Intelligent digital input/output module

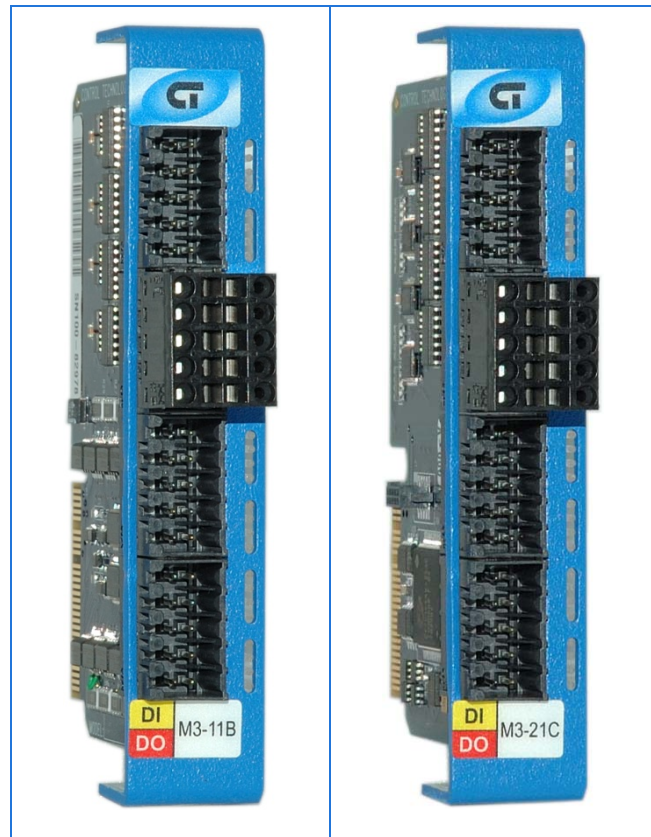| DI/O	M3-11B
DI/O	M3-21C

M3-11B: *16 sourcing inputs (+5 VDC), 16 sourcing outputs (+5 VDC) – PNP*
M3-21C: *16 smart sourcing inputs (+5 VDC), 16 smart sourcing outputs (+5 VDC) – PNP*

▶ *Wide input hysteresis voltage for solid switch points*
▶ *Individual channel status LEDs*
▶ *Optically isolated*

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: 950-531102-002	

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Performance specifications

Inputs

Parameter	Value
Input voltage	4.5 – 5.5 VDC
Max voltage	32 VDC
Nominal voltage (VN)	5 VDC
Turn ON threshold	4.0 VDC
Turn OFF threshold	1.0 VDC
Min hysteresis voltage	2.5 VDC
Min input current	5.5 mA @ 5 VDC
Input resistance to VDC RTN	1 KΩ ± 10%
Min ON current	5.4 mA
Max OFF current	1.1 mA
Hardware filter	< 1.8 msec

Outputs

Parameter	Value
Nominal voltage (Max)	5 VDC
Maximum OFF voltage	Open emitter
Maximum ON voltage @:	
50 mA	4.5 VDC
375 mA	4.0 VDC
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[4]
- 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[4]

Notes

1. Smart mode is not available on the M3-11B module.
2. In the OFF state, the outputs are pulled internally low to +5 VDC via a 1 KΩ series resistor with an LED.
3. Smart mode features are all 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.
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. Copyright © 2007 - 2013 Control Technology Corp. All Rights Reserved.

