Digital I/O Slave Units with e-CON Connectors

# CRT1- $\square$ D16S(-1)/ $\square$ D32S(-1)/ $\square$ D16SH(-1)/ $\square$ D32SH(-1)

# Industry-standard Sensor Connectors for Easy Connection to Pre-wired Sensors without Special Tools.

- A digital I/O terminal with industry-standard e-CON connectors.
- Easy to install without the use of special tools. Reduces wiring work.
- Equipped with load short-circuit detection.



#### **Ordering Information**

Name			Specifications		Model
	Innuta	16 inputs	NPN		CRT1-ID16S
	Inputs	16 inputs	PNP		CRT1-ID16S-1
	Outputs	4.C. autouta	NPN		CRT1-OD16S
	Outputs	16 outputs	PNP		CRT1-OD16S-1
	Inputs/	8 inputs /	NPN		CRT1-MD16S
	Outputs	8 outputs	PNP	Without Short-circuit and Disconnected	CRT1-MD16S-1
	Inputs	32 inputs	NPN	Line Detection	CRT1-ID32S
	inputs	32 iliputs	PNP		CRT1-ID32S-1
	Outputs	22 outpute	NPN		CRT1-OD32S
	Outputs	32 outputs	PNP		CRT1-OD32S-1
	Inputs/	16 inputs /	NPN		CRT1-MD32S
e-CON Connectors	Outputs	16 outputs	PNP		CRT1-MD32S-1
e-CON Connectors	Inputs	16 inputs	NPN	With Short-circuit and Disconnected	CRT1-ID16SH
		10 inputs	PNP		CRT1-ID16SH-1
	Outputs	16 outputs	NPN		CRT1-OD16SH
		To outputs	PNP		CRT1-OD16SH-1
	Inputs/	8 inputs /	NPN		CRT1-MD16SH
	Outputs	8 outputs	PNP		CRT1-MD16SH-1
	Inputs	32 inputs	NPN	Line Detection	CRT1-ID32SH
	inputs	32 iriputs	PNP		CRT1-ID32SH-1
	Outputs	32 outputs	NPN		CRT1-OD32SH
	Outputs	32 Julpuis	PNP		CRT1-OD32SH-1
	Inputs/	16 inputs /	NPN		CRT1-MD32SH
	Outputs	16 outputs	PNP		CRT1-MD32SH-1

Note. Output power supply connectors (Phoenix Contact K.K.) are provided with Output Units and I/O Units.

Slave  $\ensuremath{\textit{External I/O Connections}}$  in the appendix for applicable connectors.

#### **Performance Specifications**

For Basic Performance Specifications of Slave Units, refer to page 30.

# **Input Section Specifications**

#### ● Sixteen-point Input Units

Item	Specification						
Model	CRT1-ID16S	CRT1-ID16S-1	CRT1-ID16SH	CRT1-ID16SH-1			
I/O capacity	16 inputs	16 inputs					
Internal I/O common	NPN	PNP	NPN	PNP			
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)			
OFF current	1 mA max.						
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input						
ON delay	1.5 ms max.						
OFF delay	1.5 ms max.	1.5 ms max.					
Power supply short-circuit detection			Operates at 50 mA/point min.				
Disconnection detection			Operates at 0.3 mA/point max.				
Number of circuits per common	16 inputs/common	16 inputs/common					
Isolation method	Photocoupler						
Input indicator	LED (yellow)						
Installation	DIN Track						
Power supply type	Network power supply						
Power short-circuit protection	Operates at 50 mA/point min.						
Current supplied to input devices	50 mA/input						
Communications power supply current consumption	110 mA max. for 24-VDC power supply voltage 125 mA max. for 24-VDC power supply voltage 145 mA max. for 14-VDC power supply voltage						
Weight	110 g max.	110 g max.					

#### ●Thirty-two-point Input Units

Item		Specification					
Model	CRT1-ID32S	CRT1-ID32S-1	CRT1-ID32SH	CRT1-ID32SH-1			
I/O capacity	32 inputs	32 inputs					
Internal I/O common	NPN	PNP	NPN	PNP			
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)			
OFF current	1.0 mA max.						
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input						
ON delay	1.5 ms max.						
OFF delay	1.5 ms max.						
Power supply short-circuit detection			Operates at 50 mA/point min.				
Disconnection detection			Operates at 0.3 mA/point max.				
Number of circuits per common	32 inputs/common	32 inputs/common					
Isolation method	Photocoupler						
Input indicator	LED (yellow)						
Installation	DIN Track						
Power short-circuit protection	Operates at 50 mA/point min.						
Power supply type	Network power supply						
Current supplied to input devices	50 mA/input						
Communications power supply current consumption	195 mA max. for 24-VDC power supply voltage 200 mA max. for 14-VDC power supply voltage 235 mA max. for 14-VDC power supply voltage						
Weight	180 g max.						

