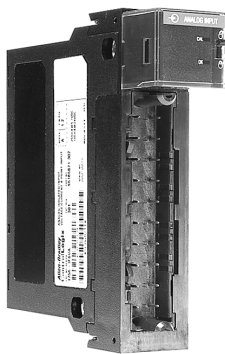


1756 ControlLogix I/O Specifications

1756 Series Catalog Numbers

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Available 1756 I/O Modules	2
ControlLogix I/O Accessories	244
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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.

LISTEN.
THINK.
SOLVE.®

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 D 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 E at the end of the catalog number.
Individually isolated	These modules have individually isolated inputs or outputs. These modules have an I at the end of the catalog number.

I/O Type	Cat. No.	Page	Cat. No.	Page	
AC digital	1756-IA8D	3	1756-LSC8XIB8I	234	
	1756-IA16	6	1756-OA8D	128	
	1756-IA16I	9	1756-OA8E	131	
	1756-IA32	12	1756-OA16	134	
	1756-IM16I	85	1756-OA16I	138	
	1756-IN16	88	1756-ON8	207	
	DC digital	1756-IB16	15	1756-OB8I	147
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1756-IH16ISOE		82	1756-OG16	201	
1756-IV16		119	1756-OH8I	204	
1756-IV32		122	1756-OV16E	211	
1756-OB8		141	1756-OV32E	215	
1756-OB8EI		144			
Contact				1756-OW16I	219
				1756-OX8I	222
Analog	1756-IF6CIS	43	1756-OF4	175	
	1756-IF6I	47	1756-OF6CI	179	
	1756-IF8	52	1756-OF6VI	183	
	1756-IF8I	60	1756-OF8	186	
	1756-IF16	68	1756-OF8I	193	
	1756-IF4FXOF2F	39			
	1756-IR6I	91			
	1756-IRT8I	96			
	1756-IR12	102			
	1756-IT6I	106			
	1756-IT6I2	110			
	1756-IT16	114			
	HART interface	1756-IF8H	57	1756-OF8H	190
1756-IF8IH		64	1756-OF8IH	197	
1756-IF16H		73			
Specialty	1756-CFM	225	1756-LSC8XIB8I	234	
	1756-HSC	230	1756-PLS	238	

1756-IA8D

ControlLogix 120V AC diagnostic input module

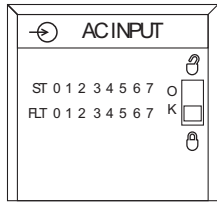
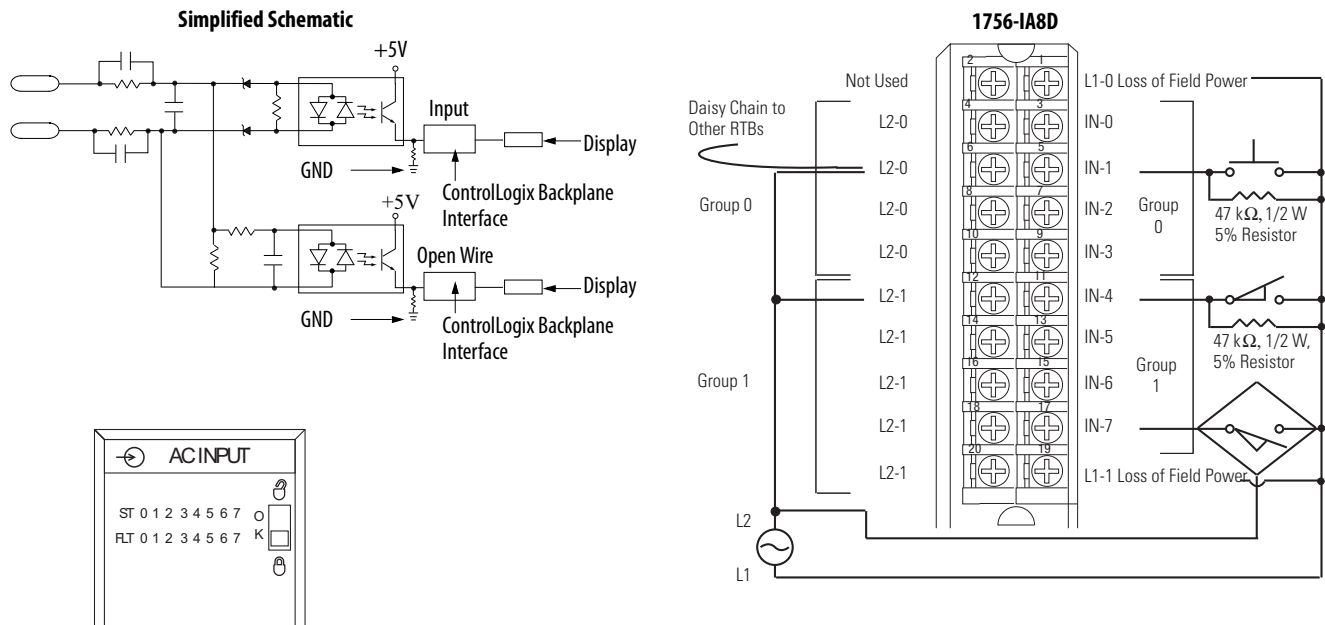


Table 1 - Diagnostic Specifications - 1756-IA8D

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 ⁽¹⁾	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 Ω @ 132V AC, 60 Hz
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽²⁾
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, 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 ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

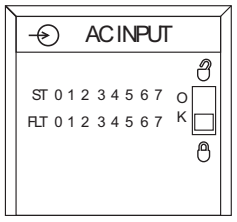
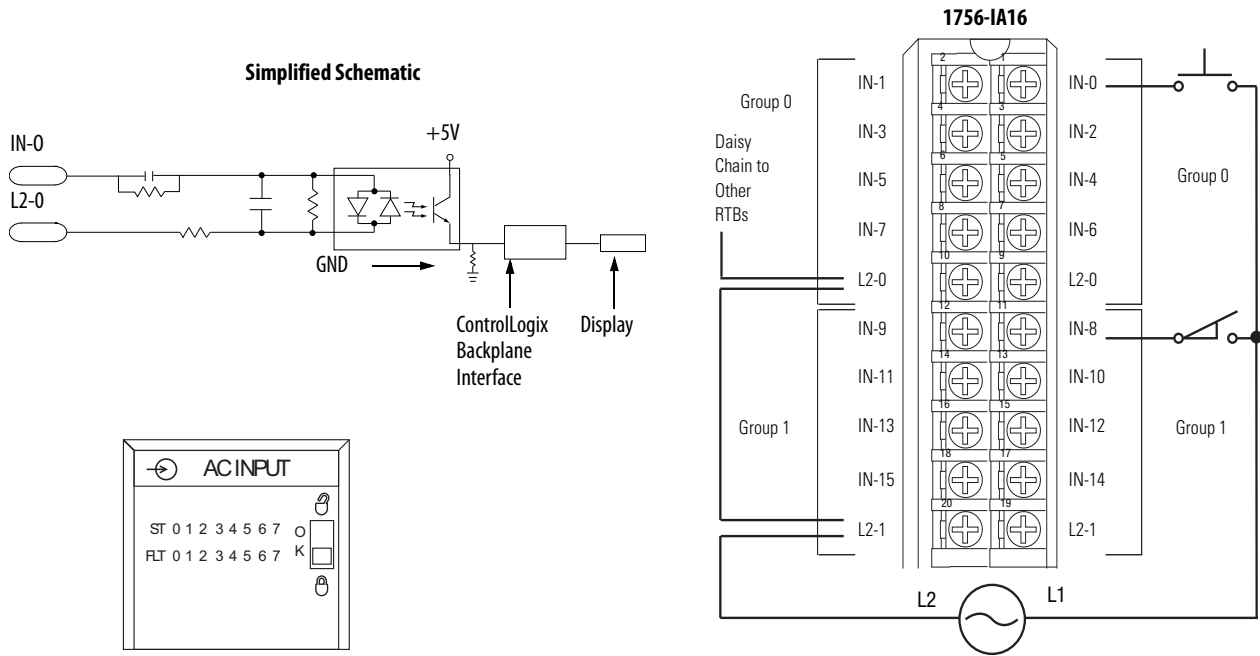


Table 5 - Technical Specifications - 1756-IA16

Attribute	1756-IA16
Inputs	16 (8 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range ⁽¹⁾	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 Ω @ 132V AC, 60 Hz
Cyclic update time	200 μ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽²⁾
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, 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 ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

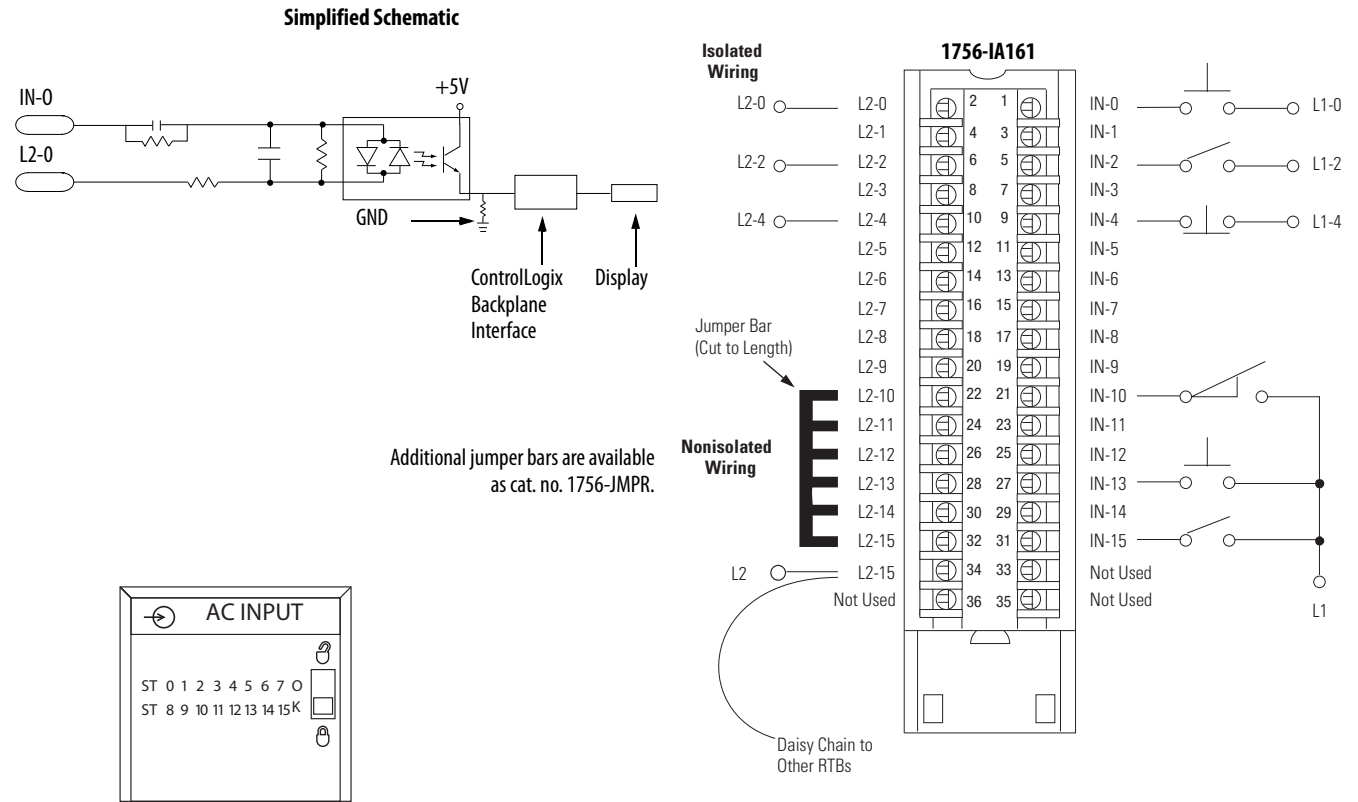


Table 8 - Technical Specifications - 1756-IA16I

Attribute	1756-IA16I
Inputs	16 individually isolated
Voltage category	120V AC 50/60 Hz
Operating voltage range ⁽¹⁾	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 Ω @ 132V AC, 60 Hz
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽²⁾
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, 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 ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

Simplified Schematic

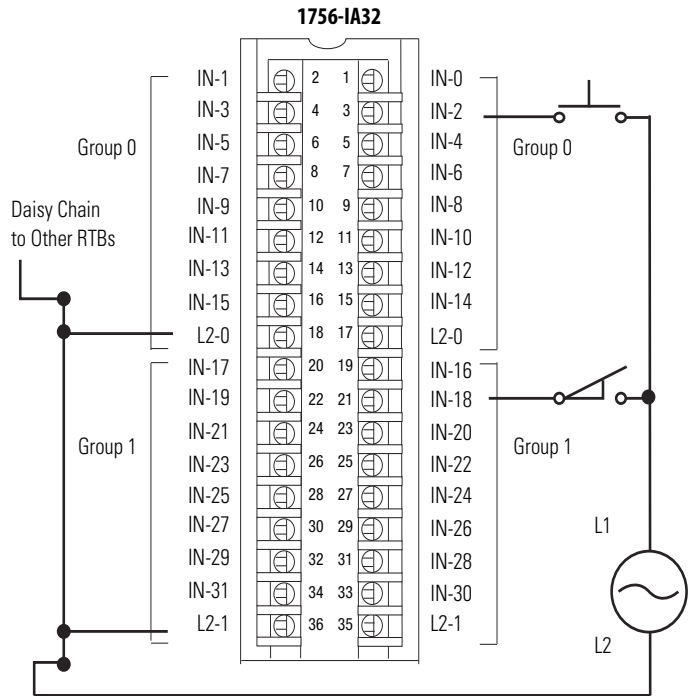
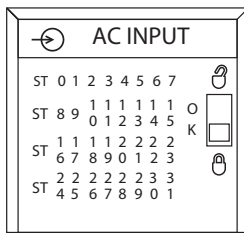
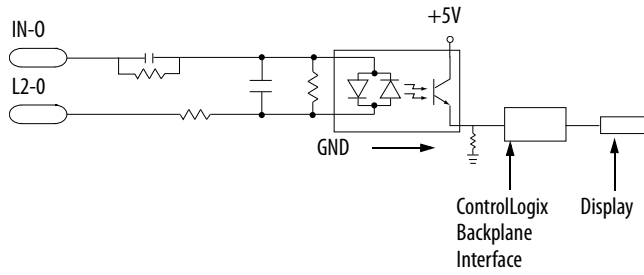


Table 11 - Technical Specifications - 1756-IA32

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 Ω @ 132V AC, 60 Hz
Cyclic update time	200 μ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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, 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 ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

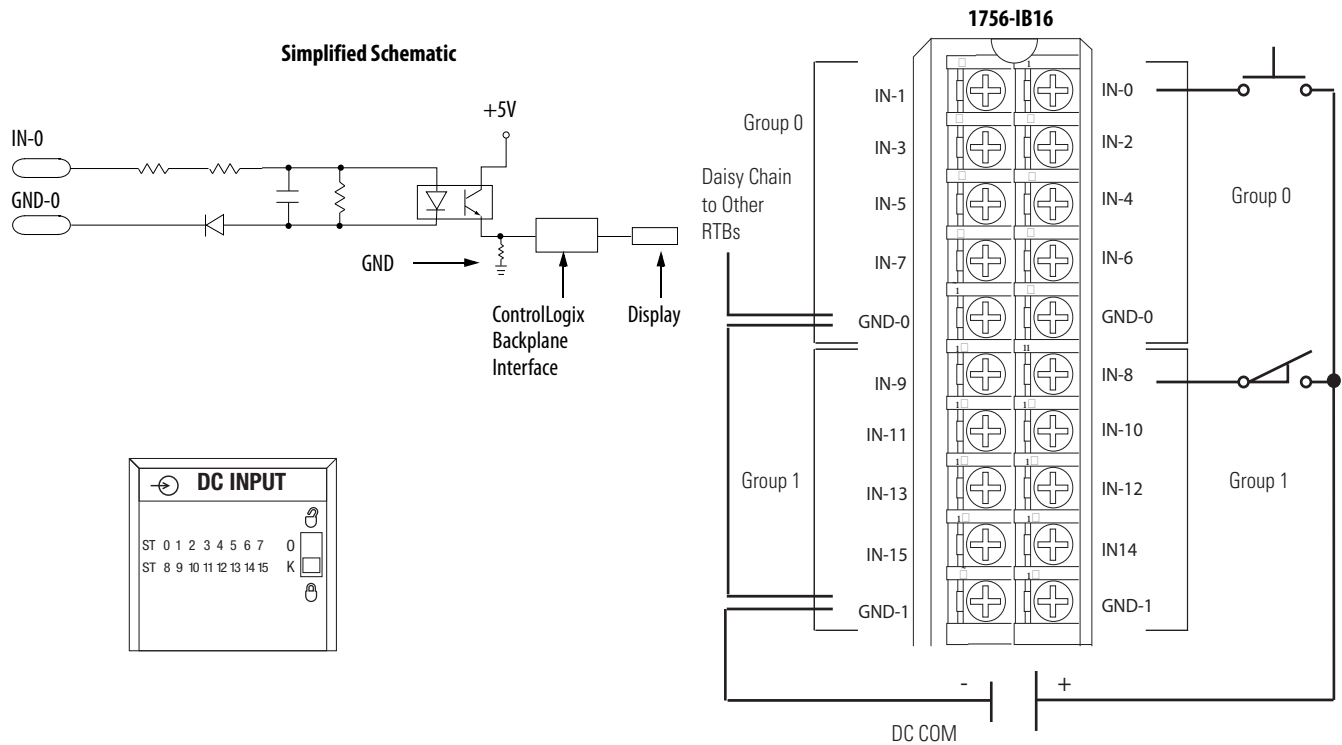


Table 14 - Technical Specifications - 1756-IB16

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 μ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 700 μ 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 Ω @ 31.2V DC
Cyclic update time	200 μ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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, 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

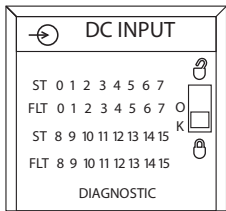
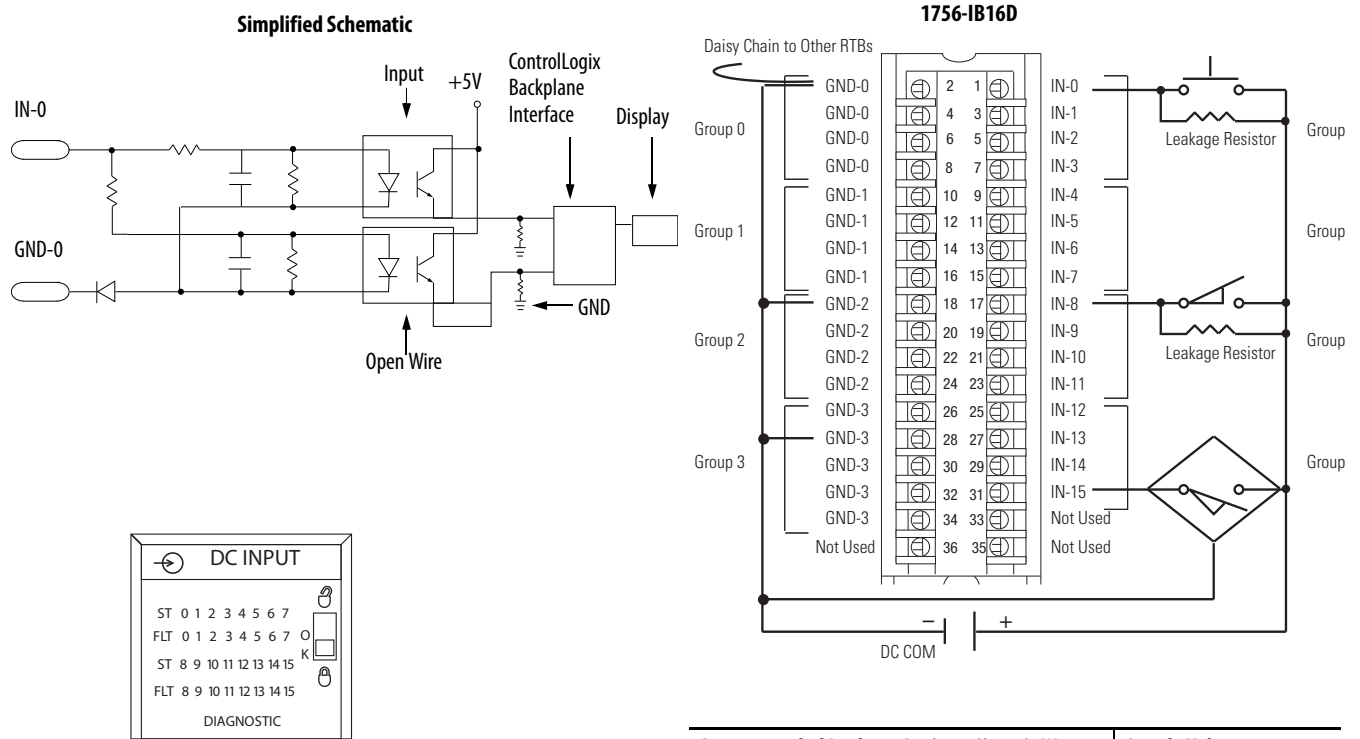
Table 16 - Certifications - 1756-IB16

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc
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 μ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 740 μ 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 Ω @ 30V DC
Cyclic update time	200 μ s. . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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, 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⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc
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

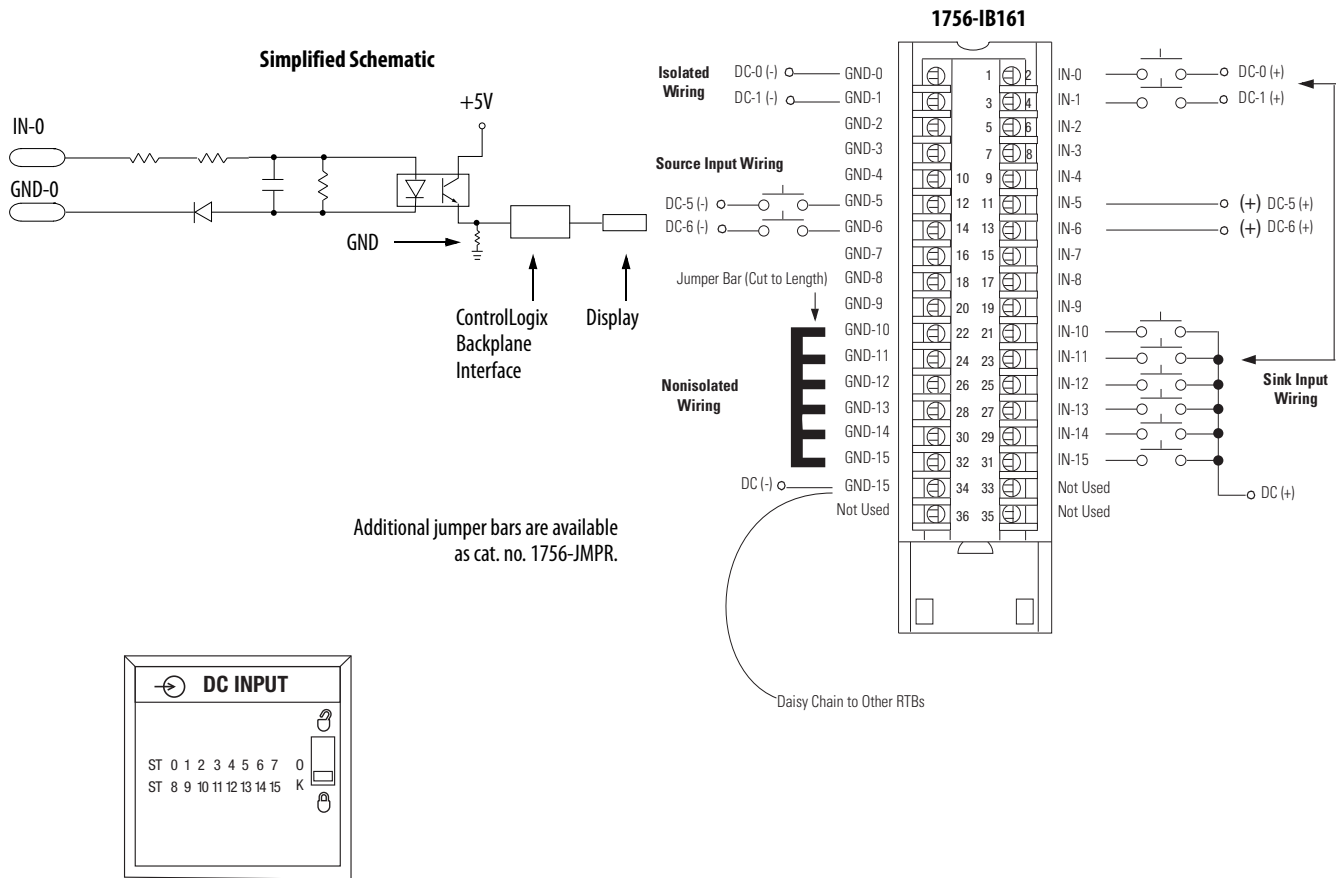


Table 21 - Technical Specifications - 1756-IB16I

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 @ 10V 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 Ω @ 30V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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 1, 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-IB16I

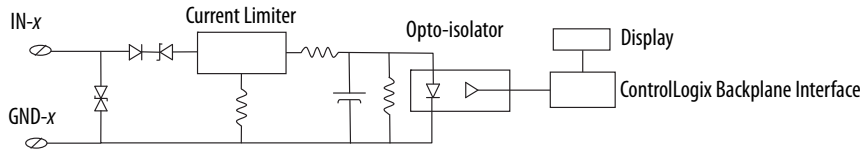
Certification⁽¹⁾	1756-IB16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

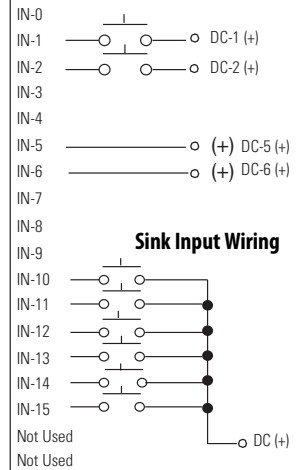
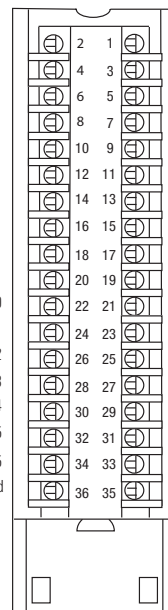


Isolated Wiring

Source Input Wiring

Nonisolated Wiring

1756-IB16IF



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

Daisy Chain to Other RTBs

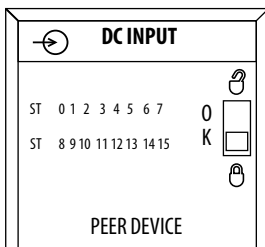


Table 24 - Technical Specifications - 1756-IB16IF

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 μ s nom/23 μ s max + user-configurable filter time of 0...30,000 μ s
On to Off	14 μ s nom/23 μ s max + user-configurable filter time of 0...30,000 μ 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 @ 10V DC
On-state current, max	5 mA @ 30V DC
Input impedance, max	6 k Ω @ 30V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 4 μ s for inputs < 4 kHz \pm 13 μ 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 ⁽¹⁾
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-IB161F

Attribute	1756-IB161F
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 1, 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-IB161F

Certification⁽¹⁾	1756-IB161F
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

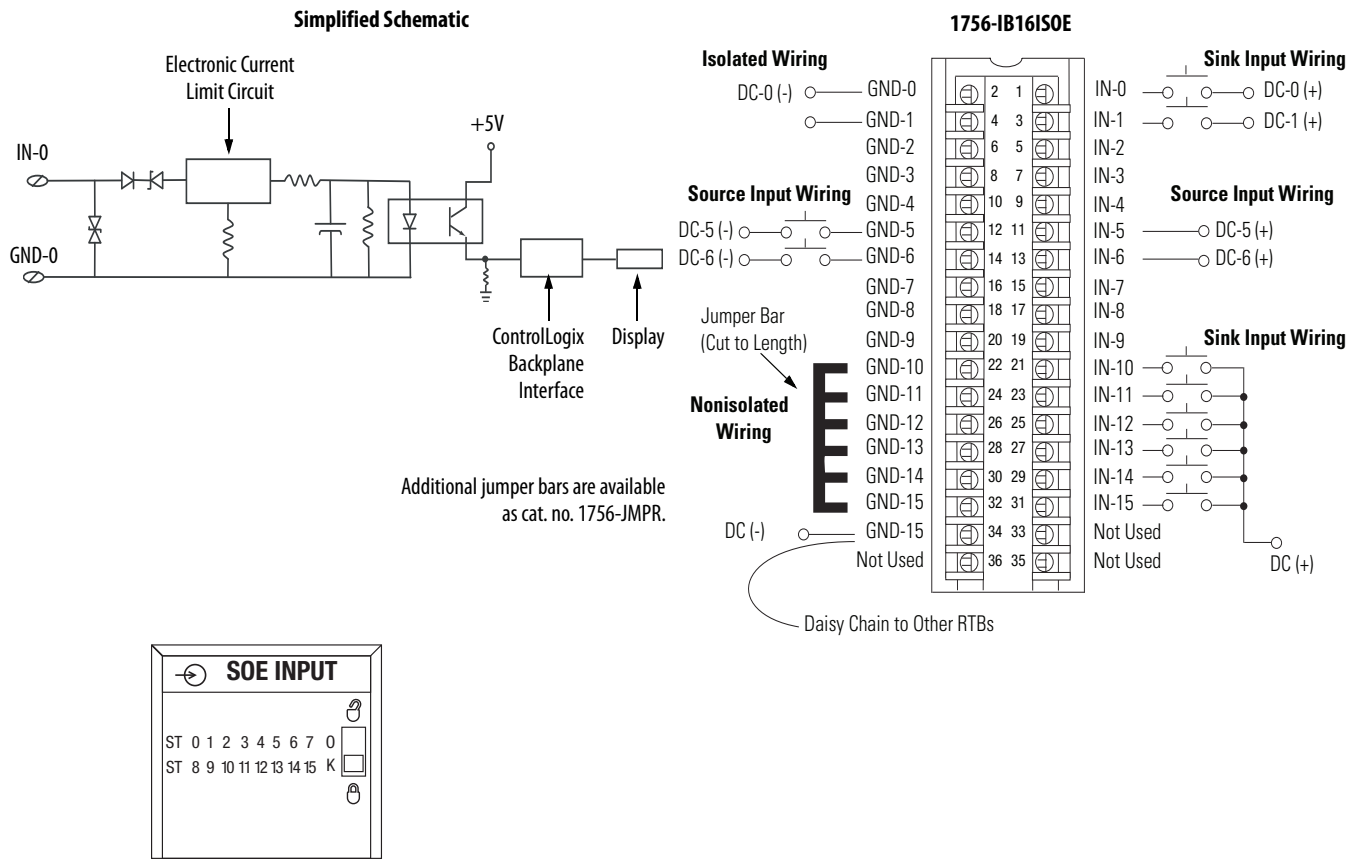


Table 27 - Technical Specifications - 1756-IB16ISOE

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 μs nom/20 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)
On to Off	Hardware delay: 25 μs nom/50 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	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

Table 27 - Technical Specifications - 1756-IB16ISOE (Continued)

Attribute	1756-IB16ISOE
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 Ω @ 55V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 100 μ 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 ⁽¹⁾
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

Table 28 - Environmental Specifications - 1756-IB16IS0E (Continued)

Attribute	1756-IB16IS0E
Emissions	CISPR 11, 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-IB16IS0E

Certification ⁽¹⁾	1756-IB16IS0E
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

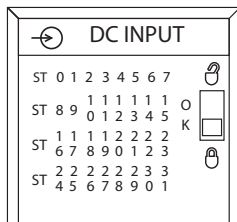
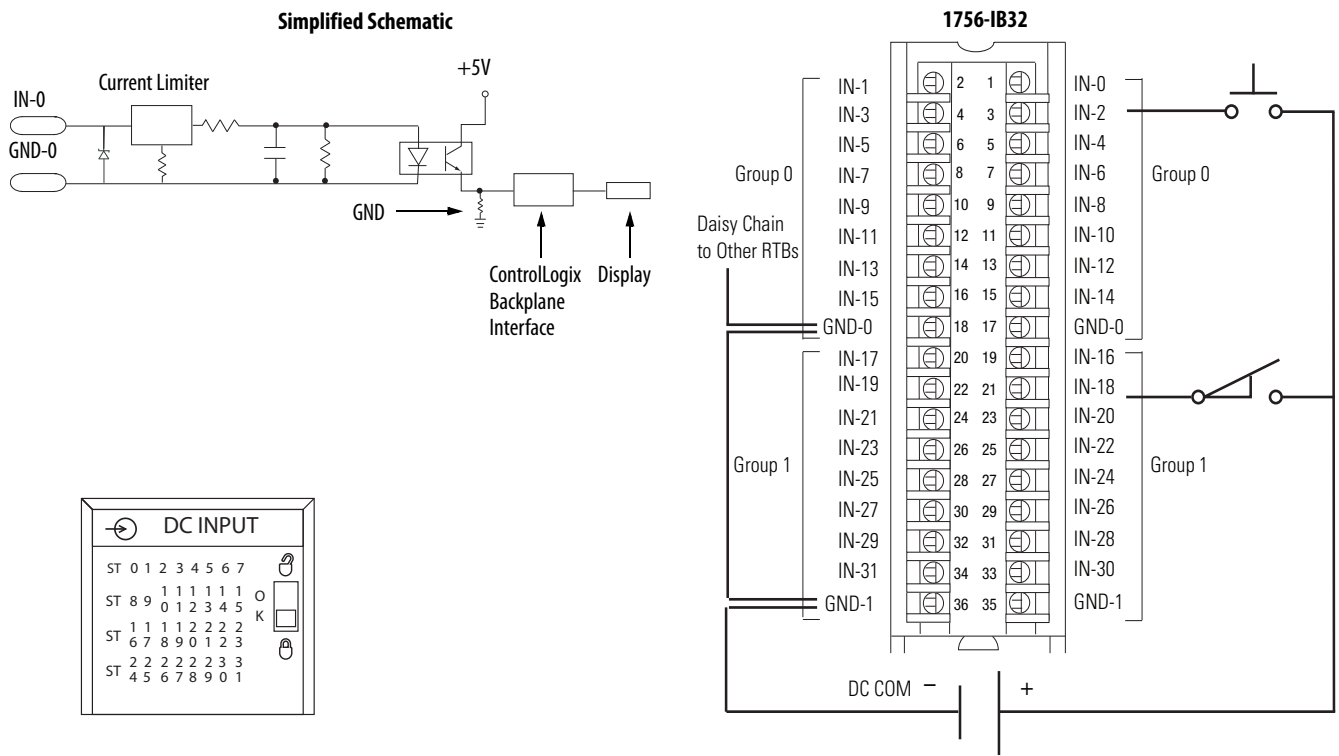


Table 30 - Technical Specifications - 1756-IB32

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 μ s max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 420 μ 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)

Table 30 - Technical Specifications - 1756-IB32 (Continued)

Attribute	1756-IB32
Input impedance, max	5.67 k Ω @ 31.2V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 31 - Environmental Specifications - 1756-IB32 (Continued)

Attribute	1756-IB32
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 ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

