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Find the *Delta Computer Systems VMC 186/40-TQ* at our website: *Click HERE*

VMC 186/40-TQ

Four Axis Linear and Rotary Control Module for VME Bus Applications

The VMC 186/40-TQ motion control module is a high performance linear and rotary motion controller for VME bus applications. Each axis can be independently programmed to use either a quadrature encoder or magnetostrictive linear displacement transducer (Temposonics™) as a position sensing device. Drive outputs can be configured to work with either current or voltage servo drive inputs.

Features

- Quadrature and magnetostrictive (Temposonics™) inputs in a single module
- Four axes of independent or coordinated control
- Optically isolated inputs and outputs
- Drive outputs - ±100 mA or ±10 volts
- Motion profiles can be changed on the fly using dual port RAM
- One millisecond PID loop control
- Front panel status indicators
- Direct connection to magnetostrictive transducers

Applications

- Palletizers/Stackers
- Laser positioning
- Tube forging machines
- Pinch roller positioning
- Robotics
- Headrigs, carriages, and other Forest industry machinery
- Hydraulic actuators
- Servo Motors

Quadrature Encoder Inputs

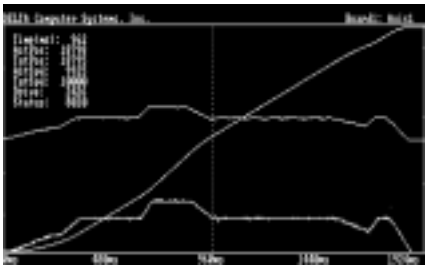
- Frequency response up to 200 KHz (800,000 Quadrature counts per second)
- 24 bit internal counters
- HOME and LIMIT signal inputs
- Input voltage range: 3.5 VDC to 24 VDC
- Encoder compatibility: Open collector, TTL and Differential

Magnetostrictive Inputs

- Resolution to 0.0005 inches
- Direct connection to magnetostrictive transducers (Temposonics)
- 1, 2, or 4 recirculations
- Positive or negative interrogation pulses
- Maximum speeds up to 120 inches per second (0.002" resolution)
- Maximum sampling rate of 4kHz
- Transducer lengths up to 130 inches (0.002" resolution)

Diagnostic Program - DCSMON (Requires VME based PC)

- Provides graphic display of latest motion profile position and velocity information



- Provides utilities to calculate motion parameters SCALE, OFFSET & DIRECTION
- Provides access to auto tuning function
- Allows user to activate simple motion profiles
- Permits user to change control parameters
- Displays parameter and status information for multiple axes
- Saves and retrieves graphic diagnostic information to and from disk
- Provides a mode to display previously saved diagnostic graphic information using a PC

DELTA Computer Systems, Inc.

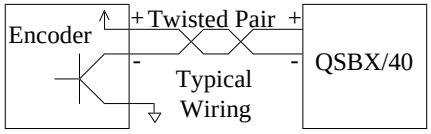
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VMC 186/40-TQ

Hardware Information

Quadrature Encoder Interface



Phases	A, B and HOME (Z)
Input Isolation	2500 VAC (optical)
Input Voltage Threshold	1.5 VDC min, 1.8 VDC typ, 3.25 VDC max
Input Current Threshold	5 mA typ, 9.5 mA max
Maximum Input Voltage	24 VDC
Encoder Compatibility	Open collector 5 to 24 VDC, TTL and Differential
Frequency Response	200 KHz, 800,000 edges per second using TTL drive

Four Digital Inputs for HOME qualification or LIMIT

Inputs	4 HOME and 4 LIMIT inputs
Input Isolation	2500 VAC (optical)
Input Voltage Threshold	1.5 VDC min, 1.8 VDC typ, 3.25 VDC max
Input Current Threshold	5 mA typ, 9.5 mA max
Maximum Input Voltage	24 VDC

Magnetostrictive Interface

Interface Type	Start/Stop digital pulse
Temposonics I and II	Direct connection
Temposonics II & RPM module	One differential driver board per axis (AMP 10)
Santest	Direct connection
Balluff	Direct connection (BTL-2-N2-XXXX-Z-S50)
T&R Electronics	One recirculation only (Consult Delta before using)
Input Isolation	2500 VAC optically isolated
Recirculations	Provided by module: 1, 2 or 4 (positive or negative pulse)
Counters	55.5 MHz
Position update rate	One millisecond
Sensor protection	4.7 and 15 ohm resistors for sensor power

Drive Outputs

Output Isolation	2500 VAC optically isolated
Current Mode	±100 milliamps
Voltage Mode	±10 Volts
Resolution	12 bit

