

# 1756 ControlLogix I/O Specifications

Catalog Numbers 1756 series

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The ControlLogix® architecture provides a wide range of input and output modules to span many applications, from high-speed digital to process control. The ControlLogix architecture uses Producer-Consumer technology, which allows input information and output status to be shared among multiple ControlLogix controllers.

Each ControlLogix I/O module mounts in a ControlLogix chassis and **requires** either a removable terminal block (RTB) or a 1492 interface module (IFM) to connect all field-side wiring. RTBs and IFMs are not included with the I/O modules. They must be ordered separately.



## Available 1756 I/O Modules

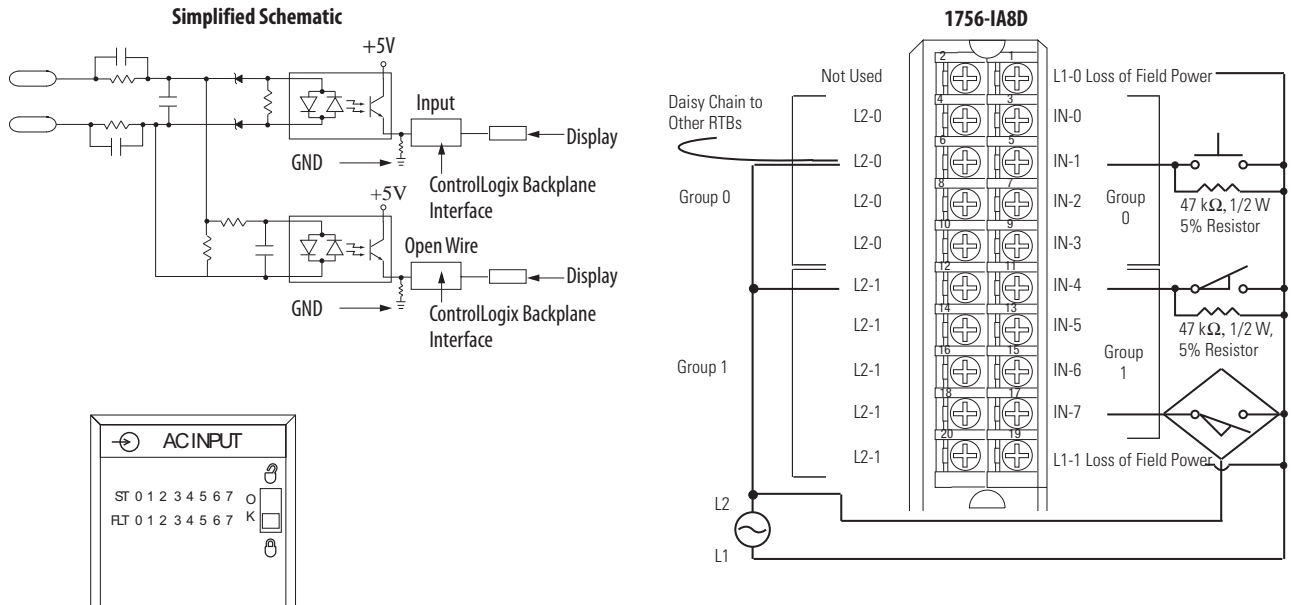
You can select these types of digital I/O modules.

Digital I/O Type	Description
Diagnostic	These modules provide diagnostic features to the point level. These modules have a <b>D</b> at the end of the catalog number.
Electronic fusing	These modules have internal electronic fusing to prevent too much current from flowing through the module. These modules have an <b>E</b> at the end of the catalog number.
Individually isolated	These modules have individually isolated inputs or outputs. These modules have an <b>I</b> at the end of the catalog number.

I/O Type	Cat. No.	Page	Cat. No.	Page
AC digital	1756-IA8D	3	1756-LSC8XIB8I	225
	1756-IA16	6	1756-OA8D	115
	1756-IA16I	9	1756-OA8E	118
	1756-IA32	12	1756-OA16	121
	1756-IM16I	80	1756-OA16I	125
	1756-IN16	83	1756-ON8	198
DC digital	1756-IB16	15	1756-OB8I	137
	1756-IB16D	18	1756-OB16D	140
	1756-IB16I	21	1756-OB16E	144
	1756-IB16IF	25	1756-OB16I	147
	1756-IB16IOSE	28	1756-OB16IEF	150
	1756-IB32	31	1756-OB16IEFS	154
	1756-IC16	34	1756-OB16IS	158
	1756-IG16	71	1756-OB32	162
	1756-IH16I	74	1756-OC8	166
	1756-IH16ISOE	77	1756-OG16	192
	1756-IV16	106	1756-OH8I	195
	1756-IV32	109	1756-OV16E	202
	1756-OB8	129	1756-OV32E	206
	1756-OB8EI	133		
	Contact			1756-OW16I
			1756-OX8I	213
Analog	1756-IF6CIS	42	1756-OF4	170
	1756-IF6I	46	1756-OF6CI	174
	1756-IF8	51	1756-OF6VI	177
	1756-IF8I	59	1756-OF8	181
	1756-IF16	64	1756-OF8I	188
	1756-IF4FXOF2F	38		
	1756-IR6I	86		
	1756-IRT8I	91		
	1756-IT6I	98		
	1756-IT6I2	102		
HART interface	1756-IF8H	56	1756-OF8H	184
	1756-IF16H	68		
Specialty	1756-CFM	216	1756-LSC8XIB8I	225
	1756-HSC	221	1756-PLS	229

## 1756-IA8D

### ControlLogix 120V AC diagnostic input module



**Table 1 - Diagnostic Specifications - 1756-IA8D**

Attribute	1756-IA8D
Open wire	Off-state leakage current 1.5 mA min
Loss of power	Transition range 46...85V AC
Timestamp of diagnostics	±1 ms

**Table 2 - Technical Specifications - 1756-IA8D**

Attribute	1756-IA8D
Inputs	8 diagnostic (4 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	79...132V AC, 47...63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms
On to Off	Hardware delay: 8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	4.5 W @ 60 °C (140 °F)

**Table 2 - Technical Specifications - 1756-IA8D (continued)**

Attribute	1756-IA8D
Thermal dissipation	15.35 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 74V AC
On-state current, max	16 mA @ 132V AC
Inrush current, max	250 mA
Input impedance, max	8.25 k $\Omega$ @ 132V AC, 60 Hz
Cyclic update time	200 $\mu$ s ... 750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1200V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74...132V, 47...63 Hz.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 3 - Environmental Specifications - 1756-IA8D**

Attribute	1756-IA8D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g

**Table 3 - Environmental Specifications - 1756-IA8D (continued)**

Attribute	1756-IA8D
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 Hz sine-wave 80% AM from 150 kHz...80 MHz

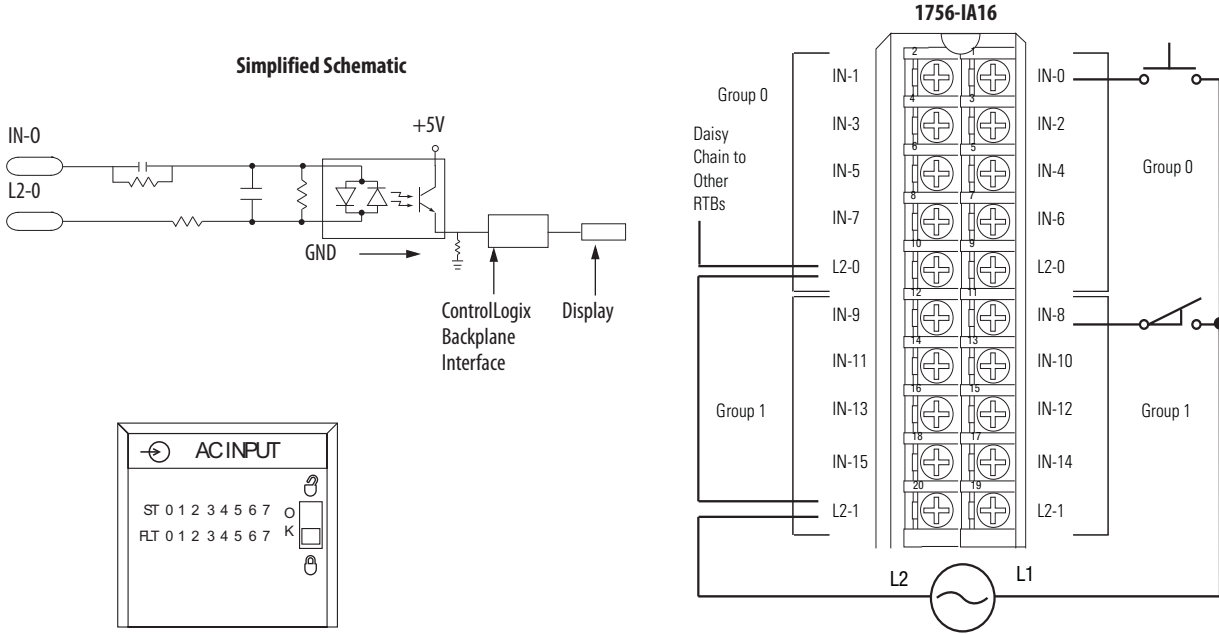
**Table 4 - Certifications - 1756-IA8D**

Certification <sup>(1)</sup>	1756-IA8D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IA16

ControlLogix 120V AC input module



**Table 5 - Technical Specifications - 1756-IA16**

Attribute	1756-IA16
Inputs	16 (8 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...132V AC, 47...63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms
On to Off	Hardware delay: 8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	2 mA
Total backplane power	0.58 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	18.41 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 74V AC
On-state current, max	13 mA @ 132V AC

**Table 5 - Technical Specifications - 1756-IA16 (continued)**

Attribute	1756-IA16
Inrush current, max	250 mA peak (decaying to <37% in 22 ms, without activation)
Input impedance, max	10.15 k $\Omega$ @ 132V AC, 60 Hz
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1400V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4
Enclosure type	None (open-style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74...132V, 47...63 Hz.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 6 - Environmental Specifications - 1756-IA16**

Attribute	1756-IA16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 6 - Environmental Specifications - 1756-IA16 (continued)**

Attribute	1756-IA16
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 7 - Certifications - 1756-IA16**

Certification <sup>(1)</sup>	1756-IA16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

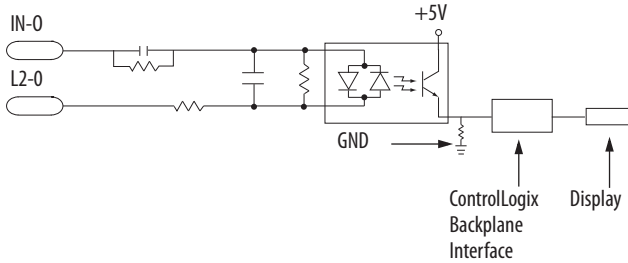
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



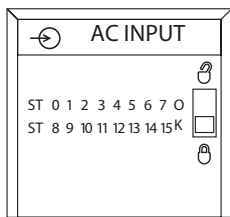
# 1756-IA16I

## ControlLogix 120V AC isolated input module

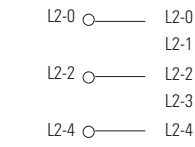
### Simplified Schematic



Additional jumper bars are available as cat. no. 1756-JMPR.

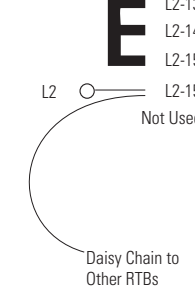


### Isolated Wiring

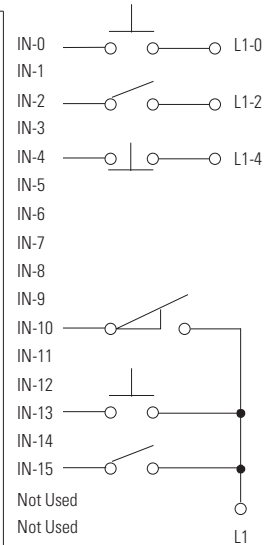
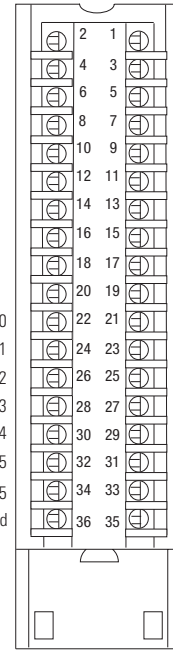


Jumper Bar (Cut to Length)

### Nonisolated Wiring



### 1756-IA16I



**Table 8 - Technical Specifications - 1756-IA16I**

Attribute	1756-IA16I
Inputs	16 individually isolated
Voltage category	120V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	79...132V AC, 47...63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms
On to Off	Hardware delay: 8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	3 mA
Total backplane power	0.71 W
Power dissipation, max	4.9 W @ 60 °C (140 °F)
Thermal dissipation	16.71 BTU/hr
Off-state voltage, max	20V

**Table 8 - Technical Specifications - 1756-IA16I (continued)**

Attribute	1756-IA16I
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 79V AC, 47...63 Hz
On-state current, max	15 mA @ 132V AC, 47...63 Hz
Inrush current, max	250 mA
Input impedance, max	8.8 k $\Omega$ @ 132V AC, 60 Hz
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1200V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74...132V, 47...63 Hz.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 9 - Environmental Specifications - 1756-IA16I**

Attribute	1756-IA16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

**Table 9 - Environmental Specifications - 1756-IA16I (continued)**

Attribute	1756-IA16I
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80 . . . 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000 . . . 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

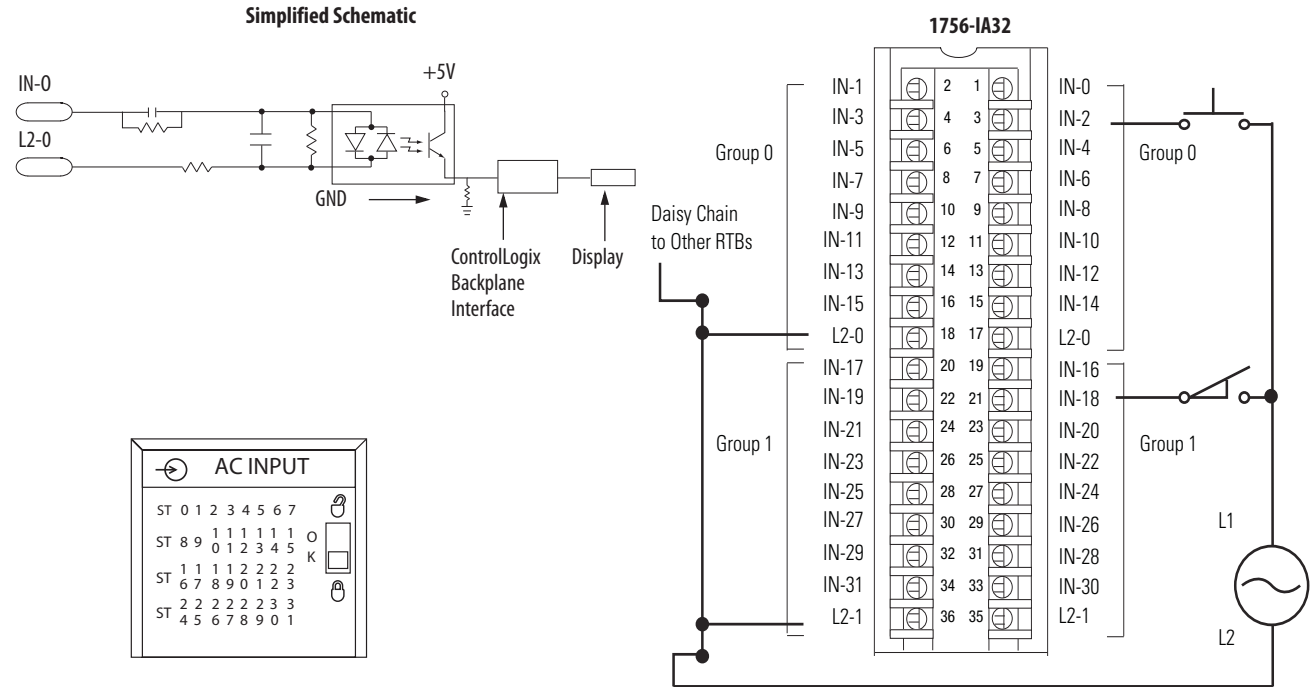
**Table 10 - Certifications - 1756-IA16I**

Certification <sup>(1)</sup>	1756-IA16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IA32

### ControlLogix AC (74...132V) input module



**Table 11 - Technical Specifications - 1756-IA32**

Attribute	1756-IA32
Inputs	32 (16 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range	74...132V AC, 47...63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 1.5 ms nom/10 ms max + filter time User-selectable filter time: 1 or 2 ms
On to Off	Hardware delay: 1 ms nom/8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Total backplane power	0.9 W
Power dissipation, max	6.1 W @ 60 °C (140 °F)
Thermal dissipation	20.8 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 74V AC
On-state current, max	15 mA @ 132V AC

**Table 11 - Technical Specifications - 1756-IA32 (continued)**

Attribute	1756-IA32
Inrush current, max	390 mA
Input impedance, max	14.0 k $\Omega$ @ 132V AC, 60 Hz
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane 125V (continuous), basic insulation type, input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 12 - Environmental Specifications - 1756-IA32**

Attribute	1756-IA32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 12 - Environmental Specifications - 1756-IA32 (continued)**

Attribute	1756-IA32
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz

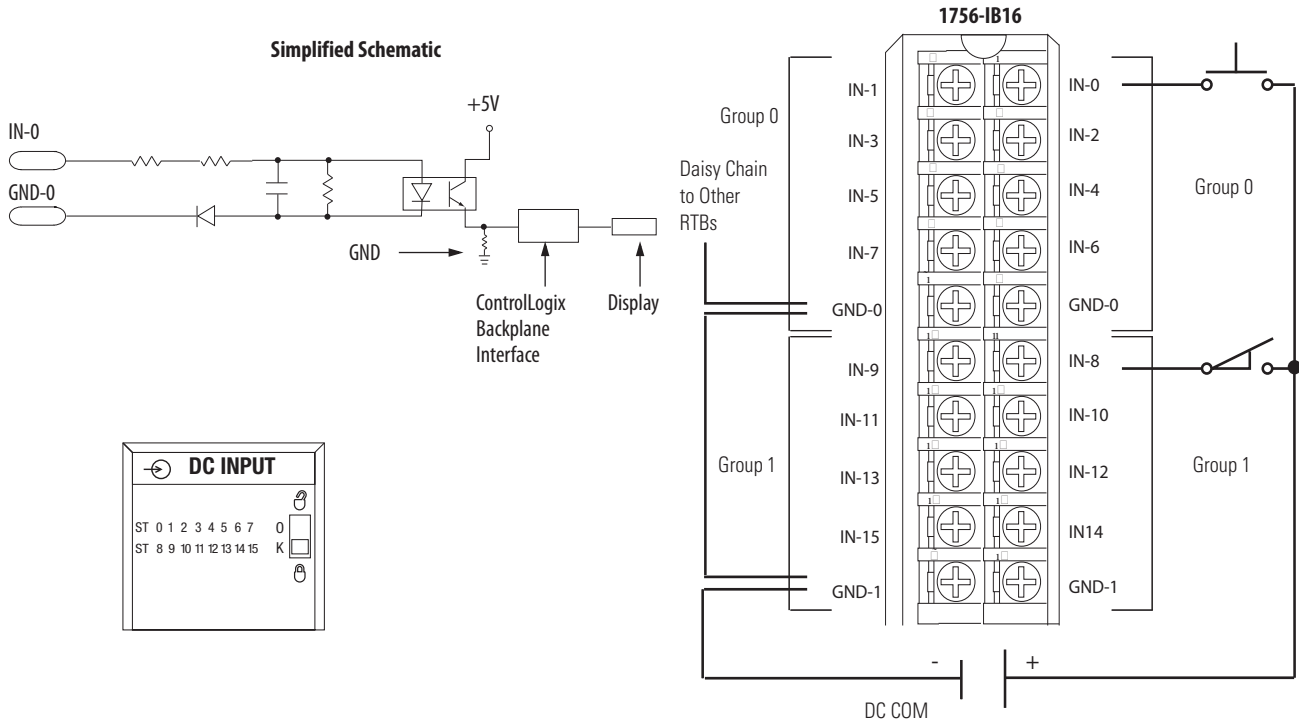
**Table 13 - Certifications - 1756-IA32**

Certification <sup>(1)</sup>	1756-IA32
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IB16

ControlLogix DC (10...31.2V) input module



**Table 14 - Technical Specifications - 1756-IB16**

Attribute	1756-IB16
Inputs	16 (8 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10...31.2V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 290 $\mu$ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 700 $\mu$ s nom/2 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	2 mA
Total backplane power	0.56 W
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.39 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	10 mA @ 31.2V DC

**Table 14 - Technical Specifications - 1756-IB16 (continued)**

Attribute	1756-IB16
Inrush current, max	250 mA peak (decaying to < 37% in 22 ms, without activation)
Input impedance, max	3.12 k $\Omega$ @ 31.2V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 15 - Environmental Specifications - 1756-IB16**

Attribute	1756-IB16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges



**Table 15 - Environmental Specifications - 1756-IB16 (continued)**

Attribute	1756-IB16
Radiated RF immunity IEC 61000-4-3	10V/m with 1kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

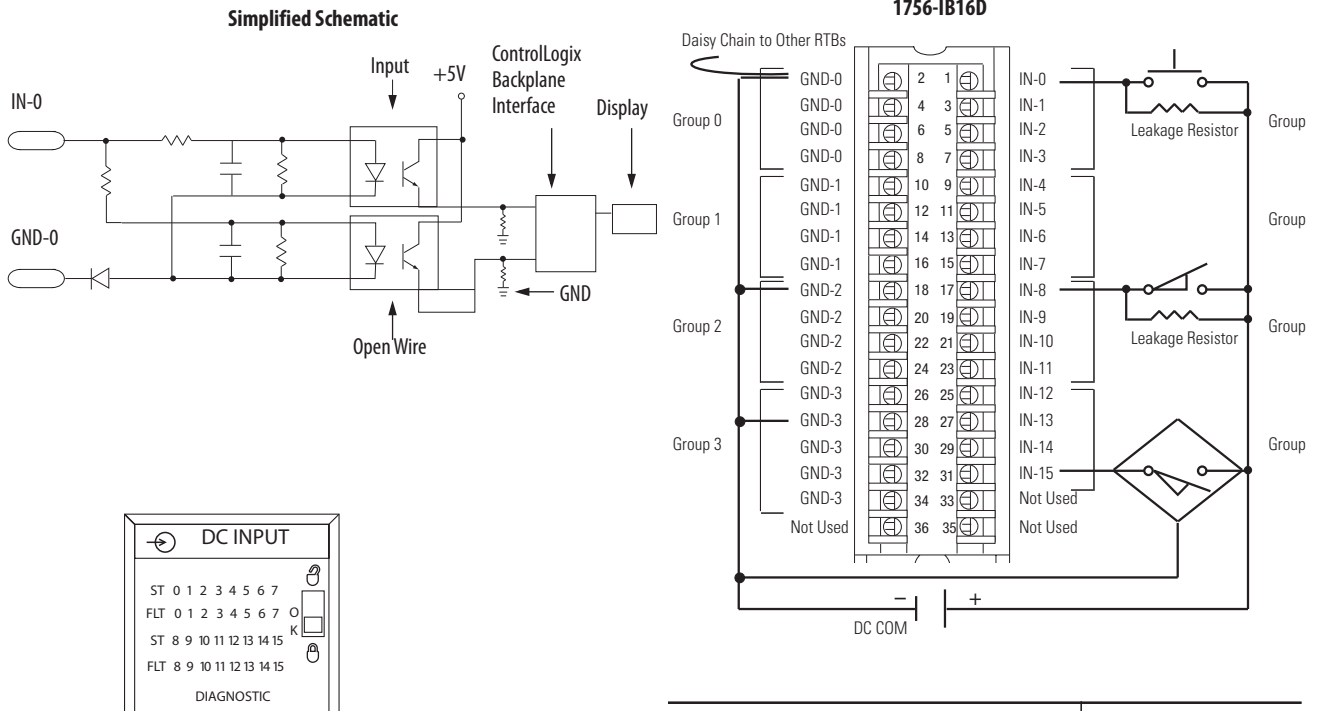
**Table 16 - Certifications - 1756-IB16**

Certification <sup>(1)</sup>	1756-IB16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IB16D

ControlLogix DC (10...30V) diagnostic input module



Recommended Leakage Resistor Size 1/4 W, 5%	Supply Voltage
3.9K	10V DC
5.6K	12V DC
15K	24V DC
20K	30V DC

**Table 17 - Diagnostic Specifications - 1756-IB16D**

Attribute	1756-IB16D
Open wire	Off-state leakage current 1.2 mA min
Timestamp of diagnostics	±1 ms

**Table 18 - Technical Specifications - 1756-IB16D**

Attribute	1756-IB16D
Inputs	16 diagnostic (4 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10...30V DC
Input voltage, nom	24V DC

**Table 18 - Technical Specifications - 1756-IB16D (continued)**

Attribute	1756-IB16D
Input delay time (screw to backplane) Off to On	Hardware delay: 340 $\mu$ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 740 $\mu$ s nom/4 ms max + filter time User-selectable filter time: 0, 1, 9, or 18 ms
Current draw @ 5.1V	150 mA
Current draw @ 24V	3 mA
Total backplane power	0.84 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	13 mA @ 30V DC
Inrush current, max	250 mA
Input impedance, max	2.31 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s ... 750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 19 - Environmental Specifications - 1756-IB16D**

Attribute	1756-IB16D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 20 - Certifications - 1756-IB16D**

Certifications <sup>(1)</sup>	1756-IB16D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions

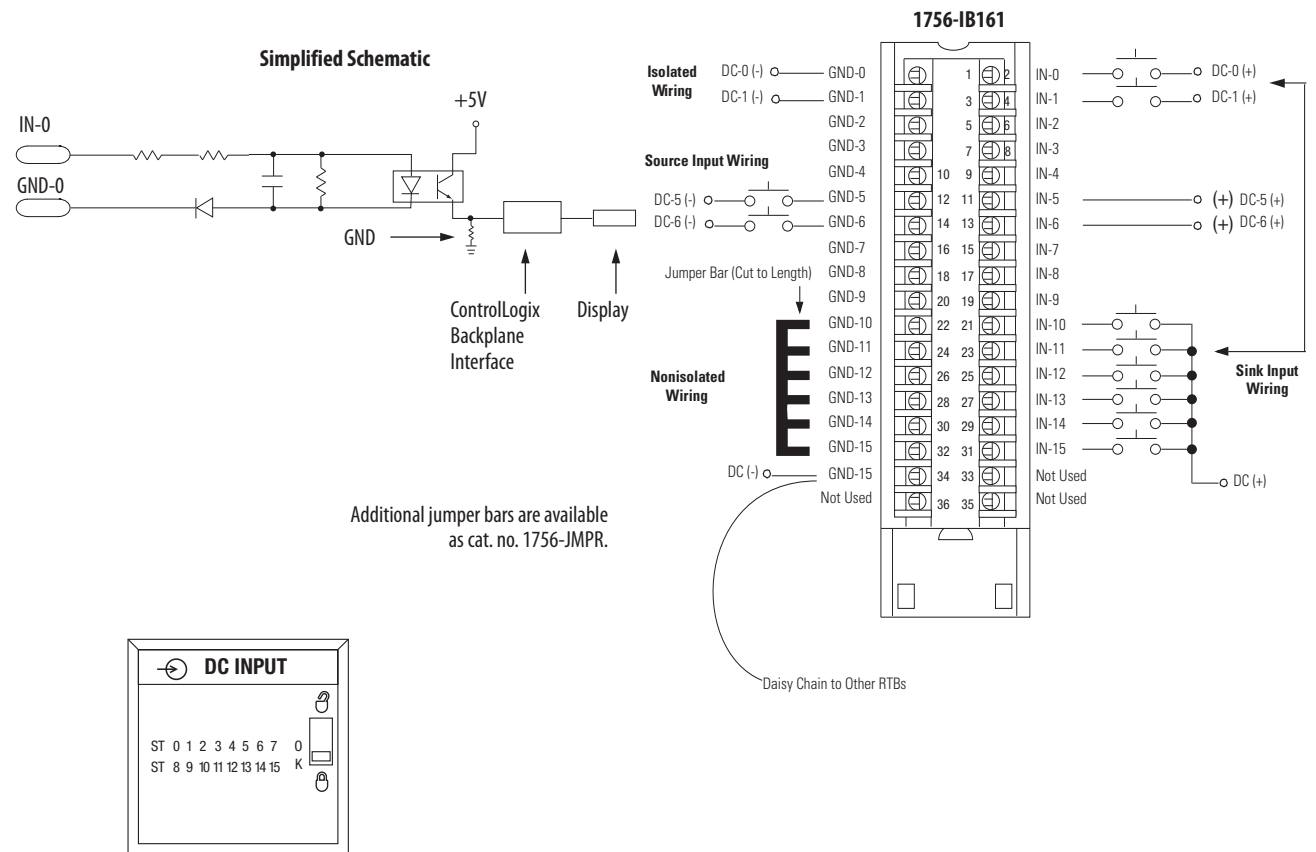
**Table 20 - Certifications - 1756-IB16D**

KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IICT3 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IB16I

ControlLogix DC (10...30V) isolated input module



**Table 21 - Technical Specifications - 1756-IB16I**

Attribute	1756-IB16I
Inputs	16 individually isolated
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On	Hardware delay: 1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 4 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	5 W @ 60 °C (140 °F)
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10 V DC
On-state current, max	10 mA @ 30V DC
Inrush current, max	250 mA peak (decaying to < 37% in 22 ms, without activation)
Input impedance, max	3 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 22 - Environmental Specifications - 1756-IB161**

Attribute	1756-IB161
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 23 - Certifications - 1756-IB161**

Certification <sup>(1)</sup>	1756-IB161
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

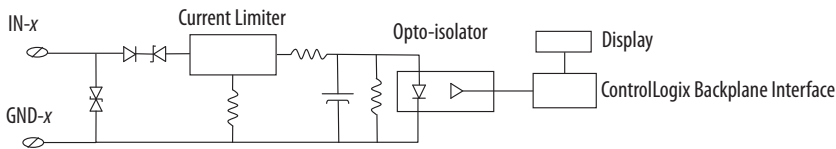
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



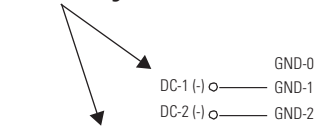
# 1756-IB16IF

ControlLogix DC (10...30V) sinking or sourcing, isolated, fast input module

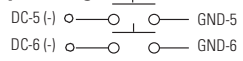
### Simplified Schematic



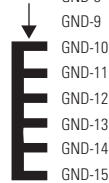
### Isolated Wiring



### Source Input Wiring



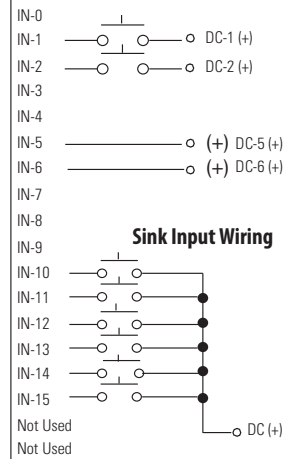
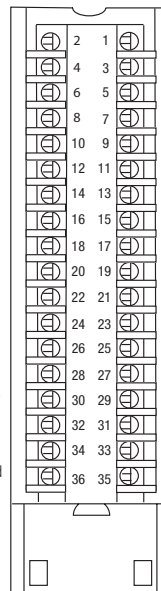
### Jumper Bar Cut to Length



### Nonisolated Wiring

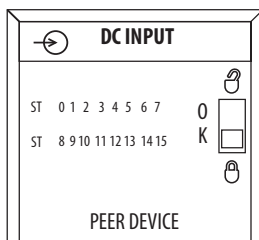


### 1756-IB16IF



Additional jumper bars may be purchased by using catalog number 1756-JMPR.

Daisy Chain to Other RTBs



**Table 24 - Technical Specifications - 1756-IB16IF**

Attribute	1756-IB16IF
Inputs	16 individually isolated
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	14 $\mu$ s nom/23 $\mu$ s max + user-configurable filter time of 0...30,000 $\mu$ s
On to Off	14 $\mu$ s nom/23 $\mu$ s max + user-configurable filter time of 0...30,000 $\mu$ s
Current draw @ 5.1V	275 mA
Current draw @ 24V	3 mA
Total backplane power	1.47 W
Power dissipation	3.8 W @ 60 °C (140 °F)
Thermal dissipation	12.97 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10 V DC
On-state current, max	5 mA @ 30V DC
Input impedance, max	6 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 4 $\mu$ s for inputs < 4 kHz $\pm$ 13 $\mu$ s for inputs > 4 kHz
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane 250V (continuous), basic insulation type, input-to-input Type tested @ 2300V AC for 60 s inputs-to-backplane Type tested @ 1500V AC for 60 s input-to-input
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 25 - Environmental Specifications - 1756-IB16IF**

Attribute	1756-IB16IF
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

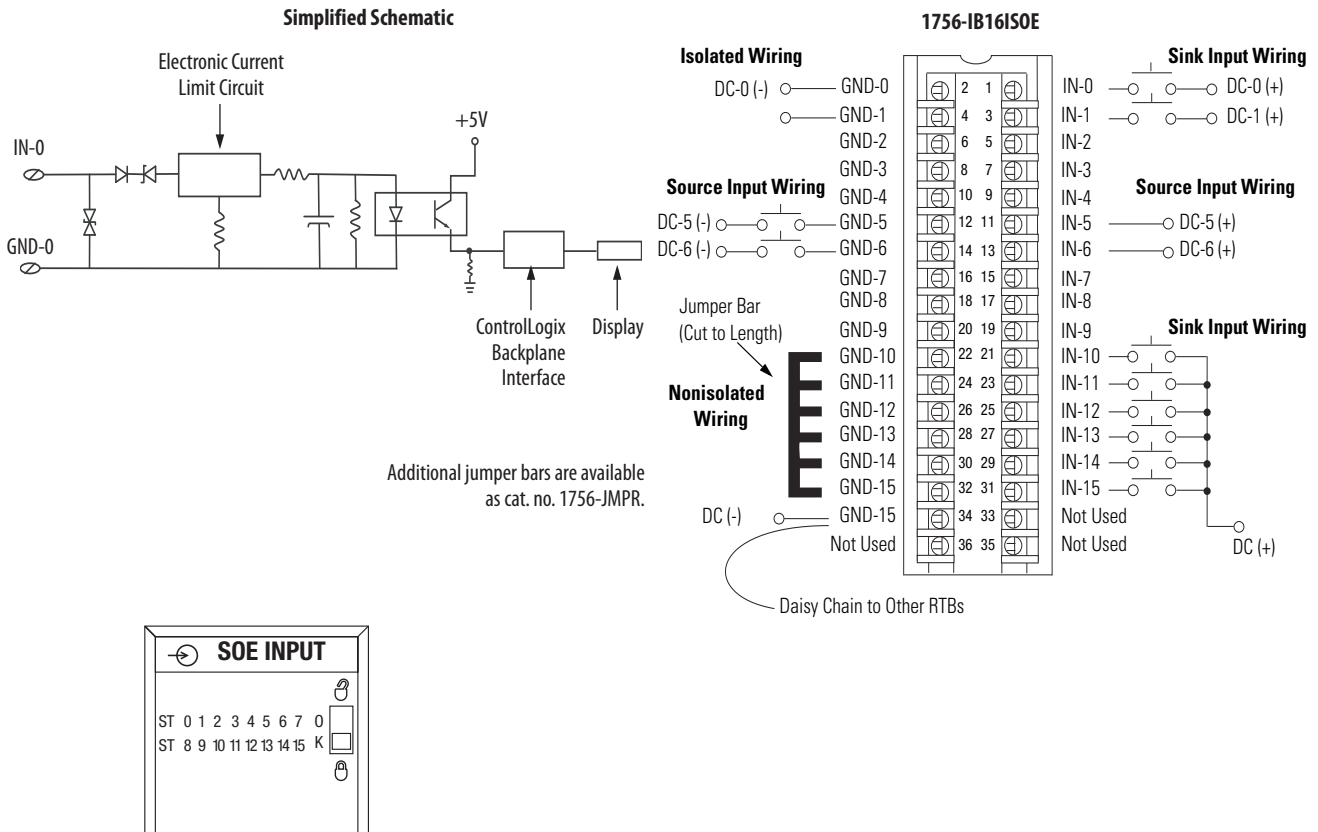
**Table 26 - Certifications - 1756-IB16IF**

Certification <sup>(1)</sup>	1756-IB16IF
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IB16ISOE

ControlLogix DC (10...55V) sequence of events input module



**Table 27 - Technical Specifications - 1756-IB16ISOE**

Attribute	1756-IB16ISOE
Inputs	16 individually isolated, sequence of events
Voltage category	24/48V DC sink/source
Operating voltage range	10...55V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On	Hardware delay: 10 $\mu$ s nom/20 $\mu$ s max + firmware scan: up to 25 $\mu$ s + filter time: 0...50 ms + ASIC delay: 175 $\mu$ s (FIFO) or 625 $\mu$ s (Coordinated System Time per point)
On to Off	Hardware delay: 25 $\mu$ s nom/50 $\mu$ s max + firmware scan: up to 25 $\mu$ s + filter time: 0...50 ms + ASIC delay: 175 $\mu$ s (FIFO) or 625 $\mu$ s (Coordinated System Time per point)
Current draw @ 5.1V	320 mA
Current draw @ 24V	2 mA
Total backplane power	1.7 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	17.22 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2.0 mA @ 9V DC
On-state current, nom	4.5 mA @ 24...31V DC
On-state current, max	5.1 mA @ 48...55V DC
Input impedance, max	10.8 k $\Omega$ @ 55V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 100 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane 125V (continuous), basic insulation type, input-to-input Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 28 - Environmental Specifications - 1756-IB16ISOE**

Attribute	1756-IB16ISOE
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	2.5 kV

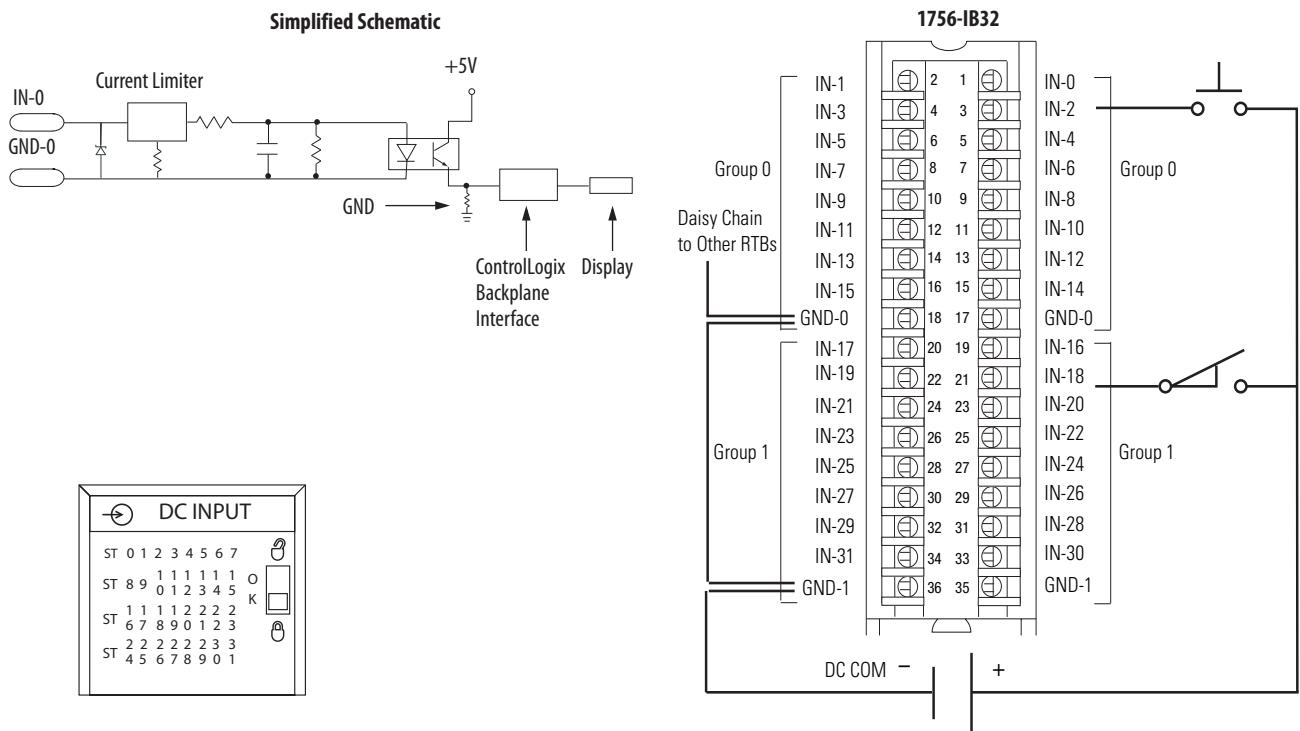
**Table 29 - Certifications - 1756-IB16ISOE**

Certification <sup>(1)</sup>	1756-IB16ISOE
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IB32

ControlLogix DC (10...31.2V) input module



**Table 30 - Technical Specifications - 1756-IB32**

Attribute	1756-IB32
Inputs	32 (16 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10...31.2V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 380 $\mu$ s max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 420 $\mu$ s max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	120 mA
Current draw @ 24V	2 mA
Total backplane power	0.66 W
Power dissipation, max	6.2 W @ 60 °C (140 °F)
Thermal dissipation	21.1 BTU/hr @ 60 °C (140 °F)
Off-state voltage, max	5V
Off-state current, max	2.27 mA
On-state current, min	4.8 mA @ 10V DC
On-state current, max	5.5 mA @ 31.2V DC
Inrush current, max	250 mA (decaying to < 37% in 22 ms, without activation)
Input impedance, max	5.67 k $\Omega$ @ 31.2V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane 250V (continuous), basic insulation type, input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 - on signal ports <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).



