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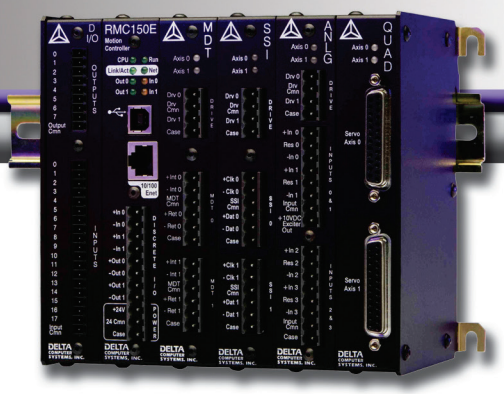
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# RMC150/151 DATASHEET



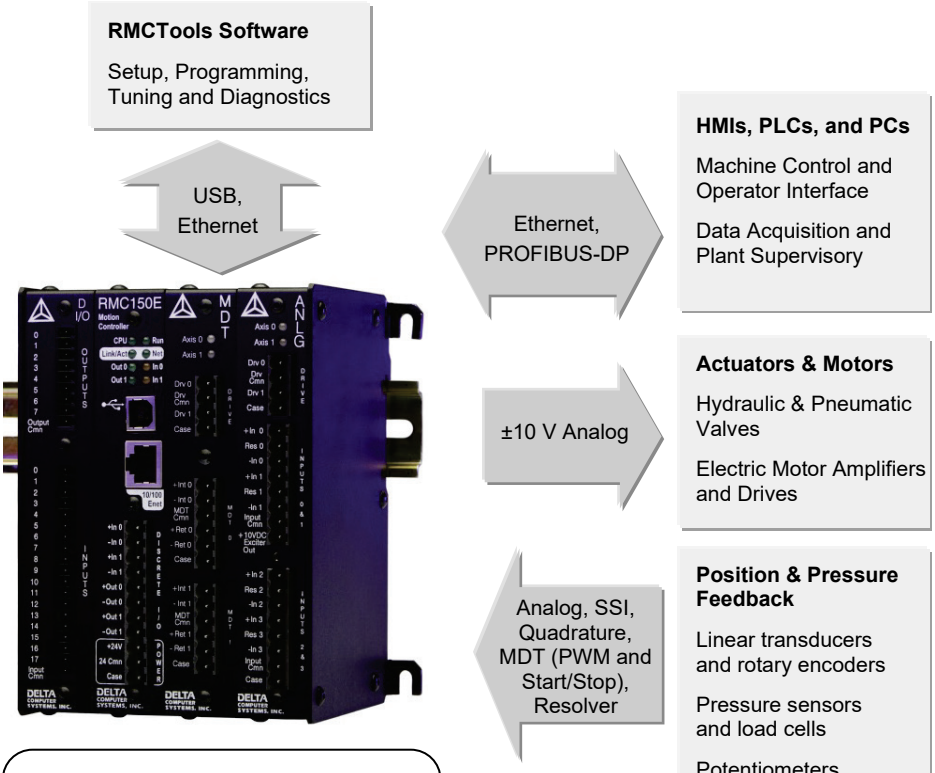
## Two, Four, Six, and Eight Axis Motion Controllers

The RMC150/151 delivers high-performance motion control to hydraulic, electric servo, and pneumatic industrial applications. With powerful control modes—including dual-loop position-pressure algorithms—and connectivity to many transducer types, the RMC provides optimum control for a wide range of motion applications.

The RMC150/151 CPU module comes standard with Ethernet, supporting protocols such as EtherNet/IP, PROFINET, and Modbus/TCP, and is designed to integrate easily with your favorite PLCs, PCs and HMIs.

Equipped with excellent graphing features and easy-to-use wizards, the RMCTools software handles setup, programming, tuning and diagnostics for both the RMC150 and RMC70 series controllers.

**Flexible Multi-axis Capability**
Modules can be "mixed and matched" to support up to 8 control axes for tightly synchronized motion, and additional reference axes up to a total of 16 control, reference or virtual axes.




All RMC motion controllers are backed by a company legacy of more than 30 years of excellent product support. Responsive 24/7 customer service is just a telephone call away.

## Industrial Applications

- Forest products
- Testing
- Metals
- Energy / Petrochemical
- Automotive
- Aerospace
- Plastics and rubber
- Entertainment
- Mining
- Petrochemical

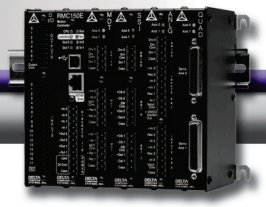
More application notes at deltamotion.com/applications.

## Communications

- **Ethernet** (10/100 Mbps), built-in on CPU.
  - EtherNet/IP
  - PROFINET
  - Modbus/TCP
  - CSP (Allen-Bradley)
  - FINS (Omron)
  - Procedure Exist (Mitsubishi Q-series)
- **USB Port**
  For use with the RMCTools software.
- **PROFIBUS-DP**

## Feedback Types

- **Magnetostrictive Linear Displacement Transducer (MDT)**
  RS-422 Start/Stop and PWM signals
- **Synchronous Serial Interface (SSI)**
  Linear and single- or multi-turn rotary
- **Analog**
  ±10 V and 4-20 mA
- **Quadratuture Encoder**
  5 V differential only (RS-422)
- **Resolver**
  Wide range of frequencies and ratios



# Part Numbers

Backplane sizes are 3, 4, 5, and 6 slots. Modules can be mixed and matched according to the table below.

**RMC150E-M2-H1-DI/O-HZ**

(Multiple options possible)

**Controller CPU.** The CPU is always in slot 1 (second slot from left). Details

| | | |
|---|---|---|
| **RMC150E** | Motion Control CPU (Includes Ethernet, RMCTools Software) | p. 5 |
| **RMC151E** | RMC150E with Dual-Loop Pressure/Force Control Option* | p. 5 |

**Slots 2-5 Modules.** Select 1-4 modules. *n* = 1 – 4.

| | | |
|---|---|---|
| **M*n*** | Magnetostrictive Displacement Transducer (MDT) for Start/Stop or PWM signals: two inputs, two ±10 V outputs | p. 7 |
| **S*n*** | Synchronous Serial Interface (SSI) for linear and single- or multi-turn rotary: two inputs, two ±10 V outputs | p. 8 |
| **Q*n*** | Quadrature for 5V differential encoder signals: two inputs, two ±10 V outputs | p. 9 |
| **R*n*** | Resolver: two inputs, two ±10 V outputs | p. 10 |
| **H*n*** | Analog:, four 16-bit ±10 V or 4-20 mA inputs, two ±10 V outputs | p. 11 |
| **A*n*** | Analog:, four 12-bit ±10 V or 4-20 mA inputs | p. 12 |
| **G*n*** | Analog: two 16-bit ±10 V inputs, two ±10 V outputs | see note on p. 11 |
| **D*n*** | Discrete I/O: 8 discrete outputs, 18 discrete inputs, 24 VDC | p. 13 |
| **U*n*** | Universal reference: two 16-bit ±10 V or 4-20 mA inputs, six discrete I/O, two high speed quadrature or SSI channels | p. 14 |
| **BL*n*** | Blank slot cover, allows for future expansion | |

**Slot 0 Modules**

| | | |
|---|---|---|
| **DI/O** | Discrete I/O module, 8 discrete outputs, 18 discrete inputs, 24 VDC | p. 13 |
| **UI/O** | Universal reference: two 16-bit ±10 V or 4-20 mA inputs, six discrete I/O, two high speed quadrature or SSI channels | p. 14 |
| **PROFI** | PROFIBUS-DP communication | p. 16 |
| **Blank** | Blank slot cover - no part number designation needed for blank cover in slot 0 | |

**Options**

| | | |
|---|---|---|
| **HZ** | Hazardous location designation Class I, Division 2, Groups A, B, C, D (not available for all modules) | p. 17 |

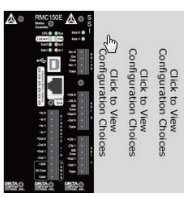
* The Dual-Loop Pressure/Force Control Option is required only for dual-loop control, such as position-pressure, position-force, velocity-pressure, or velocity-force. It is not required for pressure-only control or force-only control. The Dual-Loop option also enables advanced control algorithms with two inputs per axis such as Active Damping or Acceleration control using pressure or accelerometer feedback.

