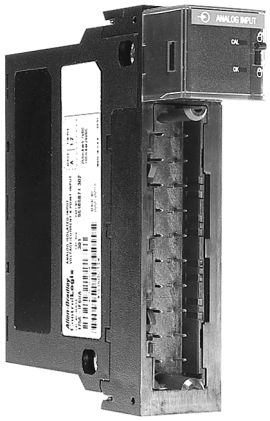
1756 ControlLogix I/O Modules Specifications



Catalog Numbers 1756 series

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.

Important User Information

Solid state equipment has operational characteristics differing from those of electromechanical equipment. Safety Guidelines for the Application, Installation and Maintenance of Solid State Controls (publication SGI-1.1 available from your local Rockwell Automation sales office or online at http://www.rockwellautomation.com/literature/) describes some important differences between solid state equipment and hard-wired electromechanical devices. Because of this difference, and also because of the wide variety of uses for solid state equipment, all persons responsible for applying this equipment must satisfy themselves that each intended application of this equipment is acceptable.

In no event will Rockwell Automation, Inc. be responsible or liable for indirect or consequential damages resulting from the use or application of this equipment.

The examples and diagrams in this manual are included solely for illustrative purposes. Because of the many variables and requirements associated with any particular installation, Rockwell Automation, Inc. cannot assume responsibility or liability for actual use based on the examples and diagrams.

No patent liability is assumed by Rockwell Automation, Inc. with respect to use of information, circuits, equipment, or software described in this manual.

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Throughout this manual, when necessary, we use notes to make you aware of safety considerations.

	**WARNING:** Identifies information about practices or circumstances that can cause an explosion in a hazardous environment, which may lead to personal injury or death, property damage, or economic loss.
IMPORTANT	Identifies information that is critical for successful application and understanding of the product.
	**ATTENTION:** Identifies information about practices or circumstances that can lead to personal injury or death, property damage, or economic loss. Attentions help you identify a hazard, avoid a hazard, and recognize the consequence
	**SHOCK HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that dangerous voltage may be present.
	**BURN HAZARD:** Labels may be on or inside the equipment, for example, a drive or motor, to alert people that surfaces may reach dangerous temperatures.

Available 1756 I/O Modules

I/O Type	Catalog Number	Page	Catalog Number	Page
AC digital	1756-IA8D 1756-IA16 1756-IA16I 1756-IA32 1756-IM16I 1756-IN16	6 9 12 15 70 73	1756-OA8 1756-OA8D 1756-OA8E 1756-OA16 1756-OA16I 1756-ON8	92 95 98 101 104 155
DC digital	1756-IB16 1756-IB16D 1756-IB16I 1756-IB16ISOE 1756-IB32 1756-IC16 1756-IG16 1756-IH16I 1756-IH16ISOE 1756-IV16 1756-IV32	18 21 24 27 30 33 61 64 67 86 89	1756-OB8 1756-OB8EI 1756-OB8I 1756-OB16D 1756-OB16E 1756-OB16I 1756-OB16IS 1756-OB32 1756-OC8 1756-OG16 1756-OH8I 1756-OV16E 1756-OV32E	107 110 113 116 119 122 125 128 131 149 152 158 161
Contact			1756-OW16I 1756-OX8I	164 167
Analog	1756-IF6CIS 1756-IF6I 1756-IF8 1756-IF16 1756-IF4FXOF2F 1756-IR6I 1756-IT6I 1756-IT6I2	36 40 44 51 58 76 80 83	1756-OF4 1756-OF6CI 1756-OF6VI 1756-OF8	134 137 140 143
HART interface	1756-IF8H 1756-IF16H	48 55	1756-OF8H	146
Specialty	1756-CFM 1756-HSC	170 175	1756-PLS	179

Digital I/O Modules

The 1756 digital I/O modules support these features:

- Variety of voltage interface capabilities
- Isolated and nonisolated module types
- Point-level output fault states
- Direct-connect or rack-optimized communication
- Field-side diagnostics on select modules

In addition, 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.

Module Type	Features
1756 digital AC input modules	• Change of state: Software configurable • Timestamp of inputs: ±200 μs • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756 digital AC output modules	• Scheduled outputs: Synchronization within 16.7 seconds maximum, reference to the Coordinated System Time • Fault states 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) • Fusing: – 1756-OA8D, 1756-OA8E: Electronically fused per point – 1756-OA16: Mechanically fused/group, 3.15 A @ 250V AC slow blow, 1500 A interruption current, Littelfuse p/n H2153.15 – All other modules: Not protected. A fused IFM is recommended to protect outputs • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756 digital DC input modules	• Reverse polarity protection: All modules except 1756-IG16 module • Change of state: Software configurable • Timestamp of inputs: – ±100 μs for sequence of events modules – ±200 μs for all other modules • Module keying: Electronic, software configurable • RTB Keying: User-defined mechanical
1756 digital DC output modules	• Scheduled outputs: Synchronization within 16.7 seconds maximum, reference to the Coordinated System Time • Fault states 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) • Fusing: – 1756-OB8EI, 1756-OB16D: Electronically fused per point – 1756-OB16E, 1756-OV16E, 1756-OV32E: Electronically fused per group – All other modules. Not protected. A fused IFM is recommended to protect outputs • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756 digital contact modules	• Scheduled outputs: Synchronization within 16.7 seconds maximum, reference to the Coordinated System Time • Configurable fault states per point: Hold last state, on or off (off is default) • Configurable states in Program mode per point: Hold last state, on or off (off is default) • Fusing: Not protected. A fused IFM is recommended to protect outputs • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical

Analog I/O Modules

The 1756 digital I/O modules support these features.

Module Type	Features
1756 analog input modules	• On-board data alarming • Scaling to engineering units • Real-time channel sampling • Data format: Integer mode (left justified, 2s complement) IEEE 32-bit floating point • Module conversion method: Sigma-Delta
1756 analog output modules	• Data format: Integer mode (left justified, 2s complement) IEEE 32-bit floating point • Module conversion method: R-Ladder DAC, monotonicity with no missing codes • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756 high-speed analog combination module	• 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 • RTB keying: User-defined mechanical
1756 analog RTD and thermocouple modules	• Data format: Integer mode (left justified, 2s complement) IEEE 32-bit floating point • Module conversion method: Sigma-Delta • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756 analog modules with HART interface	• Data format: Integer mode (left justified, 2s complement), Floating point IEEE 32 bit • Input conversion method: Successive approximation • Output conversion method: R-Ladder DAC, monotonicity with no missing codes • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical

Specialty I/O Modules

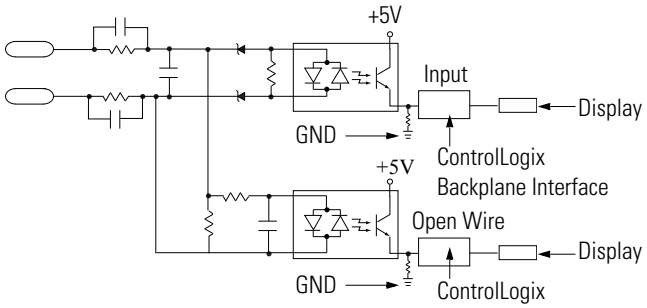
These specialty modules are available.

Module Type	Features
1756-CFM configurable flow meter module	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. • Totalizer fill and prover • High-resolution 100 kHz max • Frequency 0.0005 Hz resolution • Reverse polarity protection: Outputs only • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical
1756-HSC high-speed counter module	The 1756-HSC module provides four high-speed, output-switching, on-off windows. The module uses pulses for counting and frequency. • Counter: 1 MHz max • Rate measurement: 500 kHz max • Encoder: 250 kHz max • Debounce filter: 70 Hz max • Module keying: Electronic, software configurable • RTB keying: User-defined mechanical keying
1756-PLS programmable limit switch module	The 1756-PLS module supports enhanced packaging applications. • Requires three contiguous slots in chassis • RTB keying: User-defined mechanical

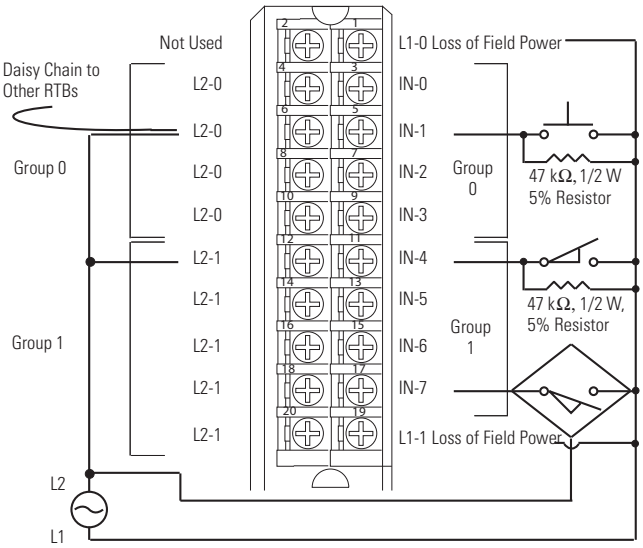
1756-IA8D

ControlLogix AC (79...132V) diagnostic input module

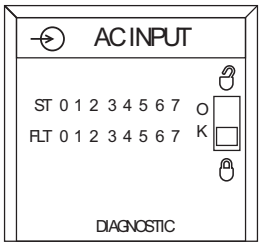
Simplified Schematic



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



Attribute	1756-IA8D
Inputs	8 diagnostic (4 points/group)
Voltage category	120V AC
Operating voltage range	79…132V AC, 47…63 Hz
Input voltage, nom	120V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms 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
Power dissipation, max	4.5 W @ 60 °C (140 °F)
Thermal dissipation	15.35 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA

Attribute	1756-IA8D
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 kΩ @ 132V AC, 60 Hz
Cyclic update time	200 μs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IA8D
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	10Vrms with 1 Hz sine-wave 80% AM from 150 kHz...80 MHz

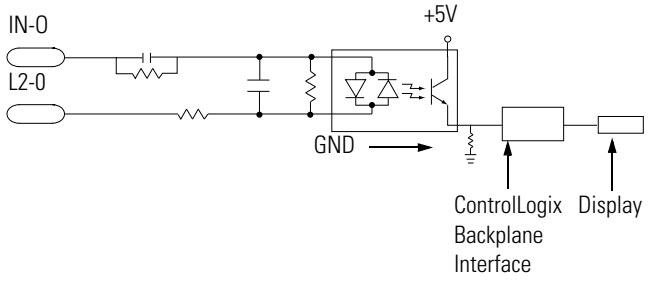
Certification[1]	1756-IA8D
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

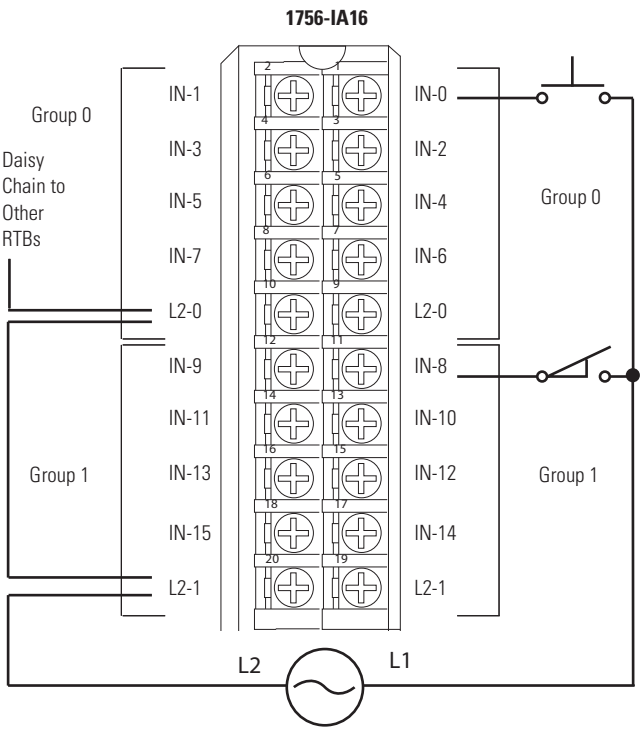
1756-IA16

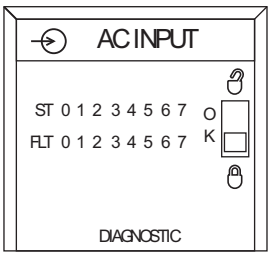
ControlLogix AC (79...132V) input module

Simplified Schematic



1756-IA16





Attribute	1756-IA16
Inputs	16 (8 points/group)
Voltage category	120V AC
Operating voltage range	74…132V AC, 47…63 Hz
Input voltage, nom	120V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms Hardware delay: 8 ms max + filter time User-selectable filter time: 9 or 18 ms
Current draw @ 5.1V	105 mA
Current draw @ 24V	2 mA
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

Attribute	1756-IA16
Inrush current, max	250 mA peak (decaying to <37% in 22 ms, without activation)
Input impedance, max	10.15 kΩ @ 132V AC, 60 Hz
Cyclic update time	200 μs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IA16
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

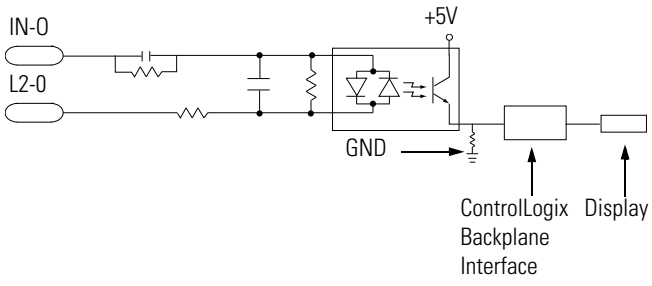
Certification[1]	1756-IA16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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

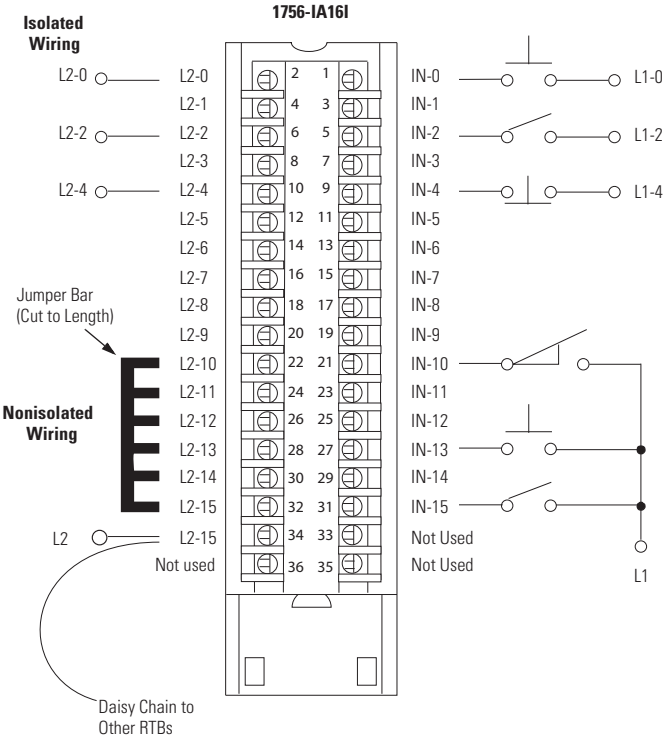
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IA16I

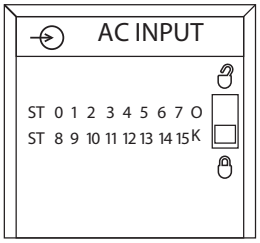
ControlLogix AC (79...132V) isolated input module

Simplified Schematic





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



Attribute	1756-IA16I
Inputs	16 individually isolated
Voltage category	120V AC
Operating voltage range	79…132V AC, 47…63 Hz
Input voltage, nom	120V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms 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
Power dissipation, max	4.9 W @ 60 °C (140 °F)
Thermal dissipation	16.71 BTU/hr
Off-state voltage, max	20V
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

Attribute	1756-IA16I
Input impedance, max	8.8 kΩ @ 132V AC, 60Hz
Cyclic update time	200 µs...750 ms
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1200V AC for 2 s
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

Certification[1]	1756-IA16I
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TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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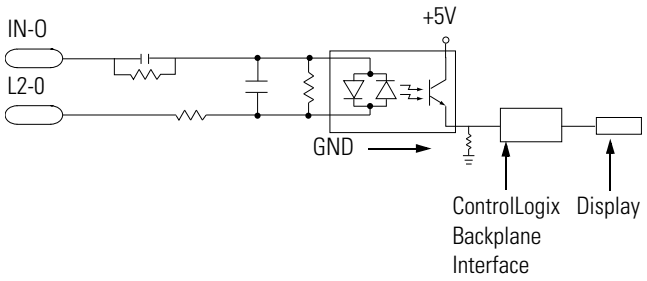
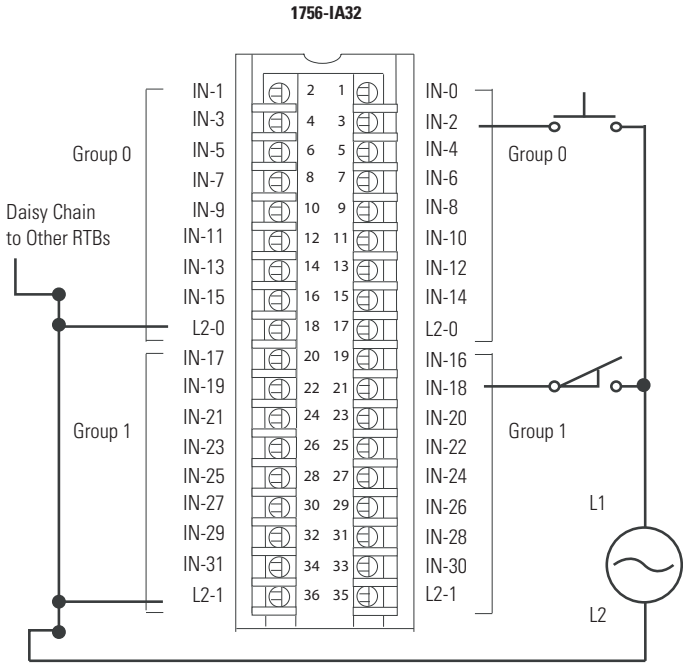
1756-IA32

