

# TA600 MOTION CONTROLLER STANDALONE VERSION



2 AND 4 AXIS  
SERVO & STEPPER  
ADVANCED DUAL PROCESSOR DESIGN

SMART SOLUTIONS IN MOTION CONTROL

## Features

- Four Servo Control Axes
- USB 2.0 Setup and Diagnostics Interface
- 24V DC Power
- Quadrature or +/-10V DC Analog Feedback
- Dual DAC's per Axis for sinusoidal Motor Control
- Brushed, Brushless, Stepper control with Feedback, Closed Loop
- Stepper Control without Feedback, Open Loop
- Application Specific Parameters Stored in EEPROM
- Dedicated I/O - Positive, Negative and Home Sensors for each Axis
- User I/O - 8 Digital Outputs, 14 Digital Inputs
- 4 High Speed Position Capture Inputs
- Integrated Emergency Stop Circuitry
- Point to Point, Multi Axis Interpolated, Circular Interpolated Moves
- Trapezoidal, SCurve, Velocity and Custom Moves

## Applications

- Semiconductor Processing Equipment
- Material Handling Systems
- Packaging Equipment



*The Trust Automation TA600 Standalone Motion Controller* continues Trust Automation Inc.'s tradition of Motion Control Innovation. The TA600 is a two or four Axis Motion Controller for any combination of Brushed, Brushless or Stepper axis control. The Advanced Dual Processor Design optimizes performance by splitting the tasks between command execution and host communication and general I/O. This advanced design delivers peak performance while reducing your development time and shortening your time to market.

The TA600 has all the features of today's advanced motion controllers with the ease of a simple 3 character programming language, providing over one hundred available commands to handle even the most demanding applications. The TA600 features an optional dual DAC output for each axis enabling controller based sinusoidal commutation of brushless rotary and linear motors. The fast 50 $\mu$ s servo update rate is specially designed for fast linear motor axes requiring fast settling times. The TA600 provides three tuning filters per axis, allowing independent Home, Moving and Stopped filters that switch automatically depending on the axis status. In addition to the three PID filters per axis, two bi-quad noise or resonance filters per axis are available as well.

By utilizing the dual processor architecture, optimizing the controller for high speed high accuracy motors and providing simple yet powerful text based programming tools, the TA600 Motion Controller gives engineers the capability to implement advanced motion controls quickly and easily.



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# Technical Specifications

## - Electrical

- o Minimum Supply Voltage 20VDC
- o Nominal Supply Voltage 24VDC
- o Maximum Supply Voltage 28VDC
- o Minimum Supply Current 0.5A
- o Maximum Supply Current 6.0A (fused)
- o 5V Supply Current Output 800mA
- o 12V Supply Current Output 50mA
- o -12V Supply Current Output 50mA

- o Temperature (ambient)
  - Normal operation +0° C to +40° C
  - Storage -20° C to +80° C
- o Humidity
  - Operating 10% to 70% non-condensing
  - Storage 10% to 90%, non-condensing
- o Protection Level Not Water Resistant

## - Mechanical

- o Weight 2lbs (.91kg)
- o Length 7.375in (188mm)
- o Width 1.500in (38mm)
- o Height 8.125in (206mm)
- o Mounting Panel

## - Connections

- o J1-J4, (Axis 1-4), 34-Pin IDC, 0.1 x 0.1 in Ribbon
- o J5, (Analog I/O), 16-Pin IDC, 0.1 x 0.1 in Ribbon
- o J6, (Digital I/O), 26-Pin IDC, 0.1 x 0.1 in Ribbon
- o J7, (Power Input), 2-Pin Phoenix Contact
- o J8, (FW Download), 10-Pin IDC, 0.1 x 0.1 in Ribbon
- o J9, (Host Comm), 4-Pin USB 2.0, Type B Male
- o J10, (E-Stop), 4-Pin Phoenix Contact

## - Environmental

- o Maximum Altitude 6,560ft (2000M)

## Controller Specifications

Feature	Units	1-Axis (min/max)	2-Axis (min/max)	3-Axis (min/max)	4-Axis (min/max)
Encoder Input Frequency	Mcounts/sec	5.0	5.0	5.0	5.0
Min Position Loop Update Rate	KHz	0.1	0.1	0.1	0.1
Max Position Loop Update Rate	KHz	19.8	9.7	6.8	4.9
Max Commutation Rate	KHz	10.0	10.0	10.0	10.0
Step/Direction, Pulse Frequency	MHz	5.0	5.0	5.0	5.0
Servo Loop Rate					
Sinusoidal Commutation Rate	μS	100	100	100	100
Analog Feedback Resolution	Bits	14	14	14	14
DAC Resolution, 2/ Axis Optional	Bits	12/16	12/16	12/16	12/16
Dedicated Digital Inputs		5	10	15	20
Dedicated Digital Outputs		2	4	6	8
User Analog Inputs		4	4	4	4
User Digital Inputs		14	14	14	14
User Digital Outputs		8	8	8	8

## Controller Features

Feature	Description
Position Range	± 2,147,483,648 counts per move (32 bit)
Velocity Range	± 655,360,000 counts/sec
Acceleration Range	± 655,360,000 counts/sec <sup>2</sup>
Jerk Range	± 8,000,000,000,000 counts/sec <sup>3</sup>
Motion Profile Modes	Trapezoidal, Point to Point & Interpolated SCurve, Point to Point Velocity Contouring Electronic Gearing Custom Contouring
Filter Gain Types	Home Filter Set Stopped Filter Set Motion Filter Set
Filter Terms	(Kp)Proportional, (Ki)Integral, (Kd)Derivative (IL)Integral Limit, (TL)Torque Limit (DS)Derivative Sub Sampling (AF)Acceleration and (VF)Velocity Feed forward

Feature	Description
Filter Terms	(PW)Position Window (SH)Parameter Global Scale
Position Error Size	± 4,294,967,296 encoder counts
Dedicated I/O, Per Axis	Positive Limit, Negative Limit Home Sensor Drive Enable User Input
User I/O	8 Digital Outputs 14 Digital Inputs 4 Analog Inputs (if not used for servo feedback)
Dedicated Emergency Stop Circuit	1 E-Stop Monitor Input 1 E-Stop Trigger Output Hardware Disable of Drive Enables on E-Stop

## Ordering Information

### Standalone Motion Controller

TA600-D01 2-Axis Standalone Motion Controller  
 TA600-D02 4-Axis Standalone Motion Controller

### Hardware Accessories

TA900-D01 TA600 Controller Interface Module, Encoder, Hall, Command, Enable, Fault, Single Axis  
 TA901-D01 TA600 Controller Interface Module, Digital I/O, 8 in / 24 out, 5-24VDC  
 TA902-D01 TA600 Controller Interface Module, Analog I/O, 4 in, +/- 10VAC  
 TA903-D01 TA600 Controller Interface Module, Stepper, Amplifier, Single Axis

### Cables

CBLZ-0600-01 TA600 Serial Programming Cable, 2 Meter  
 CBLZ-0900-01 TA900-D01 Motion Signal Breakout Cable, 1 Meter  
 CBLZ-0901-01 TA901-D01 Digital I/O Breakout Cable, 1 Meter  
 CBLZ-0902-01 TA902-D01 Analog I/O Breakout Cable, 1 Meter  
 CBLZ-0903-01 TA903-D01 Stepper Breakout Cable, 1 Meter