

## Intelligent digital input/output module

DI/O

M3-11A

DI/O

M3-21A

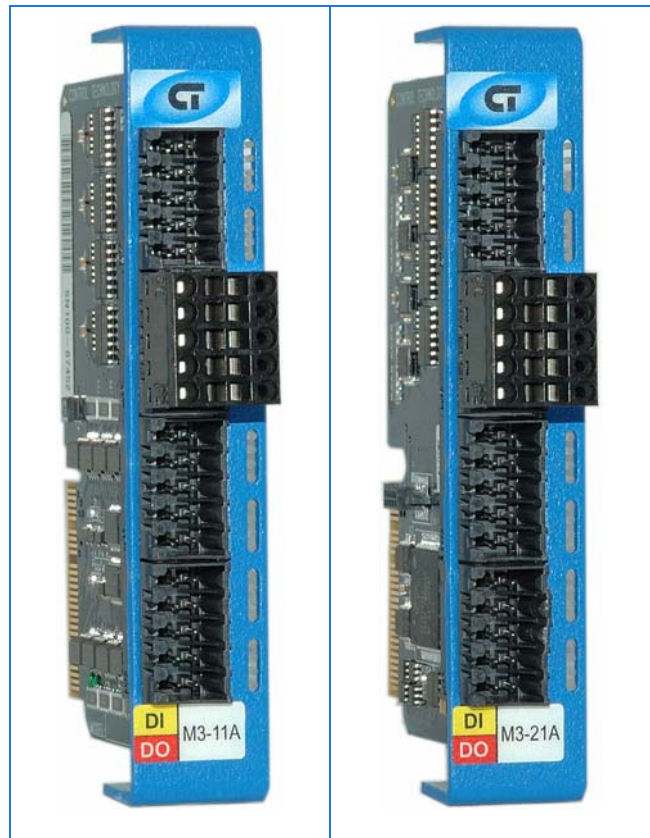
**M3-11A:** 16 sourcing inputs (+VS VDC), 16 sourcing outputs (+VS VDC)

**M3-21A:** 16 smart digital inputs (+VS VDC), 16 digital outputs (+VS VDC)

- ▶ Wide input hysteresis voltage for solid switch points
- ▶ Individual channel status LEDs
- ▶ Optically isolated
- ▶ Open emitter PNP to the controller's voltage supply
- ▶ High current: 375 mA per output/3 A per module

### General specifications

Inputs per module	16
Input type	VDC sourcing
Outputs per module	16
Output type	Sourcing (PNP open collector)
Connection	Removable terminal block
Connection type	Tension clamp
Terminal block part number	069-621010
Terminal wire size (UL 1059)	18 - 22 AWG
Test point	All connections
Status indicator	One LED per channel
Module size	1 rack slot (0.75"/19 mm)
Isolation rating	500 VDC
Operating temperature	
Horizontal installation	0 - 50°C
Vertical installation	0 - 45°C
Storage temperature	-25 - 85°C
Humidity	5 - 95% non-condensing



Actual size

Minimum hardware revision	A
Minimum firmware revision	1.02
Minimum operating system revision	5.00.90
Documentation number: 950-531101-002	

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## Performance specifications

### Inputs

Parameter	Value
Input voltage (VS)	10 – 32 VDC
Max voltage	32 VDC
Nominal voltage (VN)	24 VDC
Turn ON threshold	0.46 * VS
Turn OFF threshold	0.12 * VS
Min hysteresis voltage	0.17 * VS
Min input current	2.6 mA @ 24 VDC
Input resistance to VDC RTN	10 KΩ ± 10%
Min ON current	1.6 mA
Max OFF current	0.3 mA
Hardware filter	< 1 msec

### Outputs

Parameter	Value
Nominal voltage (VN)	24 VDC
Maximum ON voltage @:	
50 mA	VS – 0.7V
375 mA	VS – 1.4V
Maximum OFF voltage	Open emitter
Max channel current	375 mA
Max module current	3 ADC
Max controller current	8 ADC
Max leak current/channel	100 μADC

### Smart mode features

- Eight high-speed counter inputs (DIN 1 – 8 or DIN9 – 16)
- Counting max frequency 12 KHz<sup>4</sup>
- Eight hardware counter resets (DIN 9 – 16 or DIN1 – 8)
- Eight setpoint outputs (DO 1 – 8)
- Eight PWM outputs (DO9 – 16)
- PWM max frequency 12 KHz<sup>4</sup>