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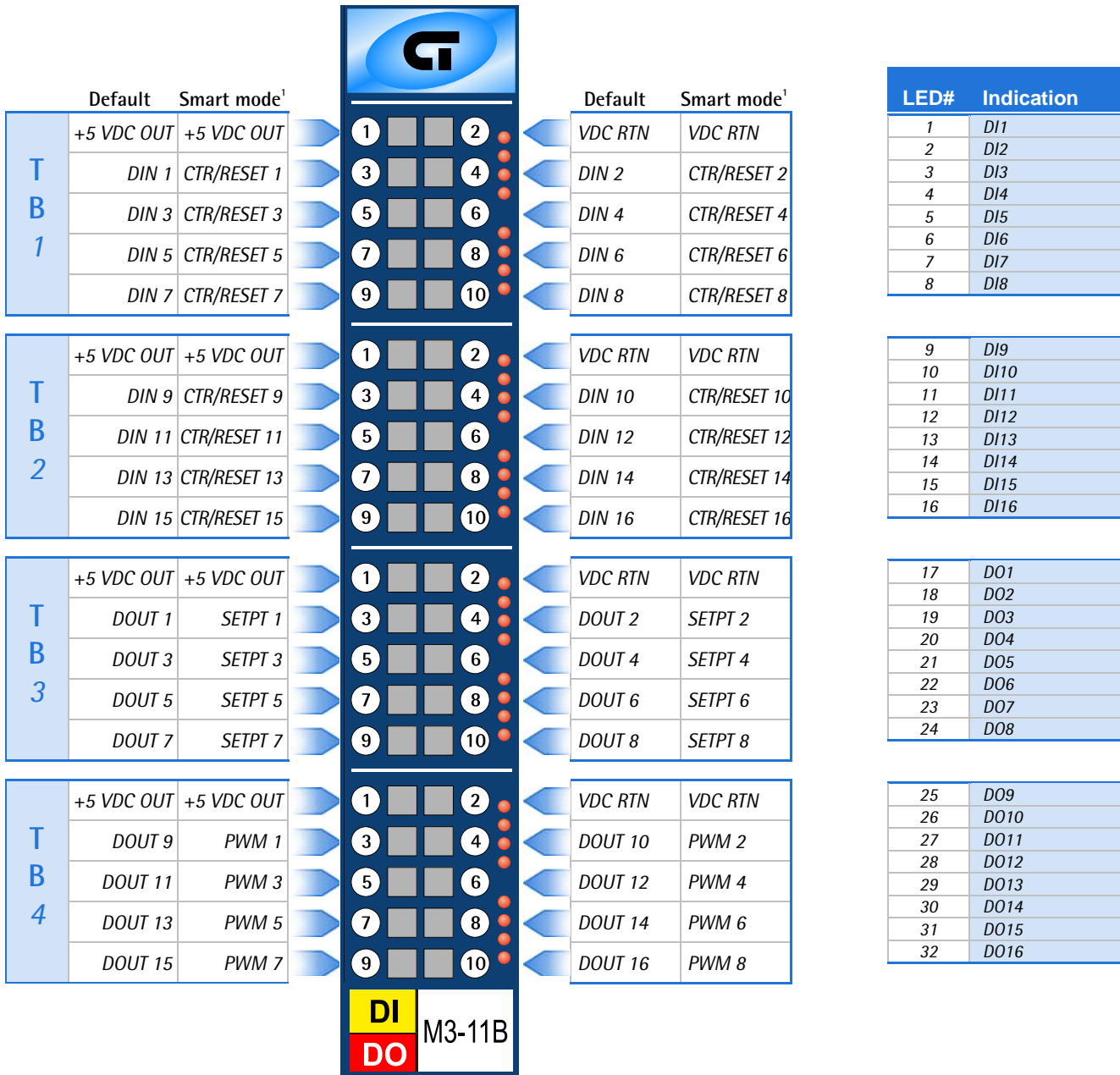**M3–11B:** *16 sourcing inputs (+5 VDC), 16 sourcing outputs (+5 VDC) – PNP*
M3–21C: *16 smart sourcing inputs (+5 VDC), 16 smart sourcing outputs (+5 VDC) – PNP*

Terminal block connections

TB 1

	Default	Smart mode[1]			Default	Smart mode[1]
	+5 VDC OUT	+5 VDC OUT	1 — 2		VDC RTN	VDC RTN
	DIN 1	CTR/RESET 1	3 — 4		DIN 2	CTR/RESET 2
	DIN 3	CTR/RESET 3	5 — 6		DIN 4	CTR/RESET 4
	DIN 5	CTR/RESET 5	7 — 8		DIN 6	CTR/RESET 6
	DIN 7	CTR/RESET 7	9 — 10		DIN 8	CTR/RESET 8