## Accessories and More


Voltage-to-Current Converters ..... p. 17
Cable Assemblies ..... p. 18
Terminal Blocks ..... p. 18
Mounting Dimensions ..... p. 19


### Online Configuration Tool

Create your own RMC150 controller and request a quote!
Go to Delta's website at www.deltamotion.com and choose **Request a Quote Online**.

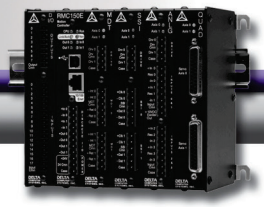



## Example Part Numbers

**RMC150E-S2-Q2**
4 axes with SSI feedback, 4 axes with quadrature feedback and a blank cover on the left-most slot

**RMC151E-H4-PROFI**
8 axes with analog feedback (8 drive outputs and 16 analog inputs) and a PROFIBUS module, 8 axes dual-loop enabled

**RMC150E-M2-Q1-D1-DI/O**
4 axes with MDT feedback, 2 axes with quadrature feedback, 2 discrete I/O modules, one of which is in slot 0.



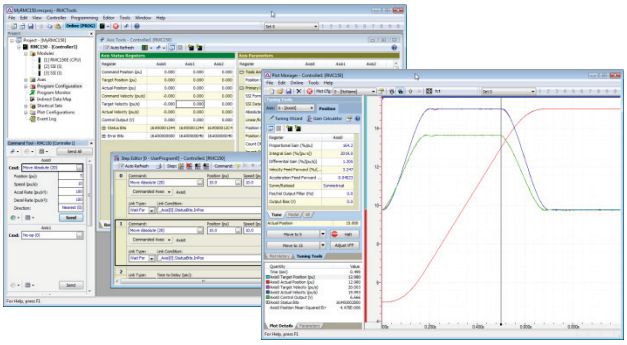
# RMCTools Software

RMCTools is a powerful motion control software package for setting up, tuning, troubleshooting, programming, and controlling all features of Delta's multi-axis RMC150/151 controllers from a PC. RMCTools also supports the RMC70 controllers.

Delta's intuitive and easy-to-use RMCTools software features flexible User Programs with extensive commands and the ability to embed mathematical expressions. Setup and tuning wizards reduce startup times, and the graphical diagnostics tools speed troubleshooting of the entire motion system. Extensive, context-sensitive help is included in RMCTools, giving you the information you need at your fingertips.

RMCTools is available for download from www.deltamotion.com.

**Supported Operating Systems:** Windows® 7/8.1/10



## RMCTools Features

Delta's powerful RMCTools software makes setup, tuning, and troubleshooting motion systems easier than ever.

### Setup

- **Wizards**
  Easy-to-use wizards include New Project, New Controller, Scale & Offset, and Autotuning.
- **Full Parameter Set**
  Monitor all axis status registers and modify parameters.

### Tuning and Diagnostics

- **Plots**
  Plot any register in the RMC, up to 16 registers per plot, sampled as fine as the control loop resolution.
- **Autotuning Wizard**
  Quickly and accurately tune your axes, using a slider bar to choose from a range of gains appropriate for your system.
- **Event Log**
  Speed troubleshooting by recording events such as parameter changes, commands, errors, and communications.
- **Program Monitor**
  Monitor User Program execution and variables.

### Programming

- **Commands**
  Issue commands directly from RMCTools. Use Shortcut Command Sets to quickly issue commands to speed the tuning process.
- **User Programs**
  Easily create programs to issue sequences of commands.
- **Program Triggers**
  Start user programs automatically based on user-defined events such as discrete inputs, error conditions, etc.
- **Mathematical Expressions**
  Expressions provide flexible programming capability for advanced calculations and machine control sequences.

# Communication Software

## RMCLink ActiveX Control and .NET Assembly

RMCLink enables full monitoring and control of RMC150/151 motion controllers via Ethernet communications from custom applications on Windows®-based PCs. RMCLink supports numerous languages, such as Visual Basic, C++, C#, VBScript, VBA (Microsoft Excel®), LabVIEW™.

RMCLink comes with fully-functioning sample projects to help you get up and running quickly. The help includes detailed walk-throughs and numerous code snippets.

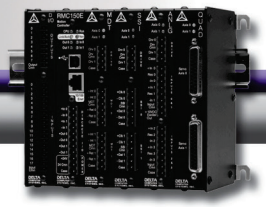
RMCLink, with extensive examples, is available for download from www.deltamotion.com.

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## Instrument Driver for Use with LabVIEW

VIs created by Delta for use with LabVIEW™ software provide full-fledged examples including plot uploading and trending. The VIs are available from the Instrument Driver portion of National Instruments' website and from www.deltamotion.com.

*LabVIEW is a trademark of National Instruments. Neither Delta, nor any software programs or other goods or services offered by Delta, are affiliated with, endorsed by, or sponsored by National Instruments.*



# RMC150 Control Features

The RMC150 provides an extensive set of motion commands and programming capability for quick and easy yet flexible motion control for virtually every motion application.

## Control Modes

### Closed Loop Control

Full PID loop control with velocity, acceleration and jerk feed forwards for precise synchronized motion. Directional gain factors support fluid power control.

### Position Control

- Point-to-Point moves
- S-curves
- Speed at Position
- Gearing
- Cyclic Sinusoidal Motion
- Splines, Cams
- Rotary motion (incremental and absolute)

### Velocity Control

- Velocity control with position feedback
- Velocity control with velocity feedback

### Pressure and Force Control

- Pressure sensor, load cell or differential force
- Linear or S-curve Ramps
- Gearing
- Cyclic Sinusoidal Profile
- Splines, Cams

### Position-Pressure and Position-Force Control

- Transition seamlessly between position control and pressure or force control.
- Pressure or Force Limit – limit the pressure or force during a position or velocity move.

### Active Damping

For high-performance control of pneumatics and difficult systems.

### Open Loop Control

Seamless transition from open loop to closed loop. Ramp Control Output between two values, or ramp based on position for hard-to-control systems.

### Quick Move

Move in open loop and stop in closed loop for fast, smooth motion with accurate stops.

### Valve Linearization

For valves with a sharp knee or “kink” in the flow versus command signal diagram.

### Custom Feedback

Control using any calculated value as feedback.

- Sum, difference, average, etc.
- Switch feedback on-the-fly
- Redundant feedback
- Feedback linearization

## High-level programming

### User Programs

Programs are easy-to-understand sequences of commands. Run multiple programs simultaneously to handle axis commands and machine control functions.

### Program Triggers

Start user programs automatically based on user-defined events such as discrete inputs, error conditions, etc.

### Variables

Recipes and other user parameters can be stored for use by user programs.

### Mathematical Expressions

Expressions provide flexible programming capability for advanced calculations and machine control sequences.

## Troubleshooting and Monitoring

### Plots

Plot any register in the RMC70, up to 16 registers per plot, sampled down to the control loop resolution.

### Event Log

Speeds troubleshooting by recording events such as parameter changes, commands, errors, and communications.

## Fault Handling

### Closed Loop stops

Ramp speed to zero at specified rate and hold position.

### Open Loop stops

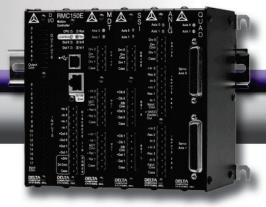
Ramp output voltage to zero at specified rate.