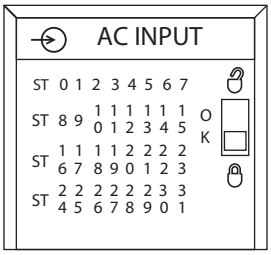
ControlLogix AC (74...132V) input module

Simplified Schematic



1756-IA32





Attribute	1756-IA32
Inputs	32 diagnostic (4 points/group)
Voltage category	120V AC
Operating voltage range	74…132V AC, 47…63 Hz
Input voltage, nom	120V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 1.5 ms nom/10 ms max + filter time User-selectable filter time: 1 or 2 ms 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
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
Inrush current, max	390 mA
Input impedance, max	14.0 kΩ @ 132V AC, 60 Hz

Attribute	1756-IA32
Cyclic update time	200 µs...750 ms
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
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

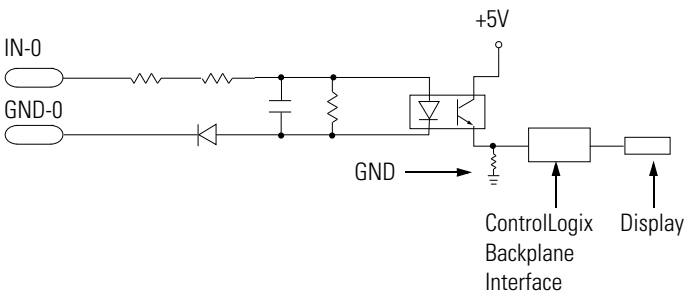
Certification[1]	**1756-IA32**
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

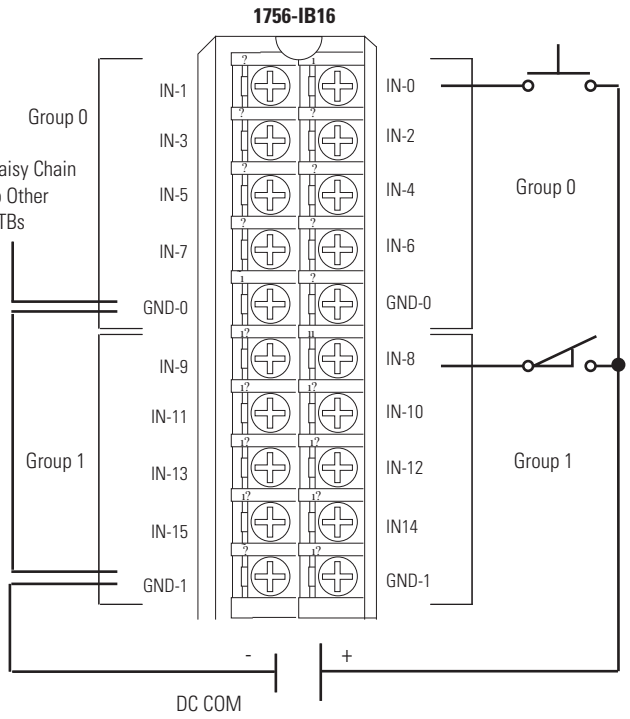
1756-IB16

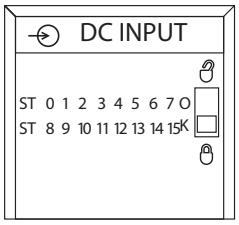
ControlLogix DC (10...31.2V) input module

Simplified Schematic



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 OFF to ON ON to OFF	 Hardware delay: 290 µs nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 700 µs 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
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

Attribute	1756-IB16
Inrush current, max	250 mA peak (decaying to < 37% in 22 ms, without activation)
Input impedance, max	3.12 kΩ @ 31.2V DC
Cyclic update time	200 μs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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 1kHz sine-wave 80% AM from 80... 2000 MHz 10V/m with 200Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200Hz 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

Attribute	1756-IB16
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

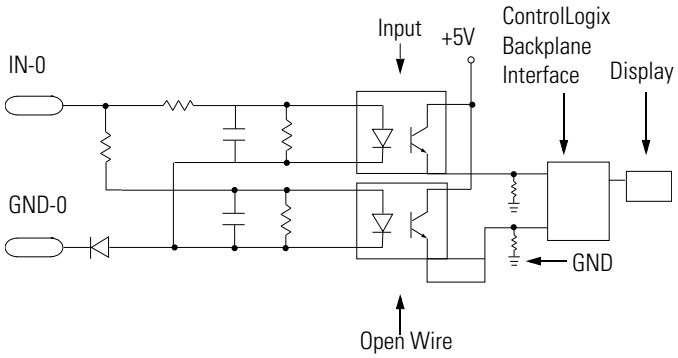
Certification[1]	1756-IB16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

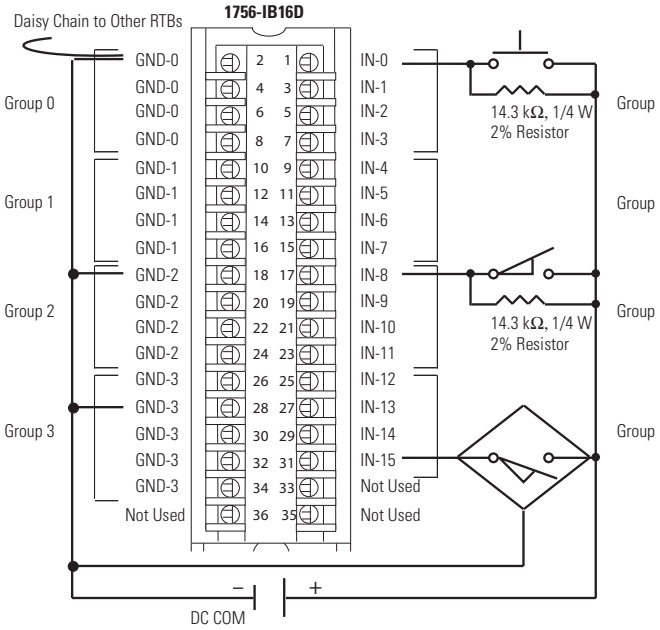
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IB16D

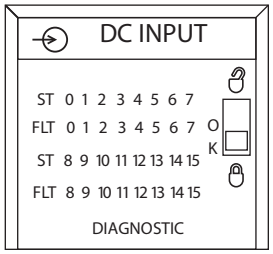
ControlLogix DC (10...30V) diagnostic input module

Simplified Schematic





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



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
Input delay time OFF to ON ON to OFF	 Hardware delay: 340 µs nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 740 µs nom/4 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	150 mA
Current draw @ 24V	3 mA
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	5V

Attribute	1756-IB16D
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 kΩ @ 30V DC
Cyclic update time	200 µs...750 ms
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
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IB16D
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

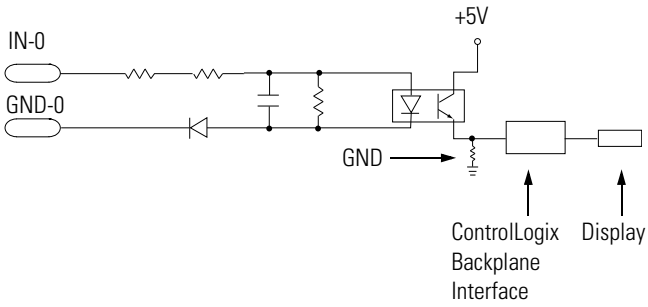
Certifications(1)	1756-IB16D
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

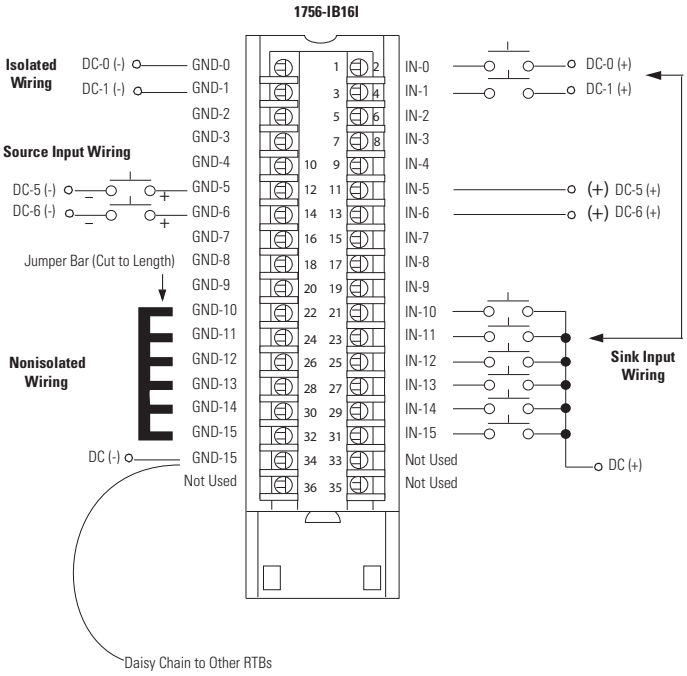
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IB16I

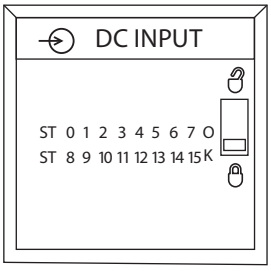
ControlLogix DC (10...30V) isolated input module

Simplified Schematic





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



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 OFF to ON ON to OFF	 Hardware delay: 1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms 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
Power dissipation, max	5 W @ 60 °C (140 °F)
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10 V DC
On-state current, max	10 mA @ 30V DC
Inrush current, max	250 mA peak (decaying to < 37% in 22 ms, without activation)

Attribute	1756-IB16I
Input impedance, max	3 kΩ @ 30V DC
Cyclic update time	200 µs...750 ms
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-IB16I
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IB16I
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

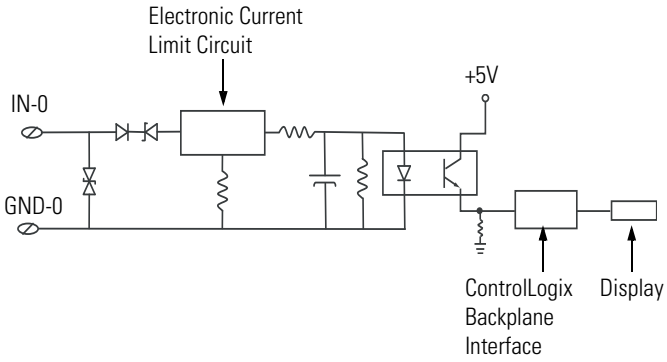
Certification[1]	1756-IB16I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

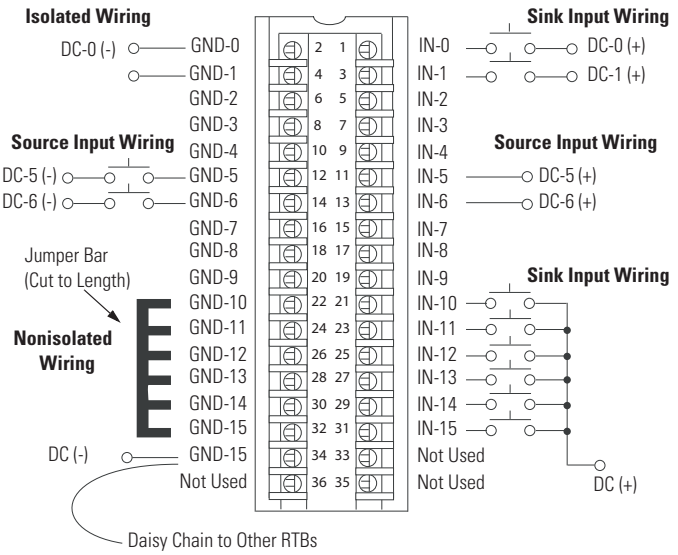
1756-IB16ISOE

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

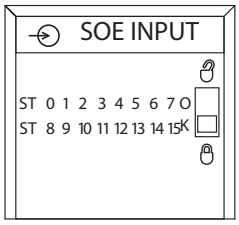
Simplified Schematic



1756-IB16ISOE



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



Attribute	1756-IB16ISOE[1]
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 OFF to ON ON to OFF	 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) 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
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	17.22 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2.0 mA @ 9V DC
On-state current, nom	4.5 mA @ 24...31V DC

Attribute	1756-IB16ISOE(1)
On-state current, max	5.1 mA @ 48…55V DC
Input impedance, max	10.8 kΩ @ 55V DC
Cyclic update time	200 µs...750 ms
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4
Enclosure type	None (open-style)

(1) If you use 1756-IB16ISOE or 1756-IH16ISOE modules in a remote rack, you must use a 1756-SYNCH SynchLink module to coordinate system time.

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IB16ISOE
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

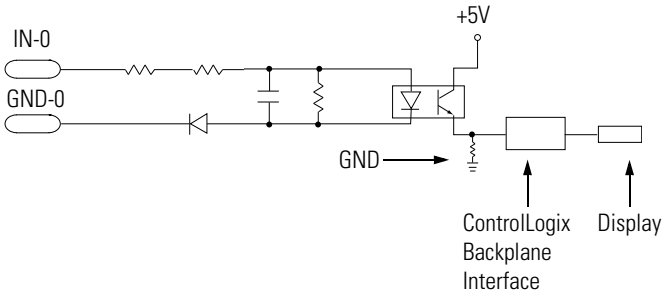
Certification[1]	1756-IB16ISOE
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

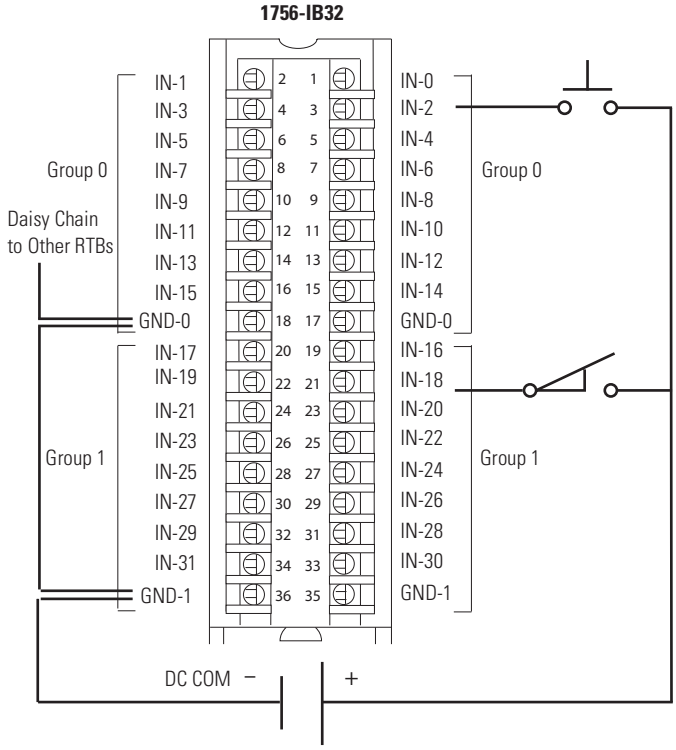
1756-IB32

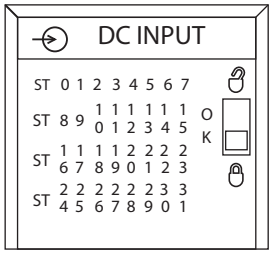
ControlLogix DC (10...31.2V) input module

Simplified Schematic



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 OFF to ON ON to OFF	 Hardware delay: 380 µs max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 420 µs 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
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	1.5 mA
On-state current, min	2 mA
On-state current, max	5.5 mA
Inrush current, max	250 mA (decaying to < 37% in 22 ms, without activation)
Input impedance, max	5.67 kΩ @ 31.2V DC

Attribute	1756-IB32
Cyclic update time	200 µs...750 ms
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1 - on signal ports(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IB32
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

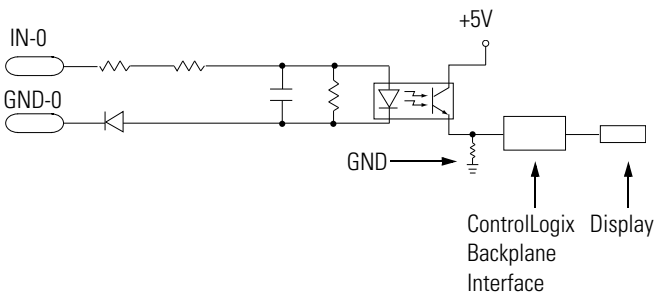
Certification[1]	1756-IB32
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

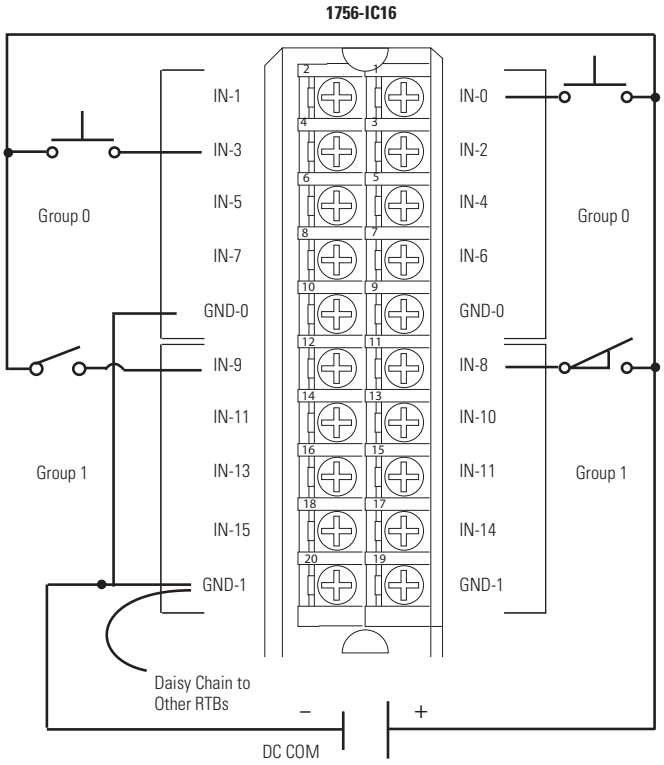
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