**Table 31 - Environmental Specifications - 1756-IB32**

Attribute	1756-IB32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

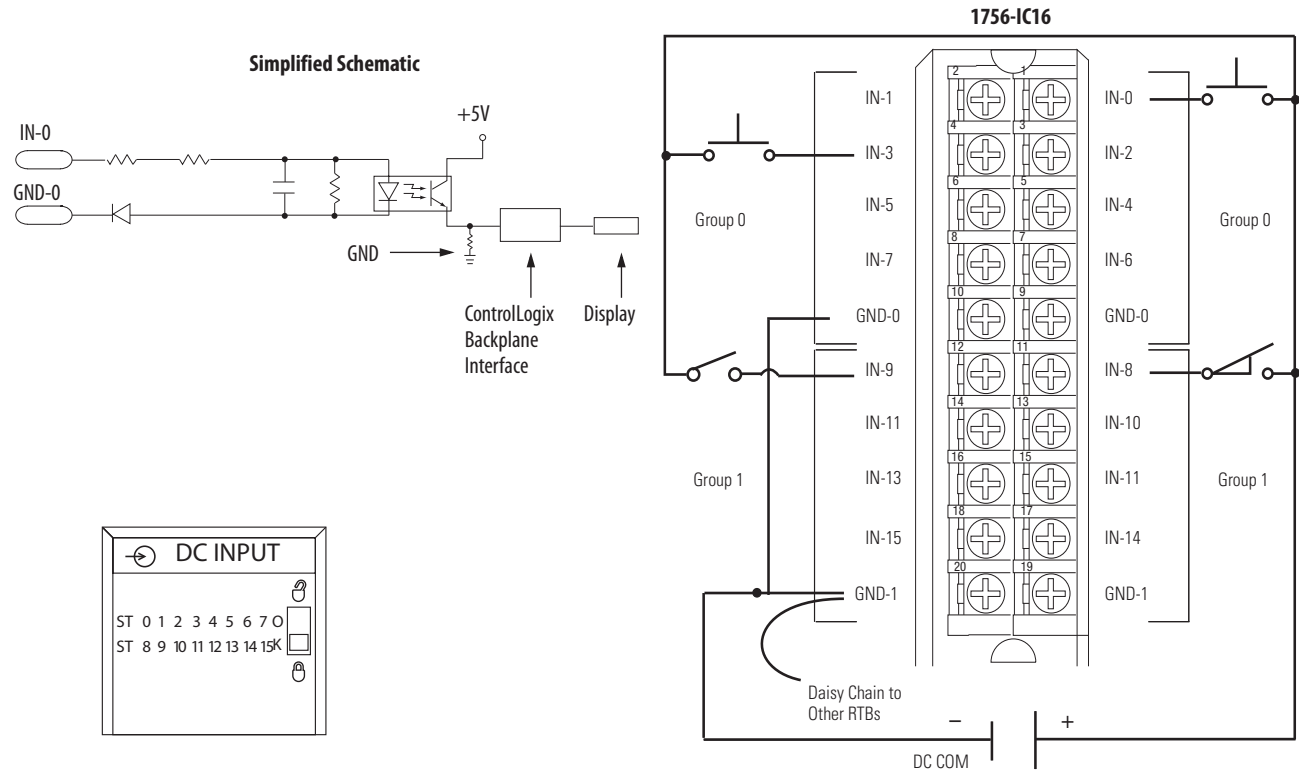
**Table 32 - Certifications - 1756-IB32**

Certification <sup>(1)</sup>	1756-IB32
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IC16

ControlLogix DC (30...60V) input module



**Table 33 - Technical Specifications - 1756-IC16**

Attribute	1756-IC16
Inputs	16 (8 points/group)
Voltage category	48V DC sink
Operating voltage range	30...55V DC @ 60 °C (140 °F) 30...60V DC @ 55 °C (131 °F)
Input voltage, nom	48V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 4 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	5.2 W @ 60 °C (140 °F)
Thermal dissipation	17.73 BTU/hr
Off-state voltage, max	10V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 30V DC
On-state current, max	7 mA @ 60V DC
Inrush current, max	250 mA
Input impedance, max	8.57 k $\Omega$ @ 60V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane 125V (continuous), basic insulation type, input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s, inputs-to-backplane Routine tested @ 924V AC for 2 s, input group-to-group
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 34 - Environmental Specifications - 1756-IC16**

Attribute	1756-IC16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

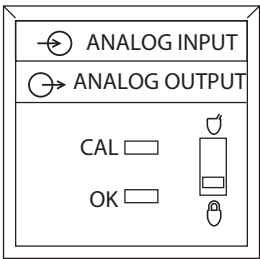
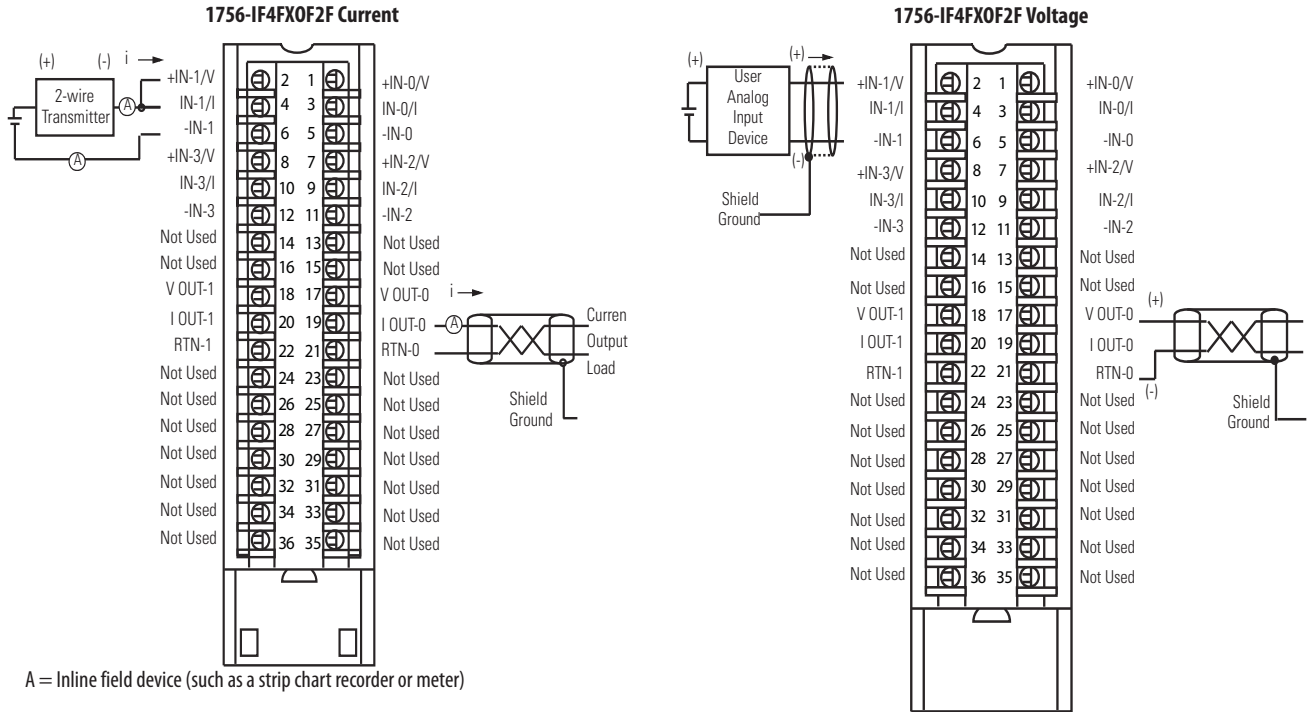
**Table 35 - Certifications - 1756-IC16**

<b>Certification<sup>(1)</sup></b>	<b>1756-IC16</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IF4FXOF2F

ControlLogix high-speed input/output analog module



**Table 36 - Technical Specifications - 1756-IF4FXOF2F**

Attribute	1756-IF4FXOF2F
Current draw at 5.1V	375 mA
Current draw at 24V	100 mA
Total backplane power	4.3 W
Power dissipation, max	Voltage: 4.3 W Current: 4.7 W
Thermal dissipation	Voltage: 14.66 BTU/hr Current: 16.02 BTU/hr
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Isolation voltage	250V (continuous), basic insulation type, inputs and outputs to backplane No isolation between individual inputs or outputs Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable

**Table 36 - Technical Specifications - 1756-IF4FXOF2F (continued)**

Attribute	1756-IF4FXOF2F
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 37 - Input Specifications - 1756-IF4FXOF2F**

Attribute	1756-IF4FXOF2F
Number	4 high-speed, sub-millisecond, differential
Input range	± 10V 0...10V 0...5V 0...20 mA (over-range indication when exceeded)
Resolution	Approx 14 bits across ±10.5V DC (21V total) ±10.5V range: 1.3 mV/bit, 14-bit effective 0...10.5V range: 1.3 mV/bit, 13-bit effective 0...5.25V range: 1.3 mV/bit, 12-bit effective Approx 12 bits across 21 mA 0...21 mA range: 5.25 µA/bit
Repeatability	±1 Least Significant Bit (LSB) <sup>(1)</sup>
Input impedance	Voltage: >1 MΩ Current: 249 Ω
Open circuit detection	Positive full-scale reading within 1 s
Overvoltage protection	Voltage: 30V DC Current: 8V AC/DC
Calibrated accuracy @ 25 °C (77 °F)	0.05% of range immediately after calibration Better than 0.1% of range within calibration interval
Calibration interval	12 months
Gain drift with temperature	Voltage: 25 ppm/°C max Current: 35 ppm/°C max
Module error	0.2% of range
Module scan time	300 µs min <sup>(2)</sup>
Input conversion method	Successive approximation

(1) Repeatability is defined as the stability of the input channel reading when a steady state signal is applied, for example, ±1 LSB is one count (1.3 mV) from the nominal reading.

(2) 300 µs min for 1756-IF4FXOF2F/B, firmware revision 3.x or greater. 400 µs min for 1756-IF4FXOF2F/A, firmware revision 1.x.

**Table 38 - Output Specifications - 1756-IF4FXOF2F**

Attribute	1756-IF4FXOF2F
Number	2 high-speed voltage or current
Output range	$\pm 10V$ 0...20 mA
Resolution	13 bits across 21 mA = 2.8 $\mu A$ /bit 14 bits across 21.8V = 1.3 mV/bit
Open circuit detection	Current output only (Output must be set to >0.1 mA)
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	Voltage: >2000 $\Omega$ Current: 0...750 $\Omega$
Output settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	0.05% of range immediately after calibration Better than 0.1% of range within calibration interval
Calibration interval	12 months
Offset drift	50 $\mu V$ /°C 1 $\mu A$ /°C
Gain drift with temperature	Voltage: 25 ppm/°C max Current: 50 ppm/°C max
Module error	Voltage: 0.2% of range Current: 0.3% of range
Update period for all channels (RPI), min	1 ms
Output conversion method	R-Ladder DAC, monotonicity with no missing codes

**Table 39 - Environmental Specifications - 1756-IF4FXOF2F**

Attribute	1756-IF4FXOF2F
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges



**Table 39 - Environmental Specifications - 1756-IF4FXOF2F (continued)**

Attribute	1756-IF4FXOF2F
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

**Table 40 - Certifications - 1756-IF4FXOF2F**

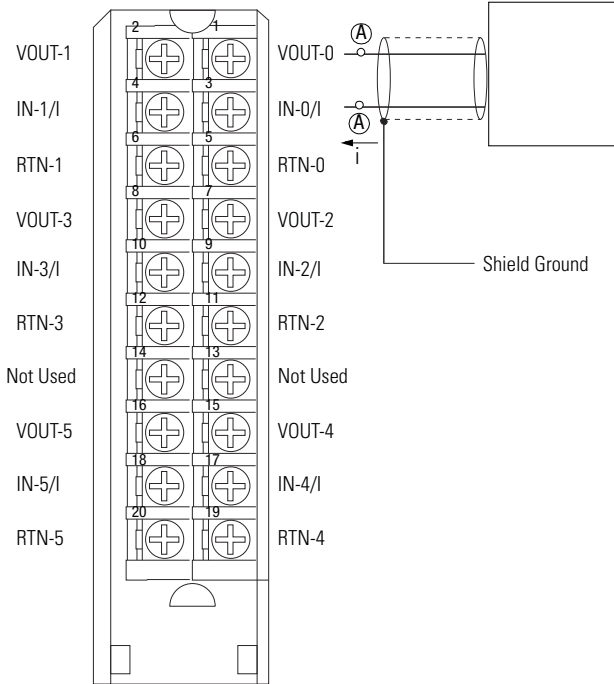
Certification <sup>(1)</sup>	1756-IF4FXOF2F
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

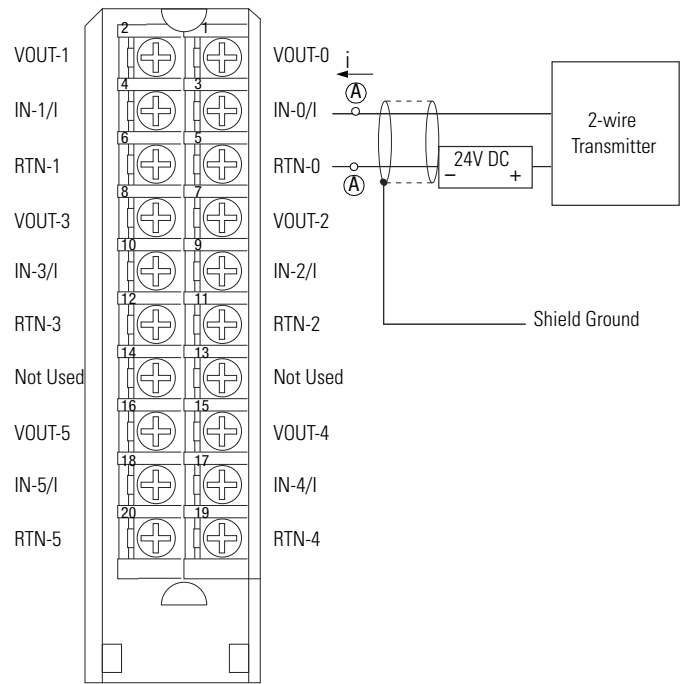
## 1756-IF6CIS

### ControlLogix sourcing current loop analog input module

**1756-IF6CIS 2-wire Transmitter Connected to the Module and the Module Providing 24V DC Loop Power**

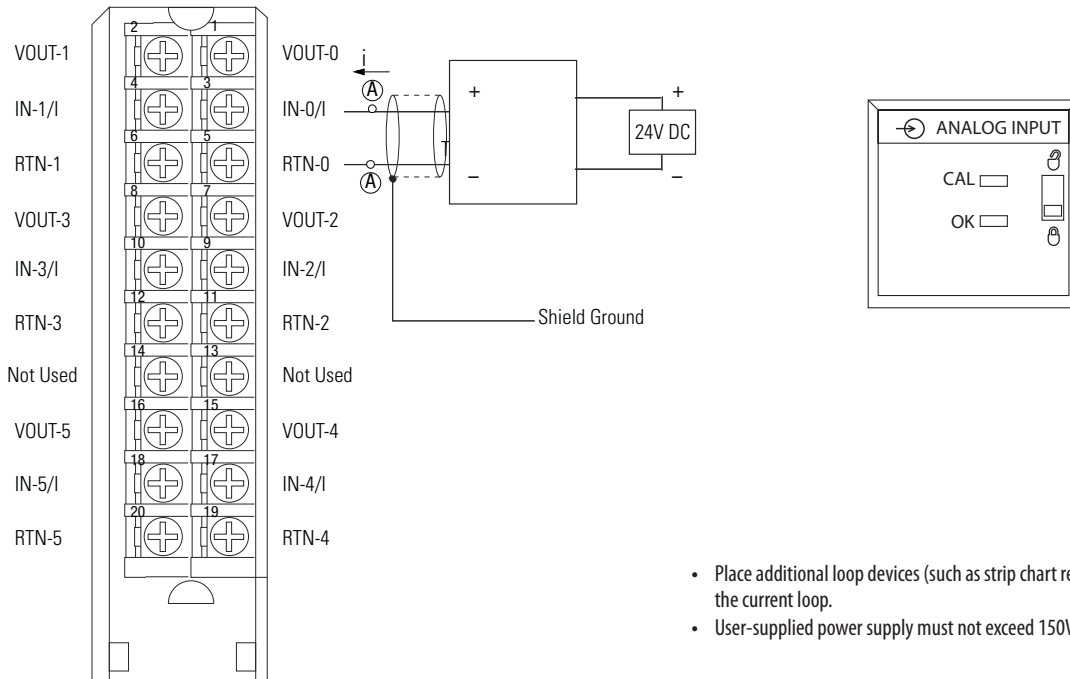


**1756-IF6CIS 2-wire Transmitter Connected to the Module and an External, User-provided Power Supply Providing 24V DC Loop Power**



Place additional loop devices (such as strip chart recorders) at either A location in the current loop.

**1756-IF6CIS 4-wire Transmitter Connected to the Module and an External, User-provided Power Supply Providing 24V DC Loop Power**



- Place additional loop devices (such as strip chart recorders) at either A location in the current loop.
- User-supplied power supply must not exceed 150VA.

**Table 41 - Signal and User Counts - 1756-IF6CIS**

Range	Low Signal and User Counts	High Signal and User Counts
0...20 mA	0 mA -32768 counts	21.09376 mA 32767 counts

**Table 42 - Technical Specifications - 1756-IF6CIS**

Attribute	1756-IF6CIS
Inputs	6 individually isolated current sourcing
Input range	0...20 mA (over-range indication when exceeded)
Resolution	16 bits 0.34 $\mu$ A/bit
Current draw @ 5.1V	250 mA
Current draw @ 24V	275 mA
Total backplane power	7.9 W
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.4 BTU/hr
Input impedance	215 $\Omega$ , approx
Sourcing voltage, min	20V DC
Sourcing voltage, max	30V DC
Sourcing current, max	Current limited to < 30 mA
Open circuit detection time	Zero reading within 5 s
Overvoltage protection, max	30V AC/DC with PTC and sense resistor
Normal mode noise rejection	60 dB @ 60 Hz <sup>(1)</sup>
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	3...262 Hz (-3 dB) <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy 25 °C (77 °F), nom	Better than 0.1% of range
Calibrated accuracy 25 °C (77 °F), max	0.025% of range
Calibration interval	12 months
Offset drift	200 nA/°C
Gain drift with temperature, nom	17 ppm/°C 0.36 $\mu$ A/°C
Gain drift with temperature, max	35 ppm/°C max 0.74 $\mu$ A/°C max
Module error	0.2% of range
Module input scan time, min	25 ms min – floating point 10 ms min – integer
On-board data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point

**Table 42 - Technical Specifications - 1756-IF6CIS (continued)**

Attribute	1756-IF6CIS
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 43 - Environmental Specifications - 1756-IF6CIS**

Attribute	1756-IF6CIS
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 43 - Environmental Specifications - 1756-IF6CIS (continued)**

Attribute	1756-IF6CIS
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz on shielded signal ports

**Table 44 - Certifications - 1756-IF6CIS**

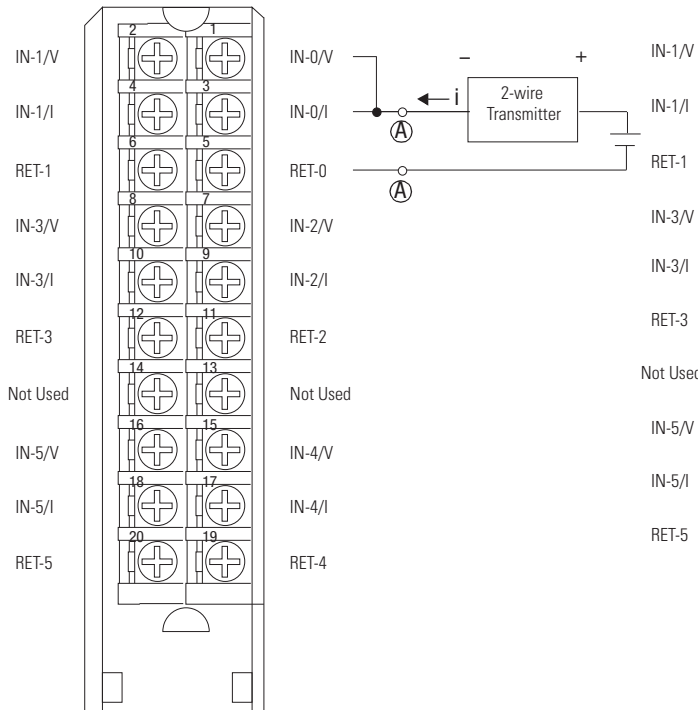
Certification <sup>(1)</sup>	1756-IF6CIS
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

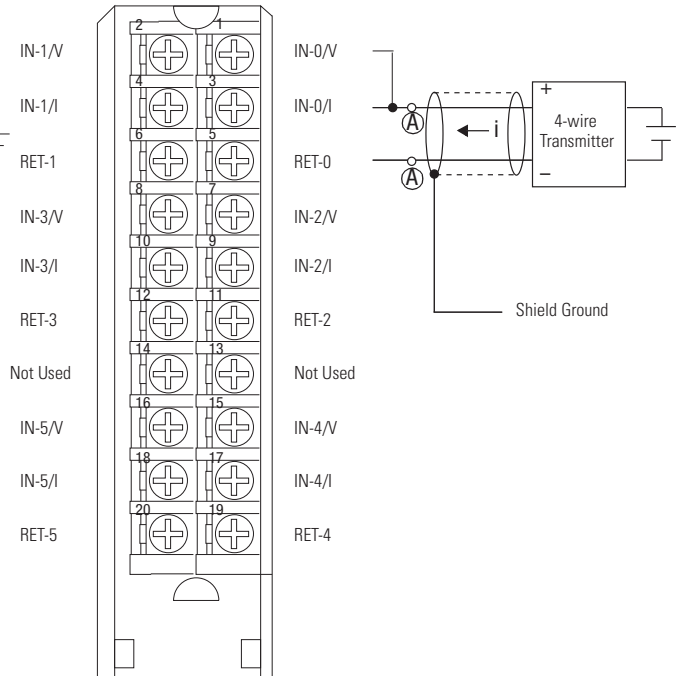
## 1756-IF6I

### ControlLogix isolated voltage/current analog input module

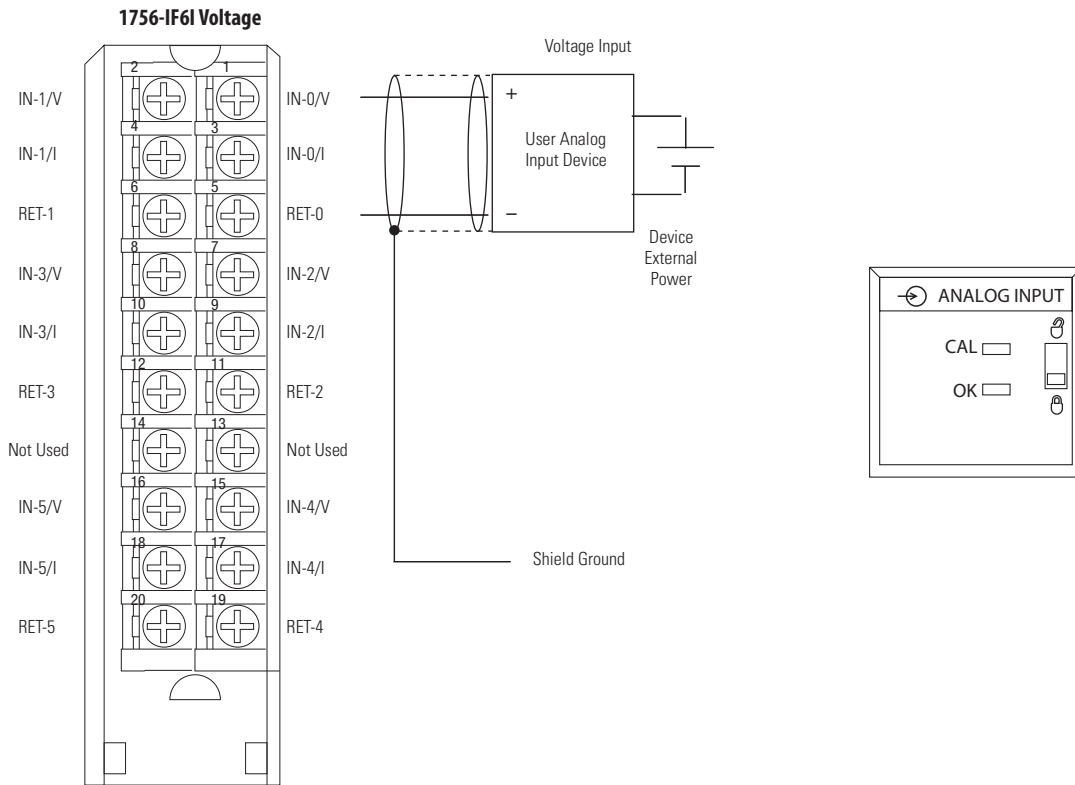
**1756-IF6I Current 2-wire**



**1756-IF6I Current 4-wire**



Place additional loop devices (such as strip chart recorders) at either A location.



**Table 45 - Signal and User Counts - 1756-IF6I**

Range	Low Signal and User Counts	High Signal and User Counts
±10V	-10.54688V -32768 counts	10.54688V 32767 counts
0...10V	0V -32768 counts	10.54688V 32767 counts
0...5V	0V -32768 counts	5.27344V 32767 counts
0...20 mA	0 mA -32768 counts	21.09376V 32767 counts

**Table 46 - Technical Specifications - 1756-IF6I**

Attribute	1756-IF6I
Inputs	6 individually isolated
Input range	±10.5V 0...10.5V 0...5.25V 0...21 mA (over-range indication when exceeded)
Resolution	16 bits 10.5V: 343 μV/bit 0...10.5V: 171 μV/bit 0...5.25V: 86 μV/bit 0...21 mA: 0.34 μA/bit
Current draw @ 5.1V	250 mA
Current draw @ 24V	100 mA

**Table 46 - Technical Specifications - 1756-IF6I (continued)**

Attribute	1756-IF6I
Total backplane power	3.7 W
Power dissipation, max	Voltage: 3.7 W Current: 4.3 W
Thermal dissipation	Voltage: 12.62 BTU/hr Current: 14.32 BTU/hr
Input impedance	Voltage: > 10 M $\Omega$ Current: 249 $\Omega$
Open circuit detection time	Positive full scale reading within 5 s
Overvoltage protection, max	Voltage: 120V AC/DC Current: 8V AC/DC (with on-board current resistor)
Normal mode noise rejection	60 dB @ 60 Hz <sup>(1)</sup>
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz (-3 dB) <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy 25 °C (77 °F)	Better than 0.1% of range
Calibration interval	6 months
Offset drift	2 $\mu$ V/°C
Gain drift with temperature	Voltage: 35 ppm/°C, 80 ppm/°C max Current: 45 ppm/°C, 90 ppm/°C max
Module error	0.54% of range
Module input scan time, min	25 ms min – floating point 10 ms min – integer <sup>(1)</sup>
On-board data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).



**Table 47 - Environmental Specifications - 1756-IF6I**

Attribute	1756-IF6I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

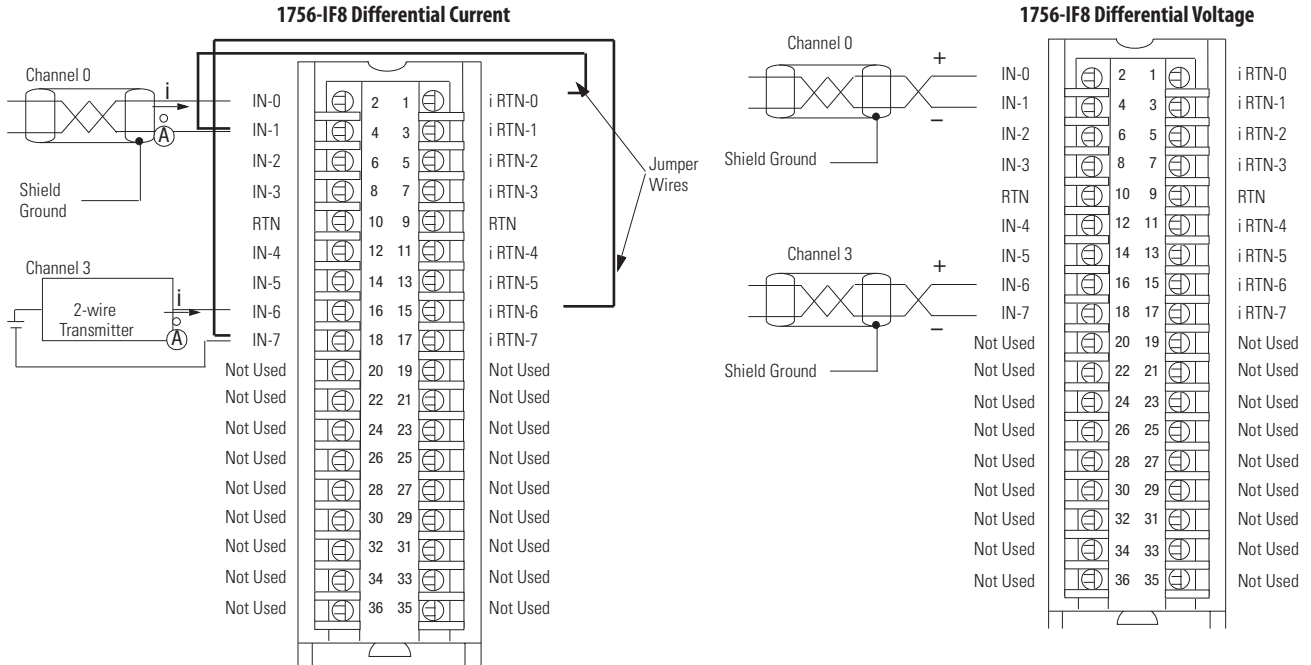
**Table 48 - Certifications - 1756-IF6I**

<b>Certification<sup>(1)</sup></b>	<b>1756-IF6I</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-IF8

## ControlLogix voltage/current analog input module



- Use this table when wiring your module in Differential mode.

This channel	Uses these terminals
Channel 0	IN-0 (+), IN-1 (-), i RTN-0
Channel 1	IN-2 (+), IN-3 (-), i RTN-2
Channel 2	IN-4 (+), IN-5 (-), i RTN-4
Channel 3	IN-6 (+), IN-7 (-), i RTN-6

- All terminals marked RTN are connected internally.
- A 249 Ω current loop resistor is located between IN-x and i RTN-x terminals.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.

**IMPORTANT:** When operating in 2 channel, High Speed mode, only use channels 0 and 2.

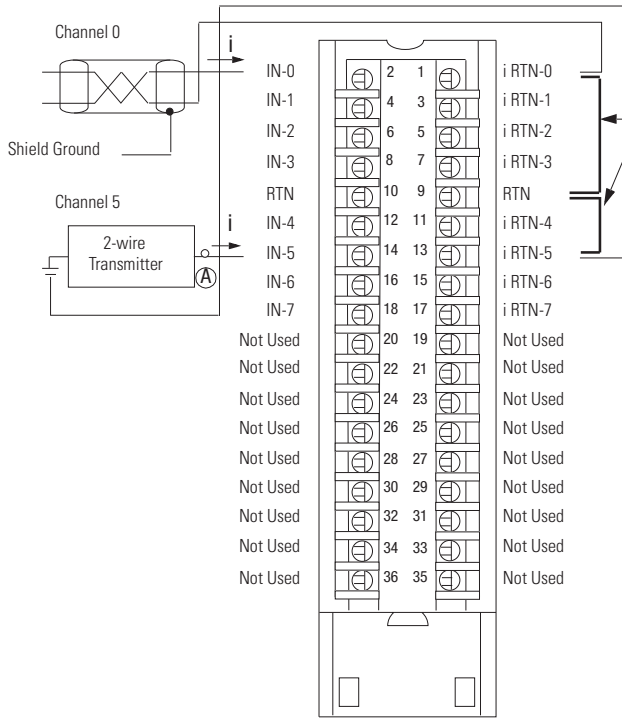
- Use this table when wiring your module in Differential mode.

This channel	Uses these terminals
Channel 0	IN-0 (+), IN-1 (-)
Channel 1	IN-2 (+), IN-3 (-)
Channel 2	IN-4 (+), IN-5 (-)
Channel 3	IN-6 (+), IN-7 (-)

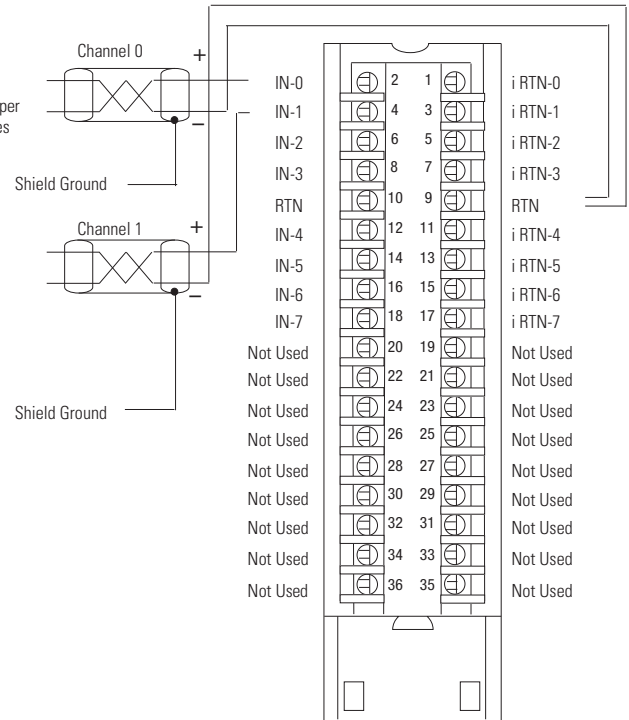
- All terminals marked RTN are connected internally.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Terminals marked RTN or i RTN are not used for differential voltage wiring.

**IMPORTANT:** When operating in 2 channel, High Speed mode, only use channels 0 and 2.

**1756-IF8 Single-ended Current**

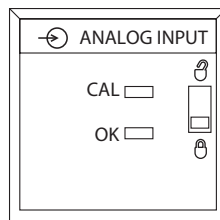


**1756-IF8 Single-ended Voltage**



- All terminals marked RTN are connected internally.
- For current applications, all terminals marked iRTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-x and iRTN-x terminals.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.

- All terminals marked RTN are connected internally.
- Terminals marked iRTN are not used for single-ended voltage wiring.



**Table 49 - Technical Specifications - 1756-IF8**

Attribute	1756-IF8
Inputs	8 single-ended 4 differential 2 high-speed differential
Input range	±10V 0...10V 0...5V 0...20 mA
Resolution	±10.25V: 320 $\mu$ V/count (15 bits plus sign bipolar) 0...10.25V: 160 $\mu$ V/count (16 bits) 0...5.125V: 80 $\mu$ V/count (16 bits) 0...20.5mA: 0.32 $\mu$ A/count (16 bits)
Current draw @ 5.1V	150 mA
Current draw @ 24V	40 mA
Total backplane power	1.73 W
Power dissipation, max	Voltage: 1.73 W Current: 2.33 W
Thermal dissipation	Voltage: 5.88 BTU/hr Current: 7.92 BTU/hr
Input impedance	Voltage: >1 M $\Omega$ Current: 249 $\Omega$
Open circuit detection time	Differential voltage: Positive full scale reading within 5 s Single-ended/diff. current: Negative full scale reading within 5 s Single-ended voltage: Even numbered channels go to positive full scale reading within 5 s, odd numbered channels go to negative full scale reading within 5 s
Overvoltage protection, max	Voltage: 30V DC Current: 8V DC
Normal mode noise rejection	>80 dB @ 50/60 Hz <sup>(1)</sup>
Common mode noise rejection	>100 dB @ 50/60 Hz
Calibrated accuracy 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Calibration interval	12 months
Offset drift	45 $\mu$ V/°C
Gain drift with temperature	Voltage: 15 ppm/°C Current: 20 ppm/°C
Module error	Voltage: 0.1% of range Current: 0.3% of range
Module input scan time, min	8 pt single-ended (floating point): 16...488 ms 4 pt differential (floating point): 8...244 ms 2 pt differential (floating point): 5...122 m <sup>(1)</sup>
On-board data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane No isolation between individual inputs Routine tested at 1350V AC for 2 s

**Table 49 - Technical Specifications - 1756-IF8 (continued)**

Attribute	1756-IF8
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 50 - Environmental Specifications - 1756-IF8**

Attribute	1756-IF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

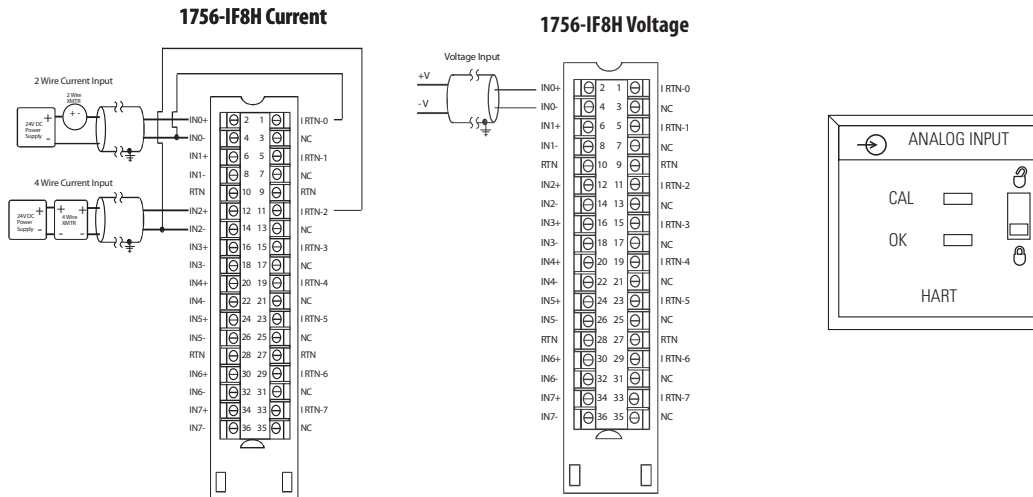
**Table 51 - Certifications - 1756-IF8**

<b>Certification<sup>(1)</sup></b>	<b>1756-IF8</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IF8H

ControlLogix voltage/current analog input module with HART protocol



**Table 52 - Technical Specifications - 1756-IF8H**

Attribute	1756-IF8H
Inputs	8 differential voltage or current
Input range	±10V 0...5V 1...5V 0...10V 0...20 mA 4...20 mA
Resolution	16...21 bits
Current draw @ 5V	300 mA
Current draw @ 24V	135 mA
Total backplane power	4.77 W
Power dissipation, max	Voltage: 3.21 W Current: 4.01 W
Thermal dissipation	Voltage: 11.0 BTU/hr Current: 13.7 BTU/hr
Input impedance	> 1 MΩ voltage 250 Ω current
Open circuit detection time	Positive full scale reading within 5 s
Overvoltage protection, max	Voltage: 30V DC Current: 8V DC
Normal mode noise rejection	> 80 dB @ 50/60 Hz
Common mode noise rejection	> 100 dB @ 50/60 Hz
Calibrated accuracy	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Calibration interval	12 months
Offset drift	90 μV/°C
Gain drift with temperature	Voltage: 10 ppm/°C Current: 20 ppm/°C



**Table 52 - Technical Specifications - 1756-IF8H (continued)**

Attribute	1756-IF8H
Module error	Voltage: 0.1% of range Current: 0.3% of range
Module input scan time, min	18...488 ms (filter dependent)
Module HART scan time	Typically 1 s per HART channel enabled. Estimate 10 s if all 8 channels have HART enabled Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	50V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Type tested at 1500V AC for 60 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 - on signal ports <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 53 - Environmental Specifications - 1756-IF8H**

Attribute	1756-IF8H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A (with appropriate enclosure)
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

**Table 53 - Environmental Specifications - 1756-IF8H (continued)**

Attribute	1756-IF8H
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

**Table 54 - Certifications - 1756-IF8H**

Certification <sup>(1)</sup>	1756-IF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul>
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements</li> <li>• II 3 G Ex nA IIC T4 Gc X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

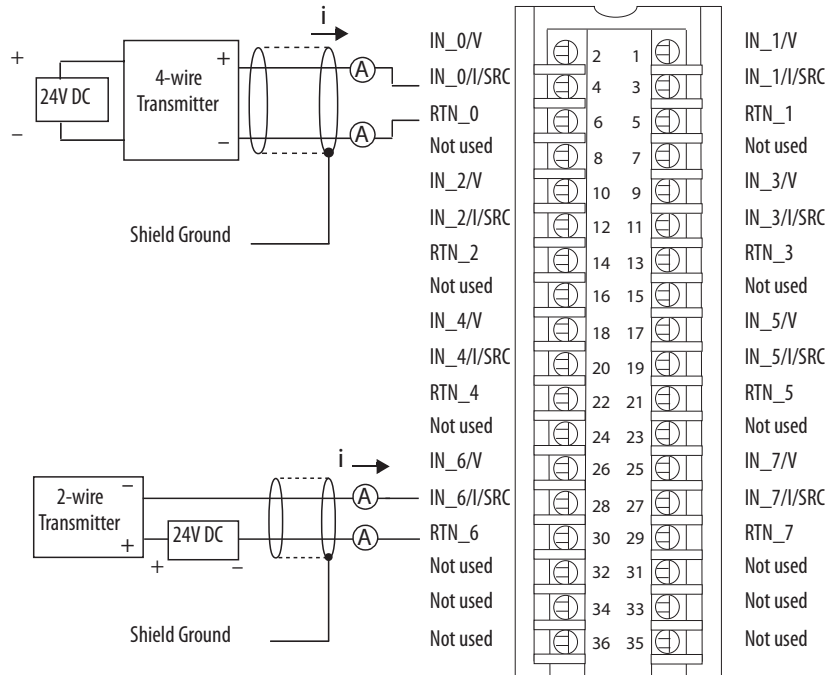
## 1756-IF8I

ControlLogix isolated voltage/current analog input module.

**1756-IF8I Module Wiring Diagram -Current Mode with External Loop Power**

**IMPORTANT:** Remember the following:

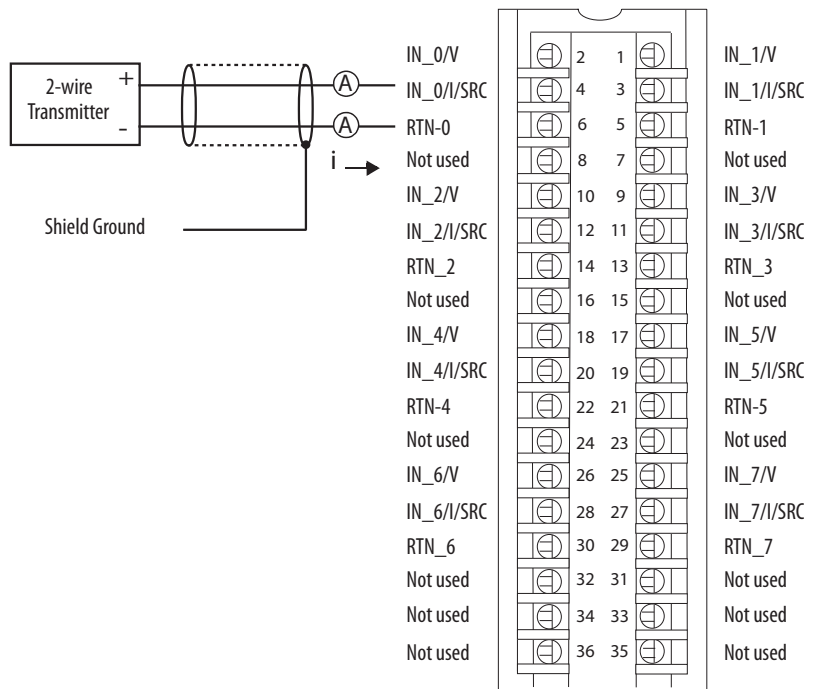
- In this wiring diagram, an external, user-provided power supply provides 24V DC loop power.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional loop devices, for example, strip chart recorders, at either 'A' location in the current loop.



