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RMC100 Series

Two, Four, Six, and Eight Axis Servo Motion Controllers

The RMC100 series brings the benefits of modular, high-performance motion control to a wide range of industrial applications. Communication options—ranging from high-speed fieldbuses to discrete I/O—make these controllers an excellent choice for large and small systems. Transducer types can be combined to control any hydraulic, electric, and pneumatic system. Powerful control modes—including position/pressure control, synchronized moves, gearing, splines, and teach mode—provide optimum control for your motion applications. Refer to other RMC data sheets or the RMCWin online help for more information. Download RMCWin from Delta's web site at **www.deltamotion.com**.

Applications

- Presses
- Injection/RIM/blow molding
- Packaging equipment
- Indexing/transfer lines
- Edgers/headrigs/veneer lathes
- Pinch rollers/winders/wrappers
- Casting/forging
- Palletizers/stackers
- Flying cutoff/curve sawing
- Cyclic testing
- Robotics/animatronics
- Pneumatic press rolls
- Tube bending/forming

Features

- Two to eight axes of position or speed control
- Isolated power input, drive outputs, discrete and analog I/O, and communications
- RS-232 port for RMCWin and the RMCCOM ActiveX Control
- Full PID with velocity and acceleration feed-forwards
- Motion and pressure profiles can be changed on-the-fly
- 256K FLASH memory for field upgrades and parameter storage
- Trapezoidal, S-curve, and spline profiling
- Teach mode
- Synchronization of 2-8 axes
- Electronic gearing
- Compact DIN-rail mount package

Communications

- PROFIBUS-DP
- Ethernet
- Modbus Plus
- Discrete I/O – 20 inputs, 10 outputs
- Serial (RS-232/422/485)

Position Transducer Interfaces

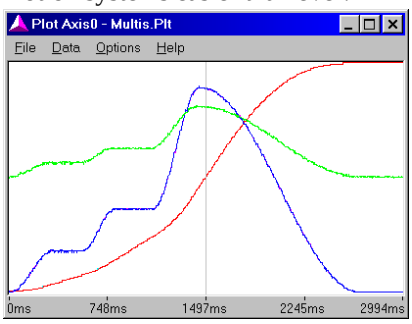
- Magnetostrictive Transducers – Start/Stop, PWM, and SSI
- Analog Transducers – 16 bit
- Quadrature Encoders
- Absolute encoders and resolvers with Synchronous Serial Interface

Drive Outputs

- All feedback interfaces are available with analog ±10 Volt outputs
- Quadrature and SSI feedback interfaces are available with stepper output

RMCWin Software

Delta's powerful RMCWin for Windows 95/98/NT/2000/XP makes setup, tuning, and troubleshooting motion systems easier than ever.



- Provides a graphic display of the latest motion profile, position and drive information
- Includes context-sensitive help and complete user manual online
- Calculates scale, offset, and velocity feed forwards
- Allows user to activate motion profiles and change control parameters from a PC
- Displays parameter and status information for all axes

Event Control

- Repeatable execution of motion commands each loop (1 or 2ms)
- Provides easy, spreadsheet-style programming
- Responds to time delays, status bit conditions, position, or inputs
- Includes 256 event steps

RMCCOM ActiveX Control

Control the RMC from your Visual Basic, Visual C++, Java, and VBA (e.g. Excel) programs.

Pressure/Force Control Option

- Control pressure or differential force at 12- or 16-bit resolution
- Transition between position and pressure/force while in motion

DELTA COMPUTER SYSTEMS, INC.