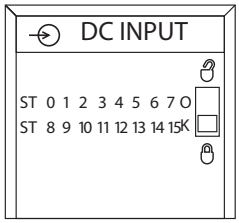
1756-IC16

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

Simplified Schematic







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 OFF to ON ON to OFF	 Hardware delay: 1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms 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
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

Attribute	1756-IC16
On-state current, max	7 mA @ 60V DC
Inrush current, max	250 mA
Input impedance, max	8.57 kΩ @ 60V DC
Cyclic update time	200 μs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-IC16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IC16
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

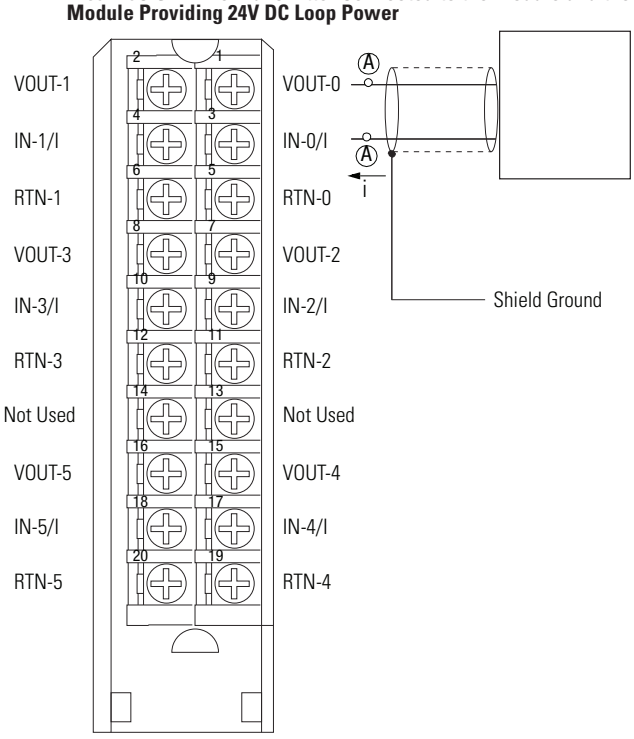
Certification[1]	1756-IC16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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-IF6CIS

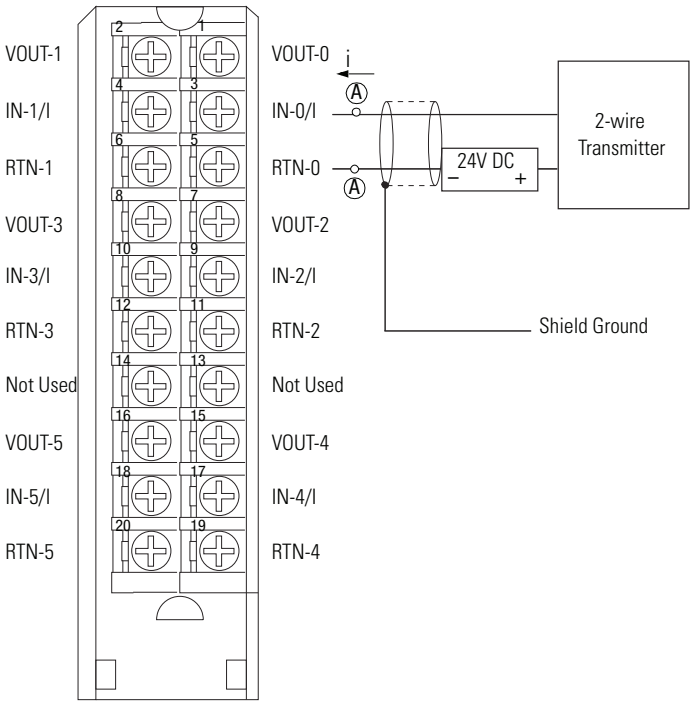
ControlLogix sourcing current loop analog input module

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



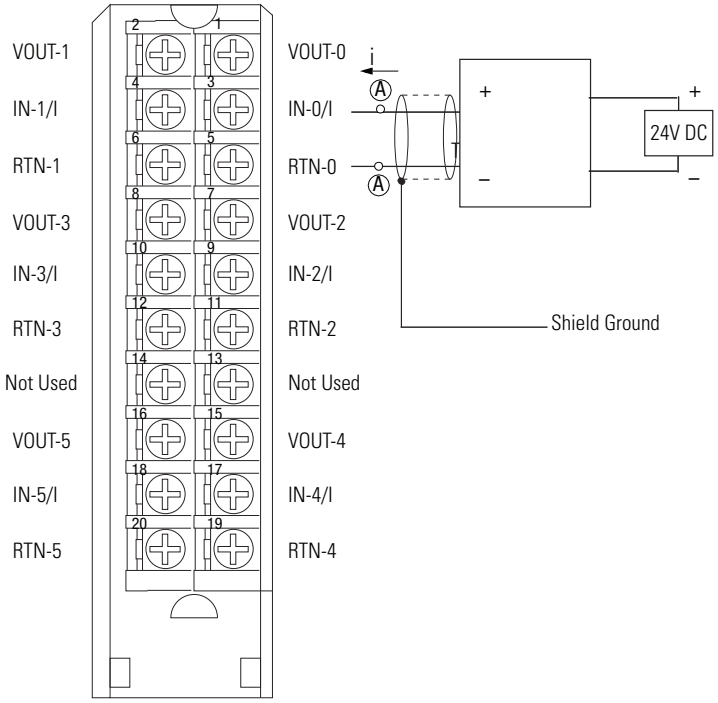
- Do not connect more than two wires to any single terminal.
- Place additional loop devices (such as strip chart recorders) at either A location in the current loop.

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



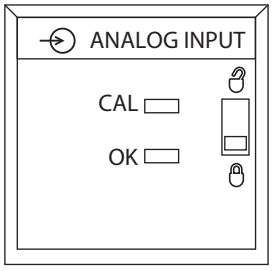
- If separate power sources are used, do not exceed the specified isolation voltage.
- Do not connect more than two wires to any single terminal.
- Place additional loop devices (such as strip chart recorders) at either A location in the current loop.

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



- If separate power sources are used, do not exceed the specified isolation voltage.
- Do not connect more than two wires to any single terminal.
- 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.

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



Attribute	1756-IF6CIS
Inputs	6 individually isolated current sourcing
Input range	0…21 mA
Resolution	16 bits 0.34 μA/bit
Current draw @ 5.1V	250 mA
Current draw @ 24V	275 mA
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

Attribute	1756-IF6CIS
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 µA/°C
Gain drift with temperature, max	35 ppm/°C max 0.74 µA/°C max
Module error	0.2% of range
Module input scan time, min	25 ms min – floating point 10 ms min – integer
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz

Attribute	1756-IF6CIS
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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

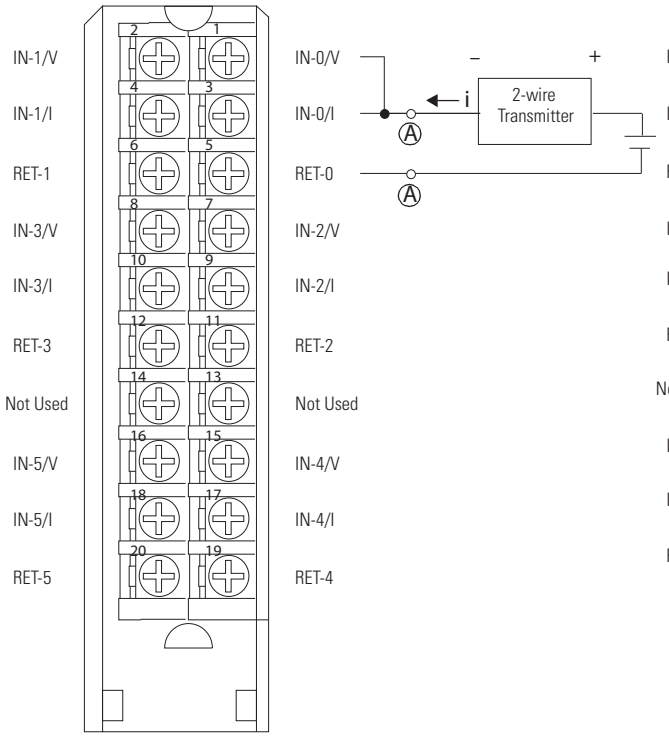
Certification(1)	1756-IF6CIS
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

1756-IF6I

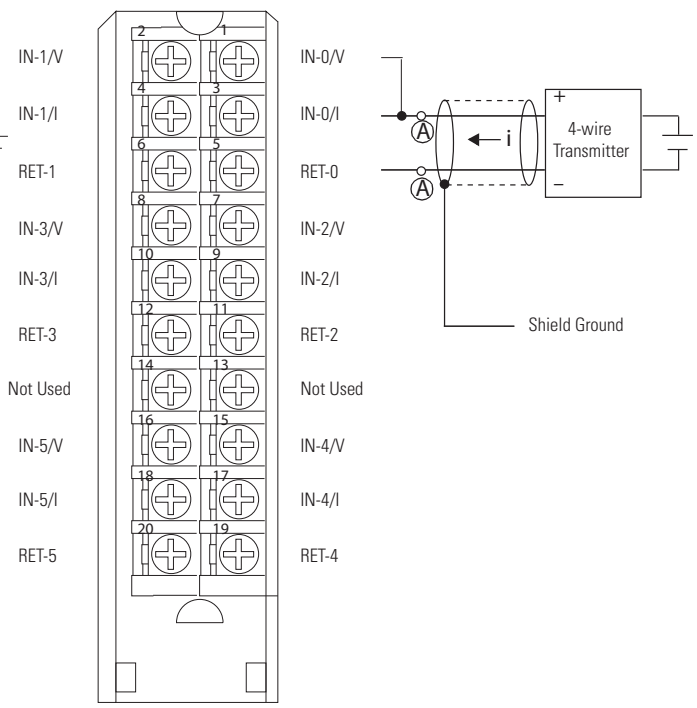
ControlLogix isolated voltage/current analog input module

1756-IF6I Current 2-wire



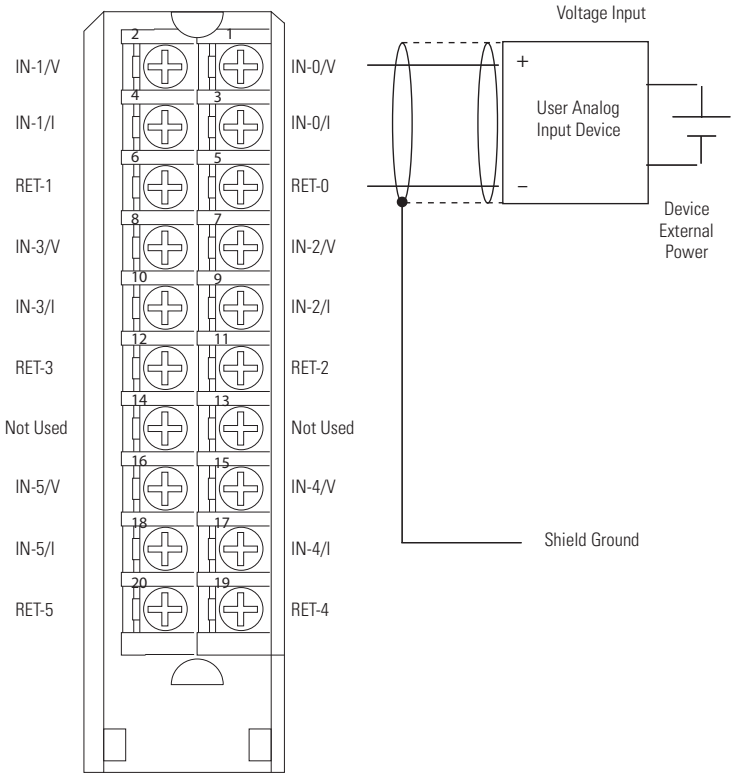
- Place additional loop devices (such as strip chart recorders) at either A location.

1756-IF6I Current 4-wire



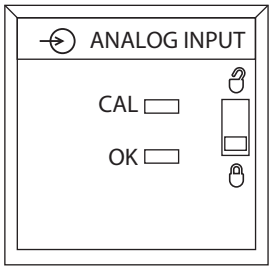
- Place additional loop devices (such as strip chart recorders) at either A location.

1756-IF6I Voltage



- Do not connect more than 2 wires to any single terminal.

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



Attribute	1756-IF6I
Inputs	6 individually isolated
Input range	±10.5V 0…10.5V 0…5.25V 0…21 mA
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

Attribute	1756-IF6I
Current draw @ 24V	100 mA
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 MΩ 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 μV/°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)
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

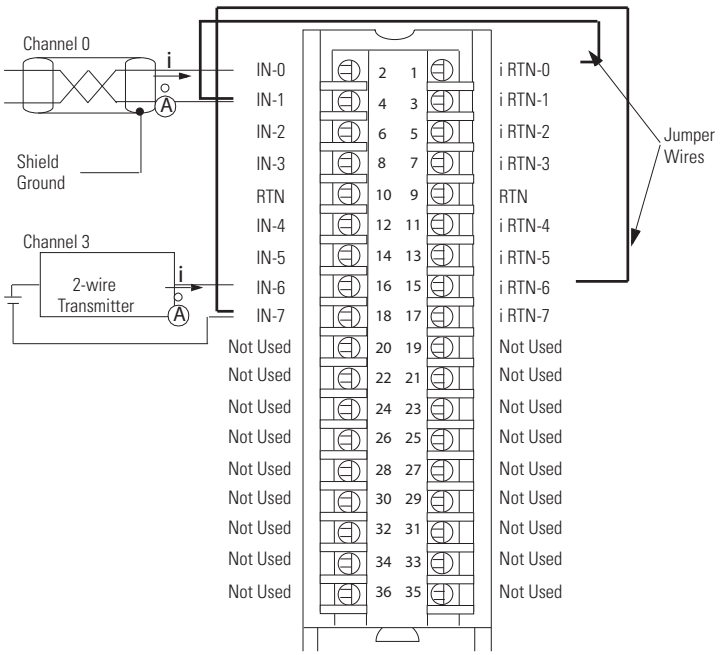
Certification(1)	1756-IF6I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

(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

1756-IF8 Differential Current



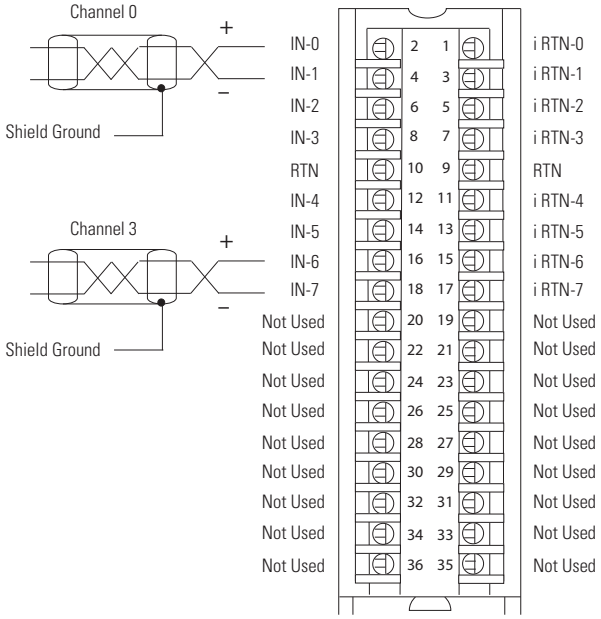
- Use this table when wiring your module in Differential mode.

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.
- Do not connect more than two wires to any single terminal.

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

1756-IF8 Differential Voltage



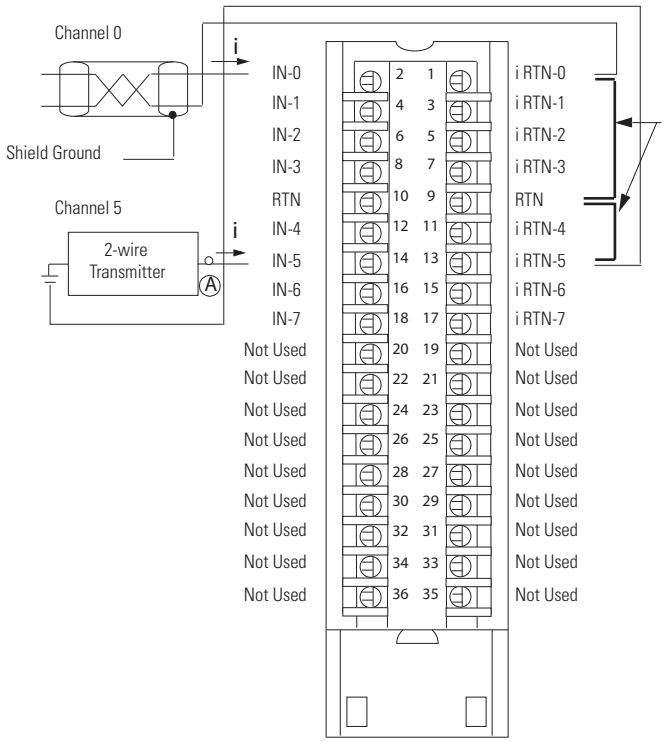
- Use this table when wiring your module in Differential mode.

