

## ***Motion Controller***

### *SC-AT-2M*



The SC-AT-2M is a compact size, stand-alone, advanced dual axes motion controller, designed to introduce innovative performance in all aspects. Its computing kernel is based on a 70 MIPS CPU, wide memory spaces, a dedicated FPGA for the encoders and I/Os interfaces, all combined with C&RS proven applications-based experience.

The result is a cost-effective product, providing high performance in a compact size and price.

The SC-AT-2M is designed to support various types of feedbacks, including incremental and absolute sensors, as well as built in interpolator for analog encoders. RS-232 and CAN Bus, multi-links communication channels, position the SC-AT-2M as the leading controller for distributed applications, significantly minimizing costs and risks.

### ***General Description***

The SC-AT-2M is a dual axes motion controller for all types of servomotors and for stepper motors, optimally designed for delivering state-of-the-art performance and small size with an attractive cost/performance ratio.

### ***Highlights***

The SC-AT-2M is a result of wide and intensive applications-based experience, molded into a powerful 70 MIPS computing kernel, boosted by an FPGA to provide smart interfaces and logic.

This first means a built-in support for wide range of feedback options, including standard incremental encoder (AquadB), analog Sin./Cos. Encoder (with built in interpolator of up to x8192), absolute serial encoders (BiSS, EnDat and SSI) and analog signal (potentiometer, Tacho, Auto focus, ...).

Furthermore, it means sampling rate of 8-16 [KHz], complex control filters, sinusoidal commutation option, and simultaneous execution of two macro threads.

The SC-AT-2M, as all other C&RS products, is designed for minimum command response time – Motion will start within 125µs (or better) upon receiving a begin-motion command.

The SC-AT-2M keywords and language syntax is compatible with all other C&RS products, providing intuitive, easy-to-use and easy-to-remember syntax, identical for the host communication and for the macro program. The SC-AT-2M is equipped with multi-links communication to support optimized performance, cost, size and risks. The controller is equipped with two RS232 ports and a CAN bus ports, all working simultaneously. The RS232 can be used for one-to-one communication, setup and monitoring while the CAN bus is used for multi-drop, distributed motion control system.

The SC-AT-2M is provided with a new IDE (Integrated Development Environment), providing intuitive, complete and intensive monitoring, control and macro debugging features just behind the mouse click. The SC-AT-2M supports (independently configured for each axis) stepper motors with pulse and direction outputs for standard stepper motor drivers. The SC-AT-2M is provided with a software package supporting system model identification (frequency response) and intensive frequency and time domain diagnostics tools. Finally, the SC-AT-2M is provided with a free DCOM software, enabling easy and immediate interfacing with the customer's application program, including Visual C++, Visual Basic, LabView and others.

### ***Technology***

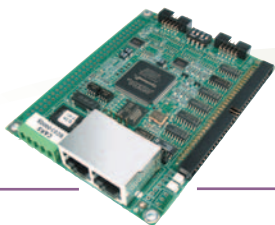
The SC-AT-2M uses new SMT packages, such as the BGA and the FBGA, as well as high-density SMT connectors and other small size SMT components, for optimized size and reliability.

The SC-AT-2M is prepared for interfacing standard and new protocols, such as: BiSS, EnDat and SSI.



### ***Control and Robotics Solutions Ltd.***

5, Mazal Eliezer St., New I.Z., Rishon Le-Zion 75653 Israel  
Tel: 972-3-9510022, Fax: 972-3-9510033  
E-mail: info@consol.co.il ■ www.consol.co.il



# Specifications

[www.consol.co.il](http://www.consol.co.il)

## General

Number of axes	2	
Dedicated I/O	Reverse and Forward limits per axis (isolated) Inhibit and Fault per axis (isolated) Emergency stop per unit (isolated) Driver command	
Uncommitted I/O	8 digital inputs (isolated) 2 fast digital inputs. 4 digital outputs (isolated) 2 fast digital output. 2 analog inputs	
Power supplies	5, ±(12-15)	V
Communication	2 x RS232, up to 115,400 CAN, up to 1	Bits/sec Mbit/sec
Protections and faults	Watchdog High position error Motor stuck Hardware limits Software position limits Emergency stop Driver fault Encoder failure	
Operating temperature	0-70	°C
Dimensions	100 x 76 x 20	mm
Diagnostics	Controller OK LED FPGA OK LED	

## Controller

Sampling rate	8-16	KHz
Encoder interface	Maximum speed up to $25 \times 10^6$ Position capturing by hardware Event generator by hardware 1/T velocity feedback by hardware (Optional)	counts/sec
Analog sin./cos. encoder	Built-in interpolator Programmable interpolation factor, up to x8192 Decimal factors supported. True, noise-free operation over all interpolation factor range	
Absolute encoders	BiSS, EnDat, SSI	
Motion modes	Point To Point, Smoothed, Repetitive, Relative /Absolute Jogging Search: Limit or Index or Input Joystick: Position or Velocity Electronic Gearing, Contouring, ECAM, Vector Motion Step: Repetitive, Relative or Absolute	
Control filter	PID or PIV modes Velocity and acceleration feed-forwards 2 <sup>nd</sup> order filter or notch filters Non-linear algorithms	
Driver command	±10v, 13 bits. Option for direct PWM Pulse and Direction for stepper motors	
User programs	Up to 2 threads simultaneously	
Programming features	Complex expressions High level: if, while, for; all support nesting Directives: define, include, target, ... Unlimited break points, single clause execution Advanced debugging environment under PC Windows	