**1756-IF8I Module Wiring Diagram -Current Mode with Internal Loop Power**

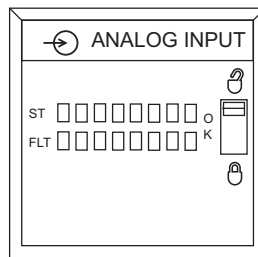
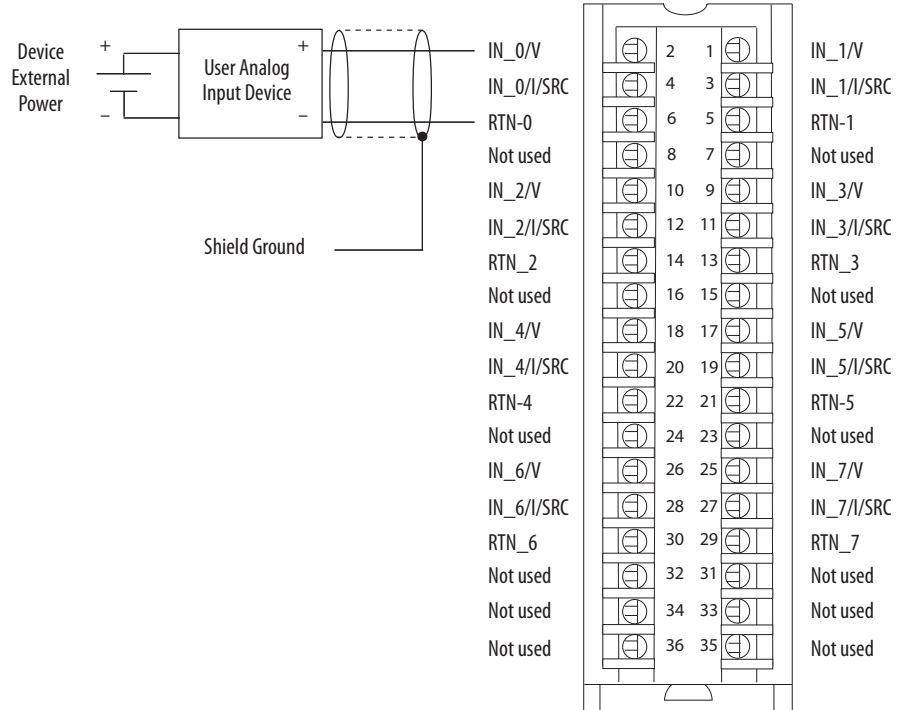
**IMPORTANT:** Remember the following:

- In this wiring diagram, the module provides 24V DC loop power.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional loop devices, for example, strip chart recorders, at either 'A' location in the current loop.



**1756-IF8I Module Wiring Diagram - Voltage Mode**

**IMPORTANT:** If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.



**Table 55 - Technical Specifications - 1756-IF8I**

Attribute	1756-IF8I
Inputs	8 isolated channels - Any combination of Voltage or Current mode
Input ranges	-10...10V 0...10V 0...5V 0...20 mA
Resolution	24-bit ±10.5V (1.49 µV/count) 0...10.5V (1.49 µV/count) 0...5.25V (1.49 µV/count) 0...21 mA (2.99 nA/count)
Current draw @ 5.1V	200 mA
Current draw @ 24V	Voltage/Non-sourcing Current mode: 150 mA Sourcing Current mode: 400 mA (In Sourcing Current mode, the channel provides loop power.)
Total backplane power	Voltage/Non-sourcing Current mode: 4.6 W Sourcing Current mode: 10.6 W
Power dissipation, max	Voltage mode: 4.6 W Non-sourcing Current mode: 5.1 W Sourcing Current mode: 7.3 W
Thermal dissipation	Voltage mode: 15.7 BTU/hr Non-sourcing Current mode: 17.4 BTU/hr Sourcing Current mode: 24.9 BTU/hr
Input impedance, approx	Voltage mode: 1 GΩ (powered); 7500 Ω (unpowered) Current mode: 125 Ω
Sourcing voltage, min	20V DC
Sourcing voltage, max	38V DC (open circuit)
Sourcing current, max	Current Limited < 45 mA (IN_x/I/SRC to RTN_x)
Open circuit detection time	5 s
Overvoltage protection, max	±30V DC
Normal mode noise rejection	80 dB @ 60 Hz <sup>(1)</sup>
Common mode noise rejection	120 dB @ 50/60 Hz
Channel bandwidth	Notch Filter configuration dependent See publication <a href="#">1756-UM540</a> for possible values.
Settling time	Notch Filter configuration dependent See publication <a href="#">1756-UM540</a> for possible values.
Calibrated accuracy 25 °C (77 °F)	0.05 %
Module error over full temperature range	0.1 %
Module input scan time, min	1 ms
On-board data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes - Rate set by Requested Packet Interval rate
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta

**Table 55 - Technical Specifications - 1756-IF8I (continued)**

Attribute	1756-IF8I
Isolation voltage	250V (continuous), Reinforced Insulation Type, inputs to backplane 250V (continuous), Basic Insulation Type, input to input Type tested at 2300V AC for 60 s, inputs to backplane Type tested at 1500V AC for 60 s, input to input
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33... 2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports <sup>(2)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).**Table 56 - Environmental Specifications - 1756-IF8I**

Attribute	1756-IF8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 56 - Environmental Specifications - 1756-IF8I (continued)**

Attribute	1756-IF8I
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . . 80 MHz

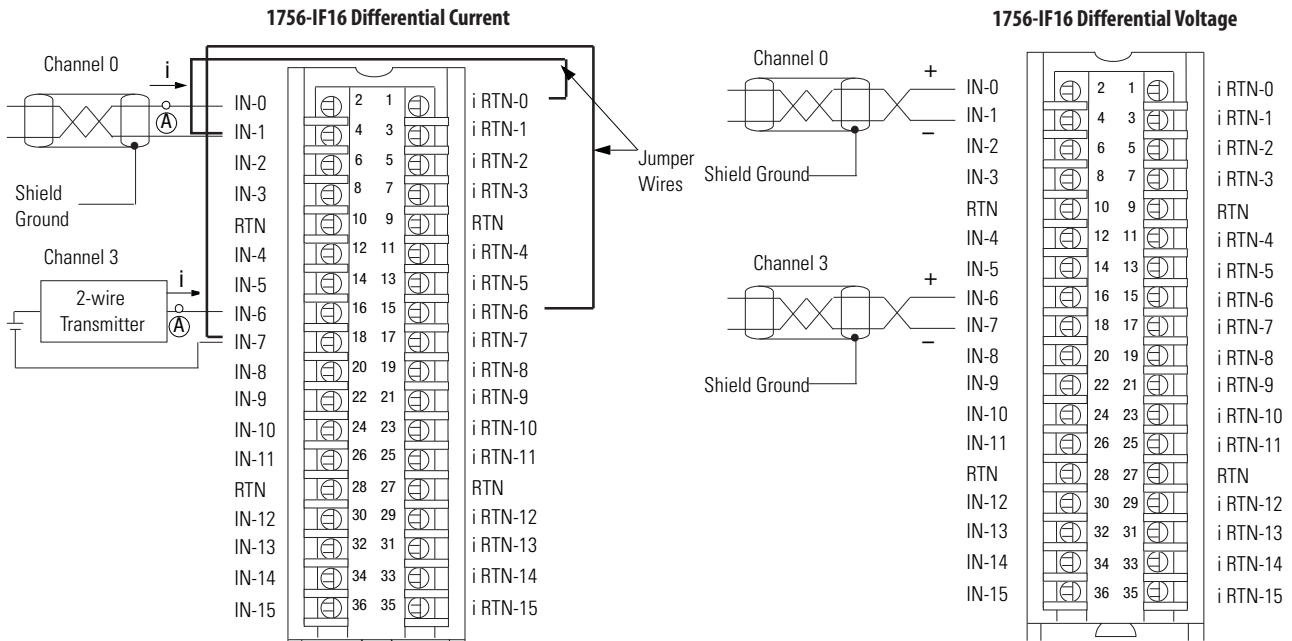
**Table 57 - Certifications - 1756-IF8I**

Certification <sup>(1)</sup>	1756-IF8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> <li>• EN 61131-2; Programmable Controllers (Clause 11)</li> </ul>
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> <li>• EN 61000-6-4; Industrial Emissions</li> </ul>
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 Gc X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> <li>• Article 58-2 of Radio Waves Act, Clause 3</li> </ul>

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IF16

### ControlLogix voltage/current analog input module



Use this table when wiring your module in Differential mode.

This channel	Uses these terminals
Channel 0	IN-0 (+), IN-1 (-), i RTN-0
Channel 1	IN-2 (+), IN-3 (-), i RTN-2
Channel 2	IN-4 (+), IN-5 (-), i RTN-4
Channel 3	IN-6 (+), IN-7 (-), i RTN-6
Channel 4	IN-8 (+), IN-9 (-), i RTN-8
Channel 5	IN-10 (+), IN-11 (-), i RTN-10
Channel 6	IN-12 (+), IN-13 (-), i RTN-12
Channel 7	IN-14 (+), IN-15 (-), i RTN-14

- All terminals marked RTN are connected internally.
- A 249 Ω current loop resistor is located between IN-x and i RTN-x terminals.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.

**IMPORTANT:** When operating in 4 channel, High Speed mode, only use channels 0, 2, 4, and 6.

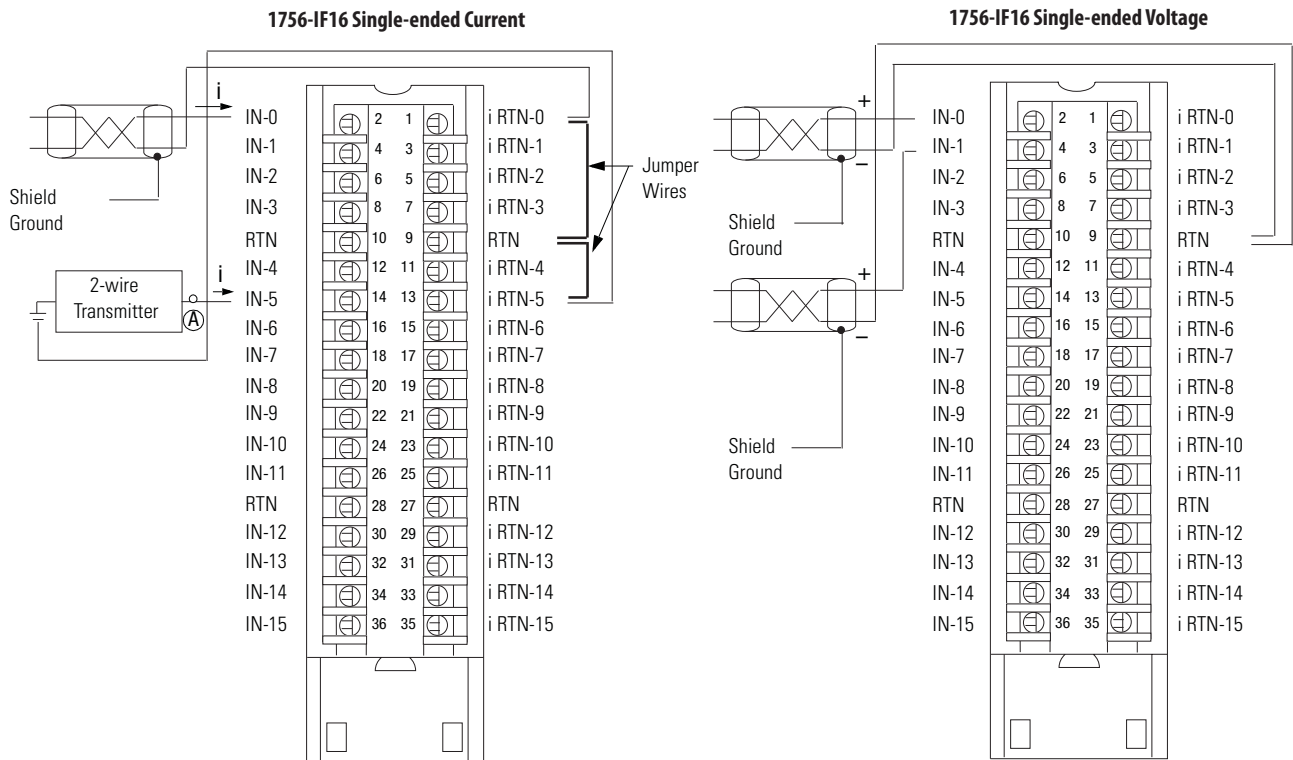
Use this table when wiring your module in Differential mode.

This channel	Uses these terminals
Channel 0	IN-0 (+), IN-1 (-)
Channel 1	IN-2 (+), IN-3 (-)
Channel 2	IN-4 (+), IN-5 (-)
Channel 3	IN-6 (+), IN-7 (-)
Channel 4	IN-8 (+), IN-9 (-)
Channel 5	IN-10 (+), IN-11 (-)
Channel 6	IN-12 (+), IN-13 (-)
Channel 7	IN-14 (+), IN-15 (-)

- All terminals marked RTN are connected internally.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Terminals marked RTN or i RTN are not used for differential voltage wiring.

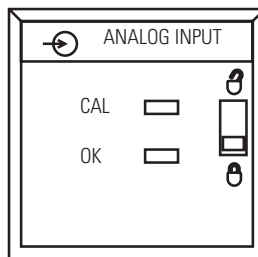
**IMPORTANT:** When operating in 4 channel, High Speed mode, only use channels 0, 2, 4, and 6.





- All terminals marked RTN are connected internally.
- For current applications, all terminals marked i RTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-x and iRTN-x terminals.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.

- All terminals marked RTN are connected internally.
- Terminals marked i RTN are not used for single-ended voltage wiring.



**Table 58 - Technical Specifications - 1756-IF16**

Attribute	1756-IF16
Inputs	16 single ended, 8 differential or 4 differential (high speed)
Input range	±10V 0...10V 0...5V 0...20 mA
Resolution	320 µV/count (15 bits + sign bipolar) @ ±10.25V 160 µV/count (16 bits) @ 0...10.25V 80 µV/count (16 bits) @ 0...5.125V 0.32 µA/count (16 bits) @ 0...20.5 mA
Current draw @ 5.1V	150 mA
Current draw @ 24V	65 mA
Total backplane power	2.33 W
Power dissipation, max	Voltage: 2.3 W Current: 3.9 W
Thermal dissipation	Voltage: 7.84 BTU/hr Current: 13.3 BTU/hr
Input impedance	Voltage: >10 MΩ Current: 249 Ω
Open circuit detection time	Differential voltage - Positive full scale reading within 5 s Single-ended/differential current - Negative full scale reading within 5 s Single-ended voltage - Even numbered channels go to positive full scale reading within 5 s, odd numbered channels go to negative full scale reading within 5 s
Overvoltage protection, max	Voltage: 30V DC Current: 8V DC
Normal mode noise rejection	>80 dB @ 50/60 Hz <sup>(1)</sup>
Common mode noise rejection	>100 dB @ 50/60 Hz
Channel bandwidth	15 Hz (-3 dB) <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Offset drift	45 µV/°C
Gain drift with temperature	Voltage: 15 ppm/°C Current: 20 ppm/°C
Module error	Voltage: 0.1% of range Current: 0.3% of range
Module input scan time, min	16 pt single-ended: 16...488 ms 8 pt differential: 8...244 ms 4 pt differential: 5...122 ms <sup>(1)</sup>
On-board data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane No isolation between individual inputs Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable

**Table 58 - Technical Specifications - 1756-IF16 (continued)**

Attribute	1756-IF16
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 59 - Environmental Specifications - 1756-IF16**

Attribute	1756-IF16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

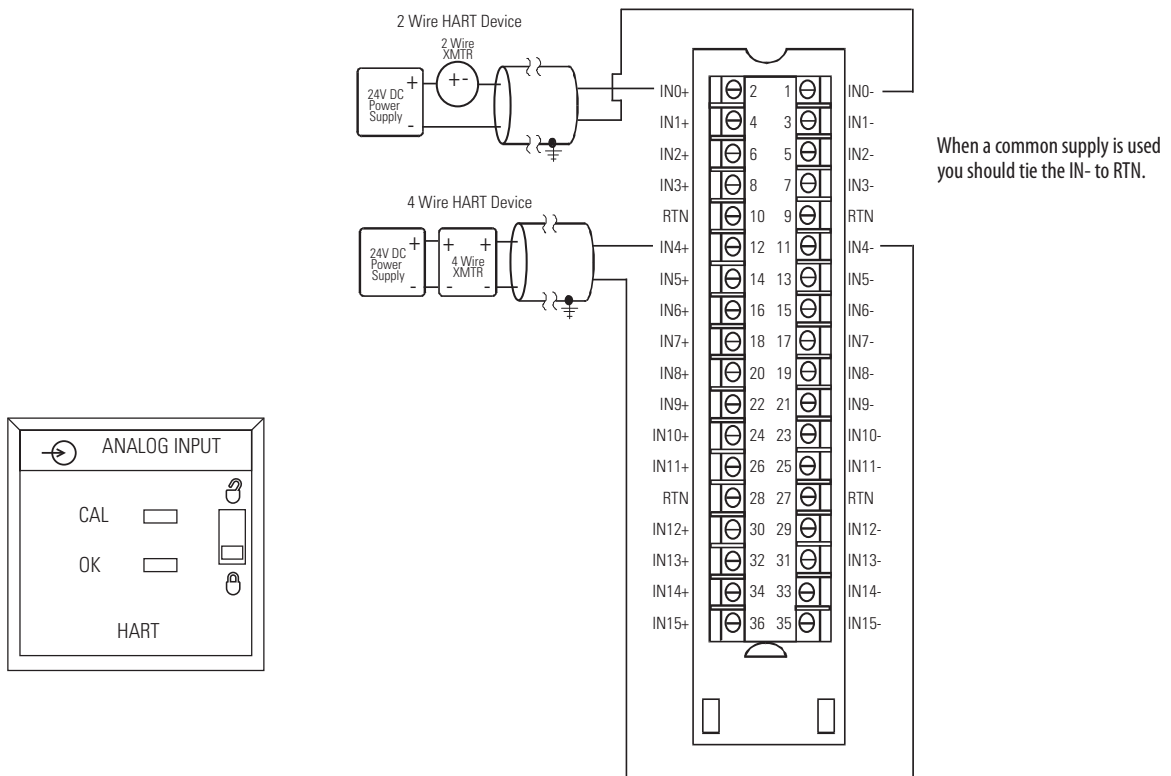
**Table 60 - Certifications - 1756-IF16**

Certification <sup>(1)</sup>	1756-IF16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IF16H

ControlLogix current analog input module with HART protocol



**Table 61 - Technical Specifications - 1756-IF16H**

Attribute	1756-IF16H
Inputs	16 differential, current
Input range	0...20 mA 4...20 mA
Resolution	16...21 bits
Current draw @ 5V	200 mA
Current draw @ 24V	125 mA
Total backplane power	4.02 W
Power dissipation, max	6 W
Thermal dissipation	12 BTU/hr
Input impedance	249 $\Omega$
Open circuit detection time	Positive full scale reading within 5 s
Overvoltage protection, max	8V DC
Normal mode noise rejection	74 dB @ 50/60 Hz (15 Hz filter) 90 dB @ 60 Hz (20 Hz filter)
Common mode noise rejection	> 90 dB @ 50/60 Hz (15 and 20 Hz filters only)
Repeatability	Better than 0.01% of range (15 and 20 Hz filters only)
Calibrated accuracy	Better than 0.13% of range (all filters)
Calibration interval	12 months
Offset drift	27 $\mu$ V/ $^{\circ}$ C
Gain drift with temperature	11ppm/ $^{\circ}$ C
Module error	0.3% of range
Module input scan time, min	11...328 ms (filter dependent)
Module HART scan time	Typically 1 s Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	50V (continuous), basic insulation type, inputs-to-backplane No isolation between individual inputs Type tested at 1500V DC for 60 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 - on signal ports <sup>(1)</sup>
North American temperature code	T5
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 62 - Environmental Specifications - 1756-IF16H**

Attribute	1756-IF16H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

**Table 63 - Certifications - 1756-IF16H**

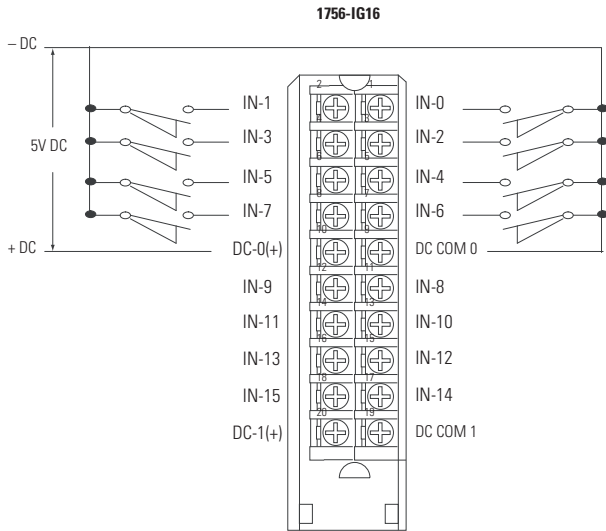
Certification <sup>(1)</sup>	1756-IF16H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul>
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

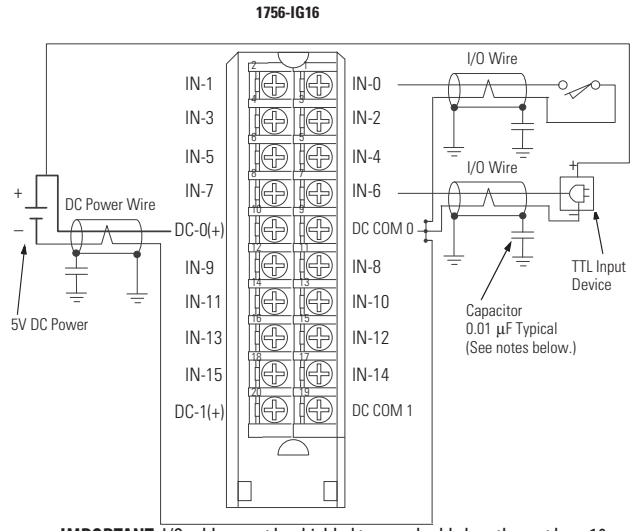
# 1756-IG16

## ControlLogix TTL input module

**Standard Wiring**

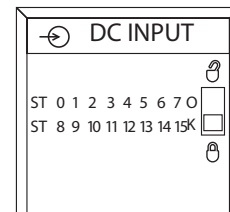
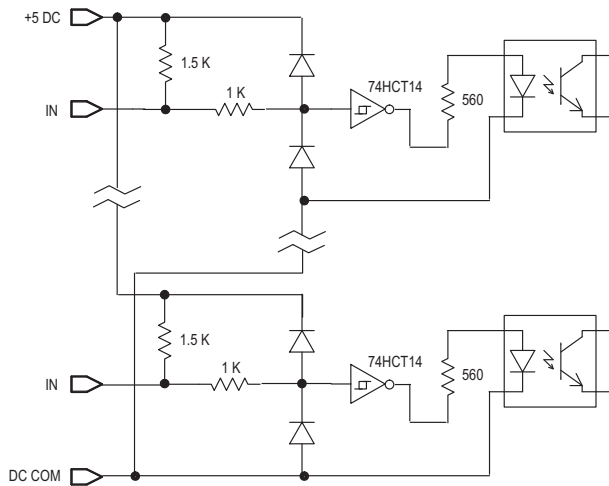


**CE Compliant Wiring**



**IMPORTANT:** I/O cables must be shielded type and cable length must be <10 m (32.8 ft) for maximum EMI noise immunity.

**Simplified Schematic**



### Low to True Format - 1756-IG16

- -0.2...0.8V = Input guaranteed to be in on-state
- 0.8...2.0V = Input state not guaranteed
- 2.0...5.5V = Input guaranteed to be in off-state

**Table 64 - Technical Specifications - 1756-IG16**

Attribute	1756-IG16
Inputs	16 (8 points/group)
Voltage category	5V DC TTL source (Low=True) <sup>(1)</sup>
Operating voltage range	4.5...5.5V DC 50 mV P-P ripple max
Input delay time (screw to backplane) Off to On (5-to-0V DC transition)	Hardware delay: 270 $\mu$ s nom/450 $\mu$ s max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off (0-to-5V DC transition)	Hardware delay: 390 $\mu$ s nom/ 700 $\mu$ s max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	110 mA
Current draw @ 24V	2 mA
Total backplane power	0.61 W
Power dissipation, max	1.4 W @ 60 °C (140 °F)
Thermal dissipation	4.8 BTU/hr @ 60 °C (140 °F)
Off-state voltage, max	2V
Off-state current, max	4.1 mA
Input impedance, max	1.4 k $\Omega$ min 1.5 k $\Omega$ typical
Input current, nom	3.7 mA @ 5V DC
Input current, max	4.1 mA @ 5V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T5
IEC temperature code	T5
Enclosure type	None (open-style)
Reverse polarity protection	No

(1) TTL inputs are inverted (-0.2 to +0.8 = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True - High logic.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).



**Table 65 - Environmental Specifications - 1756-IG16**

Attribute	1756-IG16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±1 kV at 5 kHz on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

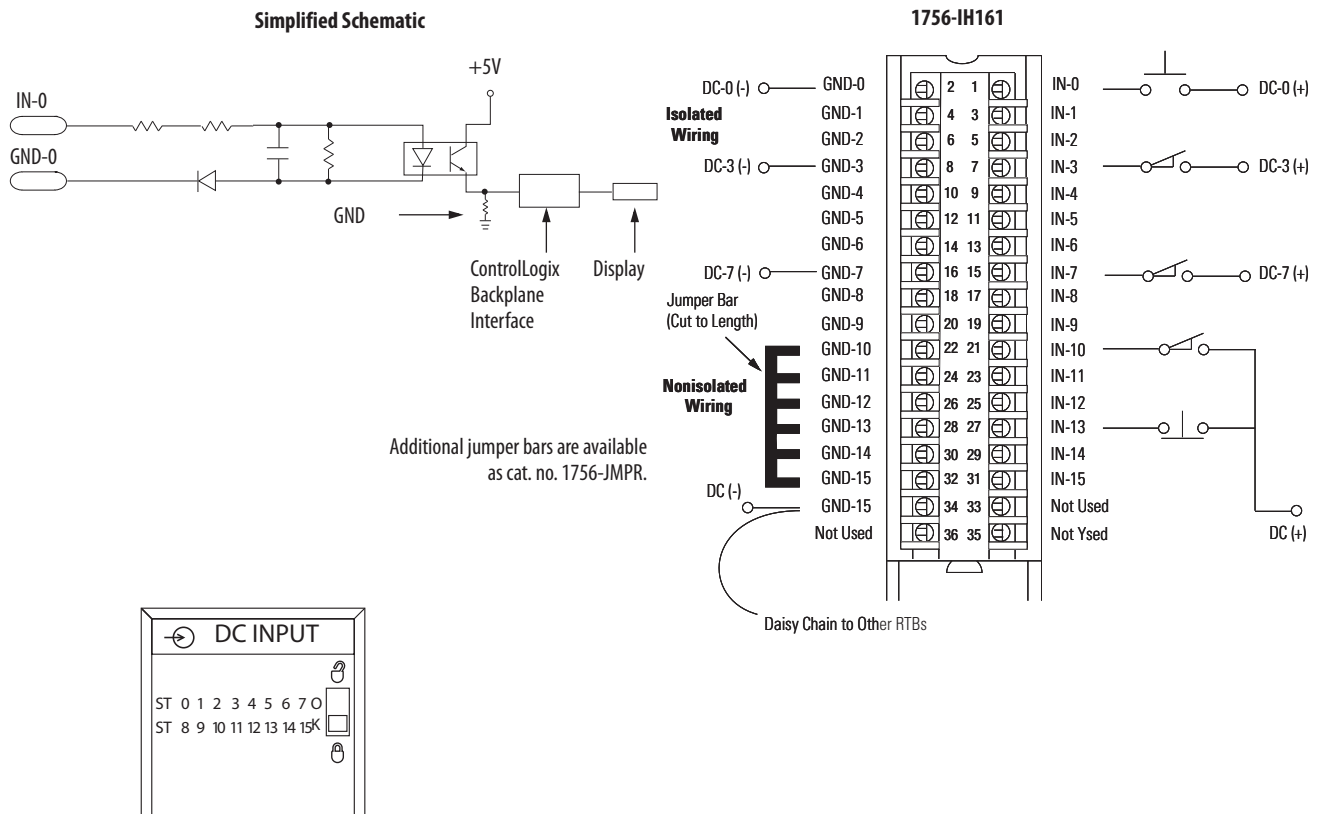
**Table 66 - Certifications - 1756-IG16**

Certification <sup>(1)</sup>	1756-IG16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T5 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IH16I

### ControlLogix 125V DC isolated input module



**Table 67 - Technical Specifications - 1756-IH16I**

Attribute	1756-IH16I
Inputs	16 individually isolated
Voltage category	125V DC sink/source
Operating voltage range	90...146V DC <sup>(1)</sup>
Input voltage, nom	125V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 2 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 6 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	3 mA
Total backplane power	0.71 W
Power dissipation, max	5 W @ 60 °C (140 °F)

**Table 67 - Technical Specifications - 1756-IH16I (continued)**

Attribute	1756-IH16I
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	20V DC
Off-state current, max	0.8 mA
On-state current, min	1 mA @ 90V DC
On-state current, max	3 mA @ 146V DC
On-state voltage Derated as follows	90...146V DC 90...146V DC @ 50 °C (122 °F), 12 Channels ON 90...132V DC @ 55 °C (131 °F), 14 Channels ON 90...125V DC @ 60 °C (140 °F), 16 Channels ON 90...146V DC @ 30 °C (86 °F), 16 Channels ON
Inrush current, max	250 mA
Input impedance, max	48.67 kΩ @ 146V DC
Cyclic update time	200 μs...750 ms
Change of state	Software configurable
Timestamp of inputs	±200 μs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) UL certification for 125V nominal. Rockwell Automation specified to the following:

- 90...146V DC @ 50 °C (122 °F), 12 channels on
- 90...132V DC @ 55 °C (131 °F), 14 channels on
- 90...125V DC @ 60 °C (140 °F), 16 channels on
- 90...146V DC @ 30 °C (86 °F), 16 channels on.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 68 - Environmental Specifications - 1756-IH16I**

Attribute	1756-IH16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)

**Table 68 - Environmental Specifications - 1756-IH161 (continued)**

Attribute	1756-IH161
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

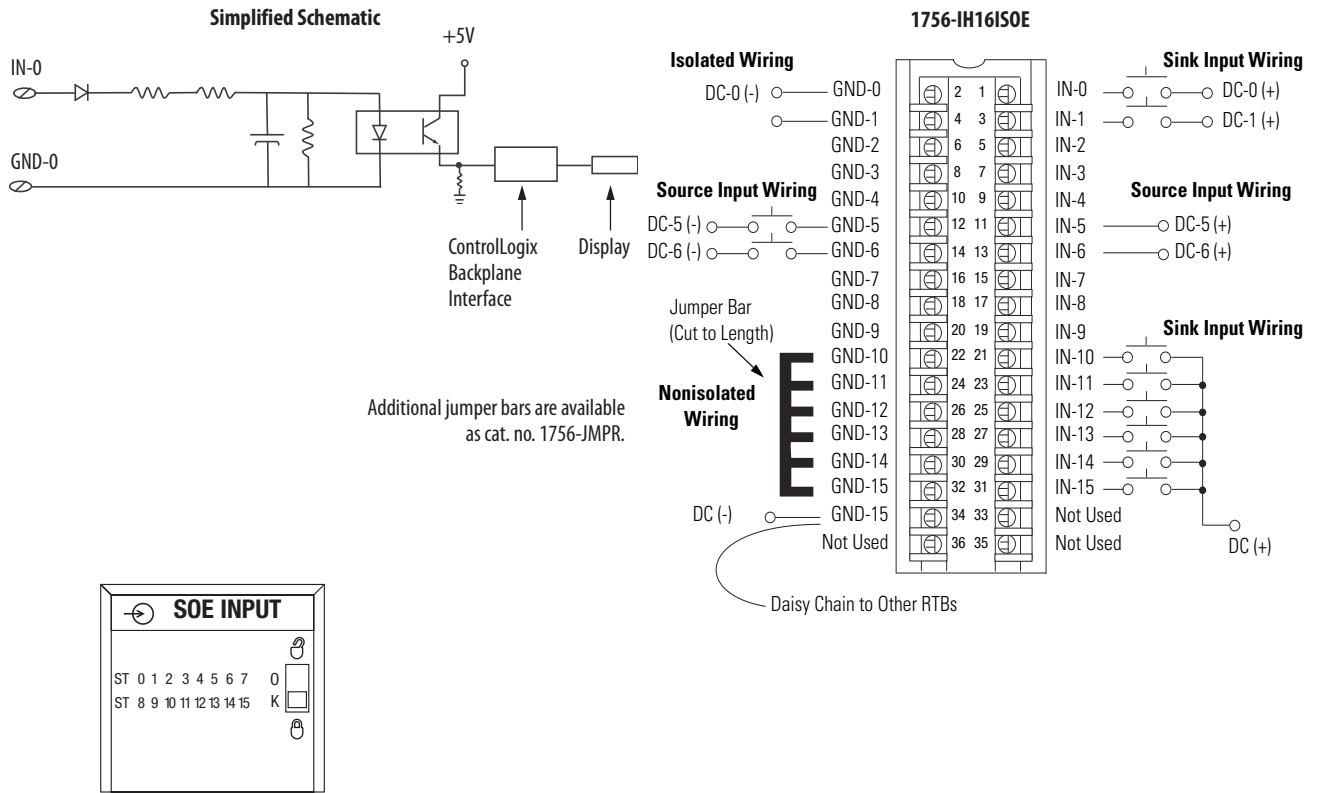
**Table 69 - Certifications - 1756-IH161**

Certification <sup>(1)</sup>	1756-IH161
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IH16ISOE

ControlLogix DC (90...140V) sequence of events input module



**Table 70 - Technical Specifications - 1756-IH16ISOE**

Attribute	1756-IH16ISOE
Inputs	16 individually isolated, sequence of events
Voltage category	125V DC sink/source
Operating voltage range	90...140V DC
Input voltage, nom	125V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 μs nom/20 μs max + firmware scan: up to 25 μs + filter time: 0...50 ms
On to Off	+ ASIC delay: 175 μs (FIFO) or 625 μs (Coordinated System Time per point) Hardware delay: 50 μs nom/75 μs max + firmware scan: up to 25 μs + filter time: 0...50 ms + ASIC delay: 175 μs (FIFO) or 625 μs (Coordinated System Time per point)
Current draw @ 5.1V	275 mA
Current draw @ 24V	2 mA
Total backplane power	1.3 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)

**Table 70 - Technical Specifications - 1756-IH16ISOE (continued)**

Attribute	1756-IH16ISOE
Thermal dissipation	17.22 BTU/hr
Off-state voltage, max	20V
Off-state current, max	0.3 mA
On-state current, min	1.15 mA @ 90V DC
On-state current, max	1.85 mA @ 140V DC
Input impedance, max	74.8 k $\Omega$
Cyclic update time	200 $\mu$ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 100 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s, inputs-to-backplane
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T3C
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 71 - Environmental Specifications - 1756-IH16ISOE**

Attribute	1756-IH16ISOE
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 . . . 60 °C (32 . . . 140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40 . . . 85 °C (-40 . . . 185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5 . . . 95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10 . . . 500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A

**Table 71 - Environmental Specifications - 1756-IH16ISOE (continued)**

Attribute	1756-IH16ISOE
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 72 - Certifications - 1756-IH16ISOE**

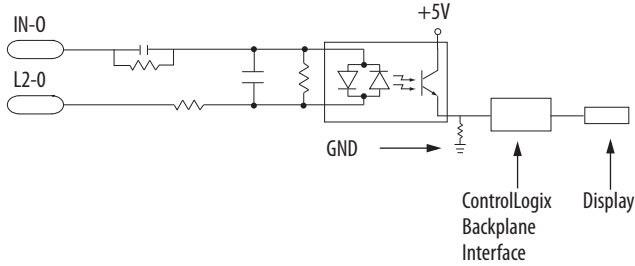
Certification <sup>(1)</sup>	1756-IH16ISOE
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

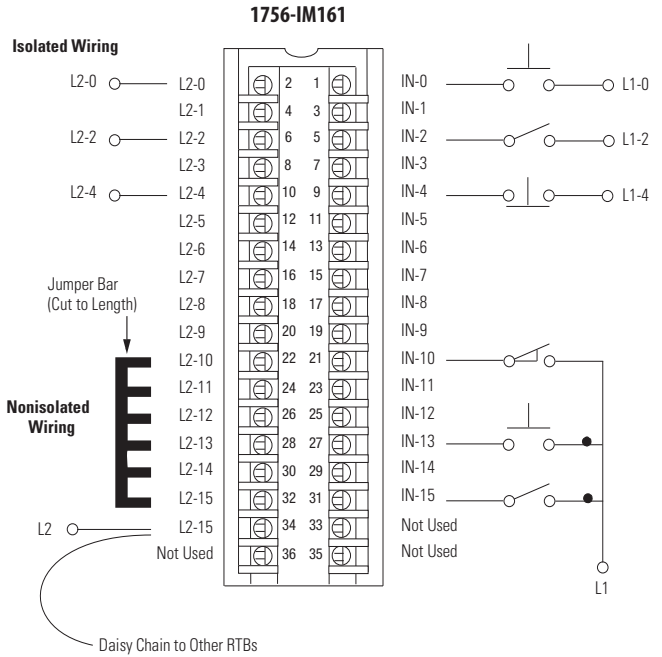
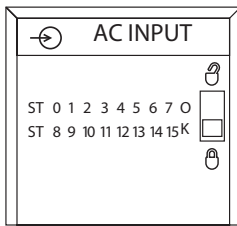
# 1756-IM16I

## ControlLogix 240V AC input module

### Simplified Schematic



Additional jumper bars are available as cat. no. 1756-JMPR.



**Table 73 - Technical Specifications - 1756-IM16I**

Attribute	1756-IM16I
Inputs	16 individually isolated
Voltage category	240V AC 50/60 Hz
Operating voltage range	159...265V AC, 47...63 Hz <sup>(1)</sup>
Input voltage, nom	240V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms
Onto Off	Hardware delay: 8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	40V



**Table 73 - Technical Specifications - 1756-IM16I (continued)**

Attribute	1756-IM16I
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 159V AC, 60 Hz
On-state current, max	13 mA @ 265V AC, 60 Hz
On-state voltage	159...265V AC, 47...63Hz @ 30 °C (86 °F) all channels ON 159...265V AC, 47...63Hz @ 40 °C (104 °F) 8 points ON 159...253V AC, 47...63Hz @ 45 °C (113 °F) all channels ON 159...242V AC, 47...63Hz @ 60 °C (140 °F) all channels ON
Inrush current, max	250 mA
Input impedance, max	20.38 k $\Omega$ @ 265V AC, 60 Hz
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4
Enclosure type	None (open-style)

(1) UL certification for 240V 50/60 Hz nominal. Rockwell Automation specified to the following:

- 159...265V AC, 47...63Hz @ 30 °C (86 °F) all channels on
- 159...265V AC, 47...63Hz @ 40 °C (104 °F) 8 points on
- 159...253V AC, 47...63Hz @ 45 °C (113 °F) all channels on
- 159...242V AC, 47...63Hz @ 60 °C (140 °F) all channels on.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 74 - Environmental Specifications - 1756-IM16I**

Attribute	1756-IM16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz

**Table 74 - Environmental Specifications - 1756-IM161 (continued)**

Attribute	1756-IM161
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz

**Table 75 - Certifications - 1756-IM161**

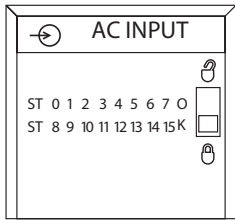
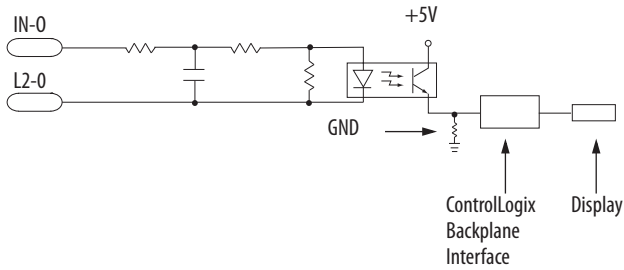
Certification <sup>(1)</sup>	1756-IM161
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-IN16

ControlLogix AC (10...30V) input module

Simplified Schematic



1756-IN16

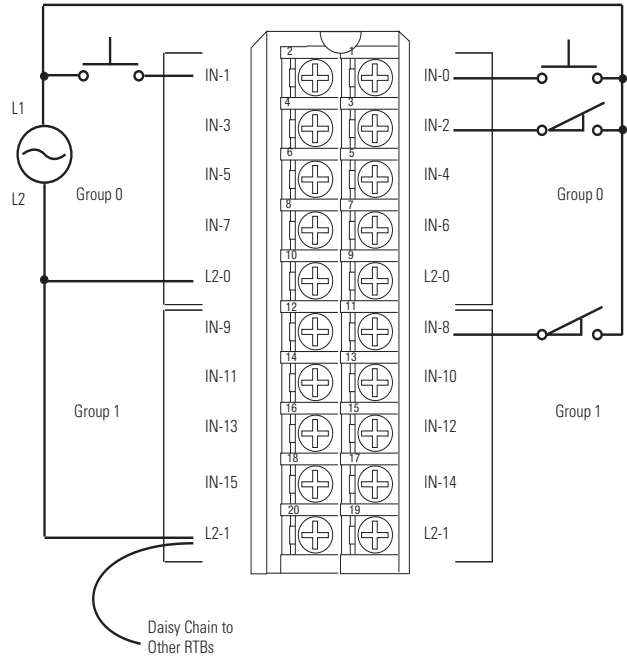


Table 76 - Technical Specifications - 1756-IN16

Attribute	1756-IN16
Inputs	16 (8 points/group)
Voltage category	24V AC 50/60 Hz
Operating voltage range	10...30V AC, 47...63 Hz
Input voltage, nom	24V AC 50/60 Hz
Input delay time (screw to backplane)	
Off to On	Hardware delay: 10 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 10 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	2 mA
Total backplane power	0.56 W
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.39 BTU/hr
Off-state voltage, max	5V
Off-state current, max	2.75 mA
On-state current, min	5 mA @ 10V AC, 60 Hz
On-state current, max	1.2 mA @ 30V AC, 60 Hz
Inrush current, max	250 mA

**Table 76 - Technical Specifications - 1756-IN16 (continued)**

Attribute	1756-IN16
Input impedance, max	2.5 k $\Omega$ @ 30V AC, 60 Hz
Cyclic update time	200 $\mu$ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 77 - Environmental Specifications - 1756-IN16**

Attribute	1756-IN16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 . . . 60 °C (32 . . . 140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40 . . . 85 °C (-40 . . . 185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5 . . . 95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10 . . . 500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80 . . . 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000 . . . 2700 MHz

**Table 77 - Environmental Specifications - 1756-IN16 (continued)**

Attribute	1756-IN16
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz

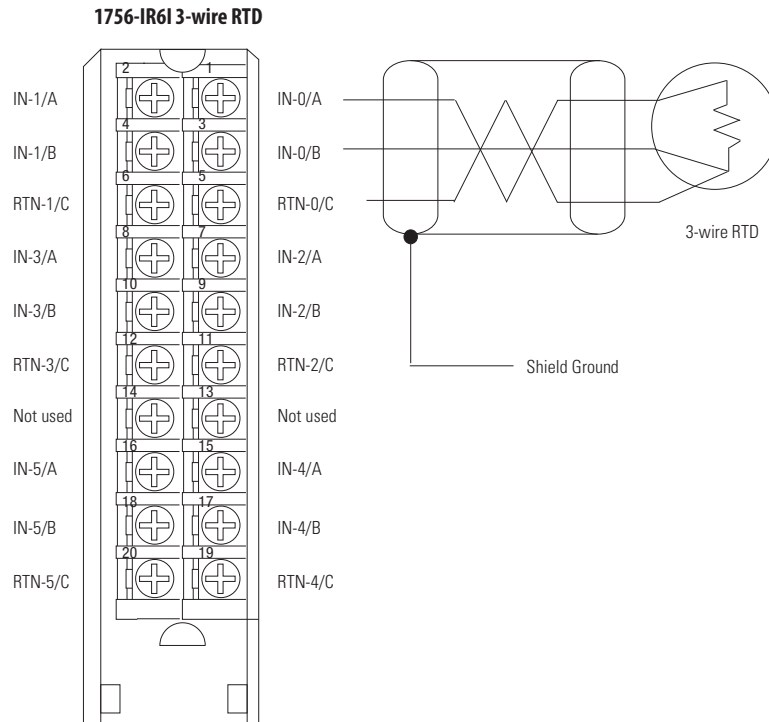
**Table 78 - Certifications - 1756-IN16**

Certification <sup>(1)</sup>	1756-IN16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

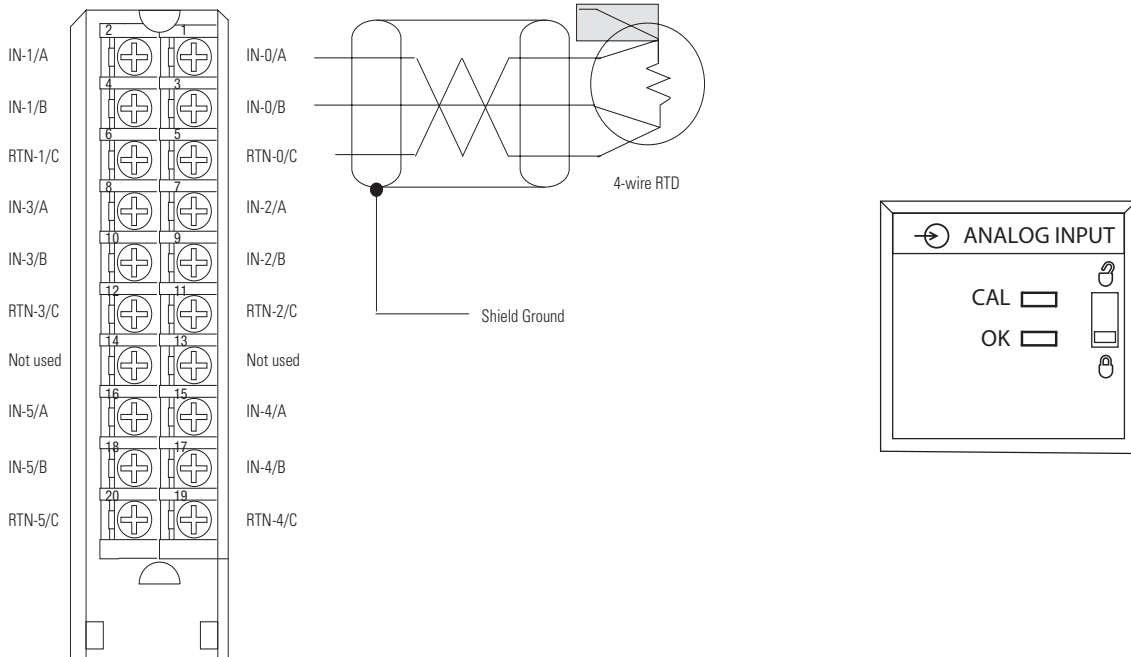
## 1756-IR6I

ControlLogix temperature sensing analog input module



**IMPORTANT:** For 2-wire resistor applications including calibration, make sure IN-x/B and RTN-x/C are shorted together as shown.

