

High-speed quad counter module

MC

M3-40E

MC

M3-40F

M3-40E: Differential-ended high-speed counter

M3-40F: Single-ended high-speed counter

- ▶ Four high-speed (10 MHz) counters
- ▶ Quadrature or single-channel mode
- ▶ Eight high-speed outputs (position-based)
- ▶ 32-bit counters
- ▶ On-board processor ensures fast execution

General specifications

Encoder inputs ¹	4
Count and direction inputs ¹	4
Gate inputs	4
Reset inputs	4
PLS input reaction time	< 50 µsec
Event zones/output	8
Connection	Removable terminal block
Connection type	Tension clamp
Terminal block part number	069-622210
Terminal wire size (UL 1059)	18 - 22 AWG
Test point	All connections
Module size	1 rack slot (0.75"/19 mm)
Bus power required (5 VDC)	0.26 mA
Isolation rating	500 VDC

1. Module is configurable to handle 4 quadrature encoder inputs or four single-channel count and direction inputs.



Minimum hardware revision	0, A
Minimum firmware revision	1.02
Minimum operating system revision	5.00.90
Documentation number: 950-534005-000	

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Performance specifications

Parameter	Value
Counter range	32-bit
Counter resolution	1 count
Max single channel rate	10 MHz
Max encoder rate	10 MHz
PLS outputs logic switching time upon reaching event	< 50 µsec
Encoder feedback type	5V – quadrature
Max encoder rate	10 MHz

Electrical specifications

Parameter	Value
Encoder and counter inputs	
Max input voltage	6 V
Turn ON threshold	3.0 VDC
Turn OFF threshold	0.125 VDC
Termination resistor	220 Ω (10 Y.)
Gate and reset inputs	
Max input voltage	32 V
Min input current	2.6 mA @ 24 VDC
Turn ON threshold	0.46 * VS
Turn OFF threshold	0.12 * VS
Nominal voltage	24 VDC
Min ON current	1.6 mA
Max OFF current	0.3 mA

Electrical specifications (cont'd)

Parameter	Value
Outputs	
Nominal voltage	VS
Max ON voltage at:	
50 mA	0.9 * VS
500 mA	1.4 * VS
Max channel current	375 mA
Max module current	3 A
Max leak current/channel	100 µADC

Additional features

Parameter	Value
Input operating modes	Count and direction or encoder
PLS output modes	Position or time-based set ON/set OFF
Encoder select	Each output's events can be based on any of the counter inputs
Output events	Set up to 8 transitions per output
Software enable	Per counter
Reset	To assigned preload
Offset	On-the-fly adjustable encoder/counter offset

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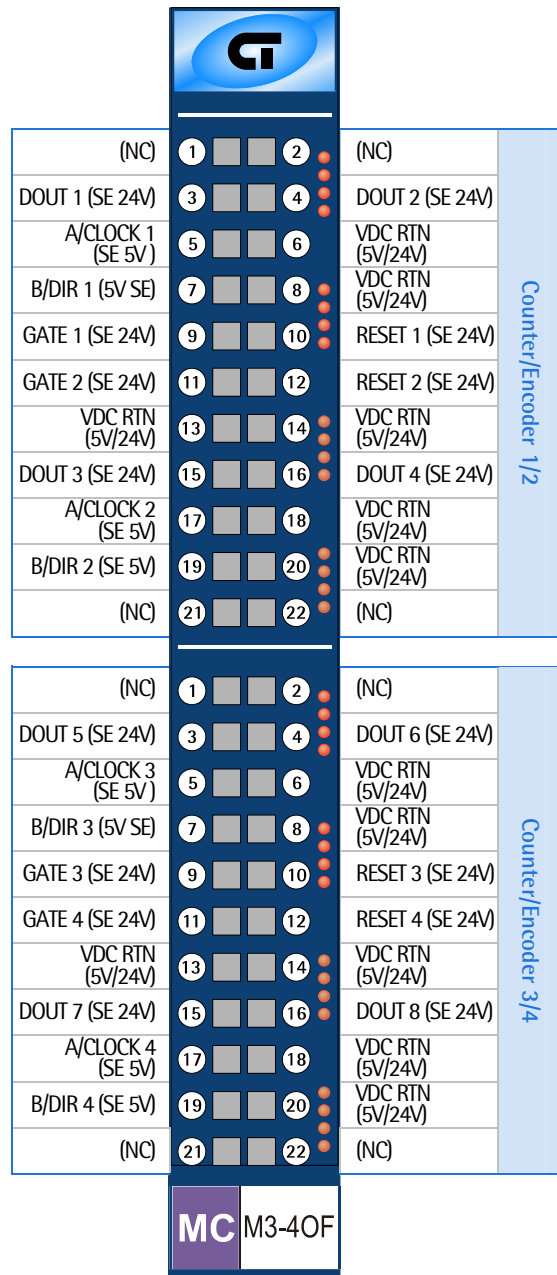
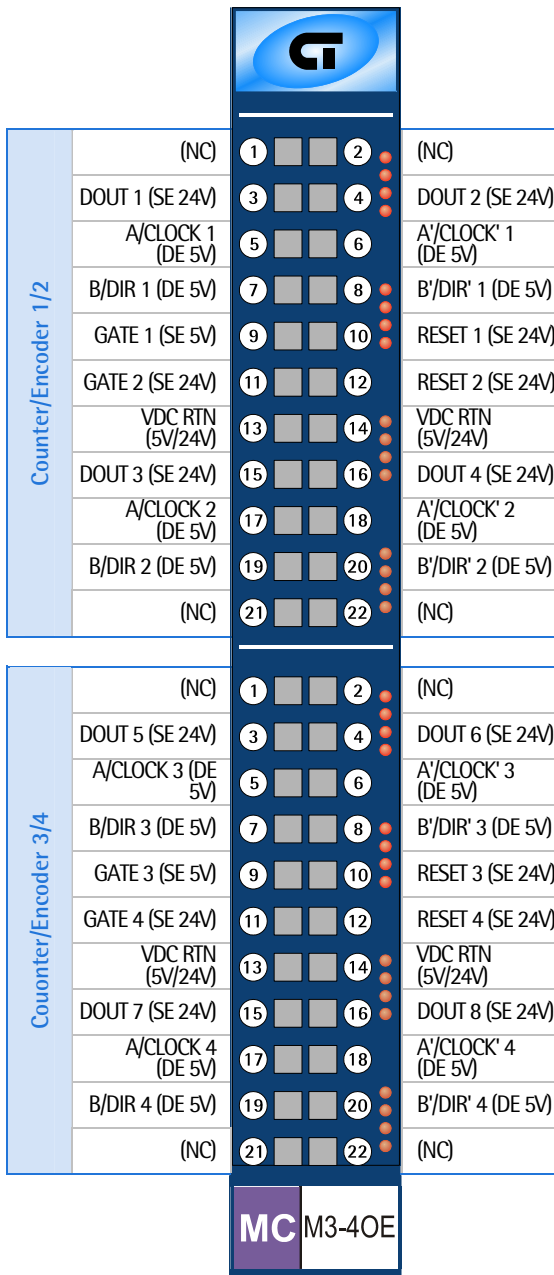
M3-40E: Differential-ended high-speed counter