## **Output Section Specifications**

#### ●Sixteen-point Output Unit

Item	Specification					
Model	CRT1-OD16S	CRT1-OD16S-1	CRT1-OD16SH	CRT1-OD16SH-1		
I/O capacity	16 outputs	•				
Internal I/O common	NPN	PNP	NPN	PNP		
Rated output current	0.5 A/output, 4 A/common					
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)		
Leakage current	0.1 mA max.			•		
ON delay	0.5 ms max.					
OFF delay	1.5 ms max.					
Load short-circuit detection		Supported.				
Disconnection detection		Operates at 3 mA/point max. (Does not operate at over 3 mA.)				
Number of circuits per common	16 outputs/common					
Isolation method	Photocoupler					
Output indicators	LED (yellow)					
Installation	DIN Track					
Power supply type	Multi-power supply					
Current supplied to output devices	100 mA/output					
Communications power supply current consumption	40 mA max. for 24-VDC power supply voltage 60 mA max. for 14-VDC power supply voltage 65 mA max. for 14-VDC power supply voltage					
I/O power supply current consumption				60 mA max. for 24-VDC power supply voltage		
Output handling for communications errors	Select either hold or clear from CX-Integrator.					
Weight	110 g max.	110 g max.				

#### ●Thirty-two-point Output Unit

Item	Specification						
Model	CRT1-OD32S	CRT1-OD32S-1	CRT1-OD32SH	CRT1-OD32SH-1			
I/O capacity	32 outputs	32 outputs					
Internal I/O common	NPN	PNP	NPN	PNP			
Rated output current	0.5 A/output, 4 A/common						
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)			
Leakage current	0.1 mA max.						
ON delay	0.5 ms max.	0.5 ms max.					
OFF delay	1.5 ms max.						
Load short-circuit detection	Supported.						
Disconnection detection		Operates at 3 mA/point max. (Does not operate at over 3 mA					
Number of circuits per common	16 outputs/common						
Isolation method	Photocoupler						
Output indicators	LED (yellow)						
Installation	DIN Track						
Power supply type	Multi-power supply						
Current supplied to output devices	100 mA/output						
Communications power supply current consumption	50 mA max. for 24-VDC power supply voltage 80 mA max. for 14-VDC power supply voltage 90 mA max. for 14-VDC power supply voltage						
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage  60 mA max. for 24-VDC power supply voltage						
Output handling for communications errors	Select either hold or clear from CX-Integrator.						
Weight	170 g max.						

### **Input and Output Section Specifications**

#### ●8-point Input and 8-point Output Units

#### **Common Specifications**

Item	Specification				
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1	
Installation	DIN Track				
Communications power supply current consumption	75 mA max. for 24-VDC powers 95 mA max. for 14-VDC powers		95 mA max. for 24-VDC power 115 mA max. for 14-VDC power		
Weight	120 g max.				

#### **Input Section Specifications**

Item	Specification					
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1		
I/O capacity	8 inputs					
Internal I/O common	NPN	PNP	NPN	PNP		
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)		
OFF current	1.0 mA max.					
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input					
ON delay	1.5 ms max.	1.5 ms max.				
OFF delay	1.5 ms max.	1.5 ms max.				
Power supply short-circuit detection			Operates at 50 mA/point min.			
Disconnection detection			Operates at 0.3 mA/point max.			
Number of circuits per common	8 inputs/common					
Isolation method	Photocoupler	Photocoupler				
Input indicator	LED (yellow)					
Power supply type	Network power supply					
Power short-circuit protection	Operates at 50 mA/point min.					
Current supplied to input devices	50 mA/input					

#### **Output Section Specifications**

Item	Specification						
Model	CRT1-MD16S	CRT1-MD16S-1	CRT1-MD16SH	CRT1-MD16SH-1			
I/O capacity	8 outputs	3 outputs					
Internal I/O common	NPN	PNP	NPN	PNP			
Rated output current	0.5 A/output, 2 A/common						
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)			
Leakage current	0.1 mA max.	0.1 mA max.					
ON delay	0.5 ms max.						
OFF delay	1.5 ms max.						
Load short-circuit detection		Supported.					
Disconnection detection	Operates at 3 mA/point max. (Does not operate at over 3 mA.)						
Number of circuits per common	8 outputs/common	8 outputs/common					
Isolation method	Photocoupler	Photocoupler					
Output indicators	LED (yellow)						
Power supply type	Multi-power supply						
Current supplied to output devices	100 mA/output						
I/O power supply current consumption	15 mA max. for 24-VDC power supply voltage  35 mA max. for 24-VDC power supply voltage						
Output handling for communications errors	Select either hold or clear from CX-Integrator.						