**1756-IR6I 4-wire RTD**



**Table 79 - Signal and User Counts - 1756-IR6I**

Range	Low Signal and User Counts	High Signal and User Counts
1...487 Ω	0.859068653 Ω -32768 counts	507.862 Ω 32767 counts
2...1000 Ω	2 Ω -32768 counts	1016.502 Ω 32767 counts
4...2000 Ω	4 Ω -32768 counts	2033.780 Ω 32767 counts
8...4020 Ω	8 Ω -32768 counts	4068.392 Ω 32767 counts

**Table 80 - Technical Specifications - 1756-IR6I**

Attribute	1756-IR6I
Inputs	6 individually isolated RTD
Input range	1...487 $\Omega$ 2...1000 $\Omega$ 4...2000 $\Omega$ 8...4000 $\Omega$
Resolution	16 bits 1...487 $\Omega$ : 7.7 m $\Omega$ /bit 2...1000 $\Omega$ : 15 m $\Omega$ /bit 4...2000 $\Omega$ : 30 m $\Omega$ /bit 8...4020 $\Omega$ : 60 m $\Omega$ /bit
Sensors supported	100, 200, 500, 1000 $\Omega$ Platinum, alpha=385 100, 200, 500, 1000 $\Omega$ Platinum, alpha=3916 120 $\Omega$ Nickel, alpha=672 100, 120, 200, 500 $\Omega$ Nickel, alpha=618 10 $\Omega$ Copper
Current draw @ 5.1V	250 mA
Current draw @ 24V	125 mA
Total backplane power	4.25 W
Power dissipation, max	4.3 W
Thermal dissipation	14.66 BTU/hr
Open circuit detection time	Negative full scale reading within 5 s with any combination of lost wires, except input terminal A alone. If input terminal A is lost by itself, the module reads a positive full scale reading within 5 s
Overvoltage protection, max	24V AC/DC
Normal mode noise rejection	60 dB at 60 Hz <sup>(1)</sup>
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy @ 25 °C	Better than 0.1% of range
Calibration interval	6 months
Offset drift	10 M $\Omega$ /°C
Gain drift with temperature, nom	50 ppm/°C
Gain drift with temperature, max	90 ppm/°C
Module error	0.54% of range
Module scan time	25 ms min floating point (ohms) 50 ms min floating point (temperature) 10 ms min integer (ohms) <sup>(1)</sup>
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1



**Table 80 - Technical Specifications - 1756-IR6I (continued)**

Attribute	1756-IR6I
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 81 - Environmental Specifications - 1756-IR6I**

Attribute	1756-IR6I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

**Table 82 - Certifications - 1756-IR6I**

Certification <sup>(1)</sup>	1756-IR6I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.

**Table 82 - Certifications - 1756-IR6I**

CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

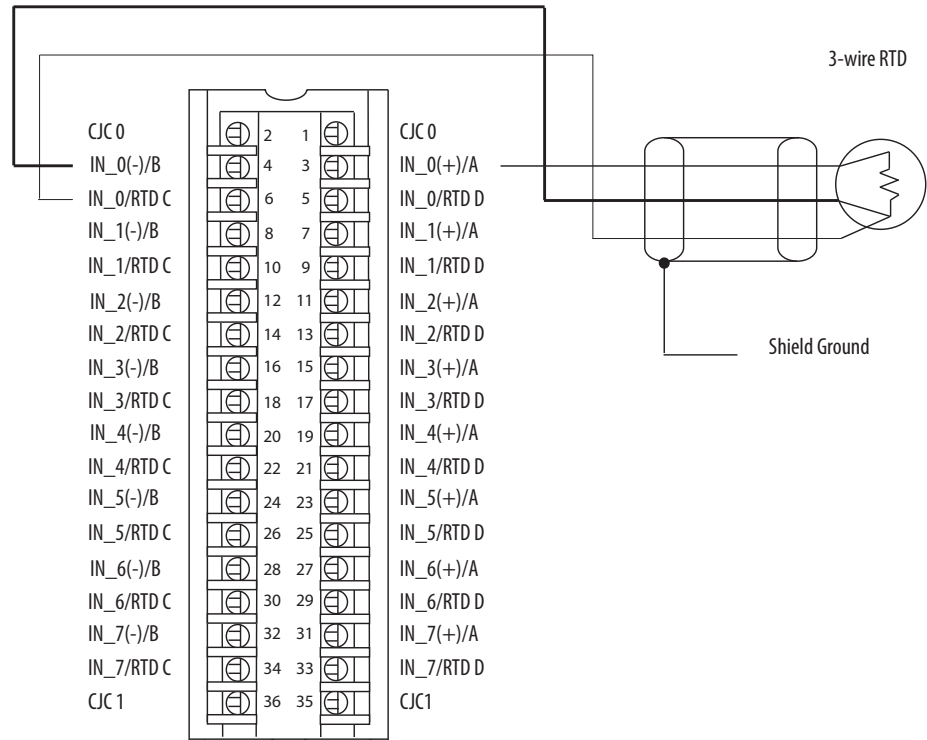
## 1756-IRT8I

ControlLogix isolated RTD/Thermocouple analog input module.

**1756-IRT8I Module Wiring Diagram - 3-wire RTD Input**

**IMPORTANT:** Remember the following:

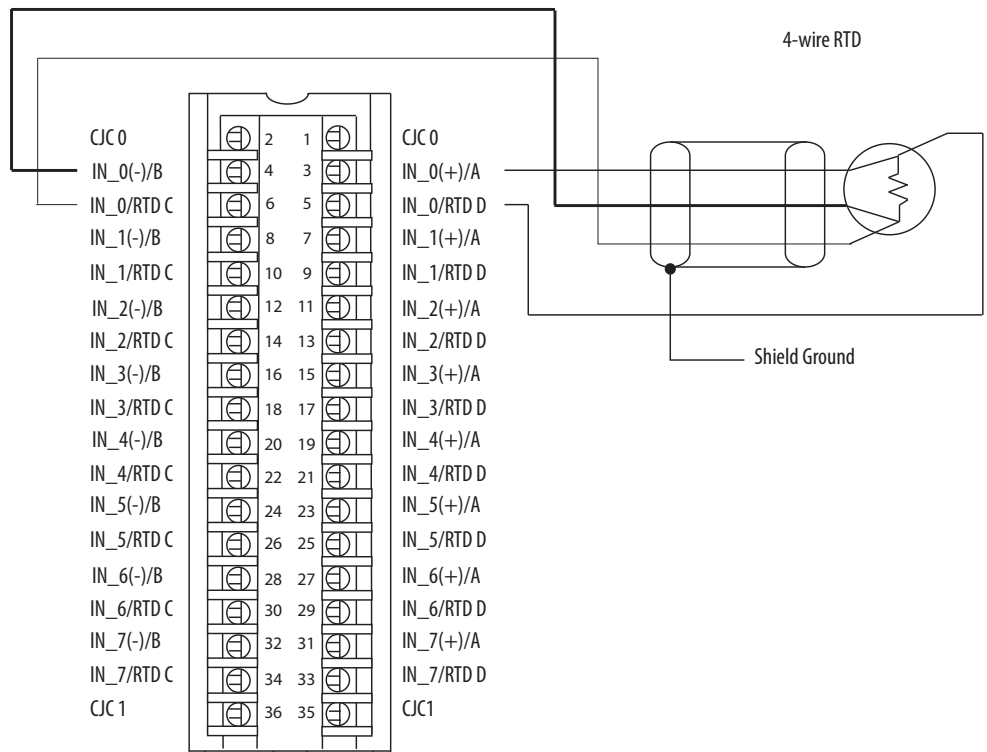
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.
- For 2-wire resistor applications including calibration, make sure IN\_x(-)/B and IN\_x/RTD C are shorted together.



**1756-IRT8I Module Wiring Diagram - 4-wire RTD Input**

**IMPORTANT:** Remember the following:

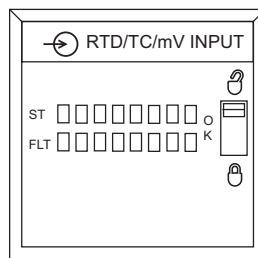
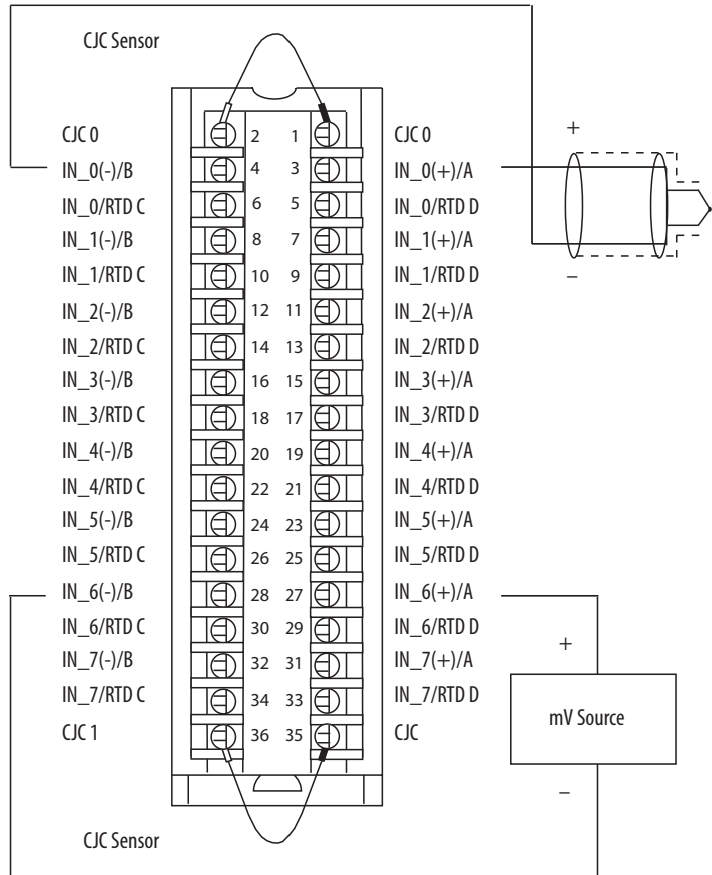
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.



**1756-IRT8I Module Wiring  
Diagram - Thermocouple Input**

**IMPORTANT:** Remember the following:

- Connect the white end of the CJC sensor to the even-numbered terminal. Connect the orange end of the CJC sensor to the odd-numbered terminals.
- For CJC 0:
  - White end - Connected to terminal number 2
  - Orange end - Connected to terminal number 1
- For CJC 1:
  - White end - Connected to terminal number 36
  - Orange end - Connected to terminal number 35
- CJC sensors do not come with the module. You must order the sensors, product catalog number 1756-CJC, separately.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.



**Table 83 - Technical Specifications - 1756-IRT8I**

Attribute	1756-IRT8I
Inputs	8 isolated channels - Any combination of RTD or Thermocouple mode Two CJC sensors for Thermocouple use. The CJC sensors, product catalog number 1756-CJC, do not come with the module. You must order the sensors separately.
Input range	1...500 $\Omega$ 2...1000 $\Omega$ 4...2000 $\Omega$ 8...4000 $\Omega$ -100...100 mV
Resolution	24 bits 0...510 $\Omega$ : 0.06 m $\Omega$ /count 0...1020 $\Omega$ : 0.12 m $\Omega$ /count 0...2040 $\Omega$ : 0.25 m $\Omega$ /count 0...4080 $\Omega$ : 0.50 m $\Omega$ /count -101...101 mV: 0.01 $\mu$ V/count
RTD sensors supported	100, 200, 500, 1000 $\Omega$ Platinum, alpha=385 100, 200, 500, 1000 $\Omega$ Platinum, alpha=3916 120 $\Omega$ Nickel, alpha=672 100, 120, 200, 500 $\Omega$ Nickel, alpha=618 10 $\Omega$ Copper
Thermocouple types	B, C, D, E, J, K, N, R, S, T, TXK/XK (L)
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA
Current draw @ 24V	150 mA
Total backplane power	4.6 W
Power dissipation, max	4.6 W
Thermal dissipation	15.7 BTU/hr
RTD excitation current	600 $\mu$ A
Input impedance, approx	1 G $\Omega$
Open circuit detection time	<ul style="list-style-type: none"> <li>Thermocouple input and 3-wire RTD input = 2 s</li> <li>4-wire RTD input = 5 s</li> </ul> <p><b>IMPORTANT: No Open Circuit Detection</b> when wires are simultaneously disconnected from the IN_x/RTD C and IN_x/RTD D terminals on same channel; where x represents the channel number.</p>
Overvoltage protection, max	$\pm$ 30V DC
Normal mode noise rejection	75 dB at 60 Hz <sup>(1)</sup>
Common mode noise rejection	125 dB @ 60 Hz 1000 $\Omega$ differential 120 dB @ 50 Hz 1000 $\Omega$ differential 160 dB @ 600V 100 $\Omega$ differential
Channel bandwidth	Notch Filter configuration dependent See publication <a href="#">1756-UM540</a> for possible values.
Settling time	Notch Filter configuration dependent See publication <a href="#">1756-UM540</a> for possible values.
Calibrated accuracy @ 25 $^{\circ}$ C	0.05%
Module error over full temperature range	0.1%

**Table 83 - Technical Specifications - 1756-IRT8I (continued)**

Attribute	1756-IRT8I
Local CJC sensor accuracy	± 0.3 °C
Remote CJC sensor, accuracy	± 0.3 °C
Module input scan time, min	1 ms
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), Reinforced Insulation Type, inputs to backplane 250V (continuous), Basic Insulation Type, input to input Type tested at 2300V AC for 60 s, inputs to backplane Type tested at 1500V AC for 60 s, input to input
RTD sensor types/temperature range (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100 Ohm PT 385	-200...870 °C
20 Ohm PT 385	-328...1598 °F
500 Ohm PT 385	73...1143 °K
1000 Ohm PT 385	132...2058 °R
100 Ohm PT 3916	-200...630 °C
20 Ohm PT 3916	-328...1166 °F
500 Ohm PT 3916	73...903 °K
1000 Ohm PT 3916	132...1626 °R
10 Ohm CU 247	-200...260 °C -328...500 °F 73...533 °K 132...960 °R
120 Ohm NI 672	-80...320 °C -112...608 °F 193...593 °K 348...1068 °R
100 Ohm NI 618	-60...250 °C
120 Ohm NI 618	-76...482 °F
200 Ohm NI 618	213...523 °K
500 Ohm NI 618	384...942 °R
Thermocouple type/temperature range	
Thermocouple Type B	21...1820 °C 68...3308 °F 293...2093 °K 528...3768 °R
Thermocouple Type C	0...2320 °C 32...4208 °F 273...2593 °K 492...4668 °R
Thermocouple Type D	0...2320 °C 32...4208 °F 273...2593 °K 492...4668 °R

**Table 83 - Technical Specifications - 1756-IRT8I (continued)**

Attribute	1756-IRT8I
Thermocouple Type E	-270...1000 °C -454...1832 °F 3...1273 °K 6...2292 °R
Thermocouple Type J	-210...1200 °C -346...2192 °F 63...1473 °K 114...2652 °R
Thermocouple Type K	-270...1372 °C -454...2502 °F 3...1645 °K 6...2961 °R
Thermocouple Type N	-270...1300 °C -454...2372 °F 3...1573 °K 6...2832 °R
Thermocouple Type R	-50...1768 °C -58...3215 °F 223...2041 °K 402...3674 °R
Thermocouple Type S	-50...1768 °C -58...3215 °F 223...2041 °K 402...3674 °R
Thermocouple Type T	-270...400 °C -454...752 °F 3...673 °K 6...1212 °R
Thermocouple Type TXK/XK (L)	-200...800 °C -328...1472 °F 73...1073 °K 132...1932 °R
Thermocouple type/resolution, nom	
Type C, R	~0.03 °C (~0.05 °F)
Type B, S	~0.04 °C (~0.07 °F)
Type E, J, K, N, T, TXK/XK (L)	~0.01 °C (~0.02 °F)
Type D	~0.02 °C (~0.04 °F)
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33...2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports <sup>(2)</sup>
North American temperature code	T4A

**Table 83 - Technical Specifications - 1756-IRT8I (continued)**

Attribute	1756-IRT8I
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 84 - Environmental Specifications - 1756-IRT8I**

Attribute	1756-IRT8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



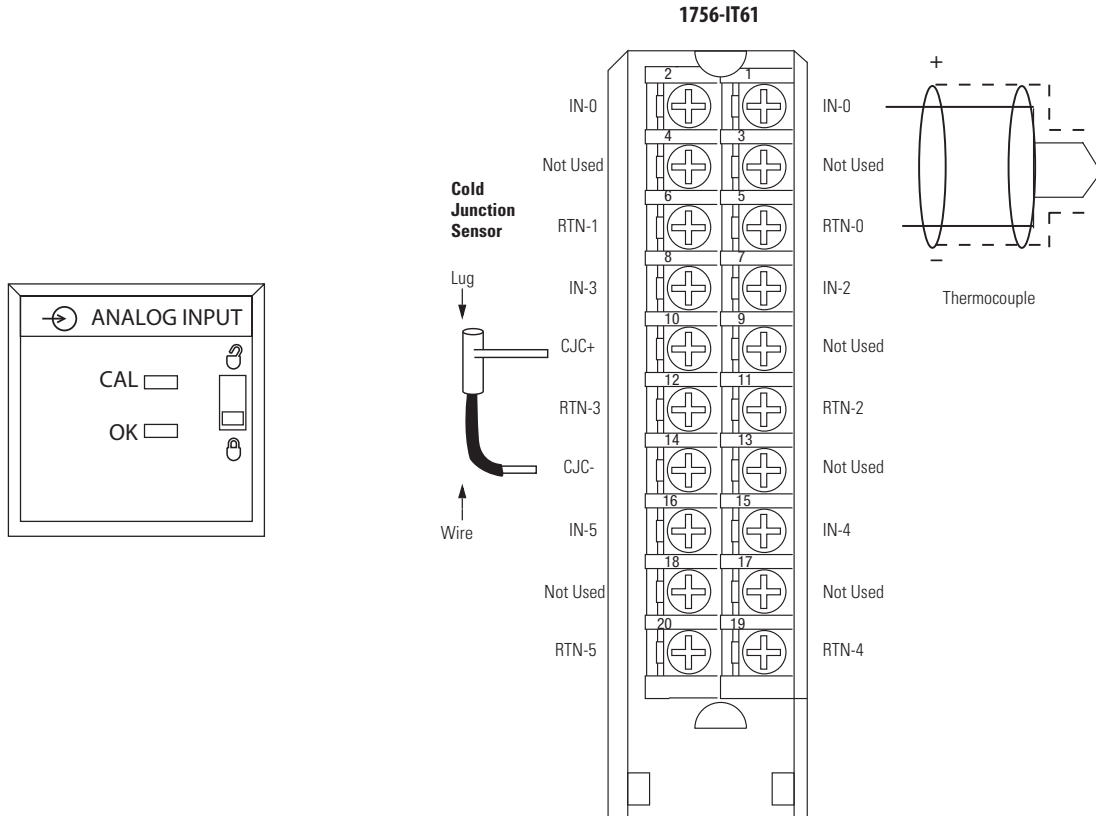
**Table 85 - Certifications - 1756-IRT8I**

Certification <sup>(1)</sup>	1756-IRT8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IT6I

ControlLogix temperature sensing analog input module



One CJC, part number 94238301, is shipped with the module. A replacement can be ordered as RP-94238301.

**Table 86 - Signal and User Counts - 1756-IT6I**

Range	Low Signal and User Counts	High Signal and User Counts
-12...30 mV	-15.80323 mV -32768 counts	31.396 mV 32767 counts
-12...78 mV	-15.15836 mV -32768 counts	79.241 mV 32767 counts

**Table 87 - Technical Specifications - 1756-IT6I**

Attribute	1756-IT6I
Inputs	6 individually isolated thermocouple 1 CJC
Input range	-12...78 mV -12...30 mV (high resolution range)
Resolution	16 bits -12...78 mV: 1.4 $\mu$ V/bit (typical) -12...30 mV: 0.7 $\mu$ V/bit (high resolution range)
Thermocouples	B, E, J, K, R, S, T, N, C

**Table 87 - Technical Specifications - 1756-IT6I (continued)**

Attribute	1756-IT6I
Thermocouple linearization	ITS-90
Current draw @ 5.1V	250 mA
Current draw @ 24V	125 mA
Total backplane power	4.3 W
Power dissipation, max	4.3 W
Thermal dissipation	14.66 BTU/hr
Input impedance	>10 M $\Omega$
Open circuit detection time	Positive full scale reading within 2 s
Overvoltage protection, max	120V AC/DC
Normal mode noise rejection	60 dB at 60 Hz <sup>(1)</sup>
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz (-3 dB) <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy @ 25 °C	Better than 0.1% of range
Calibration interval	6 months
Local CJC sensor accuracy	$\pm 0.3 \dots 3.2$ °C, depending on channel
Remote CJC sensor accuracy	$\pm 0.3$ °C
Offset drift	0.5 $\mu$ V/°C
Gain drift with temperature, nom	65 ppm/°C
Gain drift with temperature, max	80 ppm/°C
Module error	0.5% of range
Module scan time	25 ms min floating point (millivolt) 50 ms min floating point (temperature) 10 ms min integer (millivolt) <sup>(1)</sup>
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 88 - Thermocouple Ranges - 1756-IT6I**

Attribute	1756-IT6I2	
Thermocouple temperature/millivolt input range	<b>-12...78 mV range</b>	<b>-12...30 mV range</b>
Thermocouple Type B	300...1820 °C (572...3308 °F)	Full range
Thermocouple Type C	0...2315 °C (32...4199 °F)	0...1725 °C (32...3137 °F)
Thermocouple Type E	-270...1000 °C (-454...1832 °F)	-270...415 °C (-454...779 °F)
Thermocouple Type J	-210...1200 °C (-346...2192 °F)	-210...550 °C (-346...1022 °F)
Thermocouple Type K	-270...1372 °C (-454...2502 °F)	-270...725 °C (-454...1337 °F)
Thermocouple Type N	-270...1300 °C (-454...2372 °F)	-270...840 °C (-454...1544 °F)
Thermocouple Type R	-50...1768 °C (-58...3215 °F)	Full range
Thermocouple Type S	-50...1768 °C (-58...3215 °F)	Full range
Thermocouple Type T	-270...400 °C (-454...752 °F)	Full range
Thermocouple resolution over temperature range, nom	<b>-12...78 mV range</b>	<b>-12...30 mV range</b>
Type B, R, S, C	~0.15 °C (~0.28 °F)	~0.08 °C (~0.15 °F)
Type E, J, K, T, N	~0.05 °C (~0.09 °F)	~0.03 °C (~0.05 °F)
Type D	~0.07 °C (~0.13 °F)	~0.03 °C (~0.05 °F)
Type TXK/XK (L)	~0.02 °C (~0.04 °F)	~0.01 °C (~0.02 °F)

**Table 89 - Environmental Specifications - 1756-IT6I**

Attribute	1756-IT6I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 89 - Environmental Specifications - 1756-IT6I (continued)**

Attribute	1756-IT6I
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . . 80 MHz on shielded signal ports

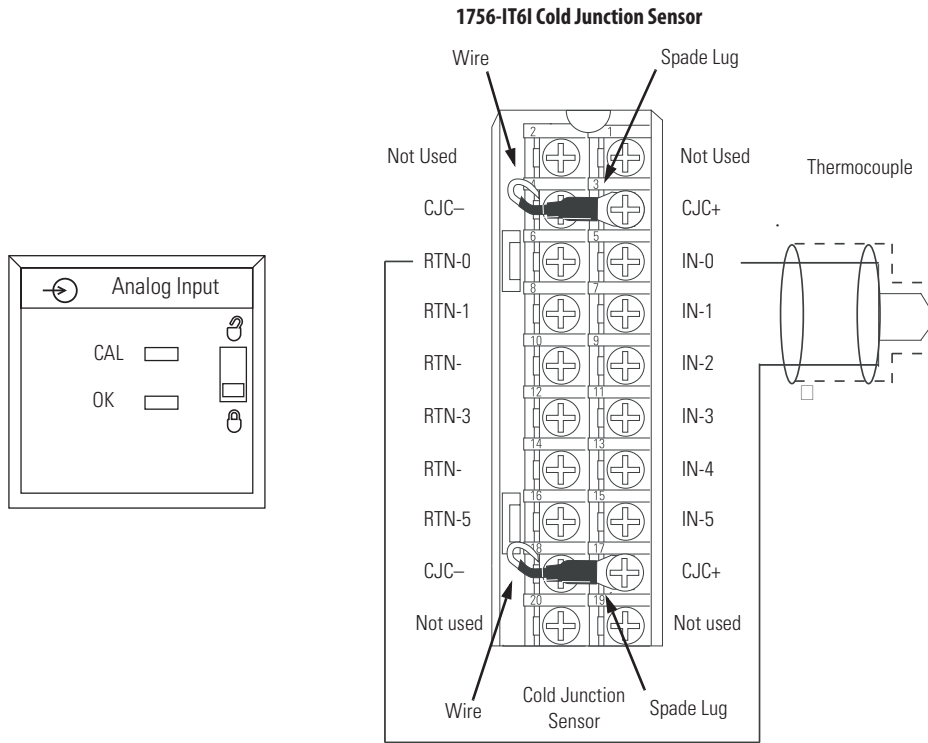
**Table 90 - Certifications - 1756-IT6I**

Certification <sup>(1)</sup>	1756-IT6I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IT612

### ControlLogix enhanced thermocouple analog input module



Two CJs, part number 94286501, are shipped with the module. Replacements can be ordered as RP-94286501.

**Table 91 - Signal and User Counts - 1756-IT612**

Range	Low Signal and User Counts	High Signal and User Counts
-12...30 mV	-15.80323 mV -32768 counts	31.396 mV 32767 counts
-12...78 mV	-15.15836 mV -32768 counts	79.241 mV 32767 counts

**Table 92 - Technical Specifications - 1756-IT612**

Attribute	1756-IT612
Inputs	6 individually isolated thermocouple 2 CJC
Input range	-12...78 mV (1.4 $\mu$ V per bit) -12...30 mV (0.7 $\mu$ V per bit – high resolution range)
Resolution	16 bits -12...78 mV: 1.4 $\mu$ V/bit -12...30 mV: 0.7 $\mu$ V/bit
Thermocouples	B, E, J, K, R, S, T, N, C, D, L (TXK/XK)
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA

**Table 92 - Technical Specifications - 1756-IT6I2 (continued)**

Attribute	1756-IT6I2
Current draw @ 24V	150 mA
Total backplane power	4.6 W
Power dissipation, max	4.6 W
Thermal dissipation	15.7 BTU/hr
Input impedance	>10 M $\Omega$
Open circuit detection time	Positive full scale reading within 2 s
Overvoltage protection, max	120V AC/DC
Normal mode noise rejection	60 dB at 60 Hz <sup>(1)</sup>
Common mode noise rejection	160 dB min, tested @ 600V AC/60 Hz applied with 100 $\Omega$ differential resistance
Channel bandwidth	15 Hz <sup>(1)</sup>
Settling time	<80 ms to 5% of full scale <sup>(1)</sup>
Calibrated accuracy @ 25 °C	0.05% of full range @ 25 °C (77 °F) typical Better than 0.1% of range @ 25 °C (77 °F) worst case
Calibration interval	12 months
Local CJC sensor accuracy	$\pm 0.3$ °C
Remote CJC sensor accuracy	$\pm 0.3$ °C
Offset drift	0.5 $\mu$ V/°C
Gain drift with temperature, nom	15 ppm/°C 1.4 $\mu$ V/°C for -12...78 mV 0.6 $\mu$ V/°C for -12...30 mV
Gain drift with temperature, max	25 ppm/°C 2.3 $\mu$ V/°C for -12...78 mV 1.1 $\mu$ V/°C for -12...30 mV
Module error	0.15% of range
Module scan time	25 ms min floating point (millivolt) 50 ms min floating point (temperature) 10 ms min integer (millivolt) <sup>(1)</sup>
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH only
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 93 - Thermocouple Ranges - 1756-IT612**

Attribute	1756-IT612	
Thermocouple temperature/millivolt input range	<b>-12...78 mV range</b>	<b>-12...30 mV range</b>
Thermocouple Type B	300...1820 °C (572...3308 °F)	Full range
Thermocouple Type C	0...2315 °C (32...4199 °F)	0...1725 °C (32...3137 °F)
Thermocouple Type E	-270...1000 °C (-454...1832 °F)	-270...415 °C (-454...779 °F)
Thermocouple Type J	-210...1200 °C (-346...2192 °F)	-210...550 °C (-346...1022 °F)
Thermocouple Type K	-270...1372 °C (-454...2502 °F)	-270...725 °C (-454...1337 °F)
Thermocouple Type N	-270...1300 °C (-454...2372 °F)	-270...840 °C (-454...1544 °F)
Thermocouple Type R	-50...1768 °C (-58...3215 °F)	Full range
Thermocouple Type S	-50...1768 °C (-58...3215 °F)	Full range
Thermocouple Type T	-270...400 °C (-454...752 °F)	Full range
Thermocouple Type D	0...2320 °C (32...4208 °F)	0...1718 °C (32...3124 °F)
Thermocouple Type L (TXK/XK)	-200...800 °C (-328...1472 °F)	200...399 °C (392...750 °F)
Thermocouple resolution over temperature range, nom	<b>-12...78 mV range</b>	<b>-12...30 mV range</b>
Type B, R, S, C	~0.15 °C (~0.28 °F)	~0.08 °C (~0.15 °F)
Type E, J, K, T, N	~0.05 °C (~0.09 °F)	~0.03 °C (~0.05 °F)
Type D	~0.07 °C (~0.13 °F)	~0.03 °C (~0.05 °F)
Type TXK/XK (L)	~0.02 °C (~0.04 °F)	~0.01 °C (~0.02 °F)

**Table 94 - Environmental Specifications - 1756-IT612**

Attribute	1756-IT612
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz



**Table 94 - Environmental Specifications - 1756-IT6I2 (continued)**

Attribute	1756-IT6I2
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . . 80 MHz on shielded signal ports

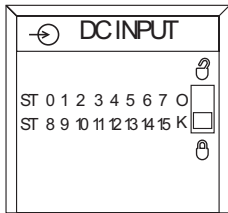
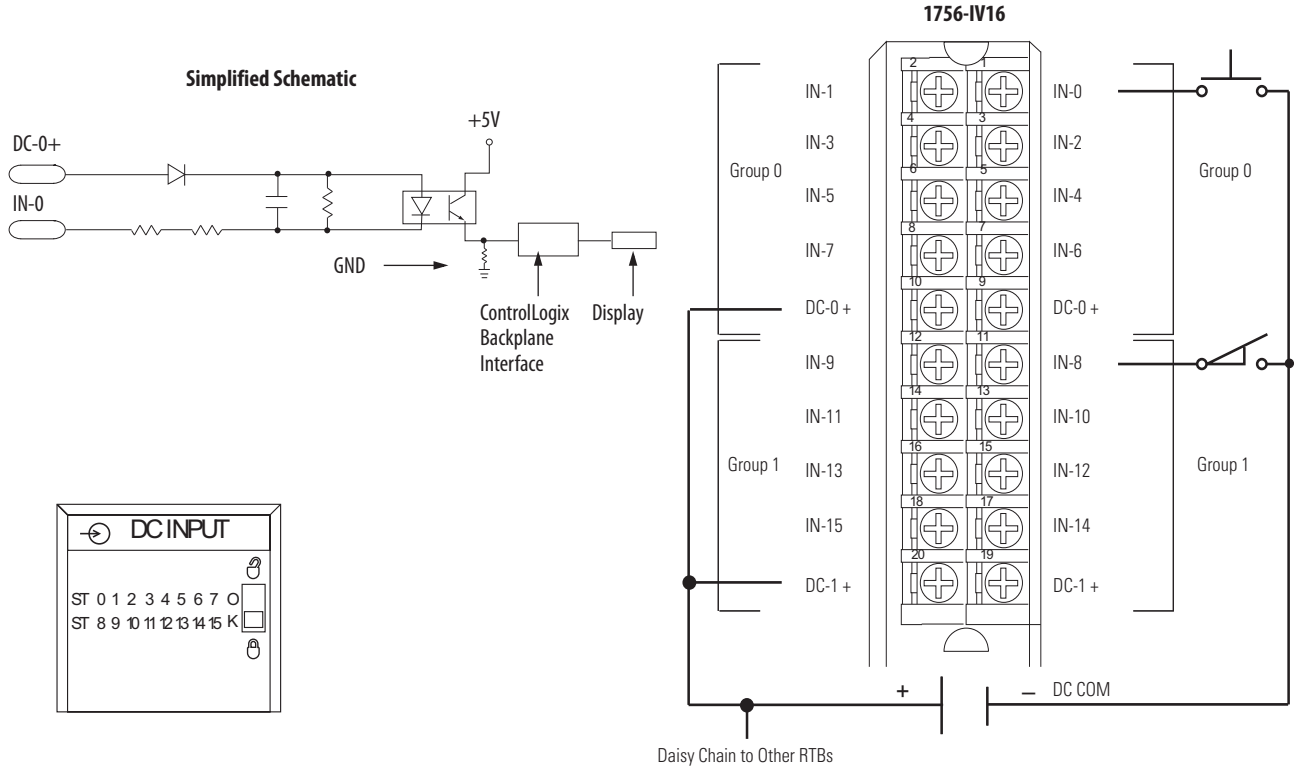
**Table 95 - Certifications - 1756-IT6I2**

Certification <sup>(1)</sup>	1756-IT6I2
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IV16

ControlLogix DC (10...30V) sourcing input module



**Table 96 - Technical Specifications - 1756-IV16**

Attribute	1756-IV16
Inputs	16 (8 points/group)
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 280 μs nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 540 μs nom/2 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	110 mA
Current draw @ 24V	2 mA
Total backplane power	0.61 W
Power dissipation, max	5.41 W @ 60 °C (140 °F)
Thermal dissipation	18.47 BTU/hr
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	10 mA @ 30V DC

**Table 96 - Technical Specifications - 1756-IV16 (continued)**

Attribute	1756-IV16
Inrush current, max	250 mA
Input impedance, max	3.2 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 97 - Environmental Specifications - 1756-IV16**

Attribute	1756-IV16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

**Table 97 - Environmental Specifications - 1756-IV16 (continued)**

Attribute	1756-IV16
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz

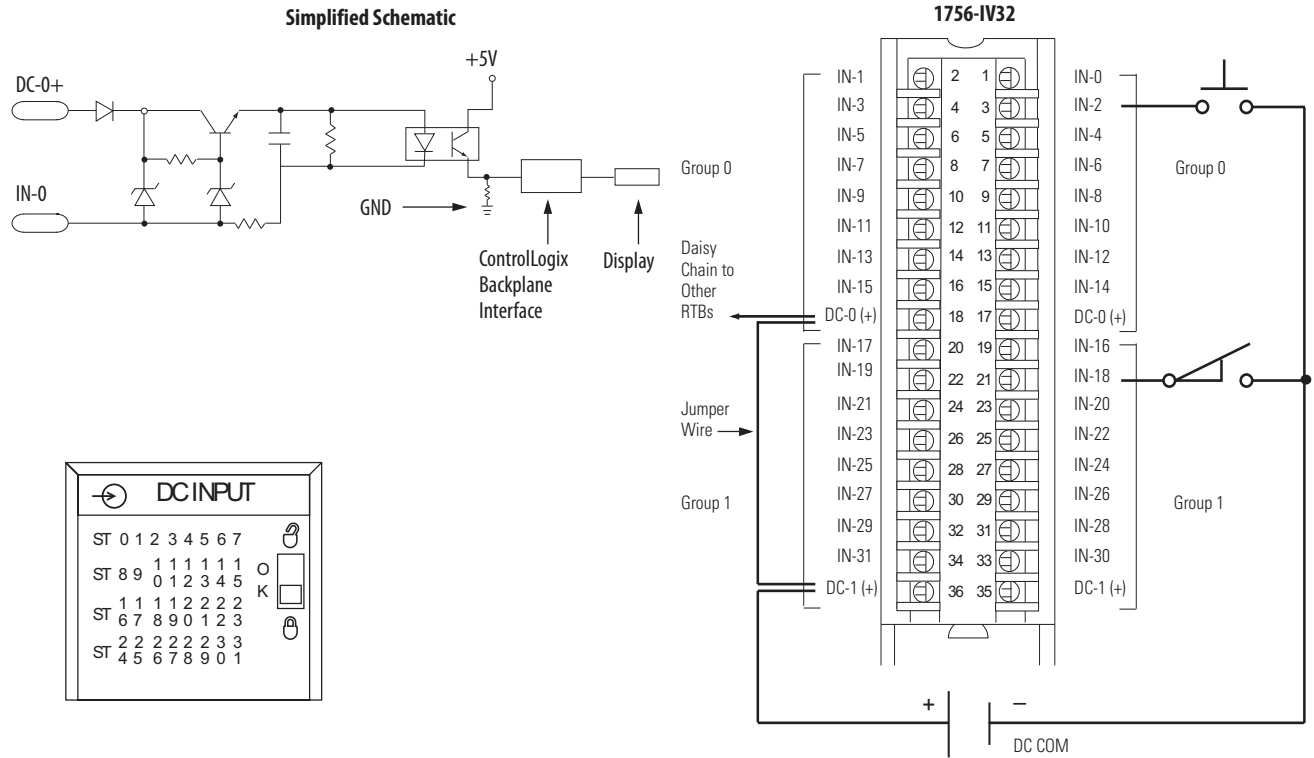
**Table 98 - Certifications - 1756-IV16**

Certification <sup>(1)</sup>	1756-IV16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-IV32

### ControlLogix DC (10...30V) sourcing input module



**Table 99 - Technical Specifications - 1756-IV32**

Attribute	1756-IV32
Inputs	32 (16 points/group)
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	Hardware delay: 350 $\mu$ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 540 $\mu$ s nom/2 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	120 mA
Current draw @ 24V	2 mA
Total backplane power	0.66 W
Power dissipation, max	4.1 W @ 60 °C (140 °F)
Thermal dissipation	14 BTU/hr @ 60 °C (140 °F)
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	3.5 mA @ 30V DC

**Table 99 - Technical Specifications - 1756-IV32 (continued)**

Attribute	1756-IV32
Inrush current, max	250 mA (decaying to <37% in 22 ms, without activation)
Input impedance, max	8.6 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s...750 ms
Change of state	Software configurable
Timestamp of inputs	$\pm$ 200 $\mu$ s
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 - on signal ports <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 100 - Environmental Specifications - 1756-IV32**

Attribute	1756-IV32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

**Table 100 - Environmental Specifications - 1756-IV32 (continued)**

Attribute	1756-IV32
Radiated RF immunity IEC 61000-4-3	10V/m with 1k Hz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

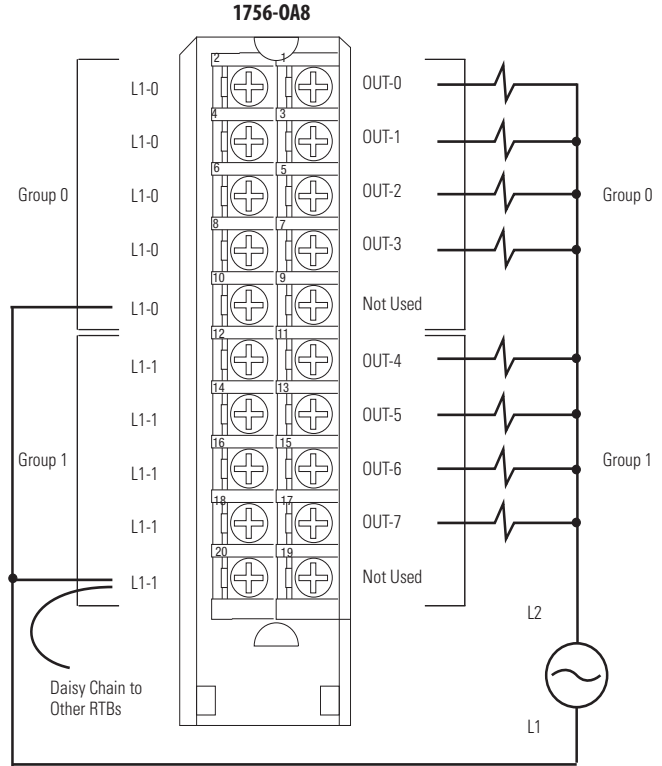
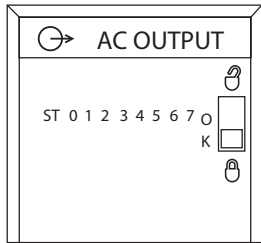
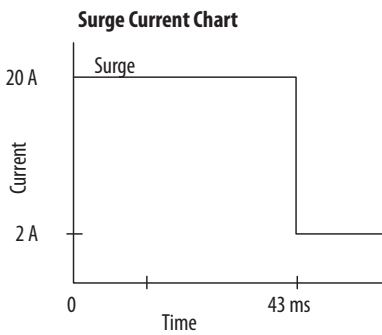
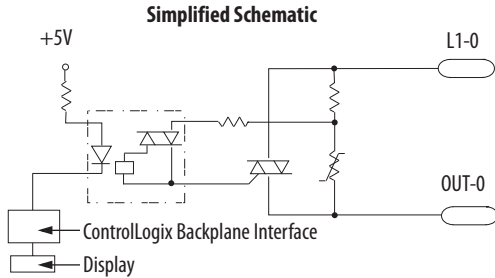
**Table 101 - Certifications - 1756-IV32**

Certification <sup>(1)</sup>	1756-IV32
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-0A8

ControlLogix 120/240V AC output module



**Table 102 - Technical Specifications - 1756-0A8**

Attribute	1756-0A8
Outputs	8 (4 points/group)
Pilot duty	2 A
Voltage category	120/240V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...265V AC 47...63 Hz
Output delay time	
Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	200 mA
Current draw @ 24V	2 mA
Total backplane power	1.07 W



**Table 102 - Technical Specifications - 1756-0A8 (continued)**

Attribute	1756-0A8
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.39 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ <50 mA
Current per point, max	2 A @ 60 °C (140 °F) linear derating
Current per module, max	5 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/μs for loads > 50 mA 0.2V/μs for loads < 50 mA <sup>(2)</sup>
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(3)</sup>
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120/240V 50/60 Hz nominal. Rockwell Automation specified to 74...265, 47...63 Hz.

