
DA301

3-Axis Stepper Motor Controller

Introduction

The DA301 is a multitasking interrupt-driven controller for simultaneous control of up to three stepper motors.

The DA301 is designed for incorporation into small motorised instruments. It is tiny, yet has powerful features found only in much more expensive controllers.



Features

- Stand-alone operation
- Low cost
- Comprehensive programming language
- Simple electrical connections
- On-board user-defined programs
- Multitasking
- Small size
- Adjustable limit detection
- Optional master controller
- Units link together for expansion

Software

The controller module is operated using an in-built stepper motor control language that contains over 60 different commands, including test and branch instructions. These are assembled together to form motion macros, which are downloaded to the unit. Macros may be executed individually and can call subroutines.

Windows® based software is used to program and configure the DA301. The module will keep its settings and programs indefinitely, but they may also be saved and loaded as disk files.

A separate software application is used to program a Master Controller, if one is attached to the system.

Communication

RS232 Serial Port for programming and external control plus Serial Peripheral Interface (SPI) for daisy chaining up to 16 DA301s to a Master Controller.

Motion Control

Individual motors are configured for default speeds, acceleration and direction. Physical limit detection, which is both directional and level-sensitive, is also set up to provide high precision homing routines. Software limits are also included. The motion control algorithms allow relative and absolute positioning with defined acceleration and deceleration (linear-quadratic).

Master Controller

The addition of a DA316 Master Controller provides for rapid development of fully dedicated systems. This is operated with a keypad and liquid crystal display for interactive manual control of a system. One or more slave motor controllers are daisy-chained to its SPI bus. The DA316 is easily programmed using HCBASIC.

Applications

X-Y table positioning
Rotary valves
Telescope and satellite tracking
Syringe dispensers and diluters
Robotics control
Laboratory samplers
Experimental rigs

Specification

Motor Control: 3 interrupt-driven stepper motors

Step Count: 65,535 steps (half or full step)

Program Memory: 200 lines

Programming Language: Inbuilt mnemonic language

Ports: 1 x RS232, 1 x SPI (two sockets)

Slave Address: Software selectable SPI slave address

Communication: Fully active during motion control

Programmable Digital I/O: Eight outputs, 4 inputs

Timers: Four 16-bit seconds timers, 4 delay timers

Counters: Four 16-bit user-defined counters

Flags Registers: Eleven 8-bit flag registers

Bit Manipulation: Flag setting, clearing and testing

Speed and Position: Four programmable registers

Weight: 60 grams

Size: 120 x 64 x 20 mm

Processor: MC68HC11E20