maximum continuous current[3]	Peak of sine	10 (20)	amp
	RMS	7.07 (14.1)	amp
Peak current (2.4 sec. max.)[3]	Peak of sine	20 (40)	amp
	RMS	7.1	amp
Nominal switching frequency[3]		14.1 (28.2)	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 maximim values, continuous	-0.6		42	V_{DC}
	Absolute maximum values, surge (duration ≤ 10ms)†	-1		+45	V
Supply Current	$+V_{LOG}$ = 9V		300		mA
	$+V_{LOG}$ = 12V		250		
	$+V_{LOG}$ = 24V		150		
	$+V_{LOG}$ = 40V		100		
Motor Supply Input ($+V_{MOT}$)		**Min.**	**Typ.**	**Max.**	**Units**
Supply Voltage	Nominal values	12	80	90	V_{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters	11		94	V_{DC}
	Absolute maximim values, continuous	-0.6		94	V_{DC}
	Absolut maximum values, surge (duration ≤ 10ms)†	-1		95	V
Supply Current[3]	Idle		1	5	mA
	Operating	-20 (-40)	±10 (±20)	20 (40)	A
	Absolute maximum value, short-circuit condition (duration ≤ 10ms)†			22.5 (45)	A

Output

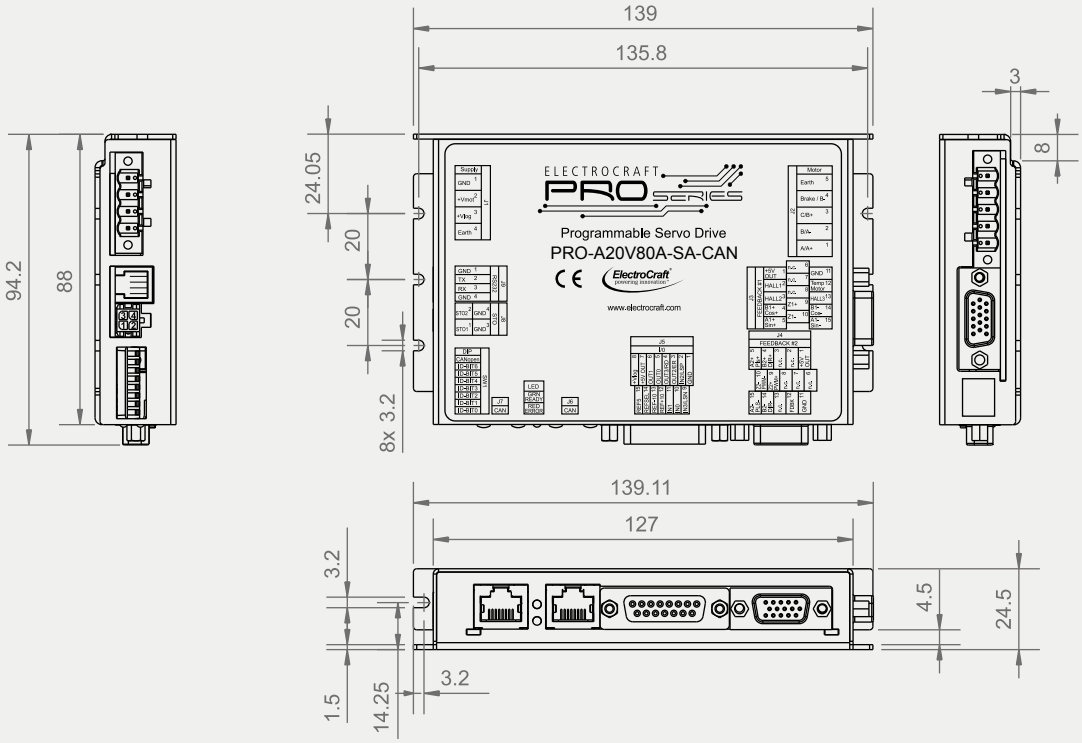
Motor Outputs (A/A+, B/A-, C/B+, BR/B-)			Min.	Typ.	Max.	Units
Nominal output current, continuous[3]	DC brushed, steppers and BLDC motors with Hall-based trapezoidal control				10 (20)	A
	Brushless motors with sinusoidal control (sinusoidal amplitude RMS value)				10 (20)	
	Brushless motors with sinusoidal control (sinusoidal effective RMS value)				7.07 (14.2)	
Motor output current, peak[3]	maximum 10s (3.6)		-20 (-40)		+20 (+40)	A
Short-circuit protection threshold[3]	measurement range				± 22.5 (± 45)	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_{PWM}				µH
		20 kHz	330			
		40 kHz	150			
		60 kHz	120			

ElectroCraft® powering innovation™

PRO-A20V80A-SA-CAN

Height: 24.5 mm
Width: 94.2 mm
Length: 139 mm

All dimensions are in mm.
Drawings not to scale.



PRO-A20V80A-SA-CAT

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