#### ●16-point Input and 16-point Output Units

#### **Common Specifications**

Item	Specification				
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1	
Installation	DIN Track				
Communications power supply current consumption	120 mA max. for 24-VDC power 140 mA max. for 14-VDC power		135 mA max. for 24-VDC power 155 mA max. for 14-VDC power		
Weight	180 g max.				

#### **Input Section Specifications**

Item		Specification				
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1		
I/O capacity	16 inputs	1	1	1		
Internal I/O common	NPN	PNP	NPN	PNP		
ON voltage	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)	10.5 VDC min. (between each input terminal and the V terminal)	10.5 VDC min. (between each input terminal and the G terminal)		
OFF current	1.0 mA max.			!		
Input current	At 24 VDC: 6.0 mA max./input At 11 VDC: 3.0 mA min./input					
ON delay	1.5 ms max.	1.5 ms max.				
OFF delay	1.5 ms max.					
Power supply short-circuit detection		Operates at 50 mA/point min.				
Disconnection detection		Operates at 0.3 mA/point max.				
Number of circuits per common	16 inputs/common					
Isolation method	Photocoupler	Photocoupler				
Input indicator	LED (yellow)					
Power supply type	Network power supply					
Power short-circuit protection	Operates at 50 mA/point min.					
Current supplied to input devices	50 mA/input					

#### **Output Section Specifications**

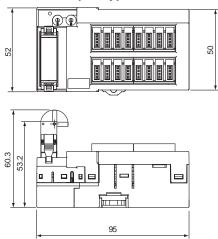
Item		Spec	cification				
Model	CRT1-MD32S	CRT1-MD32S-1	CRT1-MD32SH	CRT1-MD32SH-1			
I/O capacity	16 outputs	6 outputs					
Internal I/O common	NPN	PNP	NPN	PNP			
Rated output current	0.5 A/output, 4 A/common						
Residual voltage	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)	1.2 V max. (0.5 A DC, between each output terminal and the G terminal)	1.2 V max. (0.5 A DC, between each output terminal and the V terminal)			
Leakage current	0.1 mA max.						
ON delay	0.5 ms max.						
OFF delay	1.5 ms max.						
Load short-circuit detection	Supported.						
Disconnection detection	Operates at 3 mA/point max. (Does not operate at over 3 mA.)						
Number of circuits per common	16 outputs/common						
Isolation method	Photocoupler						
Output indicators	LED (yellow)						
Power supply type	Multi-power supply						
Current supplied to output devices	100 mA/output						
I/O power supply current consumption	20 mA max. for 24-VDC power supply voltage 15 mA max. for 24-VDC power supply voltage 60 mA max. for 24-VDC power supply voltage supply voltage						
Output handling for communications errors	Select either hold or clear from CX-Integrator.						



Dimensions (Unit: mm)

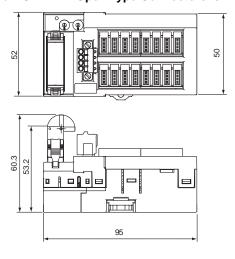
CRT1-ID16S (-1) CRT1-ID16SH (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



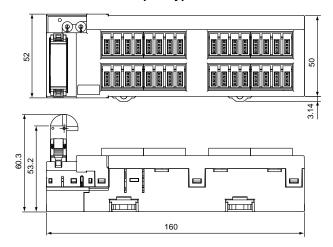
CRT1-MD16S (-1) CRT1-MD16SH (-1) CRT1-OD16S (-1) CRT1-OD16SH (-1)

#### When a DCN4-TB4 Open Type Connectors Is Mounted



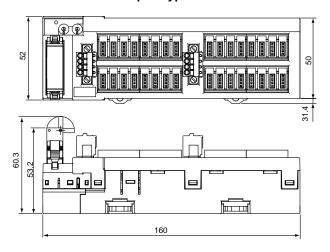
CRT1-ID32S (-1) CRT1-ID32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-OD32S (-1) CRT1-OD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted



CRT1-MD32S (-1) CRT1-MD32SH (-1)

When a DCN4-TB4 Open Type Connectors Is Mounted