VME Bus Interface

Memory Requirements	512 bytes - 128 allocated for each axis. Intel memory format (Little Endian) available with GE option
Address Modifier Support	39H - Standard non-privileged data access (24 bit) 3DH - Standard supervisory access
Interrupt Support	Single ROAK (Release On Acknowledge) interrupt for four axes using one of seven IRQ lines (IRQ 1 through IRQ 7)

Power Requirements

VME Bus	+ 5 VDC @ 2.5 amps maximum
External Magnetostrictive sensor	±15 VDC @ 500 mA, +5 VDC @ 500 mA
External drive	±15 VDC @ 500 mA

Mechanical Specifications

Size	6U
Connectors	
Back plane	P1 connector only
Linear Sensors	DB-25S
Quadrature/Switch Inputs	DB-37S
Drive	DB-15S

Environment

Operating Temperature	+32 to +140 F (0 to +60C)
Non-Operating Temperature	-40 to +185 F (-40 to +85C)
Storage Temperature	-40 to +185 F (-40 to +85C)
Humidity	0 to 93% non-condensing

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Programming Parameters

Hex Offset	Parameter Name	Default Value	Descriptions
00H	Command Position	Read Only	Requested Position with limits checked
02H	Target Position	Read Only	Calculated position of axis
04H	Actual Position	Read Only	Scaled position measurement
06H	Transducer Counts	Read Only	Raw transducer counts
08H	Status Word	Read Only	Axis error and status
			Bit 15 - Parameters initialized
			Bit 14 - Lag error
			Bit 13 - Lead error
			Bit 12 - Overdrive error
			Bit 11 - Valve out of null
			Bit 10 - Transducer not responding
			Bit 09 - Position overflow
			Bit 08 - Parameter error
			Bit 07 - Active (Axis one only)
			Bit 06 - Stopped/Obstructed
			Bit 05 - Decelerating
			Bit 04 - At Requested Speed
			Bit 03 - Accelerating
			Bit 02 - Halted
			Bit 01 - Near Command Position
			Bit 00 - At Command Position
0AH	Drive	Read Only	Output drive in raw A/D counts (12 bit)
0CH	Target Speed	Read Only	Calculated speed
0EH	Null Drive	Read Only	Current value for null drive
10H-3FH	Reserved words		
40H	Axis 1 Free Running Clock	Read Only	Free running 16 bit counter using millisecond clock
	Axis 2 Active Bit Interval	256	Active Bit toggle interval in milliseconds (Status Word axis 1)
	Axis 3 Graph Interval	2	Data capture interval (two millisecond increments)
	Axis 4 Reserved		
42H	VME Status_ID	0	VME status code returned during the ROAK interrupt cycle
44H	New Null	2048 (Write Only)	Entry for preset drive offset
46H	Estop Mask	FFFFH	Enables emergency stop on errors (Bit = 0 = Enabled)
48H	Halt Mask	0000H	Enables ramped stop on errors (Bit = 0 = Enabled)
4AH	Interrupt Mask	FFFFH	Enables VME interrupt based on Status Word (Bit = 0 = Enabled)
4CH	Feed Forward Advance	0	Time shift in milliseconds for Feed Forward term
4EH	Null Update	500	Null calculation interval in milliseconds (static integrator)
50H	Minimum Update Time (Axis one only)	1000	Minimum time in microseconds between sensor readings
52H	Dither	0	Static friction drive in percent of full drive
54H	Hysteresis	0	Deadband compensation
56H	Static Gain	50	Proportional gain at rest
58H	Extend Gain	50	Proportional gain when extending
5AH	Retract Gain	50	Proportional gain when retracting
5CH	Integral Gain	0	Integral gain while in motion
5EH	Differential Gain	0	Differential gain
60H	Extend Feed Forward	100	Feed-forward drive when extending
62H	Retract Feed Forward	100	Feed forward drive when retracting
64H	Scale	32768	Measured position conversation number
66H	Position Offset	0	Fixed position offset
68H	Direction	0	Sign of position units with respect to Transducer Counts
6AH	Maximum Position Error	250	Set point for position error indication
6CH	At Command Position	50	Window around Requested Position for status bit
6EH	Near Command Position	0	Window around Requested Position for status bit
70H	Extend Limit	Position on power-up	Maximum length allowed
72H	Retract Limit	Position on power-up	Minimum length allowed
74H	Mode	0	Function selection bits
76H	Acceleration	1000	Acceleration rate or distance
78H	Deceleration	1000	Deceleration rate or distance
7AH	Requested Speed	1000	Maximum speed during a move
7CH	Requested Position	N/A	Destination position in position units
7EH	Command	N/A	Command to be executed (F, G, H, P, O, R, S,Z,@)

Wiring Information

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VMC 186/40-TQ

DB-15P to pigtail cable (6 feet) for Drive outputs. Cable uses Alpha 1181/15 or equiv.