TB 2

	Default	Smart mode[1]			Default	Smart mode[1]
	+5 VDC OUT	+5 VDC OUT	1 — 2		VDC RTN	VDC RTN
	DIN 9	CTR/RESET 9	3 — 4		DIN 10	CTR/RESET 10
	DIN 11	CTR/RESET 11	5 — 6		DIN 12	CTR/RESET 12
	DIN 13	CTR/RESET 13	7 — 8		DIN 14	CTR/RESET 14
	DIN 15	CTR/RESET 15	9 — 10		DIN 16	CTR/RESET 16

TB 3

	Default	Smart mode[1]			Default	Smart mode[1]
	+5 VDC OUT	+5 VDC OUT	1 — 2		VDC RTN	VDC RTN
	DOUT 1	SETPT 1	3 — 4		DOUT 2	SETPT 2
	DOUT 3	SETPT 3	5 — 6		DOUT 4	SETPT 4
	DOUT 5	SETPT 5	7 — 8		DOUT 6	SETPT 6
	DOUT 7	SETPT 7	9 — 10		DOUT 8	SETPT 8

TB 4

	Default	Smart mode[1]			Default	Smart mode[1]
	+5 VDC OUT	+5 VDC OUT	1 — 2		VDC RTN	VDC RTN
	DOUT 9	PWM 1	3 — 4		DOUT 10	PWM 2
	DOUT 11	PWM 3	5 — 6		DOUT 12	PWM 4
	DOUT 13	PWM 5	7 — 8		DOUT 14	PWM 6
	DOUT 15	PWM 7	9 — 10		DOUT 16	PWM 8

DI / DO M3-11B

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

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

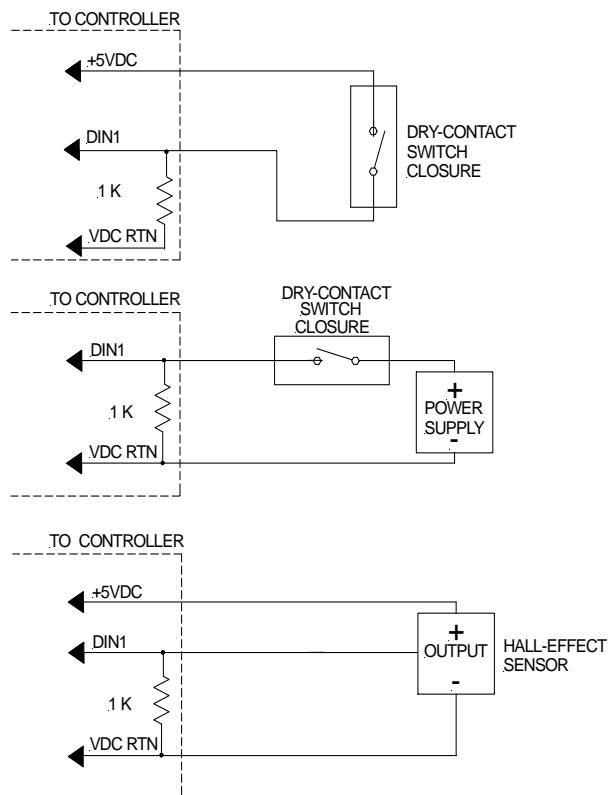| DI/O	M3-11B
DI/O	M3-21C

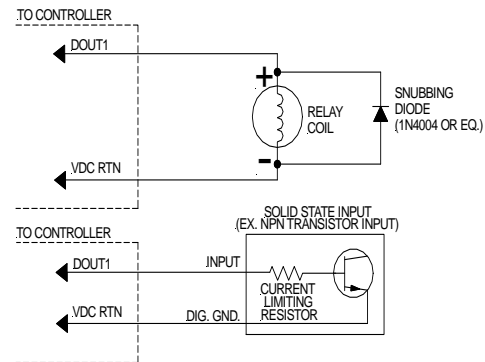## *Intelligent digital input/output module*

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.