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.
- Do not connect more than two wires to any single terminal.

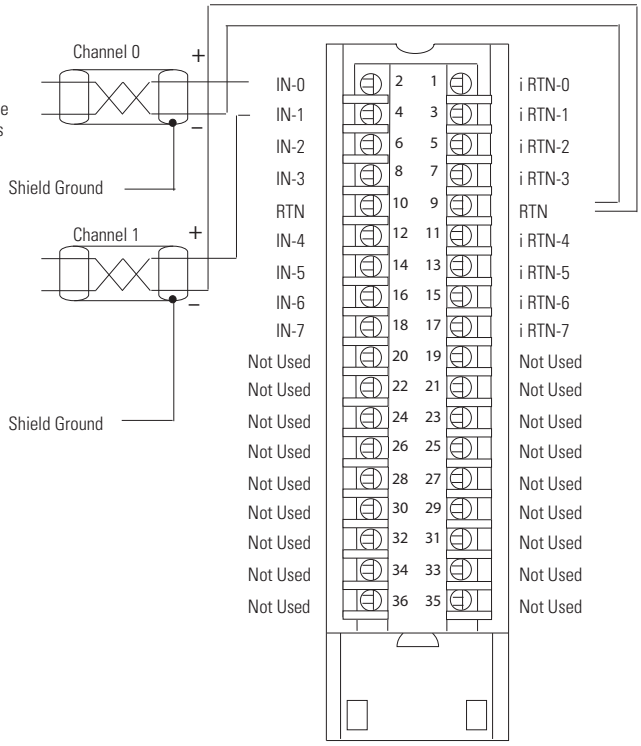
IMPORTANT: When operating in 2 channel, High Speed mode, only use channels 0 and 2.

1756-IF8 Single-ended Current

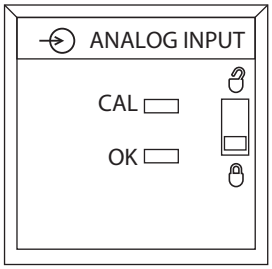


- All terminals marked RTN are connected internally.
- For current applications, all terminals marked iRTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-*x* and i RTN-*x* terminals.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.
- Do not connect more than two wires to any single terminal.

1756-IF8 Single-ended Voltage



- All terminals marked RTN are connected internally.
- Terminals marked i RTN are not used for single-ended voltage wiring.
- Do not connect more than two wires to any single terminal.



Attribute	1756-IF8
Inputs	8 single-ended 4 differential 2 high-speed differential
Input range	±10.25V 0...10.25V 0...5.125V 0…20.5 mA
Resolution	±10.25V: 320 μV/cnt (15 bits plus sign bipolar) 0…10.25V: 160 μV/cnt (16 bits) 0…5.125V: 80 μ/V cnt (16 bits) 0…20.5mA: 0.32 μA/cnt (16 bits)
Current draw @ 5.1V	150 mA
Current draw @ 24V	40 mA

Attribute	1756-IF8
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 MΩ 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 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	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)
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane. No isolation between individual inputs Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

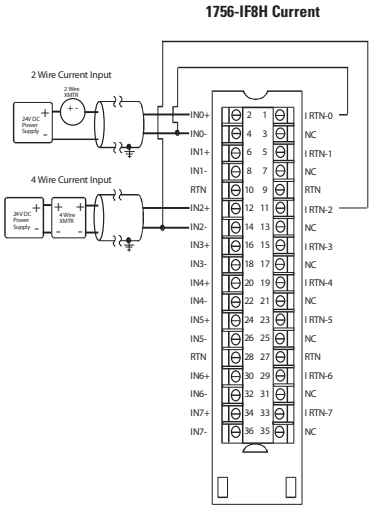
Attribute	1756-IF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

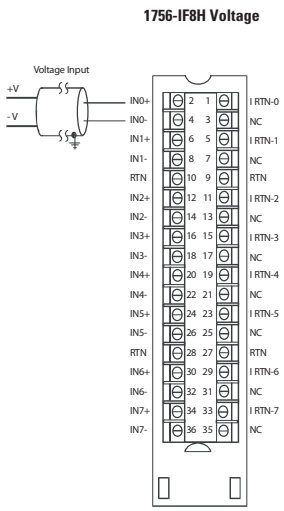
Certification(1)	1756-IF8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

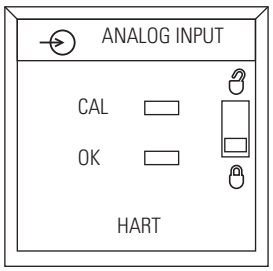
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IF8H

ControlLogix voltage/current analog input module with HART protocol







Attribute	1756-IF8H
Inputs	8 differential voltage or current
Input range	±10V 0...5V 1…5V 0...10V 0…20 mA 4…20 mA
Resolution	16…21 bits
Current draw @ 5V	300 mA
Current draw @ 24V	70 mA
Power dissipation, max	Voltage: 3.21 W Current: 4.01 W
Thermal dissipation	Voltage: 11.0 BTU/hr Current: 13.7 BTU/hr
Input impedance	> 1 MΩ voltage 250 Ω current
Open circuit detection time	Positive full scale reading within 5 s
Overvoltage protection, max	Voltage: 30V DC Current: 8V DC
Normal mode noise rejection	> 80 dB @ 50/60 Hz
Common mode noise rejection	> 100 dB @ 50/60 Hz
Calibrated accuracy	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Calibration interval	12 months
Offset drift	90 μV/°C
Gain drift with temperature	Voltage: 10 ppm/°C Current: 20 ppm/°C

Attribute	1756-IF8H
Module error	Voltage: 0.1% of range Current: 0.3% of range
Module input scan time, min	18...488 ms (filter dependent)
Module HART scan time	Typically 1 s per HART channel enabled. Estimate 10 s if all 8 channels have HART enabled Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Isolation voltage	50V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Type tested at 1500V AC for 60 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	2 - on signal ports(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IF8H
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

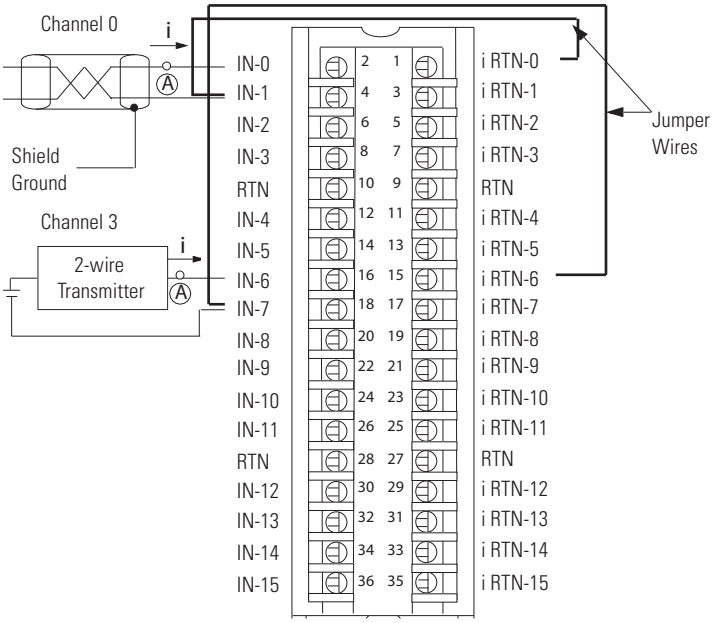
Certification(1)	1756-IF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR101622C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

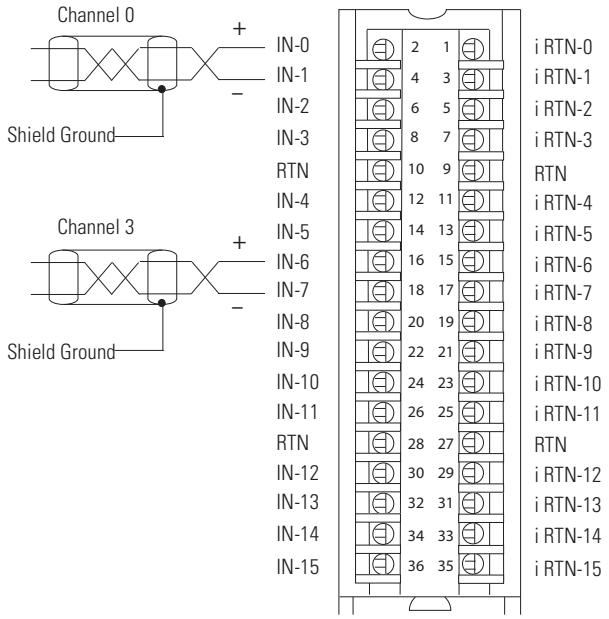
1756-IF16

ControlLogix voltage/current analog input module

1756-IF16 Differential Current



1756-IF16 Differential Voltage



- 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.
- Do not connect more than two wires to any single terminal.

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

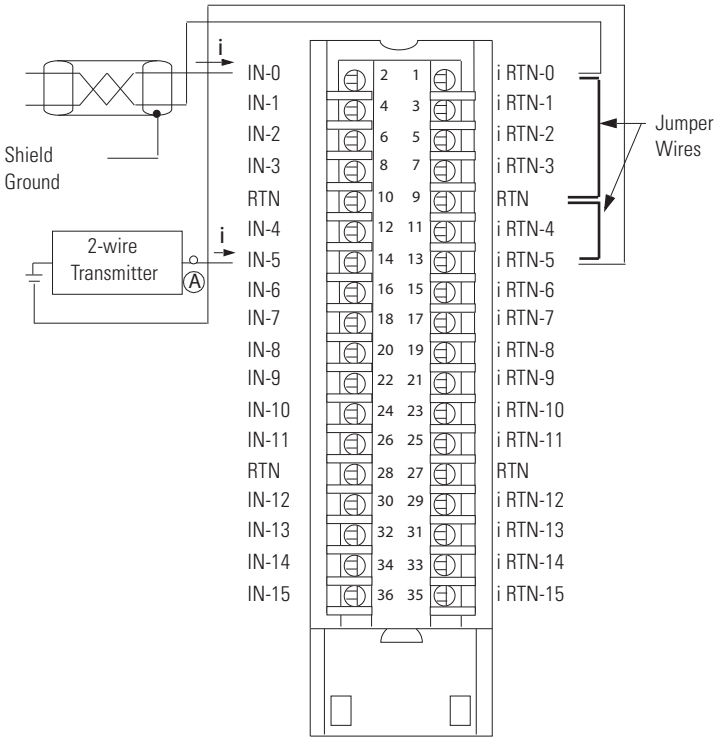
- Use this table when wiring your module in Differential mode.

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.
- Do not connect more than two wires to any single terminal.

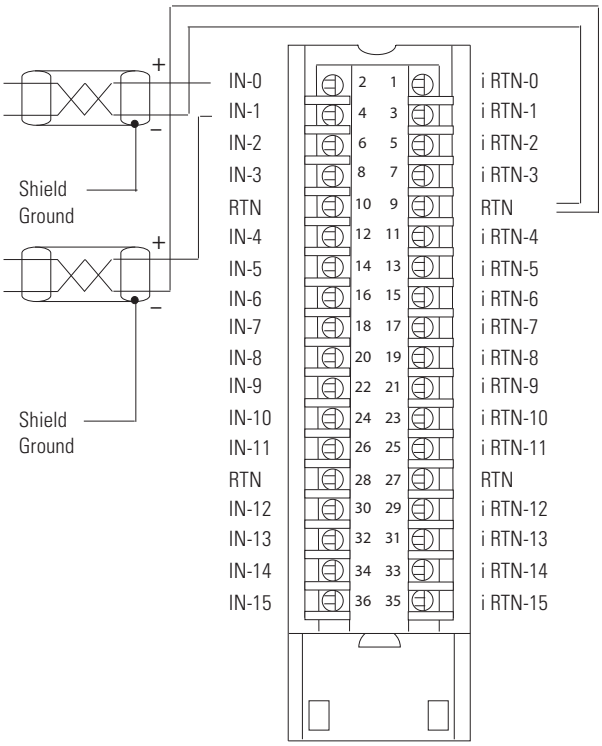
IMPORTANT: When operating in 4 channel, High Speed mode, only use channels 0, 2, 4, and 6.

1756-IF16 Single-ended Current

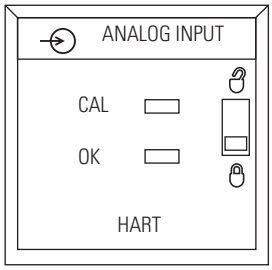


- All terminals marked RTN are connected internally.
- For current applications, all terminals marked i RTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-*x* and iRTN-*x* terminals.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.
- Do not connect more than two wires to any single terminal.

1756-IF16 Single-ended Voltage



- All terminals marked RTN are connected internally.
- Terminals marked i RTN are not used for single-ended voltage wiring.
- Do not connect more than two wires to any single terminal.



Attribute	1756-IF16
Inputs	16 single ended, 8 differential or 4 differential (high speed)
Input range	±10.25V 0…10.25V 0…5.125V 0…20.5 mA
Resolution	±10.25V (15 bits + sign bipolar) 0…10.25V (16 bits) 0…5.125V (16 bits) 0…20.5 mA (16 bits)
Current draw @ 5.1V	150 mA
Current draw @ 24V	65 mA
Power dissipation, max	Voltage: 2.3 W Current: 3.9 W

Attribute	1756-IF16
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 @ 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 Current: 20 ppm
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)
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane No isolation between individual inputs Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

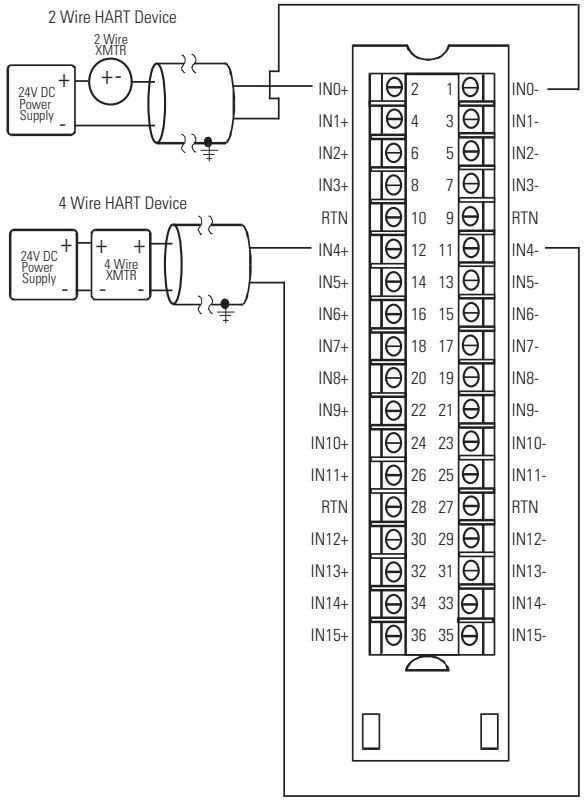
Attribute	1756-IF16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification(1)	1756-IF16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

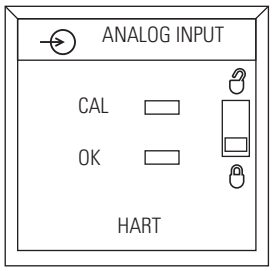
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IF16H

ControlLogix current analog input module with HART protocol



When a common supply is used you should tie the IN- to RTN.