### Multi-axis (group) stops

A fault on one axis halts multiple axes when configured as a group.

### AutoStops

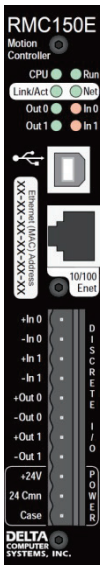
The response of axes to each fault type is easily configurable.



# RMC150E and RMC151E CPUs

### 2-8 Axes Controllers

The RMC150E and RMC151E CPUs are capable of controlling up to 8 control axes plus additional reference axes. These CPUs provide an on-board Ethernet port, a USB port for connection to the RMCTools software, two 24 VDC discrete outputs, and two 12-24 VDC discrete inputs.




### RMC150E - 8 Axes

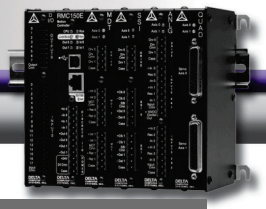
Control 8 axes, built-in Ethernet, USB monitor port, 2 discrete inputs, 2 discrete outputs.

### RMC151E – 8 Axes with Dual-Loop

RMC150E with dual-loop. Dual-loop is the ability to control two quantities–such as position and pressure–on the same axis. Notice that controlling only pressure or only force on an axis does not require the RMC151E.

## RMC150E/RMC151E CPU Specifications

| | | |
|---|---|---|
| **Motion Control** | | |
| Control loop times | | 250 μs, 500 μs, 1 ms, 2 ms, or 4 ms |
| **USB Monitor Port (for setup, programming and maintenance only)** | | |
| Connector | | USB “B” Receptacle |
| Data Rate | | Full-speed (12 Mbps) |
| **Discrete Inputs (2)** | | |
| Input type | | 12-24 VDC inputs; polarity independent |
| Logic polarity | | True “High” |
| Isolation | | 500 VAC |
| Input “High” range | | 7 to 26.4 VDC, 3 mA maximum |
| Input “Low” range | | 0 to 3.5 VDC, <1 mA |
| Maximum propagation delay | | 160 μs |
| **Discrete Outputs (2)** | | |
| Output type | | Solid State Relays (SSR) |
| Isolation | | 500 VAC |
| Rated voltage | | max ±30 V (DC or peak AC voltage) |
| Maximum current | | ±75 mA (±50 mA for Class I Div 2) |
| Maximum propagation delay | | 2.0 ms |
| Logic 1 (True, On) | | Low impedance (50 Ω maximum) |
| Logic 0 (False, Off) | | High impedance (<1 μA leakage current at 250 V) |
| **Power** | | |
| Voltage | | +24 VDC ±15% |
| Current | 3 slots | Typical 290 mA, max 375 mA |
| | 4 slots | Typical 385 mA, max 500 mA |
| | 5 slots | Typical 485 mA, max 625 mA |
| | 6 slots | Typical 585 mA, max 750 mA |
| DC-DC converter isolation | | 500 VAC |
| **Mechanical** | | |
| Mounting | | Symmetrical DIN 3 or panel-mount |
| Dimensions (see pg. 19 for drawings) | 3 slots | 4.12 x 5.95 x 4.75 in (WxHxD) (10.5 x 15.0 x 12.1 cm) width increases by 1.0 in for each slot |
| | 6 slots | 7.12 x 5.95 x 4.75 in (WxHxD) (18.1 x 15.0 x 12.1 cm) |
| Weight | 3 slots | 2 lb (0.9 kg) max |
| | 6 slots | 3 lb (1.4 kg) max |



## RMC150E/RMC151E CPU Specifications (continued)

| | |
|---|---|
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |
| **Ethernet Interface** | |
| Hardware interface | IEEE 802.3 for 100BASE-T (twisted pair) |
| Data Rate | 10/100 Mbps |
| Duplex | Full/Half-Duplex |
| Features | Auto-negotiation,<br>Auto-crossover (MDI/MDI-X) |
| Connector | RJ-45 |
| Cable | CAT5, CAT5e or CAT6, UTP or STP |
| **Ethernet Configuration** | |
| Configuration parameters | IP address, subnet mask, gateway address, enable/disable auto-negotiation |
| Configuration methods | BOOTP, DHCP, or static |
| **Ethernet Protocol Support** | |
| Application protocols<br>(Call Delta for availability of other protocols) | EtherNet/IP,<br>Modbus/TCP,<br>PROFINET,<br>CSP (DF1 over Ethernet),<br>Omron FINS,<br>Procedure Exist (Mitsubishi Q-series) |
| Framing protocol | Ethernet II |
| Internet protocol | IP (includes ICMP, ARP, and Address Collision Detection) |
| Transport protocols | TCP, UDP |

## Pin-out

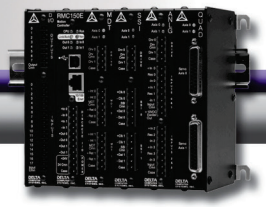
| **Discrete I/O Connector** | |
|---|---|
| +In 0<br>-In 0 | General-purpose input 0 |
| +In 1<br>-In 1 | General-purpose input 1 |
| +Out 0<br>-Out 0 | General-purpose output 0 |
| +Out 1<br>-Out 1 | General-purpose output 1 |

| **Power connector** | |
|---|---|
| +24 V | Power for entire controller |
| 24 Cmn | Power common |
| Case | Protective earth ground |

## Ordering Information

The CPU part number is the first part of the entire controller part number. Specify RMC150E, or RMC151E for the dual-loop option.

For example, **RMC150E-M2**: RMC150 motion controller with 4 axes of MDT position control.



# MDT Module

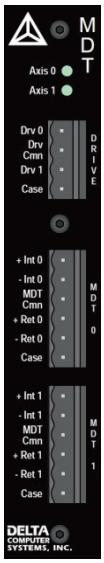
**Two Axes, Magnetostrictive Linear Displacement Transducers**

The two-axis MDT module interfaces to magnetostrictive linear displacement transducers (MDTs) with Start/Stop or Pulse Width Modulated (PWM) outputs. These absolute-position transducers are especially well suited for hydraulic applications because of their non-contact design, robustness, modularity, and resistance to contaminants.

Magnetostrictive linear displacement transducers with the SSI interface provide higher resolution than Start/Stop or PWM outputs and are supported by the RMC SSI module.

**Features:**

- Two axes of MDT feedback per module
- Up to 0.001 in (25.4 µm) resolution using Start/Stop
- Up to 0.0001 in (2.54 µm) resolution using PWM transducers with multiple recirculations
- Supports internal transducer recirculations
- Transducer length up to 398 in (10.1 m) (4 ms loop time)
- Differential (recommended) or single-ended interface
- Two isolated, ±10 V, 12-bit drive outputs per module
- Current output up to ±200 mA with VC2124 converter option




## MDT Specifications

| **Start/Stop and PWM Interface** | |
|---|---|
| Axes | Two per module |
| Return inputs | Two RS-422 differential |
| Interrogation outputs | Two RS-422 differential (External interrogation required) |
| ESD protection | 15 kV Electrostatic Discharge (ESD) protection |
| Resolution | 0.001 in (25.4 µm) Start/Stop, 0.0001 in (2.54 µm) PWM |
| Count rate | 120 MHz |
| **Drive Interface** | |
| Outputs | Two ±10 V, 5 mA maximum, 12-bit DAC |
| Isolation | 500 VAC |
| Current Output Accessory | VC2124 voltage-to-current converter output range is adjustable from ±10 mA to ±200 mA in 10 mA steps |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## MDT Pin-out

| **MDT 0 Connector** | |
|---|---|
| +Int 0 | + Interrogation |
| -Int 0 | - Interrogation |
| MDT Cmn | Transducer Common |
| +Ret 0 | + Return |
| -Ret 0 | - Return |
| Case | Chassis Ground (shield) |

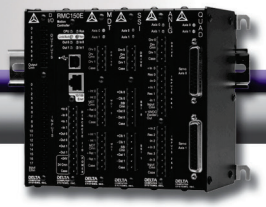
| **MDT 1 Connector** | |
|---|---|
| +Int 1 | + Interrogation |
| -Int 1 | - Interrogation |
| MDT Cmn | Transducer Common |
| +Ret 1 | + Return |
| -Ret 1 | - Return |
| Case | Chassis Ground (shield) |

| **Drive Connector** | |
|---|---|
| Drv 0 | ±10 V Drive Output |
| Drv Cmn | Drive Common |
| Drv 1 | ±10 V Drive Output |
| Case | Chassis Ground (shield) |

## MDT Ordering Information

To specify an MDT interface module, insert **-M*n*** into the part number, where ***n*** indicates the number of modules. Up to four MDT modules can be ordered in a single RMC unit. The MDT module can be used in slots 2-5. Refer to the SSI module for Magnetostrictive LDTs with a Synchronous Serial Interface (SSI) output.