(2) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/μs for loads under 50 mA. The commutating dv/dt rating of the module for loads 50...500 mA (OUTPUT to L2) is 4V/μs maximum. If the commutating dv/dt rating of the TRIAC is exceeded, the TRIAC could latch on. If the commutating dv/dt rating is exceeded in the 10...50 mA range, a resistor may be added across the output and L2. The purpose of this resistor is to increase the total output current to 50 mA ( $I=V/R$ ). At 50 mA and above, the module has a higher commutating dv/dt rating. When adding a resistor for the output to L2, be sure it is rated for the power that it will dissipate ( $P=(V**2)/R$ ). If the commutating dv/dt rating is exceeded in the 50...500 mA range, the L1 AC waveform could be at fault. Be sure the waveform is a good sinusoid, void of any anomalies such as distorted or flattened sections.

(3) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 103 - Environmental Specifications - 1756-0A8**

Attribute	1756-0A8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8k V air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 104 - Certifications - 1756-0A8**

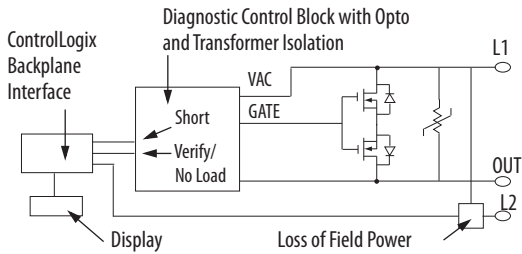
Certification <sup>(1)</sup>	1756-0A8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

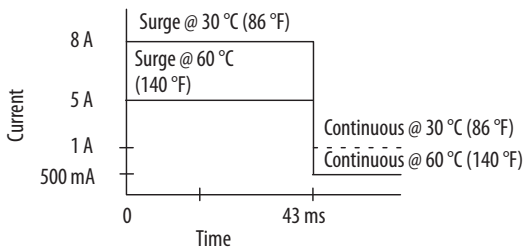
# 1756-0A8D

## ControlLogix 120V AC diagnostic output module

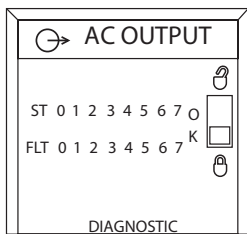
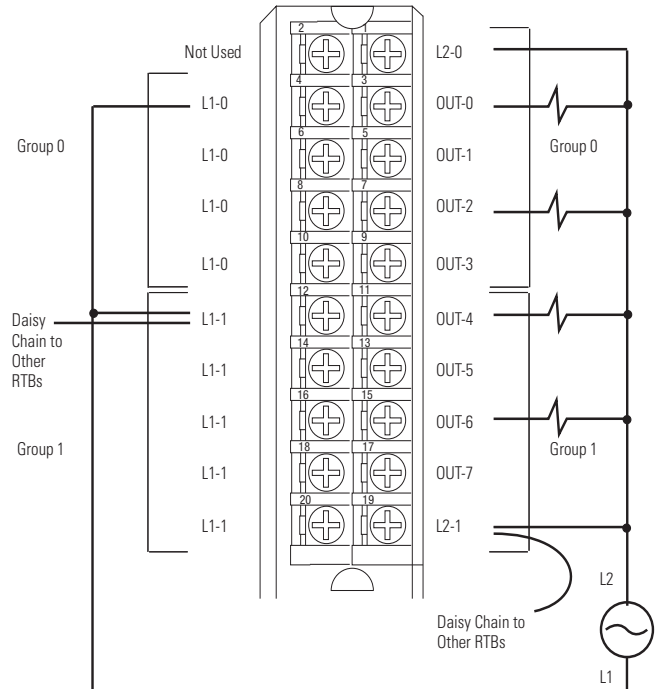
### Simplified Schematic



### Surge Current Chart



### 1756-0A8D



**Table 105 - Diagnostic Specifications - 1756-0A8D**

Attribute	1756-0A8D
Short trip, min	12 A for 500 $\mu$ s
No load	Off-state detection only
Output verification	On-state detection only
Pulse test	Configurable maximum width and max time delay from zero cross
Field power loss (zero cross)	Detects at 25V peak min (firmware phase locked loop)
Time stamp of diagnostics	$\pm 1$ ms

**Table 106 - Technical Specifications - 1756-0A8D**

Attribute	1756-0A8D
Outputs	8 diagnostic, electronic fusing (4 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...132V AC 47...63 Hz
Output delay time Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	175 mA
Current draw @ 24V	250 mA
Total backplane power	6.89 W
Power dissipation, max	5.3 W @ 60 °C (140 °F)
Thermal dissipation	18.0 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	2.5V peak @ 0.5 A 3V peak @ 1 A
Current per point, max	1 A @ 30 °C (86 °F) linear derating 0.5 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	8 A for 43 ms per point, repeatable every 2 s @ 30 °C (86 °F) 5 A for 43 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	125V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1200V AC for 2 s
Inhibit voltage, max	Zero crossing 25V peak
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74...132V, 47...63 Hz.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 107 - Environmental Specifications - 1756-0A8D**

Attribute	1756-0A8D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

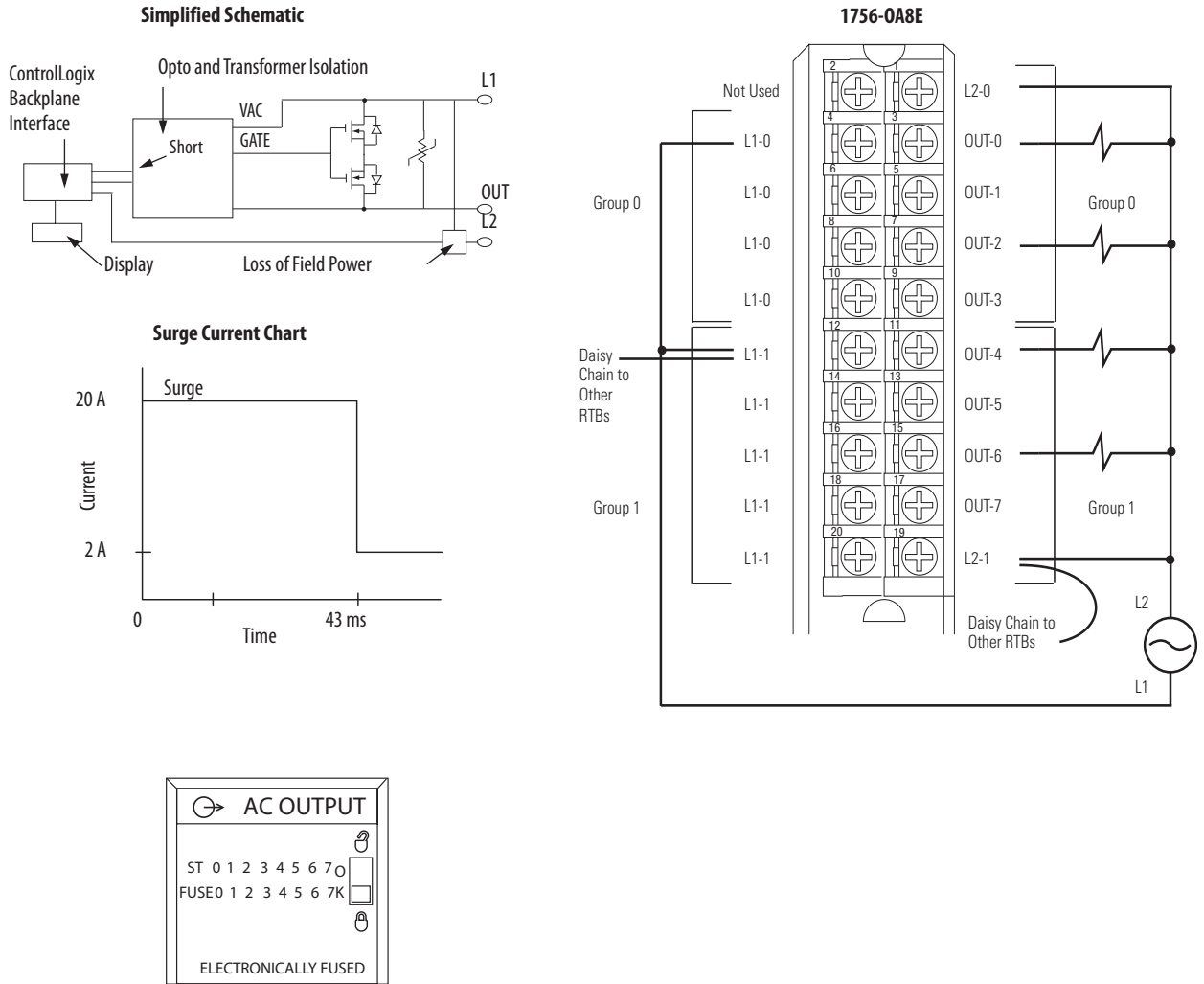
**Table 108 - Certifications - 1756-0A8D**

Certification <sup>(1)</sup>	1756-0A8D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-0A8E

ControlLogix 120 V AC electronically-fused output module



**Table 109 - Diagnostic Specifications - 1756-0A8E**

Attribute	1756-0A8E
Short trip, min	>20 A for 100 ms
Field power loss (zero cross)	Detects at 25V peak min (firmware phase locked loop)
Time stamp of diagnostics	±1 ms

**Table 110 - Technical Specifications - 1756-0A8E**

Attribute	1756-0A8E
Outputs	8 electronic fusing (4 points/group)
Pilot duty	Yes
Voltage category	120V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...132V AC 47...63 Hz
Output delay time Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	200 mA
Current draw @ 24V	250 mA
Total backplane power	7.02 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	18.76 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	4V peak @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per group, max	4 A @ 30 °C (86 °F) linear derating 2 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	125V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1200V AC for 2 s
Inhibit voltage, max	Zero crossing 25V peak
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120V 50/60Hz nominal. Rockwell Automation specified to 74...132V, 47...63 Hz.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 111 - Environmental Specifications - 1756-0A8E**

Attribute	1756-0A8E
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 112 - Certifications - 1756-0A8E**

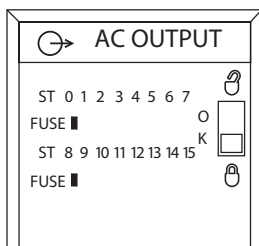
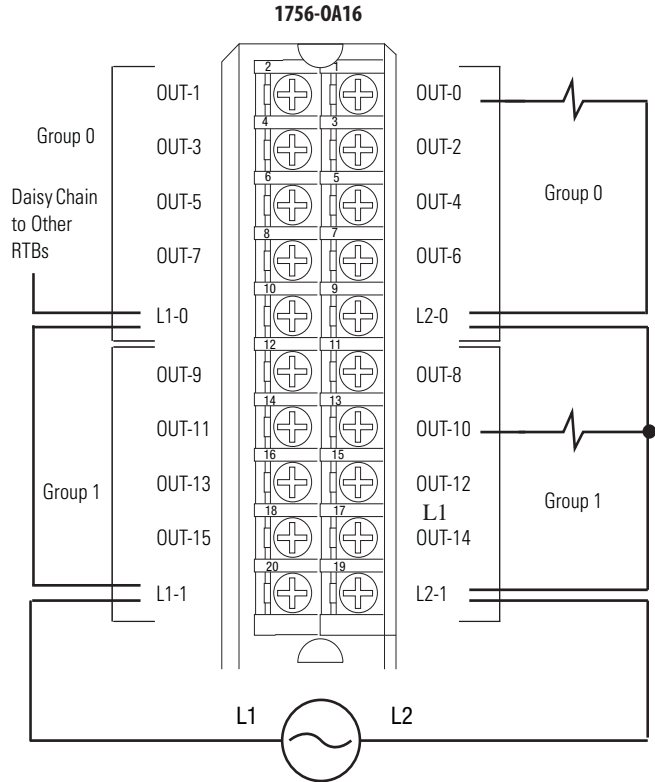
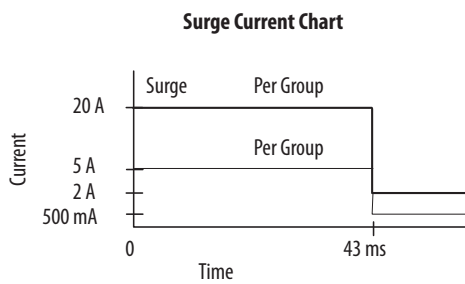
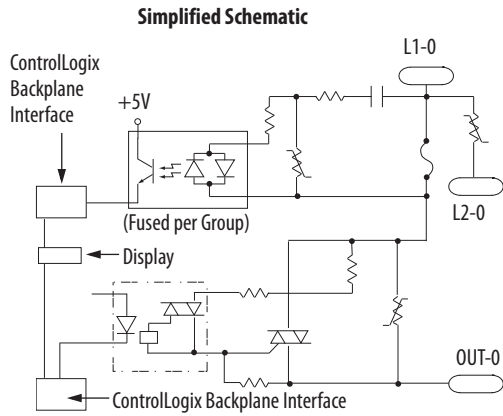
Certification <sup>(1)</sup>	1756-0A8E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



# 1756-0A16

ControlLogix 120/240V AC output module



**Table 113 - Diagnostic Specifications - 1756-0A16**

Attribute	1756-0A16
Time stamp of diagnostics	±1 ms
Fuse blown	1 fuse and indicator/group

**Table 114 - Technical Specifications - 1756-0A16**

Attribute	1756-0A16
Outputs	16 mechanically fused/group (8 points/group)
Pilot duty	0.5 A
Voltage category	120/240V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...265V AC 47...63 Hz
Output delay time Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	400 mA
Current draw @ 24V	2 mA
Total backplane power	2.1 W
Power dissipation, max	6.5 W @ 60 °C (140 °F)
Thermal dissipation	22.17 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V @ 0.5 A 5.7V @ load current < 50 mA
Current per point, max	0.5 A @ 60 °C (140 °F)
Current per group, max	2 A @ 60 °C (140 °F)
Current per module, max	4 A @ 60 °C (140 °F)
Surge current per point	5 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Surge current per group	15 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/μs for loads > 50 mA 0.2V/μs for loads < 50 mA <sup>(2)</sup>
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1400V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Mechanically fused/group, 3.15 A @ 250V AC slow blow, 1500 A interruption current, Littelfuse p/n H2153.15
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1

**Table 114 - Technical Specifications - 1756-0A16 (continued)**

Attribute	1756-0A16
Wire category	1 <sup>(3)</sup>
North American temperature code	T4
Enclosure type	None (open style)

- (1) UL certification for 120/240V 50/60 Hz nominal. Rockwell Automation specified to 74...265V, 47...63 Hz.
- (2) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ $\mu$ s for loads under 50 mA. The commutating dv/dt rating of the module for loads 50...500 mA (OUTPUT to L2) is 4V/ $\mu$ s maximum. If the commutating dv/dt rating of the TRIAC is exceeded, the TRIAC could latch on. If the commutating dv/dt rating is exceeded in the 10...50 mA range, a resistor may be added AC across the output and L2. The purpose of this resistor is to increase the total output current to 50 mA ( $I=V/R$ ). At 50 mA and above, the module has a higher commutating dv/dt rating. When adding a resistor for the output to L2, be sure it is rated for the power that it will dissipate ( $P=(V^2)/R$ ). If the commutating dv/dt rating is exceeded in the 50...500 mA range, the L1 AC waveform could be at fault. Be sure the waveform is a good sinusoid, void of any anomalies such as distorted or flattened sections.
- (3) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 115 - Environmental Specifications - 1756-0A16**

Attribute	1756-0A16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	$\pm$ 4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	$\pm$ 1 kV line-line (DM) and $\pm$ 2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 116 - Certifications - 1756-0A16**

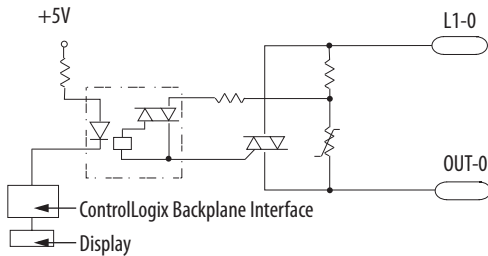
Certification <sup>(1)</sup>	1756-0A16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

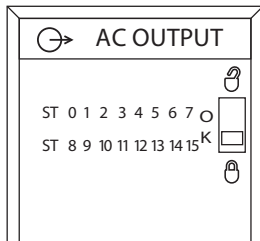
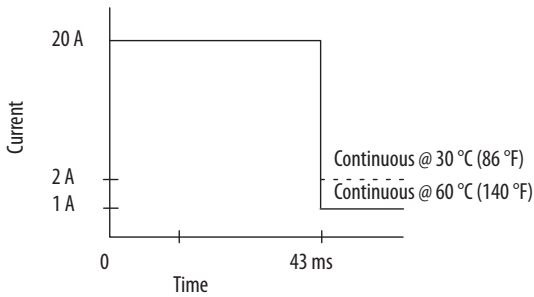
# 1756-0A16I

## ControlLogix 120/240V AC isolated output module

### Simplified Schematic

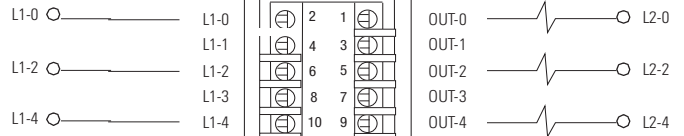


### Surge Current Chart



### 1756-0A16I

#### Isolated Wiring



#### Jumper Bar (Cut to Length)

#### Nonisolated Wiring

L1

Not Used

Daisy Chain to Other RTBs

Additional jumper bars are available as cat. no. 1756-JMPR.

**Table 117 - Technical Specifications - 1756-0A16I**

Attribute	1756-0A16I
Outputs	16 individually isolated
Pilot duty	Yes
Voltage category	120/240V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	74...265V AC 47...63 Hz
Output delay time	
Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz

**Table 117 - Technical Specifications - 1756-0A16I (continued)**

Attribute	1756-0A16I
Current draw @ 5.1V	300 mA
Current draw @ 24V	2.5 mA
Total backplane power	1.59 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	18.76 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ load current < 50 mA
Current per point, max	2 A @ 30 ° (86 °F) linear derating 1 A @ 60 °C (140 °F) linear derating
Current per module, max	5 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/ $\mu$ s for loads > 50 mA 0.2V/ $\mu$ s for loads < 50 mA <sup>(2)</sup>
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(3)</sup>
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120/240V 50/60 Hz nominal. Rockwell Automation specified to 74...265V, 47...63 Hz.

(2) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ $\mu$ s for loads under 50 mA. The commutating dv/dt rating of the module for loads 50...500 mA (OUTPUT to L2) is 4V/ $\mu$ s maximum. If the commutating dv/dt rating of the TRIAC is exceeded, the TRIAC could latch on. If the commutating dv/dt rating is exceeded in the 10...50 mA range, a resistor may be added AC across the output and L2. The purpose of this resistor is to increase the total output current to 50 mA ( $I=V/R$ ). At 50 mA and above, the module has a higher commutating dv/dt rating. When adding a resistor for the output to L2, be sure it is rated for the power that it will dissipate ( $P=(V**2)/R$ ). If the commutating dv/dt rating is exceeded in the 50...500 mA range, the L1 AC waveform could be at fault. Be sure the waveform is a good sinusoid, void of any anomalies such as distorted or flattened sections.

(3) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 118 - Environmental Specifications - 1756-0A161**

Attribute	1756-0A161
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 119 - Certifications - 1756-0A161**

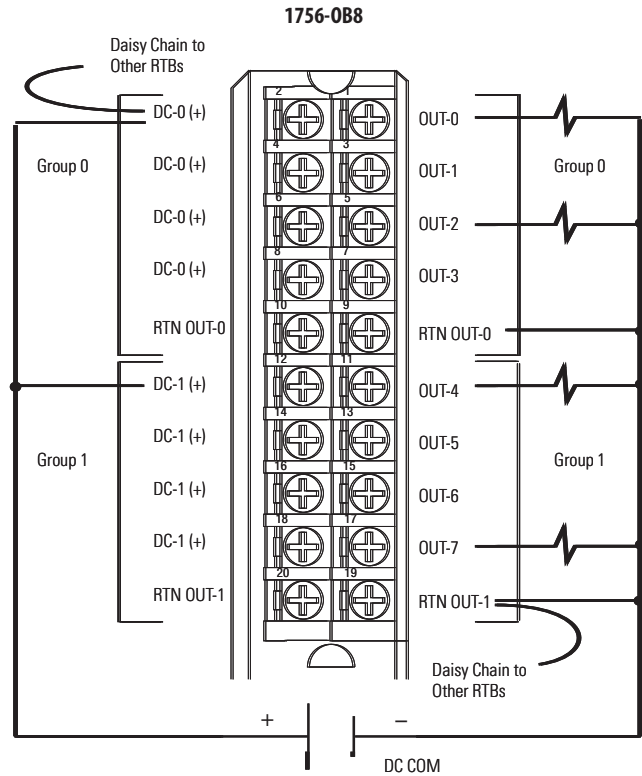
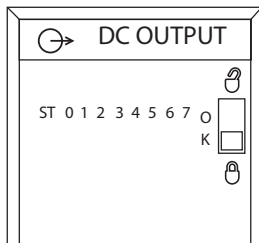
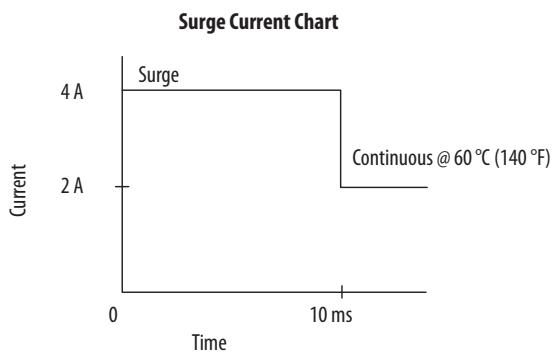
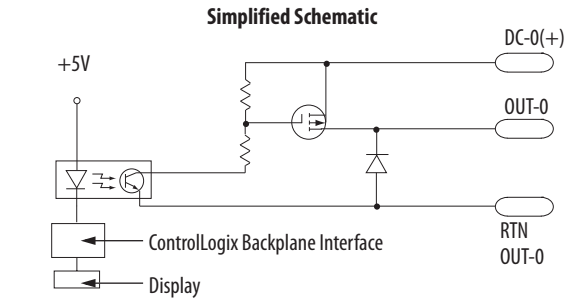
<b>Certification<sup>(1)</sup></b>	<b>1756-0A161</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



### 1756-0B8

ControlLogix DC (10...30V) output module



**Table 120 - Technical Specifications - 1756-0B8**

Attribute	1756-0B8
Outputs	8 (4 points/common)
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time	
Off to On	1 ms max
On to Off	2 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA

**Table 120 - Technical Specifications - 1756-0B8 (continued)**

Attribute	1756-0B8
Total backplane power	0.89 W
Power dissipation, max	2.5 W @ 60 °C (140 °F)
Thermal dissipation	8.53 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	1.2V DC @ 2A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms each, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 121 - Environmental Specifications - 1756-0B8**

Attribute	1756-0B8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

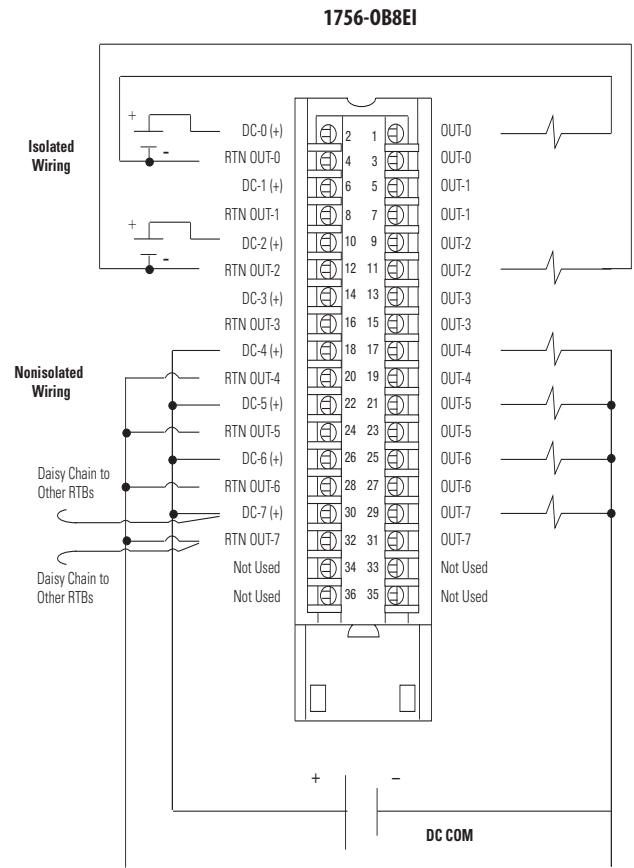
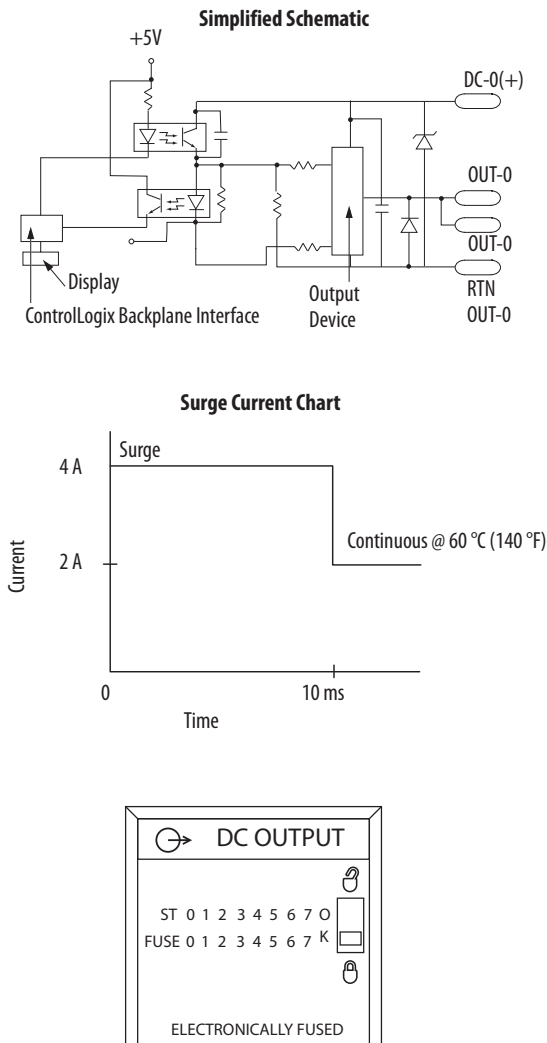
**Table 122 - Certifications - 1756-0B8**

Certification <sup>(1)</sup>	1756-0B8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OB8EI

ControlLogix DC (10...30V) electronically-fused, isolated output module



**Table 123 - Diagnostic Specifications - 1756-OB8EI**

Attribute	1756-OB8EI
Short trip	> 4.5 A for 500 $\mu$ s max (output on, then short) > 4.5 A for 1.5 ms max (output on into short)
Timestamp of diagnostics	$\pm$ 1 ms

**Table 124 - Technical Specifications - 1756-OB8EI**

Attribute	1756-OB8EI
Outputs	8 individually isolated
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time	
Off to On	1 ms max
On to Off	5 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	2 mA
Total backplane power	1.30 W
Power dissipation, max	4.7 W @ 60 °C (140 °F)
Thermal dissipation	16.03 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	10 A @ 60 °C (140 °F) 16 A @ 55 °C (131°F) linear derating
Surge current per point	4 A for 10 ms each, repeatable every 2 s
Load current, min	3 mA
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 125 - Environmental Specifications - 1756-0B8EI**

Attribute	1756-0B8EI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 126 - Certifications - 1756-OB8EI**

<b>Certification<sup>(1)</sup></b>	<b>1756-OB8EI</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



### 1756-0B8I

ControlLogix DC (10...30V) isolated output module

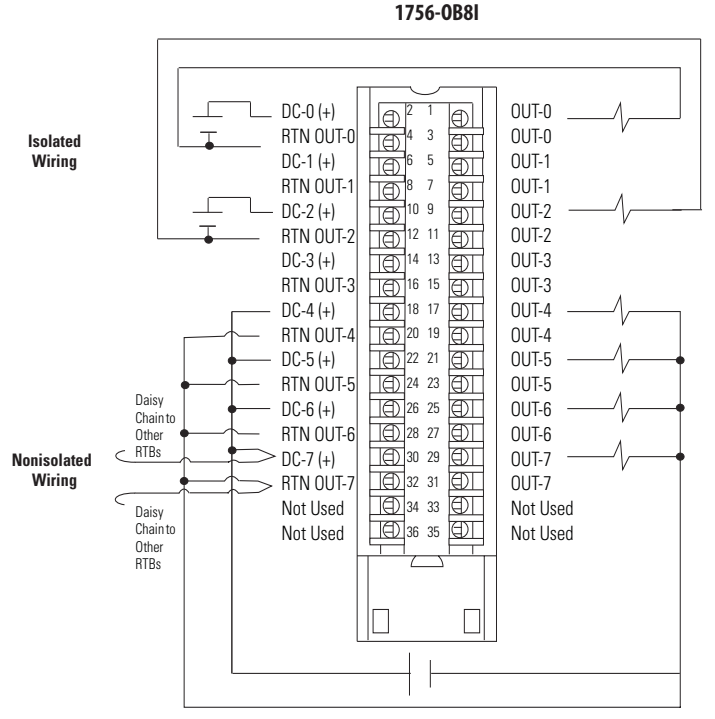
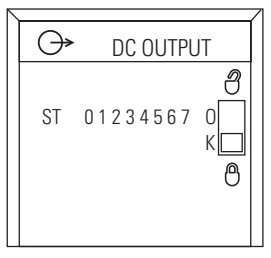
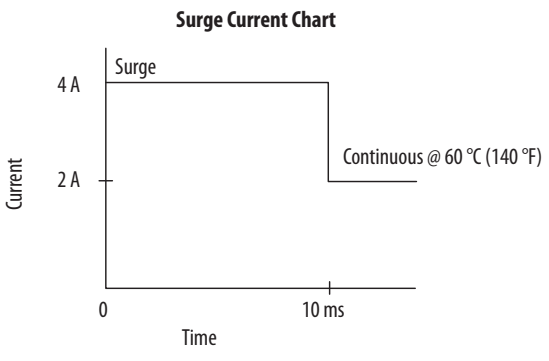
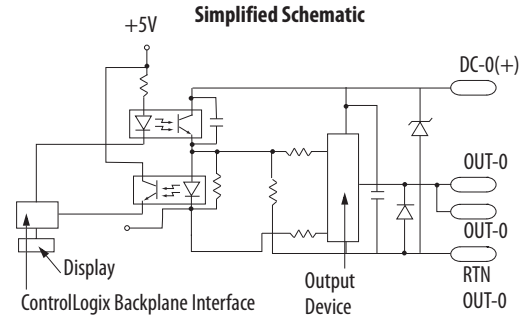


Table 127 - Technical Specifications - 1756-0B8I

Attribute	1756-0B8I
Outputs	8 individually isolated
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time	
Off to On	1 ms max
On to Off	2 ms max
Current draw @ 5.1V	165 mA

**Table 127 - Technical Specifications - 1756-OB8I (continued)**

Attribute	1756-OB8I
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	4.6W @ 60 °C (140 °F)
Thermal dissipation	15.70 BTU/hr
Off-state leakage current, max	0.5 mA per point
On-state voltage drop, max	0.5V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	16 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms each, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), reinforced insulation type, outputs-to-backplane 250V (continuous), basic insulation type, output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 128 - Environmental Specifications - 1756-OB8I**

Attribute	1756-OB8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz

**Table 128 - Environmental Specifications - 1756-0B8I (continued)**

Attribute	1756-0B8I
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80 . . . 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1k Hz sine-wave 80% AM from 2000 . . . 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz

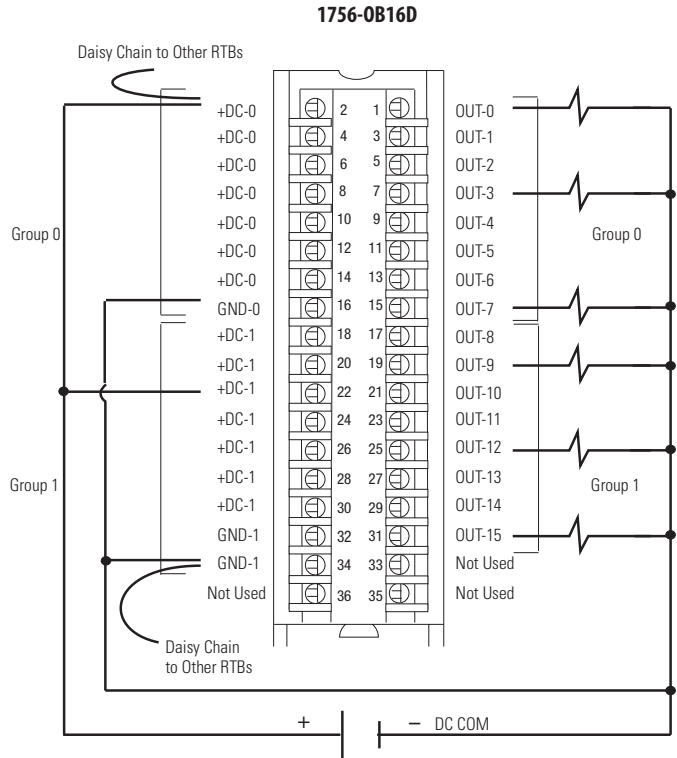
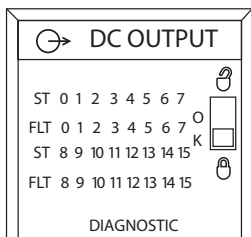
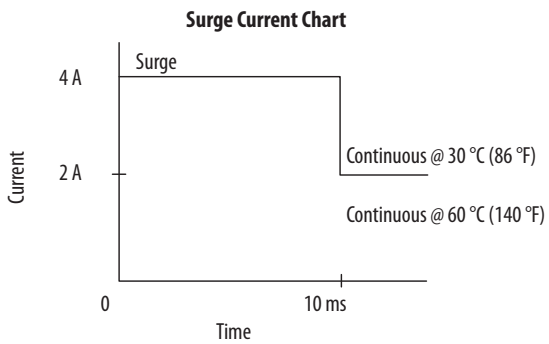
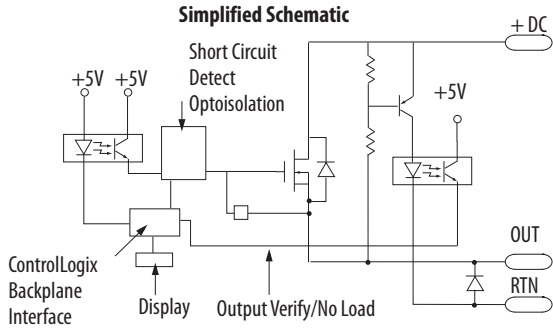
**Table 129 - Certifications - 1756-0B8I**

Certification <sup>(1)</sup>	1756-0B8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-0B16D

ControlLogix DC (19.2...30V) diagnostic output module



**Table 130 - Diagnostic Specifications - 1756-0B16D**

Attribute	1756-0B16D
Short trip	8 A for 180 ms, min 10 A for 120 ms, min
No load	Off-state detection only
Output verification	On-state detection only
Pulse test	Configurable maximum pulse width
Time stamp of diagnostics	±1 ms

**Table 131 - Technical Specifications - 1756-OB16D**

Attribute	1756-OB16D
Outputs	16 diagnostic (8 points/group)
Pilot duty	2 A (DC-135Q)
Voltage category	24V DC source
Operating voltage range	19.2...30V DC
Output delay time	
Off to On	60 $\mu$ s nom/1 ms max
On to Off	630 $\mu$ s nom/5 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	140 mA
Total backplane power	4.64 W
Power dissipation, max	3.3 W @ 60 °C (140 °F)
Thermal dissipation	11.25 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	1.2V DC @ 2A
Current per point, max	2 A @ 30 °C (86 °F) linear derating 1 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	4 A for 10 ms per point, repeatable every 1 s
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 132 - Environmental Specifications - 1756-OB16D**

Attribute	1756-OB16D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1k Hz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

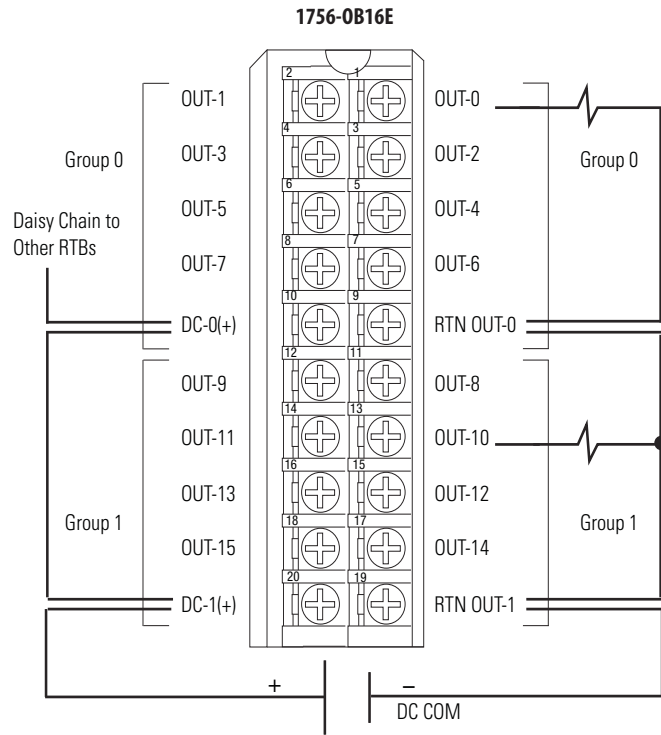
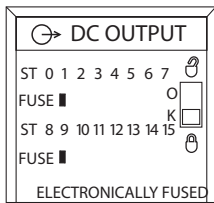
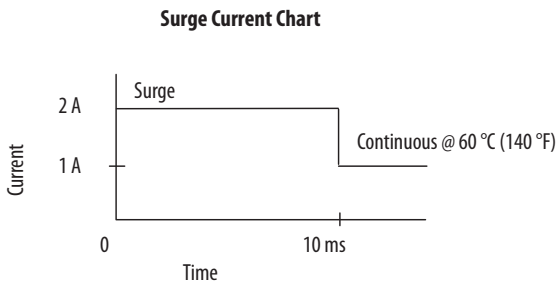
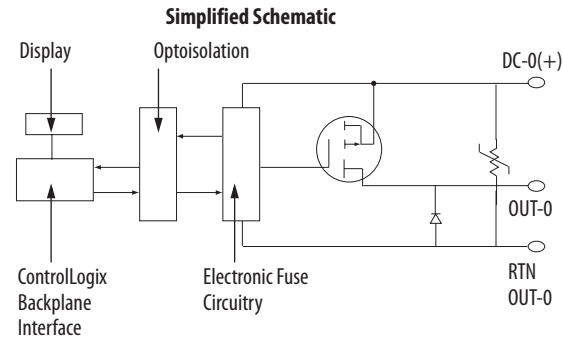
**Table 133 - Certifications - 1756-OB16D**

<b>Certification<sup>(1)</sup></b>	<b>1756-OB16D</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OB16E

ControlLogix DC (10...31.2V) electronically-fused output module



**Table 134 - Technical Specifications - 1756-OB16E**

Attribute	1756-OB16E
Outputs	16 electronically fused (8 points/group)
Voltage category	12/24V DC source
Operating voltage range	10...31.2V DC
Output delay time	
Off to On	70 $\mu$ s nom/1 ms max
On to Off	360 $\mu$ s nom/1 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	2 mA
Total backplane power	1.32 W
Power dissipation, max	4.1 W @ 60 °C (140 °F)
Thermal dissipation	13.98 BTU/hr
Off-state leakage current per point, max	1 mA per point



**Table 134 - Technical Specifications - 1756-OB16E (continued)**

Attribute	1756-OB16E
On-state voltage drop, max	400 mV DC @ 1 A
Current per point, max	1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	2 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per group
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 135 - Environmental Specifications - 1756-OB16E**

Attribute	1756-OB16E
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A

**Table 135 - Environmental Specifications - 1756-OB16E (continued)**

Attribute	1756-OB16E
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 136 - Certifications - 1756-OB16E**

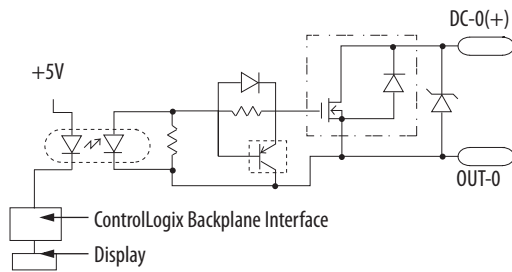
Certification <sup>(1)</sup>	1756-OB16E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

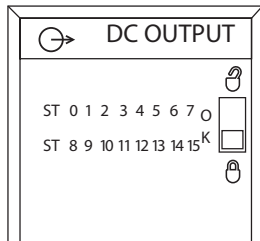
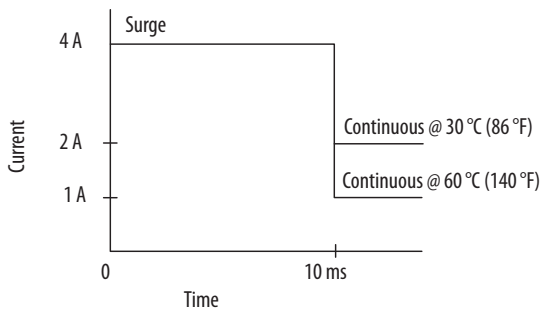
# 1756-OB16I

## ControlLogix 24V DC isolated output module

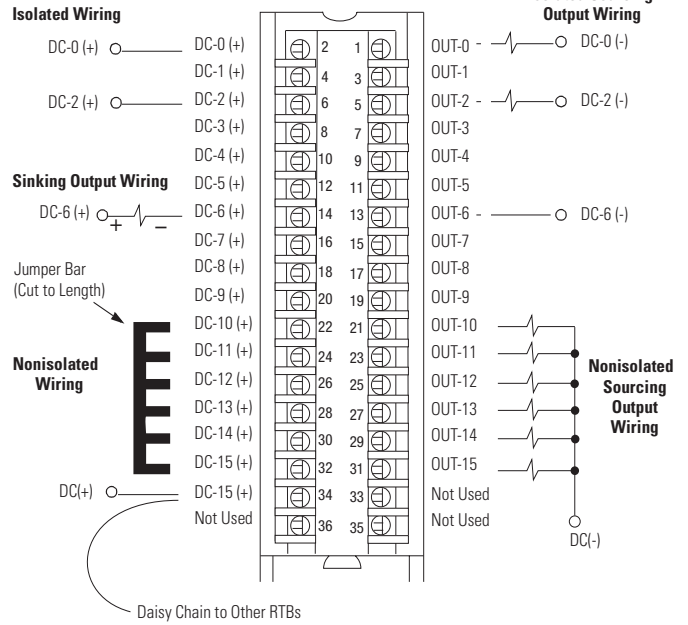
**Simplified Schematic**



**Surge Current Chart**



**1756-OB16I**



Additional jumper bars are available as cat. no. 1756-JMPR.