Attribute	1756-IF16H
Inputs	16 differential, current
Input range	0…20 mA 4…20 mA
Resolution	16...21 bits
Current draw @ 5V	200 mA
Current draw @ 24V	125 mA
Power dissipation, max	6 W
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)
Repeatability	Better than 0.01% of range (15 and 20 Hz filters only)
Calibrated accuracy	Better than 0.13% of range (all filters)

Attribute	1756-IF16H
Calibration interval	12 months
Offset drift	27 μV/°C
Gain drift with temperature	11ppm/°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
Isolation voltage	50V (continuous), basic insulation type, inputs-to-backplane No isolation between individual inputs Type tested at 1500V DC for 60 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	2 - on signal ports(2)
North American temperature code	T5
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-IF16H
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

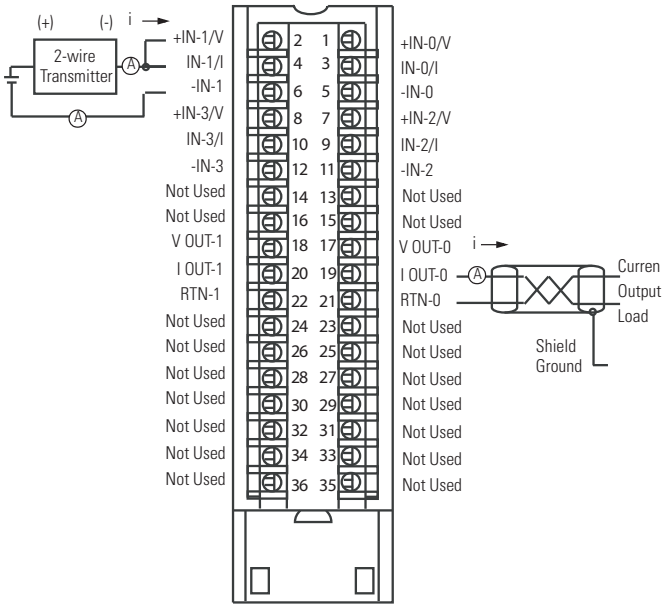
Certification(1)	1756-IF16H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X

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

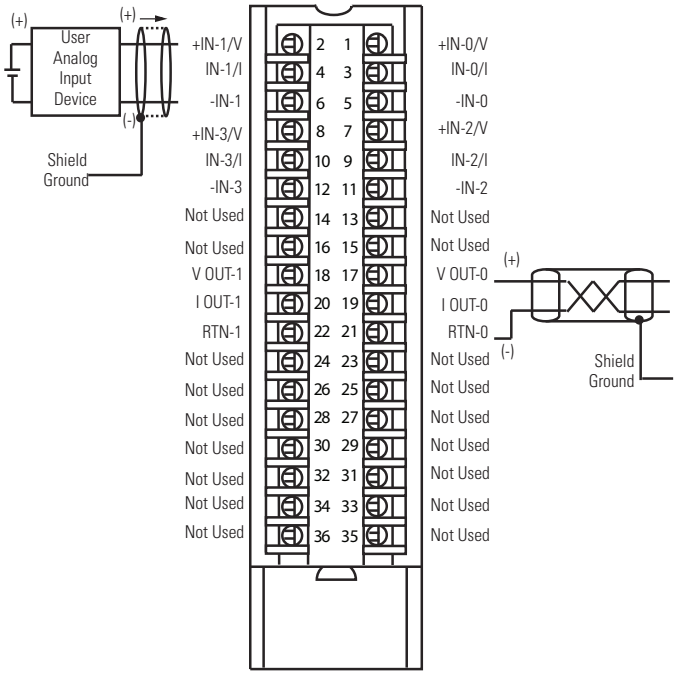
1756-IF4FXOF2F

ControlLogix high-speed input/output analog module

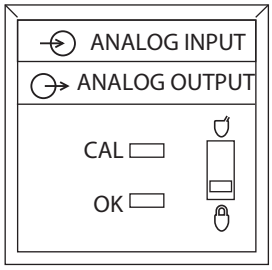
1756-IF4FXOF2F Current



1756-IF4FXOF2F Voltage



A = Inline field device (such as a strip chart recorder or meter)



Attribute	1756-IF4FXOF2
Inputs	4 high-speed, sub-millisecond, differential
Outputs	2 high-speed voltage or current
Current draw at 5.1V	375 mA
Current draw at 24V	100 mA
Power dissipation, max	Voltage: 4.3 W Current: 4.7 W
Thermal dissipation	Voltage: 14.66 BTU/hr Current: 16.02 BTU/hr
Isolation voltage	250V (continuous), basic insulation type, inputs and outputs to backplane No isolation between individual inputs or outputs Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	2(2)

Attribute	1756-IF4FXOF2
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	Inputs	Outputs
Number	4 high-speed, sub-millisecond, differential	2 high-speed voltage or current
Output range	± 10.5V 0…10.5V 0…5.25V 0…21 mA	± 10.4V 0…21 mA
Resolution	Approx. 14 bits across ±10V DC (21V total) ±10V: 1.3 mV/bit, 14-bit effective 0…10.5V: 1.3 mV/bit, 13-bit effective 0…5.25V: 1.3 mV/bit, 12-bit effective Approx. 12 bits across 21 mA 0…21 mA: 5.25 µA/bit	13 bits across 21 mA = 2.8 µA/bit 14 bits across 21.8V = 1.3 mV/bit
Impedance	Voltage: >1 MΩ Current: 249 Ω	—
Open circuit detection	Positive full-scale reading within 1 s	Current output only (Output must be set to >0.1 mA)
Overvoltage protection	Voltage: 30V DC Current: 8V AC/DC	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)	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: 35 ppm/°C max	Voltage: 25 ppm/°C max Current: 50 ppm/°C max
Module error	0.2% of range	Voltage: 0.2% of range Current: 0.3% of range
Module scan time	300 µs min(1)	

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

Attribute	1756-IF4FXOF2
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	60 °C (140 °F)
Temperature, storage 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)

Attribute	1756-IF4FXOF2
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

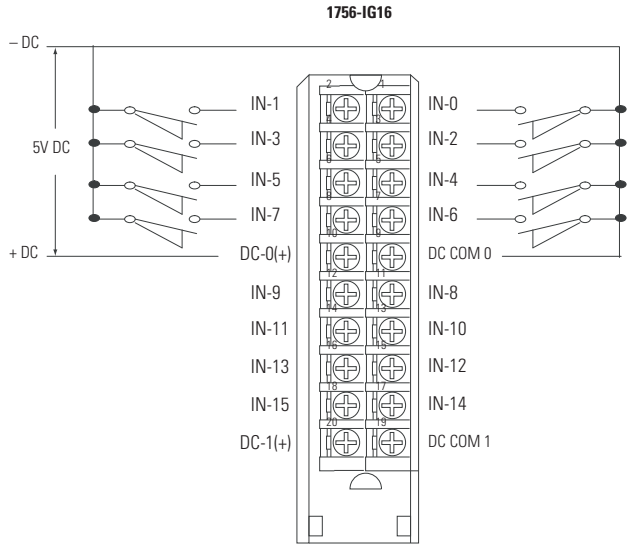
Certification(1)	1756-IF4FXOF2
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

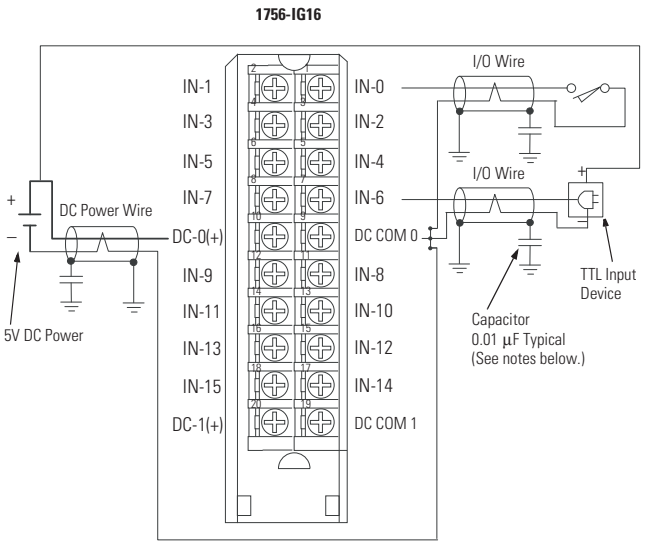
1756-IG16

ControlLogix TTL input module

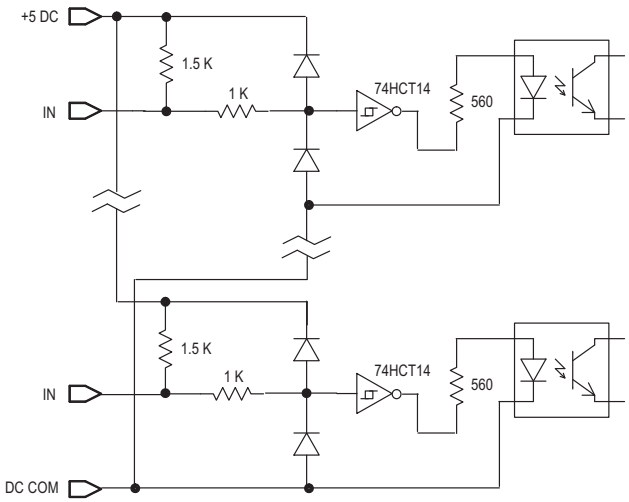
Standard Wiring



CE Compliant Wiring

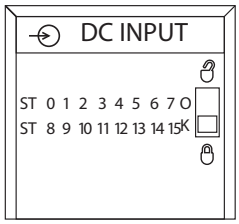


Simplified Schematic



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



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 OFF to ON (5-to-0V DC transition) ON to OFF (0-to-5V DC transition)	 Hardware delay: 270 µs nom/450 µs max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 390 µs nom/ 700 µs 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
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 kΩ min 1.5 kΩ typical
Input current, nom	3.7 mA @ 5V DC
Input current, max	4.1 mA @ 5V DC
Cyclic update time	200 µs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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[2]
Wire category	2[3]
North American temperature code	T5
IEC temperature code	T5
Enclosure type	None (open-style)

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

(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.

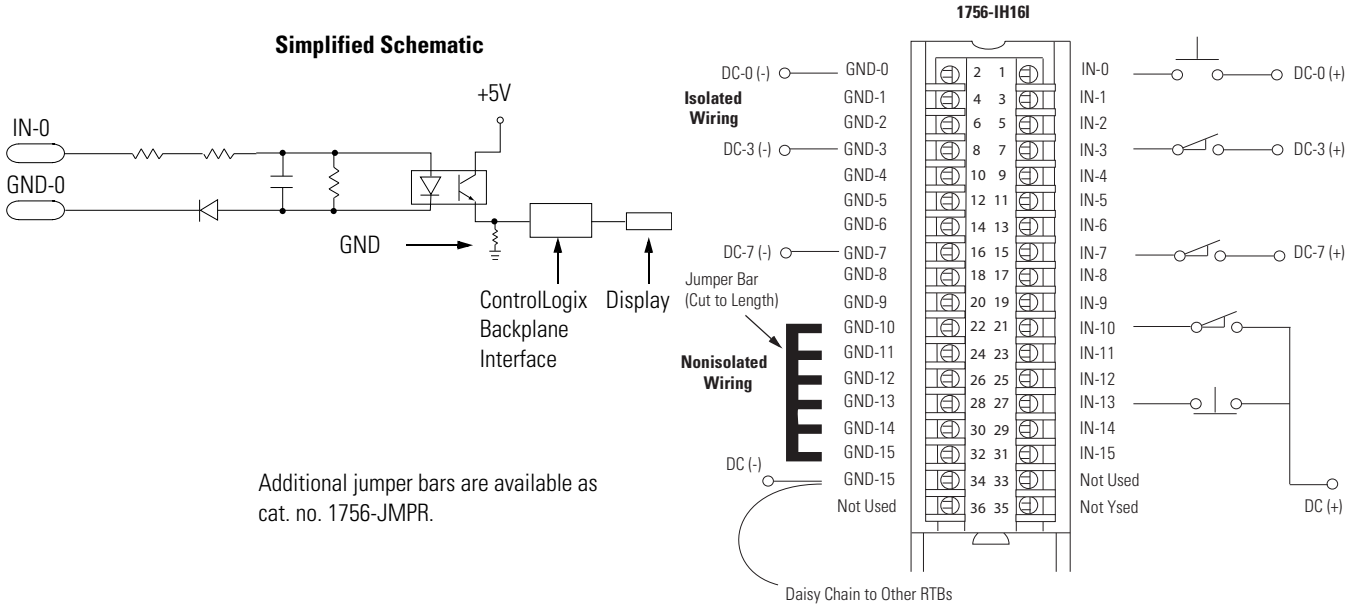
Attribute	1756-IG16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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
Conducted RF immunity IEC 61000-4-6	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

Certification(1)	1756-IG16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T5 X

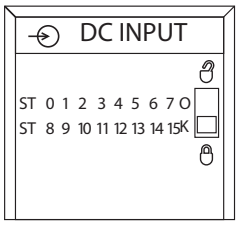
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IH16I

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



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



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 OFF to ON ON to OFF	 Hardware delay: 2 ms max + filter time User-selectable filter time: 0, 1, or 2 ms 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
Power dissipation, max	5 W @ 60 °C (140 °F)
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	20V DC
Off-state current, max	0.8 mA
On-state current, min	1 mA @ 90V DC
On-state current, max	3 mA @ 146V DC
On-state voltage Derated as follows	90...146V DC 90...146V DC @ 50 °C (122 °F), 12 Channels ON 90...132V DC @ 55 °C (131 °F), 14 Channels ON 90...125V DC @ 60 °C (140 °F), 16 Channels ON 90...146V DC @ 30 °C (86 °F), 16 Channels ON

Attribute	1756-IH16I
Inrush current, max	250 mA
Input impedance, max	48.67 kΩ @ 146V DC
Cyclic update time	200 μs...750 ms
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-IH16I
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

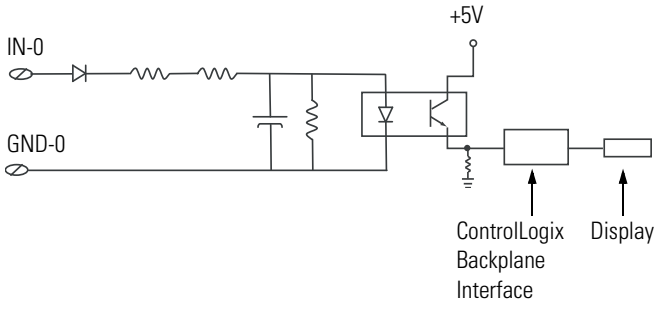
Certification[1]	1756-IH16I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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

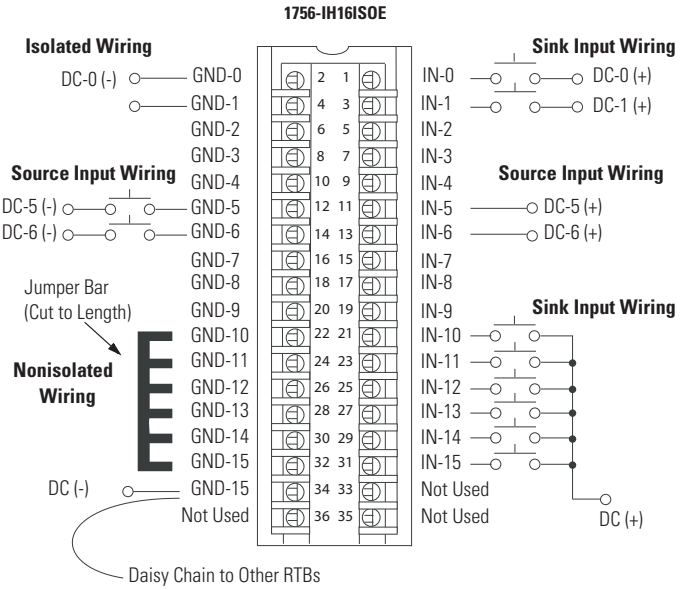
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IH16ISOE

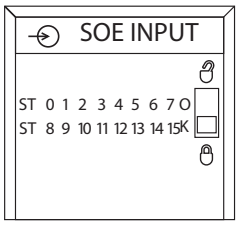
ControlLogix DC (90...140V) sequence of events input module

Simplified Schematic





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



Attribute	1756-IH16ISOE(1)
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 OFF to ON ON to OFF	 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) 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	275 mA§
Current draw @ 24V	2 mA
Power dissipation, max	5.5 W @ 60 °C (140 °F)
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 kΩ

Attribute	1756-IH16ISOE(1)
Cyclic update time	200 µs...750 ms
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s, inputs-to-backplane
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T3C
Enclosure type	None (open-style)

(1) If you use 1756-IB16ISOE or 1756-IH16ISOE modules in a remote rack, you must use a 1756-SYNCH SynchLink module to coordinate system time.

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

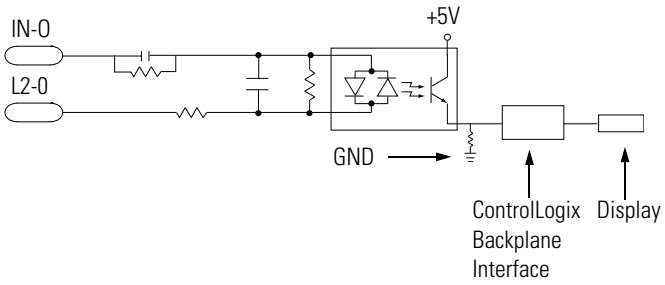
Certification[1]	**1756-IH16ISOE**
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

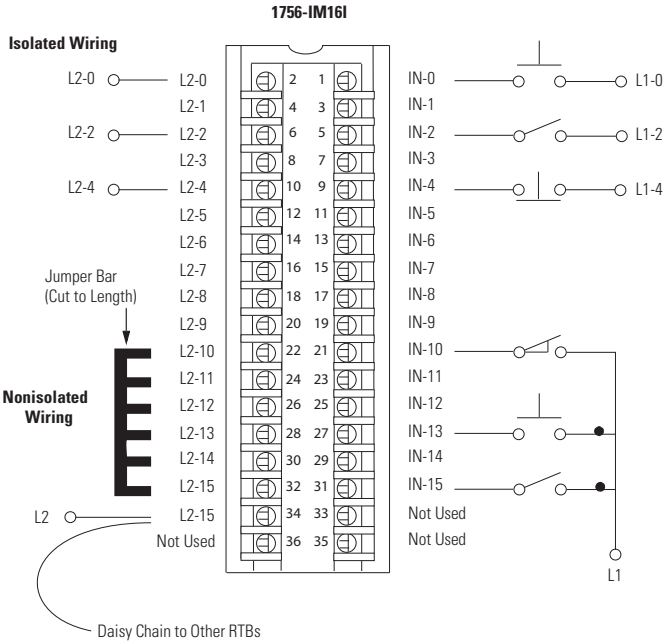
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IM16I

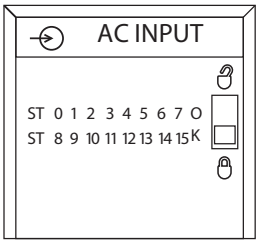
ControlLogix AC (159...265V) input module

Simplified Schematic





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



Attribute	1756-IM16I
Inputs	16 individually isolated
Voltage category	240V AC
Operating voltage range	159…265V AC, 47…63 Hz(1)
Input voltage, nom	240V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 or 2 ms 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
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	40V
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

Attribute	1756-IM16I
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 kΩ @ 265V AC, 60 Hz
Cyclic update time	200 μs...750 ms
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s
Removable terminal block housing	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-IM16I
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

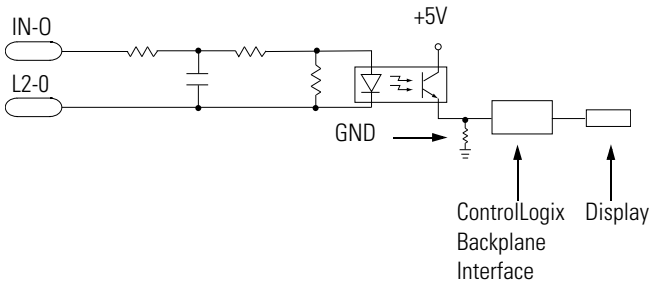
Certification[1]	1756-IM16I
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

