

ELECTRO-CRAFT
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.

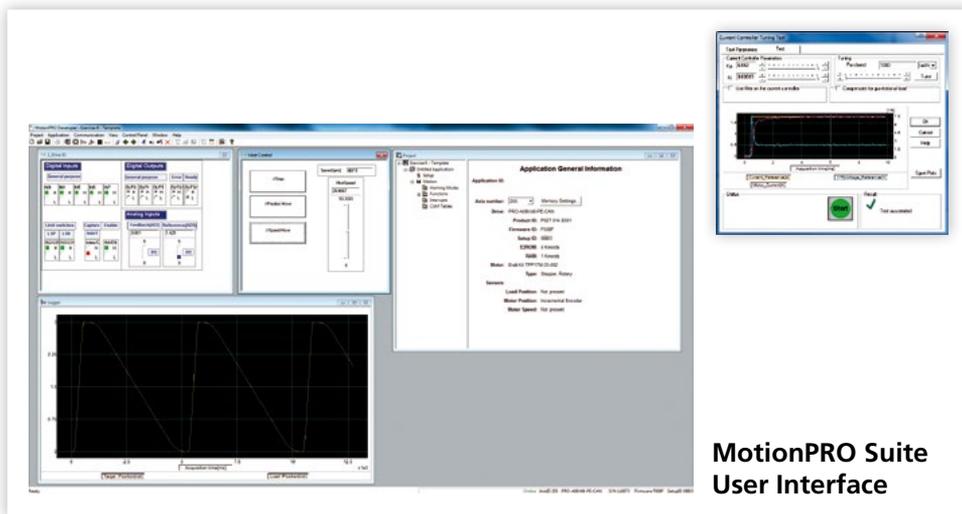
The ElectroCraft PRO Series Programmable Servo Drives are based on a new design concept offering a cost effective, compact and modular solution for the control of rotary or linear brushless, stepper or PMDC brush motors of powers up to 1600W, with 80V nominal voltage. Designed to support both low and high-volume applications, the ElectroCraft PRO Series drive integrates advanced motor control and motion control functionality in a single plug-in module

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 com-

mands received via RS-232, EtherCAT or CAN bus communication.

- Operating with Safe Torque Off, compatible with IEC 61800-5.2. 2 x STO inputs which when left unconnected, will disable motor outputs. This provides a dual redundant hardware protection that cannot be overridden by software or other hardware components.



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
- 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
- EtherCAT (CoE) in conformance with CiA402 device profile
- R-232 serial communication
- CAN-Bus 2.0B up to 1 Mbit/s CANopen (CiA 301v4.2 and 402v3.0) protocols
- Dual I 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 $\pm 10V$ [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 I²t
- 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

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)

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.)	Peak of sine	20 (40)	amp
	RMS	7.1	amp
Nominal switching frequency		14.1 (28.2)	kHz

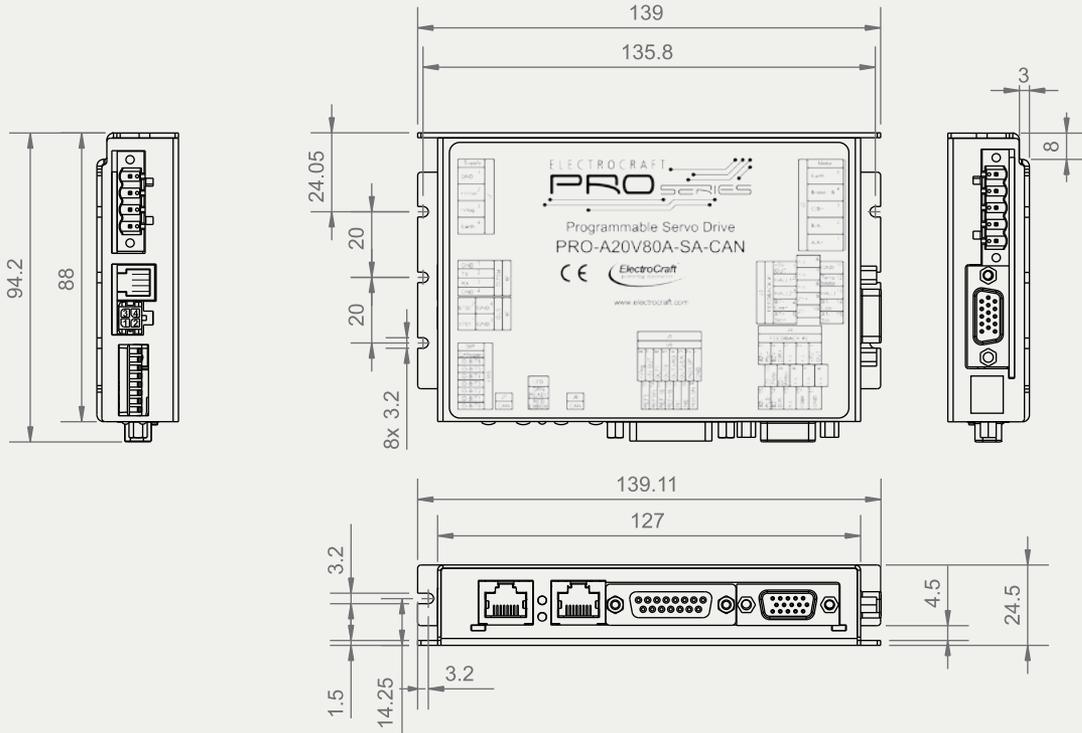
Input					
Logic Supply Input (+V _{LOG})		Min.	Typ.	Max.	Units
Supply Voltage	Nominal values	9		36	V _{DC}
	Absolute maximum values, drive operating but outside guaranteed parameters	8		40	V _{DC}
	Absolute maximum values, continuous	-0.6		42	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) ⁴	-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 maximum values, continuous	-0.6		94	V _{DC}
	Absolute maximum values, surge (duration ≤ 10ms) ⁴	-1		95	V
Supply Current	Idle		1	5	mA
	Operating	-20 (-40)	±10 (±20)	20 (40)	
	Absolute maximum value, short-circuit condition (duration ≤ 10ms) ⁴			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		

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

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

All dimensions are in mm.
Drawings not to scale.