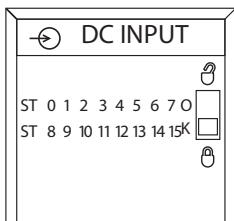
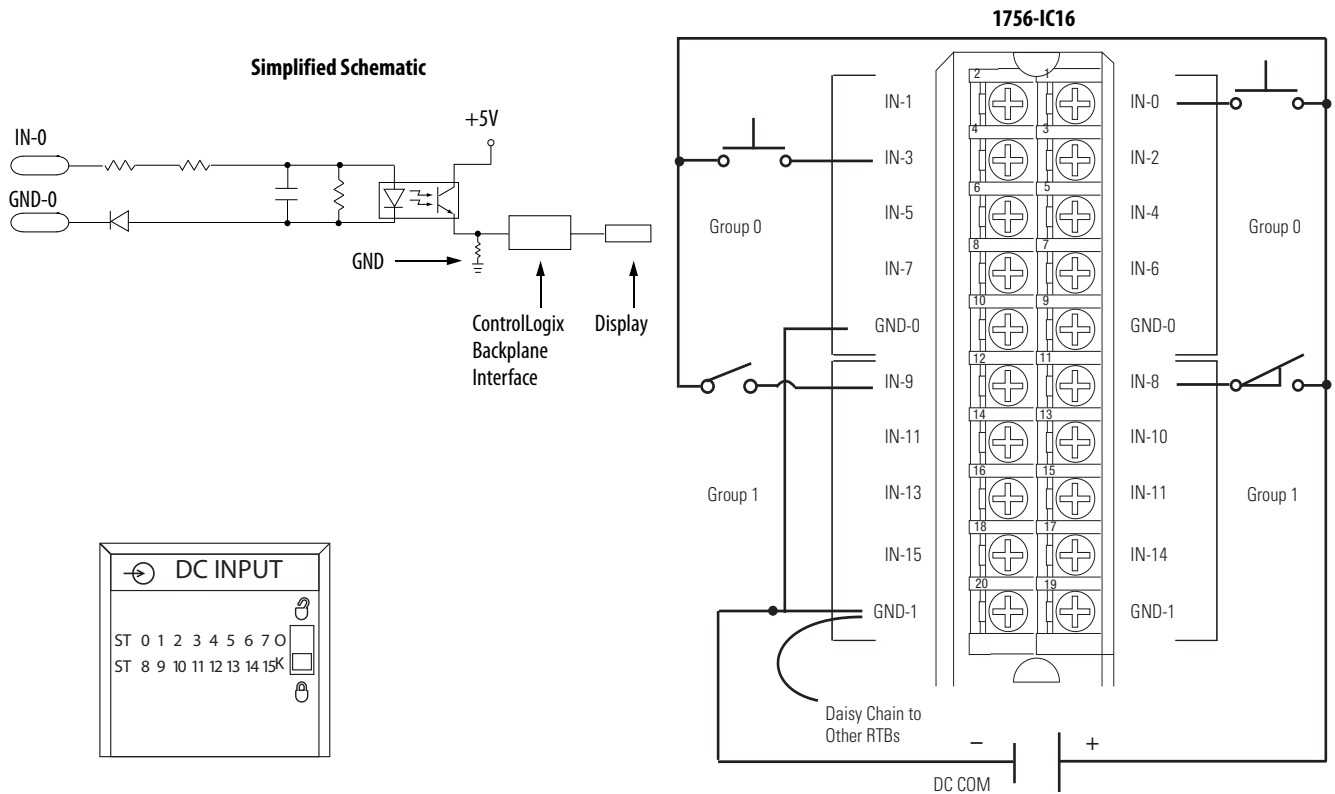


Table 33 - Technical Specifications - 1756-IC16

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

Table 33 - Technical Specifications - 1756-IC16 (Continued)

Attribute	1756-IC16
Inrush current, max	250 mA
Input impedance, max	8.57 k Ω @ 60V DC
Cyclic update time	200 μ s . . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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 $^{\circ}$ C (32 . . . 140 $^{\circ}$ F)
Temperature, surrounding air, max	60 $^{\circ}$ C (140 $^{\circ}$ 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 $^{\circ}$ C (-40 . . . 185 $^{\circ}$ 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 34 - Environmental Specifications - 1756-IC16 (Continued)

Attribute	1756-IC16
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

Certification ⁽¹⁾	1756-IC16
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

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 ⁽¹⁾
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	$\pm 10V$ 0...10V 0...5V 0...20 mA (over-range indication when exceeded)
Resolution	Approx 14 bits across $\pm 10.5V$ DC (21V total) $\pm 10.5V$ 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) ⁽¹⁾
Input impedance	Voltage: $>1 M\Omega$ 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 ⁽²⁾
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	± 10V 0...20 mA
Resolution	13 bits across 21 mA = 2.8 µA/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 Ω Current: 0...750 Ω
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 µV/°C 1 µA/°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, 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

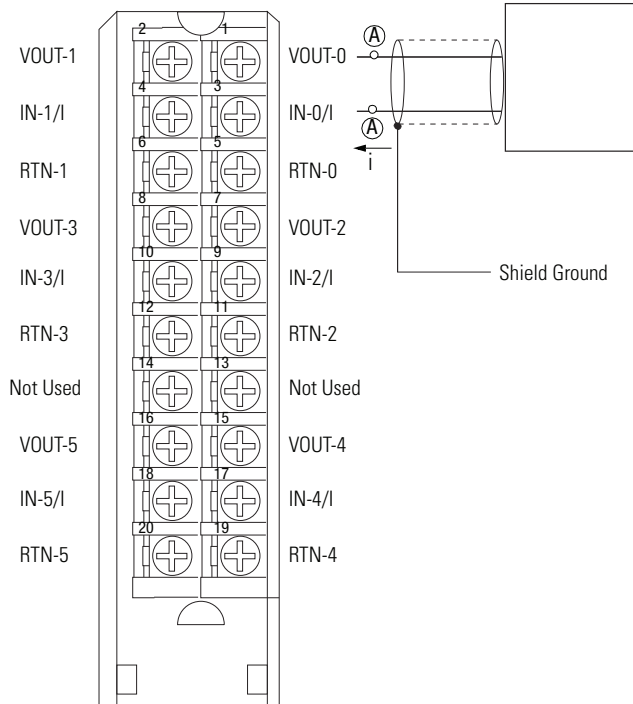
Certification ⁽¹⁾	1756-IF4FXOF2F
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

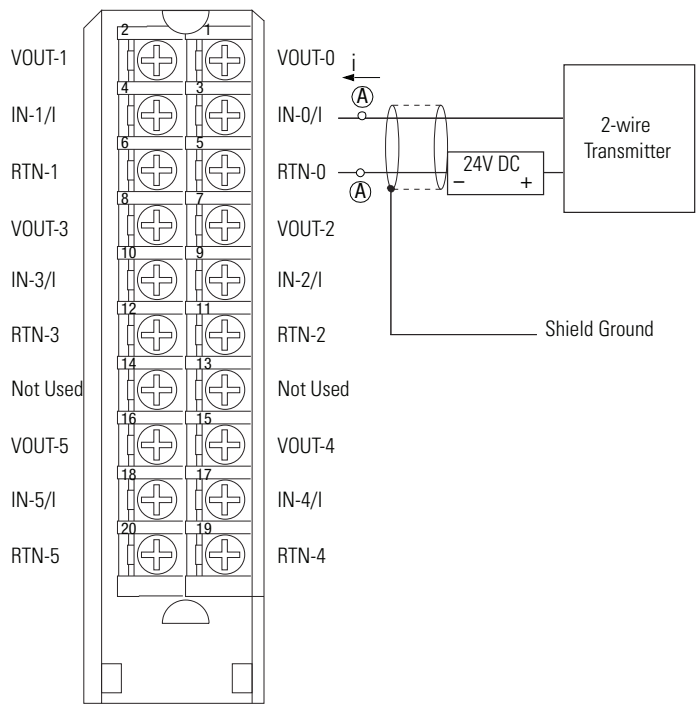
1756-IF6CIS

ControlLogix sourcing current loop analog input module

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

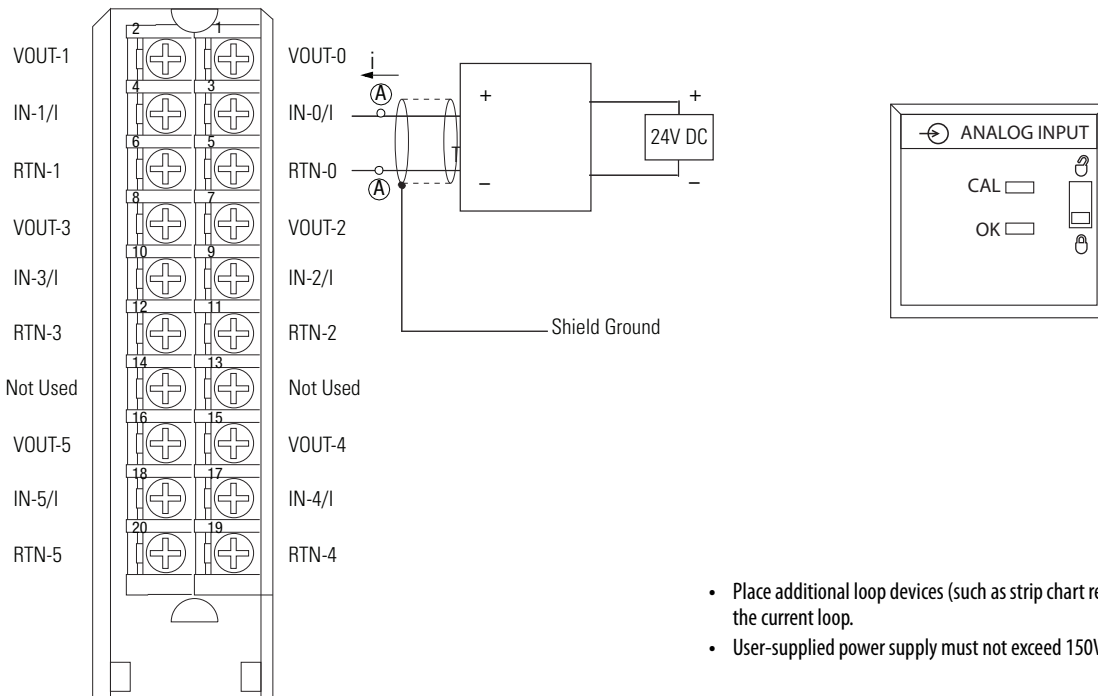


1756-IF6CIS 2-wire Transmitter Connected to the Module and an External, User-provided Power Supply Providing 24V DC Loop Power



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 μ 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 Ω , 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 ⁽¹⁾
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	3...262 Hz (-3 dB) ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
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 μ A/°C
Gain drift with temperature, max	35 ppm/°C max 0.74 μ 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 ⁽²⁾
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, 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

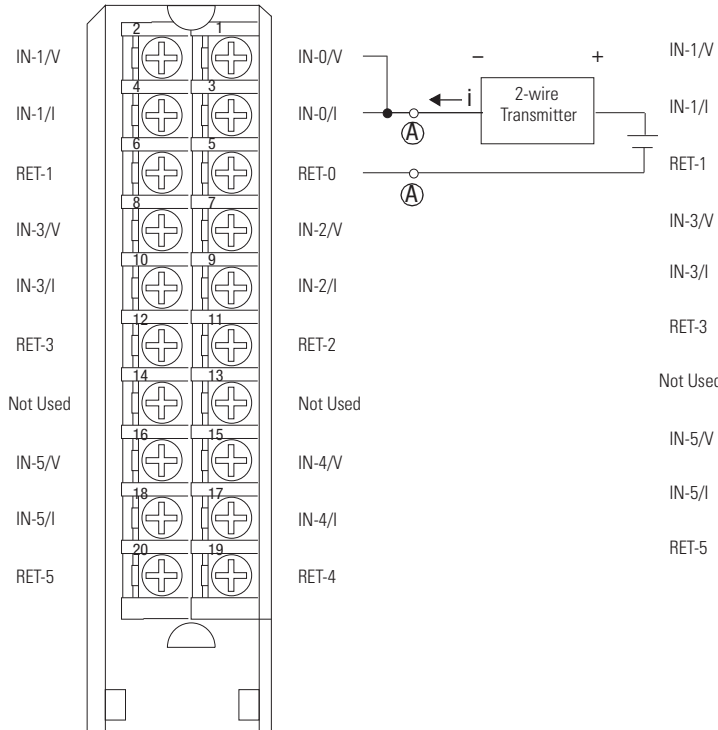
Certification ⁽¹⁾	1756-IF6CIS
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

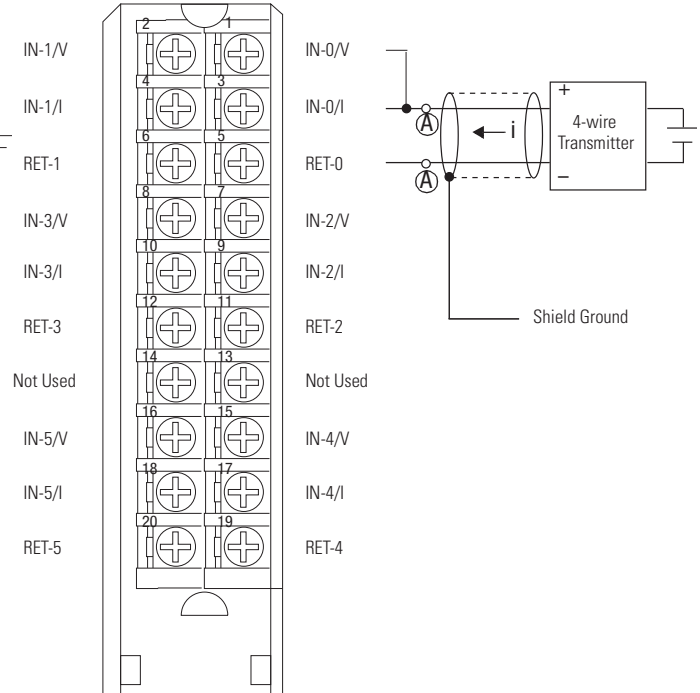
1756-IF6I

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.

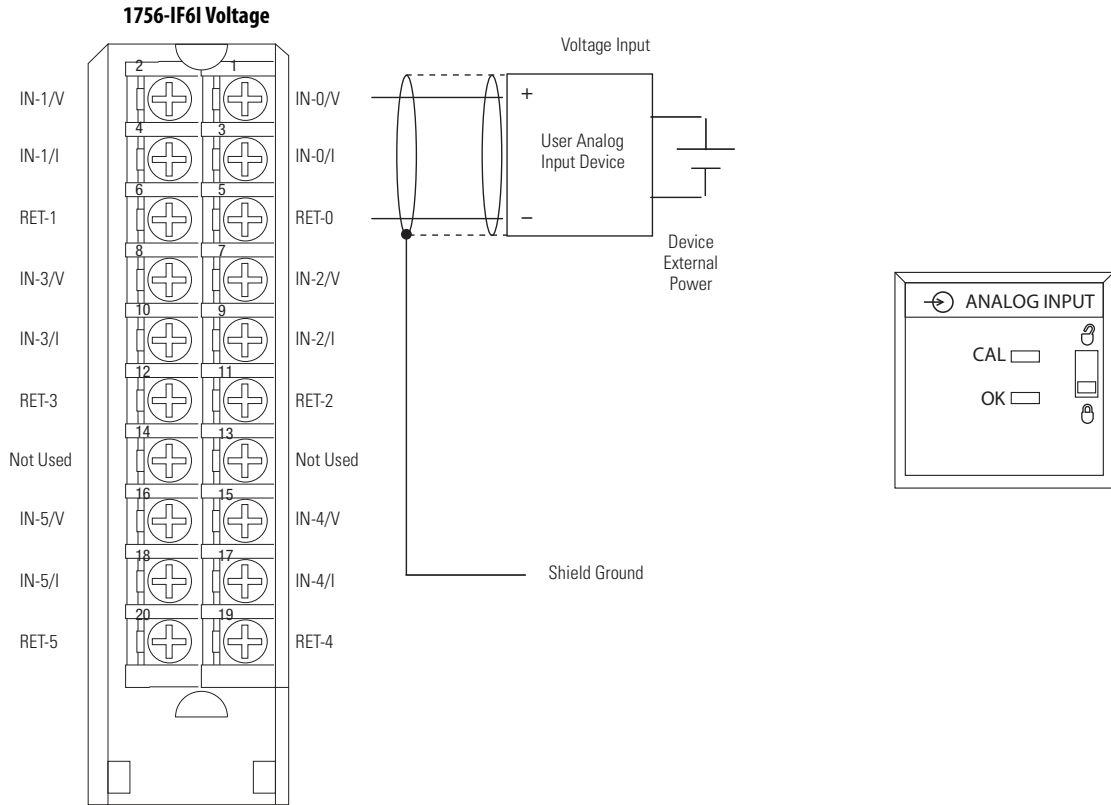


Table 45 - Signal and User Counts - 1756-IF6I

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 Ω Current: 249 Ω
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 ⁽¹⁾
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz (-3 dB) ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
Calibrated accuracy 25 °C (77 °F)	Better than 0.1% of range
Calibration interval	6 months
Offset drift	2 μ 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 ⁽¹⁾
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 ⁽²⁾
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 1, 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

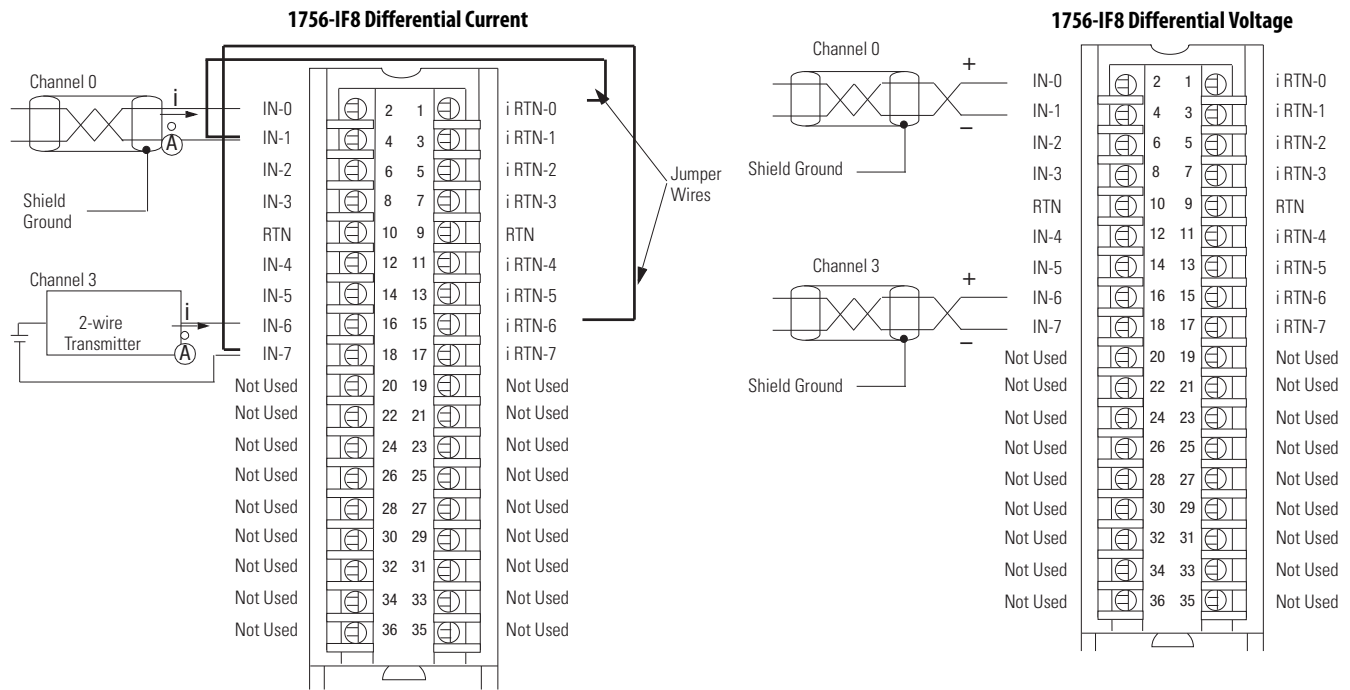
Table 48 - Certifications - 1756-IF6I

Certification⁽¹⁾	1756-IF6I
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

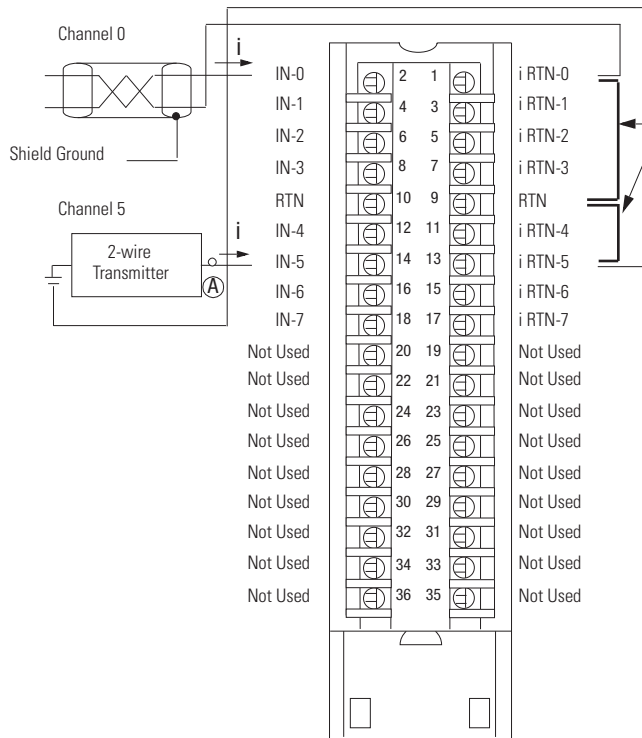
- Use this table when wiring your module in Differential mode.

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 (-)

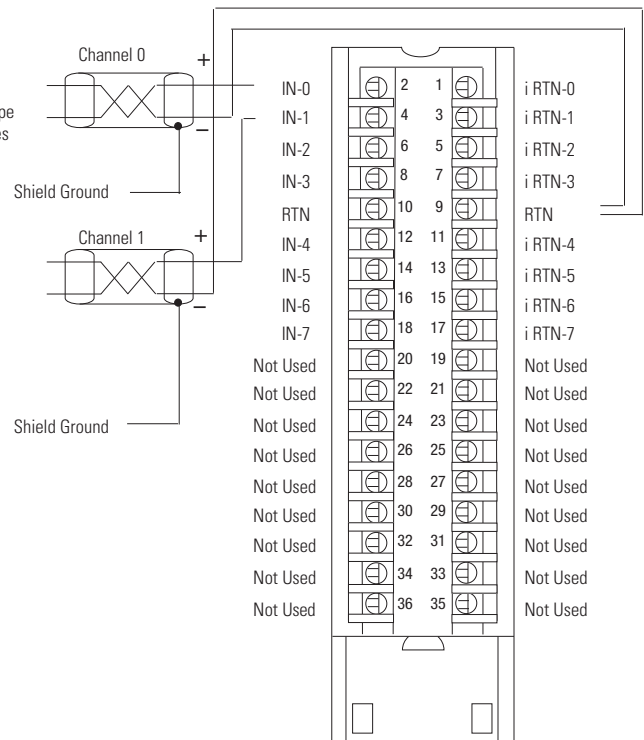
- All terminals marked RTN are connected internally.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Terminals marked RTN or i RTN are not used for differential voltage wiring.

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.

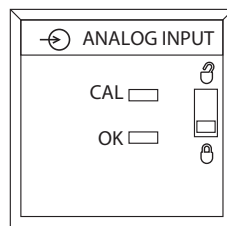


Table 49 - Technical Specifications - 1756-IF8

Attribute	1756-IF8
Inputs	8 single-ended 4 differential 2 high-speed differential
Input range	$\pm 10V$ 0...10V 0...5V 0...20 mA
Resolution	$\pm 10.25V$: 320 μV /count (15 bits plus sign bipolar) 0...10.25V: 160 μV /count (16 bits) 0...5.125V: 80 μV /count (16 bits) 0...20.5mA: 0.32 μA /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 Ω
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 ⁽¹⁾
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 $\mu V/^\circ C$
Gain drift with temperature	Voltage: 15 ppm/ $^\circ C$ Current: 20 ppm/ $^\circ C$
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 ⁽¹⁾
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 ⁽²⁾
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 1, 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

Certification⁽¹⁾	1756-IF8
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

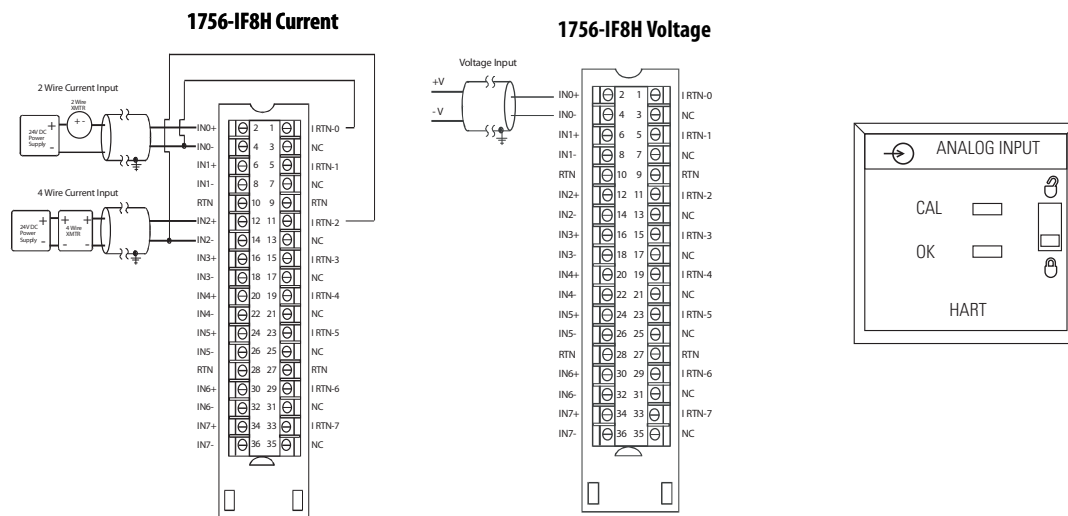


Table 52 - Technical Specifications - 1756-IF8H

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
Voltage and current ratings	Backplane: 300 mA max @ 5.1V DC, 135 mA max @ 24V DC Input voltage range: -10...10V Input current range: 4...20 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

Table 52 - Technical Specifications - 1756-IF8H (Continued)

Attribute	1756-IF8H
Gain drift with temperature	Voltage: 10 ppm/°C Current: 20 ppm/°C
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) <ul style="list-style-type: none"> Basic insulation type, input channels-to-backplane No isolation between individual input channels 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 shielded signal ports ⁽¹⁾
Wire size	1756-TBCH removable terminal block <ul style="list-style-type: none"> Single wire connection: 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max Double wire connection: 0.33...1.3 mm² (22...16 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max 1756-TBS6H removable terminal block <ul style="list-style-type: none"> 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max
Temperature code	North American: T4A ATEX: T4
Enclosure type rating	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

Table 53 - Environmental Specifications - 1756-IF8H (Continued)

Attribute	1756-IF8H
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Operating: 30 g Nonoperating: 50 g
Emissions	IEC 61000-6-4
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	±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 ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
RCM	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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc DEMKO12ATEX1219040
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

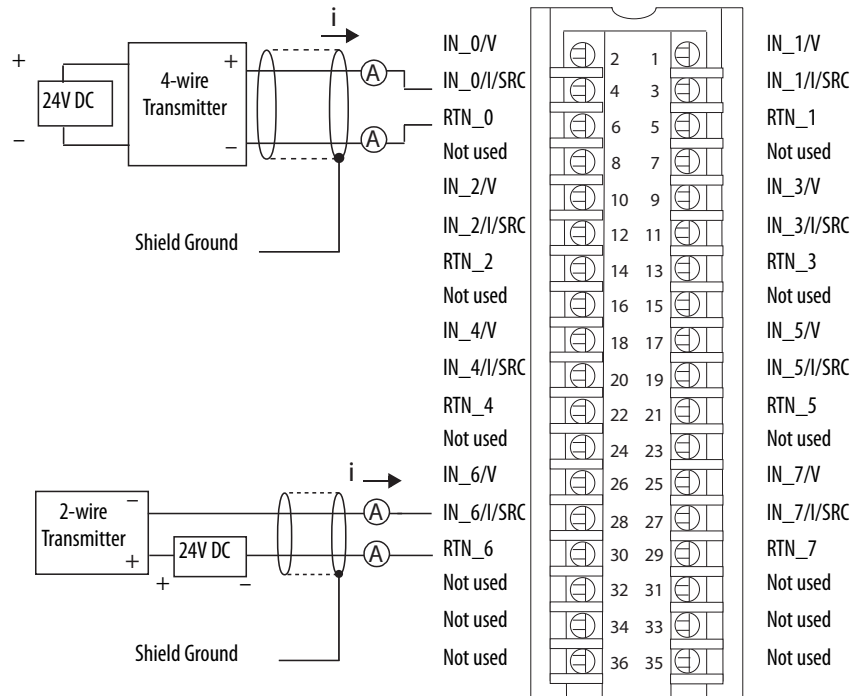
1756-IF8I

ControlLogix isolated voltage/current analog input module.

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

IMPORTANT: Remember the following:

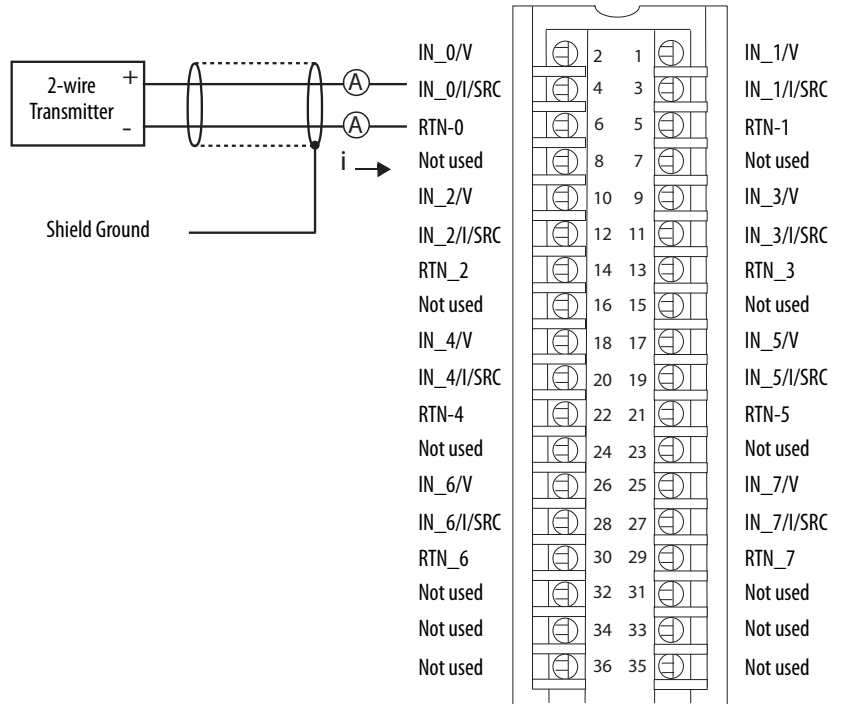
- In this wiring diagram, an external, user-provided power supply provides 24V DC loop power.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional loop devices, for example, strip chart recorders, at either 'A' location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

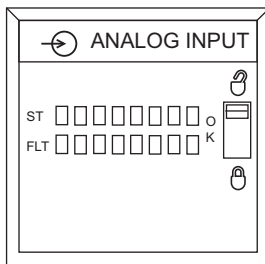
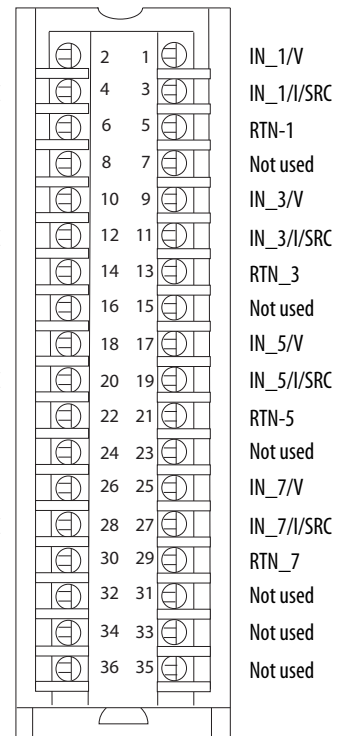
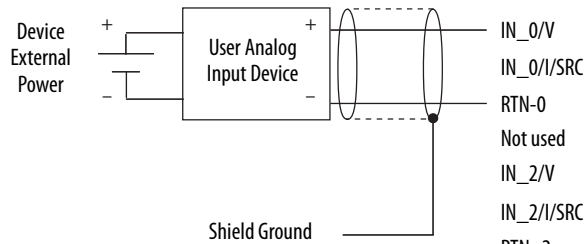


Table 55 - Technical Specifications - 1756-IF8I

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

Table 55 - Technical Specifications - 1756-IF8I (Continued)

Attribute	1756-IF8I
Input impedance, approx	Voltage mode: 1 G Ω (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	\pm 30V DC
Normal mode noise rejection	80 dB @ 60 Hz ⁽¹⁾
Common mode noise rejection	120 dB @ 50/60 Hz
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 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
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 ² (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 ⁽²⁾
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, 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 57 - Certifications - 1756-IF8I

Certification ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> 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-IF8IH

ControlLogix isolated current analog input module with HART protocol

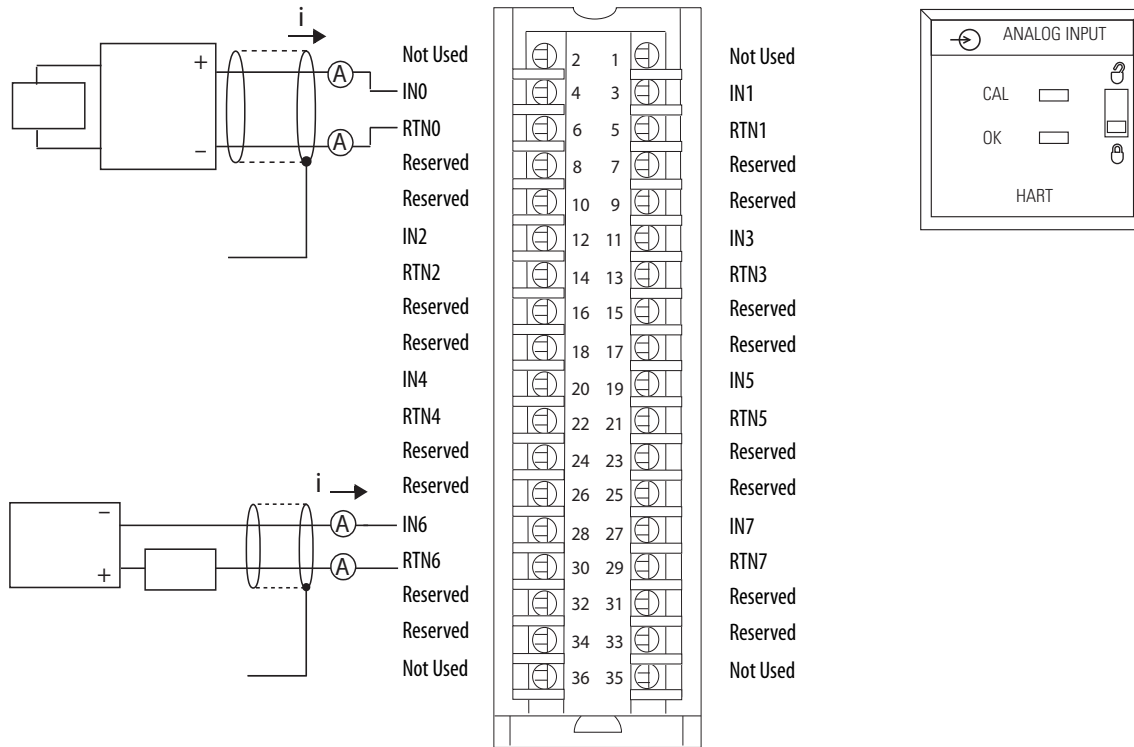


Table 58 - Technical Specifications - 1756-IF8IH

Attribute	1756-IF8IH
Inputs	8 current
Input range	0...20 mA (0...20.58 mA) 4...20 mA (3.42...20.58 mA)
Resolution	16...21 bits
Voltage and current ratings	Backplane: 210 mA @ 5.1V DC, 110 mA @ 24V DC Input Current: 0...20 mA and 4...20 mA Input Voltage: 5...30V DC
Power dissipation within module	4 W
Inrush current	400 mA @ 5V 450 mA @ 24V
Isolation voltage	250V (continuous) <ul style="list-style-type: none"> Reinforced insulation type, inputs to backplane Basic Insulation Type, input to input, and inputs to ground Type tested at 3535V DC for 60 s, inputs to backplane Type tested at 2120V DC for 60 s, input to input, and inputs to ground
Input impedance	250 Ω ±5Ω
Open circuit detection time	5 s (4...20 mA range only)
Input overvoltage protection	+28.8V DC
Normal mode noise rejection	> 90 dB @ 50 Hz and 60 Hz with 10 Hz filter > 74 dB @ 50 Hz and 60 Hz with 15 Hz filter > 33 dB @ 50 Hz and > 90 dB @ 60Hz with 20Hz filter

Table 58 - Technical Specifications - 1756-IF8IH (Continued)

Attribute	1756-IF8IH
Common mode noise rejection	> 90 dB @ 50 Hz and 60 Hz (10 Hz, 15 Hz, or 20 Hz filters only)
Calibrated accuracy at 25 °C with HART disabled	Better than 0.15% of range (all filters, monotonicity not guaranteed)
Calibrated accuracy at 25 °C with HART enabled	1.5% of full scale with 250 Hz filter 0.5% of full scale with 100 Hz filter 0.2% of full scale with 50 Hz or 60 Hz filter 0.15% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibrated accuracy over full temperature range with HART enabled	1.8% of full scale with 250 Hz filter 0.8% of full scale with 100 Hz filter 0.5% of full scale with 50 Hz or 60 Hz filter 0.4% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibration interval	12 mos typical
Input offset drift with temperature	<=300 μ A/°C
Gain drift with temperature	20 ppm/°C
Module error over full temperature range with HART disabled	0.3% of range (all filters)
Module scan time for all channels - analog, min	18...488 ms (filter dependent)
Typical module HART dynamic variables update time for all channels	1 sec typical with no pass-through or device information messaging active
Data format	32-bit floating point
Input conversion method	Sigma-Delta ADC (24-bit converter)
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
RTB screw torque	4.4 lb-in (0.4 N·m)
Slot width	1
Wire category	2 - on signal ports ⁽¹⁾
Wire type	Shielded copper
Wire Size	1756-TBCH <ul style="list-style-type: none"> Single wire connection: 0.33...2.1 mm² (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 Double wire connection: 0.33...1.3 mm² (22...16 AWG) solid or stranded copper wire rated at 90 °C (194 °F), or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H <ul style="list-style-type: none"> 0.33...2.1 mm² (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
IEC temperature code	T4
North American temperature code	T5
Enclosure type	None (open-style)

(1) Use this conductor category information for planning conductor routing. See Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

Table 59 - Environmental Specifications - 1756-IF8IH

Attribute	1756-IF8IH
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, 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)
Temperature, surrounding air, max	60 °C (140 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
Operating Altitude, max	2000 m
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Operating: 30 g Nonoperating: 50 g
Emissions	IEC 61000-6-4
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 10V/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

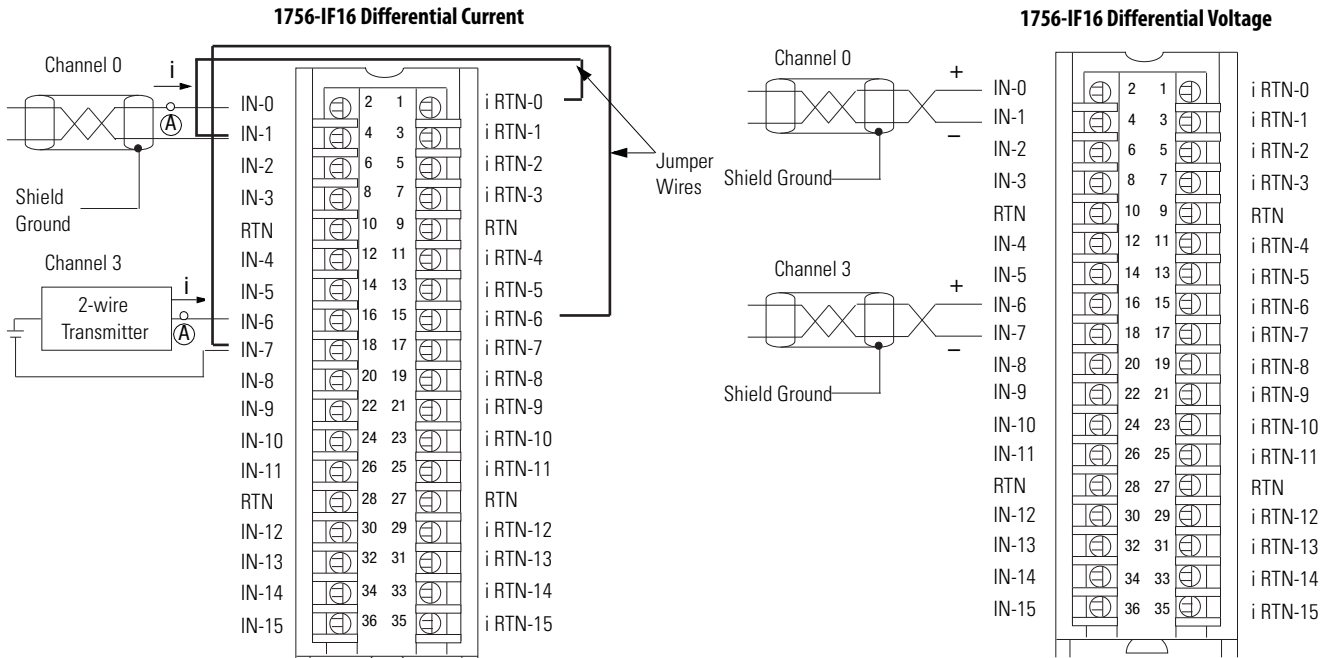
Table 60 - Certifications - 1756-IF8IH

Certification ⁽¹⁾	1756-IF8IH
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 US and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1: Meas./Control/Lab., Industrial Requirements • EN 61000-6-2: Industrial Immunity • EN 61000-6-4: Industrial Emissions • EN 61131-2: Programmable Controllers (Clause 8, Zone A and B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> • EN 61131-2: Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • EN 61000-6-4: Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-15: Potentially Explosive Atmospheres, Protection “n” • EN 60079-0: General Requirements II 3 G Ex nA IIC T4 Gc DEMK014ATEX1238X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) When product is 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.