**Table 137 - Technical Specifications - 1756-OB16I**

Attribute	1756-OB16I
Outputs	16 individually isolated
Pilot duty	2 A (DC-13SQ)
Voltage category	12/24V DC sink/source
Operating voltage range <sup>(1)</sup>	10...30V DC
Output delay time	
Off to On	1 ms max
On to Off	2 ms max
Current draw @ 5.1V	350 mA

**Table 137 - Technical Specifications - 1756-OB16I (continued)**

Attribute	1756-OB16I
Current draw @ 24V	2.5 mA
Total backplane power	1.8 W
Power dissipation, max	3.6 W @ 60 °C (140 °F)
Thermal dissipation	12.28 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) 1 A @ 60 °C (140 °F) (linear derating)
Current per module, max	8 A @ 30 °C (86 °F) 4 A @ 60 °C (140 °F) (linear derating)
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane 125V (continuous), basic insulation type, output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10...30V DC.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 138 - Environmental Specifications - 1756-OB16I**

Attribute	1756-OB16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)

**Table 138 - Environmental Specifications - 1756-OB161 (continued)**

Attribute	1756-OB161
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

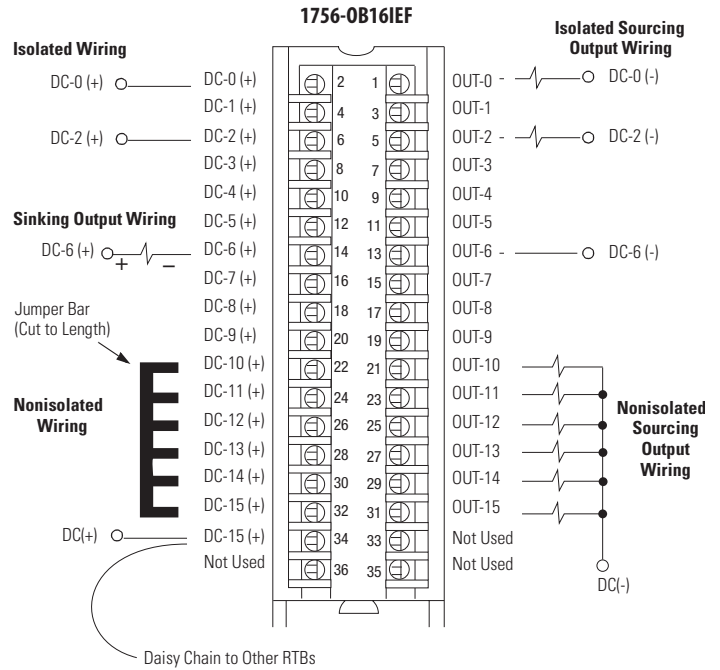
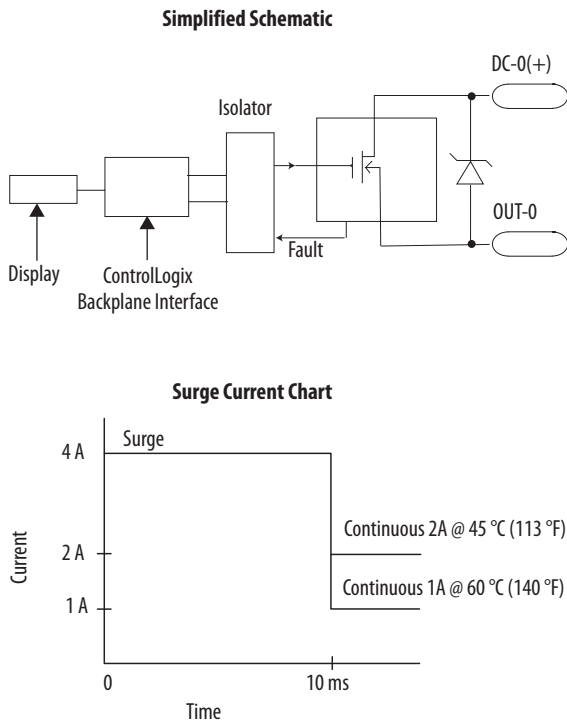
**Table 139 - Certifications - 1756-OB161**

Certification <sup>(1)</sup>	1756-OB161
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

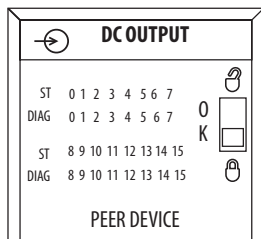
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OB16IEF

ControlLogix DC (10...30V) electronically-protected, sinking or sourcing, isolated, fast output module



Additional jumper bars may be purchased by using catalog number 1756-JMPR.



**Table 140 - Technical Specifications - 1756-OB16IEF**

Attribute	1756-OB16IEF
Outputs	16 individually isolated
Pilot duty	4 A inrush
Voltage category	12/24V DC sink/source
Operating voltage range	10 . . . 30V DC
Output delay time (backplane to screw)	
Off to On	14 $\mu$ s nom/23 $\mu$ s max
On to Off	14 $\mu$ s nom/23 $\mu$ s max
PWM cycle time	1 ms min/1 hour max
PWM On time	200 $\mu$ s min/1 hour max
PWM On time accuracy	$\pm$ 20 $\mu$ s
Current draw @ 5.1V	320 mA
Current draw @ 24V	3 mA
Total backplane power	1.7 W
Power dissipation	4.9 W max (16 channels @ 1 A or 4 channels @ 2 A)
Thermal dissipation	16.71 BTU/hr
Off-state leakage current per point, max	< 0.1 mA per point
On-state voltage drop, max	0.2V DC @ 1 A 0.4V DC @ 2 A
Current per point, max	2 A @ 45 °C (113 °F) 4 channels max 1 A @ 60 °C (140 °F)
Current per module, max	16 A @ 60 °C (140 °F) 1 A max per channel 8 A @ 45 °C (113 °F) 2 A max per channel
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	CIP Sync only
States in Fault mode per point	Hold last state, On or Off (Off is default)
Duration of Fault mode per point	1, 2, 5, 10 s, Forever (Forever is default)
Final state after Fault mode duration per point	On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), reinforced insulation type, outputs-to-backplane 250V (continuous), basic insulation type, output-to-output Type tested at 2300V AC for 60 s outputs-to-backplane Type tested at 1500V AC for 60 s output-to-output
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Reverse polarity protection	No
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports <sup>(1)</sup>

**Table 140 - Technical Specifications - 1756-OB16IEF (continued)**

Attribute	1756-OB16IEF
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 141 - Environmental Specifications - 1756-OB16IEF**

Attribute	1756-OB16IEF
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz



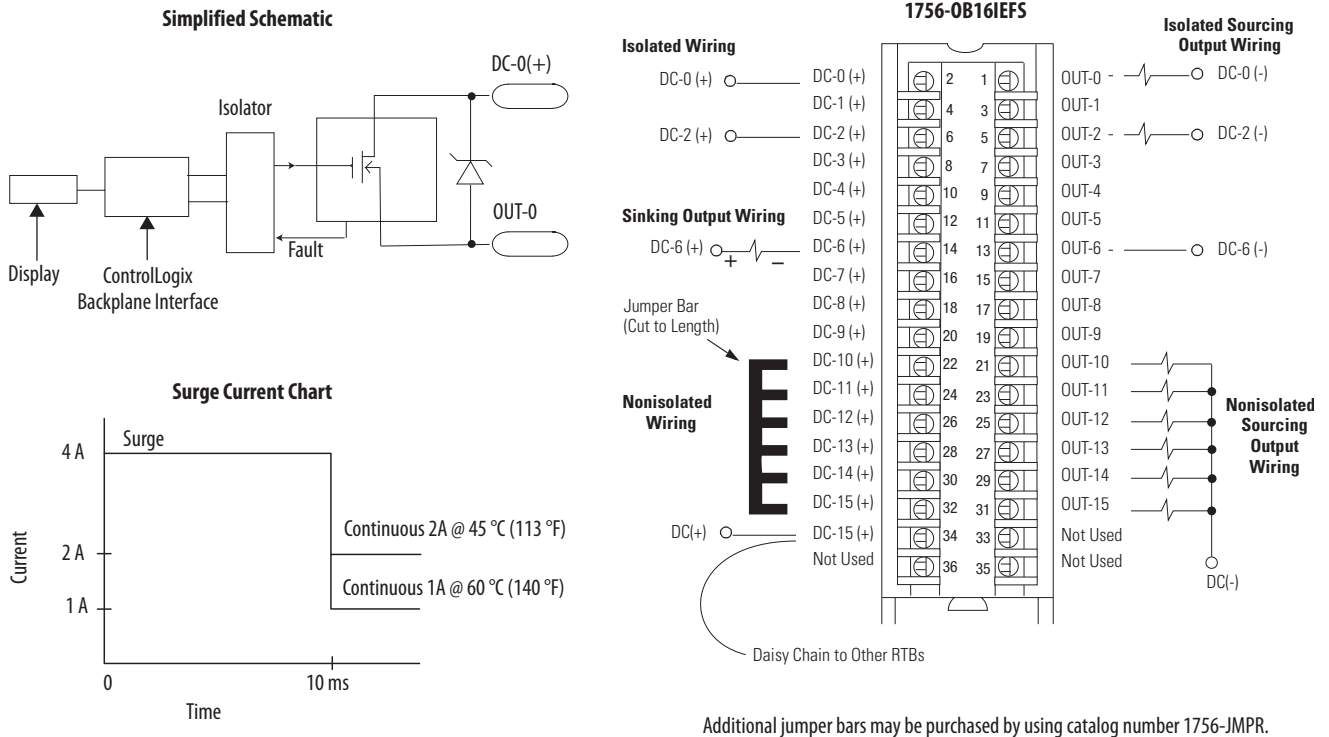
**Table 142 - Certifications - 1756-OB16IEF**

Certification <sup>(1)</sup>	1756-OB16IEF
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

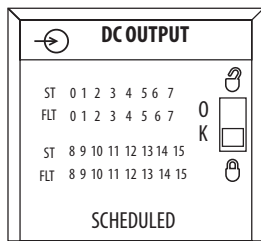
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OB16IEFS

ControlLogix DC (10...30V) scheduled, electronically-protected, sinking or sourcing, isolated, fast output module



Additional jumper bars may be purchased by using catalog number 1756-JMPR.



**Table 143 - Technical Specifications - 1756-OB16IEFS**

Attribute	1756-OB16IEFS
Outputs	16 scheduled, individually isolated
Pilot duty	4 A inrush
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Unscheduled output delay time (backplane to screw)	
Off to On	14 μs nom/23 μs max
On to Off	14 μs nom/23 μs max

**Table 143 - Technical Specifications - 1756-OB16IEFS (continued)**

Attribute	1756-OB16IEFS
Schedule accuracy	$\pm 10 \mu\text{s}$ nom when all components are synchronized to the current CIP Sync Grandmaster
PWM cycle time	1 ms min/1 hour max
PWM On time	200 $\mu\text{s}$ min/1 hour max
PWM On-time accuracy	$\pm 20 \mu\text{s}$
Current draw @ 5.1V	320 mA
Current draw @ 24V	3 mA
Total backplane power	1.7 W
Power dissipation	4.9 W max (16 channels @ 1 A or 4 channels @ 2 A)
Thermal dissipation	16.71 BTU/hr
Off-state leakage current per point, max	< 0.1 mA per point
On-state voltage drop, max	0.2V DC @ 1 A 0.4V DC @ 2 A
Current per point, max	2 A @ 45 °C (113 °F) 4 channels max 1 A @ 60 °C (140 °F)
Current per module, max	16 A @ 60 °C (140 °F) 1 A max per channel 8 A @ 45 °C (113 °F) 2 A max per channel
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	CIP Sync only
States in Fault mode per point	Hold last state, On or Off (Off is default)
Duration of Fault mode per point	1, 2, 5, 10 s, Forever (Forever is default)
Final state after Fault mode duration per point	On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), reinforced insulation type, outputs-to-backplane 250V (continuous), basic insulation type, output-to-output Type tested at 2300V AC for 60 s outputs-to-backplane Type tested at 1500V AC for 60 s output-to-output
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Reverse polarity protection	No
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 144 - Environmental Specifications - 1756-OB16IEFS**

Attribute	1756-OB16IEFS
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 145 - Certifications - 1756-OB16IEFS**

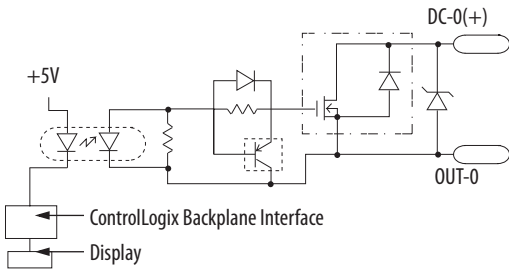
Certification <sup>(1)</sup>	1756-OB16IEFS
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

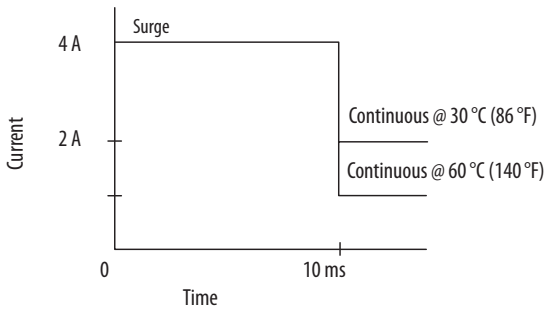
## 1756-0B16IS

ControlLogix 24V DC scheduled, isolated output module

**Simplified Schematic**

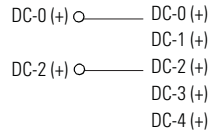


**Surge Current Chart**

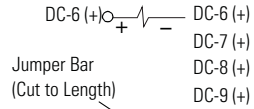


**1756-0B16IS**

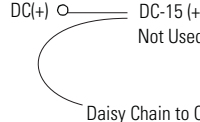
**Isolated Wiring**



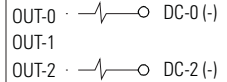
**Sinking Output Wiring**



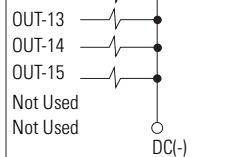
**Nonisolated Wiring**



**Isolated Sourcing Output Wiring**

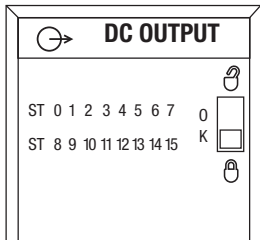


**Nonisolated Sourcing Output Wiring**



Daisy Chain to Other RTBs

Additional jumper bars are available as cat. no. 1756-JMPR.



**Table 146 - Technical Specifications - 1756-OB161S**

Attribute	1756-OB161S
Outputs	16 individually isolated, 8 scheduled
Pilot duty	2 A (DC-135Q)
Voltage category	12/24V DC sink/source
Operating voltage range <sup>(1)</sup>	10...30V DC
Output delay time	
Off to On	1 ms max
On to Off	2 ms max
Current draw @ 5.1V	350 mA
Current draw @ 24V	2.5 mA
Total backplane power	1.8 W
Power dissipation, max	3.6 W @ 60 °C (140 °F)
Thermal dissipation	12.28 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) 1 A @ 60 °C (140 °F) (linear derating)
Current per module, max	8 A @ 30 °C (86 °F) 4 A @ 60 °C (140 °F) (linear derating)
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM can be used to protect outputs. See publication <a href="#">1492-TD008</a> . However, the ControlLogix system has been agency certified using only the ControlLogix RTBs, that is, 1756-TBCH, 1756-TBNH, 1756-TBSH, and 1756-TBS6H. Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application-specific approval by the certifying agency.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(2)</sup>
Wire type	Copper
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10...30V DC

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 147 - Environmental Specifications - 1756-OB161S**

Attribute	1756-OB161S
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



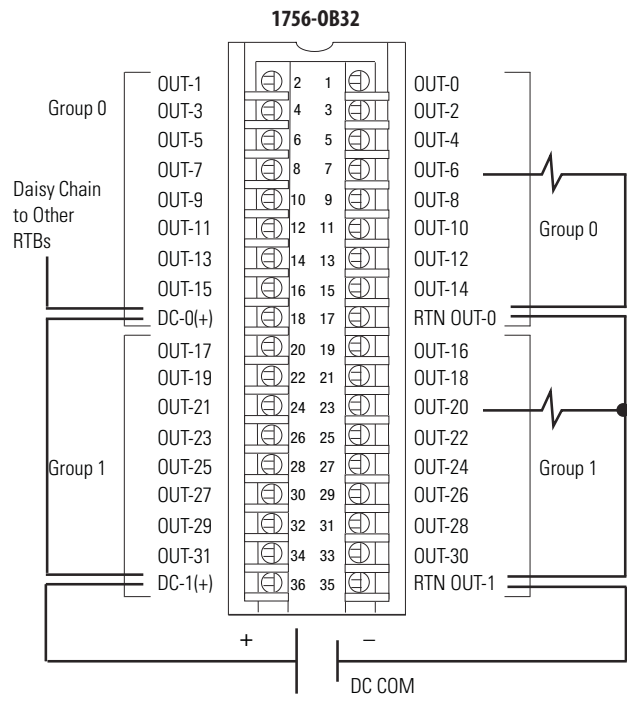
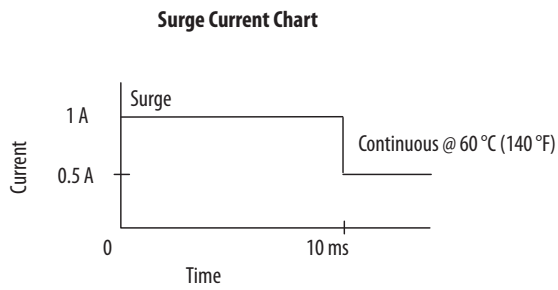
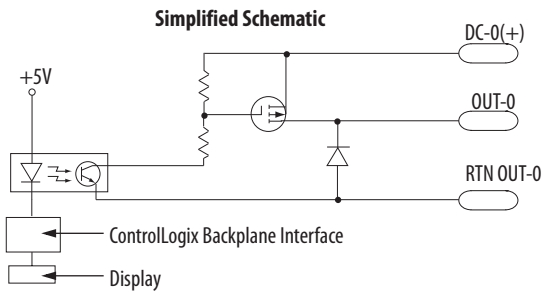
**Table 148 - Certifications - 1756-OB16IS**

<b>Certification<sup>(1)</sup></b>	<b>1756-OB16IS</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-0B32

ControlLogix DC (10...31.2V) output module



DC OUTPUT										
ST	0	1	2	3	4	5	6	7		
ST	8	9	1	1	1	1	1	1	O	
			0	1	2	3	4	5	K	
			1	1	1	2	2	2		
ST	6	7	8	9	0	1	2	3		
			2	2	2	2	3	3		
ST	4	5	6	7	8	9	0	1		

**Table 149 - Technical Specifications - 1756-OB32**

Attribute	1756-OB32
Outputs	32 (16 points/group)
Voltage category	12/24V DC source
Operating voltage range	10...31.2V DC
Output delay time	
Off to On	60 $\mu$ s nom/1 ms max
On to Off	200 $\mu$ s nom/1 ms max
Current draw @ 5.1V	300 mA
Current draw @ 24V	2 mA
Total backplane power	1.58 W
Power dissipation, max	4.8 W @ 60 °C (140 °F)
Thermal dissipation	16.37 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	200 mV DC @ 0.5 A
Current per point, max	0.5 A @ 50 °C (122 °F) linear derating 0.35 A @ 60 °C (140 °F)
Current per module, max	16 A @ 50 °C (122 °F) linear derating 10 A @ 60 °C (140 °F)
Surge current per point, max	1 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM can be used to protect outputs. See publication <a href="#">1492-TD008</a> . However, the ControlLogix system has been agency certified using only the ControlLogix RTBs, that is, 1756-TBCH, 1756-TBNH, 1756-TBSH, and 1756-TBS6H. Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application-specific approval by the certifying agency.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 150 - Environmental Specifications - 1756-OB32**

Attribute	1756-OB32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

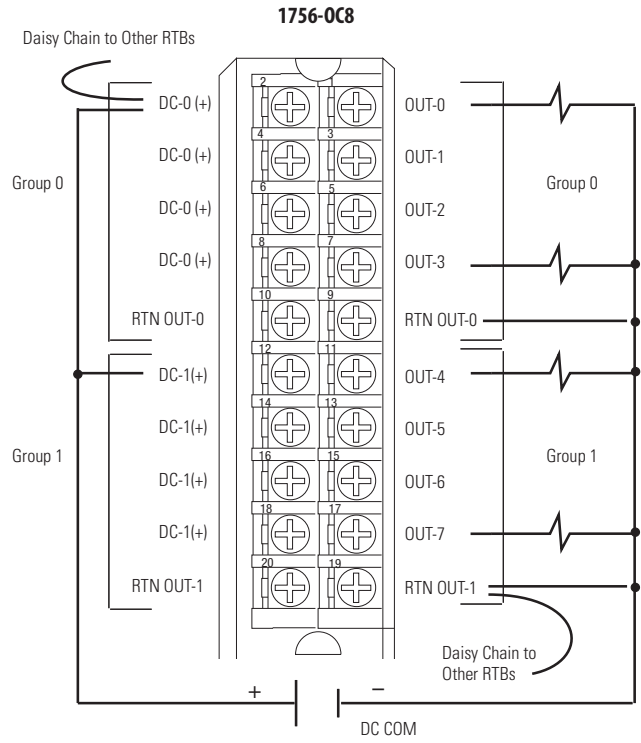
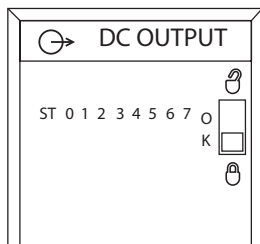
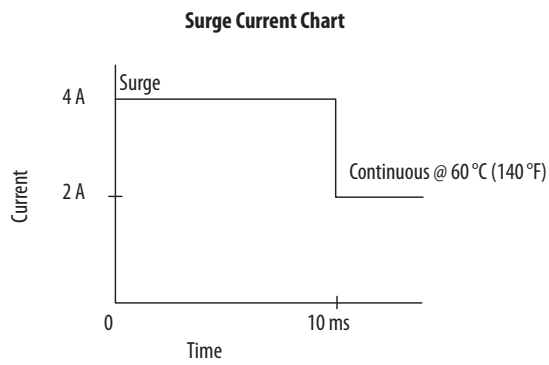
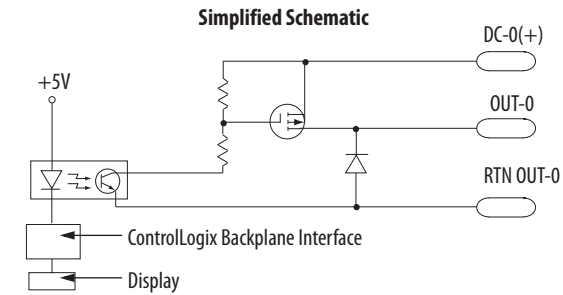
**Table 151 - Certifications - 1756-OB32**

<b>Certification<sup>(1)</sup></b>	<b>1756-OB32</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-0C8

ControlLogix DC (30...60V) output module



**Table 152 - Technical Specifications - 1756-0C8**

Attribute	1756-0C8
Outputs	8 (4 points/group)
Pilot duty	2 A
Voltage category	48V DC source
Operating voltage range	30...60V DC
Output delay time	
Off to On	1 ms, max
On to Off	2 ms, max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	4.9 W @ 60 °C (140 °F)
Thermal dissipation	16.71 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 153 - Environmental Specifications - 1756-0C8**

Attribute	1756-0C8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



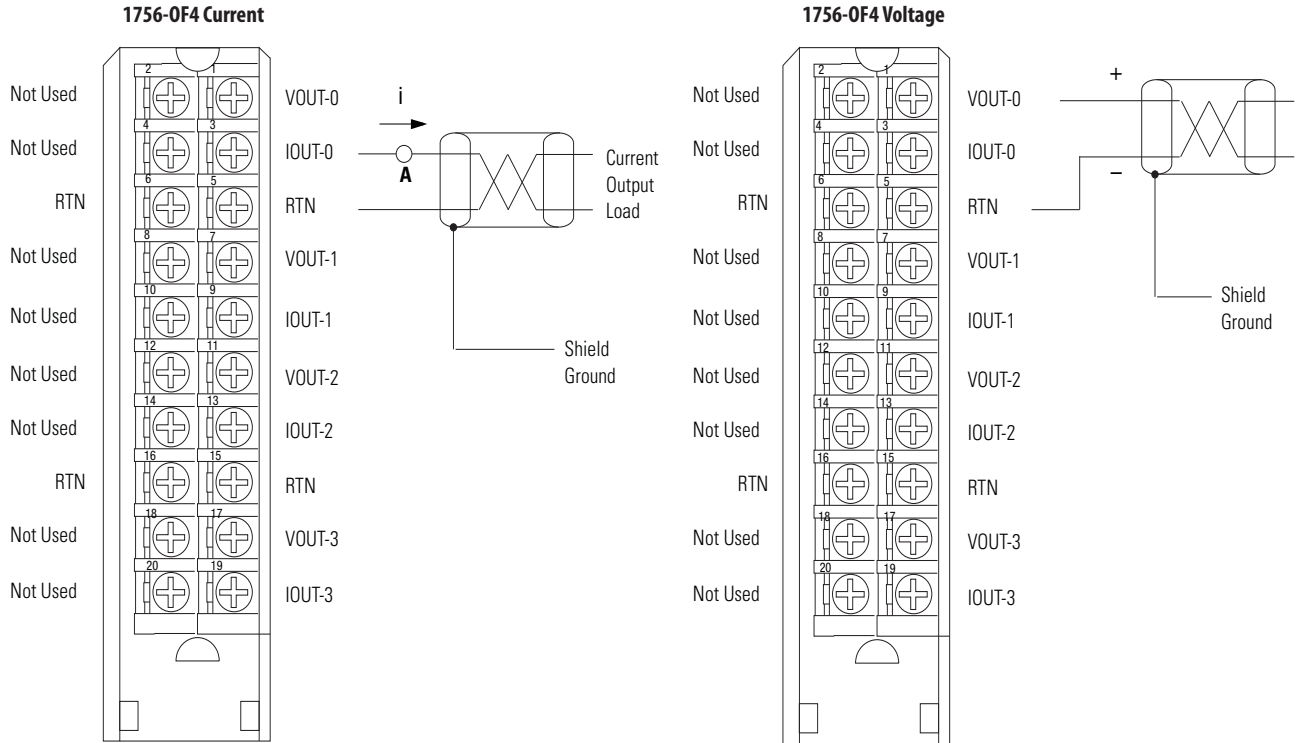
**Table 154 - Certifications - 1756-0C8**

<b>Certification<sup>(1)</sup></b>	<b>1756-0C8</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

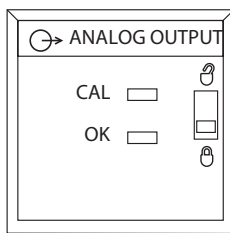
## 1756-OF4

ControlLogix voltage/current output analog module



- Place additional loop devices (such as strip chart recorders) at the A location noted above.
- All terminals marked RTN are connected internally.

All terminals marked RTN are connected internally.



**Table 155 - Signal and User Counts - 1756-OF4**

Range	Low Signal and User Counts	High Signal and User Counts
0...20 mA	0 mA -32768 counts	21.2916 mA 32767 counts
±10V	-10.4336V -32768 counts	10.4336V 32767 counts

**Table 156 - Technical Specifications - 1756-OF4**

Attribute	1756-OF4
Outputs	4 voltage or current outputs
Output range	$\pm 10V$ 4...20 mA
Resolution	Voltage: 15 bits across 10.5V, 320 $\mu V$ /bit Current: 15 bits across 21mA, 650 nA/bit
Current draw @ 5.1V	150 mA
Current draw @ 24V	120 mA
Total backplane power	5.8 W
Power dissipation, max	3.25 W, 4 channel current
Thermal dissipation	10.91 BTU/hr
Open circuit detection	Current output only (Output must be set to >0.1 mA)
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21mA or less
Drive capability	Voltage: >2000 $\Omega$ Current: 0...750 $\Omega$
Settling time	<2 ms to 95% of final value with resistive loads
Calibrated accuracy	Better than 0.05% of range from 4...21 mA, -10.4...10.4V
Calibration interval	12 months typical
Offset drift	50 $\mu V/^\circ C$ 100 nA/ $^\circ C$
Gain drift with temperature	Voltage: 25 ppm/ $^\circ C$ , 520 $\mu V/^\circ C$ Current: 50 ppm/ $^\circ C$ , 1050 $\mu A/^\circ C$
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module scan time	12 ms floating point 8 ms integer
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), reinforced insulation type, output channels-to-backplane No isolation between individual output channels Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 157 - Environmental Specifications - 1756-OF4**

Attribute	1756-OF4
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

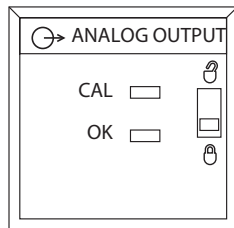
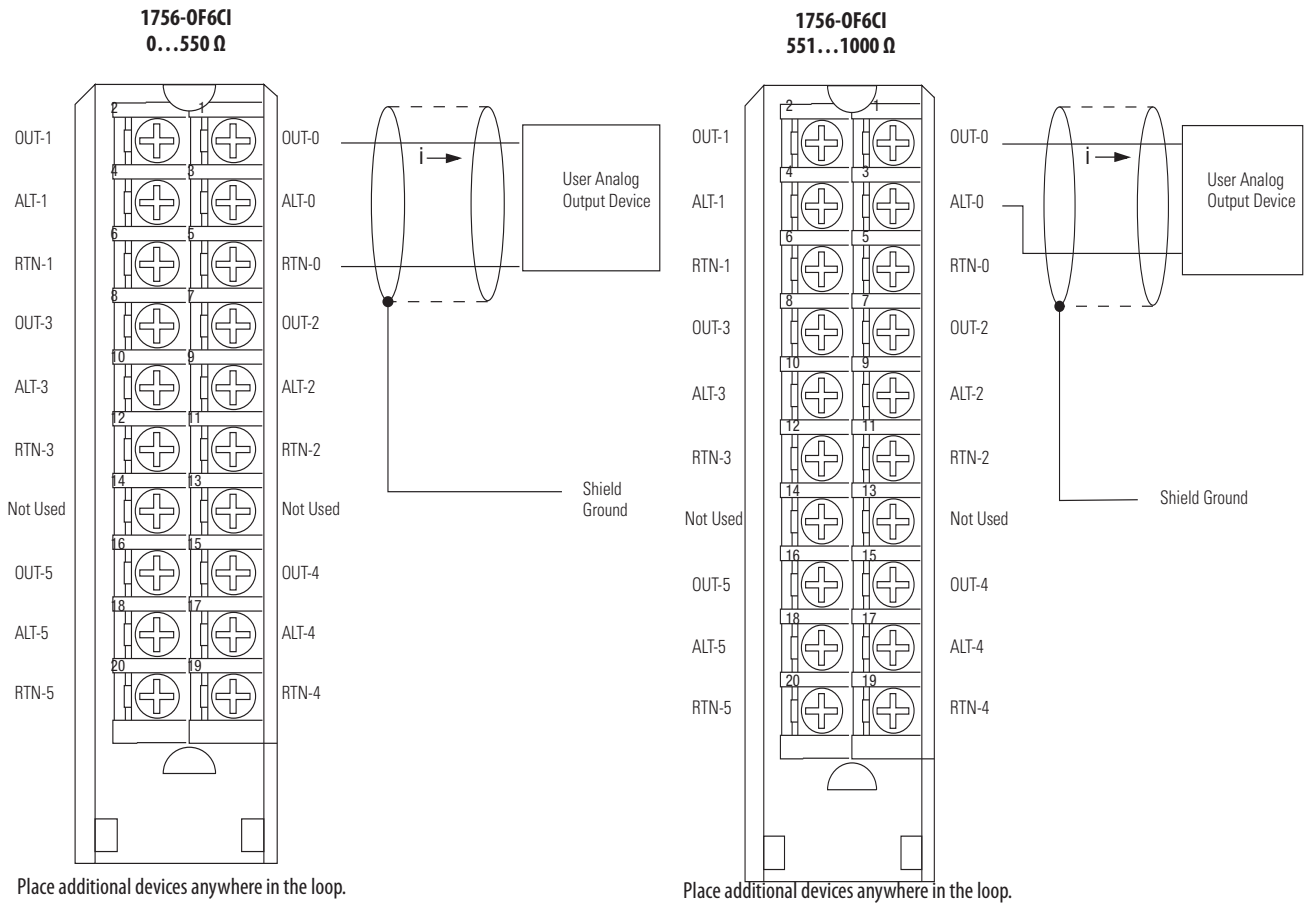
**Table 158 - Certifications - 1756-OF4**

<b>Certification<sup>(1)</sup></b>	<b>1756-OF4</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OF6CI

ControlLogix current loop output analog module



**Table 159 - Signal and User Counts - 1756-OF6CI**

Range	Low Signal and User Counts	High Signal and User Counts
0...21 mA	0 mA -32768 counts	21.074 mA 32767 counts

**Table 160 - Technical Specifications - 1756-OF6CI**

Attribute	1756-OF6CI
Outputs	6 individually isolated
Output range	0...21 mA
Resolution	13 bits across 21 mA (2.7 $\mu$ A)
Current draw @ 5.1V	250 mA for 0...550 $\Omega$ loads terminated on OUTs and RTNs 250 mA for 551...1000 $\Omega$ loads terminated on OUTs and ALTs
Current draw @ 24V	225 mA for 0...550 $\Omega$ loads terminated on OUTs and RTNs 300 mA for 551...1000 $\Omega$ loads terminated on OUTs and ALTs
Total backplane power	6.7 W for 0...550 $\Omega$ range 8.5 W for 551...1000 $\Omega$ range
Power dissipation, max	5.5 W (0...550 $\Omega$ loads) 6.1 W (551...1000 $\Omega$ loads)
Thermal dissipation	18.76 BTU/hr (0...550 $\Omega$ loads) 20.80 BTU/hr (551...1000 $\Omega$ loads)
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	0...1000 $\Omega$ Separate field terminations for 0...550 $\Omega$ and 551...1000 $\Omega$
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.1% of range from 4...21 mA
Calibration interval	6 months typical
Offset drift	1 $\mu$ A/°C typical
Gain drift with temperature, nom	60 ppm/°C
Gain drift with temperature, max	100 ppm/°C
Module error	0.6% of range
Module scan time, max	25 ms floating point 10 ms integer
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 161 - Environmental Specifications - 1756-OF6CI**

Attribute	1756-OF6CI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports



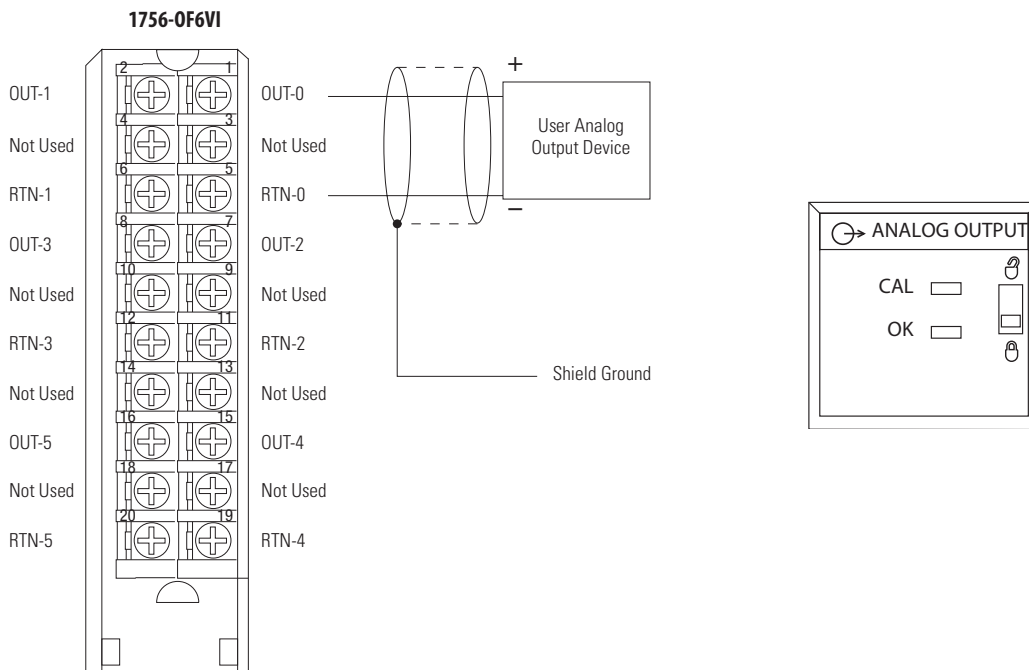
**Table 162 - Certifications - 1756-OF6CI**

Certification <sup>(1)</sup>	1756-OF6CI
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OF6VI

ControlLogix voltage loop output analog module



Place additional devices anywhere in the loop.

**Table 163 - Signal and User Counts - 1756-OF6VI**

Range	Low Signal and User Counts	High Signal and User Counts
±10V	-10.517V -32768 counts	10.517V 32767 counts

**Table 164 - Technical Specifications - 1756-OF6VI**

Attribute	1756-OF6VI
Outputs	6 individually isolated
Output range	± 10.5V
Resolution	14 bits across 21V (1.3 mV) (13 bits across 10.5V +sign bit)
Current draw @ 5.1V	250 mA
Current draw @ 24V	175 mA
Total backplane power	5.5 W
Power dissipation, max	4.85 W
Thermal dissipation	16.54 BTU/hr
Output impedance	<1 Ω
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited
Drive capability	> 1000 Ω loads, 10 mA
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.1% of range
Calibration interval	6 months typical
Offset drift	60 μV/ °C typical
Gain drift with temperature, nom	50 ppm/°C
Gain drift with temperature, max	80 ppm/°C
Module error	0.5% of range
Module scan time, max	25 ms floating point 10 ms integer
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>

**Table 164 - Technical Specifications - 1756-OF6VI (continued)**

Attribute	1756-OF6VI
North American temperature code	T4A
IEC temperature code	T4
Enclosure	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 165 - Environmental Specifications - 1756-OF6VI**

Attribute	1756-OF6VI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

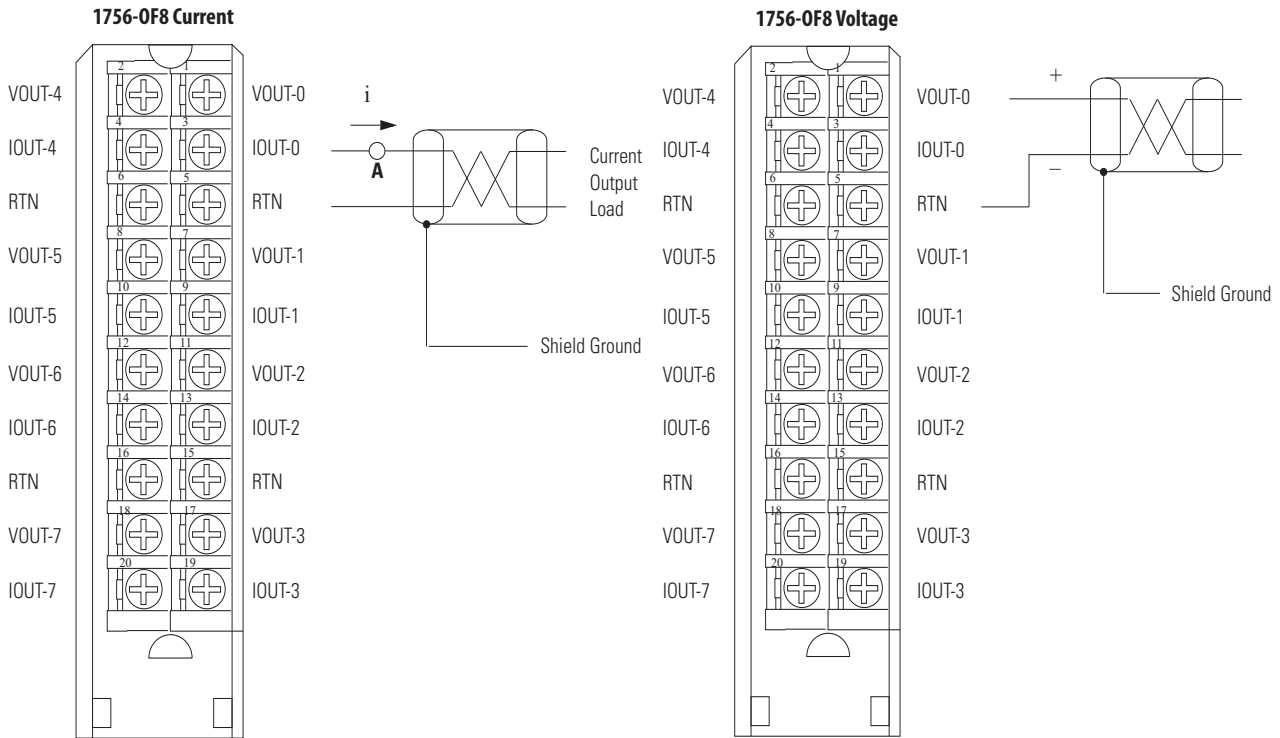
**Table 166 - Certifications - 1756-OF6VI**

<b>Certification<sup>(1)</sup></b>	<b>1756-OF6VI</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

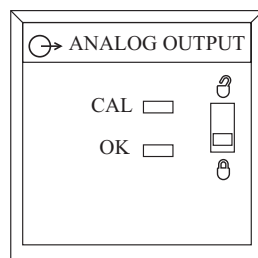
## 1756-0F8

### ControlLogix voltage/current output analog module



- Place additional loop devices (such as strip chart recorders) at the A location noted above.
- All terminals marked RTN are connected internally.