For example, **RMC150E-M2-A1**: 4 axes of MDT position control and 4 analog inputs.



# SSI Module

**Two Axes, Synchronous Serial Interface**

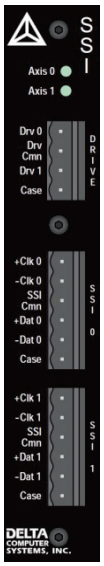
The two-axis SSI module interfaces to transducers with the Synchronous Serial Interface (SSI) output. Many types of transducers are available with SSI, including magnetostrictive linear displacement transducers, absolute encoders, and laser measuring devices.

SSI has a number of advantages over other interfaces:

- Higher noise immunity
- Absolute positions
- Available on a wide variety of transducers
- Many SSI devices offer higher precision. For example, magnetostrictive LDTs offer higher resolutions with SSI interface than for other interface types, such as Start/Stop, PWM, voltage, or current.

**Features:**

- Two axes of SSI feedback per module
- Binary or gray code
- 8 to 31 data bits
- Differential RS-422 SSI interface
- Two isolated, ±10 V, 12-bit drive outputs per module
- Current output up to ±200 mA with VC2124 converter option




## SSI Specifications

| | |
|---|---|
| **SSI Interface** | |
| Axes | Two per module |
| Data inputs | Two RS-422 differential, 150 Ω input impedance |
| Clock outputs | Two RS-422 differential |
| Clock frequency | User-selectable 230 kHz or 921 kHz |
| Cable type | Twisted pair, shielded, low capacitance communication cable |
| Cable length maximum | Transducer dependent (approx. 300-600 ft) |
| ESD protection | 15 kV Electrostatic Discharge (ESD) protection |
| Resolution | Transducer dependent (up to 2 µm or approximately 0.00008 in for magnetostrictive LDTs) |
| Count encoding | Binary or Gray Code |
| Data bits | 8 to 31 bits |
| **Drive Interface** | |
| Outputs | Two ±10 V, 5 mA maximum, 12-bit DAC |
| Isolation | 500 VAC |
| Current Output Accessory | VC2124 voltage-to-current converter output range is adjustable from ±10 mA to ±200 mA in 10mA steps |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## SSI Pin-out

| SSI 0 Connector | |
|---|---|
| +Clk 0 | + Clock Output |
| -Clk 0 | - Clock Output |
| SSI Cmn | Transducer Common |
| +Dat 0 | + Data Input |
| -Dat 0 | - Data Input |
| Case | Chassis Ground (shield) |

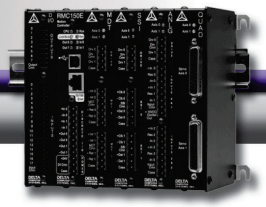
| SSI 1 Connector | |
|---|---|
| +Clk 1 | + Clock Output |
| -Clk 1 | - Clock Output |
| SSI Cmn | Transducer Common |
| +Dat 1 | + Data Input |
| -Dat 1 | - Data Input |
| Case | Chassis Ground (shield) |

| Drive Connector | |
|---|---|
| Drv 0 | ±10 V Drive Output |
| Drv Cmn | Drive Common |
| Drv 1 | ±10 V Drive Output |
| Case | Chassis Ground (shield) |

## SSI Ordering Information

To specify an SSI interface module, insert ***-Sn*** into the part number, where ***n*** indicates the number of modules. Up to four SSI modules can be ordered in a single RMC unit. The SSI module can be used in slots 2-5.

For example, **RMC150E-S3-A1:** 6 axes of SSI position control and 4 analog inputs.



# Quadrature Module

**Two Axes, 5 V differential (RS-422) A, B, and Z**

The two-axis Quadrature module interfaces to linear and rotary transducers and encoders with 5 V differential (RS-422) A, B, and Z outputs. Many types of transducers and encoders are available with quadrature outputs.

In addition to A, B, and Z (index) inputs, each axis includes a high-speed homing input, a drive enable output, a drive fault input, and two high-speed inputs for limit switches or high-speed position latching.

**Features:**

- Two axes of quadrature feedback per mdoule
- 4,000,000 counts per second
- High-speed inputs: home, position latch, travel limits
- Digital noise filters on all inputs
- All discrete inputs are isolated
- Drive fault inputs, Drive enable outputs
- Two isolated, ±10 V, 14-bit drive outputs per module
- Current output to ±200 mA with VC2124 converter option




## Quadrature Specifications

| | |
|---|---|
| **Inputs and Outputs** | |
| Axes | Two per module |
| Inputs | Two 5 V differential (RS-422), 215 Ω input impedance, A, B and Z |
| ESD Protection | 15 kV Electrostatic Discharge (ESD) Protection |
| Maximum Encoder Frequency | 4,000,000 counts/s |
| Fault Inputs, Home Inputs, and high-speed Limit or Registration Inputs | Input "High" range: 3.2 to 26.4 VDC, 3.5 mA min., 10 mA max.<br>Input "Low" range: 0 to 2 VDC, < 1 mA<br>Max input voltage: 26.4 V, 500 VAC isolation, compatible with most limit switches, TTL, and CMOS outputs |
| Home input response time | 50 µs |
| Index (Z) input response time | 125 ns |
| Drive Enable output | Solid State relay, 50 Ω, 30 V, 75 mA (50 mA for Class I, Div 2), 1.5 ms, 500 VAC isolation |
| **Drive Interface** | |
| Outputs | Two ±10 V, 5 mA maximum, 14-bit DAC |
| Isolation | 500 VAC |
| Current Output Accessory | VC2124 voltage-to-current converter output range is adjustable from ±10 mA to ±200 mA in 10mA steps |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## Quadrature Pin-out

| Pin | Function |
|---|---|
| 1 | A- |
| 2 | A+ |
| 3 | B- |
| 4 | B+ |
| 5 | No connection |
| 6 | Registration X / Neg Limit - |
| 7 | Registration X / Neg Limit + |
| 8 | Registration Y / Pos Limit - |

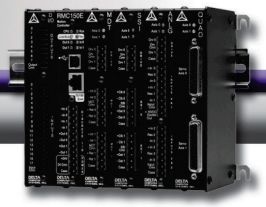
| Pin | Function |
|---|---|
| 9 | Registration Y / Pos Limit + |
| 10 | No connection |
| 11 | No connection |
| 12 | ±10 V Drive Output |
| 13 | Drive Output Common |
| 14 | Z- Index from encoder |
| 15 | Z+ Index from encoder |
| 16 | Encoder Common |

| Pin | Function |
|---|---|
| 17 | No connection |
| 18 | Home Input - |
| 19 | Home Input + |
| 20 | Fault Input - |
| 21 | Fault Input + |
| 22 | No connection |
| 23 | No connection |
| 24 | Enable Output |
| 25 | Enable Output |

## Quadrature Ordering Information

To specify a Quadrature module, insert **-Q*n*** into the part number, where ***n*** indicates the number of modules. Up to four Quadrature modules can be ordered in a single RMC unit. The Quadrature module can be used in slots 2-5.