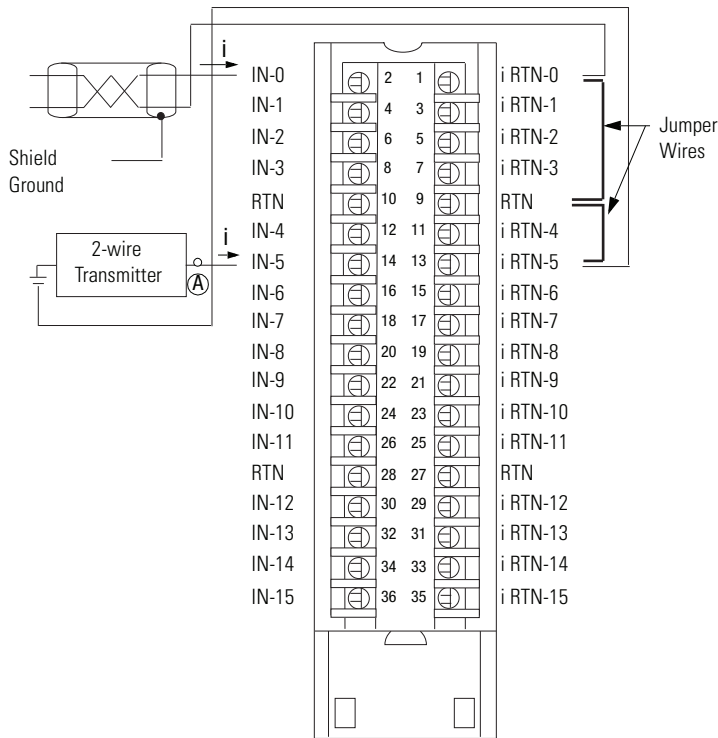
Use this table when wiring your module in Differential mode.

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 (-)

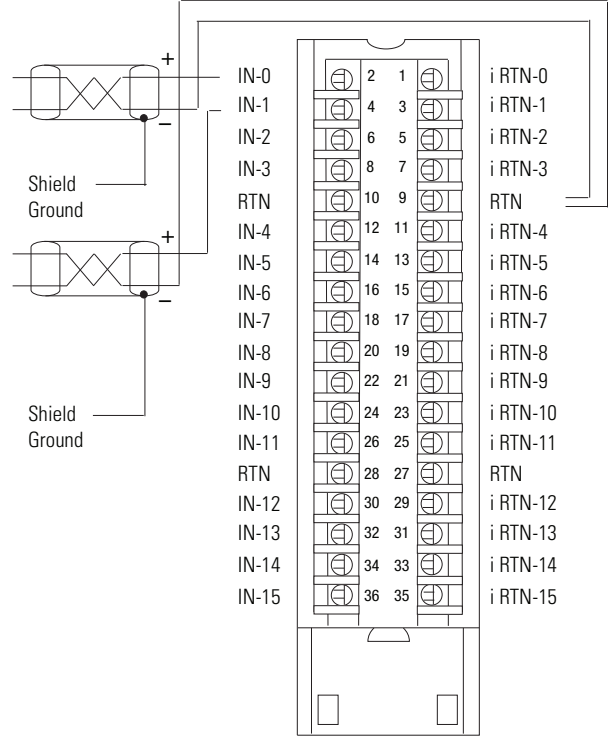
- All terminals marked RTN are connected internally.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to a RTN terminal to maintain the module's accuracy.
- Terminals marked RTN or i RTN are not used for differential voltage wiring.

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

1756-IF16 Single-ended Current



1756-IF16 Single-ended Voltage



- 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.

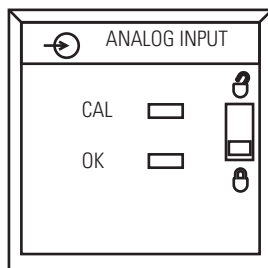


Table 61 - Technical Specifications - 1756-IF16

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 ⁽¹⁾
Common mode noise rejection	>100 dB @ 50/60 Hz
Channel bandwidth	15 Hz (-3 dB) ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
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 ⁽¹⁾
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 61 - 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 ⁽²⁾
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 62 - 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, 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 63 - Certifications - 1756-IF16

Certification⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

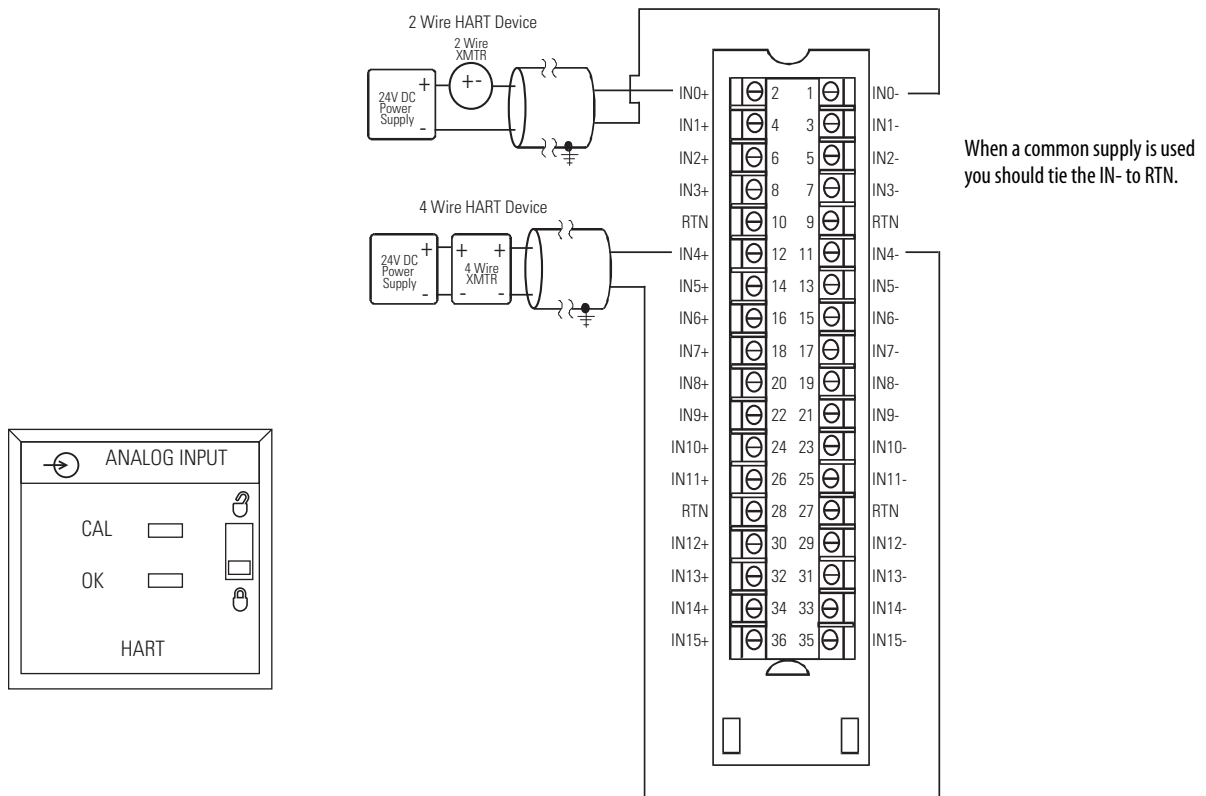


Table 64 - Technical Specifications - 1756-IF16H

Attribute	1756-IF16H
Inputs	16 differential, current
Input range	0...20 mA 4...20 mA
Resolution	16...21 bits
Voltage and current ratings	Backplane: 5.1V DC @ 200 mA, 24V DC @ 125 mA Input current range: 0...20 mA
Total backplane power	4.02 W
Power dissipation, max	6 W
Isolation voltage	50V (continuous) <ul style="list-style-type: none"> Basic insulation type, input channels to backplane No isolation between individual input channels Type tested at 1500V DC for 60 s
Thermal dissipation	12 BTU/hr
Input impedance	249 Ω
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)

Table 64 - Technical Specifications - 1756-IF16H (Continued)

Attribute	1756-IF16H
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 $\mu\text{V}/^\circ\text{C}$
Gain drift with temperature	11ppm/ $^\circ\text{C}$
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 size	1756-TBCH removable terminal block <ul style="list-style-type: none"> Single wire connection: 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max Double wire connection: 0.33...1.3 mm² (22...16 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max 1756-TBS6H removable terminal block <ul style="list-style-type: none"> 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max
Wire category	2 - on shielded signal ports ⁽¹⁾
Temperature code	North American: T5 ATEX: T4
Enclosure type rating	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 65 - 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)

Table 65 - Environmental Specifications - 1756-IF16H (Continued)

Attribute	1756-IF16H
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 IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Operating: 30 g Nonoperating: 50 g
Emissions	IEC 61000-6-4
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 66 - Certifications - 1756-IF16H

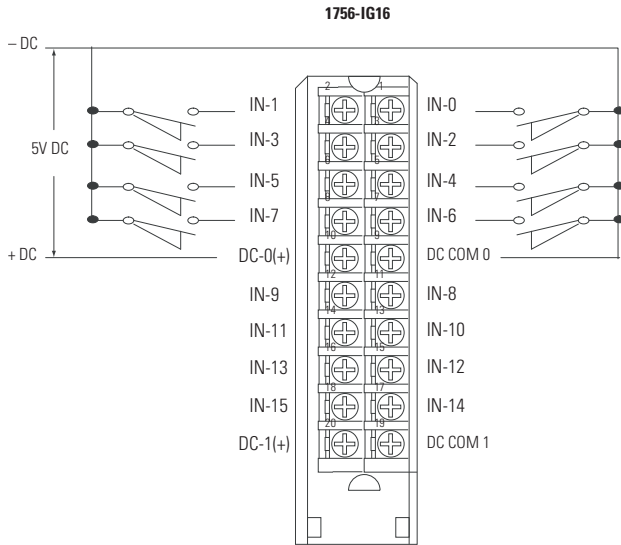
Certification ⁽¹⁾	1756-IF16H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc DEMK012ATEX1219040
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

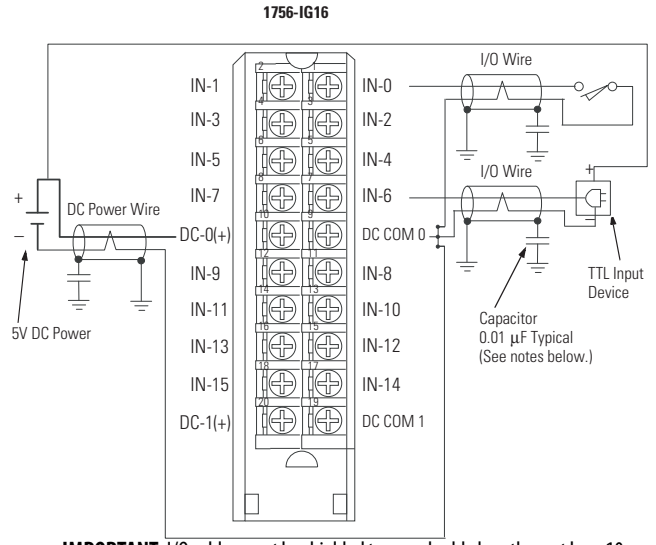
1756-IG16

ControlLogix TTL input module

Standard Wiring

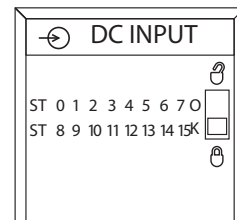
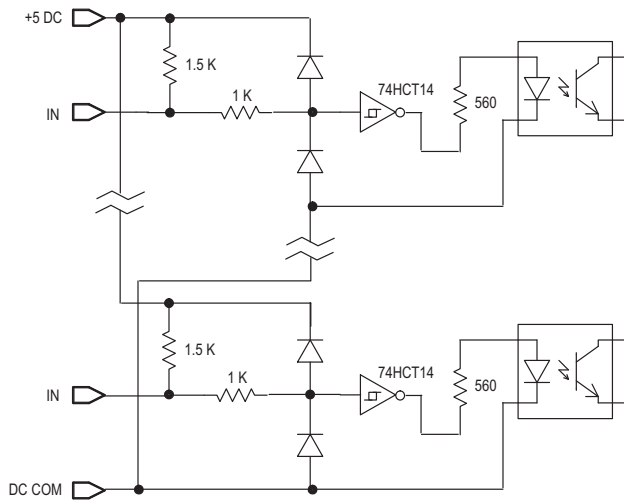


CE Compliant Wiring



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 67 - Technical Specifications - 1756-IG16

Attribute	1756-IG16
Inputs	16 (8 points/group)
Voltage category	5V DC TTL source (Low=True) ⁽¹⁾
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 μ s nom/450 μ s max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off (0-to-5V DC transition)	Hardware delay: 390 μ s nom/ 700 μ 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 Ω min 1.5 k Ω typical
Input current, nom	3.7 mA @ 5V DC
Input current, max	4.1 mA @ 5V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽²⁾
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 68 - 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, 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 69 - Certifications - 1756-IG16

Certification ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T5 X Gc
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

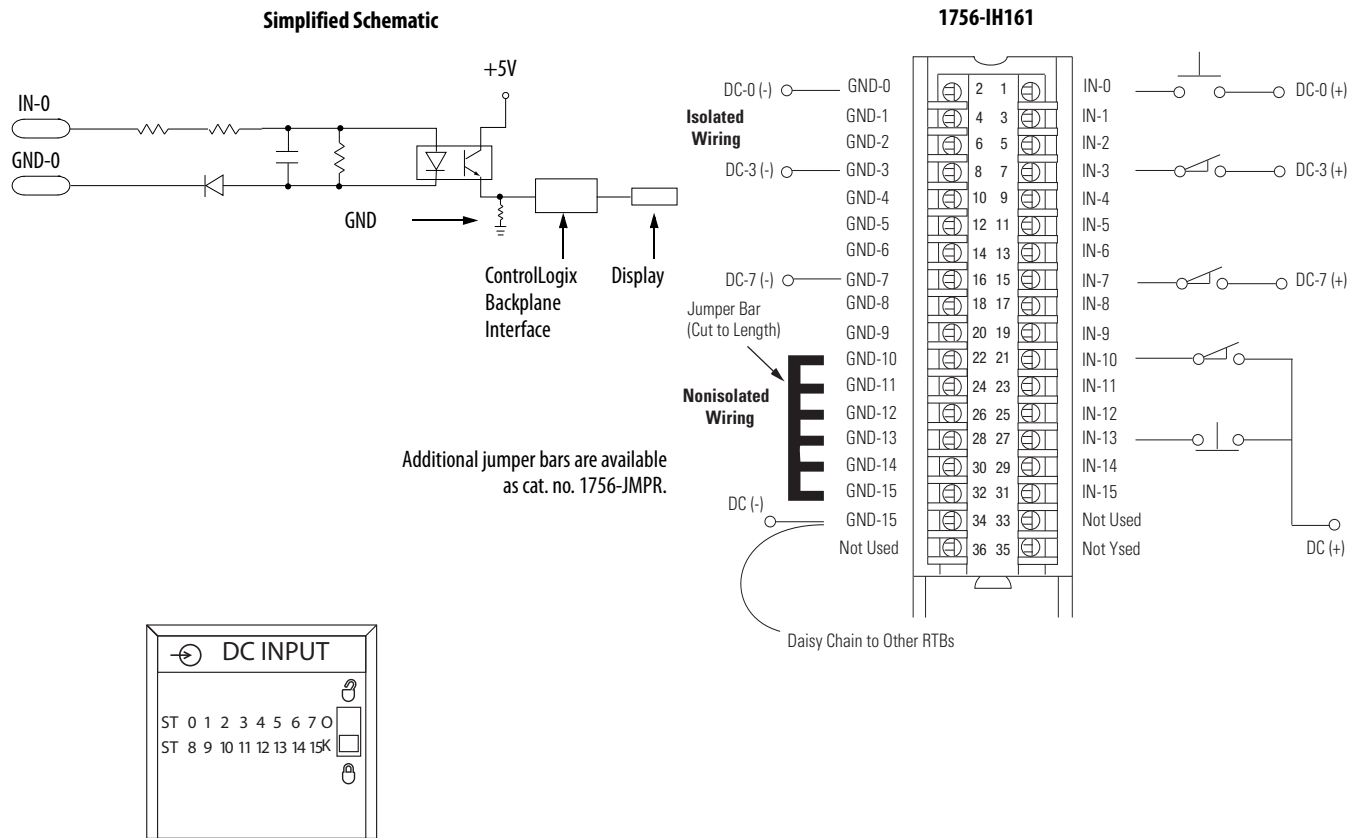


Table 70 - Technical Specifications - 1756-IH16I

Attribute	1756-IH16I
Inputs	16 individually isolated
Voltage category	125V DC sink/source
Operating voltage range	90...146V DC ⁽¹⁾
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 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)
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	20V DC

Table 70 - Technical Specifications - 1756-IH16I (Continued)

Attribute	1756-IH16I
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 ⁽²⁾
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 71 - 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)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing

Table 71 - Environmental Specifications - 1756-IH16I (Continued)

Attribute	1756-IH16I
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, 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 72 - Certifications - 1756-IH16I

Certification ⁽¹⁾	1756-IH16I
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

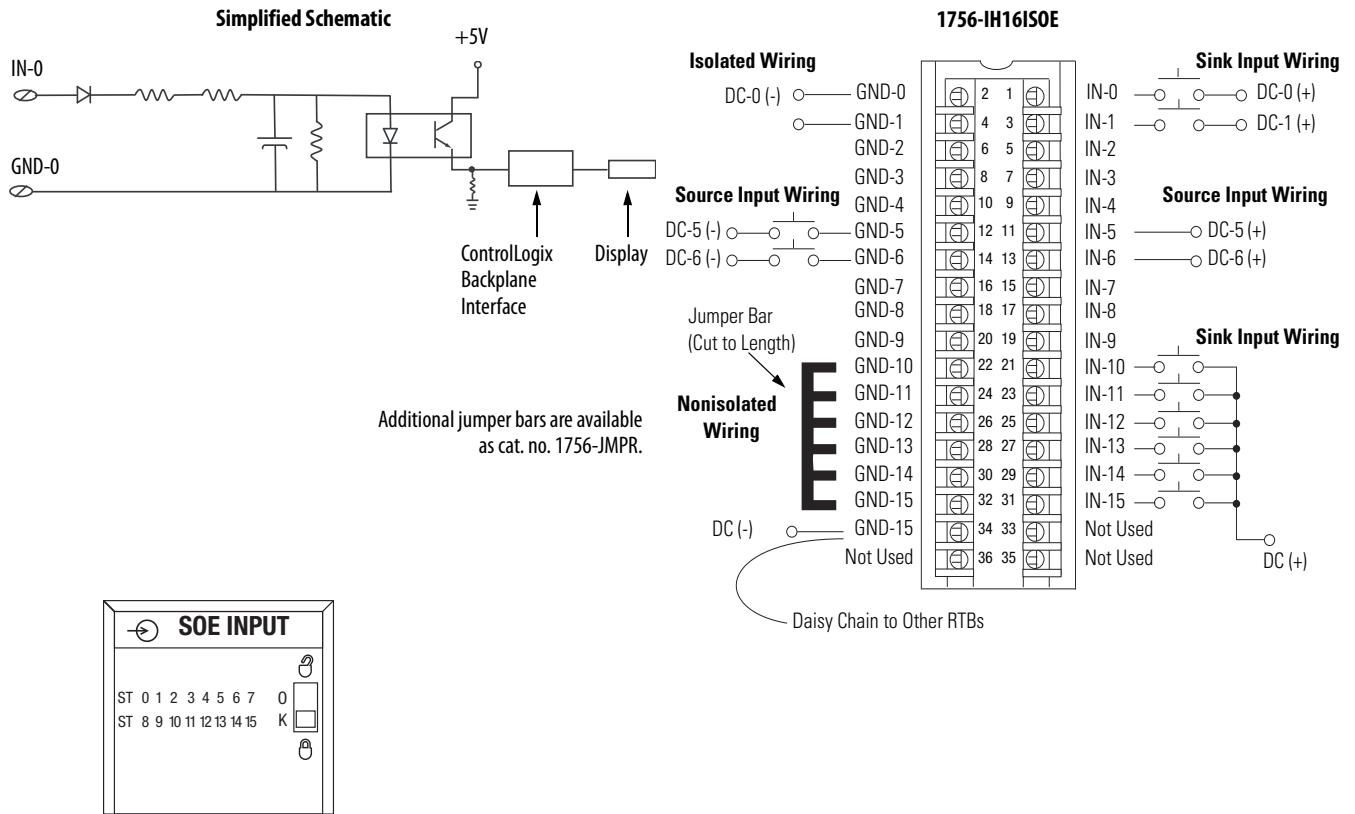


Table 73 - Technical Specifications - 1756-IH16ISOE

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 73 - 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 Ω
Cyclic update time	200 μ s. . . 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 100 μ 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 ⁽¹⁾
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 74 - 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, Class A

Table 74 - 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 75 - Certifications - 1756-IH16ISOE

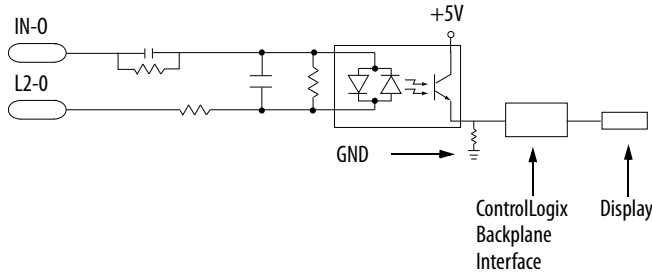
Certification ⁽¹⁾	1756-IH16ISOE
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

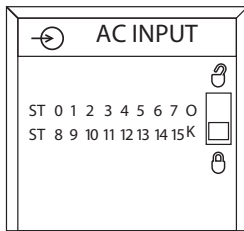
1756-IM16I

ControlLogix 240V AC input module

Simplified Schematic

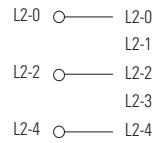


Additional jumper bars are available as cat. no. 1756-JMPR.



1756-IM16I

Isolated Wiring



Nonisolated Wiring

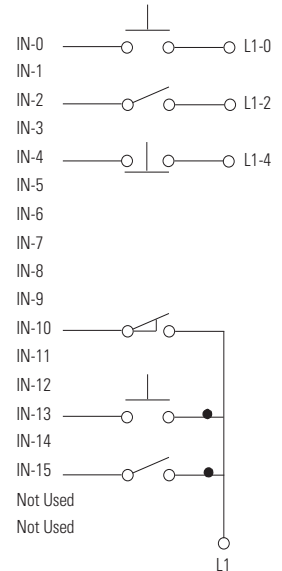
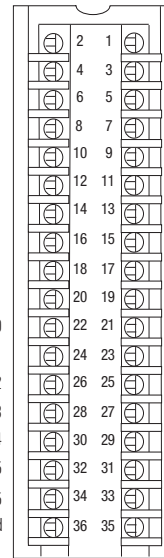
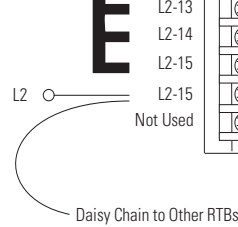


Table 76 - Technical Specifications - 1756-IM16I

Attribute	1756-IM16I
Inputs	16 individually isolated
Voltage category	240V AC 50/60 Hz
Operating voltage range	159...265V AC, 47...63 Hz ⁽¹⁾
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 76 - 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 Ω @ 265V AC, 60 Hz
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽²⁾
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 77 - 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 77 - Environmental Specifications - 1756-IM16I (Continued)

Attribute	1756-IM16I
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, 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 78 - Certifications - 1756-IM16I

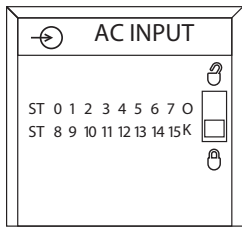
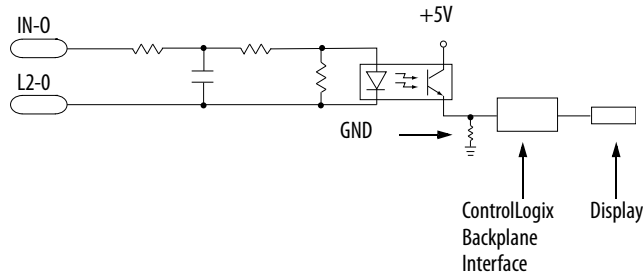
Certification ⁽¹⁾	1756-IM16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

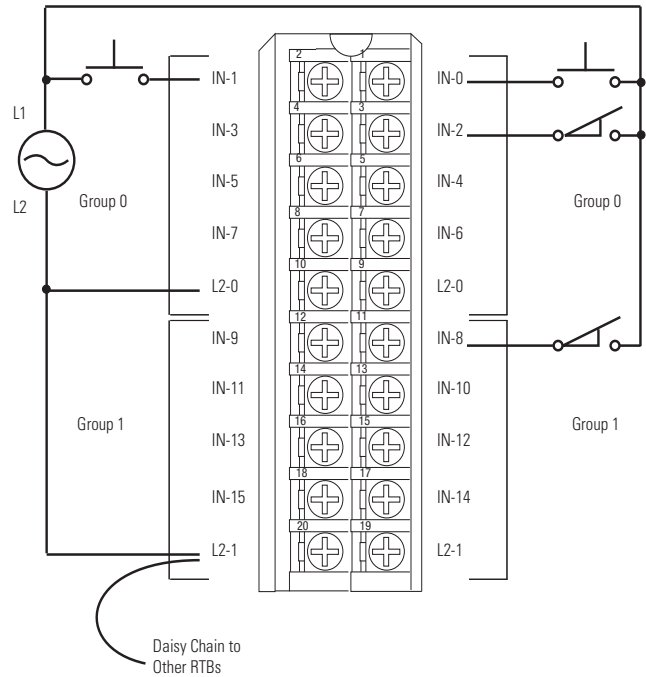


Table 79 - Technical Specifications - 1756-IN16

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 79 - Technical Specifications - 1756-IN16 (Continued)

Attribute	1756-IN16
Input impedance, max	2.5 k Ω @ 30V AC, 60 Hz
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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 80 - 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, 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 80 - 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

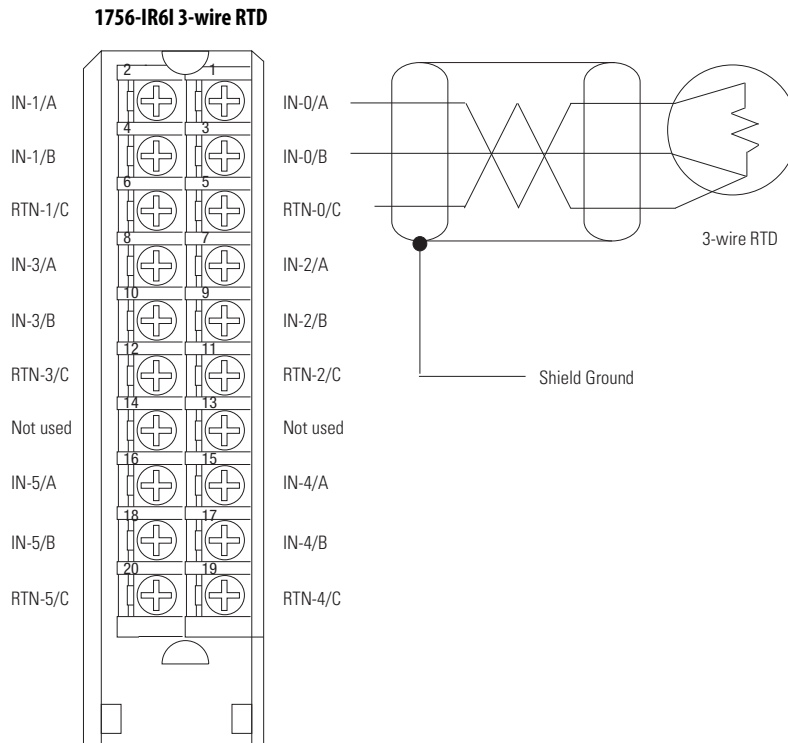
Table 81 - Certifications - 1756-IN16

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc
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-IR61 4-wire RTD

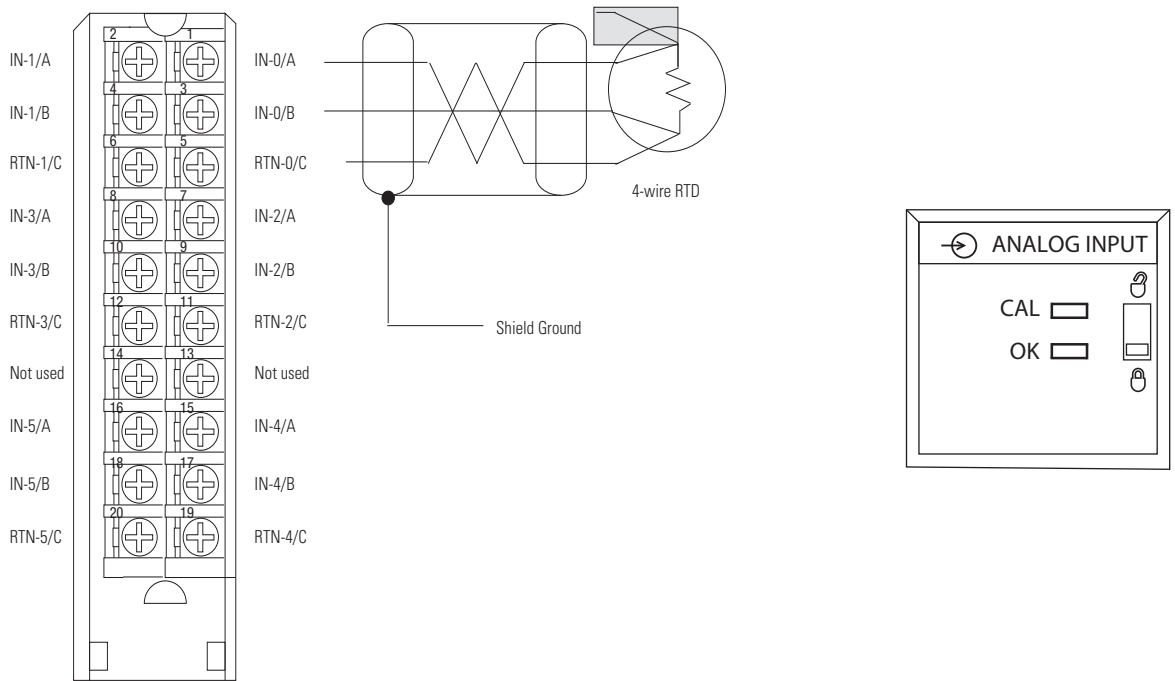


Table 82 - Signal and User Counts - 1756-IR61

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 83 - Technical Specifications - 1756-IR6I

Attribute	1756-IR6I
Inputs	6 individually isolated RTD
Input range	1...487 Ω 2...1000 Ω 4...2000 Ω 8...4000 Ω
Resolution	16 bits 1...487 Ω : 7.7 m Ω /bit 2...1000 Ω : 15 m Ω /bit 4...2000 Ω : 30 m Ω /bit 8...4020 Ω : 60 m Ω /bit
Sensors supported	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω 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 ⁽¹⁾
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
Calibrated accuracy @ 25 °C	Better than 0.1% of range
Calibration interval	6 months
Offset drift	10 M Ω /°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) ⁽¹⁾
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 83 - Technical Specifications - 1756-IR6I (Continued)

Attribute	1756-IR6I
Wire category	2 ⁽²⁾
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 84 - 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, 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 85 - Certifications - 1756-IR6I

Certification⁽¹⁾	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.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

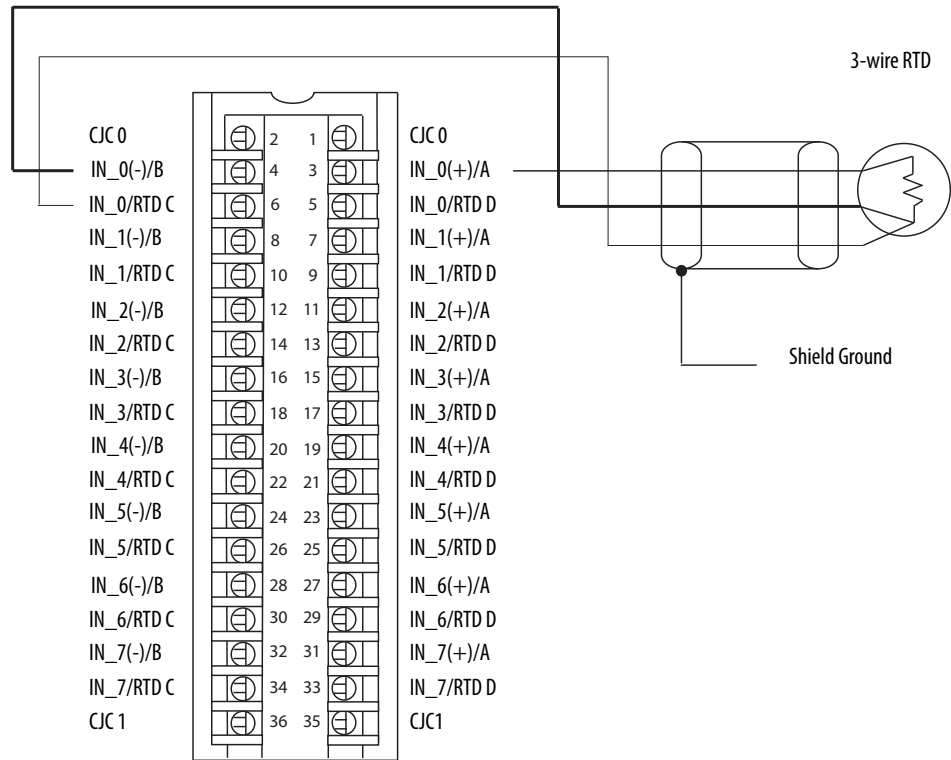
1756-IRT8I

ControlLogix isolated RTD/Thermocouple analog input module.