All terminals marked RTN are connected internally.



**Table 167 - Signal and User Counts - 1756-0F8**

Range	Low Signal and User Counts	High Signal and User Counts
0...20 mA	0 mA -32768 counts	21.2916 mA 32767 counts
±10V	-10.4336V -32768 counts	10.4336V 32767 counts

**Table 168 - Technical Specifications - 1756-OF8**

Attribute	1756-OF8
Outputs	8 voltage or current
Output range	$\pm 10V$ 0...20 mA
Resolution	15 bits across 21 mA - 650 nA/bit 15 bits across 10.4V - 320 $\mu V$ /bit
Current draw @ 5.1V	150 mA
Current draw @ 24V	210 mA
Total backplane power	5.8 W
Power dissipation, max	4.92 W, 8 channel current
Thermal dissipation	16.78 BTU/hr
Open circuit detection	Current output only (Output must be set to >0.1 mA)
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	Voltage: > 2000 $\Omega$ Current: 0...750 $\Omega$
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.05% of range from 4...21 mA, -10.4...10.4V
Calibration interval	12 months typical
Offset drift	50 $\mu V/^\circ C$ typical (Voltage mode) 0.1 $\mu A/^\circ C$ typical (Current mode)
Gain drift with temperature, max	Voltage: 25 ppm/ $^\circ C$ max Current: 50 ppm/ $^\circ C$ max
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module scan time, min	12 ms floating point 8 ms integer
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), reinforced insulation type, output channels-to-backplane No isolation between individual output channels Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 169 - Environmental Specifications - 1756-OF8**

Attribute	1756-OF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

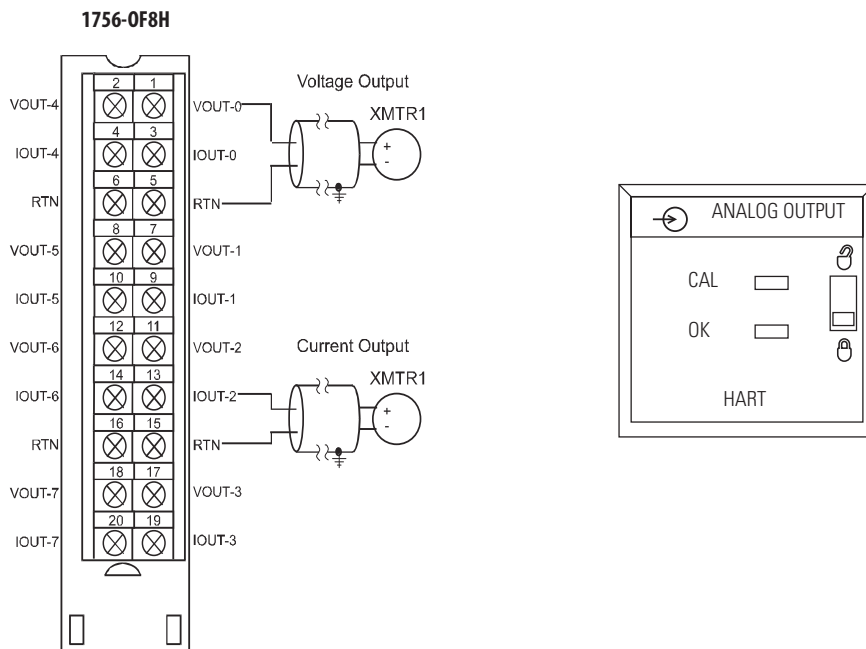
**Table 170 - Certifications - 1756-OF8**

Certification <sup>(1)</sup>	1756-OF8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-OF8H

ControlLogix voltage/current output analog module with HART protocol





**Table 171 - Signal and User Counts - 1756-OF8H**

Range	Low Signal and User Counts	High Signal and User Counts
0...20 mA	0 mA -32768 counts	21.2916 mA 32767 counts
±10V	-10.4336V -32768 counts	10.4336V 32767 counts

**Table 172 - Technical Specifications - 1756-OF8H**

Attribute	1756-OF8H
Outputs	8 voltage or current
Output range	±10V 0...20 mA 4...20 mA
Resolution	15...16 bits
Current draw @ 5V	200 mA
Current draw @ 24V	230 mA
Total backplane power	6.54 W
Power dissipation, max	4.92 W, 8 channel current
Thermal dissipation	16.78 BTU/hr
Output impedance	Voltage: >2 kΩ @ 10.4V Current: 50...750 Ω drive
Open circuit detection time	Current output only (output must be set to < 0.1mA)
Overvoltage protection, max	±24V DC
Drive capability	Voltage: > 2000 Ω @ 10.4V Current: 50...750 Ω with short circuit survival current
Load reactance, max	Voltage: 1 μF Current: 10 μH
Settling time	Current (no HART): < 23 ms to 95% with resistive loads Current (with HART): < 37 ms to 95% with resistive loads Voltage: < 8.5 ms to 95% with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Calibration interval	12 months typical
Offset drift	100 μV/°C typical 200 nA/°C typical
Gain drift with temperature	Voltage: 20 ppm/°C Current: 35 ppm/°C
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module output scan time, min	12 ms floating point
Module HART scan time	Typically 1 s per HART channel enabled Estimate 10 s if all 8 channels have HART enabled Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Data format	Integer mode (left justified, 2s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation

**Table 172 - Technical Specifications - 1756-OF8H (continued)**

Attribute	1756-OF8H
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	50V (continuous), basic insulation type, output channels-to-backplane No isolation between individual output channels Type tested at 1500V AC for 60 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 173 - Environmental Specifications - 1756-OF8H**

Attribute	1756-OF8H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 173 - Environmental Specifications - 1756-OF8H (continued)**

Attribute	1756-OF8H
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz. . . 80 MHz on shielded signal ports

**Table 174 - Certifications - 1756-OF8H**

Certification <sup>(1)</sup>	1756-OF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul>
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> <li>• II 3 G Ex nA IIC T4 Gc X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

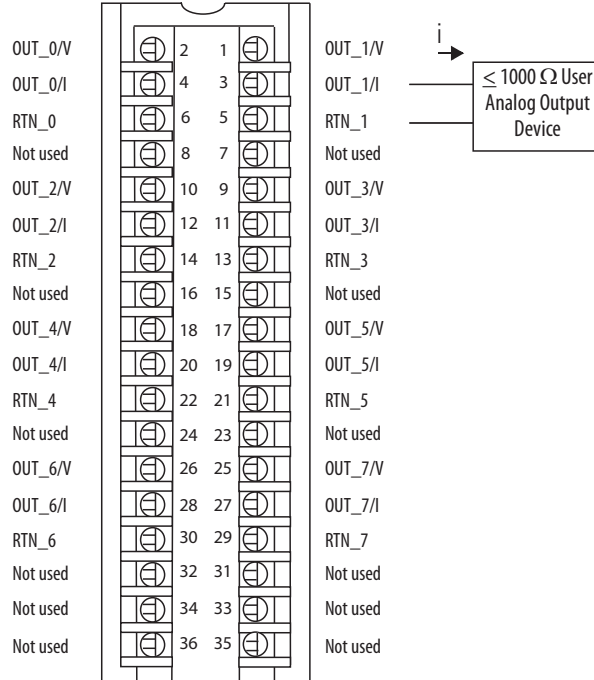
## 1756-0F8I

ControlLogix isolated voltage/current output analog module.

### 1756-0F8I Module Wiring Diagram - Current Mode

**IMPORTANT:** Remember the following:

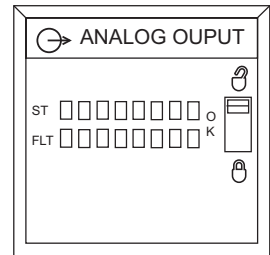
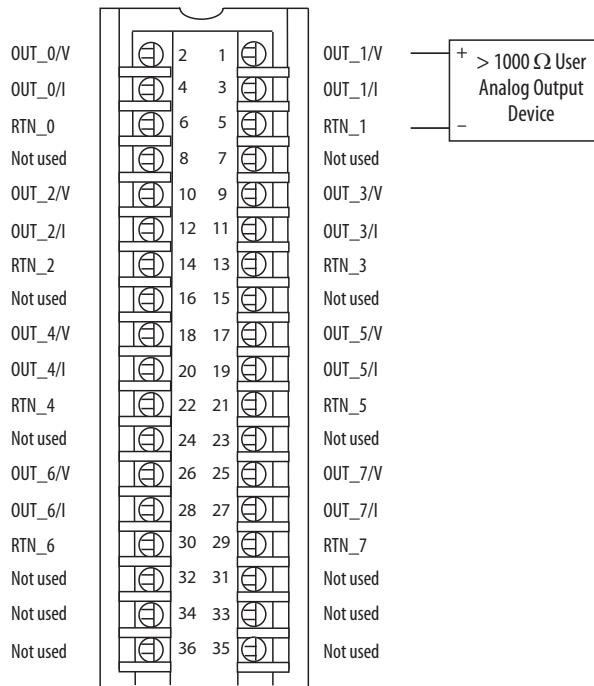
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional devices anywhere in the loop.



### 1756-0F8I Module Wiring Diagram - Voltage Mode

**IMPORTANT:** Remember the following:

- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional devices anywhere in the loop.



**Table 175 - Technical Specifications - 1756-OF8I**

Attribute	1756-OF8I
Outputs	8 isolated channels - Any combination of voltage or current mode
Output range	-10...10V 0...10V 0...5V 0...20 mA
Resolution	16-bit ±10.5V (0.32 mV/count) 0...10.5V (0.16 mV/count) 0...5.25V (0.08 mV/count) 0...21 mA (0.32 $\mu$ A/count)
Current draw @ 5.1V	200 mA
Current draw @ 24V	Voltage or Current mode with 250 $\Omega$ loads = 220 mA Current mode with 500 $\Omega$ loads = 275 mA Current mode with 750 $\Omega$ loads = 340 mA Current mode with 1000 $\Omega$ loads = 385 mA
Total backplane power	Voltage mode = 6.3 W Current mode with 250 $\Omega$ loads = 6.3 W Current mode with 500 $\Omega$ loads = 7.6 W Current mode with 750 $\Omega$ loads = 9.2 W Current mode with 1000 $\Omega$ loads = 10.2 W
Power dissipation, max	Voltage mode = 5.4 W Current mode with 250 $\Omega$ loads = 5.4 W Current mode with 500 $\Omega$ loads = 5.8 W Current mode with 750 $\Omega$ loads = 6.5 W Current mode with 1000 $\Omega$ loads = 6.7 W
Thermal dissipation	Voltage mode = 18.4 BTU/hr Current mode with 250 $\Omega$ loads = 18.4 BTU/hr Current mode with 500 $\Omega$ loads = 19.8 BTU/hr Current mode with 750 $\Omega$ loads = 22.2 BTU/hr Current mode with 1000 $\Omega$ loads = 22.9 BTU/hr
Output impedance	46 $\Omega$ (Current output)
Open circuit detection	Current output = Yes
Short circuit detection	Voltage output = Yes
Overvoltage protection	±30V DC (voltage/current)
Drive capability	Current output = 0...1000 $\Omega$ Voltage output = >1000 $\Omega$
Settling time	< 2 ms to 95% of final value with Resistive loads
Calibrated accuracy @ 25 °C (77 °F)	0.05%
Module error over full temperature range	0.1%
Module scan time, min	1 ms
Data format	IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes

**Table 175 - Technical Specifications - 1756-OF8I (continued)**

Attribute	1756-OF8I
Isolation voltage	250V (continuous), Reinforced Insulation Type, outputs to backplane 250V (continuous), Basic Insulation Type, output to output Type tested at 2300V AC for 60 s, outputs to backplane Type tested at 1500V AC for 60 s, output to output
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33... 2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 176 - Environmental Specifications - 1756-OF8I**

Attribute	1756-OF8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 176 - Environmental Specifications - 1756-OF8I**

Attribute	1756-OF8I
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

**Table 177 - Certifications - 1756-OF8I**

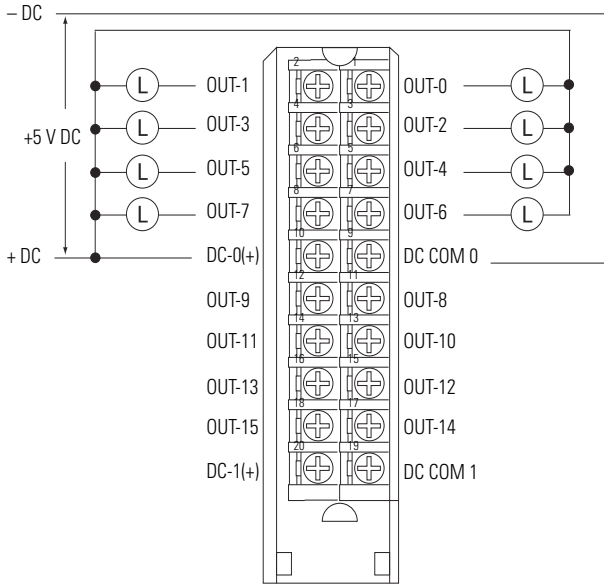
Certification <sup>(1)</sup>	1756-OF8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

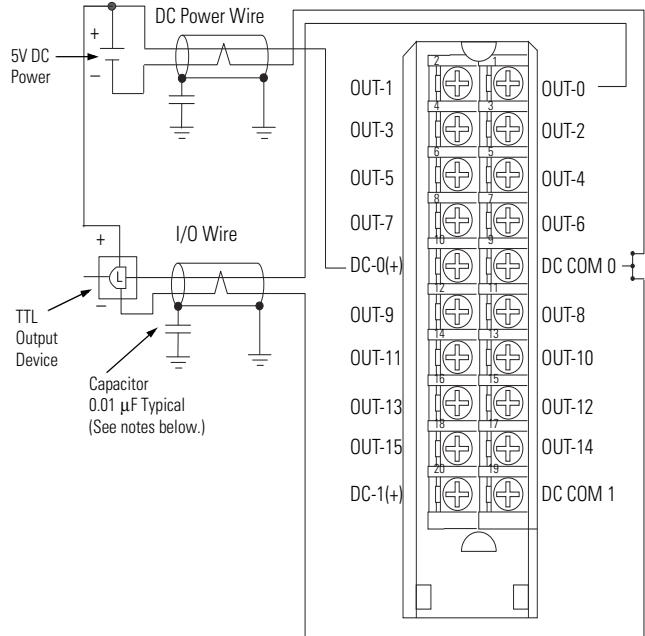
## 1756-0G16

### ControlLogix TTL output module

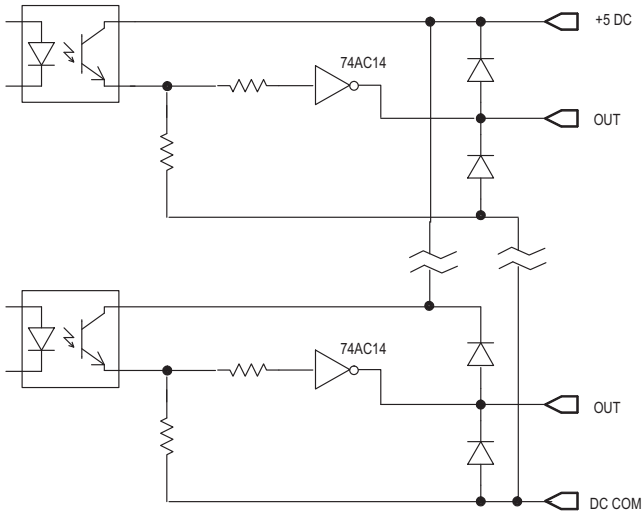
**1756-0G16 Standard Wiring**



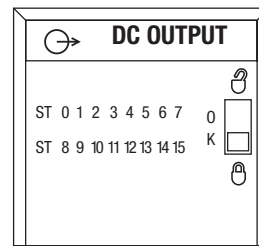
**1756-0G16 CE Compliant Wiring**



**Simplified Schematic**



**IMPORTANT:** I/O cables must be shielded type and cable length must be <10 m (32.8 ft) for maximum EMI noise immunity.



### Low to True Format - 1756-0G16

- 0...0.4V DC = Output guaranteed to be in on-state
- 0.4...4.5V DC = Output state not guaranteed
- 4.5...5.5V DC = Output guaranteed to be in off-state



**Table 178 - Technical Specifications - 1756-0G16**

Attribute	1756-0G16
Outputs	16 (8 points/group)
Voltage category	5V DC TTL (Low=TRUE <sup>(1)</sup> )
Operating voltage range	4.5 . . . 5.5V DC source, 50 mV P-P ripple max
Output delay time (resistive load) Off to On (5V-to-0V DC transition) On to Off (0V-to-5V DC transition)	45 $\mu$ s nom/450 $\mu$ s max 145 $\mu$ s nom/700 $\mu$ s max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Total backplane power	1.12 W
Power dissipation, max	1.5 W @ 60 °C (140 °F)
Thermal dissipation	5.2 BTU/hr @ 60 °C (140 °F)
Off-state leakage current per point, max	0.1 mA per point
On-state voltage drop, max	0.4V DC
Continuous current, max	24 mA
Load current per point, max	24 mA
Load current per module, max	384 mA
Load current	0.15 mA
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 <sup>(2)</sup>
North American temperature code	T5
IEC temperature code	T5
Enclosure type	None (open-style)

(1) TTL outputs are inverted (0 to +0.4V dc = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True - High logic.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 179 - Environmental Specifications - 1756-0G16**

Attribute	1756-0G16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

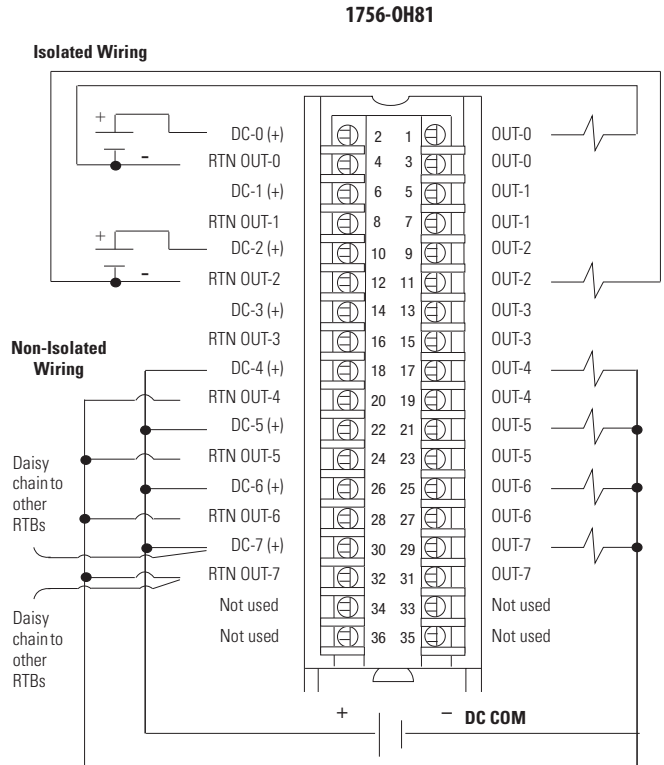
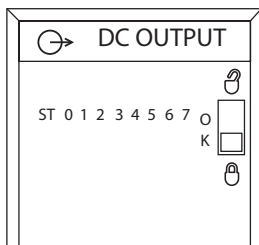
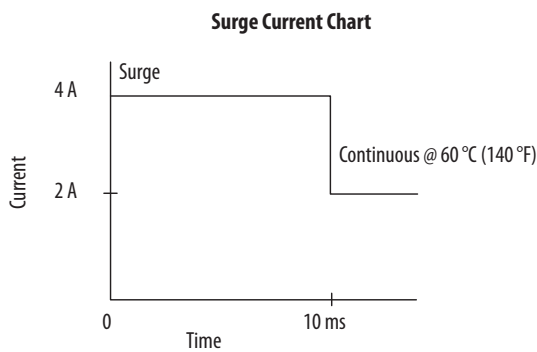
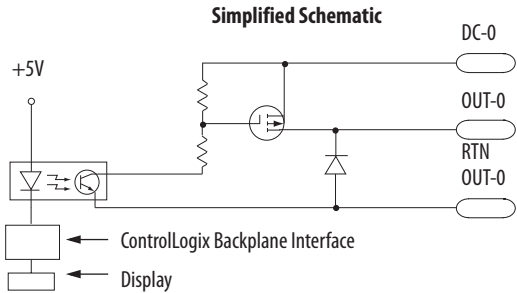
**Table 180 - Certifications - 1756-0G16**

Certification <sup>(1)</sup>	1756-0G16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul>
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IICT5 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-0H8I

ControlLogix DC (90...146V) isolated output module



**Table 181 - Technical Specifications - 1756-0H8I**

Attribute	1756-0H8I
Outputs	8 individually isolated
Voltage category	120V DC sink/source
Operating voltage range	90...146V DC
Output delay time	
Off to On	2 ms max
On to Off	2 ms max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA

**Table 181 - Technical Specifications - 1756-OH8I (continued)**

Attribute	1756-OH8I
Total backplane power	1.11 W
Power dissipation, max	3.3 W @ 60 °C (140 °F)
Thermal dissipation	11.25 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 182 - Environmental Specifications - 1756-OH8I**

Attribute	1756-OH8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g

**Table 182 - Environmental Specifications - 1756-OH8I (continued)**

Attribute	1756-OH8I
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

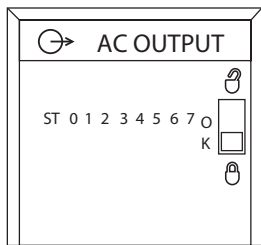
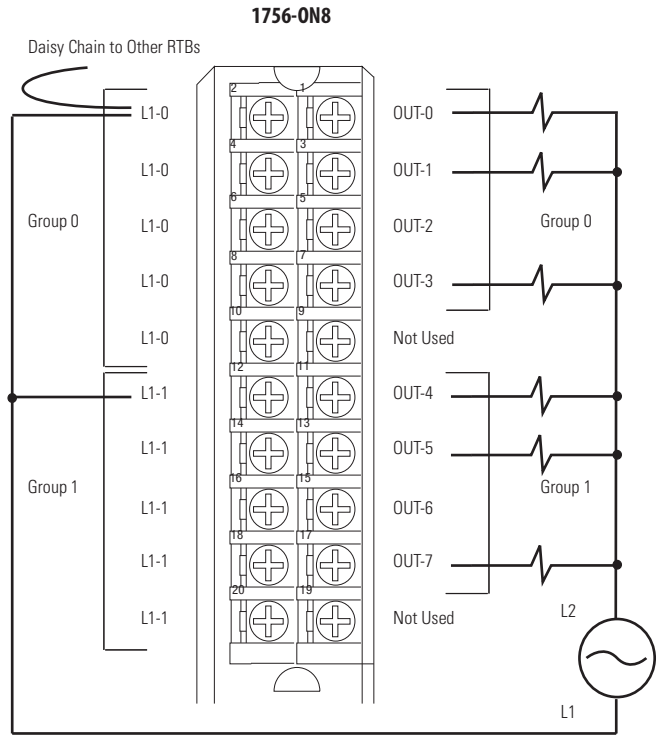
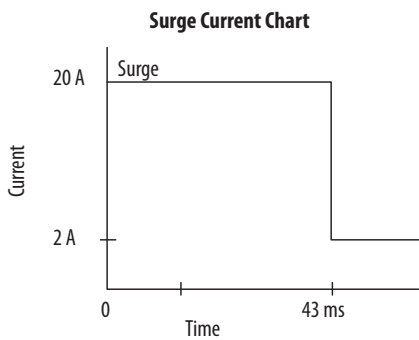
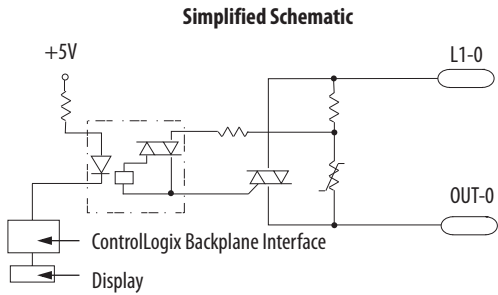
**Table 183 - Certifications - 1756-OH8I**

Certification <sup>(1)</sup>	1756-OH8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-0N8

ControlLogix 24V AC output module



**Table 184 - Technical Specifications - 1756-0N8**

Attribute	1756-0N8
Outputs	8 (4 points/group)
Voltage category	24V AC 50/60 Hz
Operating voltage range <sup>(1)</sup>	10...30V AC, current >50 mA, 47...63Hz 16...30V AC, current <50 mA, 47...63Hz
Output delay time	
Off to On	9.3 ms @ 60 Hz 11 ms @ 50 Hz
On to Off	9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	200 mA

**Table 184 - Technical Specifications - 1756-ON8 (continued)**

Attribute	1756-ON8
Current draw @ 24V	2 mA
Total backplane power	1.07 W
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.39 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ load current < 50 mA
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	5 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/μs for loads > 50 mA 0.2V/μs for loads < 50 mA <sup>(2)</sup>
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(3)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open style)

(1) UL certification for 24V 50/60 Hz nominal. Rockwell Automation specified to 10...30V, 47...63 Hz.

(2) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/μs for loads under 50 mA. The commutating dv/dt rating of the module for loads 50...500 mA (OUTPUT to L2) is 4V/μs maximum. If the commutating dv/dt rating of the TRIAC is exceeded, the TRIAC could latch on. If the commutating dv/dt rating is exceeded in the 10...50 mA range, a resistor may be added AC across the output and L2. The purpose of this resistor is to increase the total output current to 50 mA ( $I=V/R$ ). At 50 mA and above, the module has a higher commutating dv/dt rating. When adding a resistor for the output to L2, be sure it is rated for the power that it will dissipate ( $P=(V^2)/R$ ). If the commutating dv/dt rating is exceeded in the 50...500 mA range, the L1 AC waveform could be at fault. Be sure the waveform is a good sinusoid, void of any anomalies such as distorted or flattened sections.

(3) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 185 - Environmental Specifications - 1756-0N8**

Attribute	1756-0N8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



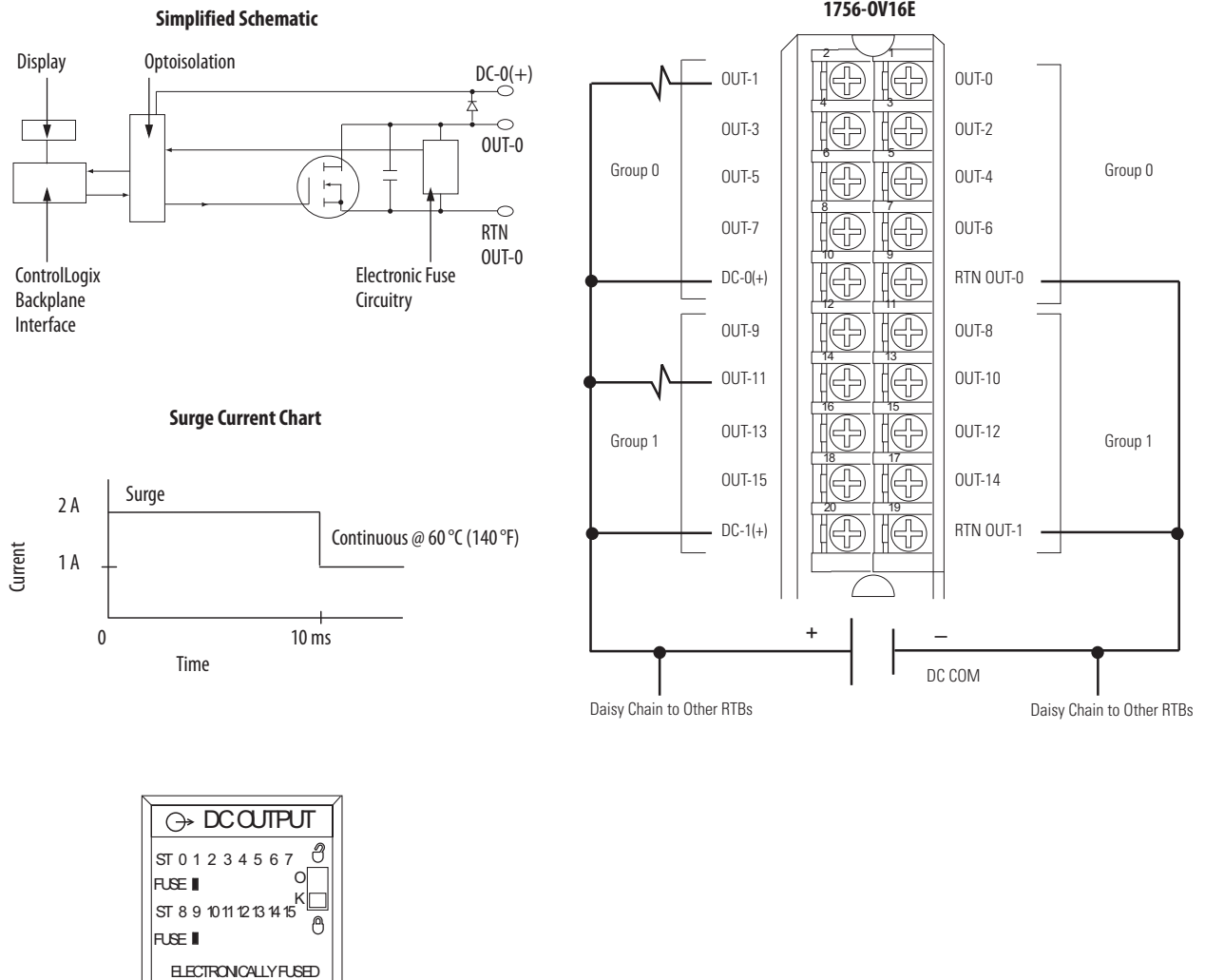
**Table 186 - Certifications - 1756-0N8**

<b>Certification<sup>(1)</sup></b>	<b>1756-0N8</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-0V16E

ControlLogix DC (10...30V) electronically-fused, sinking output module



**Table 187 - Diagnostic Specifications - 1756-0V16E**

Attribute	1756-0V16E
Short trip	5 A for 20 ms @ 24V DC (output on, then short) 5 A for 20 ms @ 24V DC (output on into short)
Time stamp of diagnostics	±1 ms

**Table 188 - Technical Specifications - 1756-OV16E**

Attribute	1756-OV16E
Outputs	16 electronically fused (8 points/group)
Pilot duty	1 A (DC-13/SR)
Voltage category	12/24V DC sink
Output delay time	
Off to On	75 $\mu$ s nom/1 ms max
On to Off	360 $\mu$ s nom/1 ms max
Operating voltage range	10...30V DC
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Total backplane power	1.12 W
Power dissipation, max	6.72 W @ 60 °C (140 °F)
Thermal dissipation	22.94 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	700 mV DC @ 1 A
Current per point, max	1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	2 A for 10 ms per Point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per group
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 189 - Environmental Specifications - 1756-0V16E**

Attribute	1756-0V16E
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

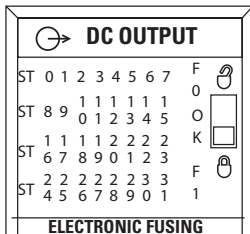
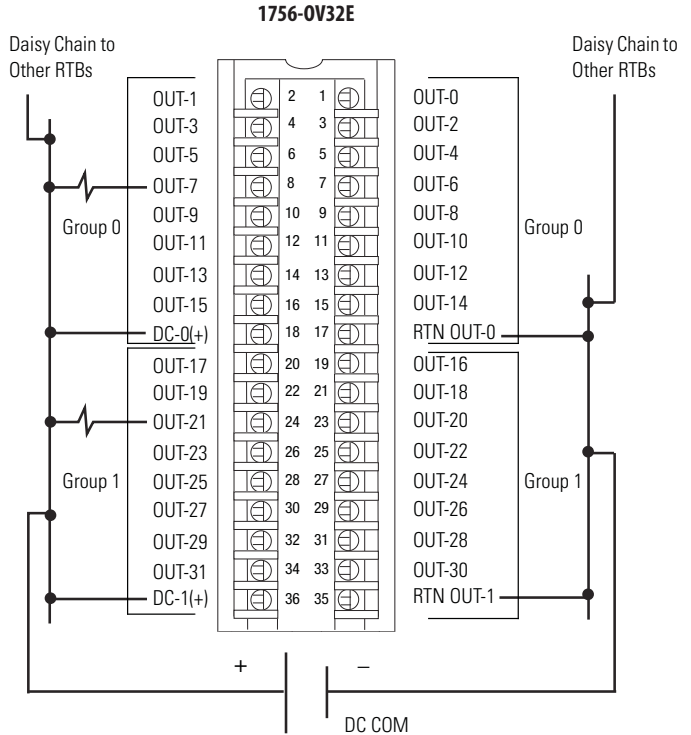
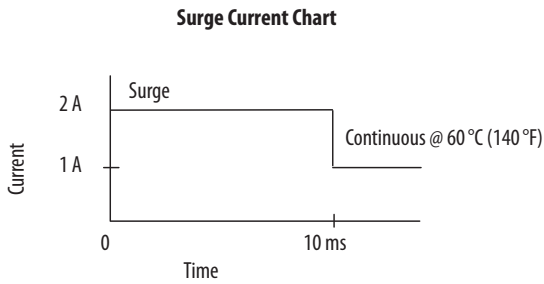
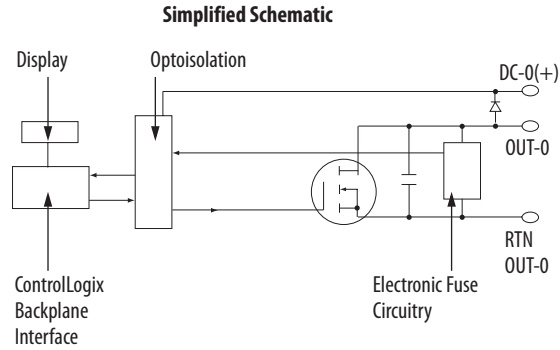
**Table 190 - Certifications - 1756-0V16E**

<b>Certification<sup>(1)</sup></b>	<b>1756-0V16E</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-0V32E

ControlLogix DC (10...30V) electronically-fused, sinking output module



**Table 191 - Diagnostic Specifications - 1756-0V32E**

Attribute	1756-0V32E
Short trip	5 A for 20 ms @ 24V DC (output on then short) 5 A for 20 ms @ 24V DC (output into short)
Time stamp of diagnostics	±1 ms

**Table 192 - Technical Specifications - 1756-0V32E**

Attribute	1756-0V32E
Outputs	32 electronically fused (16 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10...30V DC
Output delay time (24V to 0V DC transition)	
Off to On	75 $\mu$ s nom/300 $\mu$ s max
On to Off	230 $\mu$ s nom/1 ms max
Current draw @ 5.1V	390 mA
Current draw @ 24V	2 mA
Total backplane power	2.04 W
Power dissipation, max	5.88 W @ 60 °C (140 °F)
Thermal dissipation	20.1 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	350 mV DC @ 0.5 A
Current per point, max	0.5 A @ 50 °C (122 °F) linear derating 0.35 A @ 60 °C (140 °F)
Current per group, max	8 A @ 50 °C (122 °F) linear derating 5 A @ 60 °C (140 °F)
Current per module, max	16 A @ 50 °C (122 °F) linear derating 10 A @ 60 °C (140 °F)
Surge current per point	2 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	2 mA per output
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per group
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 193 - Environmental Specifications - 1756-0V32E**

Attribute	1756-0V32E
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz



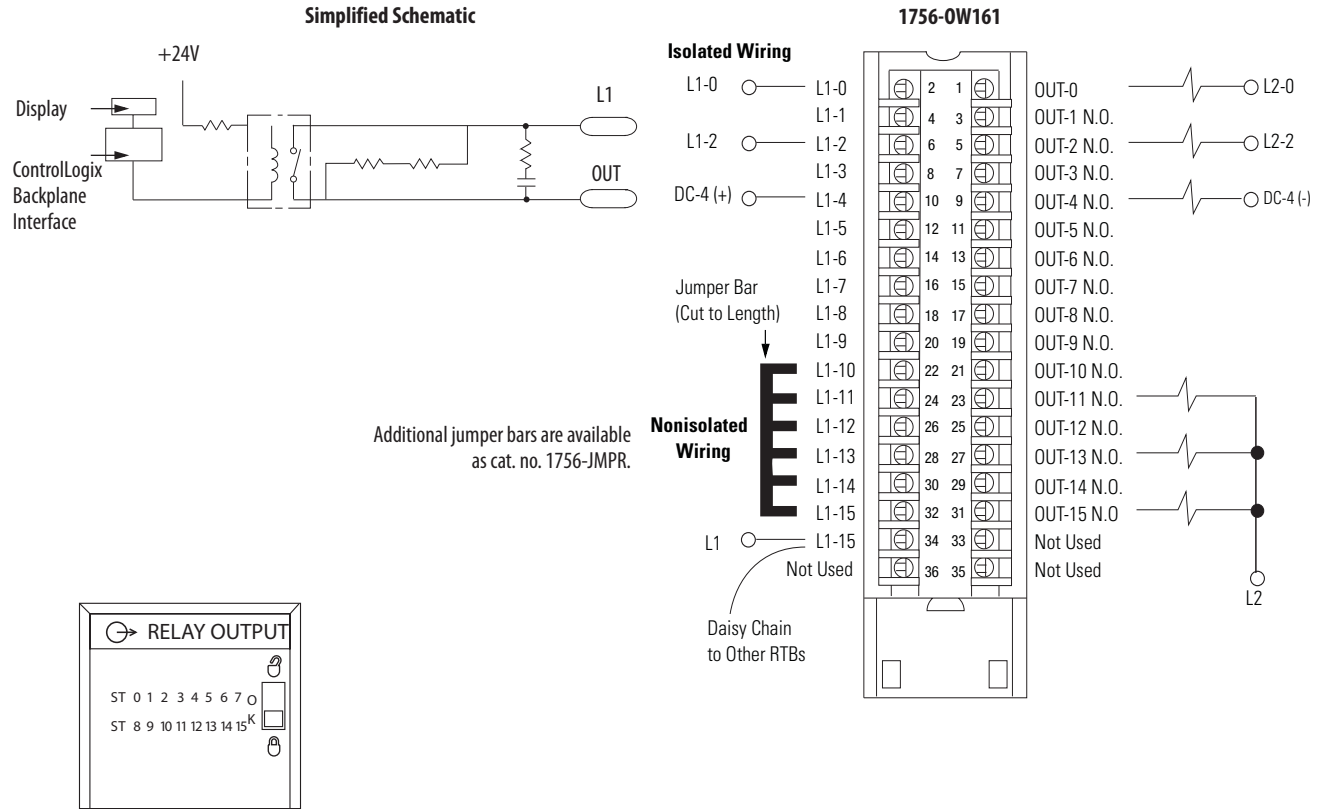
**Table 194 - Certifications - 1756-0V32E**

<b>Certification<sup>(1)</sup></b>	<b>1756-0V32E</b>
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

# 1756-0W16I

ControlLogix AC (10...240V) DC (5...125V) isolated contact module



**Table 195 - Technical Specifications - 1756-0W16I**

Attribute	1756-0W16I
Outputs	16 N.O. individually isolated
Pilot duty	C300/R150
Operating voltage range	5...125V DC 10...240V AC
Output voltage range (load dependent)	1 A @ 5...30V DC 0.5 A @ 48V DC 0.22 A @ 125V DC 1.5A @ 120V AC 50/60 Hz 0.75A @ 240V AC 50/60 Hz
Output delay time	
Off to On	10 ms max
On to Off	10 ms max
Current draw @ 5.1V	150 mA
Current draw @ 24V	150 mA
Total backplane power	4.4 W
Power dissipation, max	4.5 W @ 60 °C (140 °F)

**Table 195 - Technical Specifications - 1756-OW16I (continued)**

Attribute	1756-OW16I
Thermal dissipation	15.35 BTU/hr
Off-state leakage current per point, max	1.5 mA per point
Minimum load current	10 mA per point
Initial contact resistance, max	100 mΩ @ 6V 1 A
Switching frequency, max	1 operation/3 s (0.3 Hz at rated load)
Bounce time, mean	1.2 ms
Expected contact life	300 K cycles resistive 100 K cycles inductive
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM can be used to protect outputs. See publication <a href="#">1492-TD008</a> . However, the ControlLogix system has been agency certified using only the ControlLogix RTBs, that is, 1756-TBCH, 1756-TBNH, 1756-TBSH, and 1756-TBS6H. Any application that requires agency certification of the ControlLogix system using other wiring termination methods may require application-specific approval by the certifying agency.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 196 - Environmental Specifications - 1756-OW16I**

Attribute	1756-OW16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g

**Table 196 - Environmental Specifications - 1756-0W16I (continued)**

Attribute	1756-0W16I
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 197 - Certifications - 1756-0W16I**

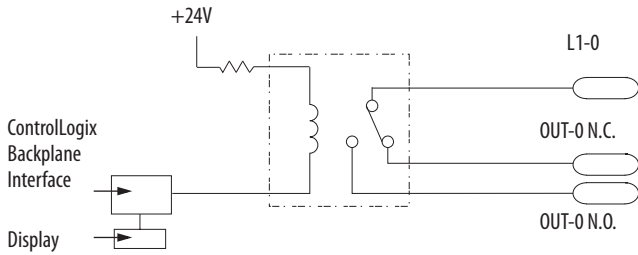
Certification <sup>(1)</sup>	1756-0W16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

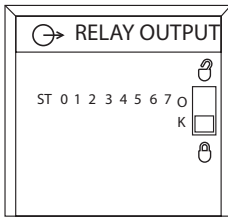
# 1756-0X81

ControlLogix AC (10...240V) DC (5...125V) isolated contact module

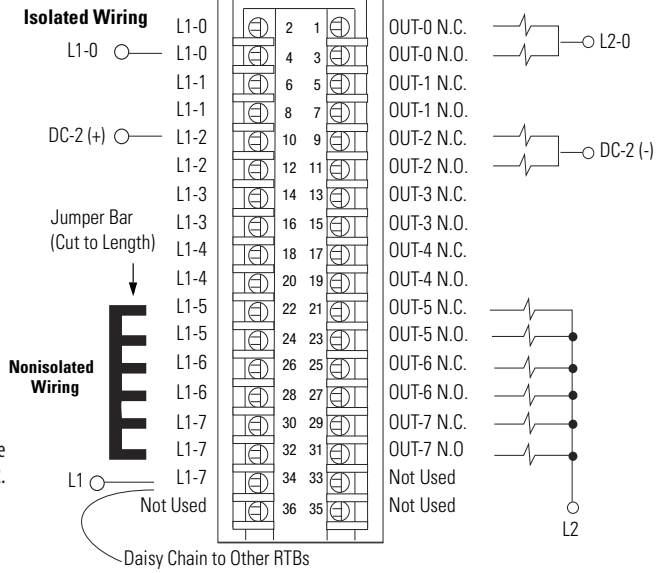
**Simplified Schematic**



Additional jumper bars are available as cat. no. 1756-JMPR.