RMC100 Series

Position Axis Parameters

Setup Parameters

Configuration	Controller operating configuration
Scale Offset	These fields allow for position unit conversion
Extend Limit	Maximum position allowed
Retract Limit	Minimum position allowed
Proportional Gain	Proportional gain for PID loop
Integral Gain	Integral gain for PID loop
Differential Gain	Differential gain for PID loop
Extend Vel. Feed Forward Retract Vel. Feed Forward	Open loop compensation terms proportional to target velocity
Extend Accel. Feed Fwd Retract Accel. Feed Fwd	Open loop compensation terms proportional to target acceleration
Dead Band Eliminator	Valve dead band compensation
In Position	Window for in-position indication
Following Error	Allowable position error
Automatic Stop Enable	Enable for stop on errors

Dynamic Control Parameters

Mode	Select from these features: Graph disable S-curve ramps Synchronization Electronic Gearing Quick mode Monitor Pressure mode Integrator modes (avoid windup and overshoot)
Acceleration	Acceleration rate, distance, or time
Deceleration	Deceleration rate, distance, or time
Speed	Maximum speed during a move
Command Value	Destination position
Command	Command to be executed (refer to online help for complete list of commands)

Status Information

Command Position	Requested position within limits
Target Position	Calculated desired position of axis
Actual Position	Measured position based on current Transducer Counts that have been Scaled and Offset
Transducer Counts	Raw transducer counts
Status Word	Axis errors and status
Drive	Drive output in millivolts
Actual Speed	Calculated speed
Null Drive	Current null drive in millivolts
Step	Last step executed
Link Value	Value at which next step executes

Pressure/Force Axis Parameters

Setup Parameters

Configuration	Controller operating configuration
Scale A Offset A Scale B Offset B	These fields allow for unit conversion for both pressure and differential force transducers.
Proportional Gain	Proportional gain for PID loop
Integral Gain	Integral gain for PID loop
Differential Gain	Differential gain for PID loop
Extend Feed Forward Retract Feed Forward	Open loop compensation terms proportional to pressure change
Integrator Preload	Enable tuning of bumpless transfer
Drive Transfer Percent	from position to pressure control
At Pressure Window	Window for at-pressure indication
Pressure Window	Allowable pressure/force error
Automatic Stop Enable	Enable for stop on errors

Dynamic Control Parameters

Mode	Select from these features: Curved and linear ramps Auto-calculated ramp slope Integrator modes (avoid windup and overshoot)
Pressure Set A	Pressure control entry threshold
Pressure Set B	Pressure control exit threshold
Ramp Time	Time to ramp between pressures
Command Value	Desired pressure
Command	Command to be executed (refer to online help for complete list of commands)

Status Information

Command Pressure/Force	Requested pressure/force
Target Pressure/Force	Calculated desired pressure/force
Actual Pressure/Force	Currently measured pressure/force
Transducer Counts A Transducer Counts B	Raw value read from analog transducers
Actual Force A Actual Force B	Values of each force component in a differential force application
Status Word	Axis errors and status
Drive	Drive output in millivolts

For detailed explanations of these parameters and RMC functionality, refer to RMCWin's online help. Download RMCWin from Delta's web site at **www.deltamotion.com**.

Delta Computer Systems, Inc. 1818 SE 17th St., Battle Ground, WA 98604-8579
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RMC100 Series Specifications