For example, **RMC150E-Q2-A1: 4** axes of quadrature position control and 4 analog inputs.



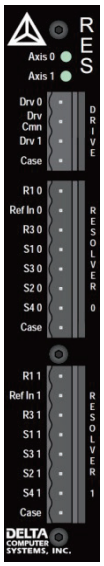
# Resolver Module

**Two Axes, Resolvers 800 Hz to 5 kHz, ratios 0.42 to 1.41**

The two-axis Resolver module interfaces to resolvers. These single-turn absolute-position transducers are well-suited for hazardous and harsh environments due to the simplicity and robustness of the transducer construction.

**Features:**

- Two axes of resolver feedback per module
- 14 or 16 bit resolution
- Reference frequency from 800 Hz to 5 kHz
- Resolver Transformation Ratios from 0.42 to 1.41
- Custom frequency and transformation ratios options available – contact Delta
- Two isolated, ±10 V, 14-bit drive outputs per module
- Current output up to ±200 mA with VC2124 converter option




## Resolver Specifications

| **Inputs** | |
|---|---|
| Axes | Two per module |
| Reference Frequency | 800 Hz to 5 kHz |
| Reference Output Voltage | 1.41 to 4.8 V RMS |
| Reference Output Current | 28 mA max. |
| Resolver Transformation Ratio (SINMAX/Reference) | 0.42 to 1.41 |
| Resolution | 14 or 16 bits |
| Maximum Speed | 3000 RPM at 14 bits and 600 RPM at 16 bits |
| Maximum Acceleration | 1200 RPS per second at 14 bits, 60 RPS per second at 16 bits |
| Accuracy | 4 Minutes +1 LSB |
| **Drive Interface** | |
| Outputs | Two ±10 V, 5 mA maximum, 14-bit DAC |
| Isolation | 500 VAC |
| Current Output Accessory | VC2124 voltage-to-current converter output range is adjustable from ±10 mA to ±200 mA in 10 mA steps |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## Resolver Pin-out

| **Resolver 0 Connector** | |
|---|---|
| R1 0 | Reference Output + |
| Ref In 0 | Reference In (normally not used) |
| R3 0 | Reference Ouput – |
| S1 0 | Sine Input + |
| S3 0 | Sine Input – |
| S2 0 | Cosine Input + |
| S4 0 | Cosine Input – |
| Case | Chassis ground (shield) |

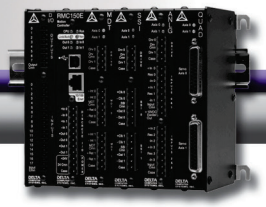
| **Resolver 1 Connector** | |
|---|---|
| R1 1 | Reference Output + |
| Ref In 1 | Reference In (normally not used) |
| R3 1 | Reference Ouput – |
| S1 1 | Sine Input + |
| S3 1 | Sine Input – |
| S2 1 | Cosine Input + |
| S4 1 | Cosine Input – |
| Case | Chassis ground (shield) |

| **Drive Connector** | |
|---|---|
| Drv 0 | ±10 V Drive Output |
| Drv Cmn | Drive Common |
| Drv 1 | ±10 V Drive Output |
| Case | Chassis Ground (shield) |

## Resolver Ordering Information

To specify a Resolver module, insert **-R*n*** into the part number, where ***n*** indicates the number of modules. Up to four Resolver modules can be ordered in a single RMC unit. The Resolver module can be used in slots 2-5.

For example, **RMC150E-R2**: 4 axes of resolver position control.



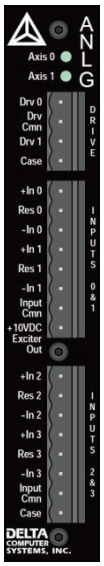
# Analog (H) Module

### Two Axes, Four Voltage or Current Inputs

The two-axis H module interfaces to ±10 V, ±5 V, and 4-20 mA transducers. This module includes two drive outputs and four 16-bit inputs for controlling position, velocity, pressure, or force. The four inputs provide flexibility in your system, and can be used for such things as reference inputs (e.g. a joystick input), connecting to two pressure transducers to control the resultant force on a hydraulic cylinder, or for dual-loop position-pressure or position-force control (requires the RMC151E CPU).

### Features:

- Four isolated 16-bit inputs
- 8 times oversampling
- ±10 V, ±5 V, and 4-20 mA input ranges
- +10 V exciter output
- Two isolated, ±10 V, 12-bit drive outputs per module
- Current output up to ±200 mA with VC2124 converter option




## Analog Specifications

| | |
|---|---|
| **Inputs** | |
| Inputs | Four 16-bit differential |
| Isolation | 500 VAC |
| Overvoltage protection | ±40 V |
| Input ranges | ±10 V, ±5 V, 4-20 mA (each input independently configurable) |
| Input impedance | 1 MΩ |
| Input filter slew rate | 25 V/ms |
| Oversampling | 8 times per control loop |
| Offset drift with temperature | 0.2 LSB/°C typical (±10 V range) |
| Gain drift with temperature | 20 ppm/°C typical (±10 V range) |
| Non-linearity | 12 LSB (counts) typical (±10 V range) |
| Exciter output | 10 VDC ± 2%, 8 mA (for use with potentiometers only) |
| **Drive Interface** | |
| Outputs | Two ±10 V, 5 mA maximum, 12-bit DAC |
| Isolation | 500 VAC |
| Current Output Accessory | VC2124 voltage-to-current converter output range is adjustable from ±10 mA to ±200 mA in 10mA steps |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

**Note: Analog (G) Module**

The Analog (G) module has two ±10 V inputs and two ±10 V drive outputs.

Delta recommends using the H module instead of the G module. The similarly-priced H module has four analog inputs instead of two and supports 4-20 mA feedback.

For detailed specifications on the G module, refer to the RMC100 datasheets at www.deltamotion.com/dloads.

## Analog Pin-out

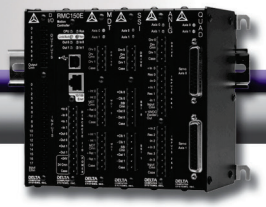
| Inputs 0&1 Connector | |
|---|---|
| +In 0 | Differential analog input 0+ |
| Res 0 | Connect to +In 0 for 4-20 mA |
| –In 0 | Differential analog input 0– |
| +In 1 | Differential analog input 1+ |
| Res 1 | Connect to +In 1 for 4-20 mA |
| –In 1 | Differential analog input 1– |
| Input Cmn | Analog common (Isolated) |
| +10 VDC Exciter Out | +10 VDC output for use with potentiometers only |

| Inputs 2&3 Connector | |
|---|---|
| +In 2 | Differential analog input 2+ |
| Res 2 | Connect to +In 2 for 4-20 mA |
| –In 2 | Differential analog input 2– |
| +In 3 | Differential analog input 3+ |
| Res 3 | Connect to +In 3 for 4-20 mA |
| –In 3 | Differential analog input 3– |
| Input Cmn | Analog common (Isolated) |
| Case | Chassis Ground (shield) |

| Drive Connector | |
|---|---|
| Drv 0 | ±10 V Drive Output |
| Drv Cmn | Drive Common |
| Drv 1 | ±10 V Drive Output |
| Case | Chassis Ground (shield) |

## Analog Ordering Information

To specify an H module, insert **-H*n*** into the part number, where ***n*** indicates the number of modules. Up to four H modules can be ordered in a single RMC unit. The H module can be used in slots 2-5.
For example, **RMC150E-H2-DI/O**: Two H modules and one discrete I/O module.