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

IMPORTANT: Remember the following:

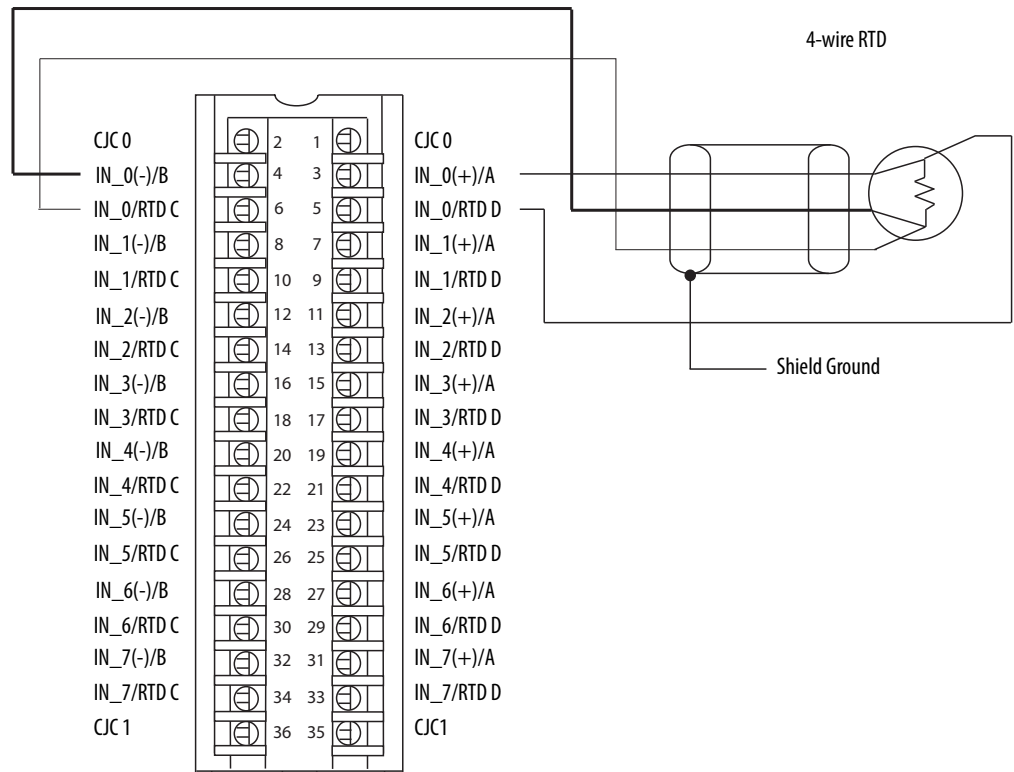
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.
- For 2-wire resistor applications including calibration, make sure IN_x(-)/B and IN_x/RTD C are shorted together.



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.

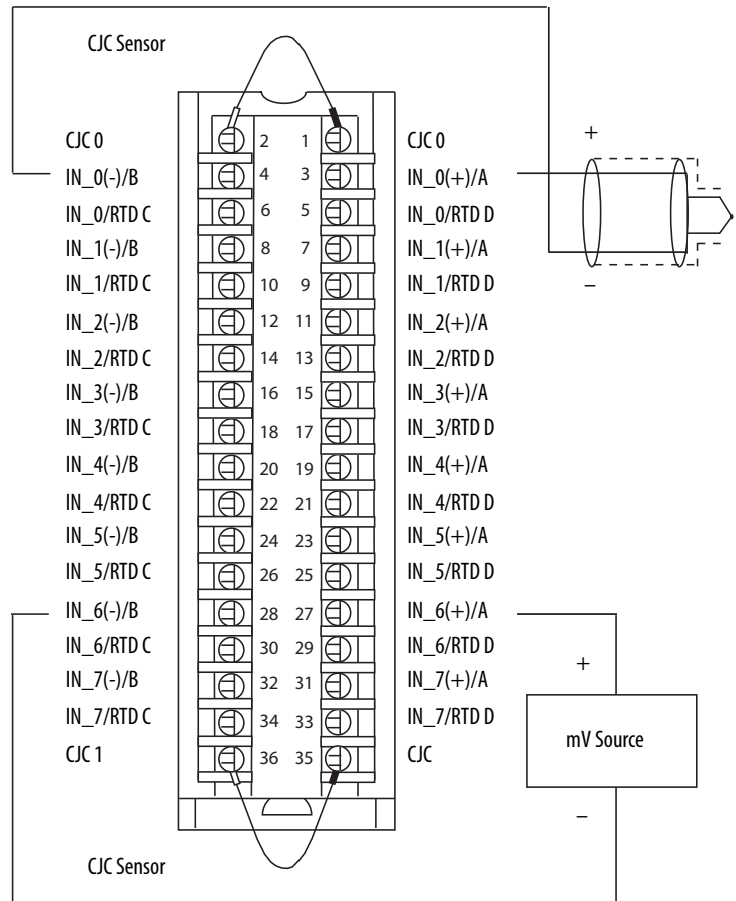
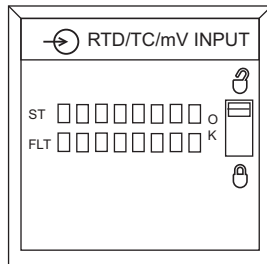


Table 86 - Technical Specifications - 1756-IRT8I

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 Ω 2...1000 Ω 4...2000 Ω 8...4000 Ω -100...100 mV
Resolution	24 bits 0...510 Ω: 0.06 mΩ/count 0...1020 Ω: 0.12 mΩ/count 0...2040 Ω: 0.25 mΩ/count 0...4080 Ω: 0.50 mΩ/count -101...101 mV: 0.01 μV/count
RTD sensors supported	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω Copper, alpha=427

Table 86 - Technical Specifications - 1756-IRT8I (Continued)

Attribute	1756-IRT8I
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 μ A
Input impedance, approx	1 G Ω
Open circuit detection time	<ul style="list-style-type: none"> Thermocouple input and 3-wire RTD input = 2 s 4-wire RTD input = 5 s <p>IMPORTANT: No Open Circuit Detection 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 ⁽¹⁾
Common mode noise rejection	125 dB @ 60 Hz 1000 Ω differential 120 dB @ 50 Hz 1000 Ω differential 160 dB @ 600V 100 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Calibrated accuracy @ 25 °C	0.05%
Module error over full temperature range	0.1%
Local CJC sensor accuracy	\pm 0.3 °C
Remote CJC sensor, accuracy	\pm 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 Type tested at 2300V AC for 60 s, inputs to backplane insulation type, inputs to backplane 250V (continuous), basic insulation type, input to input 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 Ω PT 385 20 Ω PT 385 500 Ω PT 385 1000 Ω PT 385	-200...870 °C (-328...1598 °F) 73...1143 °K 132...2058 °R
100 Ω PT 3916 20 Ω PT 3916 500 Ω PT 3916 1000 Ω PT 3916	-200...630 °C (-328...1166 °F) 73...903 °K 132...1626 °R

Table 86 - Technical Specifications - 1756-IRT8I (Continued)

Attribute	1756-IRT8I
10 Ω CU 427	-200...260 °C (-328...500 °F) 73...533 °K 132...960 °R
120 Ω NI 672	-80...320 °C (-112...608 °F) 193...593 °K 348...1068 °R
100 Ω NI 618 120 Ω NI 618 200 Ω NI 618 500 Ω NI 618	-60...250 °C (-76...482 °F) 213...523 °K 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
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/XX (L)	-200...800 °C (-328...1472 °F) 73...1073 °K 132...1932 °R

Table 86 - Technical Specifications - 1756-IRT8I (Continued)

Attribute	1756-IRT8I
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 ² (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 ⁽²⁾
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 87 - 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 87 - Environmental Specifications - 1756-IRT8I (Continued)

Attribute	1756-IRT8I
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 88 - Certifications - 1756-IRT8I

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

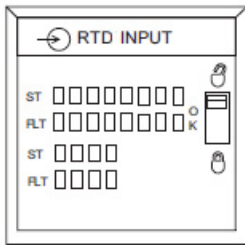
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

1756-IR12

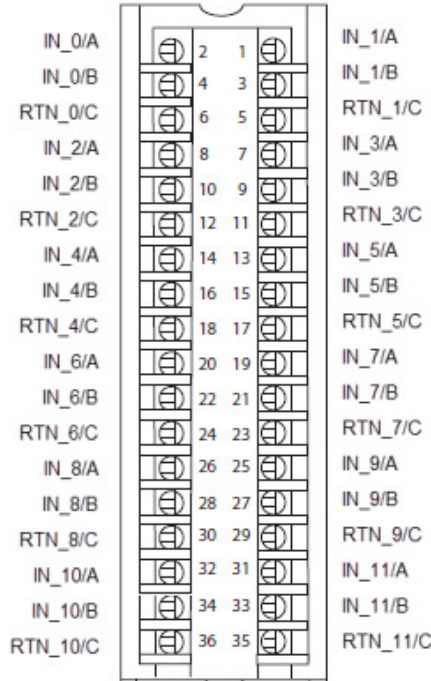
ControlLogix RTD analog input module

IMPORTANT: Remember the following:

- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- For 2-wire resistor applications including calibration, make sure IN_x/B and RTN_x/C are shorted together.



1756-IR12 3-wire RTD



3-wire RTD

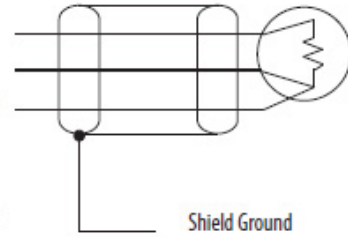


Table 89 - Technical Specifications - 1756-IR12

Attribute	1756-IR12
Inputs	12 channels RTD mode
Input range	1...500 Ω 2...1000 Ω 4...2000 Ω 8...4000 Ω
Resolution	24 bits 0...510 Ω: 0.06 mΩ/count 0...1020 Ω: 0.12 mΩ/count 0...2040 Ω: 0.25 mΩ/count 0...4080 Ω: 0.50 mΩ/count
RTD sensors supported	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω Copper, alpha=427
Current draw @ 5.1V	200 mA
Current draw @ 24V	70 mA
Total backplane power	2.7 W
Power dissipation, max	2.7 W

Table 89 - Technical Specifications - 1756-IR12

Thermal dissipation	9.2 BTU/hr
RTD excitation current	600 μ A
Overvoltage protection, max	\pm 30V DC
Common mode noise rejection	120 dB @ 60 Hz 1000 Ω differential 100 dB @ 50 Hz 1000 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Open circuit detection	Positive full-scale reading within 2 s
Calibrated accuracy @ 25 °C	0...510 Ω range: 0.1% Other Ω ranges: 0.25%
Module error over full temperature range	0...510 Ω range: 0.2% Other Ω ranges: 0.5%
Module input scan time, min	50 ms
Data format	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 Type tested at 1800V AC for 60s
RTD sensor types/temperature range (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100 Ω PT 385 20 Ω PT 385 500 Ω PT 385 1000 Ω PT 385	-200...870 °C (-328...1598 °F) 73...1143 °K 132...2058 °R
100 Ω PT 3916 20 Ω PT 3916 500 Ω PT 3916 1000 Ω PT 3916	-200...630 °C (-328...1166 °F) 73...903 °K 132...1626 °R
10 Ω CU 427	-200...260 °C (-328...500 °F) 73...533 °K 132...960 °R
120 Ω NI 672	-80...320 °C (-112...608 °F) 193...593 °K 348...1068 °R
100 Ω NI 618 120 Ω NI 618 200 Ω NI 618 500 Ω NI 618	-60...250 °C (-76...482 °F) 213...523 °K 384...942 °R
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1

Table 89 - Technical Specifications - 1756-IR12

Wire size	0.33... 2.1 mm ² (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 ⁽¹⁾
North American Temp Code	T4A
ATEX Temp Code	T4
IECEx Temp 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 90 - Environmental Specifications - 1756-IR12

Attribute	1756-IR12
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	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 IEC 61000-6-4	CISPR 11, 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 at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 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 5/100kHz on shielded ports
Surge Transient Immunity IEC 61000-4-5	±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

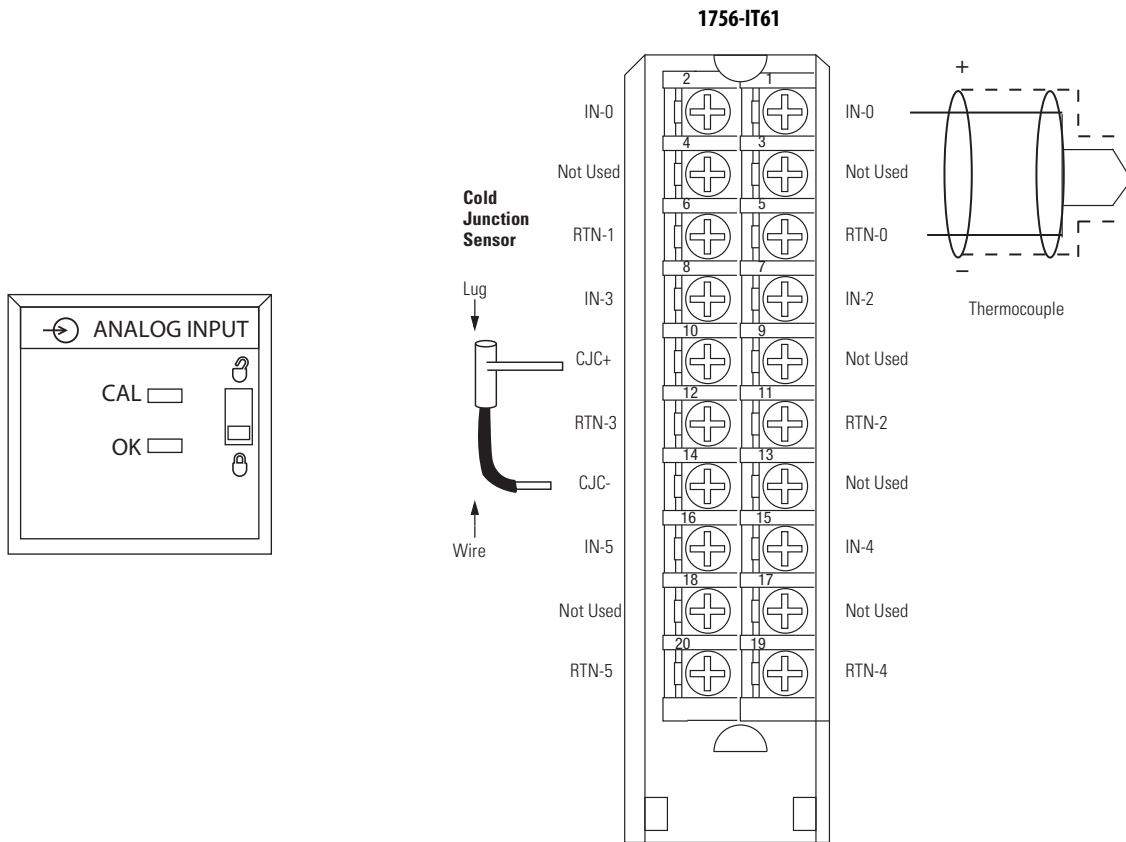
Table 91 - Certifications - 1756-IR12

Certification⁽¹⁾ (when product is marked)	Description
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> • EN 61010-2-201; Control Equipment Safety Requirements
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> • EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: <ul style="list-style-type: none"> • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at 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 92 - 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 93 - 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 μV/bit (typical) -12...30 mV: 0.7 μV/bit (high resolution range)
Thermocouples	B, E, J, K, R, S, T, N, C, D, L (TXK/XX)

Table 93 - 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 Ω
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 ⁽¹⁾
Common mode noise rejection	120 dB @ 60 Hz 100 dB @ 50 Hz
Channel bandwidth	15 Hz (-3 dB) ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
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	± 0.3 °C
Offset drift	0.5 μ 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) ⁽¹⁾
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 ⁽²⁾
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 94 - Thermocouple Ranges - 1756-IT6I

Attribute	1756-IT6I	
Thermocouple temperature/millivolt input range	-12...78 mV range	-12...30 mV range
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)	0...200...399 °C (392...750 °F) °C (32...3124 °F)
Thermocouple resolution over temperature range, nom	-12...78 mV range	-12...30 mV range
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 95 - 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, 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 95 - 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

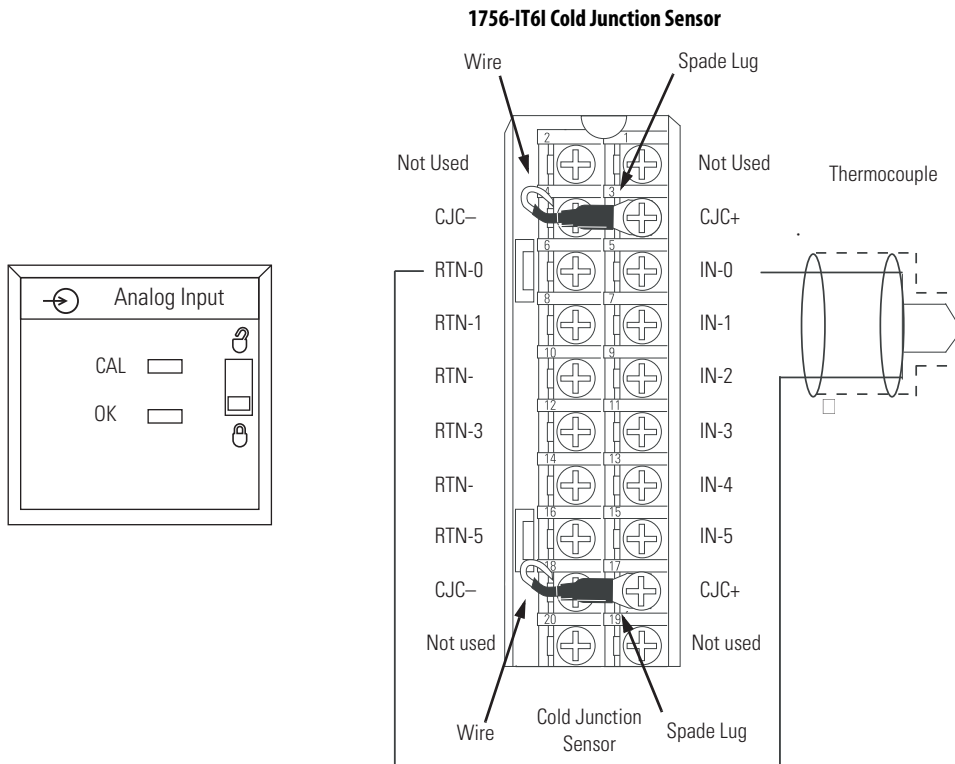
Table 96 - Certifications - 1756-IT6I

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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-IT6I2

ControlLogix enhanced thermocouple analog input module



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

Table 97 - Signal and User Counts - 1756-IT6I2

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 98 - Technical Specifications - 1756-IT6I2

Attribute	1756-IT6I2
Inputs	6 individually isolated thermocouple 2 CJC
Input range	-12...78 mV (1.4 μ V per bit) -12...30 mV (0.7 μ V per bit – high resolution range)
Resolution	16 bits -12...78 mV: 1.4 μ V/bit -12...30 mV: 0.7 μ 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 98 - 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 Ω
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 ⁽¹⁾
Common mode noise rejection	160 dB min, tested @ 600V AC/60 Hz applied with 100 Ω differential resistance
Channel bandwidth	15 Hz ⁽¹⁾
Settling time	<80 ms to 5% of full scale ⁽¹⁾
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	± 0.3 °C
Remote CJC sensor accuracy	± 0.3 °C
Offset drift	0.5 μ V/°C
Gain drift with temperature, nom	15 ppm/°C 1.4 μ V/°C for -12...78 mV 0.6 μ V/°C for -12...30 mV
Gain drift with temperature, max	25 ppm/°C 2.3 μ V/°C for -12...78 mV 1.1 μ 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) ⁽¹⁾
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 ⁽²⁾
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 99 - Thermocouple Ranges - 1756-IT612

Attribute	1756-IT612	
Thermocouple temperature/millivolt input range	-12...78 mV range	-12...30 mV range
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)	0...200...399 °C (392...750 °F) °C (32...3124 °F)
Thermocouple resolution over temperature range, nom	-12...78 mV range	-12...30 mV range
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 100 - 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, 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 100 - Environmental Specifications - 1756-IT612 (Continued)

Attribute	1756-IT612
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 101 - Certifications - 1756-IT612

Certification ⁽¹⁾	1756-IT612
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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-IT16

ControlLogix thermocouple analog input module.

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.

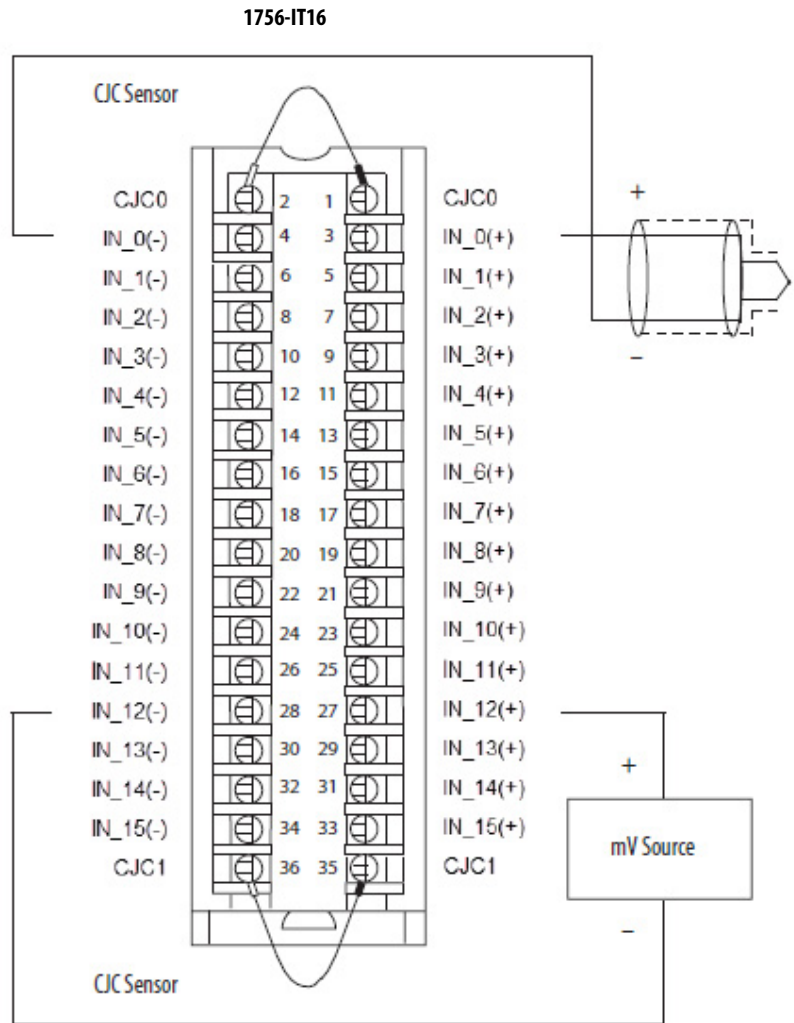
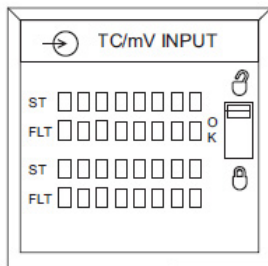


Table 102 - 1756-IT16 - Technical Specifications

Attribute	1756-IT16
Inputs	16 channels, 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	-100... 100 mV max 5 VA
Resolution	24 bits -101... 101 mV: 0.01 μ V/count
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	80 mA
Total backplane power	3 W

Table 102 - 1756-IT16 - Technical Specifications

Attribute	1756-IT16
Power dissipation, max	3 W
Thermal dissipation	9.9 BTU/hr
Input impedance, approx	1 G Ω
Overvoltage protection, max	\pm 30V DC
Normal mode noise rejection	75 dB at 60 Hz ⁽¹⁾
Common mode noise rejection	120 dB @ 60 Hz 1000 Ω differential 100 dB @ 50 Hz 1000 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Open circuit detection	Positive full-scale reading within 2 s
Calibrated accuracy @ 25 °C	0.1%
Module error over full temperature range	0.2%
Local CJC sensor accuracy	\pm 0.3 °C
Remote CJC sensor, accuracy	\pm 0.3 °C
Module input scan time, min	50 ms
Data format	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 Type tested at 1800V AC for 60s
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
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

Table 102 - 1756-IT16 - Technical Specifications

Attribute	1756-IT16
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 ² (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 shielded signal ports ⁽²⁾
North American Temp Code	T4A
ATEX Temp Code	T4
IECEx Temp 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 103 - 1756-IT16 - Environmental Specifications

Attribute	1756-IT16
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 IEC 61000-6-4	CISPR 11, 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 at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 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 5/100kHz on shielded 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
Enclosure Type Rating	None (open-style)

Table 104 - Certifications - 1756-IT16

Certification⁽¹⁾ (when product is marked)	Description
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> EN 61010-2-201; Control Equipment Safety Requirements
RCM	Australian Radiocommunications Act, compliant with: <ul style="list-style-type: none"> EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none"> EN 60079-0; General Requirements EN 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc DEMK015ATEX1482X
IECEX	IECEX System, compliant with: <ul style="list-style-type: none"> IEC 60079-0; General Requirements IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc IECEX UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: <ul style="list-style-type: none"> Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

(1) See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IV16

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

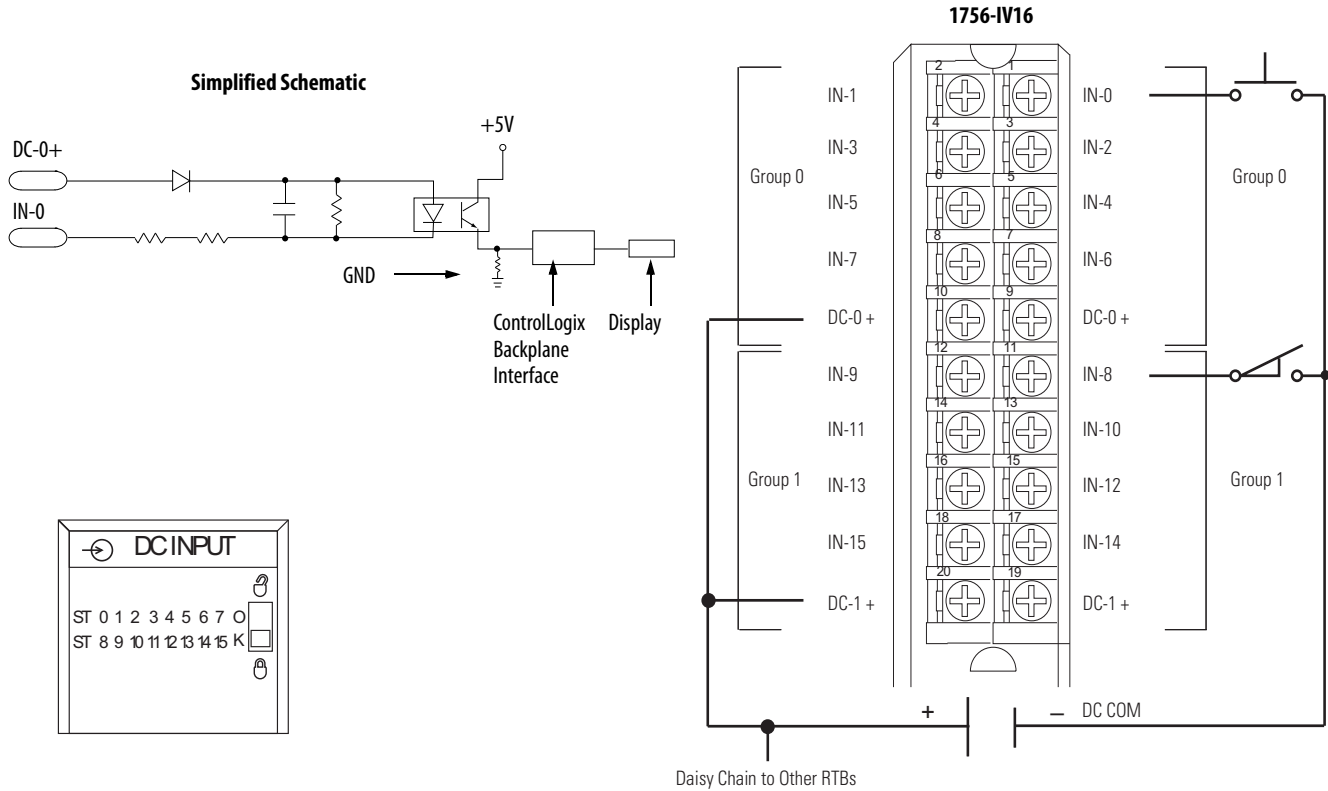


Table 105 - Technical Specifications - 1756-IV16

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 μ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 540 μ s 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 105 - Technical Specifications - 1756-IV16 (Continued)

Attribute	1756-IV16
Inrush current, max	250 mA
Input impedance, max	3.2 k Ω @ 30V DC
Cyclic update time	200 μ s...750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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 106 - 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 106 - 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 107 - Certifications - 1756-IV16

Certification ⁽¹⁾	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/EC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

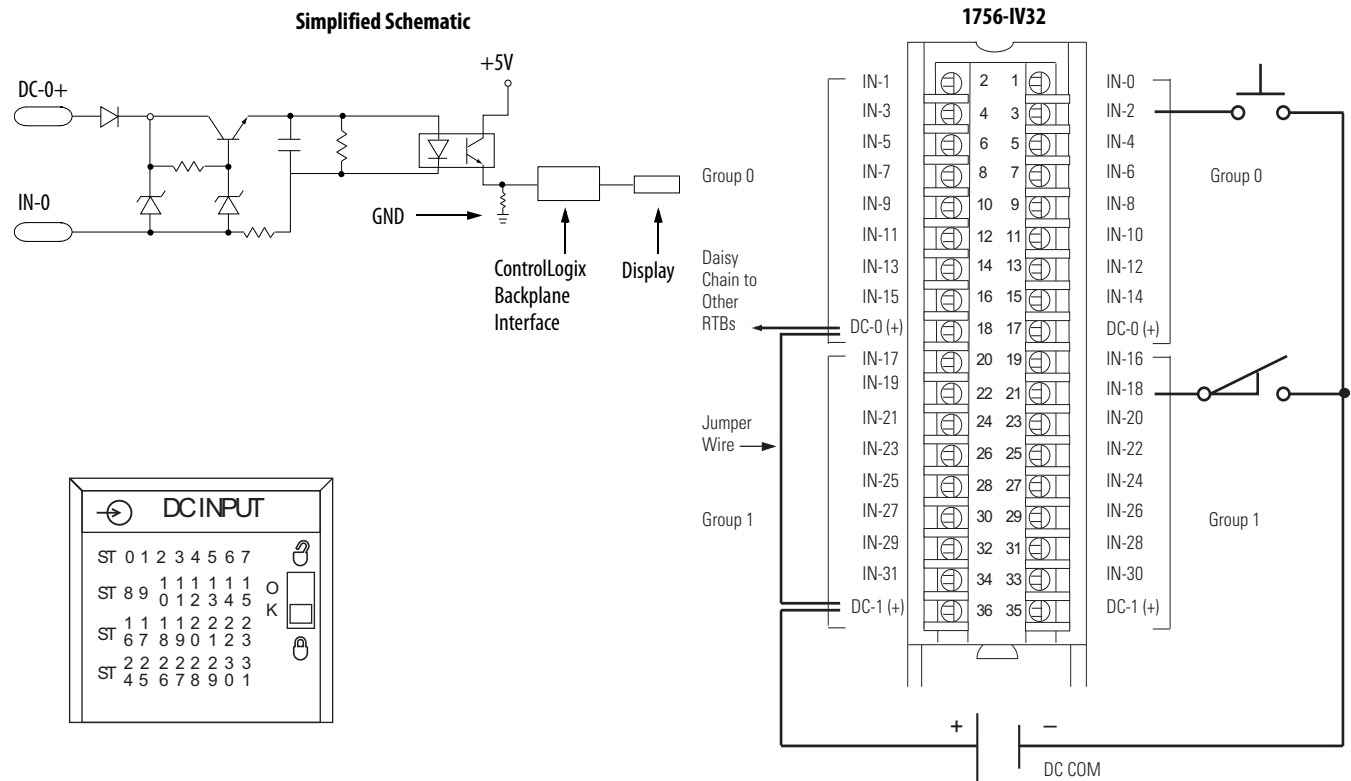


Table 108 - Technical Specifications - 1756-IV32

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 μ s nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms
On to Off	Hardware delay: 540 μ 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 108 - 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 Ω @ 30V DC
Cyclic update time	200 μ s ... 750 ms
Change of state	Software configurable
Timestamp of inputs	\pm 200 μ 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 ⁽¹⁾
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 109 - 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 109 - 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 110 - Certifications - 1756-IV32

Certification ⁽¹⁾	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/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