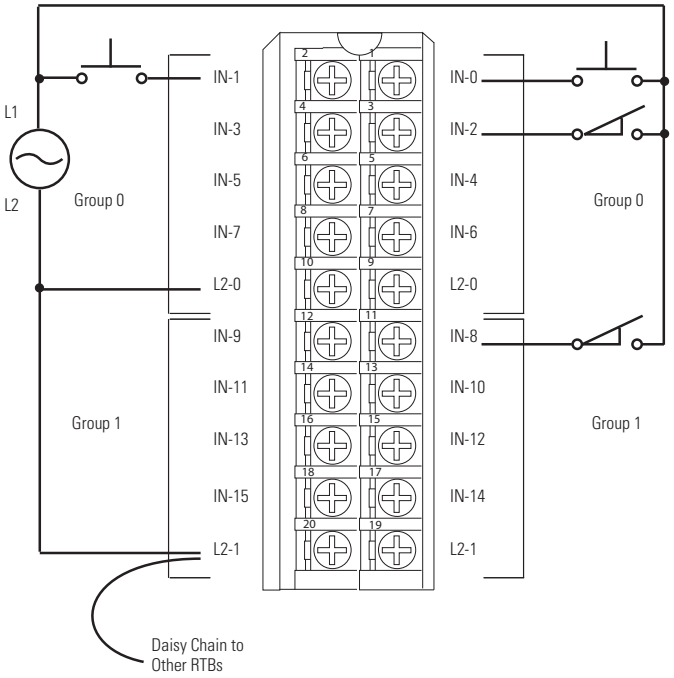
1756-IN16

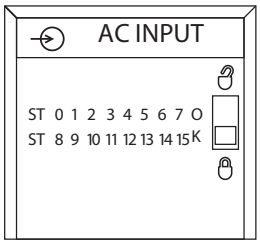
ControlLogix AC (10...30V) input module

Simplified Schematic



1756-IN16





Attribute	1756-IN16
Inputs	16 (8 points/group)
Voltage category	24V AC
Operating voltage range	10…30V AC, 47…63 Hz
Input voltage, nom	24V AC
Input delay time OFF to ON ON to OFF	 Hardware delay: 10 ms max + filter time User-selectable filter time: 0, 1, or 2 ms 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
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
Input impedance, max	2.5 kΩ @ 30V AC, 60 Hz

Attribute	1756-IN16
Cyclic update time	200 µs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

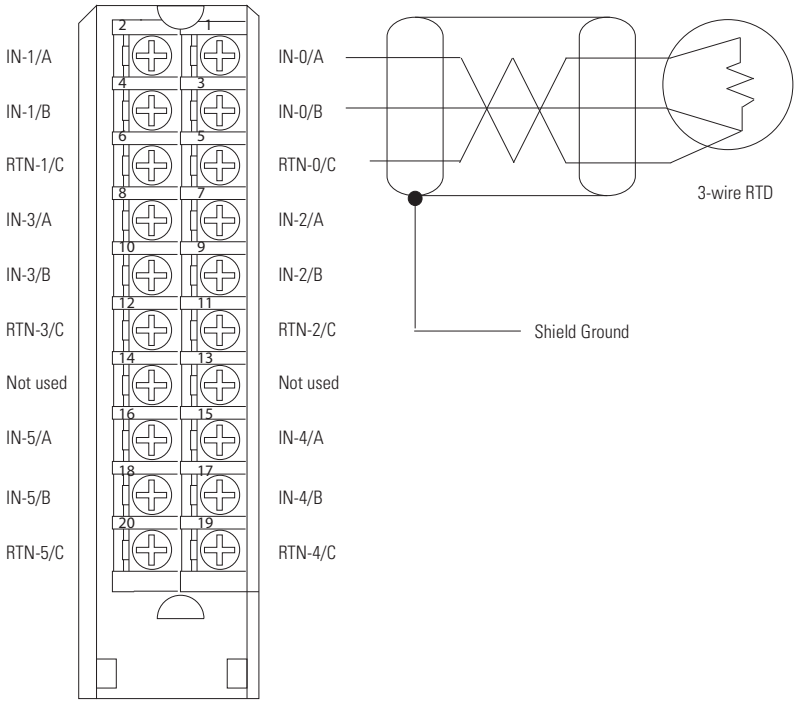
Certification[1]	1756-IN16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X
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

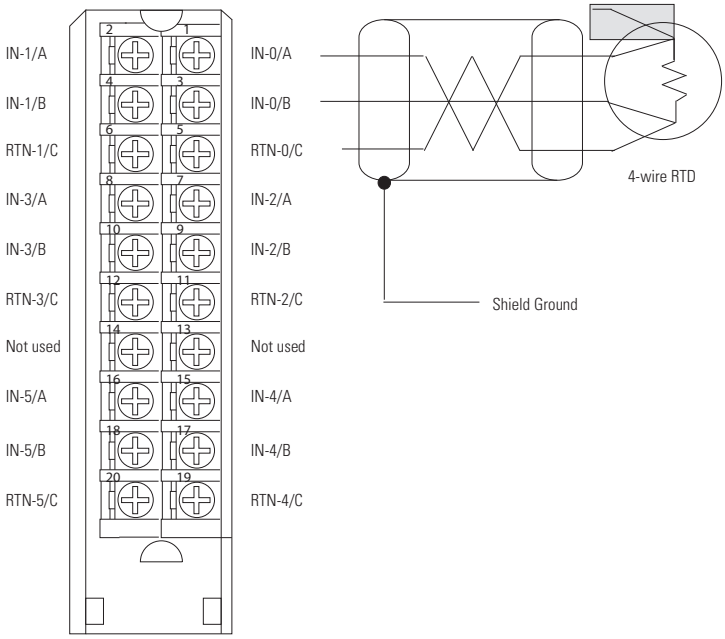
1756-IR6I 3-wire RTD



Do not connect more than two wires to any single terminal.

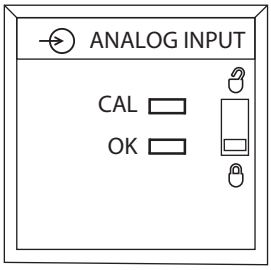
IMPORTANT: For 2-wire resistor applications including calibration, make sure IN-*x*/B and RTN-*x*/C are shorted together as shown.

1756-IR6I 4-wire RTD



- Do not connect more than two wires to any single terminal.
- Wiring is exactly the same as the 3-wire RTD with one wire left open.

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



Attribute	1756-IR6I
Inputs	6 individually isolated RTD
Input range	1…487 Ω 2…1000 Ω 4…2000 Ω 8…4020 Ω
Resolution	16 bits 1…487 Ω: 7.7 mΩ/bit 2…1000 Ω:15 mΩ/bit 4…2000 Ω:30 mΩ/bit 8…4020 Ω:60 mΩ/bit

Attribute	1756-IR6I
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
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 MΩ/°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)
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

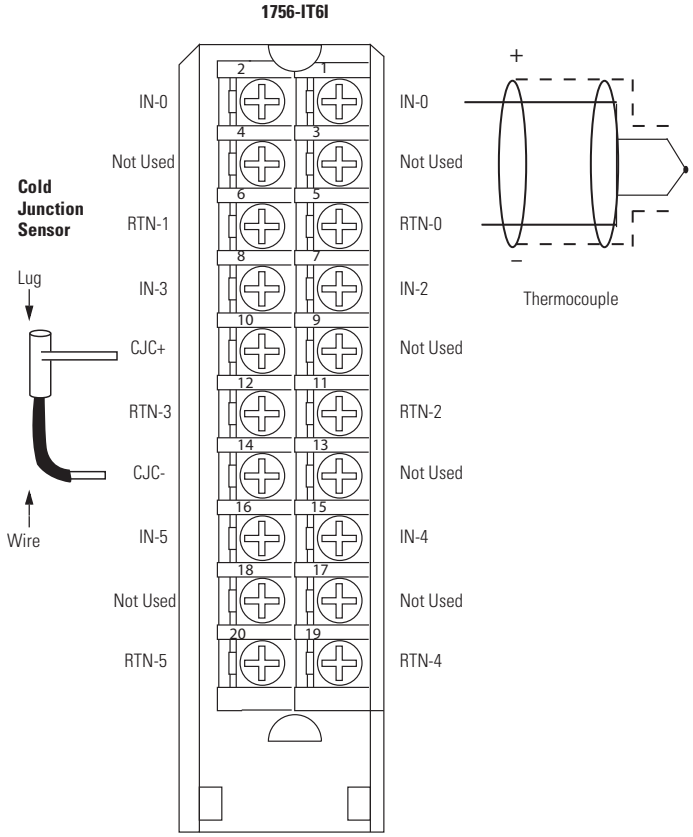
Attribute	1756-IR6I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification[1]	1756-IR6I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

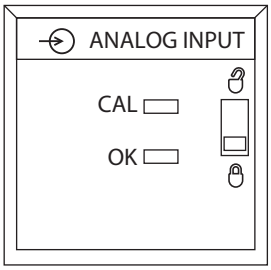
1756-IT6I

ControlLogix temperature sensing analog input module



- Do not connect more than two wires to any single terminal.
- One CJC, part number 94238301, is shipped with the module. A replacement can be ordered as RP-94238301.

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



Attribute	1756-IT6I
Inputs	6 individually isolated thermocouple 1 CJC
Input range	-12…78 mV -12…30 mV
Resolution	16 bits -12...78 mV: 1.4 μV/bit -12...30 mV: 0.7 μV/bit

Attribute	1756-IT6I
Thermocouples	B, E, J, K, R, S, T, N, C
Current draw @ 5.1V	250 mA
Current draw @ 24V	125 mA
Power dissipation, max	4.3 W
Thermal dissipation	14.66 BTU/hr
Input impedance	>10 MΩ
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	±0.3…3.2 °C, depending on channel
Remote CJC sensor accuracy	±0.3 °C
Offset drift	0.5 μV/°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)
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

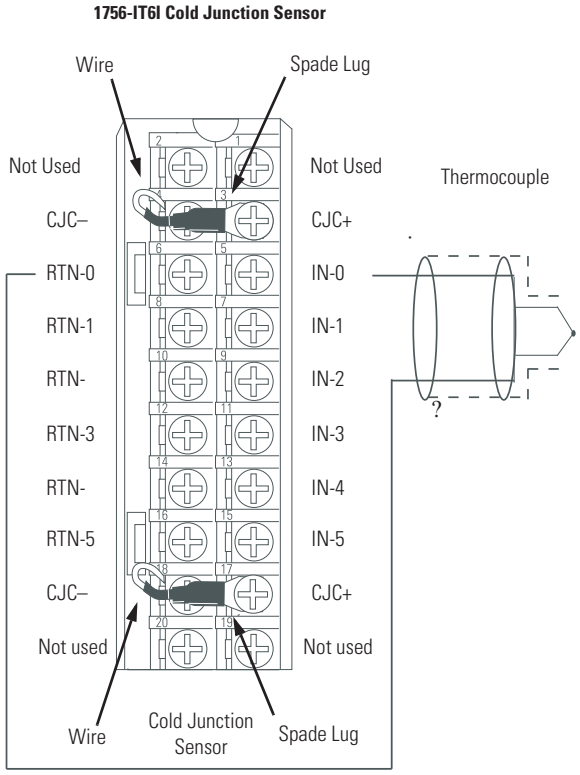
Attribute	1756-IT6I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification(1)	1756-IT6I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

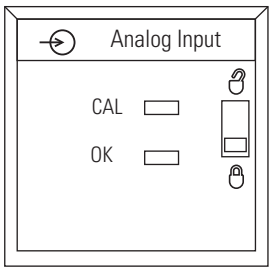
1756-IT6I2

ControlLogix enhanced thermocouple analog input module



- Do not connect more than two wires to any single terminal.
- Two CJCs, part number 94286501, are shipped with the module. Replacements can be ordered as RP-94286501.

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



Attribute	1756-IT6I2
Inputs	6 individually isolated thermocouple 2 CJC
Input range	-12…78 mV (1.4 μV per bit) -12…30 mV (0.7 μV per bit – high resolution range)
Resolution	16 bits -12...78 mV: 1.4 μV/bit -12...30 mV: 0.7 μV/bit
Thermocouples	B, E, J, K, R, S, T, N, C, D, L (TXK/XK)

Attribute	1756-IT6I2
Current draw @ 5.1V	200 mA
Current draw @ 24V	150 mA
Power dissipation, max	4.6 W
Thermal dissipation	15.7 BTU/hr
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	Better than 0.1% of range
Calibration interval	12 months
Local CJC sensor accuracy	±0.3 °C
Remote CJC sensor accuracy	±0.3 °C
Offset drift	0.5 µV/°C
Gain drift with temperature, nom	15 ppm/°C 1.4 µV/°C for -12…78 mV 0.6 µV/°C for -12…30 mV
Gain drift with temperature, max	25 ppm/°C 2.3 µV/°C for -12…78 mV 1.1 µV/°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)
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	2(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

(1) Notch filter dependent.

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

(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.

Attribute	1756-IT6I2
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

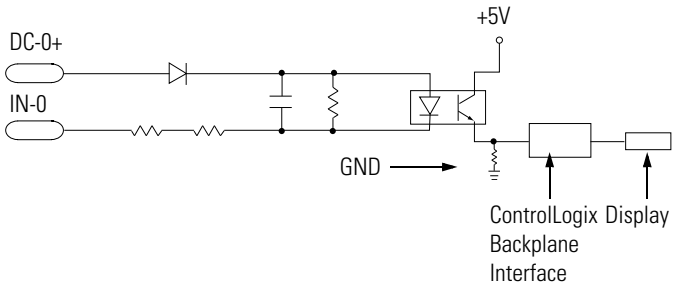
Certification(1)	1756-IT6I2
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

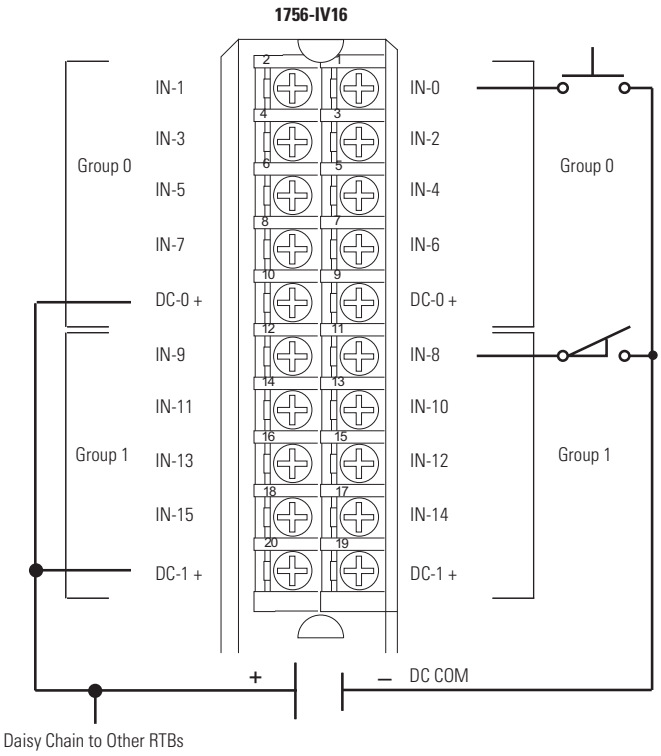
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

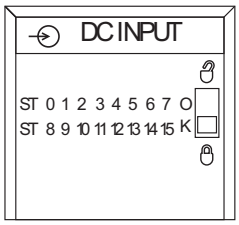
1756-IV16

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

Simplified Schematic







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 OFF to ON ON to OFF	 Hardware delay: 280 µs nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 540 µs nom/2 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	110 mA
Current draw @ 24V	2 mA
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
Inrush current, max	250 mA

Attribute	1756-IV16
Input impedance, max	3.2 kΩ @ 30V DC
Cyclic update time	200 μs...750 ms
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
Removable terminal block housing	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

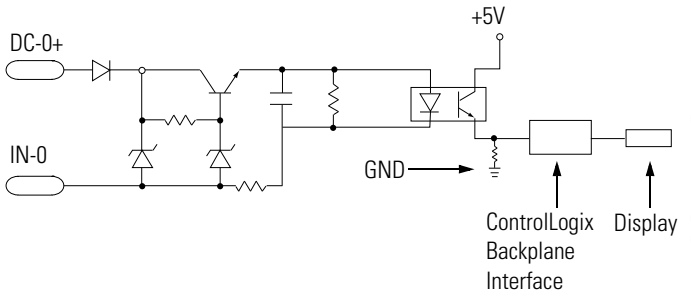
Certification[1]	1756-IV16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

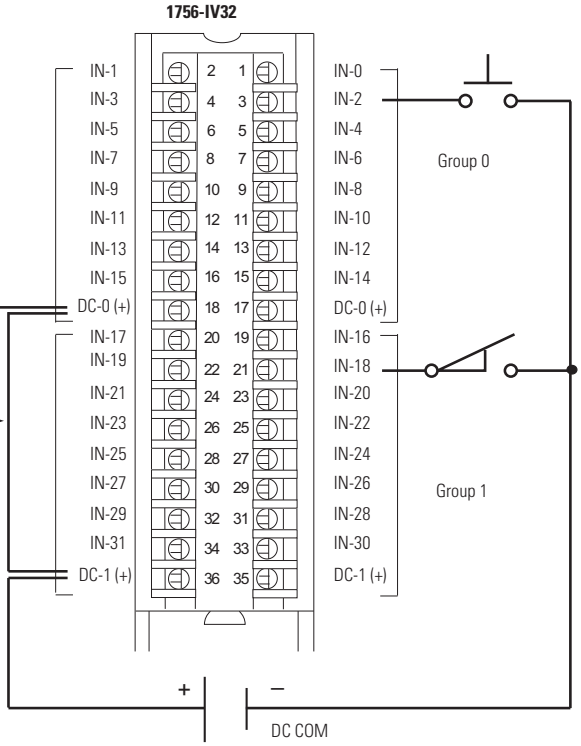
1756-IV32

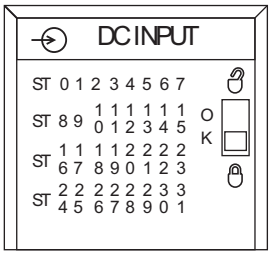
ControlLogix DC (10...30V) sourcing input module