# Analog (A) Module

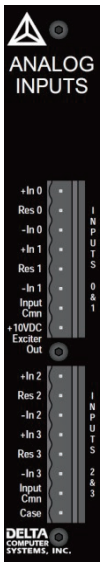
### Four Voltage or Current Inputs

The A module provides four 12-bit analog inputs, individually configurable as ±10 V, ±5 V, or 4-20 mA. The inputs provide flexibility in designing your system, and are typically used in the following applications:

- Dual-loop position-pressure or position-force control. The A module is typically used to provide the analog inputs for the pressure transducers or force load cells.
- Reference inputs, such as joystick inputs.
- Differential force input from two pressure transducers on a hydraulic cylinder.

### Features:

- Four isolated 12-bit inputs
- 8 times oversampling
- ±10 V, ±5 V, and 4-20 mA input ranges
- +10 V exciter output




## Analog Specifications

| **Inputs** | |
|---|---|
| Inputs | Four 12-bit differential |
| Isolation | 500 VAC |
| Overvoltage protection | ±40 V |
| Input ranges | ±10 V, ±5 V, 4-20 mA (each input independently configurable) |
| Input impedance | 1 MΩ |
| Input filter slew rate | 25 V/ms |
| Oversampling | 8 times per control loop |
| Offset drift with temperature | 0.01 LSB/°C typical (±10 V range) |
| Gain drift with temperature | 20 ppm/°C typical (±10 V range) |
| Non-linearity | 1 LSB (count) typical (±10 V range) |
| Exciter output | 10 VDC ± 2%, 8 mA (for use with potentiometers only) |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## Analog Pin-out

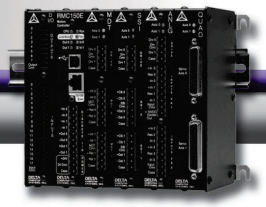
| **Inputs 0&1 Connector** | |
|---|---|
| +In 0 | Differential analog input 0+ |
| Res 0 | Connect to +In 0 for 4-20 mA |
| –In 0 | Differential analog input 0– |
| +In 1 | Differential analog input 1+ |
| Res 1 | Connect to +In 1 for 4-20 mA |
| –In 1 | Differential analog input 1– |
| Input Cmn | Analog common (Isolated) |
| +10 VDC Exciter Out | +10 VDC output for use with potentiometers only |

| **Inputs 2&3 Connector** | |
|---|---|
| +In 2 | Differential analog input 2+ |
| Res 2 | Connect to +In 2 for 4-20 mA |
| –In 2 | Differential analog input 2– |
| +In 3 | Differential analog input 3+ |
| Res 3 | Connect to +In 3 for 4-20 mA |
| –In 3 | Differential analog input 3– |
| Input Cmn | Analog common (Isolated) |
| Case | Chassis Ground (shield) |

## Analog Ordering Information

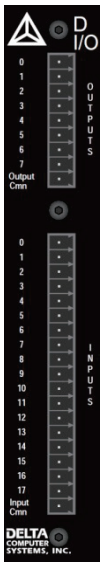
To specify an A module, insert **-A*n*** into the part number, where ***n*** indicates the number of modules. Up to four A modules can be ordered in a single RMC unit (four is rare, as the RMC would have no drive outputs for control). The A module can be used in slots 2-5.

For example, **RMC150E-M2-A1-DI/O**: 4 axes of MDT position control, 4 analog inputs, and one discrete I/O module.



# Discrete I/O Module

**18 Discrete Inputs, 8 Discrete Outputs**




The Discrete I/O module provides 8 discrete outputs and 18 discrete inputs, supporting 5 V to 24 V signal levels. The discrete I/O can be used for many tasks, for example, starting motion sequences, providing interlocks, starting external events, simple communications, and more.

## Discrete I/O Specifications

| | |
|---|---|
| **Discrete Inputs** | |
| Inputs | 18, compatible with signal levels from 5V to 24V |
| Input Characteristics | 5-24 VDC, sinking (requires sourcing driver) |
| Logic Polarity | True high |
| Isolation | 500 VAC |
| Input “High” Range | 3 to 26.4 VDC<br>3.2 mA minimum, 10 mA maximum |
| Input “Low” Range | 0 to 2 VDC<br>< 1 mA |
| Filtering | Inputs 0-15: 500 µs<br>Inputs 16-17: 250 µs |
| Maximum Propagation Delay | 100 µs + filtering |
| **Outputs** | |
| Outputs | 8, Solid State Relay |
| Logic polarity | True On |
| Isolation | 500 VAC |
| Maximum voltage | ±30 V (DC or peak AC voltage rating of SSR) |
| Maximum current | ±75 mA (±50 mA for Class I, Div 2) |
| Maximum propagation delay | 1.5 ms |
| Logic 1 (True, On) | Low impedance (50 Ω maximum) |
| Logic 0 (False, Off) | High impedance (<1 µA leakage current at 250 V) |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## Discrete I/O Pin-out

| Discrete Outputs | |
|---|---|
| 0-7 | General Outputs 0-7 |
| Output Cmn | Common (high or low side) |

| Discrete Inputs | |
|---|---|
| 0-17 | General Inputs 0-17 |
| Input Cmn | Common (must be low side) |

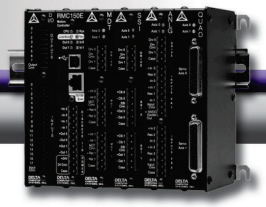
## Discrete I/O Ordering Information

The part number depends on the slot in which the Discrete I/O module is installed. The Discrete I/O module for slot 0 is not interchangeable with the Discrete I/O module for slots 2-5.

**Slot 0:** Append **-DI/O** to the part number.

**Slots 2-5:** Insert **-D*n*** to the part number, where ***n*** indicates the number of modules.

For example, **RMC150E-M2-D1-DI/O**: 4 axes of MDT position control and 2 discrete I/O modules, one of which is in slot 0.



# Universal I/O Module

### 2 Analog Inputs, 6 Discrete I/O, 2 Quadrature/SSI Channels

The Universal Input/Output module provides two analog inputs, six discrete inputs/outputs, and two high-speed channels that can be configured for quadrature inputs, SSI inputs, or even inter-controller communications for synchronizing axes between RMCs.

### Analog Input Features:

- Two 16-bit analog inputs, ±10 V or 4-20 mA

### Discrete I/O Features:

- Six I/O, individually configurable as input or output
- Inputs: 12 to 24 VDC, sinking or sourcing
- Outputs: Solid state relay, 75 mA
- Inputs 0 and 1 can be used as high-speed registration inputs in conjunction with the quadrature inputs.

### High-Speed Channel Features

Each of the two RS-422 channels is independently configurable as Quadrature or SSI.

### Quadrature Channels

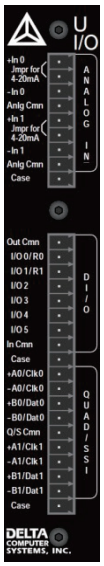
Each high-speed channel can be configured as quadrature.

- A and B quadrature inputs
- Requires 5 V differential (RS-422) signals
- Discrete inputs 0 and 1 can be used as high-speed registration or homing inputs in conjunction with quadrature inputs 0 and 1, respectively.

### SSI Channels

Each high-speed channel can be configured to do the following SSI tasks:

- **Receive SSI Input from a Transducer**
  This is a standard SSI input for obtaining data from an SSI transducer or encoder.
- **Send Data Out Via SSI (Slave)**
  The SSI channel behaves as a transducer or encoder and will return data to the requesting master.
- **Synchronize Multiple RMCs to One Transducer**
  The SSI channel can monitor the data that another RMC is receiving from an SSI device. This makes it possible to synchronize multiple RMCs to one SSI transducer.
- **Communicate between RMCs**
  The SSI channels can exchange data between RMCs every loop time of the controller, providing the ability to tightly synchronize axes between RMCs.