### Notes

1. Smart mode is not available on the M3-11A module.
2. In the OFF state, the outputs are pulled internally low to VDC RTN via a 10 KΩ series resistor with an LED.
3. Smart mode features are controlled by CTC's QuickBuilder software on a point-by-point basis. When smart features are not enabled, inputs and outputs retain their default features. Smart mode features can be set up by direct register settings; refer to *Doc. No. 951-530006: Model 5300 Quick Reference Register Guide* for more information.
4. Maximum frequency of 12 KHz is valid if only counter inputs or only PWM outputs are enabled. If both high-speed counters and PWM are enabled, max frequency is 6 KHz.
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](http://www.ctc-control.com). Copyright © 2007 Control Technology Corp. All Rights Reserved.

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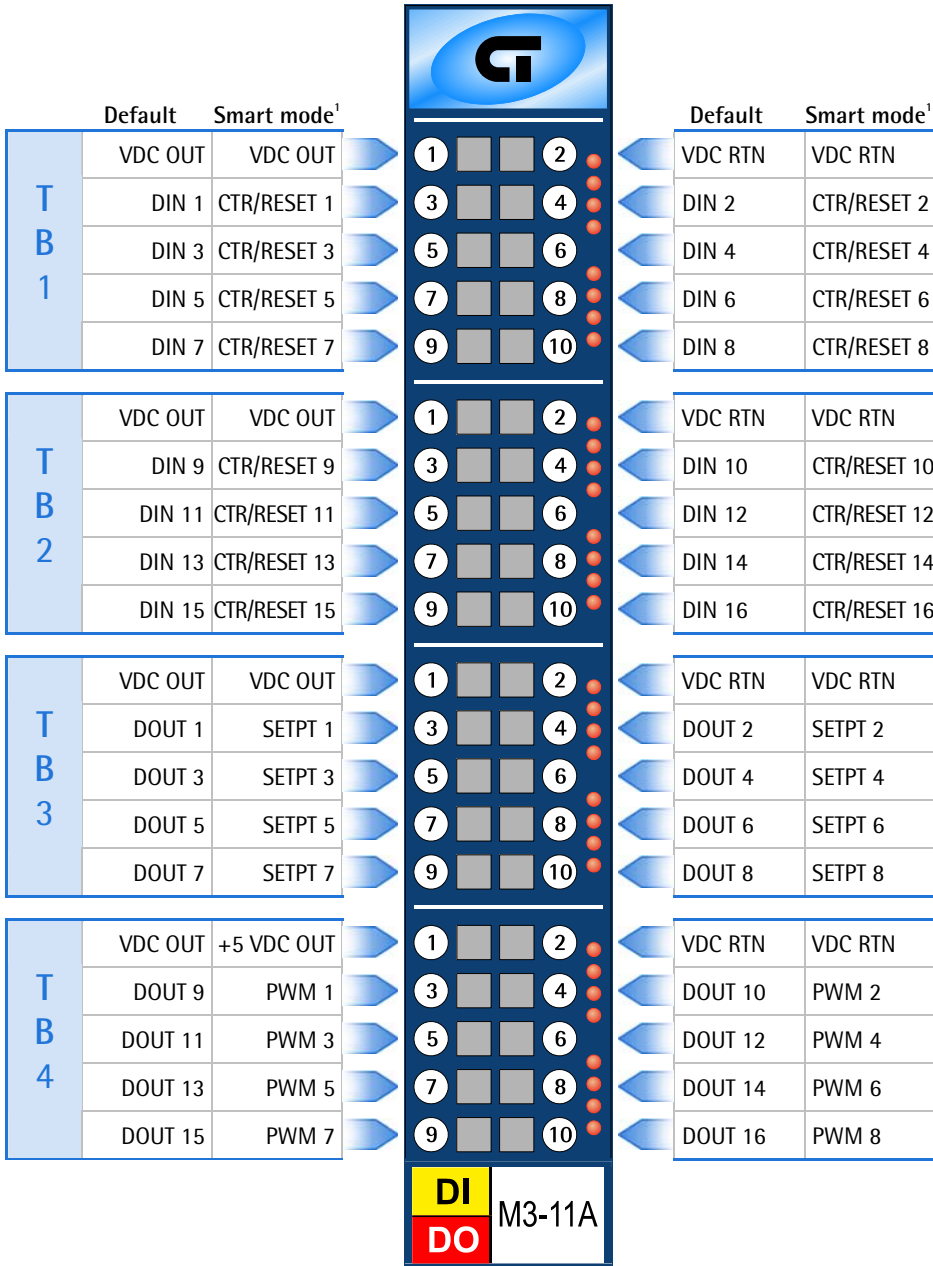
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M3-11A: 16 sourcing inputs (+VS VDC), 16 sourcing outputs (+VS VDC)