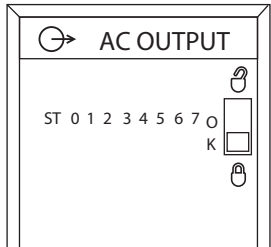
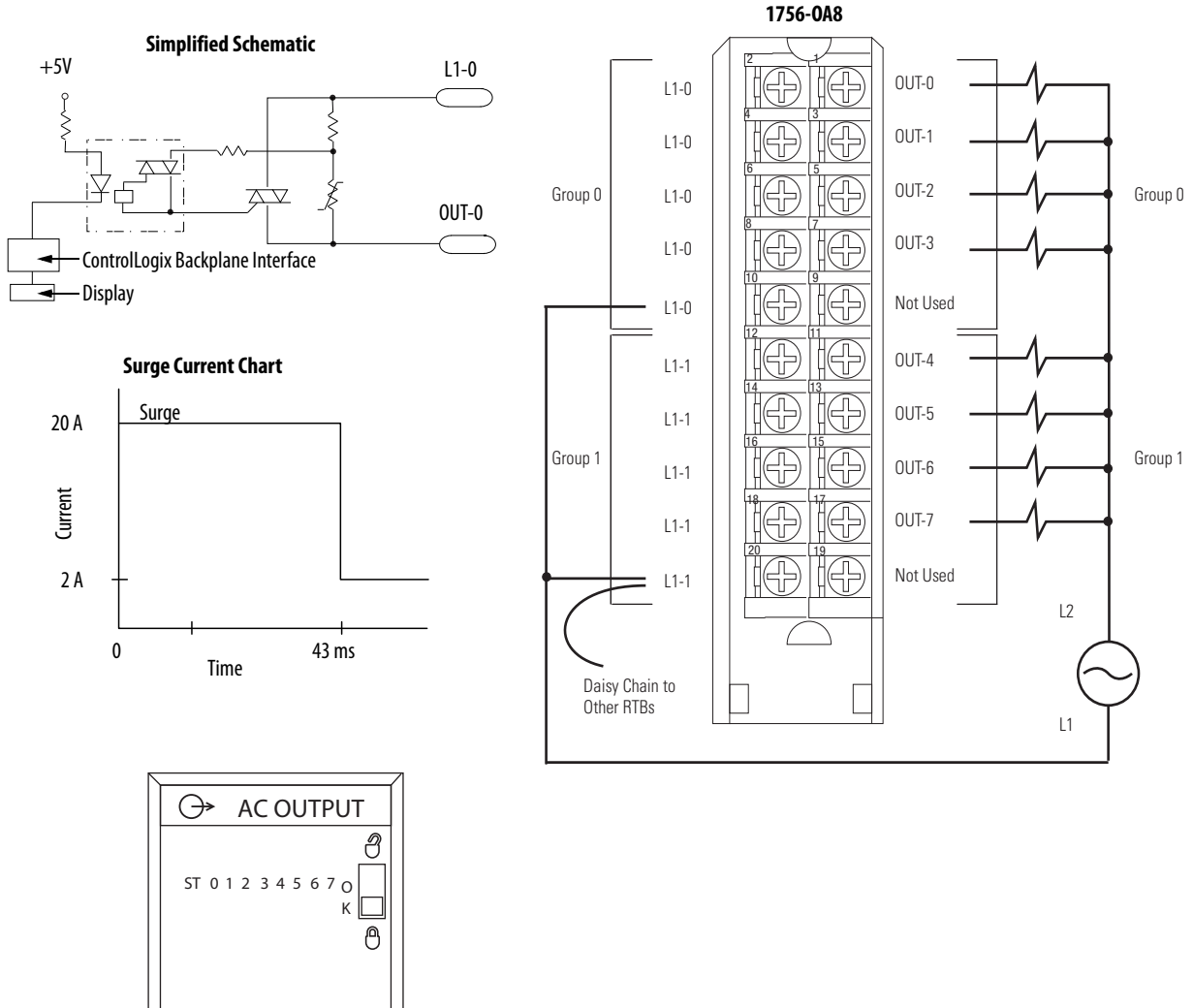


Table 111 - Technical Specifications - 1756-0A8

Attribute	1756-0A8
Outputs	8 (4 points/group)
Pilot duty	2 A
Voltage category	120/240V AC 50/60 Hz
Operating voltage range ⁽¹⁾	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 111 - 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 ⁽²⁾
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 ⁽³⁾
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 112 - 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, 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 113 - Certifications - 1756-0A8

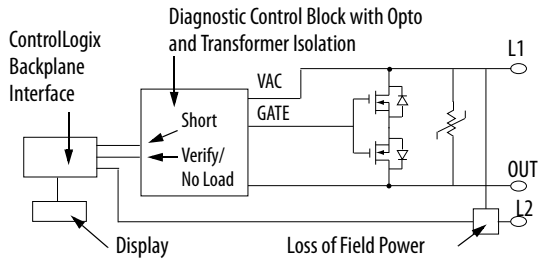
Certification ⁽¹⁾	1756-0A8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

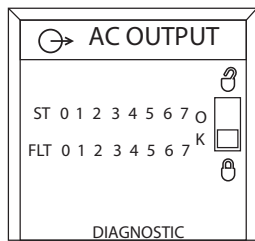
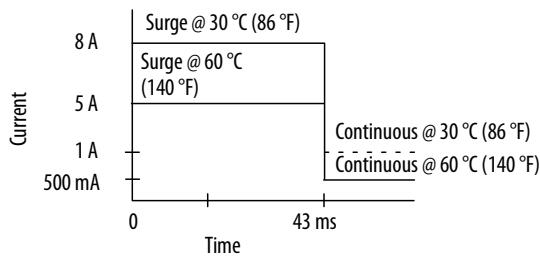
1756-0A8D

ControlLogix 120V AC diagnostic output module

Simplified Schematic



Surge Current Chart



1756-0A8D

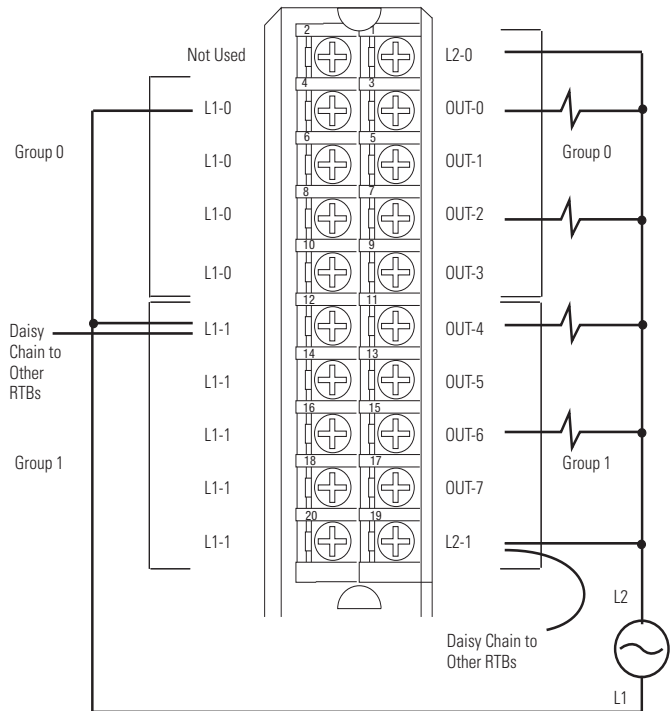


Table 114 - Diagnostic Specifications - 1756-0A8D

Attribute	1756-0A8D
Short trip, min	12 A for 500 μ 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 115 - 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 ⁽¹⁾	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 ⁽²⁾
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 116 - 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, 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 117 - Certifications - 1756-0A8D

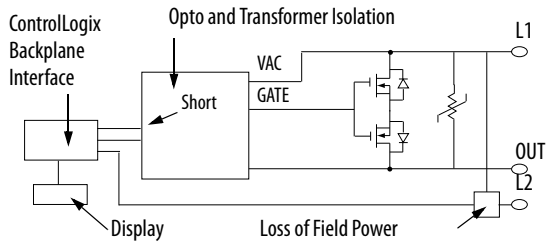
Certification ⁽¹⁾	1756-0A8D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

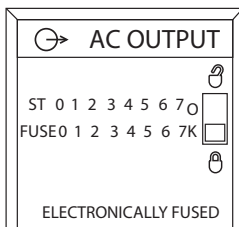
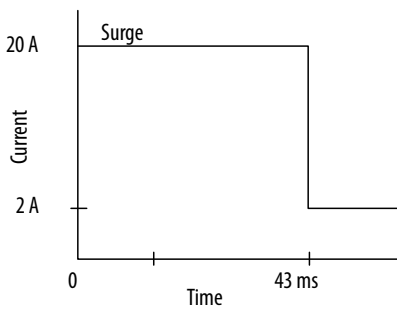
1756-0A8E

ControlLogix 120V AC electronically-fused output module

Simplified Schematic



Surge Current Chart



1756-0A8E

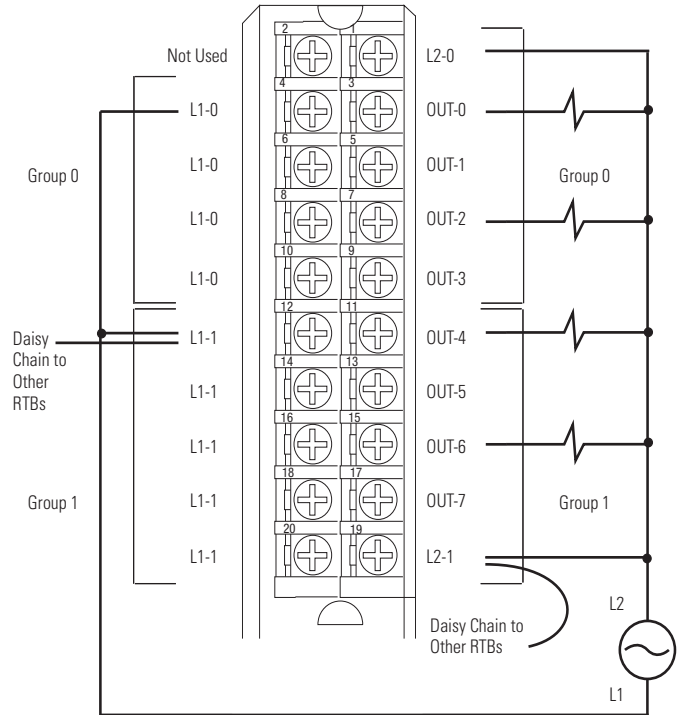


Table 118 - Diagnostic Specifications - 1756-0A8E

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 119 - 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 ⁽¹⁾	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 ⁽²⁾
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 120 - 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, 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	±1k V 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 121 - Certifications - 1756-0A8E

Certification ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

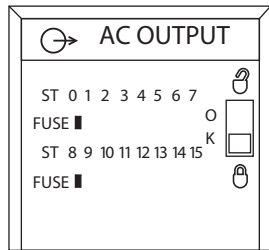
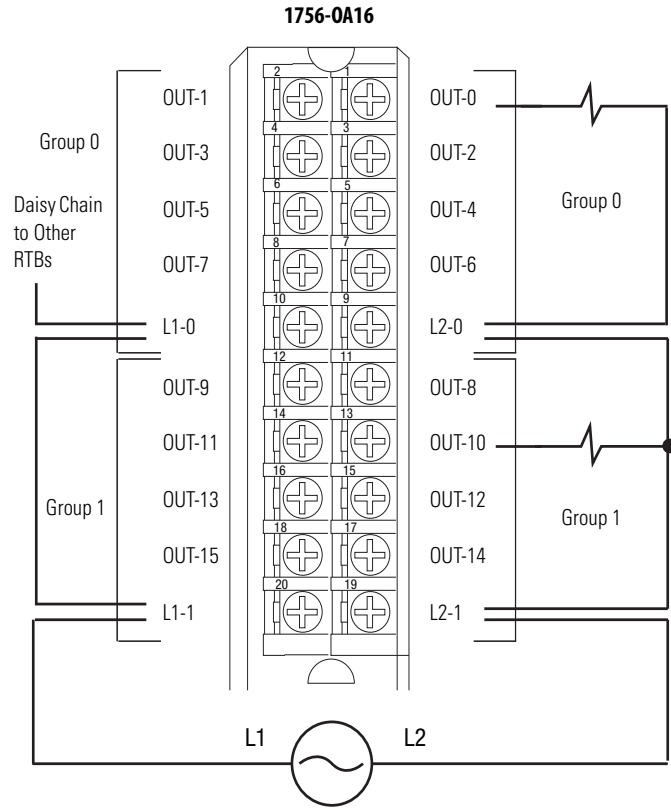
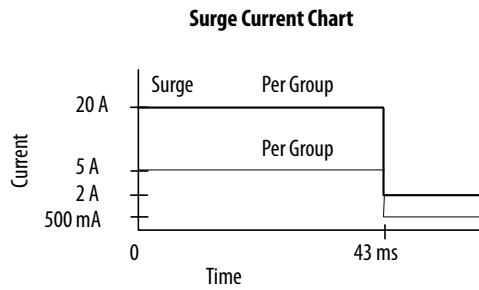
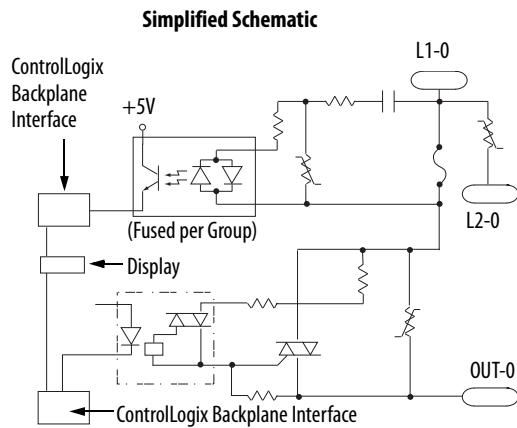


Table 122 - Diagnostic Specifications - 1756-0A16

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

Table 123 - 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 ⁽¹⁾	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 ⁽²⁾
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 123 - Technical Specifications - 1756-0A16 (Continued)

Attribute	1756-0A16
Wire category	1 ⁽³⁾
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/ μ s for loads under 50 mA. The commutating dv/dt rating of the module for loads 50...500 mA (OUTPUT to L2) is 4V/ μ 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 124 - 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, 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 125 - Certifications - 1756-OA16

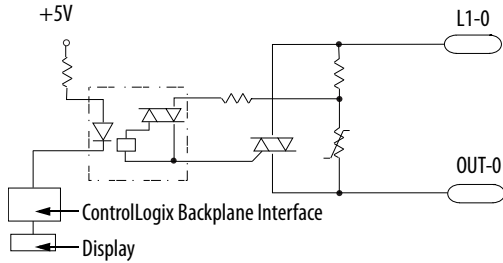
Certification ⁽¹⁾	1756-OA16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

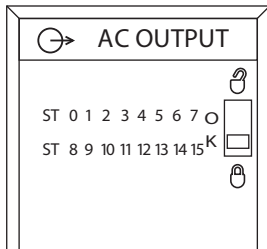
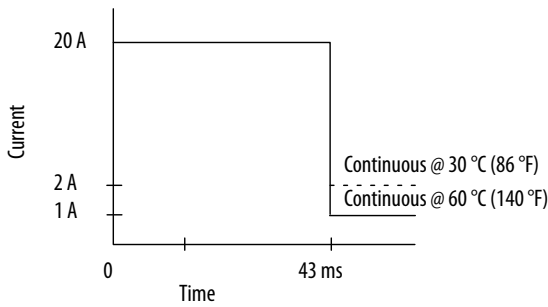
1756-0A16I

ControlLogix 120/240V AC isolated output module

Simplified Schematic

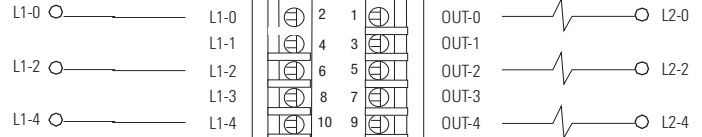


Surge Current Chart

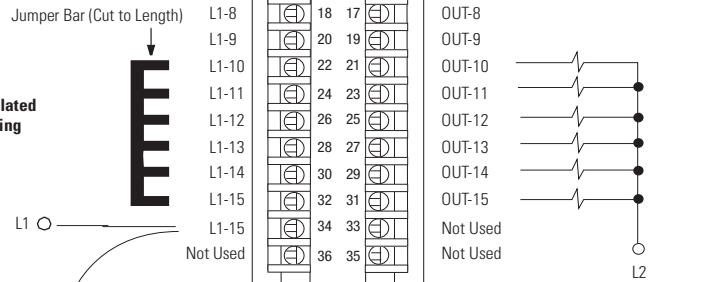


1756-0A16I

Isolated Wiring



Nonisolated Wiring



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

Table 126 - 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 ⁽¹⁾	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	300 mA
Current draw @ 24V	2.5 mA
Total backplane power	1.59 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)

Table 126 - Technical Specifications - 1756-0A16I (Continued)

Attribute	1756-0A16I
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/μs for loads > 50 mA 0.2V/μs for loads < 50 mA ⁽²⁾
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 ⁽³⁾
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/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 127 - Environmental Specifications - 1756-0A16I

Attribute	1756-0A16I
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)

Table 127 - Environmental Specifications - 1756-0A16I

Attribute	1756-0A16I
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, 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 128 - Certifications - 1756-0A16I

Certification ⁽¹⁾	1756-0A16I
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

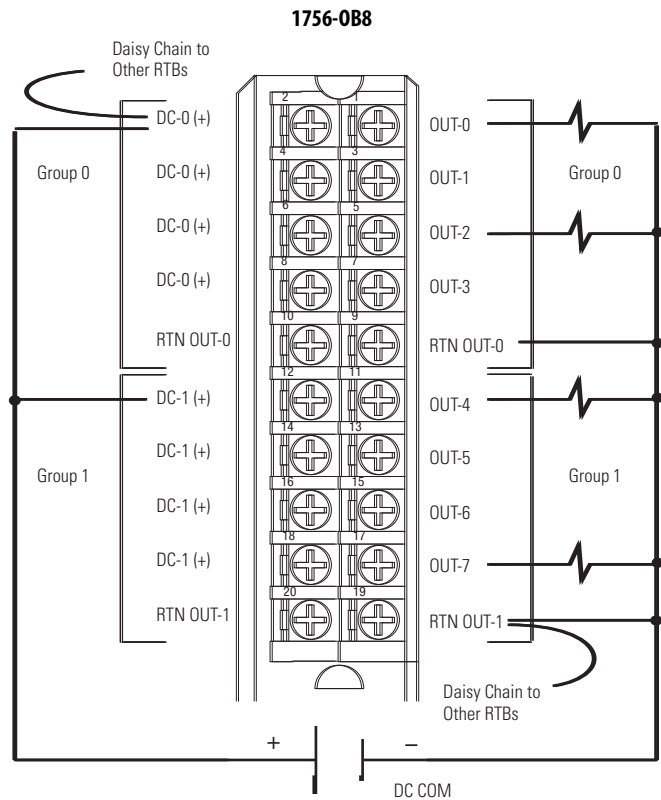
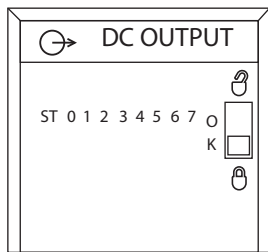
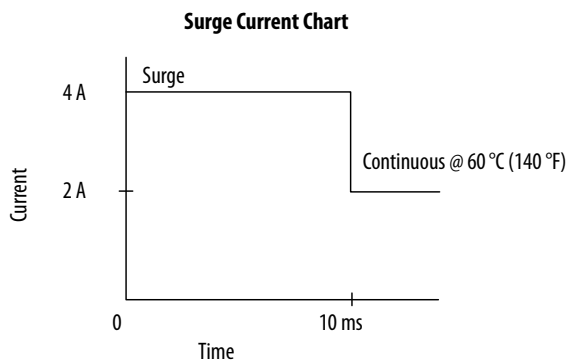
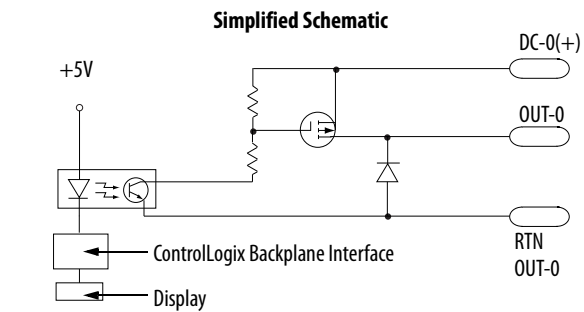


Table 129 - Technical Specifications - 1756-0B8

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
Total backplane power	0.89 W
Power dissipation, max	2.5 W @ 60 °C (140 °F)
Thermal dissipation	8.53 BTU/hr

Table 129 - Technical Specifications - 1756-OB8 (Continued)

Attribute	1756-OB8
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 ⁽¹⁾
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 130 - Environmental Specifications - 1756-OB8

Attribute	1756-OB8
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 130 - Environmental Specifications - 1756-0B8 (Continued)

Attribute	1756-0B8
Emissions	CISPR 11, 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 131 - Certifications - 1756-0B8

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

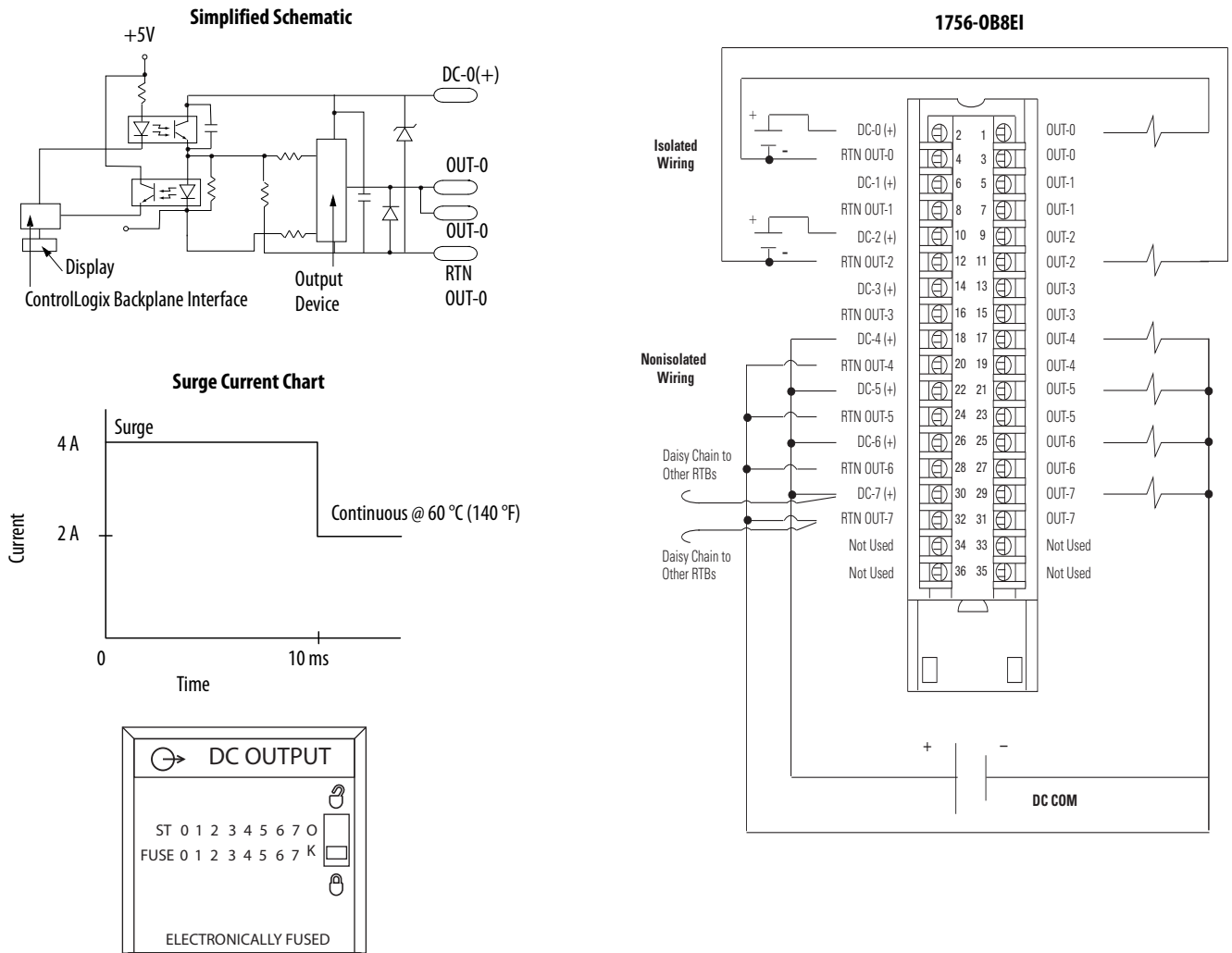


Table 132 - Diagnostic Specifications - 1756-OB8EI

Attribute	1756-OB8EI
Short trip	> 4.5 A for 500 μ 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 133 - 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

Table 133 - Technical Specifications - 1756-OB8EI (Continued)

Attribute	1756-OB8EI
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 ⁽¹⁾
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 134 - Environmental Specifications - 1756-OB8EI

Attribute	1756-OB8EI
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 134 - Environmental Specifications - 1756-0B8EI (Continued)

Attribute	1756-0B8EI
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, 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 135 - Certifications - 1756-0B8EI

Certification ⁽¹⁾	1756-0B8EI
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

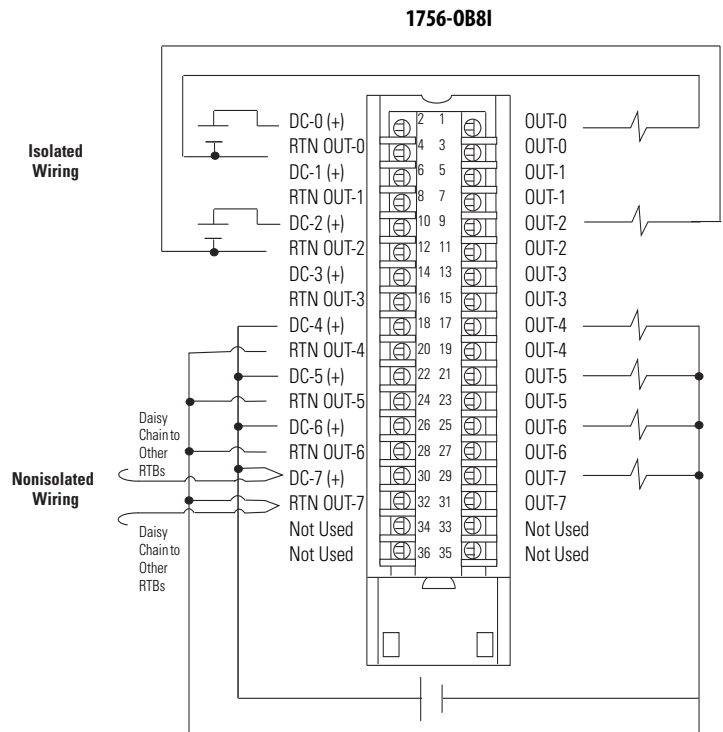
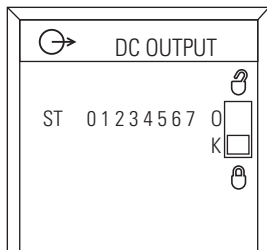
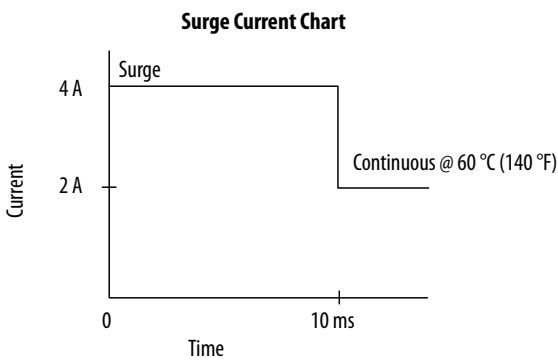
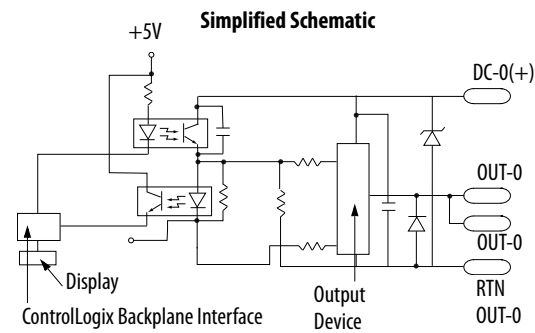


Table 136 - Technical Specifications - 1756-0B8I

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
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	4.6W @ 60 °C (140 °F)

Table 136 - Technical Specifications - 1756-0B8I (Continued)

Attribute	1756-0B8I
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 ⁽¹⁾
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 137 - Environmental Specifications - 1756-0B8I

Attribute	1756-0B8I
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 137 - Environmental Specifications - 1756-0B8I (Continued)

Attribute	1756-0B8I
Emissions	CISPR 11, 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 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 138 - Certifications - 1756-0B8I

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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-OB16D

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

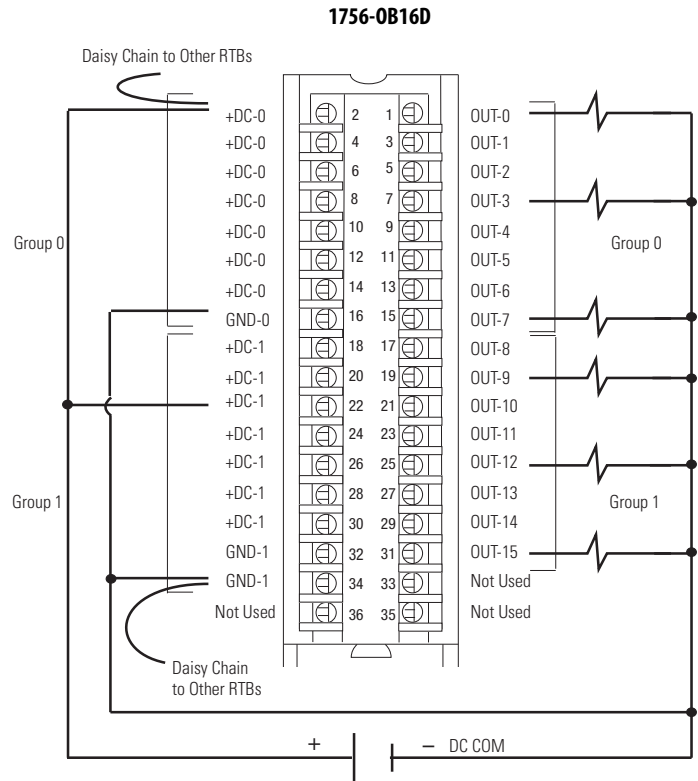
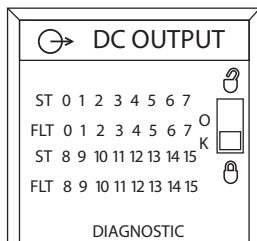
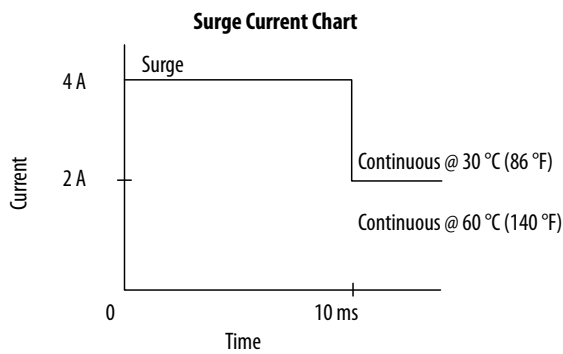
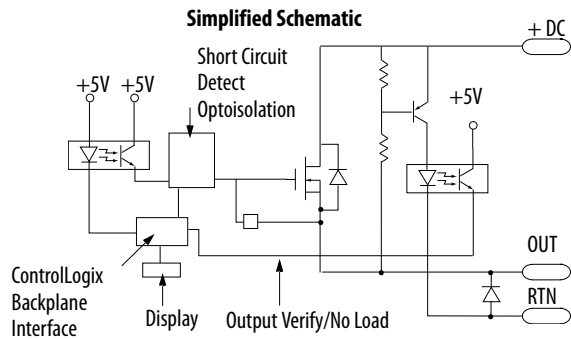


Table 139 - Diagnostic Specifications - 1756-OB16D

Attribute	1756-OB16D
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 140 - Technical Specifications - 1756-OB16D

Attribute	1756-OB16D
Outputs	16 diagnostic (8 points/group)
Pilot duty	2 A (DC-135Q)
Voltage category	24V DC source

Table 140 - Technical Specifications - 1756-OB16D (Continued)

Attribute	1756-OB16D
Operating voltage range	19.2...30V DC
Output delay time	
Off to On	60 μ s nom/1 ms max
On to Off	630 μ 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 ⁽¹⁾
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 141 - 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)

Table 141 - Environmental Specifications - 1756-OB16D (Continued)

Attribute	1756-OB16D
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, 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

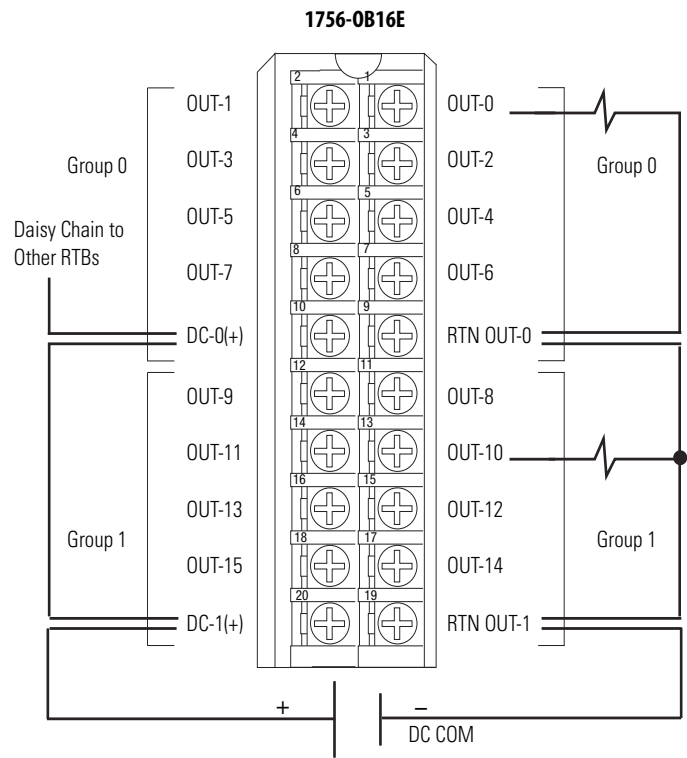
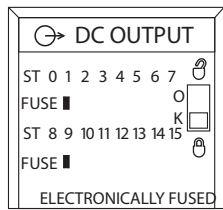
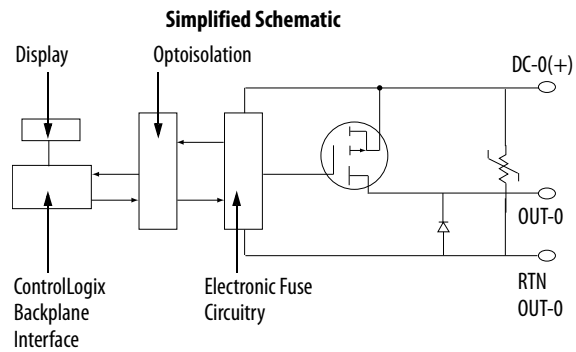
Table 142 - Certifications - 1756-OB16D

Certification ⁽¹⁾	1756-OB16D
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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



Surge Current Charts

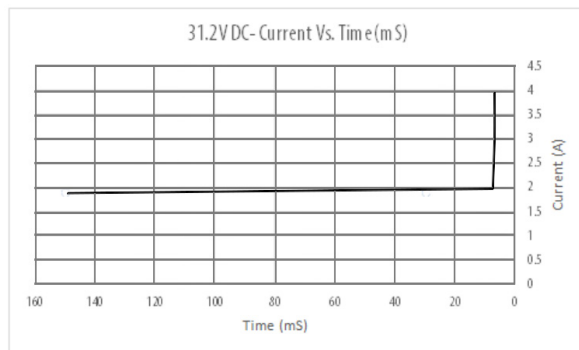
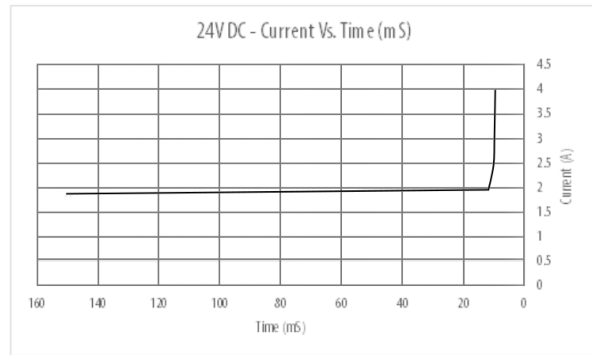
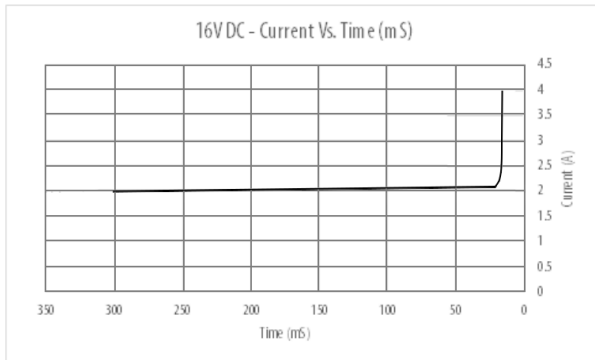
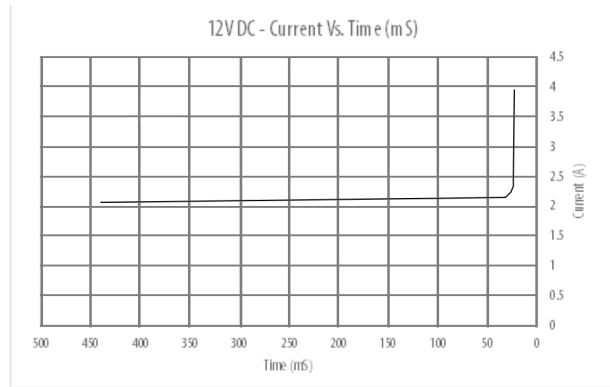
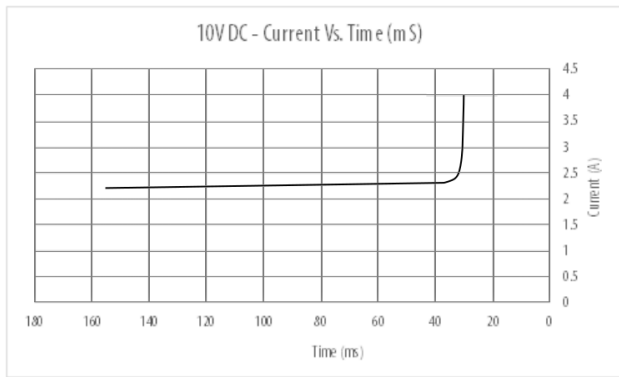