## Specifications

See next page.

## Universal I/O Pin-out

| Analog In Connector | |
|---|---|
| +In 0 | Differential analog input 0+ |
| Jmpr for 4-20 mA | Connect to +In0 for 4-20 mA |
| -In 0 | Differential analog input 0- |
| Input Cmn | Analog common (Isolated) |
| +In 1 | Differential analog input 1+ |
| Jmpr for 4-20 mA | Connect to +In0 for 4-20 mA |
| -In 1 | Differential analog input 1- |
| Input Cmn | Analog common (Isolated) |
| Case | Chassis Ground (shield) |

| DI/O Connector | |
|---|---|
| Out Cmn | Common to one side of all outputs |
| I/O 0/RO | Input or Output |
| I/O 1/R1 | Input or Output |
| I/O 2 | Input or Output |
| I/O 3 | Input or Output |
| I/O 4 | Input or Output |
| I/O 5 | Input or Output |
| In Cmn | Common to one side of all inputs |
| Case | Chassis Ground (shield) |

| Quad/SSI Connector | |
|---|---|
| +A0/Clk0<br>-A0/Clk0 | Channel 0: A Input, Clock Output, or Clock Input |
| +B0/Dat0<br>-B0/Dat0 | Channel 0: B Input, Data Input, or Data Output |
| Q/S Cmn | Quad/SSI Common |
| +A1/Clk1<br>-A1/Clk1 | Channel 1: A Input, Clock Output, or Clock Input |
| +B1/Dat1<br>-B1/Dat1 | Channel 1: B Input, Data Input, or Data Output |
| Case | Chassis Ground (shield) |

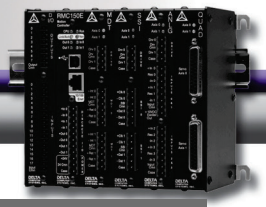
## Universal I/O Ordering Information

The part number depends on the slot in which the Universal I/O module is installed. The Universal I/O module for slot 0 is not interchangeable with the Universal I/O module for slots 2-5.

**Slot 0:** Append **-UI/O** to the part number.

**Slots 2-5:** Insert **-U*n*** to the part number, where ***n*** indicates the number of modules.

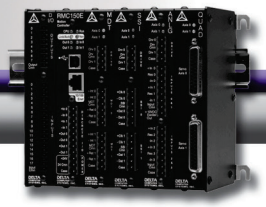
For example, **RMC150E-M2-UI/O**: 4 axes of MDT position control and one Universal I/O module in slot 0.



## Universal I/O Specifications

| Analog Inputs | |
|---|---|
| Inputs | Two 16-bit differential inputs |
| Isolation | 500 VAC |
| Overvoltage protection | ±40 V |
| Input ranges | ±10 V and 4-20 mA (each input independently configurable) |
| Input impedance | 5 MΩ |
| Input filter frequency | 1.2 kHz |
| Input filter slew rate | 25 V/ms |
| Sampling rate | 60 kHz |
| Offset drift with temperature | 0.2 LSB/°C typical |
| Gain drift with temperature | 20 ppm/°C typical |
| Non-linearity | 12 LSB (counts) typical over full 16-bit range |
| **Discrete I/O – General** | |
| Discrete I/O points | 6; each is individually configurable as input or output |
| Isolation | 500 VAC |
| **Discrete I/O – Inputs** | |
| Input characteristics | 12-24 VDC, sinking or sourcing |
| Logic polarity | True “high” |
| Input “high” range | 7 to 26.4 VDC (polarity independent), 3mA maximum |
| Input “low” range | 0 to 3.5 VDC (polarity independent), <1 mA |
| Maximum propagation delay | 160 μs + filtering |
| Filtering | 50 μs (value stable for 7 samples @ 8 μs interval) |
| Registration | Inputs 0 and 1 can be used as high-speed registration inputs in conjunction with the quadrature inputs. For this use, filtering can be set to 100ns (max propagation delay is still 160 μs). |
| **Discrete I/O – Outputs** | |
| Output characteristics | Solid State Relay |
| Logic polarity | True On |
| Maximum voltage | ±30 V (DC or peak AC rating of SSR) |
| Maximum current | ±75 mA |
| Maximum propagation delay | 2.0 ms |
| Logic 1 (True, On) | Low impedance (25 Ω typ, 50 Ω max) |
| Logic 0 (False, Off) | High impedance (<1 μA at 250 V) |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | Contact Delta |

| High-Speed Channels | |
|---|---|
| Channels | 2, independently configurable |
| Transducer types | MDT with SSI output, single- or multi-turn absolute SSI encoders, quadrature encoders.<br>**Note:** Linear MDTs with SSI output should be of the synchronized type. Non-synchronized is not well-suited for motion control. |
| Modes | Quadrature input – ±A and ±B inputs<br>SSI Standard input – for interfacing to transducers and encoders<br>SSI Monitor input – for monitoring SSI communication on another device<br>SSI Slave output – emulates a transducer<br>SSI Master output – for sending data to another controller |
| Input type (Data/Clock/Quad) | RS-422 (5 V differential) (Single-ended encoders not supported due to low noise immunity) |
| Output type (Clock/Data) | RS-422 (5 V differential) |
| Clock frequency | 250 kHz, 500 kHz, or 971 kHz, user-selectable |
| Resolution | Transducer dependent (typically down to 2μm or approximately 0.00008” for MDTs) |
| SSI count encoding | Binary or Gray code |
| SSI count data length | 8 to 32 bits |
| Termination | 215 Ω – user-selectable on all inputs |
| Registration | Discrete inputs 0 and 1 can be used as high-speed registration for channels 0 and 1 respectively. |
| Registration response time | 160 μs |
| Max encoder frequency | 8,000,000 quadrature counts per second |
| Maximum cable length | 1000 ft (Low capacitance, shielded, twisted pair computer communication cable) |
| Electrostatic discharge (ESD) protection | 15 kV (human body model) |
| Isolation | 500 VAC |



# PROFIBUS Module

### PROFIBUS-DP Communications

The RMC150 PROFIBUS-DP module supports data rates up to 12 Mbaud, which permits high-speed transfer of any data to and from the RMC, including position commands, parameters, and status information.

The RMC's PROFIBUS interface gives the flexibility of several modes, including I/O Modes with in/out data of 4, 8, 16, or 32 registers. Select the mode that best fits your application and PROFIBUS master's capabilities.

With the PROFIBUS module installed, the RMC150/151 supports simultaneous Ethernet and PROFIBUS communications.



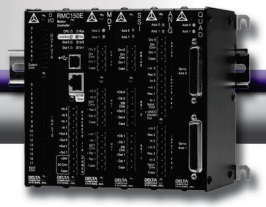

## PROFIBUS Specifications

| PROFIBUS-DP Interface | |
|---|---|
| Data Rate | 9.6 kbaud up to 12 Mbaud |
| Isolation | 2500 VAC |
| Product Identifier Number | 0x0AC6 |
| Features Supported | Sync Mode, Freeze Mode, Auto-baud rate detect |
| Valid Station Addresses | 0-126 (set by software or Set Slave Address function) |
| Connector | Standard PROFIBUS-DP DB-9 (use termination in cable connectors as per PROFIBUS specification) |
| **Environment** | |
| Operating temperature | +32 to +140°F (0 to +60°C) |
| Storage temperature | -40 to +185°F (-40 to +85°C) |
| Agency compliance | UL, CUL. Optional: Class I, Division 2, see pg. 17 |

## PROFIBUS Ordering Information

To specify a PROFIBUS interface module, append **-PROFI** to the part number. The PROFIBUS module can only be used in slot 0.

For example, **RMC150E-M2-PROFI**: 4 axes of MDT position control and PROFIBUS communications.



# Class I Division 2 Compliance

Hazardous location designation Class I, Division 2, Groups A, B, C, D is available for the RMC150E, excluding the G and UI/O modules.