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## Terminal block connections



LED#	Indication
1	DI1
2	DI2
3	DI3
4	DI4
5	DI5
6	DI6
7	DI7
8	DI8

9	DI9
10	DI10
11	DI11
12	DI12
13	DI13
14	DI14
15	DI15
16	DI16

17	DO1
18	DO2
19	DO3
20	DO4
21	DO5
22	DO6
23	DO7
24	DO8

25	DO9
26	DO10
27	DO11
28	DO12
29	DO13
30	DO14
31	DO15
32	DO16

### Note

- Smart mode is not available on the M3-11A module.
- If TB1 is set up as counters, TB2 will be resets and vice versa.

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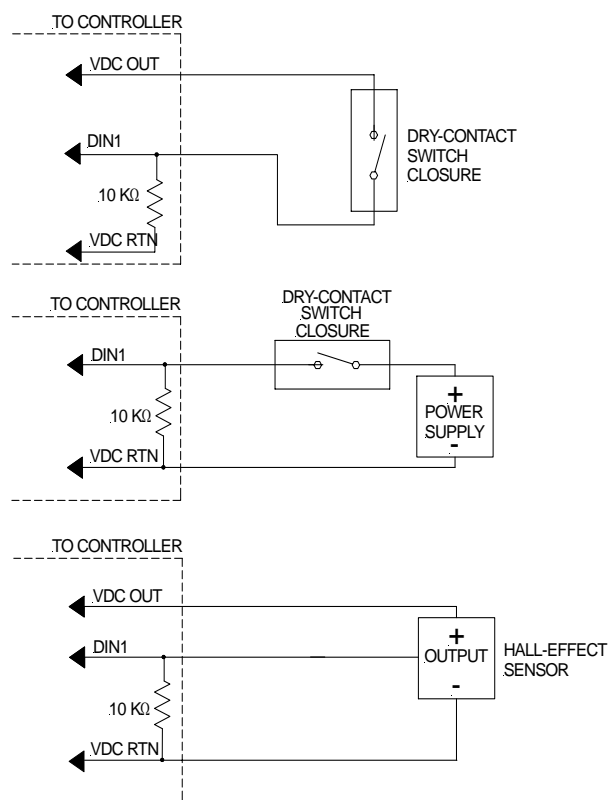
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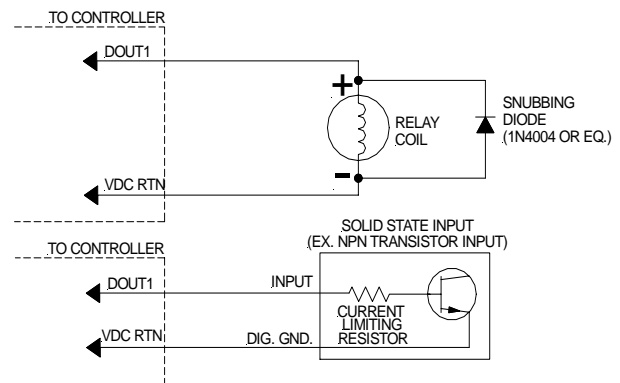
M3-21A

### Application information

#### Typical input application



#### Typical output application



#### Notes

1. 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 ground (VDC RTN).
2. For register and programming information, refer to the appropriate controller Applications Guide.
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4. Observe proper current limiting with transistor loads.
5. Use high-speed diode or equivalent to limit inductive load kicks.
6.  $VDC \text{ OUT} = V_S$  (DC voltage supplied to controller's power supply).