Pin	Function	Wire Color
1	+15 input	RED
2	Power Supply Common	BLACK
3	-15 input	WHITE
4	Common	GREEN
5	Drive Out 1	ORANGE
6	Common	BLUE
7	Common	BROWN
8	Drive Out 2	YELLOW
9	Common	RED/BLACK
10	Drive Out 4	RED/YELLOW
11	Common	RED/GREEN
12	Common	TAN
13	Drive Out 3	PINK
14	Common	GRAY
15	Common	VIOLET

DB37P to pigtail cable (10 feet) for quadrature inputs. Cable uses Alpha 5480/19 or equiv.

Pin	Function	Wire Color
1	Axis 1 Phase A+ input	BLACK pair 1
20	Axis 1 Phase A- input	RED pair 1
2	Axis 1 Phase B+ input	BLACK pair 2
21	Axis 1 Phase B- input	WHITE pair 2
3	Axis 2 Phase A+ input	BLACK pair 3
22	Axis 2 Phase A- input	GREEN pair 3
4	Axis 2 Phase B+ input	BLACK pair 4
23	Axis 2 Phase B- input	BLUE pair 4
5	Axis 3 Phase A+ input	BLACK pair 5
24	Axis 3 Phase A- input	YELLOW pair 5
6	Axis 3 Phase B+ input	BLACK pair 6
25	Axis 3 Phase B- input	BROWN pair 6
7	Axis 4 Phase A+ input	BLACK pair 7
26	Axis 4 Phase A- input	ORANGE pair 7
8	Axis 4 Phase B+ input	RED pair 8
27	Axis 4 Phase B- input	WHITE pair 8
9	Axis 1 Home Z+ input	RED pair 9
28	Axis 1 Home Z- input	GREEN pair 9
10	Axis 2 Home Z+ input	RED pair 10
29	Axis 2 Home Z- input	BLUE pair 10
11	Axis 3 Home Z+ input	RED pair 11
30	Axis 3 Home Z- input	YELLOW pair 11
12	Axis 4 Home Z+ input	RED pair 12
31	Axis 4 Home Z- input	BROWN pair 12
13	Axis 1 Limit + input	RED pair 13
32	Axis 1 Limit - input	ORANGE pair 13
14	Axis 2 Limit + input	GREEN pair 14
33	Axis 2 Limit - input	WHITE pair 14
15	Axis 3 Limit + input	GREEN pair 15
34	Axis 3 Limit - input	BLUE pair 15
16	Axis 4 Limit + input	GREEN pair 16
35	Axis 4 Limit - input	YELLOW pair 16
17	N/C	GREEN pair 17
36	N/C	BROWN pair 17
18	N/C	GREEN pair 18
37	N/C	ORANGE pair 18

DB-25P to pigtail cable (6 feet) for magnetostrictive sensor inputs . Cable uses Alpha 1181/25 or equiv.

Pin	Function	Wire Color
1	+15 input	RED
2	Power supply common	BLACK
3	-15 input	WHITE
4	+5 input	GREEN
5	+12 output	ORANGE
6	Common	GRAY
7	Interrogation pulse 1	BROWN
8	+15v axis 1	PINK
9	Return pulse 1	YELLOW
10	-15v axis 1	VIOLET
11	Common	TAN
12	Interrogation pulse 2	BLUE
13	+15v axis 2	RED/BLACK
14	Return pulse 2	RED/YELLOW
15	-15v axis 2	RED/GREEN
16	Common	WHITE/BLACK
17	Interrogation pulse 3	WHITE/BLUE
18	+15v axis 3	WHITE/RED
19	Return pulse 3	WHITE/YELLOW
20	-15v axis 3	WHITE/GREEN
21	Common	WHITE/GRAY
22	Interrogation pulse 4	WHITE/BROWN
23	+15v axis 4	WHITE/ORANGE
24	Return pulse 4	WHITE/BLACK/RED
25	-15v axis 4	WHITE/VIOLET

Ordering Information

Part Number: VMC 186/40-TQ. Provided with each VMC 186/40-TQ: Reference manual, 6' DB15P, 6' DB25P and 10' DB37P pigtail cable, DCSMON software and manual.

Options and Accessories

Part Number	Description
VMC 186/40-TQGE	GE 90/70 PLC compatible version
VMC 186/40-TQTI	Siemens TI 575 PLC compatible version
VMC 186/40-TA	Analog interface for pressure control
SSS/10	1 axis Servo System Simulator
AMP 10	1 axis RS 422 converter(two required)
MCCBS-01	6 ft DB-15P cable with pigtails
MCCBS-02	6 ft DB-25P cable with pigtails
MCCBS-03	10 ft DB-37P cable with pigtails

Company Profile

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

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