- Products marked "Class I Division 2, Group A, B, C, D" are suitable for use in Class I Division 2, Groups A, B, C, and D hazardous locations and nonhazardous locations only.
- WARNING—EXPLOSION HAZARD—DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS.
- WARNING—EXPLOSION HAZARD—SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2.
- Maximum surrounding air temperature of 60° C.
- The RMC150E USB port is intended for configuration, programming, and troubleshooting purposes only. It should not be connected during normal operation.
- Wire gauge, screw clamp torque and wire type requirements are listed in the RMC Startup Guide and RMCTools help.

## Class I Division 2 Ordering Information

To specify Class I, Division 2, append "-HZ" to the entire RMC part number. Class I Division 2 compliance is not available for RMC configurations with the G and UI/O modules.

# Voltage-to Current Converters

Delta's voltage-to-current converters are designed for converting a voltage drive output to a current drive output in order to control a servo valve. Delta offers several voltage-to-current converters to fit your needs. The maximum output current is adjustable in increments of 10 mA up to the maximum output current range.

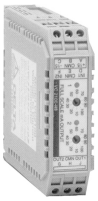
| Part Number | Description | Output Current Range* | Power Supply |
|---|---|---|---|
| VC2124 | 2-channel voltage-to-current converter | ±100 mA per channel | 24V DC |
| VC2100 | 2-channel voltage-to-current converter | ±100 mA per channel | ±15 VDC |
| VC2100-HS | 2-channel voltage-to-current converter – high speed** | ±100 mA per channel | ±15 VDC |



**VC2124**



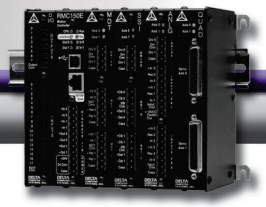
**VC2100**



**VC2100-HS**

* Channels can be connected in parallel to provide higher current. For example, two ±100 mA channels connected in parallel will provide ±200 mA.

**Most hydraulic control applications do not require the high-speed converter.



## Cable Assemblies

Delta 's provides cable assemblies for certain products. The table below lists the available cables:

| Cable Part No | Length | Cable Description |
|---|---|---|
| RMC-CB-QUAD-01-06 | 6 ft. | Cable for Quadrature module. 1 DB25 to 3 individual pig-tailed cables for drive, encoder, and limits. |
| RMC-CB-QUAD-01-10 | 10 ft. | |
| RMC-CB-QUAD-01-15 | 15 ft. | |
| RMC-CB-QUAD-01-20 | 20 ft. | |

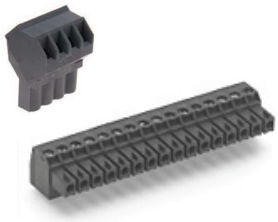


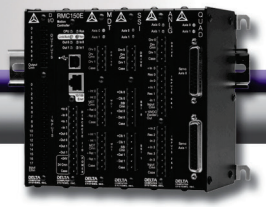
Custom lengths are available per request. A drawing of RMC-CB-QUAD-01-xx is available on the Downloads page of Delta's website at www.deltamotion.com/dloads.

## Terminal Blocks

All RMCs ship with connectors. Connectors are also available for order individually from Delta. The table below lists the available connectors. These parts are also available from connector manufacturers Amphenol Pcd or WECO using these part numbers.

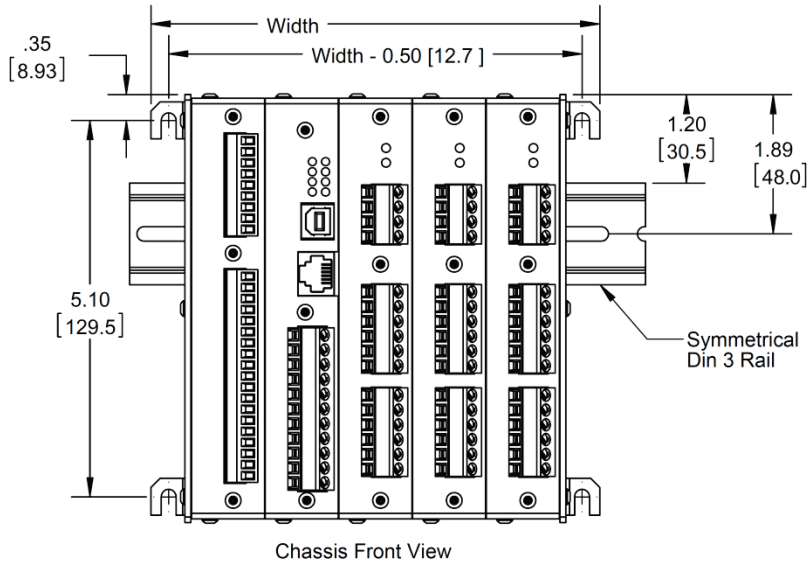
| Connector Part No | Connector Description | For Modules |
|---|---|---|
| 121-C-111/04 (WECO) | RMC100/150 4-pin Terminal Block | M, S, H, G, R |
| 121-C-111/06 (WECO) | RMC100/150 6-pin Terminal Block | M, S |
| 121-C-111/08 (WECO) | RMC100/150 8-pin Terminal Block | H, A, G, R |
| 121-C-111/11 (WECO) | RMC100/150 11-pin Terminal Block | RMC150/151E |
| ELVP09100 (Amphenol Pcd) | RMC100/150 9-pin Terminal Block | DI/O, UI/O |
| ELVP19100 (Amphenol Pcd) | RMC100/150 19-pin Terminal Block | DI/O, UI/O |





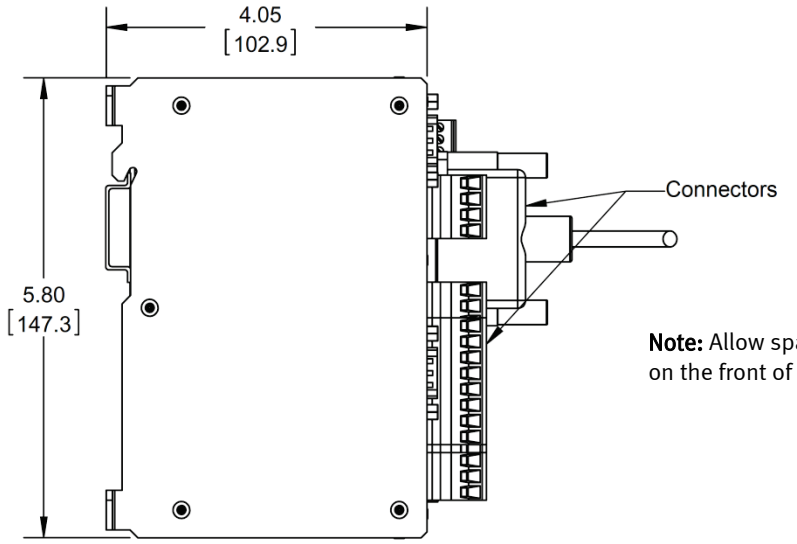
# Mounting Dimensions

The width of the RMC depends on the number of slots in the backplane.
CAD drawings of the RMC are available at www.deltamotion.com/dloads.
Units are in inches [mm].



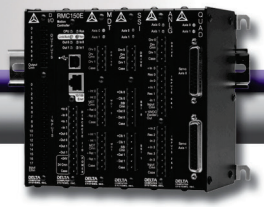

Chassis Front View

| Slots | Width |
|---|---|
| 3 | 4.12 in [105 mm] |
| 4 | 5.12 in [130 mm] |
| 5 | 6.12 in [155 mm] |
| 6 | 7.12 in [181 mm] |




Chassis Side View

**Note:** Allow space for the connectors on the front of the RMC.



# The RMC Family of Motion Control




## Connect. Control. Optimize.

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