Table 143 - Technical Specifications - 1756-OB16E

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 μ s nom/1 ms max
On to Off	360 μ 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)

Table 143 - Technical Specifications - 1756-OB16E (Continued)

Attribute	1756-OB16E
Thermal dissipation	13.98 BTU/hr
Off-state leakage current per point, max	1 mA per point
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, typical	2 A for 10 ms per point, repeatable every 2 s @ 0 °C (32 °F) @ 24V DC
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 ⁽¹⁾
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-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

Table 144 - Environmental Specifications - 1756-OB16E (Continued)

Attribute	1756-OB16E
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, 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 145 - Certifications - 1756-OB16E

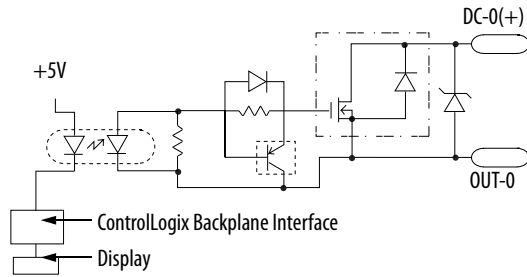
Certification ⁽¹⁾	1756-OB16E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

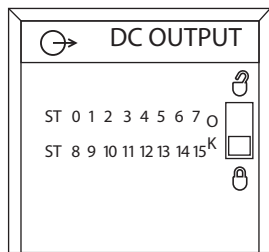
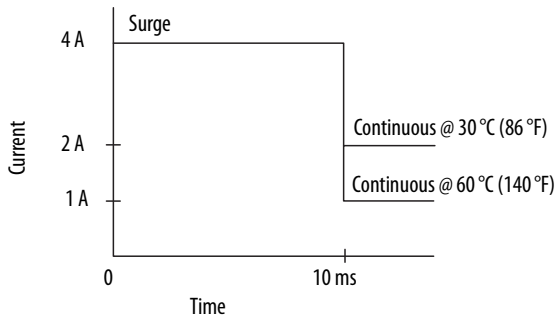
1756-OB16I

ControlLogix 24V DC isolated output module

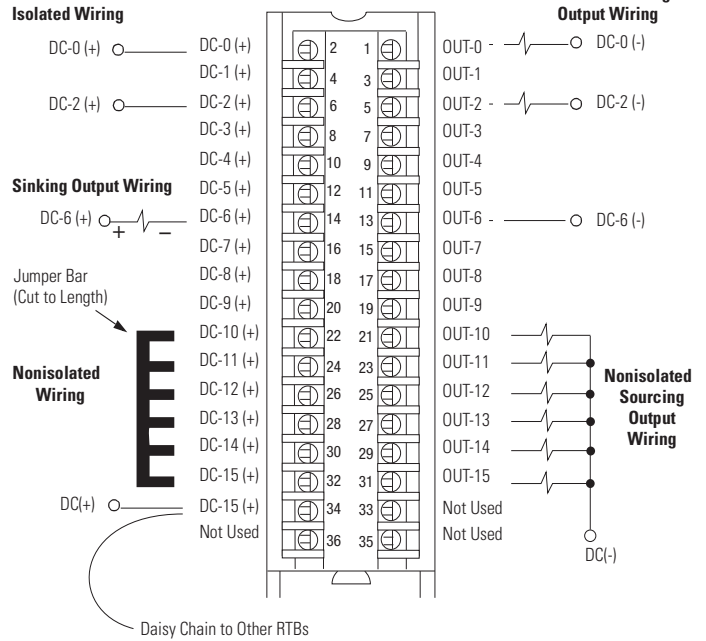
Simplified Schematic



Surge Current Chart



1756-OB16I



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

Table 146 - 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 ⁽¹⁾	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)

Table 146 - Technical Specifications - 1756-OB16I (Continued)

Attribute	1756-OB16I
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 ⁽²⁾
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-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)
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 147 - Environmental Specifications - 1756-OB161 (Continued)

Attribute	1756-OB161
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, 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

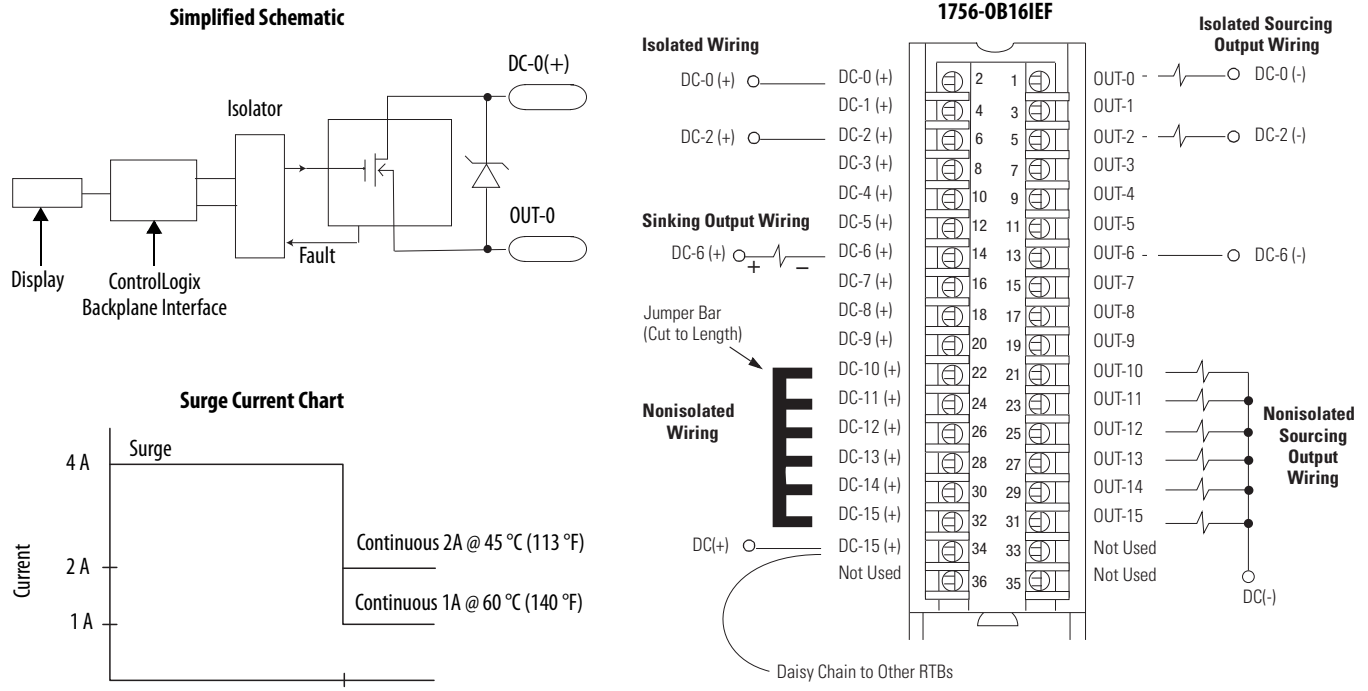
Table 148 - Certifications - 1756-OB161

Certification ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

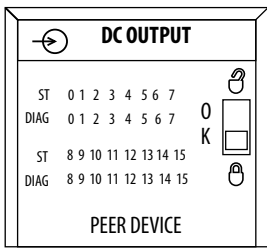


Table 149 - Technical Specifications - 1756-OB16IEF

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 μs nom/23 μs max
On to Off	14 μs nom/23 μs max
PWM cycle time	1 ms min/1 hour max
PWM On time	200 μs min/1 hour max
PWM On time accuracy	± 20 μs
Current draw @ 5.1V	320 mA

Table 149 - Technical Specifications - 1756-OB16IEF (Continued)

Attribute	1756-OB16IEF
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 ⁽¹⁾
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 150 - 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)

Table 150 - Environmental Specifications - 1756-OB16IEF (Continued)

Attribute	1756-OB16IEF
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, 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

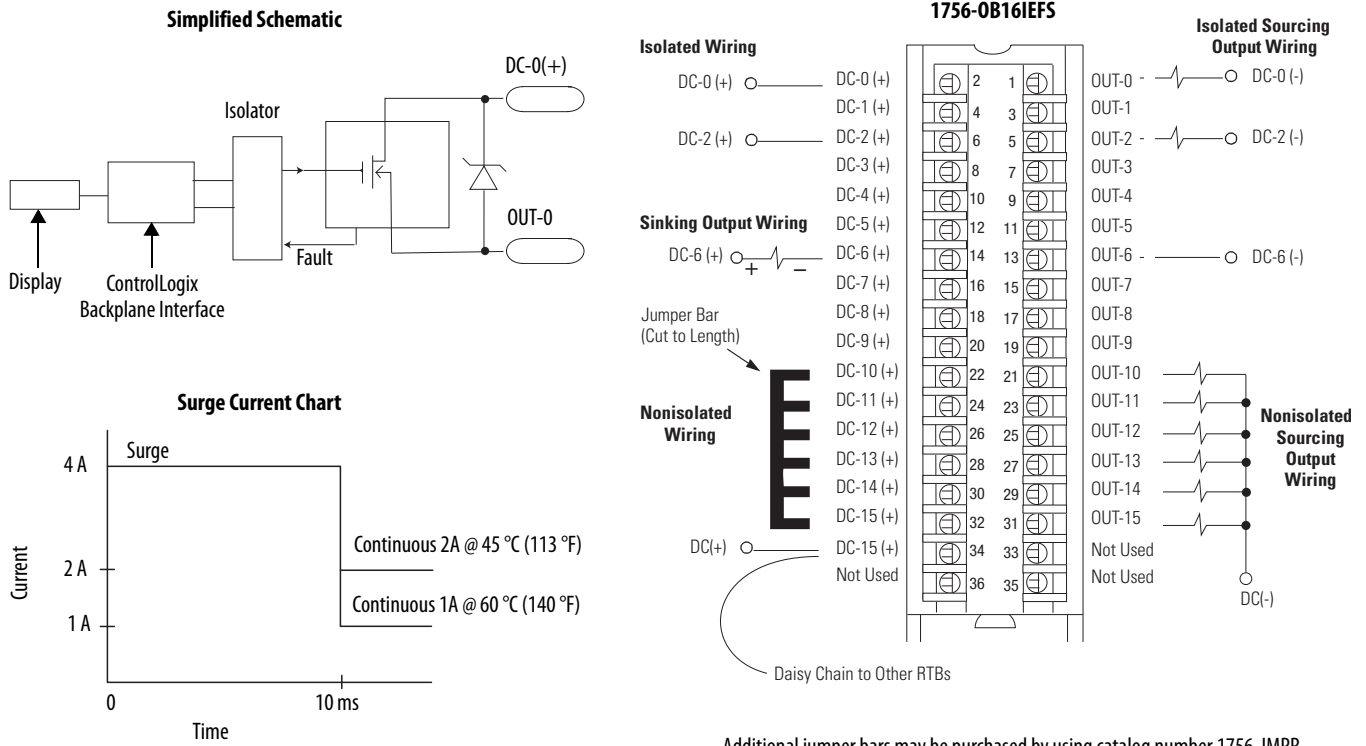
Table 151 - Certifications - 1756-OB16IEF

Certification ⁽¹⁾	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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

1756-0B16IEFS

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.

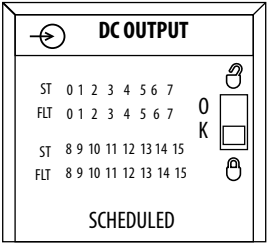


Table 152 - Technical Specifications - 1756-0B16IEFS

Attribute	1756-0B16IEFS
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
Schedule accuracy	± 10 μs 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 μs min/1 hour max
PWM On-time accuracy	± 20 μs

Table 152 - Technical Specifications - 1756-OB16IEFS (Continued)

Attribute	1756-OB16IEFS
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 ⁽¹⁾
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-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, 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-OB16IEFS

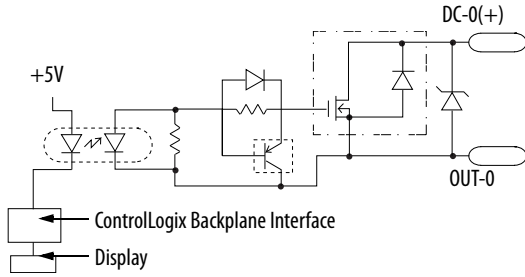
Certification ⁽¹⁾	1756-OB16IEFS
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

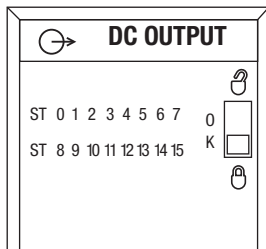
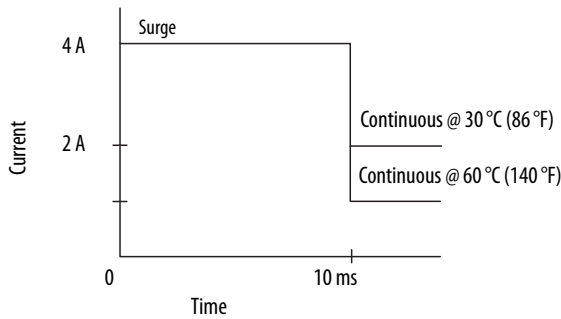
1756-0B16IS

ControlLogix 24V DC scheduled, isolated output module

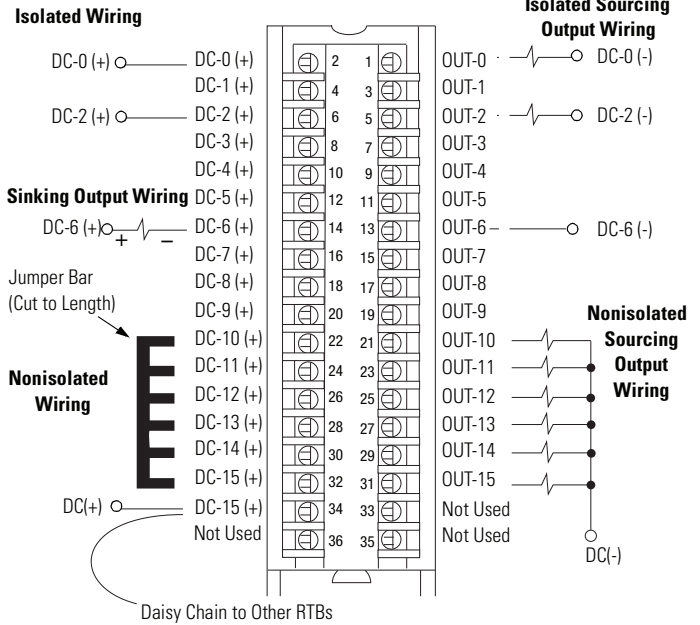
Simplified Schematic



Surge Current Chart



1756-0B16IS



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

Table 155 - Technical Specifications - 1756-0B16IS

Attribute	1756-0B16IS
Outputs	16 individually isolated, 8 scheduled
Pilot duty	2 A (DC-13SQ)
Voltage category	12/24V DC sink/source
Operating voltage range ⁽¹⁾	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

Table 155 - Technical Specifications - 1756-OB16IS (Continued)

Attribute	1756-OB16IS
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 1492-TD008 . 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 ⁽²⁾
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 156 - Environmental Specifications - 1756-OB16IS

Attribute	1756-OB16IS
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

Table 156 - Environmental Specifications - 1756-OB16IS

Attribute	1756-OB16IS
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, 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 157 - Certifications - 1756-OB16IS

Certification ⁽¹⁾	1756-OB16IS
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

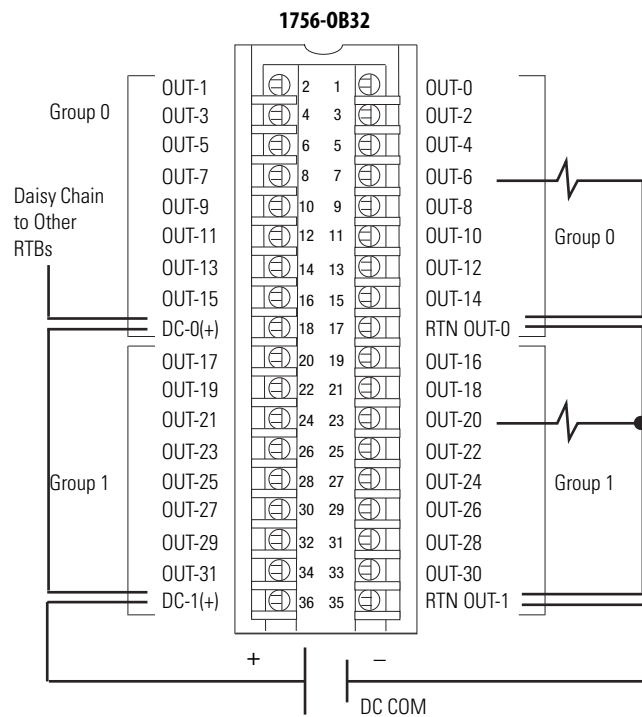
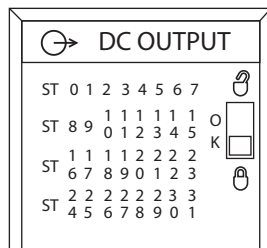
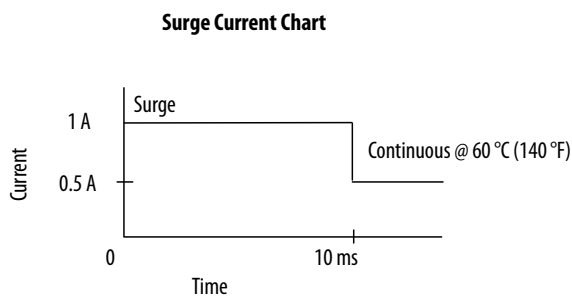
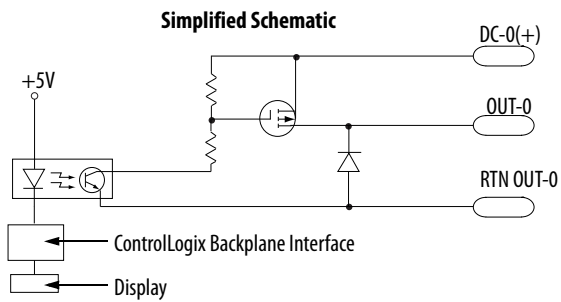


Table 158 - Technical Specifications - 1756-0B32

Attribute	1756-0B32
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 μ s nom/1 ms max
On to Off	200 μ 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

Table 158 - Technical Specifications - 1756-OB32 (Continued)

Attribute	1756-OB32
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 1492-TD008 . 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 ⁽¹⁾
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 159 - 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

Table 159 - Environmental Specifications - 1756-OB32 (Continued)

Attribute	1756-OB32
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, 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 160 - Certifications - 1756-OB32

Certification ⁽¹⁾	1756-OB32
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc
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

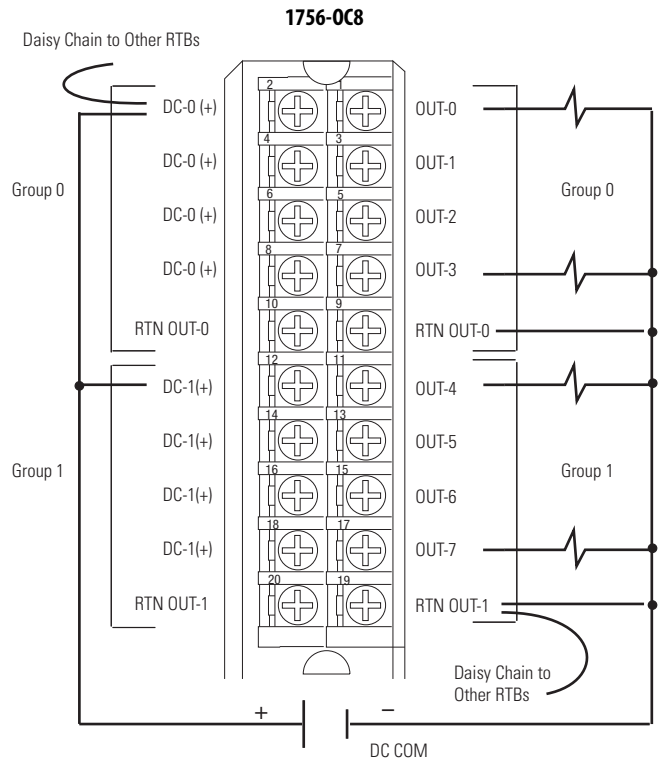
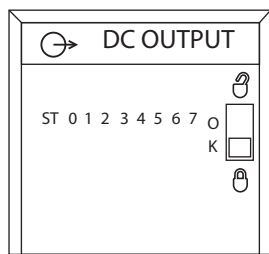
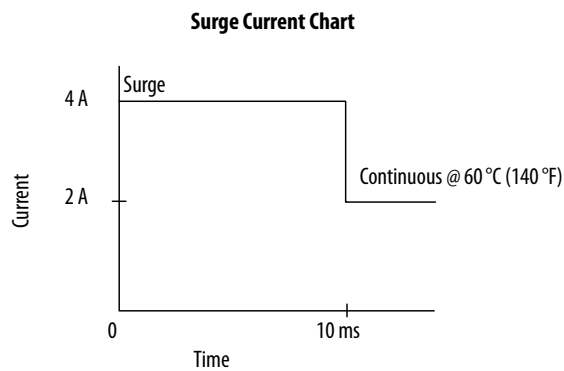
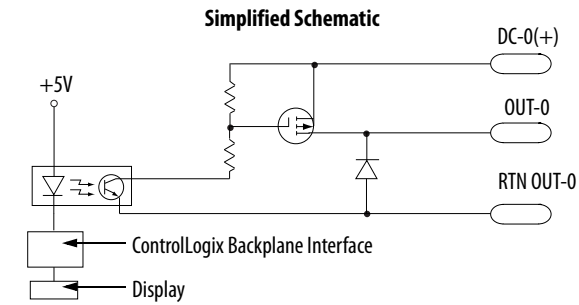


Table 161 - Technical Specifications - 1756-0C8

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)

Table 161 - Technical Specifications - 1756-0C8 (Continued)

Attribute	1756-0C8
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 ⁽¹⁾
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 162 - 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

Table 162 - Environmental Specifications - 1756-0C8 (Continued)

Attribute	1756-0C8
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, 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

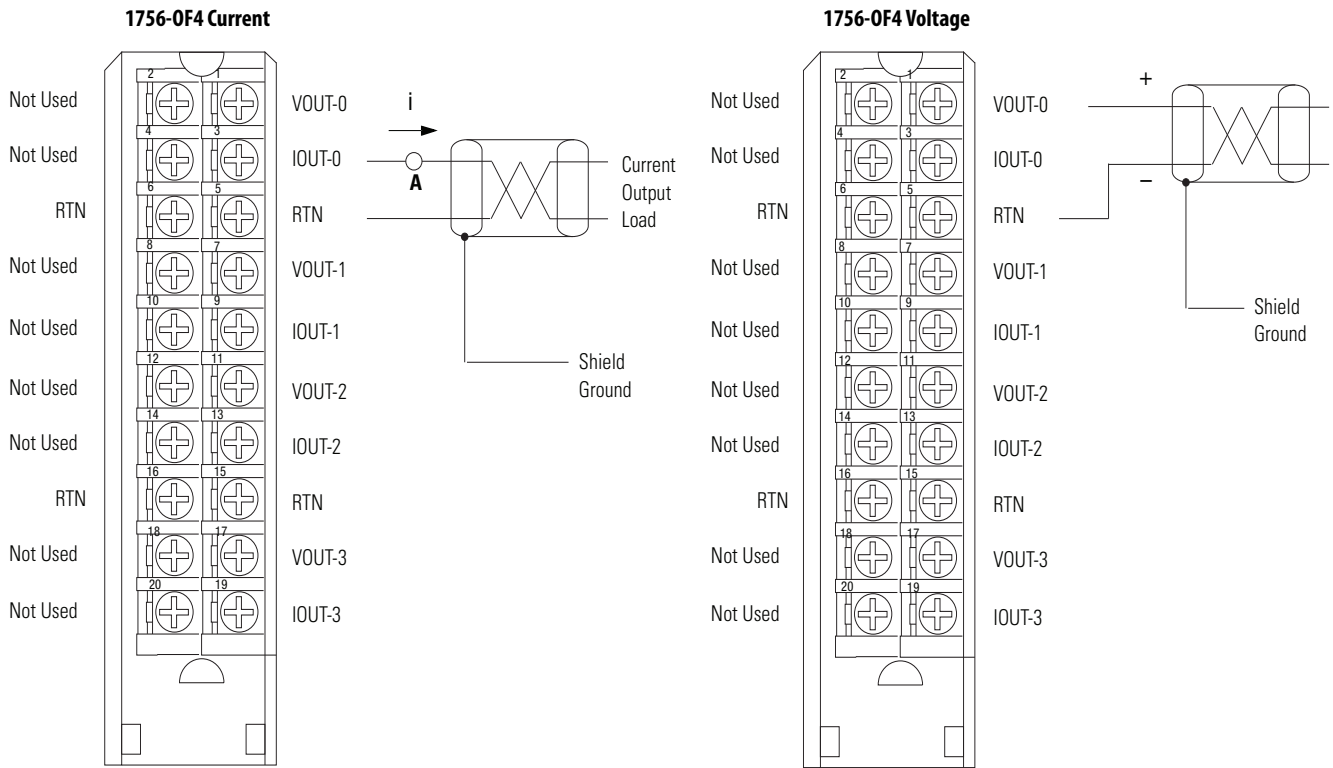
Table 163 - Certifications - 1756-0C8

Certification ⁽¹⁾	1756-0C8
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

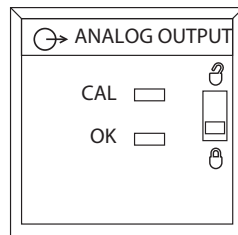


Table 164 - Signal and User Counts - 1756-OF4

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 165 - Technical Specifications - 1756-0F4

Attribute	1756-0F4
Outputs	4 voltage or current outputs
Output range	±10V 4...20 mA
Resolution	Voltage: 15 bits across 10.5V, 320 µV/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 Ω Current: 0...750 Ω
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 µV/°C 100 nA/°C
Gain drift with temperature	Voltage: 25 ppm/°C, 520 µV/°C Current: 50 ppm/°C, 1050 µA/°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 ⁽¹⁾
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 166 - Environmental Specifications - 1756-0F4

Attribute	1756-0F4
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, 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 167 - Certifications - 1756-0F4

Certification⁽¹⁾	1756-0F4
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

1756-0F6CI

ControlLogix current loop output analog module

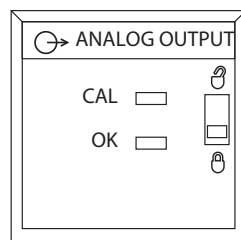
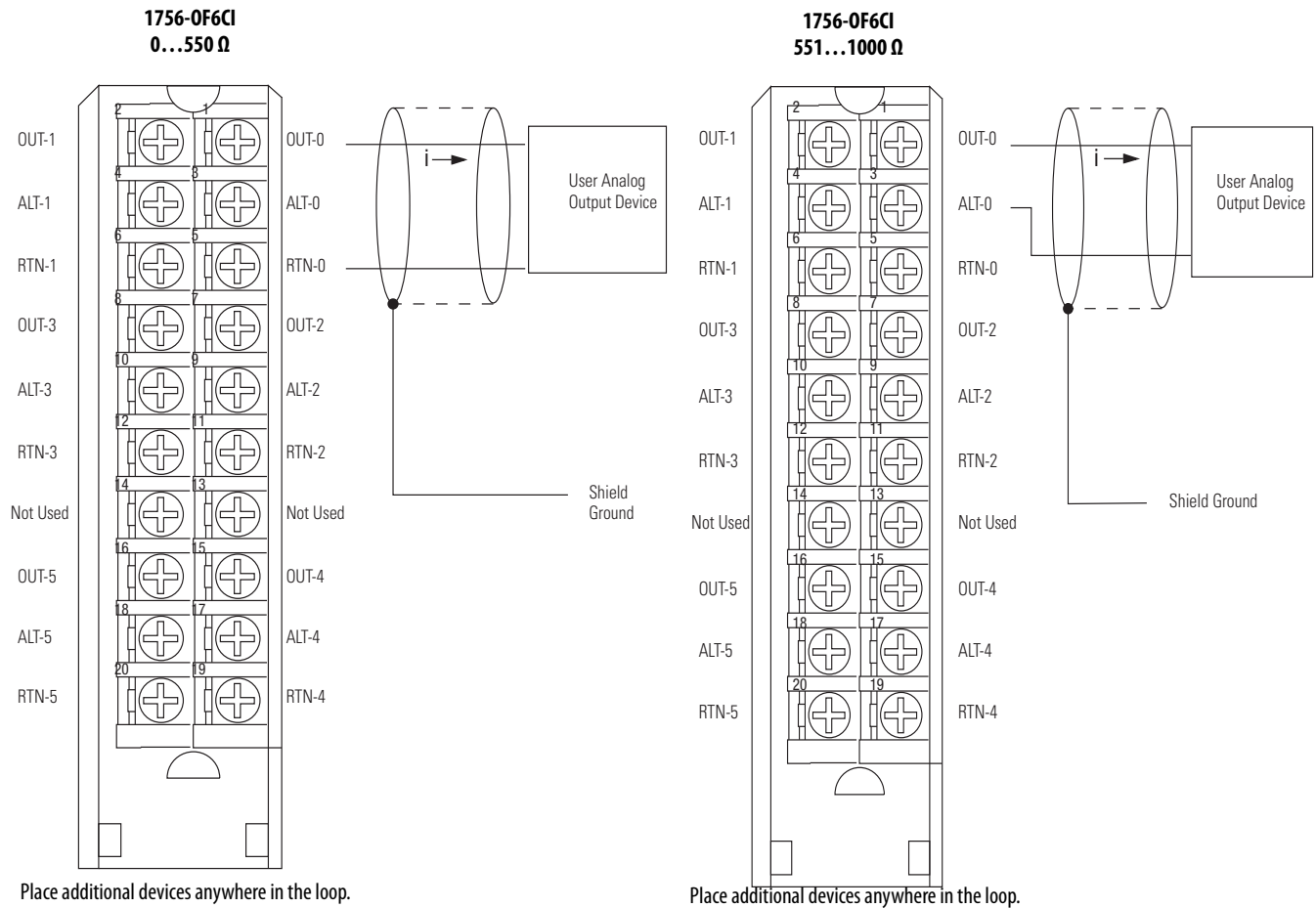


Table 168 - Signal and User Counts - 1756-0F6CI

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

Table 169 - Technical Specifications - 1756-0F6CI

Attribute	1756-0F6CI
Outputs	6 individually isolated
Output range	0...21 mA
Resolution	13 bits across 21 mA (2.7 μ A)
Current draw @ 5.1V	250 mA for 0...550 Ω loads terminated on OUTs and RTNs 250 mA for 551...1000 Ω loads terminated on OUTs and ALTs
Current draw @ 24V	225 mA for 0...550 Ω loads terminated on OUTs and RTNs 300 mA for 551...1000 Ω loads terminated on OUTs and ALTs
Total backplane power	6.7 W for 0...550 Ω range 8.5 W for 551...1000 Ω range
Power dissipation, max	5.5 W (0...550 Ω loads) 6.1 W (551...1000 Ω loads)
Thermal dissipation	18.76 BTU/hr (0...550 Ω loads) 20.80 BTU/hr (551...1000 Ω loads)
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	0...1000 Ω Separate field terminations for 0...550 Ω and 551...1000 Ω
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 $^{\circ}$ C (77 $^{\circ}$ F)	Better than 0.1% of range from 4...21 mA
Calibration interval	6 months typical
Offset drift	1 μ A/ $^{\circ}$ C typical
Gain drift with temperature, nom	60 ppm/ $^{\circ}$ C
Gain drift with temperature, max	100 ppm/ $^{\circ}$ 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 ⁽¹⁾
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 170 - Environmental Specifications - 1756-0F6CI

Attribute	1756-0F6CI
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, 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

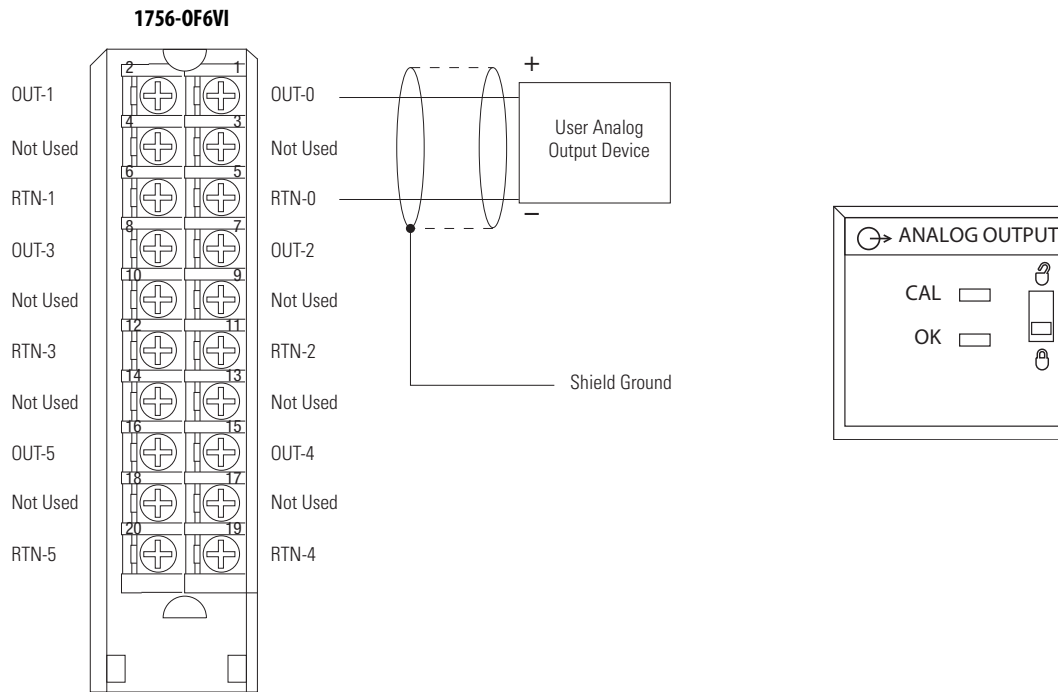
Table 171 - Certifications - 1756-0F6CI

Certification⁽¹⁾	1756-0F6CI
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

1756-0F6VI

ControlLogix voltage loop output analog module



Place additional devices anywhere in the loop.