Simplified Schematic



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 OFF to ON ON to OFF	 Hardware delay: 350 µs nom/1 ms max + filter time User-selectable filter time: 0, 1, or 2 ms Hardware delay: 540 µs nom/2 ms max + filter time User-selectable filter time: 0, 1, 2, 9, or 18 ms
Current draw @ 5.1V	120 mA
Current draw @ 24V	2 mA
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
On-state current, max	3.5 mA
Inrush current, max	250 mA (decaying to <37% in 22 ms, without activation)
Input impedance, max	8.6 kΩ @ 30V DC

Attribute	1756-IV32
Cyclic update time	200 µs...750 ms
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1 - on signal ports(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

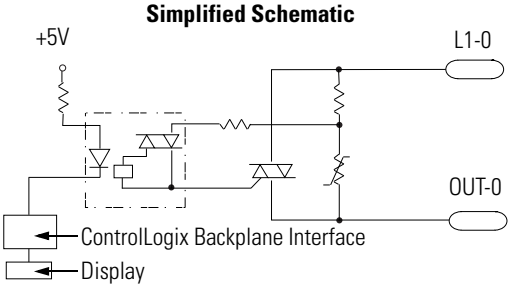
Certification[1]	1756-IV32
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

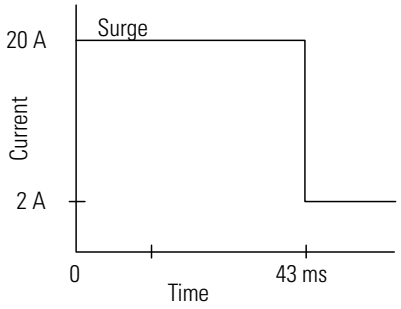
1756-OA8

ControlLogix AC (74...265V) output module

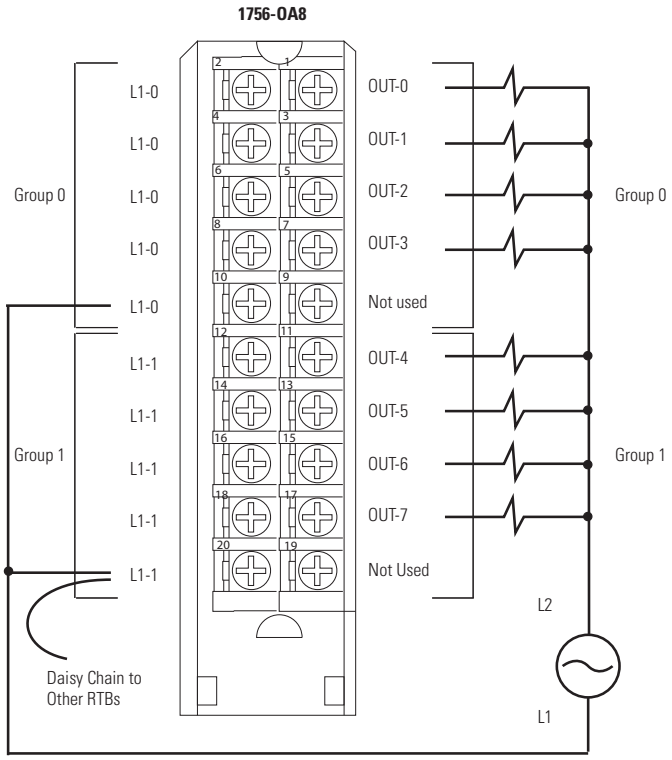
Simplified Schematic

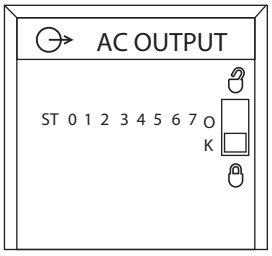


Surge Current Chart



1756-OA8





Attribute	1756-OA8
Outputs	8 (4 points/group)
Voltage category	120/240V AC
Operating voltage range	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
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

Attribute	1756-OA8
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(1)
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4A
Enclosure type	None (open style)

(1) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ms for loads under 50 mA. The commutating dv/dt rating of the module for loads 50…500 mA (OUTPUT to L2) is 4V/ms 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.

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

(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.

Attribute	1756-OA8
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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

Attribute	1756-OA8
Emissions	CISPR 11: Group 1, 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

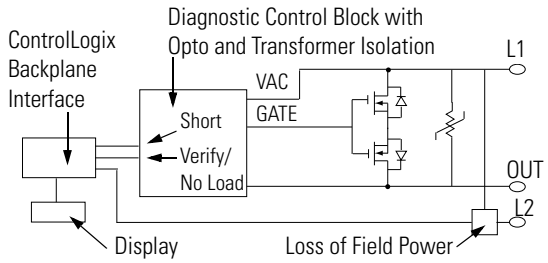
Certification[1]	1756-OA8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

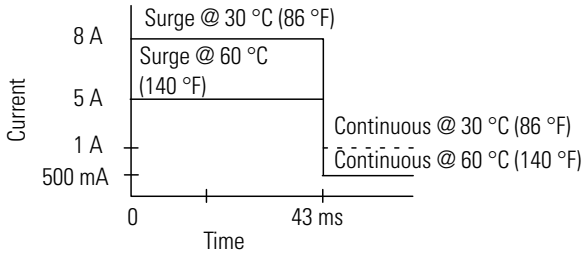
1756-OA8D

ControlLogix AC (74...132V) diagnostic output module

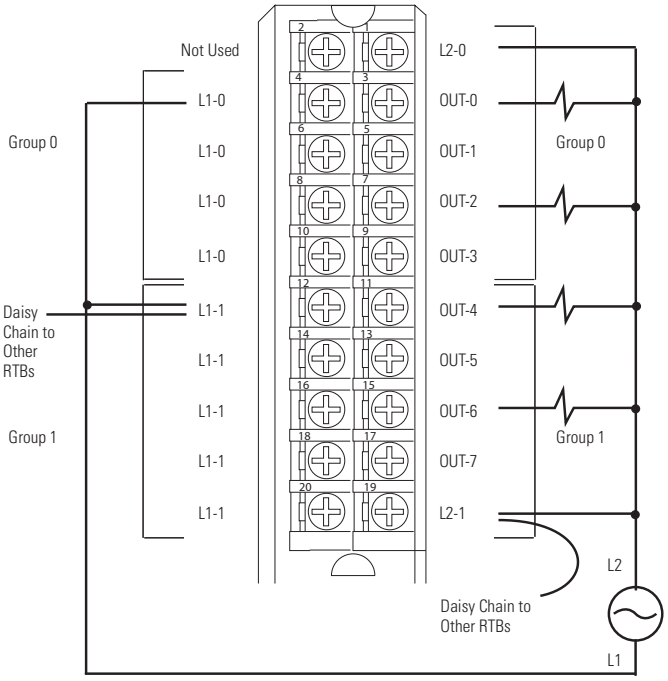
Simplified Schematic



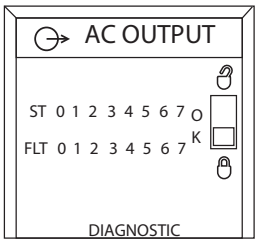
Surge Current Chart



1756-OA8D



Attribute	1756-OA8D
Short trip, min	12 A for 500 μs
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	±1 ms



Attribute	1756-OA8D
Outputs	8 diagnostic, electronic fusing (4 points/group)
Voltage category	120V AC
Operating voltage range	74…132V AC 47…63 Hz

Attribute	1756-OA8D
Output delay time OFF to ON ON to OFF	 9.3 ms @ 60 Hz 11 ms @ 50 Hz 9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	175 mA
Current draw @ 24V	250 mA
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open style)

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

(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.

Attribute	1756-OA8D
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	60 °C (140 °F)
Temperature, storage 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)

Attribute	1756-OA8D
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

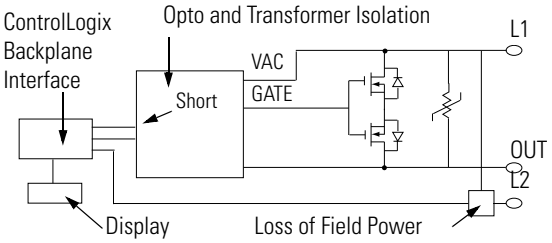
Certification(1)	1756-OA8D
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

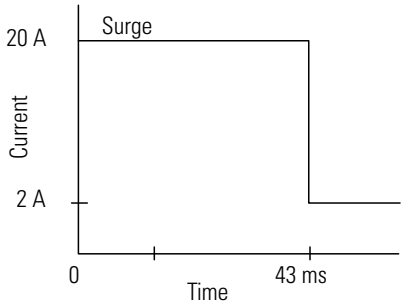
1756-OA8E

ControlLogix AC (74...132V) electronically-fused output module

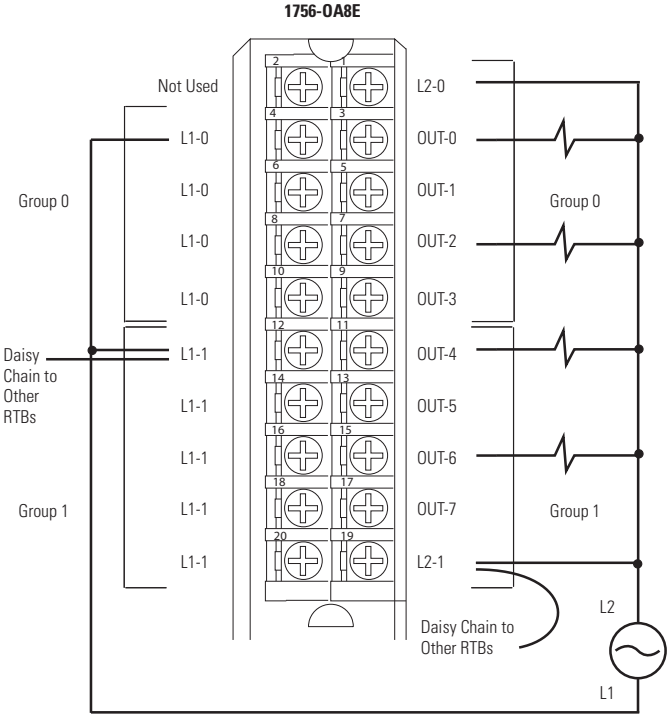
Simplified Schematic



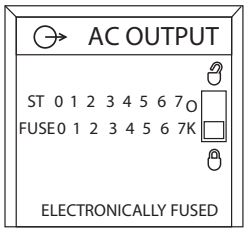
Surge Current Chart



1756-OA8E



Attribute	1756-OA8E
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



Attribute	1756-OA8E
Outputs	8 electronic fusing (4 points/group)
Voltage category	120V AC
Operating voltage range	74…132V AC 47…63 Hz
Output delay time OFF to ON ON to OFF	 9.3 ms @ 60 Hz 11 ms @ 50 Hz 9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	200 mA
Current draw @ 24V	250 mA
Power dissipation, max	5.5 W @ 60 °C (140 °F)

Attribute	1756-OA8E
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open style)

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

(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.

Attribute	1756-OA8E
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-OA8E
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

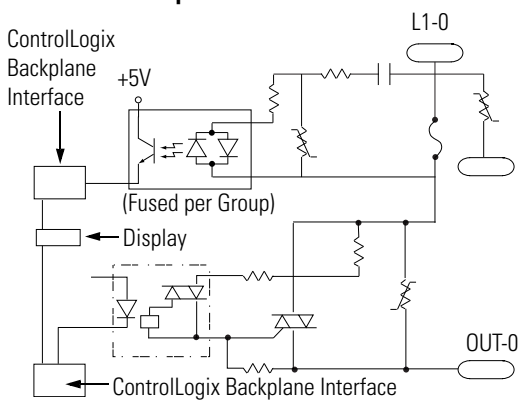
Certification[1]	1756-OA8E
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

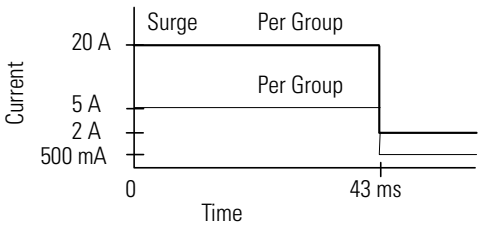
1756-OA16

ControlLogix AC (74...265V) output module

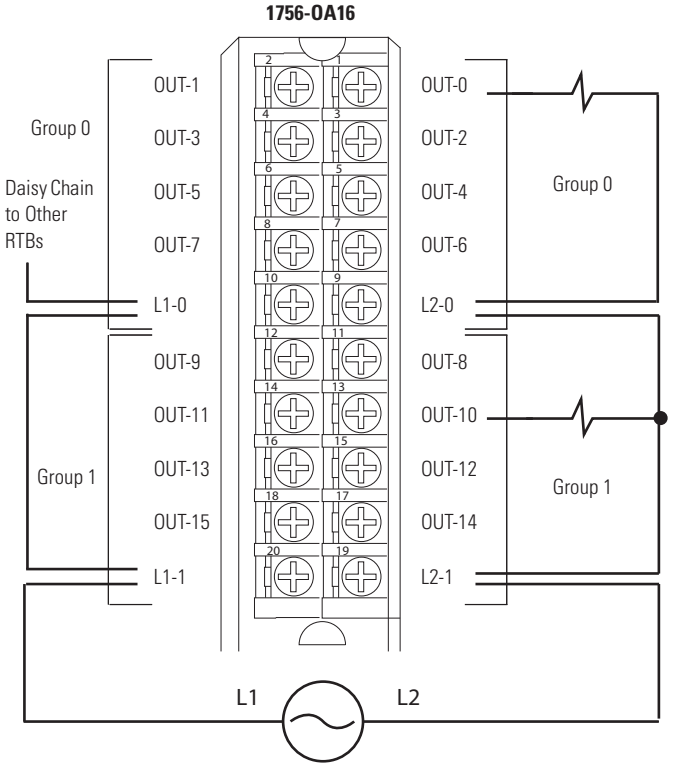
Simplified Schematic



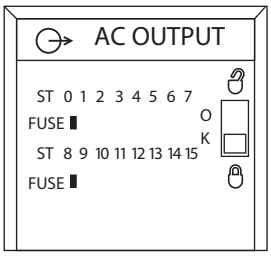
Surge Current Chart



1756-OA16



Attribute	1756-OA16
Time stamp of diagnostics	±1 ms
Fuse blown	1 fuse and indicator/group



Attribute	1756-OA16
Outputs	16 mechanically fused/group (8 points/group)
Voltage category	120/240V AC
Operating voltage range	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

Attribute	1756-OA16
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(1)
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
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
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4
Enclosure type	None (open style)

(1) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ms for loads under 50 mA. The commutating dv/dt rating of the module for loads 50…500 mA (OUTPUT to L2) is 4V/ms 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 ross 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.

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

(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.

Attribute	1756-OA16
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

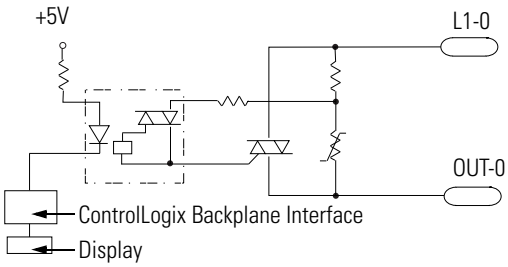
Certification(1)	1756-OA16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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

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

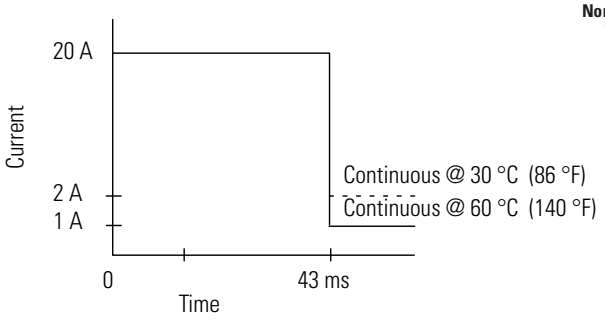
1756-OA16I

ControlLogix AC (74...265V) isolated output module

Simplified Schematic

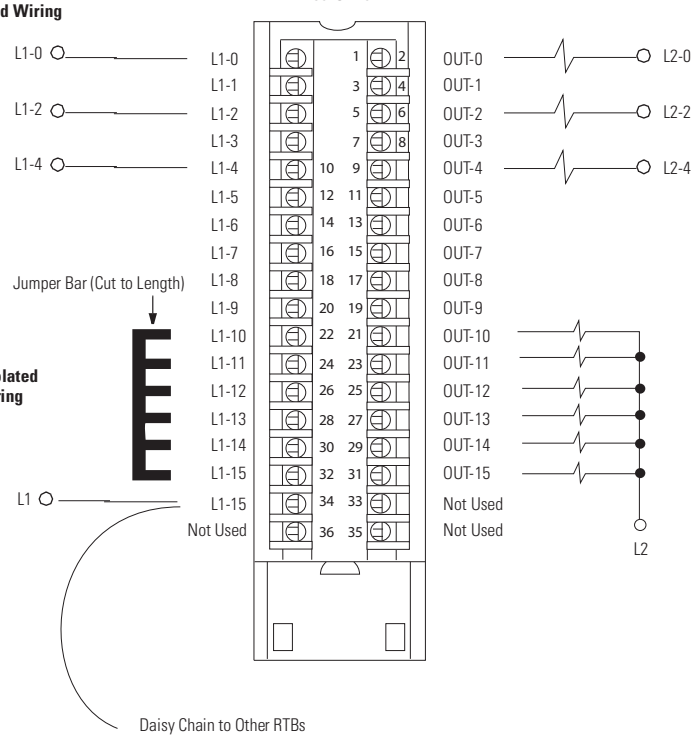


Surge Current Chart

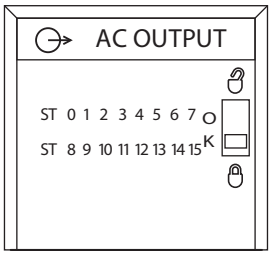


1756-OA16I

Isolated Wiring



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



Attribute	1756-OA16I
Outputs	16 individually isolated
Voltage category	120/240V AC
Operating voltage range	74…265V AC 47…63 Hz
Output delay time OFF to ON ON to OFF	 9.3 ms @ 60 Hz 11 ms @ 50 Hz 9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	300 mA
Current draw @ 24V	2.5 mA
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	18.76 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ load current < 50 mA

Attribute	1756-OA16I
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(1)
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4A
Enclosure type	None (open style)

(1) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ms for loads under 50 mA. The commutating dv/dt rating of the module for loads 50…500 mA (OUTPUT to L2) is 4V/ms 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 ross 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.