Motion Control	Control loop time	1 or 2 ms depending on module configuration
	Maximum speed	65,535 user-defined position units per second
RS-232 Port	Interface with Delta's RMCWin and RMCCOM ActiveX Control.	Requires a PC with Windows 95/98/Me/NT/2000/XP.
	Connector	DB-9 Male
	Cable	Null modem
RJ-11 LCD Terminal Jack	Interface with Delta's optional four-line 20-character LCD display with keypad	Allows viewing status information, changing parameters, and issuing commands
Discrete I/O	Isolation	2500 VAC optically isolated
	Logic Polarity	True High
	Inputs	2; independent (sink or source) 6 mA max at 5 V; 10 mA max at 24 V 26.4 VDC maximum
	Input voltage threshold	2.75 VDC typical, 3 VDC Max
	Input current threshold	2.7 mA typical, 3.2mA maximum
	Outputs	2; independent (sink or source) Solid State Relay, 50 Ω maximum on resistance, 30 V and 100 mA maximum, Tpd_{max} of 1.5 ms
Power	Voltage	+24 VDC ±20%
	Current – 2 axes (3 slots)	Typical 290 mA @ 24 VDC, max 375 mA
	4 axes (4 slots)	Typical 385 mA @ 24 VDC, max 500 mA
	6 axes (5 slots)	Typical 485 mA @ 24 VDC, max 625 mA
	8 axes (6 slots)	Typical 585 mA @ 24 VDC, max 750 mA
	DC-DC converter isolation	500 VAC, 700 VDC, input to controller
Mechanical	Mounting	Symmetrical DIN 3 or panel-mount
	Dimensions – 2 axes (3 slots)	4.12 x 5.95 x 4.75 in (10.5 x 15.0 x 12.1 cm) (WxHxD)
	8 axes (6 slots)	7.12 x 5.95 x 4.75 in (18.1 x 15.0 x 12.1 cm) (WxHxD)
	Weight – 2 axes (3 slots)	2.0 lb (0.9 kg) max
	8 axes (6 slots)	3.0 lb (1.4 kg) max
Environment	Operating temperature	+32 to +140°F (0 to +60°C)
	Storage temperature	-40 to +185°F (-40 to +85°C)
	Agency compliance	CE, UL, CUL

Wiring Information for the RMC100

RS-232:

Pin	Function
2	Receive
3	Transmit
5	Common

Power:

Pin	Function
+24V	+24 Volt Input
24 Cmn	24 Volt Common
Case	Controller Chassis Ground (shield)

Discrete I/O:

Pin	Function
+ In 0	+ Input 0
- In 0	- Input 0
+ In 1	+ Input 1
- In 1	- Input 1
+ Out 0	+ Output 0
- Out 0	- Output 0
+ Out 1	+ Output 1
- Out 1	- Output 1

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RMC100 Series

RMC100 Series Part Numbers

Not all combinations of modules are possible. See individual data sheets for details on modules and options. This information plus an easy-to-use Price List program are available on our web site at **www.deltacompsys.com**.

RMC100-M1-PROFI

RMC100 Series CPU

Pressure/Force Control Option
(0=disabled, 1=enabled)

(Multiple options possible)

Magnetostrictive Displacement Transducer (MDT) module (Start/Stop and PWM)
(designate **-M*n***, *n* = 1-4 modules; 2 axes per module)

Synchronous Serial Interface (SSI) modules (MDT, absolute encoder, resolver)
(designate **-S*n***, *n* = 1-4 modules; Analog output, 2 axes per module)
(designate **-SST*n***, *n* = 1-4 modules; Stepper output, 2 axes per module)

Quadrature modules
(designate **-Q*n***, *n* = 1-4 modules; Analog output, 2 axes per module)
(designate **-QST*n***, *n* = 1-4 modules; Stepper output, 2 axes per module)

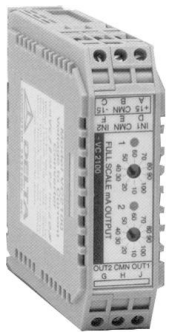
Analog modules
(designate **-H*n***, *n* = 1-4 modules; four 16-bit inputs / 2 axes per module)
(designate **-G*n***, *n* = 1-4 modules; two 16-bit inputs / 2 axes per module)
(designate **-A*n***, *n* = 1-2 modules; four 12-bit inputs only per module)

Sensor DI/O module
(designate **-D1**)

Communication
(designate **-PROFI**, **-DI/O**, **-MB+**, **-ENET**, **-SERIAL**; others in development)



RMC100-M1-PROFI



VC2100



LCD420

Accessories

Part Number	Description
LCD420	LCD display and keypad
VC2100	Voltage-to-current converter
SSn-PEn-BGn	Family of Servo System and Position/Pressure Simulators

Company Profile

Delta Computer Systems, Inc. manufactures motion controllers, color sensors/sorters, and other industrial controls providing high-performance automation solutions to a wide range of industries.

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