Table 172 - Signal and User Counts - 1756-0F6VI

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

Table 173 - Technical Specifications - 1756-0F6VI

Attribute	1756-0F6VI
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

Table 173 - Technical Specifications - 1756-0F6VI (Continued)

Attribute	1756-0F6VI
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 μ V/°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 ⁽¹⁾
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 174 - Environmental Specifications - 1756-0F6VI

Attribute	1756-0F6VI
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 174 - Environmental Specifications - 1756-OF6VI (Continued)

Attribute	1756-OF6VI
Emissions	CISPR 11, 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

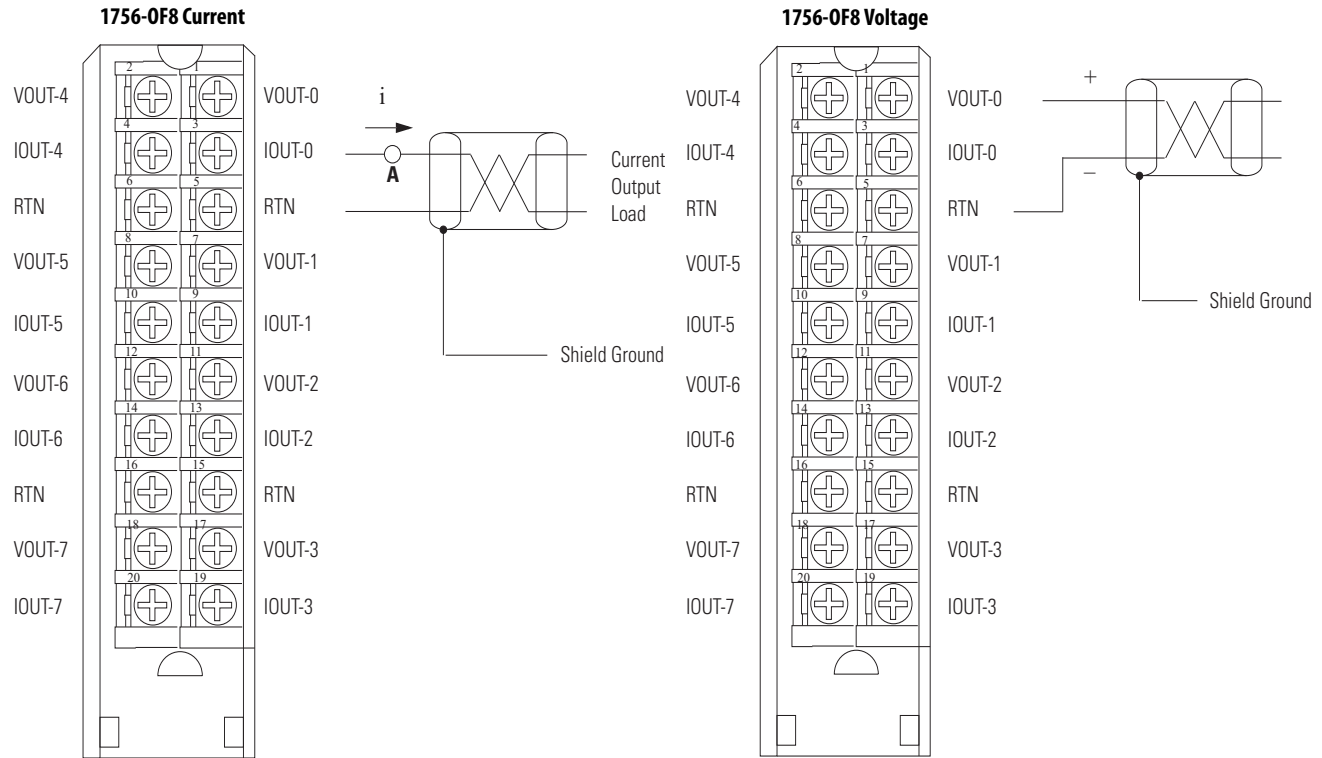
Table 175 - Certifications - 1756-OF6VI

Certification ⁽¹⁾	1756-OF6VI
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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-OF8

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.

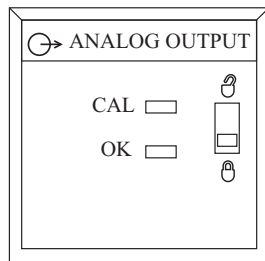


Table 176 - Signal and User Counts - 1756-OF8

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 177 - Technical Specifications - 1756-0F8

Attribute	1756-0F8
Outputs	8 voltage or current
Output range	± 10V 0...20 mA
Resolution	15 bits across 21 mA - 650 nA/bit 15 bits across 10.4V - 320 µV/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 Ω Current: 0...750 Ω
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 µV/°C typical (Voltage mode) 0.1 µA/°C typical (Current mode)
Gain drift with temperature, max	Voltage: 25 ppm/°C max Current: 50 ppm/°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 ⁽¹⁾
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 178 - Environmental Specifications - 1756-0F8

Attribute	1756-0F8
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, 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 179 - Certifications - 1756-OF8

Certification⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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.

1756-0F8H

ControlLogix voltage/current output analog module with HART protocol

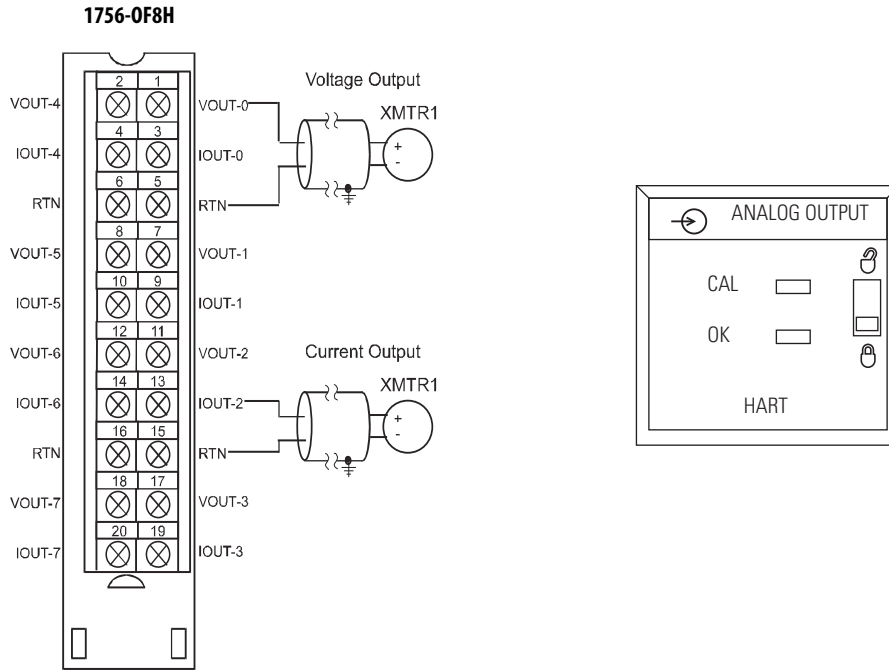


Table 180 - Signal and User Counts - 1756-0F8H

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 181 - Technical Specifications - 1756-0F8H

Attribute	1756-0F8H
Outputs	8 voltage or current
Output range	±10V 0...20 mA 4...20 mA
Resolution	15...16 bits
Voltage and current ratings	Backplane: 200 mA max @ 5.1V DC, 230 mA max @ 24V DC Output voltage range: -10...10.4V Output current range: 0...20 mA
Total backplane power	6.54 W
Power dissipation, max	Current: 4.92 W
Thermal dissipation	16.78 BTU/hr
Isolation voltage	50V (continuous) <ul style="list-style-type: none"> Basic insulation type, output channels to backplane No isolation between individual output channels Type tested at 1500V AC for 60 s

Table 181 - Technical Specifications - 1756-OF8H (Continued)

Attribute	1756-OF8H
Output impedance	Voltage: >2 k Ω @ 10.4V Current: 50...750 Ω drive
Open circuit detection time	Current output only (output must be set to < 0.1mA)
Overvoltage protection, max	\pm 24V DC
Drive capability	Voltage: > 2000 Ω @ 10.4V Current: 50...750 Ω with short circuit survival current
Load reactance, max	Voltage: 1 μ F Current: 10 μ H
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 μ V/°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
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2 - on shielded signal ports ⁽¹⁾
Wire size	1756-TBCH removable terminal block <ul style="list-style-type: none"> Single wire connection: 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max Double wire connection: 0.33...1.3 mm² (22...16 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max 1756-TBS6H removable terminal block <ul style="list-style-type: none"> 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max
Temperature code	North American: T4 ATEX: T4
Enclosure type rating	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 - 1756-0F8H

Attribute	1756-0F8H
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)	Operating: 30 g Nonoperating: 50 g
Emissions	IEC 61000-6-4
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	±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 183 - Certifications - 1756-0F8H

Certification ⁽¹⁾	1756-0F8H
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
RCM	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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc DEMK012ATEX1219040
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

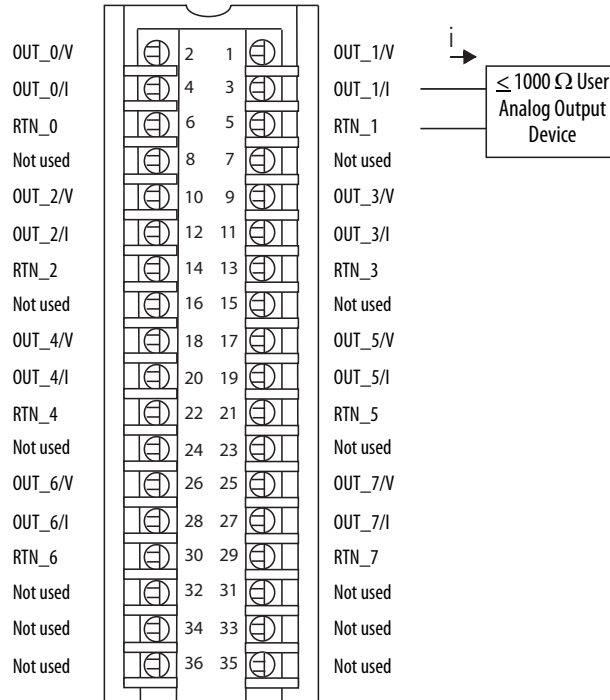
1756-0F8I

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.

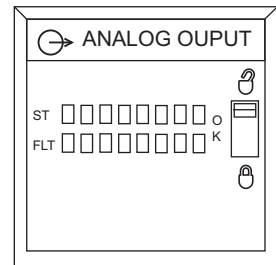
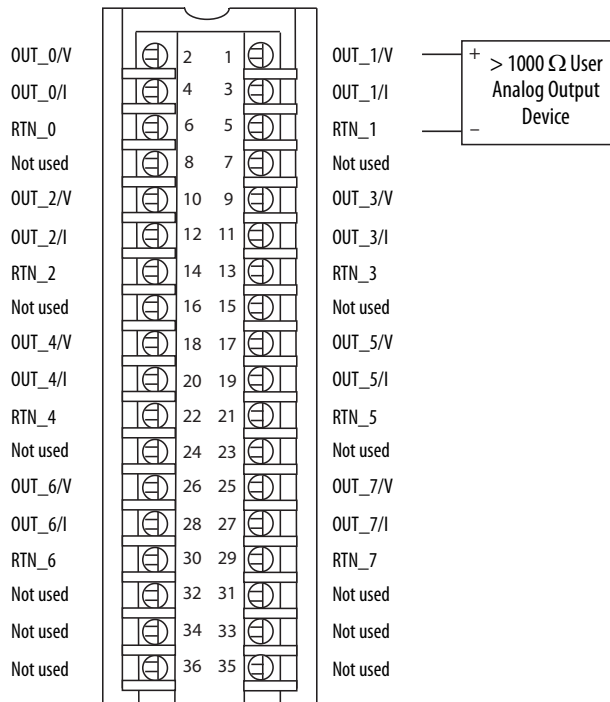


Table 184 - Technical Specifications - 1756-0F8I

Attribute	1756-0F8I
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 µA/count)
Current draw @ 5.1V	200 mA
Current draw @ 24V	Voltage or Current mode with 250 Ω loads = 220 mA Current mode with 500 Ω loads = 275 mA Current mode with 750 Ω loads = 340 mA Current mode with 1000 Ω loads = 385 mA
Total backplane power	Voltage mode = 6.3 W Current mode with 250 Ω loads = 6.3 W Current mode with 500 Ω loads = 7.6 W Current mode with 750 Ω loads = 9.2 W Current mode with 1000 Ω loads = 10.2 W
Power dissipation, max	Voltage mode = 5.4 W Current mode with 250 Ω loads = 5.4 W Current mode with 500 Ω loads = 5.8 W Current mode with 750 Ω loads = 6.5 W Current mode with 1000 Ω loads = 6.7 W
Thermal dissipation	Voltage mode = 18.4 BTU/hr Current mode with 250 Ω loads = 18.4 BTU/hr Current mode with 500 Ω loads = 19.8 BTU/hr Current mode with 750 Ω loads = 22.2 BTU/hr Current mode with 1000 Ω loads = 22.9 BTU/hr
Output impedance	46 Ω (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 Ω Voltage output = >1000 Ω
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 184 - 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 ² (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 ⁽¹⁾
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 185 - 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, 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 185 - Environmental Specifications - 1756-0F8I

Attribute	1756-0F8I
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 186 - Certifications - 1756-0F8I

Certification ⁽¹⁾	1756-0F8I
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
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.

1756-0F8IH

ControlLogix isolated HART current analog output module

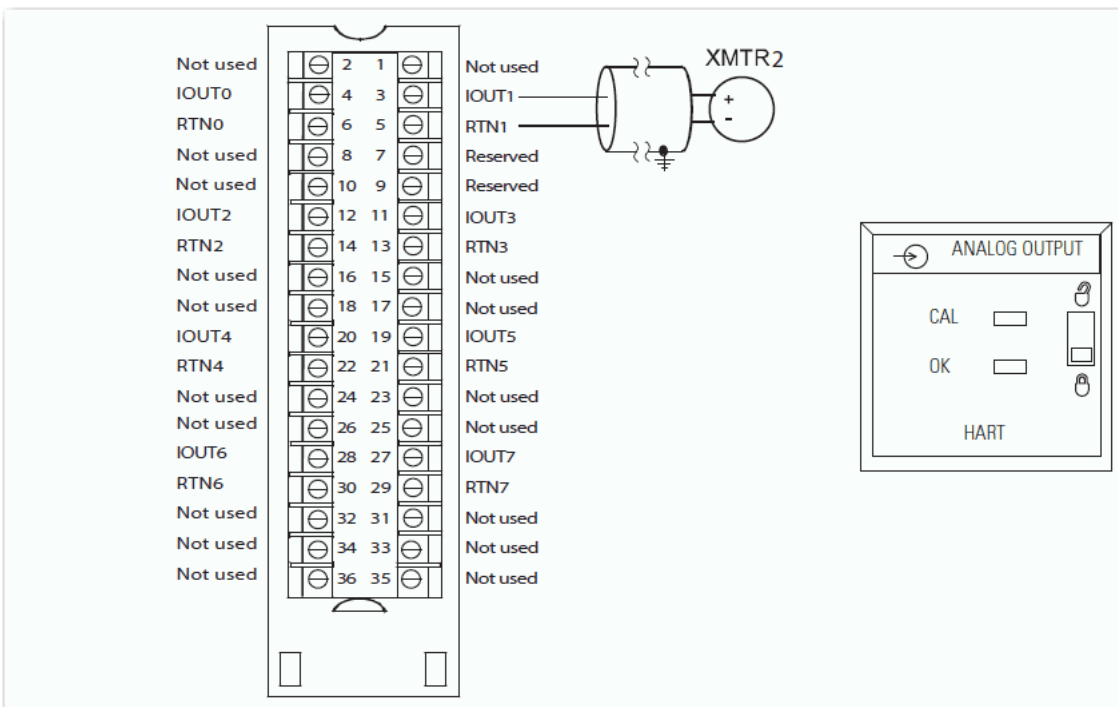


Table 187 - Signal and User Counts - 1756-0F8IH

Range	Low Signal	High Signal
0...21 mA	0 mA	21.2916 mA

Table 188 - Technical Specifications - 1756-0F8IH

Attribute	1756-0F8IH
Outputs	8 current
Output range	0...20 mA 4...20 mA
Resolution	15 bits across 24 mA, 732 nA per bit
Voltage and current ratings	Backplane: 220 mA @ 5.1V DC, 360 mA @ 24V DC Output current: 0...20 mA and 4...20 mA Output Voltage: 5...30V DC
Current draw @ 24V	400 mA (estimated)
Power dissipation, max	6.5 W nom (< 6.4 W with 50 Ω resistance load on all channels, <6.5 W with 250 Ω resistance load on all channels, <6.7 W with 750 Ω resistance load on all channels)
Open circuit detection	Current output only (output must be set >= 0.1 mA)
Overvoltage protection, max	±24V DC
Output short circuit protection	Current electronically limited to <= 21 mA with no damage
Drive capability	50...750 Ω with short circuit survival
Load reactance, max	10 μH

Table 188 - Technical Specifications - 1756-0F8IH (Continued)

Attribute	1756-0F8IH
Settling time	HART not enabled: < 23 ms to 95% with resistive loads HART enabled: < 100 ms to 95% with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	0.15% @ 4...20 mA
Calibration interval	12 mos typical
Offset drift	±3 ppm of full scale range/°C (72 nA/°C typical)
Gain drift with temperature	±4 ppm of full scale range/°C
Module error	0.3% @ 4...20 mA
Module scan time	Analog: 10 ms for all channels HART: 10 ms for all channels
Data format	IEEE 32-bit floating point
Output conversion method	R-Ladder DAC
Isolation voltage	250V (continuous) <ul style="list-style-type: none"> Reinforced insulation type, outputs to backplane Basic insulation type, output to output, and outputs to ground Type tested at 3535V DC for 60 s, outputs to backplane Type tested at 2120V DC for 60 s, output to output, and outputs to ground
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⁾
Wire type	Shielded copper
Wire size	1756-TBCH removable terminal block <ul style="list-style-type: none"> Single wire connection: 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max Double wire connection: 0.33...1.3 mm² (22...16 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max 1756-TBS6H removable terminal block <ul style="list-style-type: none"> 0.33...2.1 mm² (22...14 AWG) solid or stranded shielded copper wire rated at 90 °C (194 °F), or greater, 12 mm (3/64 in.) insulation max
Temperature code	North American: T4A IEC: T4
Enclosure type rating	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-OF8IH

Attribute	1756-OF8IH
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 (operating) IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10...500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	Operating: 30 g Nonoperating: 50 g
Emissions	IEC 61000-6-4
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 square wave 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz square wave 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000...2700 MHz
EFT/B immunity IEC 61000-4-4	±3 kV @ 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 190 - Certifications - 1756-OF8IH

Certification ⁽¹⁾	1756-OF8IH
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"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A and B) European Union 2006/95/EC LVD, compliant with: <ul style="list-style-type: none"> EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61999-6-4; Industrial Emissions

Table 190 - Certifications - 1756-0F8IH

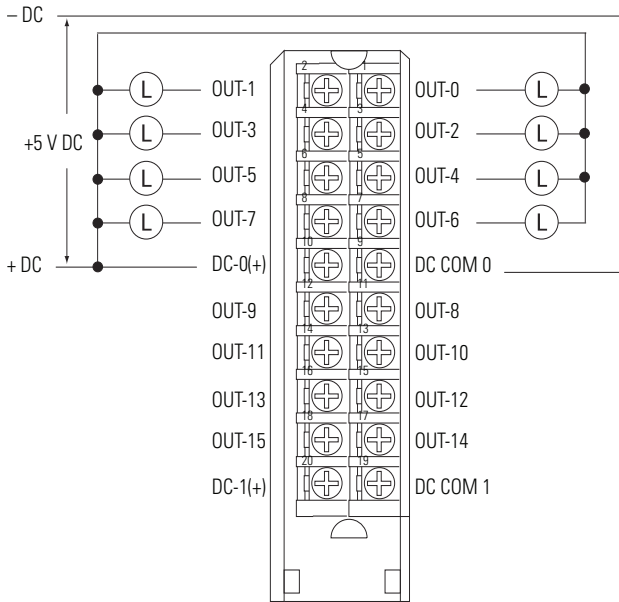
Ex	European Union 94/9/EC ATEX Directive, compliant with: <ul style="list-style-type: none">• EN 60079-15; Potentially Explosive Atmospheres, Protection "n"• EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc DEMKO14ATEX1238X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

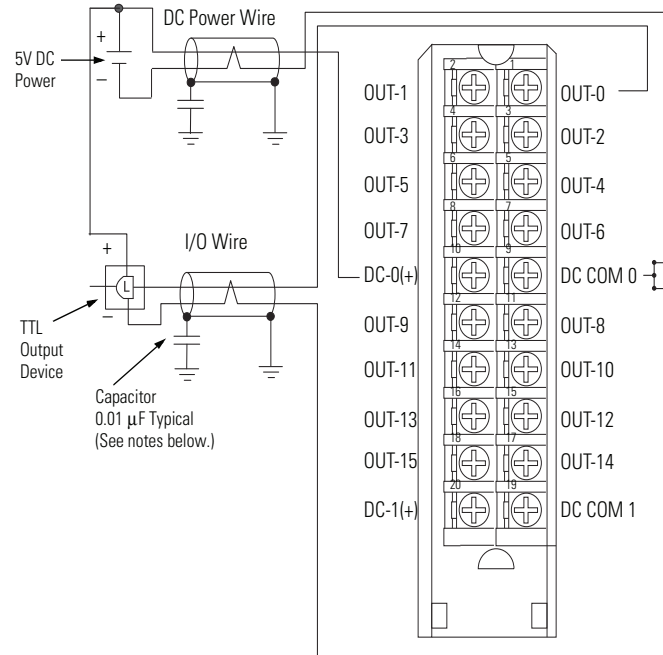
1756-0G16

ControlLogix TTL output module

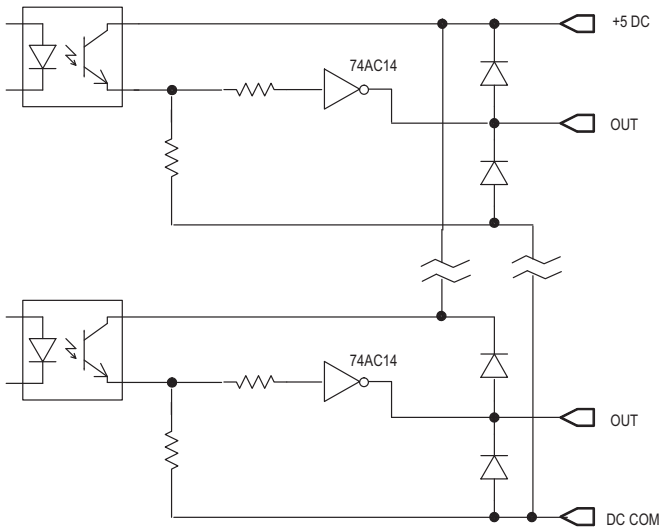
1756-0G16 Standard Wiring



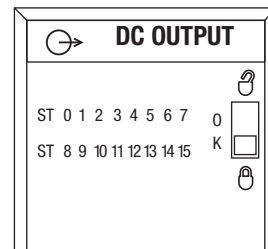
1756-0G16 CE Compliant Wiring



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 191 - Technical Specifications - 1756-0G16

Attribute	1756-0G16
Outputs	16 (8 points/group)
Voltage category	5V DC TTL (Low=True ⁽¹⁾)
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)	45 μ s nom/450 μ s max
On to Off (0V-to-5V DC transition)	145 μ s nom/700 μ 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 ⁽²⁾
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 192 - 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, 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

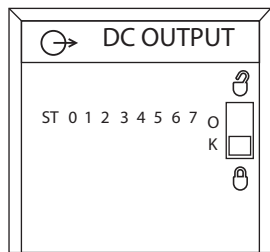
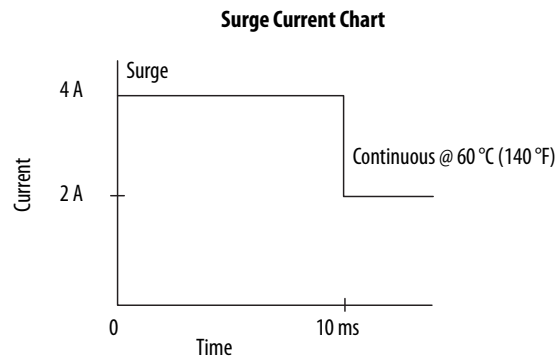
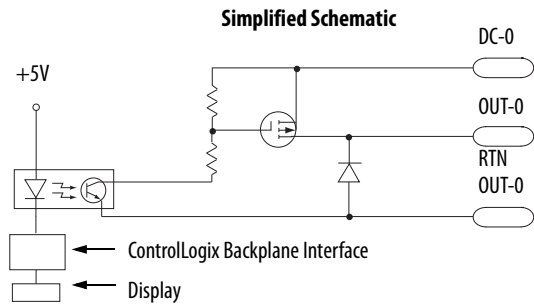
Table 193 - Certifications - 1756-0G16

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B)
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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T5 X Gc
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.

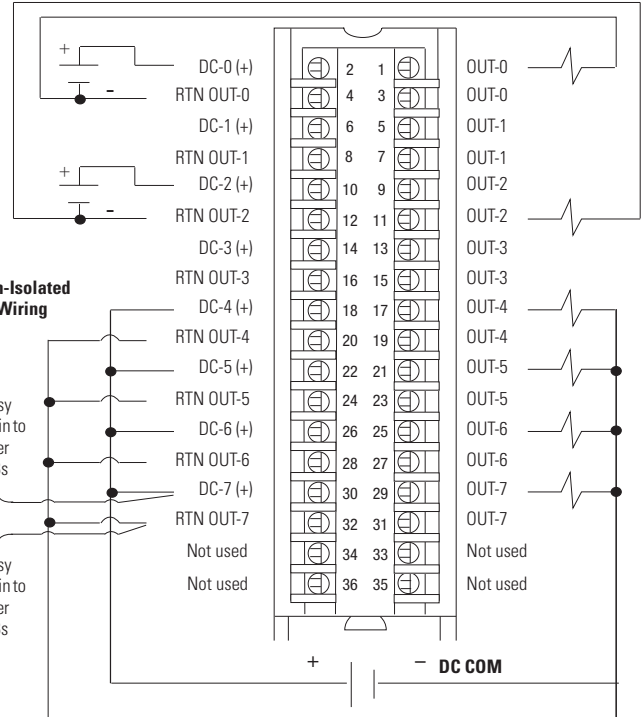
1756-0H8I

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



1756-0H8I

Isolated Wiring



Non-Isolated Wiring

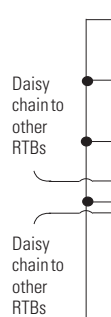


Table 194 - Technical Specifications - 1756-0H8I

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
Total backplane power	1.11 W
Power dissipation, max	3.3 W @ 60°C (140 °F)
Thermal dissipation	11.25 BTU/hr

Table 194 - Technical Specifications - 1756-OH8I (Continued)

Attribute	1756-OH8I
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 ⁽¹⁾
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 195 - 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
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Table 195 - Environmental Specifications - 1756-0H8I (Continued)

Attribute	1756-0H8I
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 196 - Certifications - 1756-0H8I

Certification ⁽¹⁾	1756-0H8I
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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

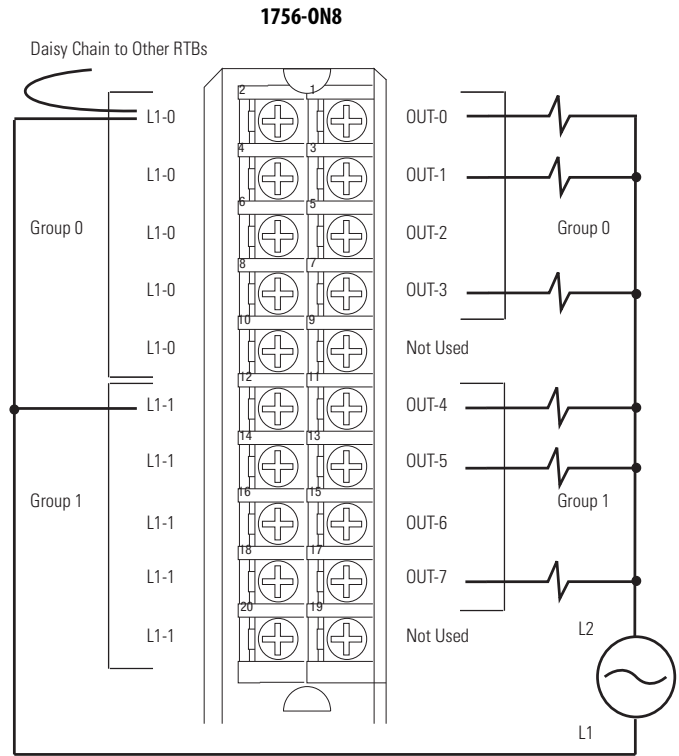
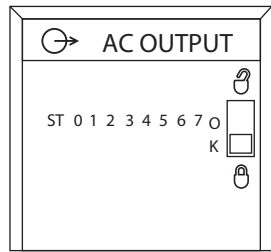
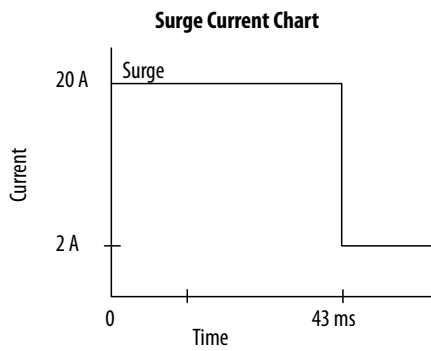
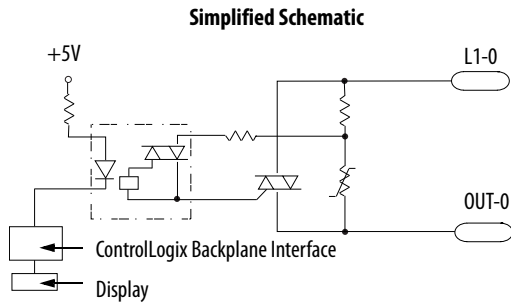


Table 197 - Technical Specifications - 1756-0N8

Attribute	1756-0N8
Outputs	8 (4 points/group)
Voltage category	24V AC 50/60 Hz
Operating voltage range ⁽¹⁾	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
Current draw @ 24V	2 mA
Total backplane power	1.07 W

Table 197 - Technical Specifications - 1756-0N8 (Continued)

Attribute	1756-0N8
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 ⁽²⁾
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 ⁽³⁾
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 198 - Environmental Specifications - 1756-ON8

Attribute	1756-ON8
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, 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 199 - Certifications - 1756-0N8

Certification⁽¹⁾	1756-0N8
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IICT4 X Gc
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

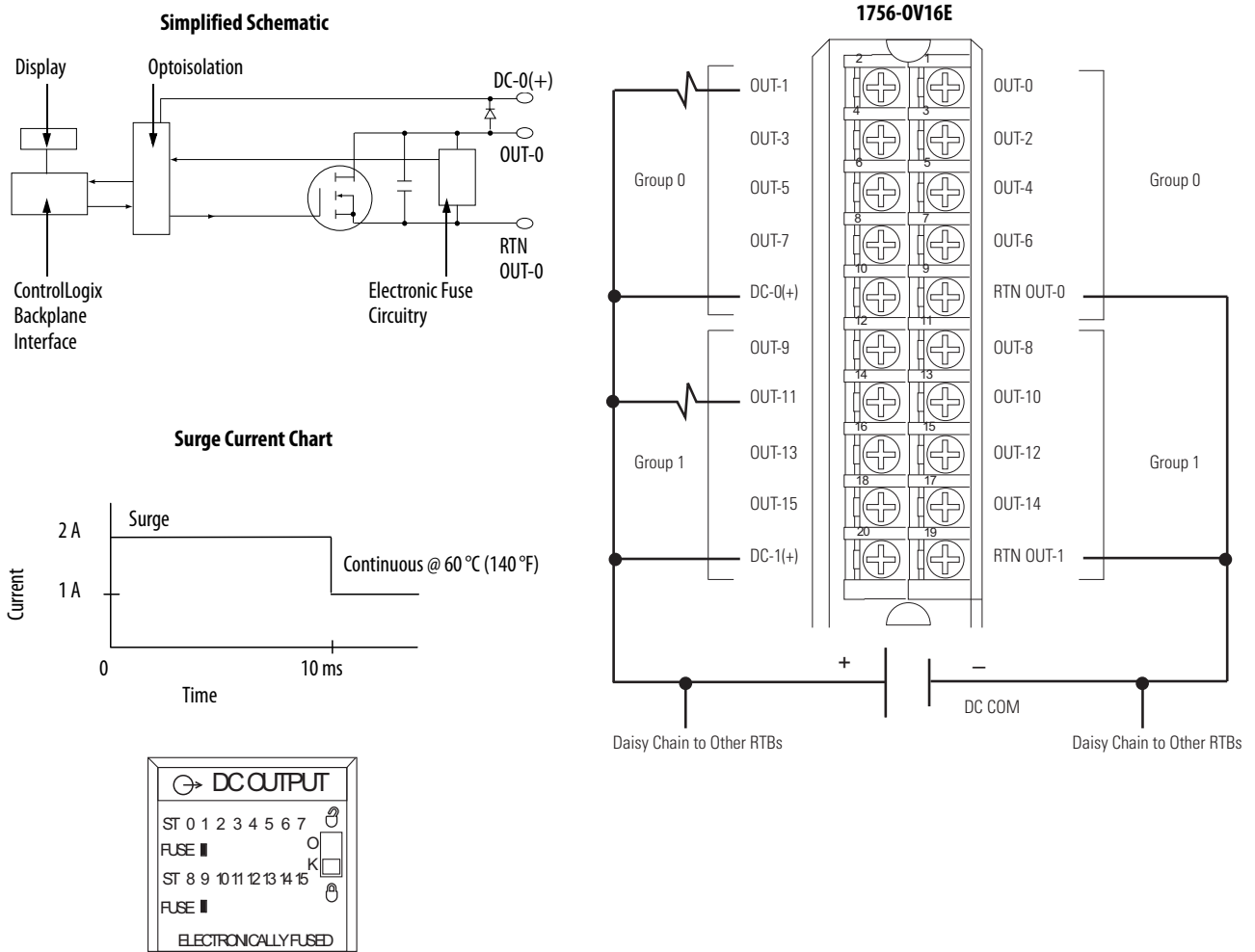


Table 200 - Diagnostic Specifications - 1756-0V16E

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 201 - Technical Specifications - 1756-0V16E

Attribute	1756-0V16E
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 μ s nom/1 ms max
On to Off	360 μ 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 ⁽¹⁾
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 202 - 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, 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 203 - Certifications - 1756-0V16E

Certification⁽¹⁾	1756-0V16E
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

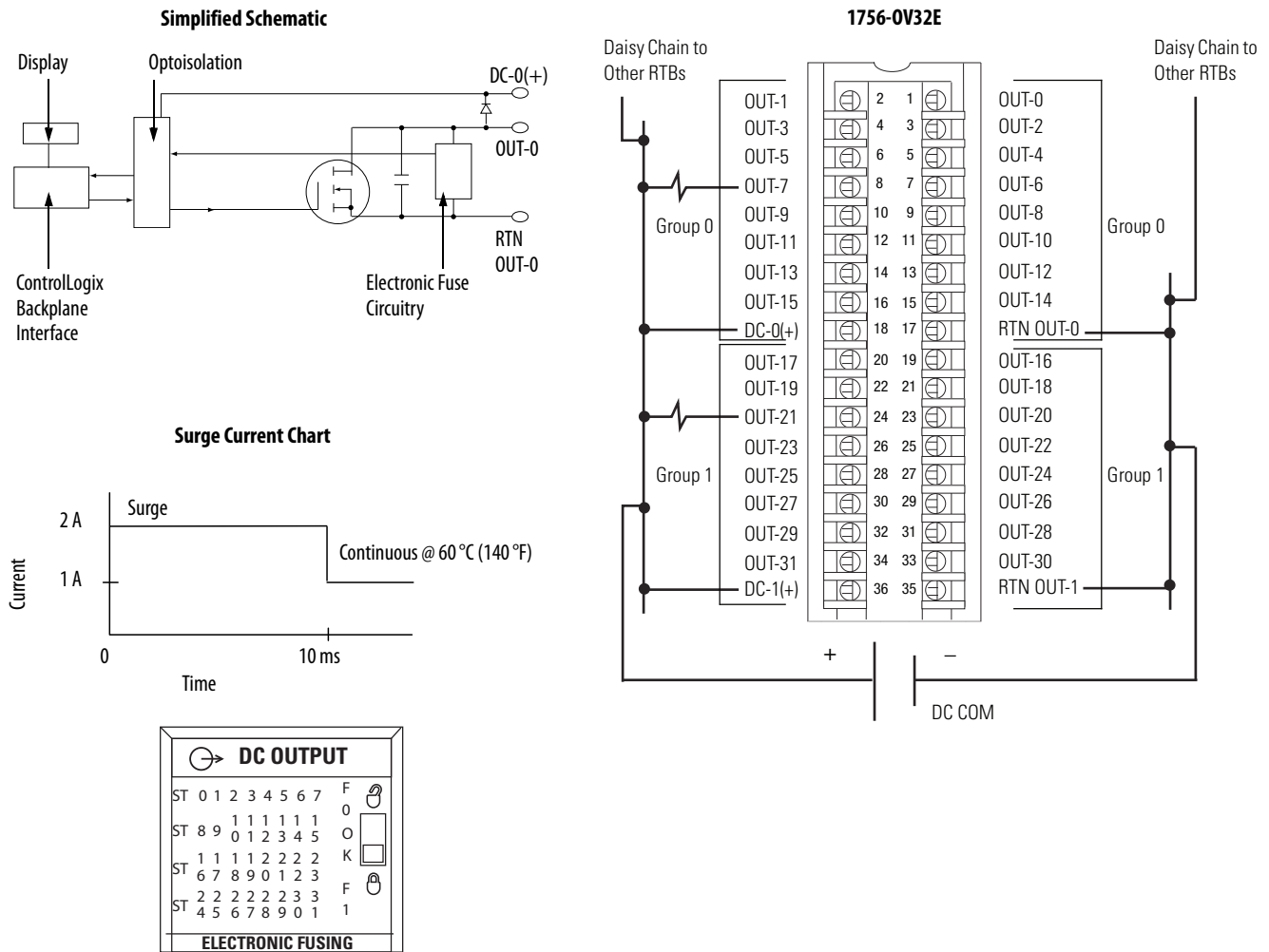


Table 204 - Diagnostic Specifications - 1756-0V32E

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 205 - 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 µs nom/300 µs max
On to Off	230 µs nom/1 ms max