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Terminal block connections

M3-40E: Quad Counter (Diff.-ended)

M3-40F: Quad Counter (Single-ended)



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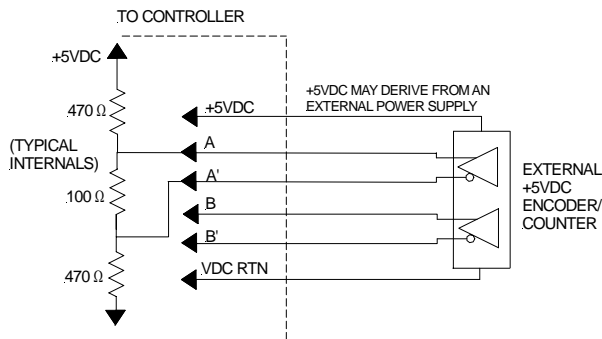
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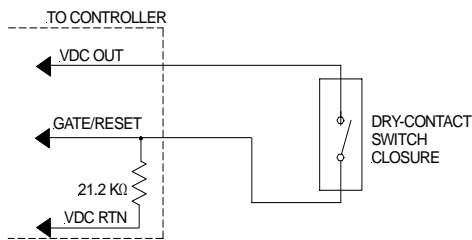
M3-40F

Application Information

Differential Encoder/Counter Application

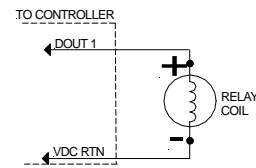


All Single-ended Inputs Application

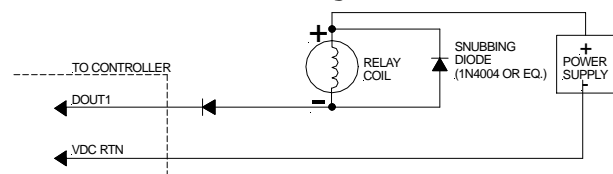


Digital Output Applications

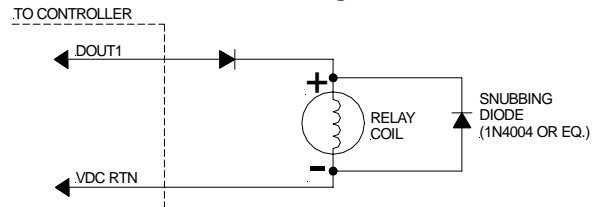
Push-Pull



Sinking



Sourcing



Notes

1. If an output is used to drive transistor loads, proper current limiting must be observed.
2. When a digital device is powered via an external power source, it may be necessary to tie the ground of this power source to the controller's voltage supply return (VDC RTN).
3. For register and programming information, refer to the appropriate controller Applications Guide.
4. When operating with encoder input, connect encoder A to CLOCK and encoder B to DIR.
5. The information and illustrations contained herein are the property of Control Technology Corporation and are subject to change without notice. Data based on VS = 24 VDC @ 25°C unless otherwise noted. For additional information and/or updates, visit www.ctc-control.com. Copyright © 2007 Control Technology Corporation. All Rights Reserved.
6. VS refers to the voltage supply of the controller.