**1756-0X81**



**Table 198 - Technical Specifications - 1756-0X8I**

Attribute	1756-0X8I
Outputs	8 N.O. 8 N.C. individually isolated (2 points per group)
Pilot duty	C300/R150
Operating voltage range	5...125V DC 10...240V AC
Contact current rating	1 A @ 5...30V DC 0.5 A @ 48V DC 0.22 A @ 125V DC 1.5A @ 120VAC 50/60 Hz 0.75A @ 240VAC 50/60 Hz
Output delay time Off to On On to Off	13 ms max 13 ms max
Current draw @ 5.1V	100 mA
Current draw @ 24V	100 mA
Total backplane power	2.9 W
Power dissipation, max	3.1 W @ 60 °C (140 °F)
Thermal dissipation	10.57 BTU/hr
Off-state leakage current per point, max	0 mA
Minimum load current	10 mA per point
Initial contact resistance, max	100 mΩ @ 6V 1 A
Switching frequency, max	1 operation/3 s (0.3 Hz at rated load)
Bounce time, mean	1.2 ms
Expected contact life	300 K cycles resistive 100 K cycles inductive
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 <sup>(1)</sup>
North American temperature code	T4A
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 199 - Environmental Specifications - 1756-0X8I**

Attribute	1756-0X8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

**Table 200 - Certifications - 1756-0X8I**

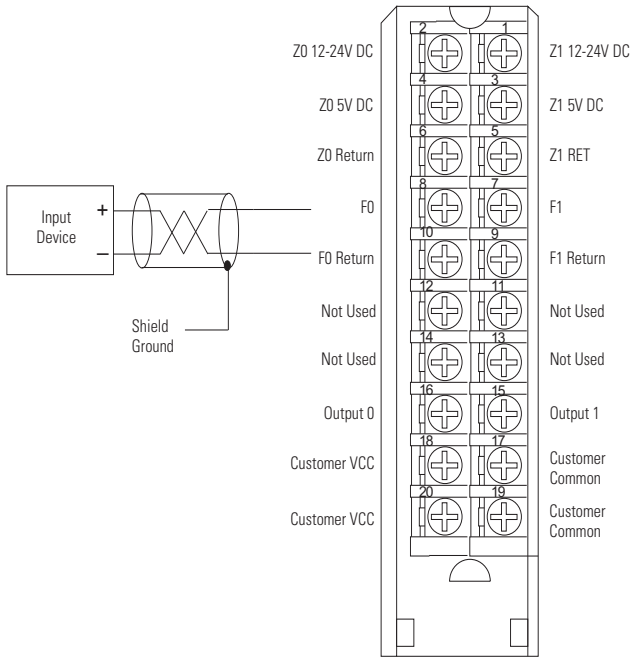
Certification <sup>(1)</sup>	1756-0X8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

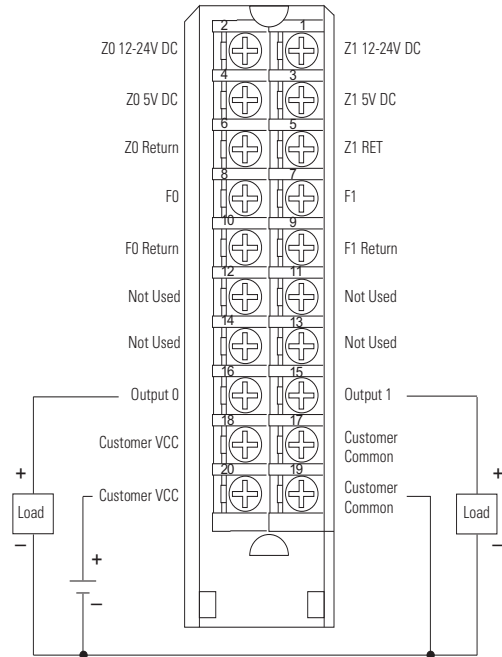
## 1756-CFM

ControlLogix configurable flow meter module

**1756-CFM Standard Magnetic Pickup**



**1756-CFM Standard Output**

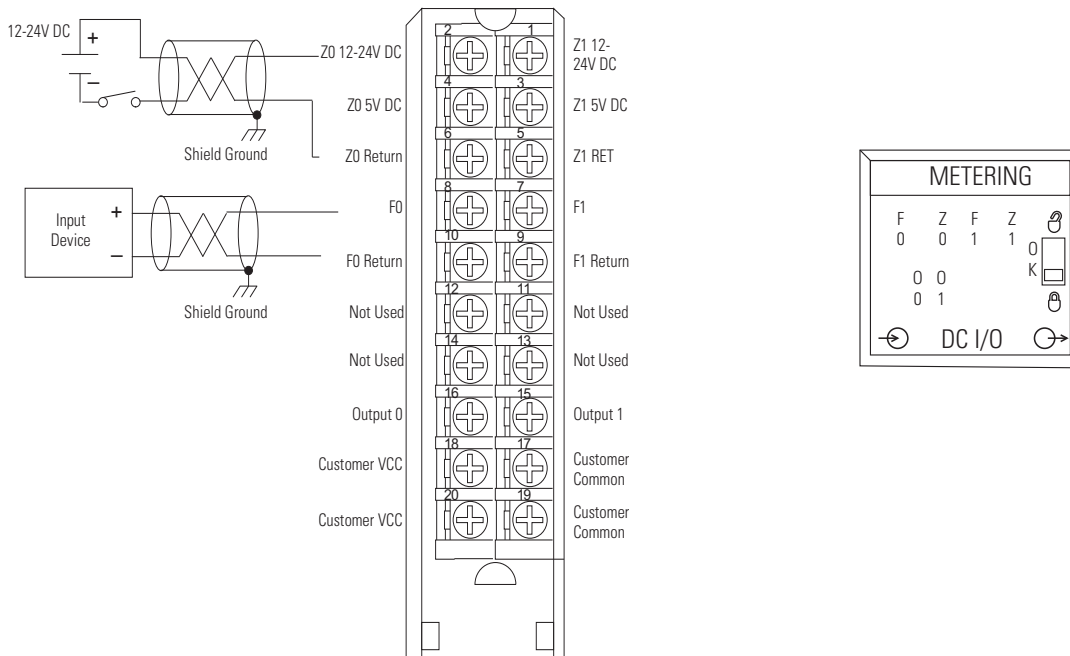


This wiring diagram can be used in applications with 50 mV (magnetic pickup), 1.3V (TTL), or 4V (preamp level) thresholds. You must use RSLogix™ 5000 software to choose the appropriate threshold level for your specific application.



The 1756-CFM module provides Totalizer mode for metering applications, or high-speed frequency measurements for speed or rate control applications, on two channels connected to flowmeters.

**1756-CFM Standard Prover/Store Count**



- Detectors 1 and 2 must be wired in parallel.
- Customer VCC may be used to power detectors. In this case, though, the maximum current on the wiring arm must be less than 4 A.
- The wiring example above shows a 12-24V DC standard prover connected to the module. If you use a 5V DC standard prover, make sure the positive wire is connected to the 5V terminal (such as Z0 5V DC).

**Table 201 - Technical Specifications - 1756-CFM**

Attribute	1756-CFM
Inputs	4 (2 per channel)
Inputs per channel	2 flowmeter (F) inputs used for all modes 2 gate inputs used in Totalizer mode for prover/store count
Outputs	2 current sourcing
Current draw at 5.1V	300 mA
Current draw at 24V	16 mA
Total backplane power	1.7 W
Power dissipation, max	6 W @ 60 °C (140 °F)
Thermal dissipation	20.4 BTU/hr
Isolation voltage	250V (continuous), reinforced insulation type, I/O-to-backplane 250V (continuous), basic insulation type, I/O group-to-group Routine tested at 1900V DC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical

**Table 201 - Technical Specifications - 1756-CFM (continued)**

Attribute	1756-CFM
Slot width	1
Wire category	2 on signal ports 1 on power ports <sup>(1)</sup>
North American temperature code	T4
Enclosure type	None (open-style)
Totalizer fill and prover	Yes
High resolution, max	100 kHz
Frequency	0.0005 Hz resolution
Reverse polarity protection	Outputs only

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 202 - Input Specifications - 1756-CFM**

Attributes	1756-CFM
Inputs	4 (2 per channel)
Inputs per channel	2 flowmeter (F) inputs used for all modes 2 gate inputs used in Totalizer mode for prover/store count
Count range, max	2,147,483,647
Input frequency, max	100 kHz @ flowmeter inputs (overrange occurs at 100 kHz)
Flowmeter input voltage	±30V, selectable input thresholds of 50 mV, 1.3V and 4V: • ±30V peak unterminated open circuit voltage, magnetic pickup • TTL compatible, input voltage >1.3V DC is Logic 1 and -0.7...1.3V DC is Logic 0 • 12...24V DC powered preamp output, 4V DC threshold
Flowmeter input impedance	5 k $\Omega$ ±30% resistive
Filtering (inputs F0 & F1)	Firmware selectable: High-speed 100 kHz or low-pass filter for frequencies < 70 Hz
Gate input voltage range	5V operation: 4.5...5.5V DC 12/24V operation: 10...26.4V DC
Gate input on-state current, min	4 mA
Gate input on-state current, nom	15 mA
Mechanical filter debouncing (Z0 & Z1 Inputs)	Software selectable
Input sampling period	User selectable

**Table 203 - Output Specifications - 1756-CFM**

Attribute	1756-CFM
Outputs	2 current sourcing
Output voltage source	Customer supplied
Output voltage range, nom <sup>(1)</sup>	5V operation: 4.5...5.5V DC for 3...20 mA load per point 12/24V operation: 10...31.2V DC for 40 mA...1 A load per point
Output type	IEC 1A 24V DC
Output Current per point <sup>(1)</sup>	1 A @ 10...31.2V DC 20 mA @ 4.5...5.5V DC <sup>(2)</sup>
Surge current	2 A for 50 ms, repeatable every 2 s
Off-state leakage current, max	< 300 $\mu$ A @ 31.2V DC
On-state voltage drop, max	0.6 $\Omega$ x current
Output control	Any number of outputs is assignable to any of 2 flowmeter channels Each output can have 2 "turn-on" and "turn-off" preset values
Output switching time	< 50 $\mu$ s turn on, <300 $\mu$ s turn off Outputs triggered by Total; all other "turn-on" and "turn-off" times <1ms
Overload current	Electronic (< 4A)
Output short circuit protection	Electronic (No indication of fault. Remove overload and toggle output on/off to restore.)
Output reverse polarity protection	Yes (If wired incorrectly, module outputs may be permanently disabled.)

(1) UL rating for 24V DC, 24VA.

(2) All outputs can be on simultaneously without derating.

**Table 204 - Environmental Specifications - 1756-CFM**

Attribute	1756-CFM
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1k Hz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz

**Table 204 - Environmental Specifications - 1756-CFM (continued)**

Attribute	1756-CFM
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on unshielded output and power ports ±4 kV at 5 kHz on shielded input ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on unshielded output and power ports ±2 kV line-earth (CM) on shielded input ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz . . . 80 MHz on shielded signal ports

**Table 205 - Certifications - 1756-CFM**

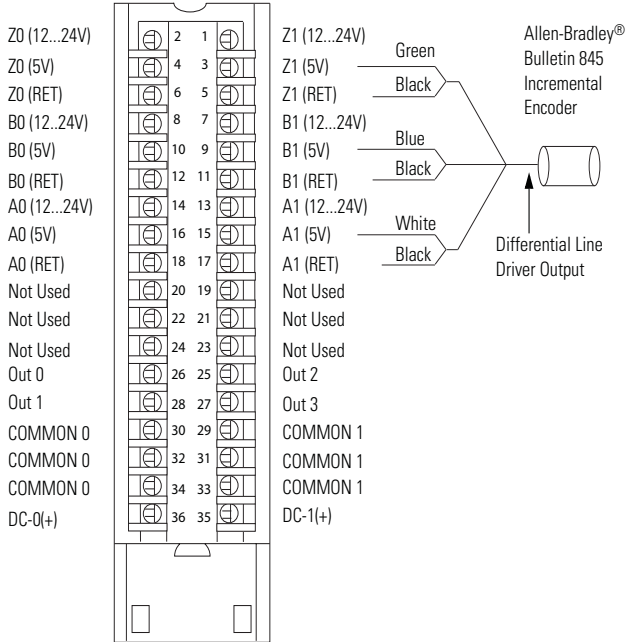
Certification <sup>(1)</sup>	1756-CFM
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>• EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>• EN 61000-6-2; Industrial Immunity</li> <li>• EN 61000-6-4; Industrial Emissions</li> <li>• EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

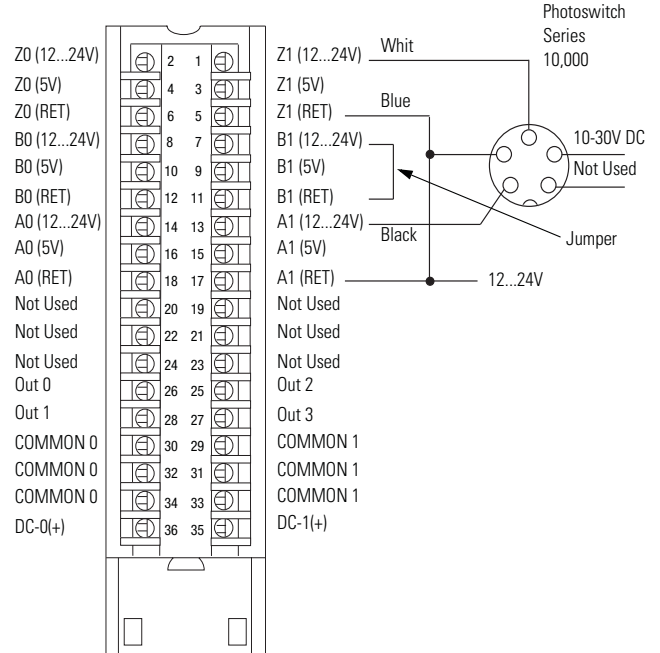
# 1756-HSC

## ControlLogix high-speed counter module

**1756-HSC to Allen-Bradley 845 Incremental Encoder**

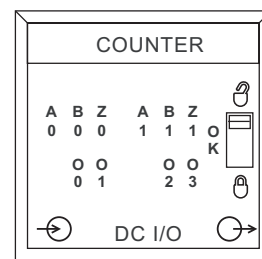
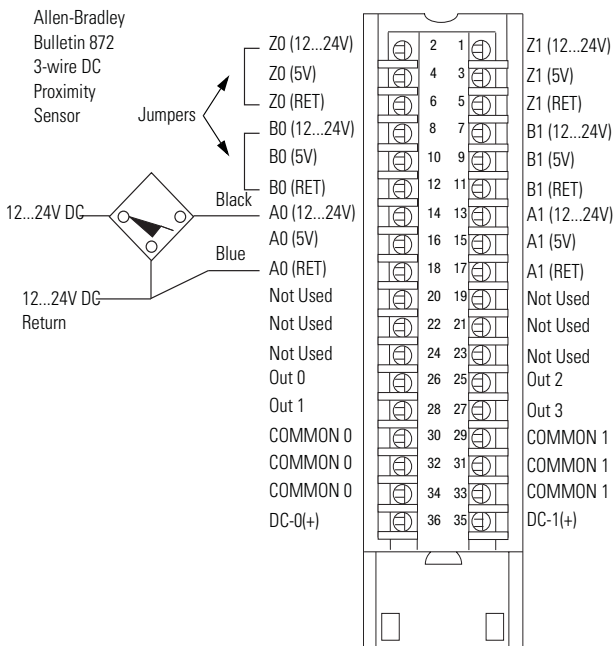


**1756-HSC to Allen-Bradley Series 10,000 Photoelectric Sensor**



The 1756-HSC module provides four high-speed, output-switching, on-off windows. The module uses pulses for counting and frequency.

**1756-HSC to Allen-Bradley 8723-wire DC Proximity Sensor**



**Table 206 - Technical Specifications - 1756-HSC**

Attribute	1756-HSC
Number of counters	2
Inputs per counter	3 (A, B, Z for gate/reset)
Outputs	4 (2 points/group)
Operating voltage range <sup>(1)</sup>	5V operation: 4.5...5.5V DC 12/24V operation: 10...26.4V DC
Current draw at 5.1V	300 mA
Current draw at 24V	3 mA
Total backplane power	1.6 W
Power dissipation, max	5.6 W @ 60 °C (140 °F)
Thermal dissipation	19.1 BTU/hr
Isolation voltage	125V (continuous), basic insulation type, input group-to-backplane 30V (continuous), basic insulation type, input group-to-input group Routine tested at 1900V DC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 on signal ports 1 on power ports <sup>(2)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

(1) UL rating is 24V DC.

(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 207 - Input Specifications - 1756-HSC**

Attribute	1756-HSC
Number of counters	2
Inputs per counter	3 (A, B, Z for gate/reset)
Input frequency, max	1 MHz in counter modes (A input) 500 kHz in rate measurement mode (A input) 250 kHz in encoder mode (A/B inputs, X1 or X4) 70 Hz with filter enabled
Count range	0...16,777,214
Counting frequency, max	1000 kHz
Input current, min	4 mA
Input current, nom	15 mA

**Table 208 - Output Specifications - 1756-HSC**

Attribute	1756-HSC
Outputs	4 (2 per common)
Output delay time Off to On On to Off	20 $\mu$ s nom/50 $\mu$ s max 60 $\mu$ s nom/300 $\mu$ s max
Off-state leakage current per point, max	300 $\mu$ A
On-state voltage drop, max	0.55V
Output current rating, per point <sup>(1)</sup>	20 mA @ 4.5...5.5V DC 1.0 A @ 10...31.2V DC
Current limit	< 4 A
Surge current per point	2 A for 10 ms every 1s @ 60 °C (140 °F)
Load current per point, min	5V operation: 3 mA 12/24V operation: 40 mA
Output control	Up to two outputs are assigned to each counter channel Each output can have two 'turn-on' and 'turn-off' preset values
Short circuit protection	Electronic (Remove overload and toggle On/Off to restore.)
Reverse polarity protection	Yes (If wired incorrectly, module outputs may be permanently disabled.)
Counter, max	1 MHz
Rate measurement, max	500 kHz
Encoder, max	250 kHz
Debounce filter, max	70 Hz

(1) UL rating is 24V DC, 24VA.

**Table 209 - Environmental Specifications - 1756-HSC**

Attribute	1756-HSC
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

**Table 209 - Environmental Specifications - 1756-HSC (continued)**

Attribute	1756-HSC
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000... 2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on power ports ±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on power ports ±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports ±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz... 80 MHz on shielded signal ports

**Table 210 - Certifications - 1756-HSC**

Certification <sup>(1)</sup>	1756-HSC
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

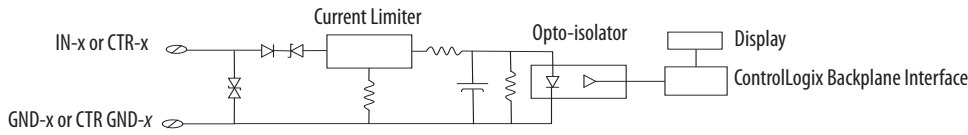
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.



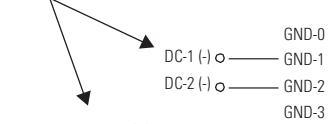
# 1756-LSC8XIB8I

ControlLogix 10...30V low-speed counter module

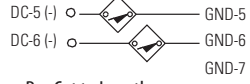
### Simplified Schematic



### Isolated Wiring



### Source Input Wiring



### Jumper Bar Cut to Length



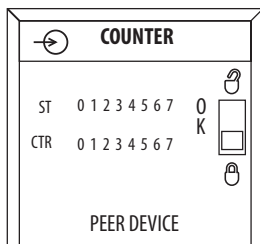
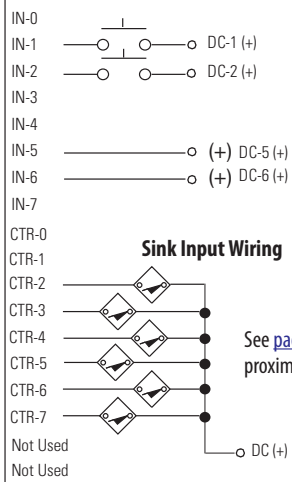
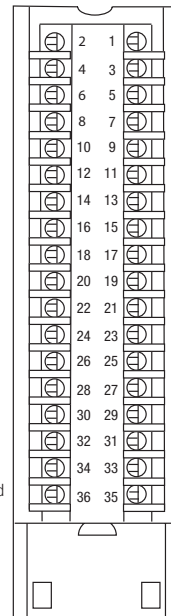
### Nonisolated Wiring



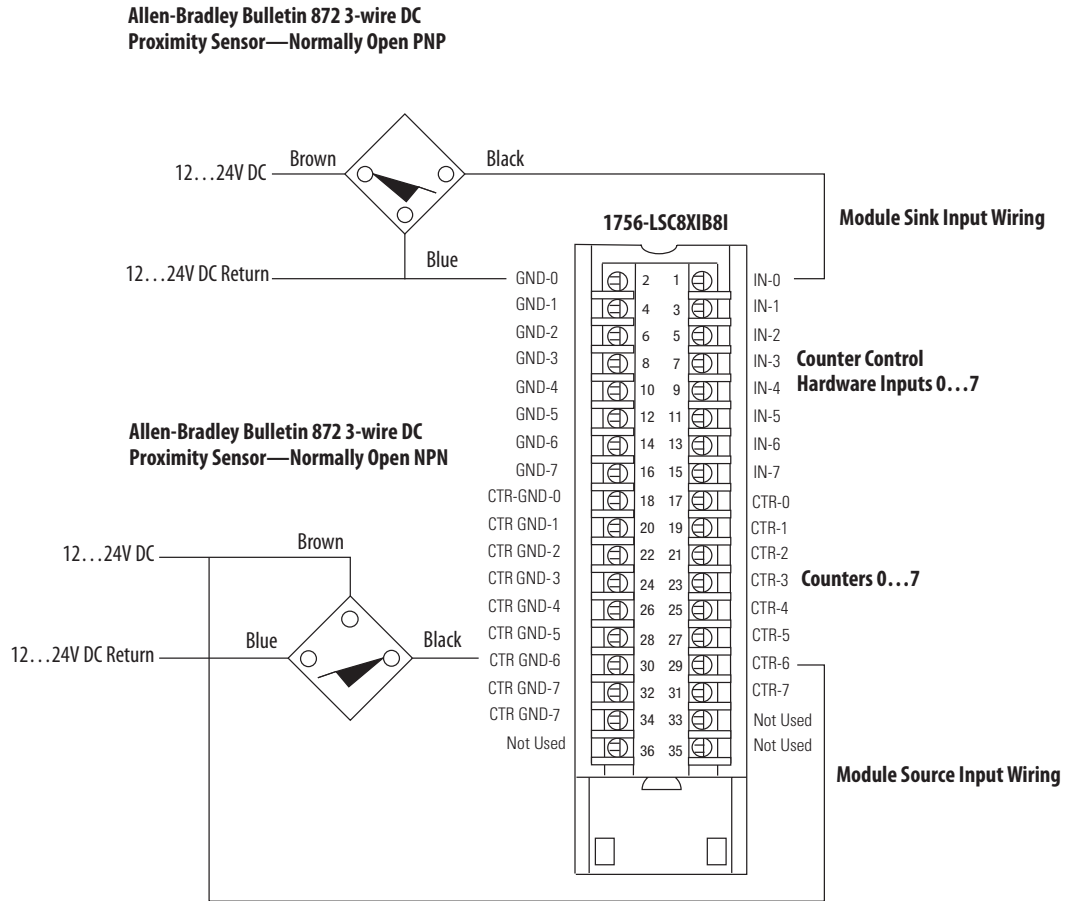
Additional jumper bars may be purchased by using catalog number 1756-JMPR.

Daisy Chain to Other RTBs

### 1756-LSC8XIB8I



The following diagram shows how to wire a proximity sensor to the module's eight counters or eight hardware inputs. Counters use incoming pulses for counts and frequency with two user-configurable On/Off windows per counter. Hardware inputs provide standard input or counter control functionality. Hardware inputs provide standard input or counter control functionality.



**Table 211 - Counter Specifications - 1756-LSC8XIB8I**

Attribute	1756-LSC8XIB8I
Number of counters	8 individually isolated
Counting frequency, max	40 kHz
Count range	0...2,147,483,648 (31-bit counter)
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10 V DC
On-state current, max	5 mA @ 30V DC
Change of state	Enter or exit user-configurable windows

**Table 212 - Hardware Input Specifications - 1756-LSC8XIB8I**

Attribute	1756-LSC8XIB8I
Inputs	8 individually isolated, standard input or counter control functionality
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane)	
Off to On	14 $\mu$ s nom/23 $\mu$ s max + user-configurable filter time of 0...30,000 $\mu$ s
On to Off	14 $\mu$ s nom/23 $\mu$ s max + user-configurable filter time of 0...30,000 $\mu$ s
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	5 mA @ 30V DC
Change of state	Any transition

**Table 213 - Module Specifications - 1756-LSC8XIB8I**

Attribute	1756-LSC8XIB8I
Current draw @ 5.1V	275 mA
Current draw @ 24V	3 mA
Total backplane power	1.47 W
Power dissipation	3.8 W @ 60 °C (140 °F)
Thermal dissipation	12.97 BTU/hr
Input impedance, max	6 k $\Omega$ @ 30V DC
Cyclic update time	200 $\mu$ s...750 ms
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane 250V (continuous), basic insulation type, input-to-input Type tested @ 2300V AC for 60 s inputs-to-backplane Type tested @ 1500V AC for 60 s input-to-input
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports <sup>(1)</sup>
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 214 - Environmental Specifications - 1756-LSC8XIB8I**

Attribute	1756-LSC8XIB8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

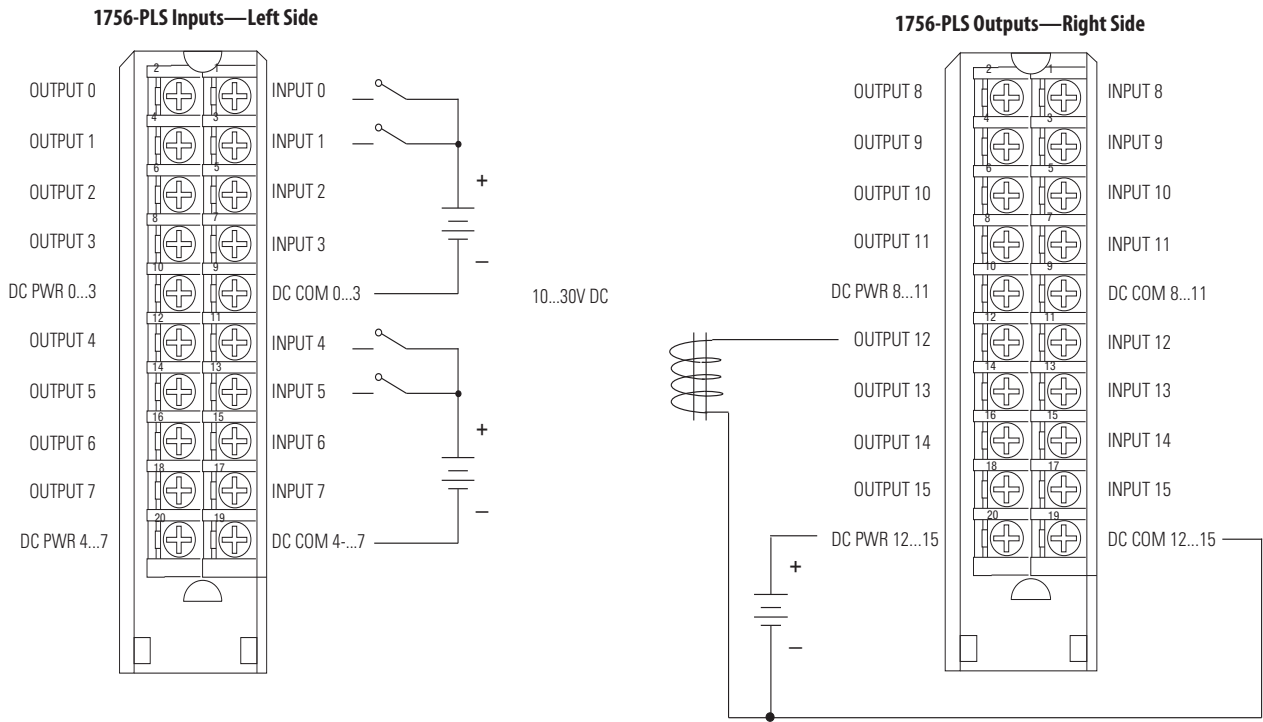
**Table 215 - Certifications - 1756-LSC8XIB8I**

Certification <sup>(1)</sup>	1756-LSC8XIB8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc</li> </ul>
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3

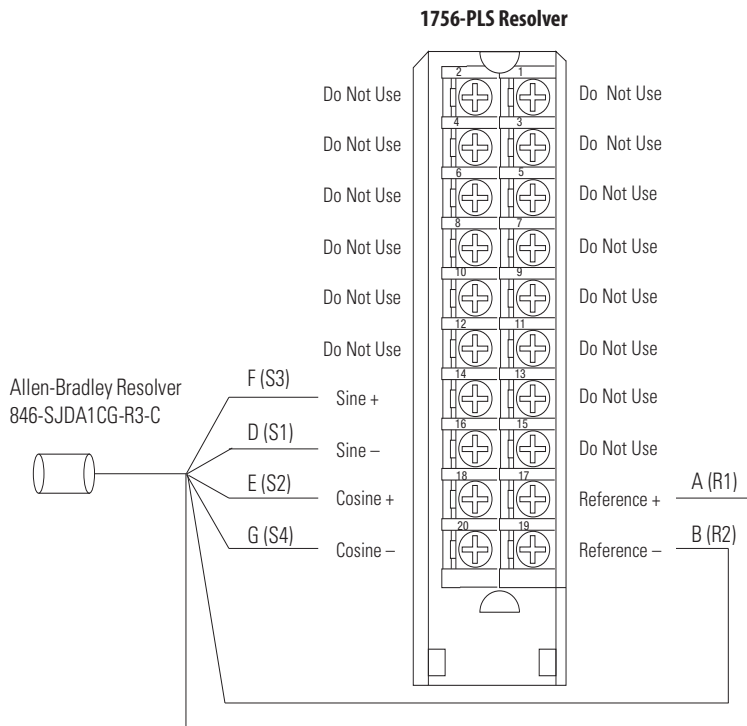
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## 1756-PLS

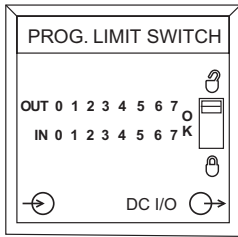
ControlLogix programmable limit switch module



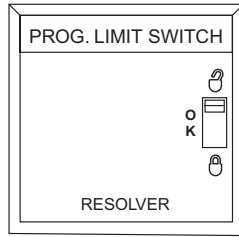
The 1756-PLS module supports enhanced packaging applications. The module requires three contiguous slots in the chassis.



Indicator for Left Slot I/O Module



Indicator for Left Resolver Module



Indicator for Right Slot I/O Module

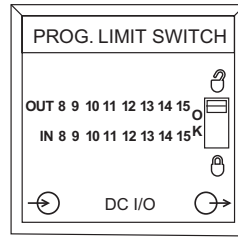


Table 216 - Technical Specifications - 1756-PLS

Attribute	1756-PLS
Module configuration	Left section: 2 groups of 4 outputs and 4 inputs each Center section: resolver interface and I/O control Right section: 2 groups of 4 outputs and 4 inputs each
Current draw at 5.1V	1 A
Current draw at 24V	125 mA
Total backplane power	8.1 W
Power dissipation, nom	22.62 W @ 30 °C (86 °F) 18.22 W @ 60 °C (140 °F)
Power dissipation, max	25.7 W @ 30 °C (86 °F) 21.3 W @ 60 °C (140 °F)
Thermal dissipation, nom	77.23 BTU/hr @ 30 °C (86 °F) 62.2 BTU/hr @ 60 °C (140 °F)
Thermal dissipation, max	87.74 BTU/hr @ 30 °C (86 °F) 72.72 BTU/hr @ 60 °C (140 °F)
Isolation voltage	250V (continuous), basic insulation type, I/O-to-backplane, I/O group-to-group, resolver-to-backplane, and resolver-to-I/O Routine tested at 1900V DC for 2 s
Removable terminal block	Requires 3 RTBs: 1756-TBNH or 1756-TBSH
RTB keying	User-defined mechanical
Slot width	3
Wire category	2 on signal ports 1 on power ports <sup>(1)</sup>
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open style)

(1) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

**Table 217 - Resolver Specifications - 1756-PLS**

Attribute	1756-PLS
Resolver location	Center section
Compatible resolver	Allen-Bradley resolver 846-SJxxx-R3-x (x = customer options)
Resolver interface	2V rms, reference output (differential pair) 2V rms, sine and cosine inputs (2 differential pairs)
Reference voltage	2V rms $\pm 20\%$
Reference frequency	5 kHz $\pm 20\%$
Digital resolution	12 bits (4096 counts from hardware)
Angular resolution	0.088 °/bit
Digital count range	0...4095 (decimal)
Maximum tracking rate	$\pm 1800$ RPM
Repeatability	$\pm 0.0488\%$ of full scale
Accuracy	$\pm 0.0976\%$ of full scale

**Table 218 - Input Specifications - 1756-PLS**

Attribute	1756-PLS
Inputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range <sup>(1)</sup>	10.8...31.2V DC
Input delay time (screw to backplane)	
Off to On	< 15 $\mu$ s @ 30 °C (86 °F) < 150 $\mu$ s @ 60 °C (140 °F)
On to Off	< 30 $\mu$ s @ 30 °C (86 °F) < 200 $\mu$ s @ 60 °C (140 °F)
Power dissipation, inputs, nom	1.86 W @ 60 °C (140 °F)
Power dissipation, inputs, max	2.8 W @ 60 °C (140 °F)
Thermal dissipation, inputs, nom	6.35 BTU/hr
Thermal dissipation, inputs, max	9.56 BTU/hr
On-state voltage, min	10V DC
On-state voltage, nom	10.8...26.4V DC
On-state voltage, max	31.2V DC
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state current, min	3 mA
On-state current, max	10 mA
Input impedance, max	3.3 k $\Omega$ @ 24V DC
Reverse polarity protection	Yes

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10.8...31.2V DC.

**Table 219 - Output Specifications - 1756-PLS**

Attribute	1756-PLS
Outputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range <sup>(1)</sup>	10...31.2V DC
Output delay time	
Off to On	< 15 $\mu$ s @ 60 °C (140 °F)
On to Off	< 25 $\mu$ s @ 60 °C (140 °F)
Power dissipation, outputs, nom	5.4 W @ 30 °C (86 °F) 3.2 W @ 60 °C (140 °F)
Power dissipation, outputs, max	6 W @ 30 °C (86 °F) 3.8 W @ 60 °C (140 °F)
Thermal dissipation, outputs, nom	18.43 BTU/hr @ 30 °C (86 °F) 10.93 BTU/hr @ 60 °C (140 °F)
Thermal dissipation, outputs, max	21.48 BTU/hr @ 30 °C (86 °F) 11.93 BTU/hr @ 60 °C (140 °F)
Output power dissipation/slot thermal dissipation	3.2 W @ 60 °C (140 °F) 10.93 BTU/hr @ 60 °C (140 °F)
Off-state leakage current per point, nom	<10 $\mu$ A @ 60 °C (140 °F)
Off-state leakage current per point, max	300 mA @ 60 °C (140 °F)
On-state voltage, min	10V DC
On-state voltage, nom	10.8...26.4V DC
On-state voltage, max	31.2V DC
Output voltage drop, max	0.55V DC
Current per point, max	1 A @ 30 °C <sup>(2)</sup> (86 °F)
Current per group, max	4 A @ 30 °C <sup>(3)</sup> (86 °F)
Current per module, max	8 A @ 30 °C <sup>(4)</sup> (86 °F)
Current limit	< 4 A
Surge current per point	2 A for 10 ms every 1 s @ 60 °C (140 °F)
Load current per point, min	40 mA
Output switching time	Switching 1 A @ 24V DC
Short circuit protection	Electronic (No indication of fault. Remove load and toggle on/off to restore.)
Reverse polarity protection	Yes, current limited. (If wired incorrectly, outputs may be permanently disabled.)

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10.8...31.2V DC.

(2) Derate 16.7 mA/ °C above 30 °C (86 °F): 0.5 A @ 60 °C (140 °F).

(3) Derate 66.8 mA/ °C above 30 °C (86 °F): 2 A @ 60 °C (140 °F).

(4) Derate 133.6 mA/ °C above 30 °C (86 °F): 4 A @ 60 °C (140 °F).



**Table 220 - Environmental Specifications - 1756-PLS**

Attribute	1756-PLS
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...85 °C (-40...185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11 (IEC 61000-6-4): Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80...2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on unshielded I/O and power ports ±2 kV at 5 kHz on shielded resolver ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on unshielded I/O and power ports ±2 kV line-earth (CM) on shielded resolver ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

**Table 221 - Certifications - 1756-PLS**

Certification <sup>(1)</sup>	1756-PLS
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> <li>EN 61326-1; Meas./Control/Lab., Industrial Requirements</li> <li>EN 61000-6-2; Industrial Immunity</li> <li>EN 61000-6-4; Industrial Emissions</li> <li>EN 61131-2; Programmable Controllers (Clause 8, Zone A &amp; B)</li> </ul> European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> <li>EN 60079-15; Potentially Explosive Atmospheres, Protection "n"</li> <li>EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc</li> </ul>

(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

## ControlLogix I/O Accessories

Place 1756 I/O modules in any slot in a 1756 chassis. Each chassis requires a power supply.

Product	Cat. No.
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2 1756-CPR2 cable

- For more information on chassis specifications, see ControlLogix Chassis Specifications Technical Data, publication [1756-TD006](#).
- For more information on power supply specifications, see ControlLogix Power Supply Specifications Technical Data, publication [1756-TD005](#).
- For more information on choosing the right power supply for your application, see the additional product documentation, for example, a user manual, for your 1756 ControlLogix I/O module.

## 1756 Removable Terminal Blocks



Removable terminal blocks (RTBs) provide a flexible interconnection between your plant wiring and 1756 I/O modules. The RTB plugs into the front of the I/O module. The type of module determines which RTB you need. You can choose screw-clamp or spring-clamp RTBs.

RTBs are not shipped with I/O modules. You must order them separately. The standard housing on the front of the wiring arm is not deep enough for 2.5 mm<sup>2</sup> (14 AWG) wiring. If you plan to use 2.5 mm<sup>2</sup> (14 AWG) wiring, also order the extended housing.



**ATTENTION:** If separate power sources are used, do not exceed the specified isolation voltage: referring to each individual module's specifications on the preceding pages.

**Table 222 - RTB Specifications - 1756-TBNH, 1756-TBSH, 1756-TBCH, 1756-TBS6H, 1756-TBE**

Attribute	1756-TBNH	1756-TBSH	1756-TBCH	1756-TBS6H	1756-TBE
Description	20-position NEMA screw-clamp removable block	20-pin spring-clamp removable terminal block with standard housing	36-pin cage-clamp removable terminal block with standard housing	36-pin spring-clamp removable terminal block with standard housing	Extended depth terminal block housing
Screw torque	1.36 N•m (12 lb-in)	N/A	0.5 N•m (4.4 lb-in)	N/A	N/A
Wire size <sup>(1)</sup>	0.33...2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33...2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than one conductors on any single terminal.	Single wire connection: 0.33...2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max Double wire connection: 0.33...1.3 mm <sup>2</sup> (22...16 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33...2.1 mm <sup>2</sup> (22...14 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than one conductors on any single terminal.	
Screwdriver width	8 mm (5/16 in.) max	N/A	3.2 mm (1/8 in.)	N/A	N/A

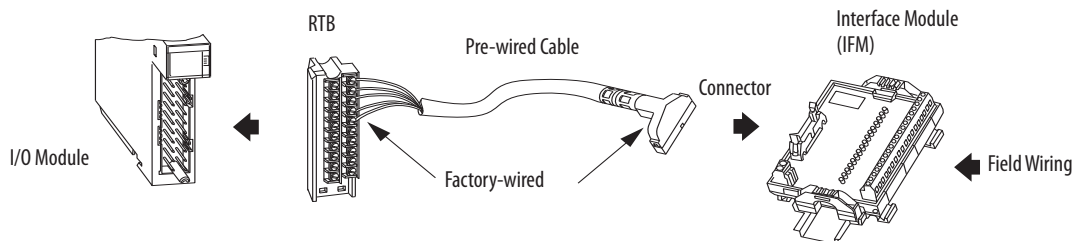
(1) Maximum wire size requires extended housing, catalog number 1756-TBE.

## Wiring Systems



As an alternative to buying RTBs and connecting the wires yourself, you can buy a wiring system of the following:

- Interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the pre-wired cables that match the I/O module to the IFM.
- Analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the pre-wired cables that match the I/O module to the AIFM.
- I/O module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.



## Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlLogix System User Manual, publication <a href="#">1756-UM001</a>	Provides information about using a ControlLogix system.
Industrial Automation Wiring and Grounding Guidelines, publication <a href="#">1770-4.1</a>	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, <a href="http://www.ab.com">http://www.ab.com</a>	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at <http://www.rockwellautomation.com/literature/>. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

**Notes:**

## Important User Information

Read this document and the documents listed in the additional resources section about installation, configuration, and operation of this equipment before you install, configure, operate, or maintain this product. Users are required to familiarize themselves with installation and wiring instructions in addition to requirements of all applicable codes, laws, and standards.

Activities including installation, adjustments, putting into service, use, assembly, disassembly, and maintenance are required to be carried out by suitably trained personnel in accordance with applicable code of practice.

If this equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.

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