Table 205 - Technical Specifications - 1756-0V32E (Continued)

Attribute	1756-0V32E
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 ⁽¹⁾
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 206 - 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, 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 207 - Certifications - 1756-0V32E

Certification⁽¹⁾	1756-0V32E
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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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

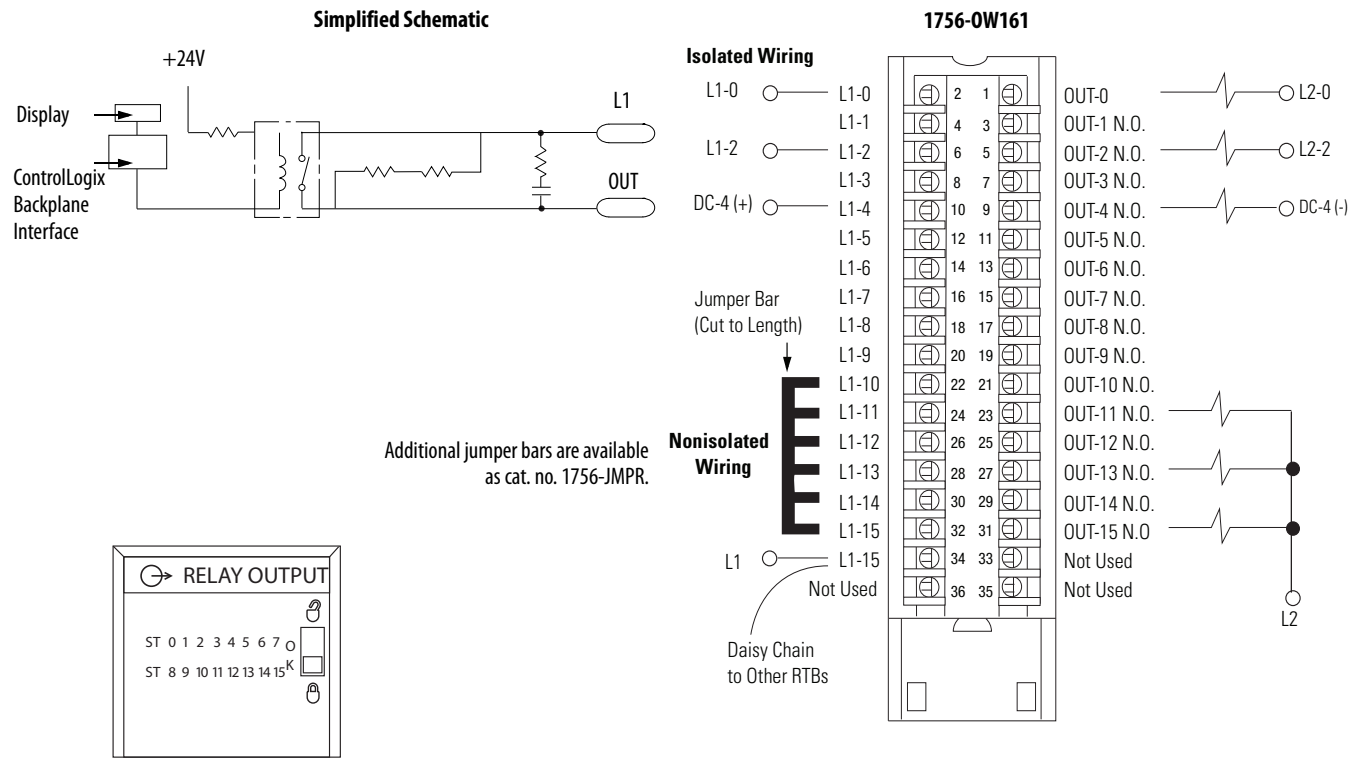


Table 208 - Technical Specifications - 1756-0W16I

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)
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

Table 208 - Technical Specifications - 1756-0W16I (Continued)

Attribute	1756-0W16I
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 1492-TD008 . 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 ⁽¹⁾
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 209 - Environmental Specifications - 1756-0W16I

Attribute	1756-0W16I
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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 209 - Environmental Specifications - 1756-0W16I (Continued)

Attribute	1756-0W16I
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 210 - Certifications - 1756-0W16I

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

1756-0X8I

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

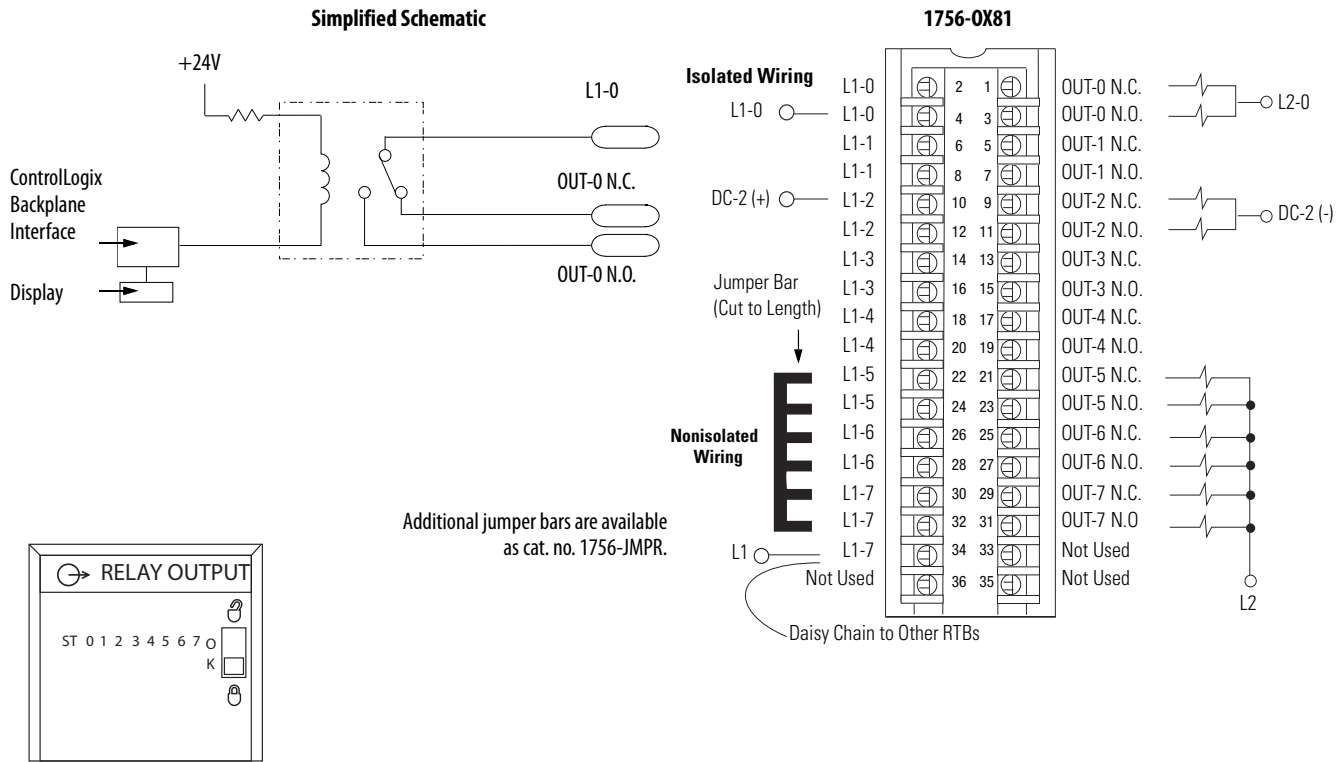


Table 211 - Technical Specifications - 1756-0X8I

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	13 ms max
On to Off	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

Table 211 - Technical Specifications - 1756-0X8I

Attribute	1756-0X8I
Initial contact resistance, max	100 m Ω @ 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 ⁽¹⁾
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 212 - 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 212 - Environmental Specifications - 1756-0X8I (Continued)

Attribute	1756-0X8I
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 213 - Certifications - 1756-0X8I

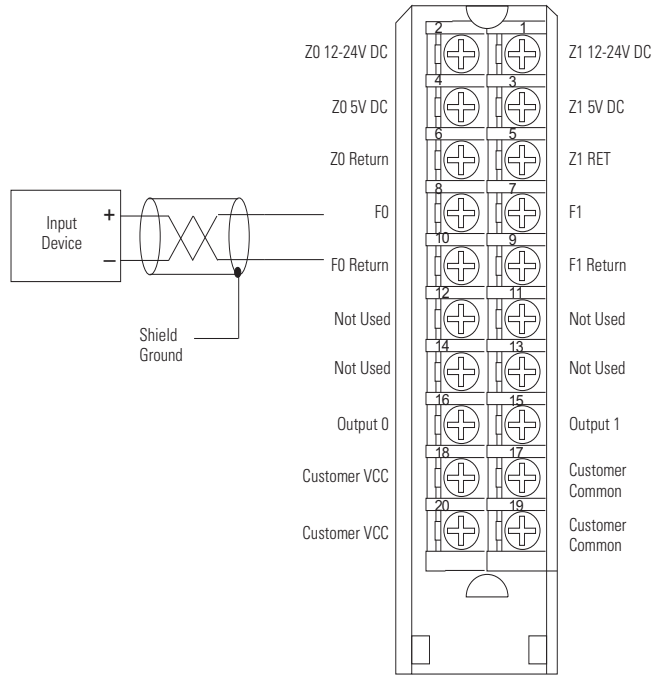
Certification ⁽¹⁾	1756-0X8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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.

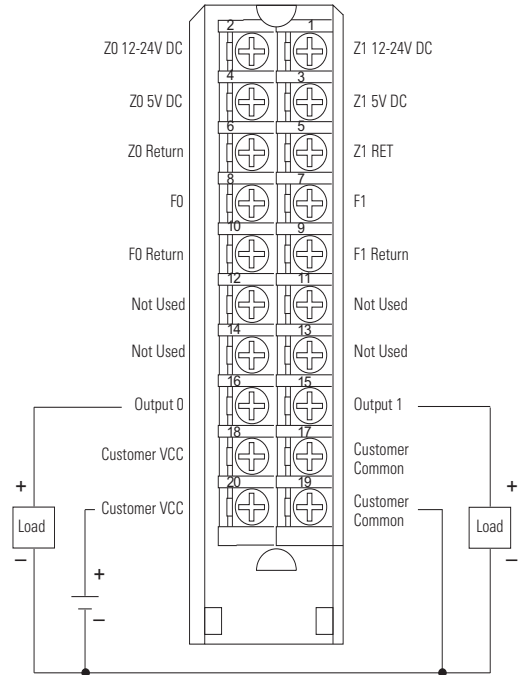
1756-CFM

ControlLogix configurable flow meter module

1756-CFM Standard Magnetic Pickup



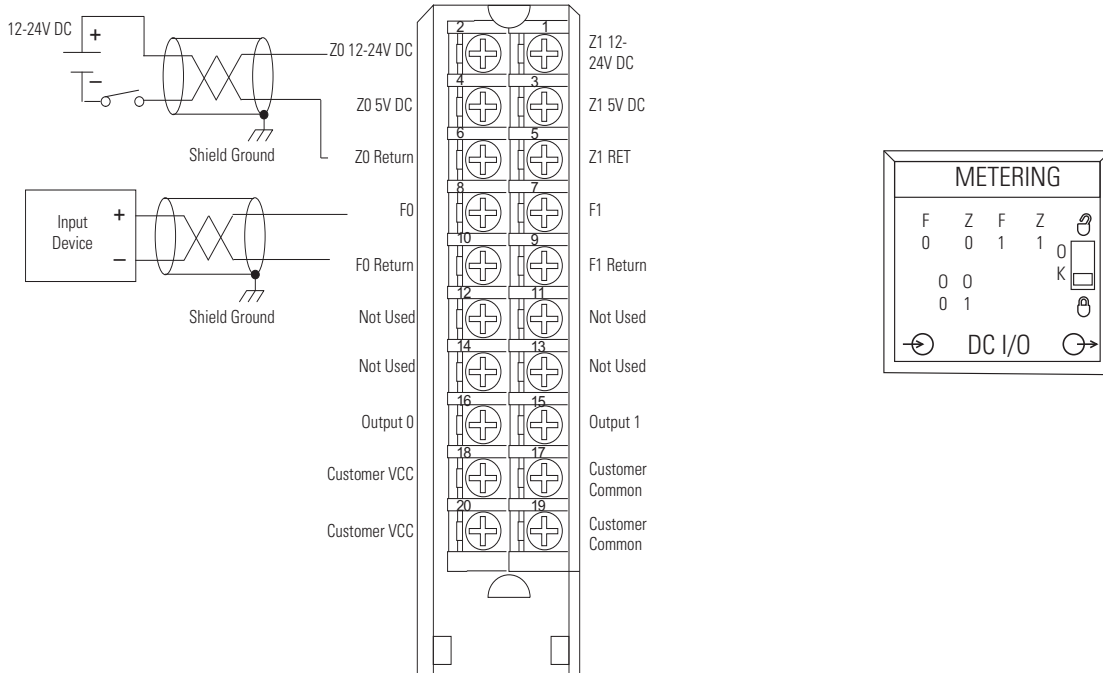
1756-CFM Standard Output



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 214 - 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 214 - Technical Specifications - 1756-CFM (Continued)

Attribute	1756-CFM
Slot width	1
Wire category	2 on signal ports 1 on power ports ⁽¹⁾
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 215 - 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: <ul style="list-style-type: none"> • ±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 Ω ±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 216 - Output Specifications - 1756-CFM

Attribute	1756-CFM
Outputs	2 current sourcing
Output voltage source	Customer supplied
Output voltage range, nom ⁽¹⁾	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 ⁽¹⁾	1 A @ 10...31.2V DC 20 mA @ 4.5...5.5V DC ⁽²⁾
Surge current	2 A for 50 ms, repeatable every 2 s
Off-state leakage current, max	< 300 μ A @ 31.2V DC
On-state voltage drop, max	0.6 Ω 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 μ s turn on, <300 μ 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 217 - 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, 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 217 - 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 218 - Certifications - 1756-CFM

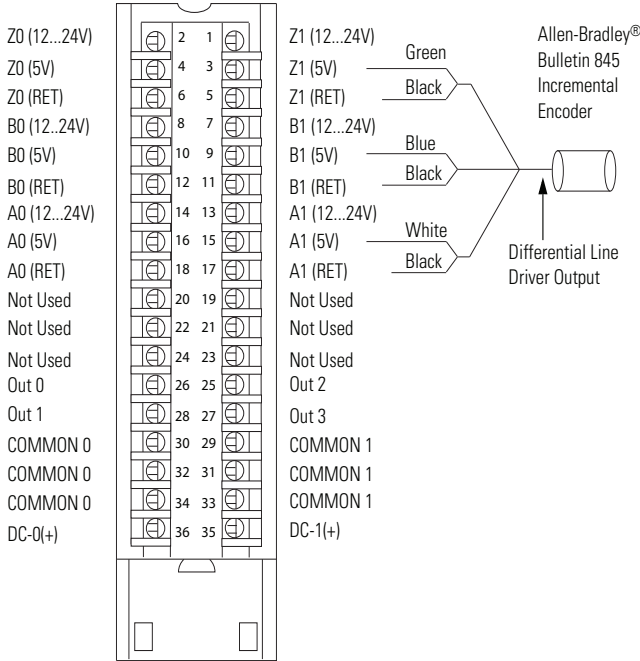
Certification ⁽¹⁾	1756-CFM
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

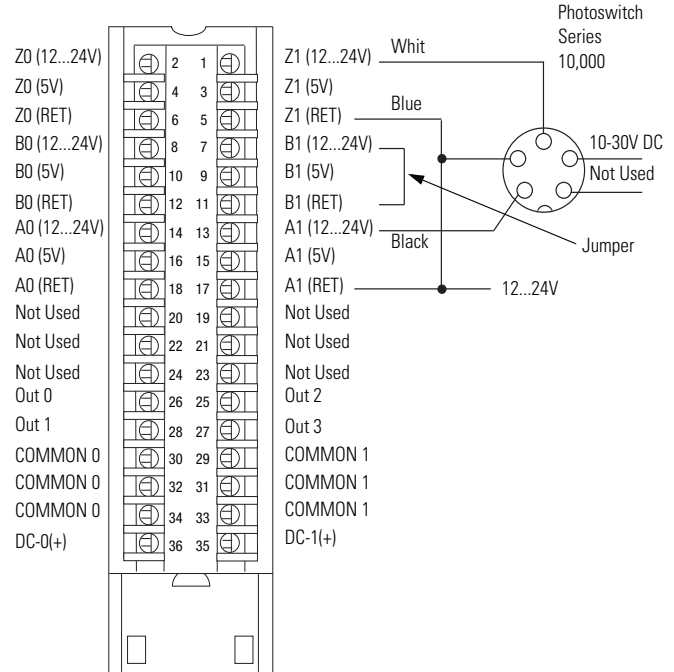
1756-HSC

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 872 3-wire DC Proximity Sensor

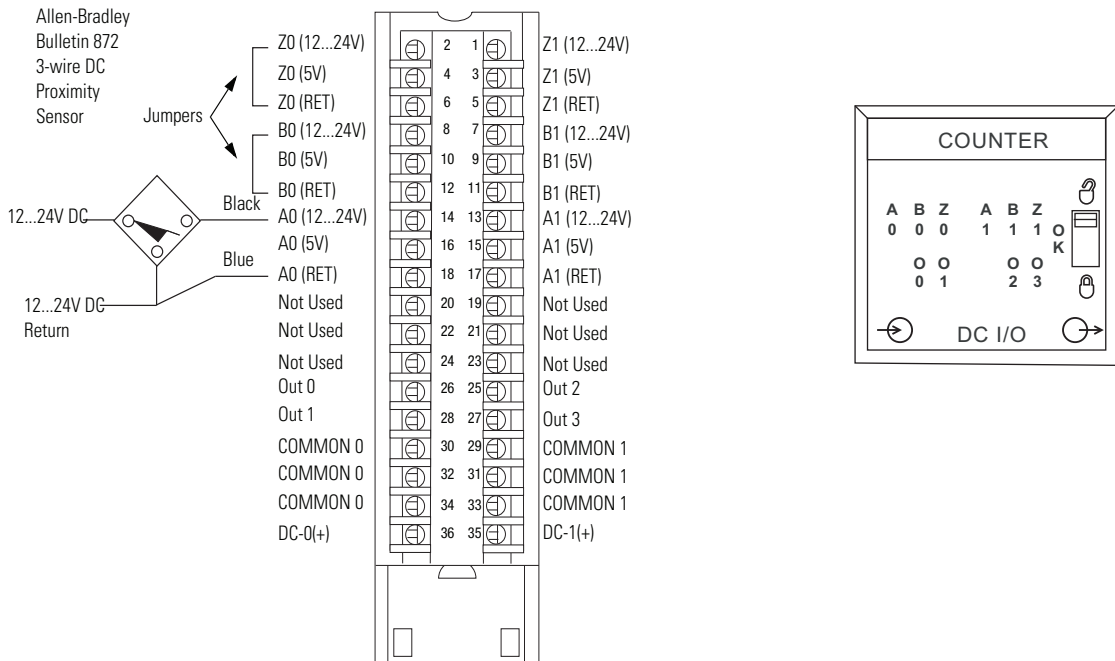


Table 219 - Technical Specifications - 1756-HSC

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 ⁽¹⁾	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 ⁽²⁾
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 220 - 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 221 - Output Specifications - 1756-HSC

Attribute	1756-HSC
Outputs	4 (2 per common)
Output delay time Off to On On to Off	20 μ s nom/50 μ s max 60 μ s nom/300 μ s max
Off-state leakage current per point, max	300 μ A
On-state voltage drop, max	0.55V
Output current rating, per point ⁽¹⁾	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 222 - 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, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Table 222 - 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 223 - Certifications - 1756-HSC

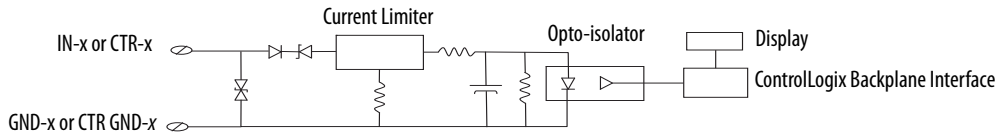
Certification ⁽¹⁾	1756-HSC
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
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



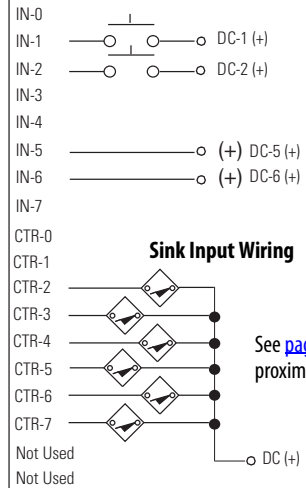
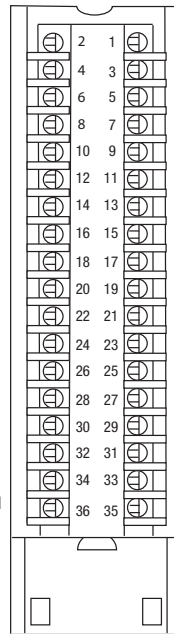
Isolated Wiring

Source Input Wiring

Jumper Bar Cut to Length

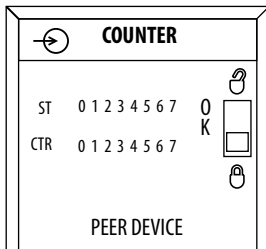
Nonisolated Wiring

1756-LSC8XIB8I



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

Daisy Chain to Other RTBs



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.

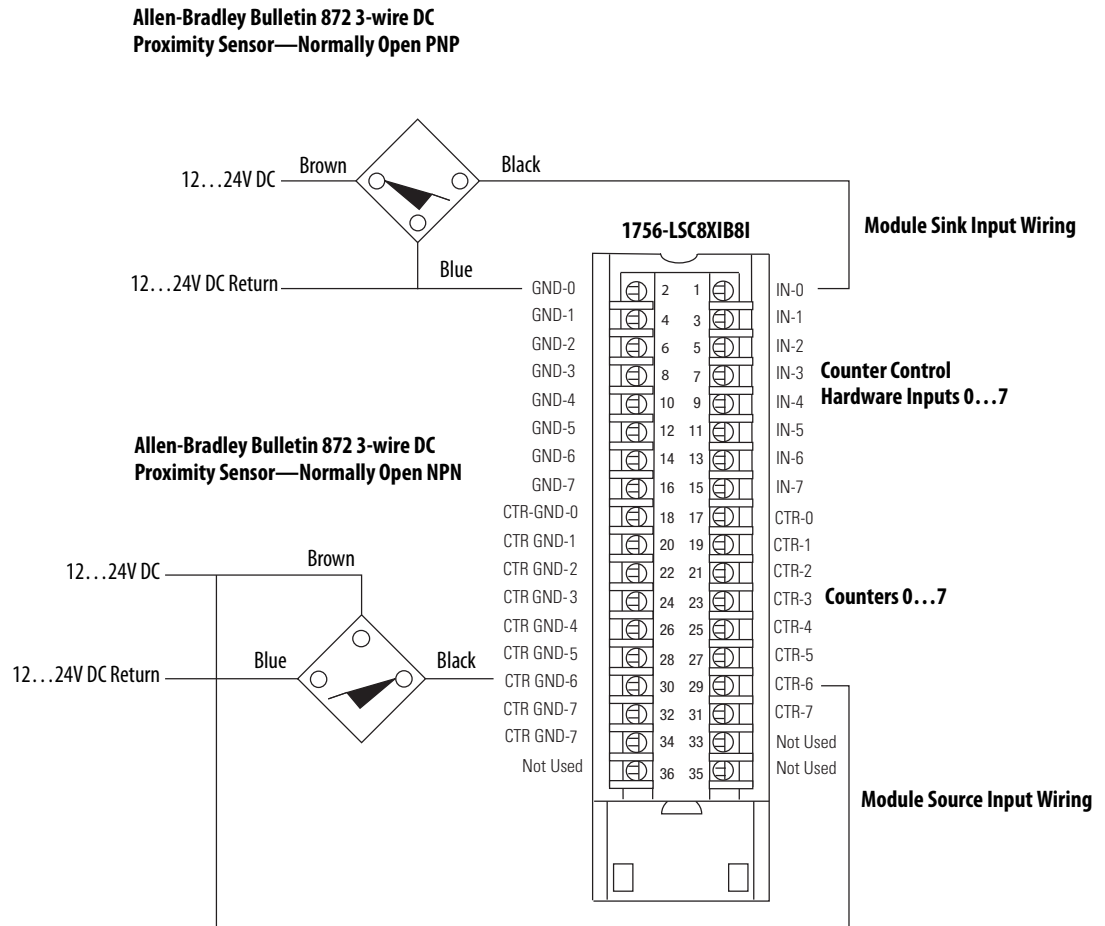


Table 224 - Counter Specifications - 1756-LSC8XIB8I

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 @ 10V DC
On-state current, max	5 mA @ 30V DC
Change of state	Enter or exit user-configurable windows

Table 225 - 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 μ s nom/23 μ s max + user-configurable filter time of 0...30,000 μ s
On to Off	14 μ s nom/23 μ s max + user-configurable filter time of 0...30,000 μ 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 226 - 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 Ω @ 30V DC
Cyclic update time	200 μ 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 ⁽¹⁾
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 227 - 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, 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

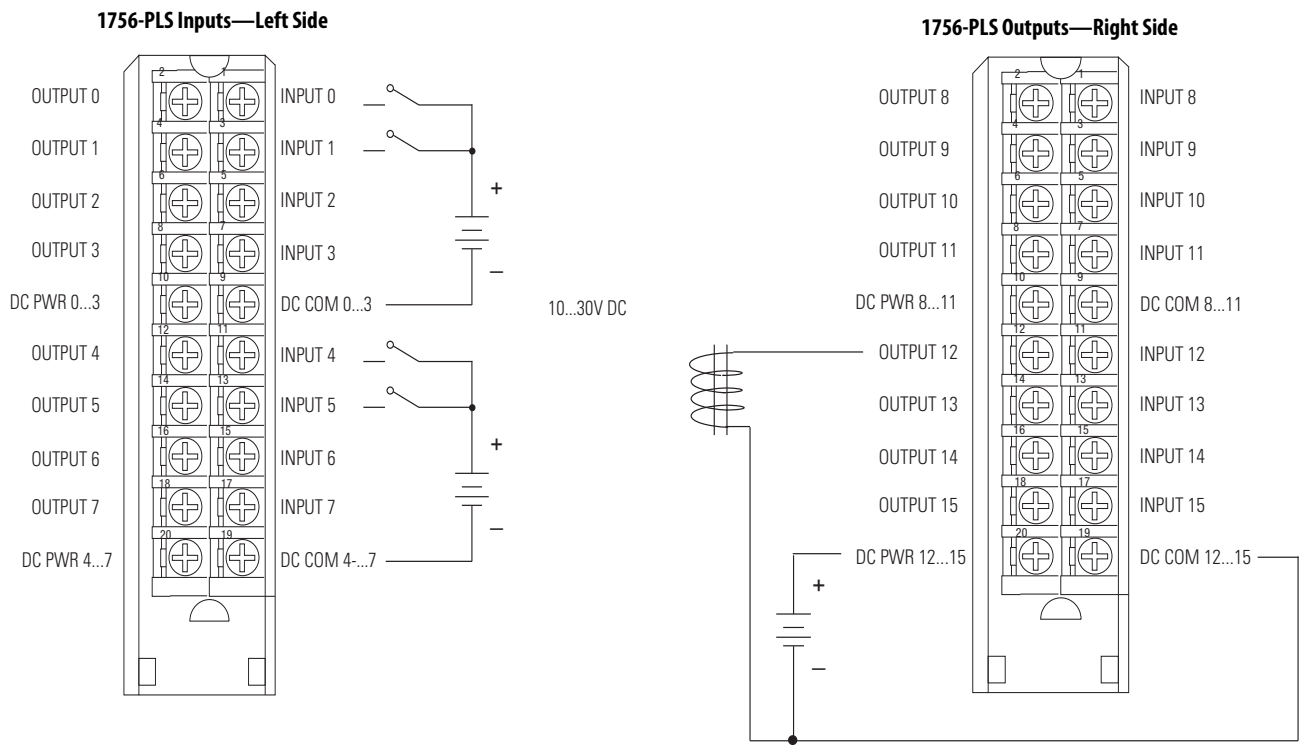
Table 228 - Certifications - 1756-LSC8XIB8I

Certification ⁽¹⁾	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/IEC EMC Directive, compliant with: <ul style="list-style-type: none"> EN 61326-1; Meas./Control/Lab., Industrial Requirements EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> EN 60079-15; Potentially Explosive Atmospheres, Protection "n" EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3

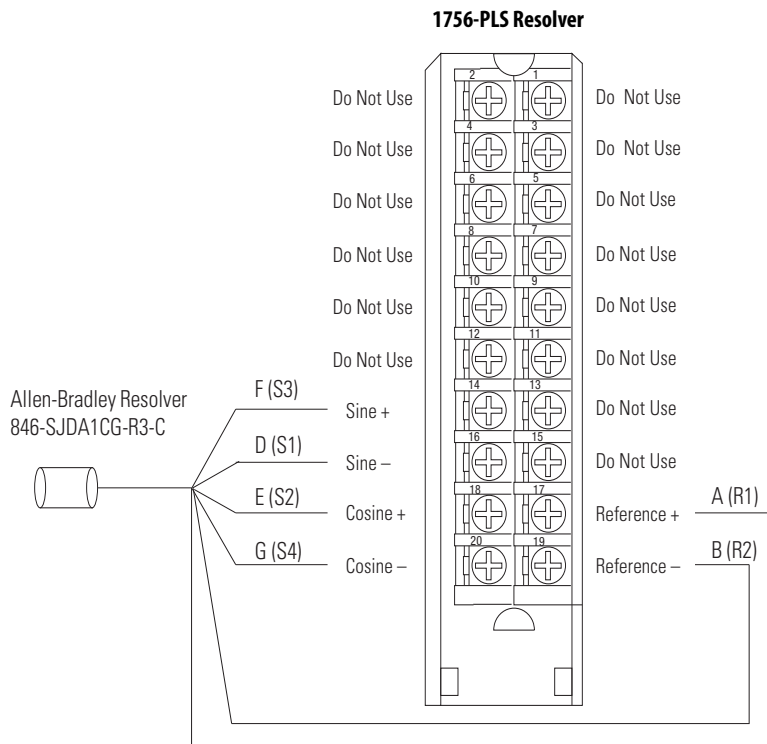
(1) When marked. See the Product Certification link at <http://www.ab.com> for Declarations of Conformity, Certificates, and other certification details.

1756-PLS

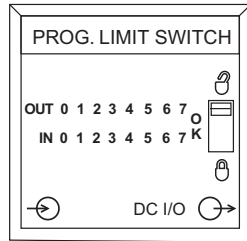
ControlLogix programmable limit switch module



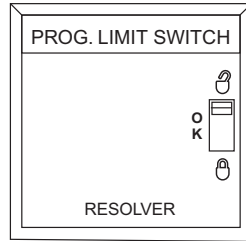
The 1756-PLS module supports enhanced packaging applications. The module requires three contiguous slots in the chassis.



Indicator for Left Slot I/O Module



Indicator for Left Resolver Module



Indicator for Right Slot I/O Module

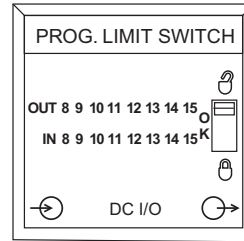


Table 229 - Technical Specifications - 1756-PLS

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 ⁽¹⁾
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 230 - 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	± 1800 RPM
Repeatability	$\pm 0.0488\%$ of full scale
Accuracy	$\pm 0.0976\%$ of full scale

Table 231 - 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 ⁽¹⁾	10.8 . . . 31.2V DC
Input delay time (screw to backplane)	
Off to On	< 15 μ s @ 30 °C (86 °F) < 150 μ s @ 60 °C (140 °F)
On to Off	< 30 μ s @ 30 °C (86 °F) < 200 μ 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 Ω @ 24V DC
Reverse polarity protection	Yes

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10.8 . . . 31.2V DC.

Table 232 - 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 ⁽¹⁾	10...31.2V DC
Output delay time	
Off to On	< 15 μ s @ 60 °C (140 °F)
On to Off	< 25 μ 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 μ 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 ⁽²⁾ (86 °F)
Current per group, max	4 A @ 30 °C ⁽³⁾ (86 °F)
Current per module, max	8 A @ 30 °C ⁽⁴⁾ (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 233 - 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, 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 234 - Certifications - 1756-PLS

Certification ⁽¹⁾	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"> • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) 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"> • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X Gc

(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 mm² (14 AWG) wiring. If you plan to use 2.5 mm² (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 235 - 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 ⁽¹⁾	0.33...2.1 mm ² (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 ² (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 ² (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 ² (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 ² (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

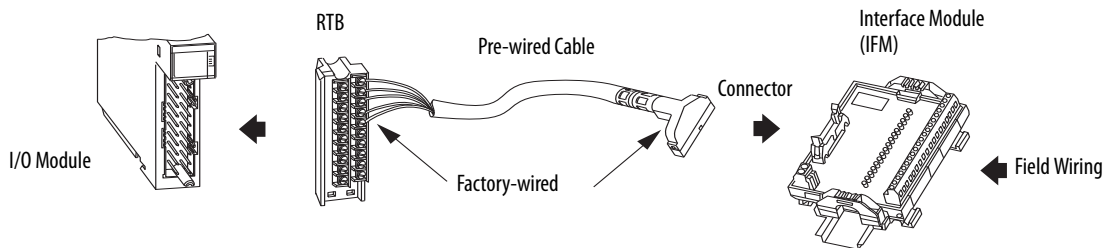
(1) Maximum wire size requires extended housing, catalog number 1756-TBE.

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 1756-UM001	Provides information about using a ControlLogix system.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation® industrial system.
Product Certifications website, http://www.ab.com	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:

Rockwell Automation Support

Rockwell Automation provides technical information on the Web to assist you in using its products.

At <http://www.rockwellautomation.com/support> you can find technical and application notes, sample code, and links to software service packs. You can also visit our Support Center at <https://rockwellautomation.custhelp.com/> for software updates, support chats and forums, technical information, FAQs, and to sign up for product notification updates.

In addition, we offer multiple support programs for installation, configuration, and troubleshooting. For more information, contact your local distributor or Rockwell Automation representative, or visit <http://www.rockwellautomation.com/services/online-phone>.

Installation Assistance

If you experience a problem within the first 24 hours of installation, review the information that is contained in this manual. You can contact Customer Support for initial help in getting your product up and running.

United States or Canada	1.440.646.3434
Outside United States or Canada	Use the Worldwide Locator at http://www.rockwellautomation.com/rockwellautomation/support/overview.page , or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to help ensure that they are fully operational when shipped from the manufacturing facility. However, if your product is not functioning and needs to be returned, follow these procedures.

United States	Contact your distributor. You must provide a Customer Support case number (call the phone number above to obtain one) to your distributor to complete the return process.
Outside United States	Please contact your local Rockwell Automation representative for the return procedure.

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