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

(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.

Attribute	1756-OA16I
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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

Attribute	1756-OA16I
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

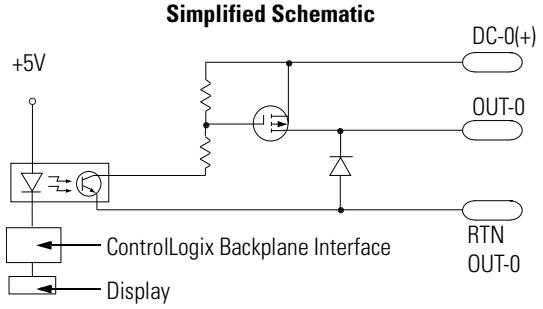
Certification[1]	1756-OA16I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

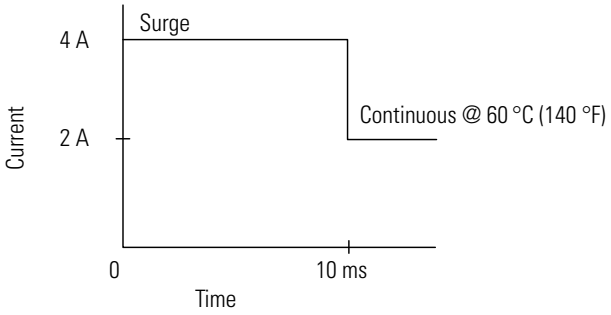
1756-OB8

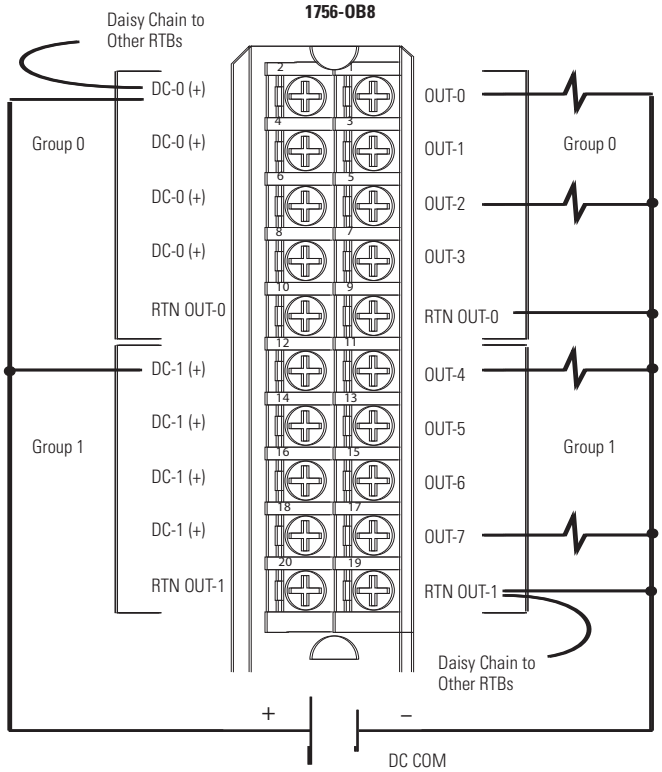
ControlLogix DC (10...30V) output module

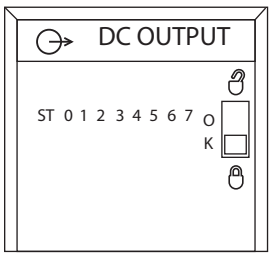
Simplified Schematic



Surge Current Chart







Attribute	1756-OB8
Outputs	8 electronically fused, individually isolated
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time OFF to ON ON to OFF	 1 ms max 2 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	2 mA
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 @ 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 per point, repeatable every 2 s
Load current, min	3 mA per point

Attribute	1756-OB8
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

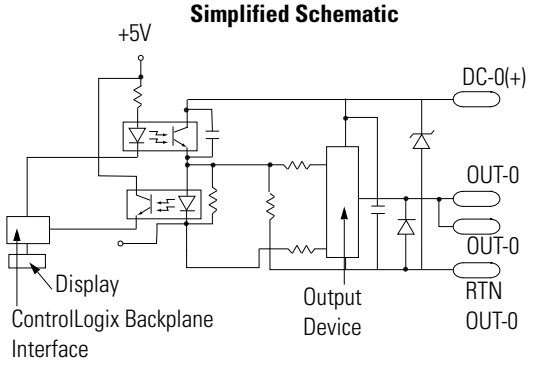
Certification[1]	1756-OB8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

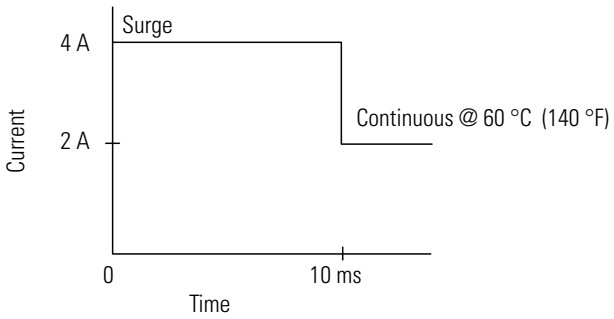
1756-OB8EI

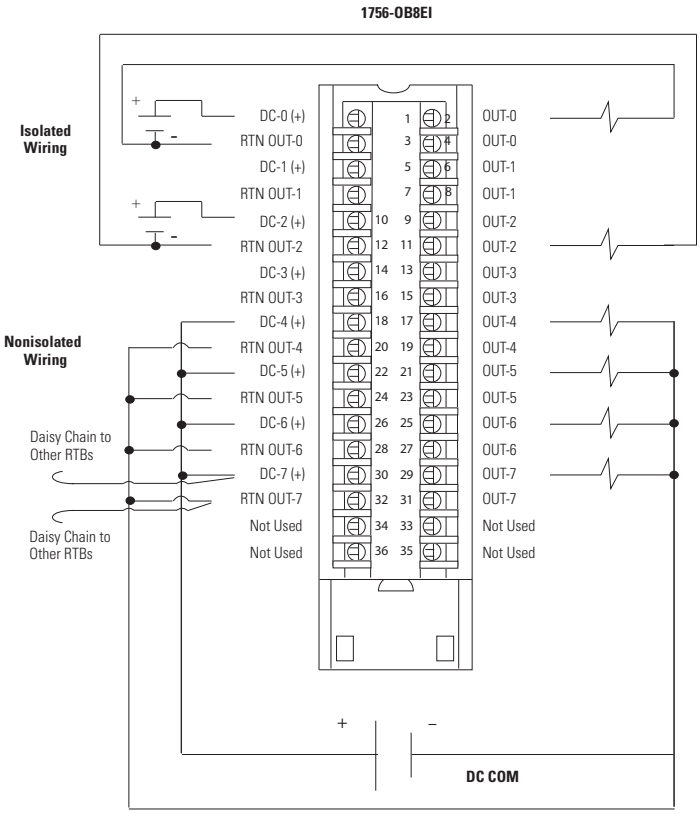
ControlLogix DC (10...30V) electronically-fused, isolated output module

Simplified Schematic

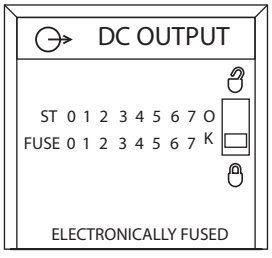


Surge Current Chart





Attribute	1756-OB8EI
Short trip	> 4.5 A for 500 μs max (output on, then short) > 4.5 A for 1.5 ms max (output on into short)
Timestamp of diagnostics	±1 ms



Attribute	1756-OB8EI
Outputs	8 individually isolated
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time OFF to ON ON to OFF	 1 ms max 5 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Power dissipation, max	4.7 W @ 60 °C (140 °F)
Thermal dissipation	16.03 BTU/hr

Attribute	1756-OB8EI
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	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 1 s @ 60 °C (140 °F)
Load current, min	2 mA
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-OB8EI
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

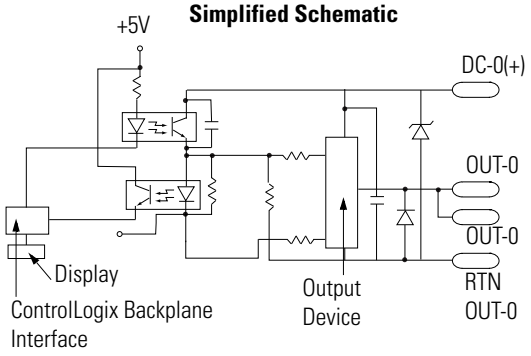
Certification(1)	1756-OB8EI
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

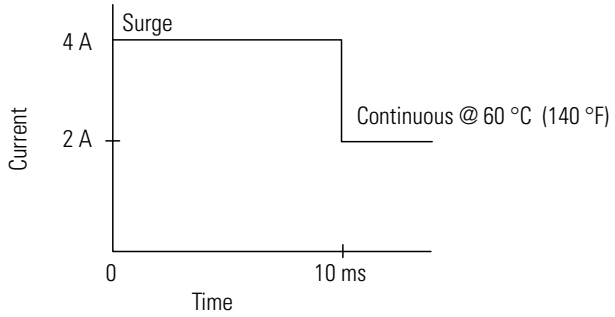
1756-OB8I

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

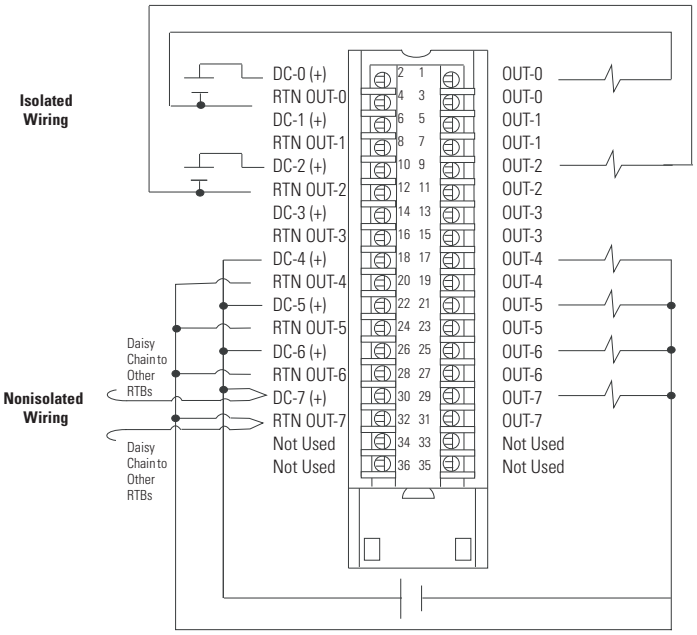
Simplified Schematic

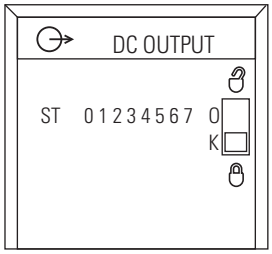


Surge Current Chart



1756-OBI





Attribute	1756-OB8I
Outputs	8 individually isolated
Voltage category	12/24V DC source
Operating voltage range	10...30V DC
Output delay time OFF to ON ON to OFF	 1 ms max 2 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Power dissipation, max	4.6W @ 60 °C (140 °F)
Thermal dissipation	15.70 BTU/hr
Off-state leakage current, max	0.5 mA per point
On-state voltage drop, max	0.5V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	16 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms each, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA

Attribute	1756-OB8I
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OB8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

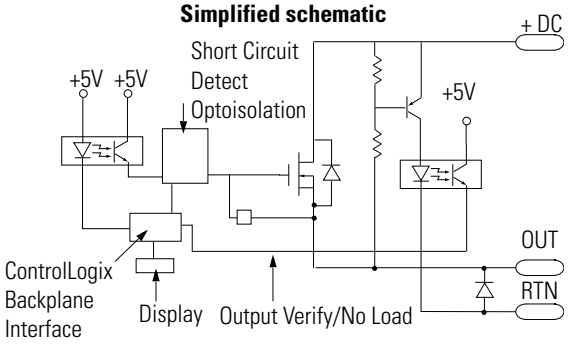
Certification[1]	1756-OB8I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

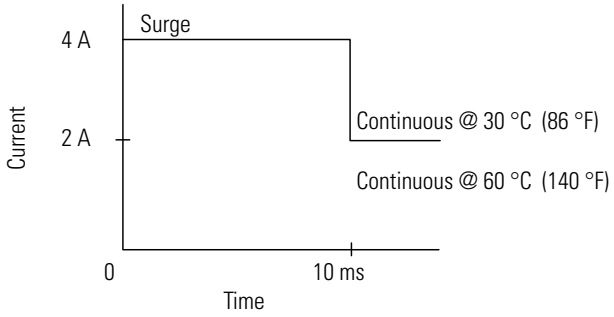
1756-OB16D

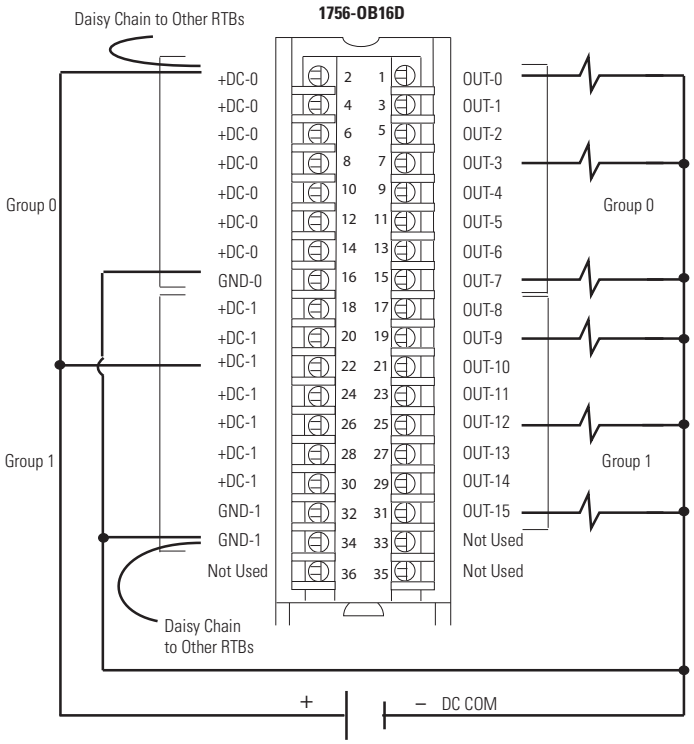
ControlLogix DC (19.2...30V) diagnostic output module

Simplified schematic

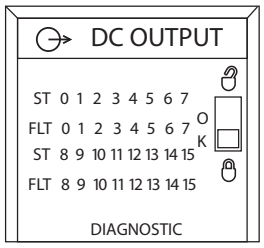


Surge Current Chart





Attribute	1756-OB16D
Short trip	8 A for 180 ms 10 A for 120 ms
No load	Off-state detection only
Output verification	On-state detection only
Pulse test	Configurable maximum pulse width
Time stamp of diagnostics	±1 ms



Attribute	1756-OB16D
Outputs	16 diagnostic (8 points/group)
Voltage category	24V DC source
Operating voltage range	19.2...30V DC
Output delay time OFF to ON ON to OFF	 60 µs nom/1 ms max 630 µs nom/5 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	140 mA

Attribute	1756-OB16D
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
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-OB16D
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

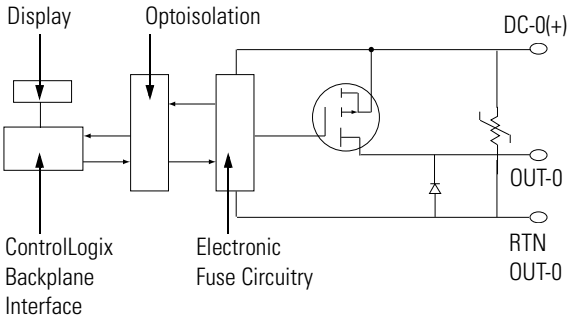
Certification[1]	1756-OB16D
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

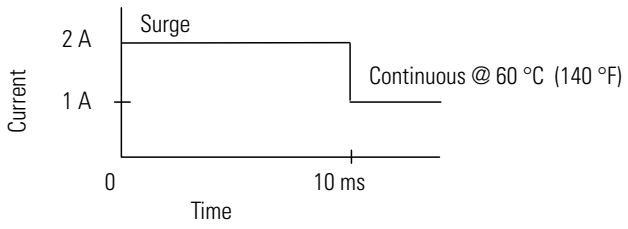
1756-OB16E

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

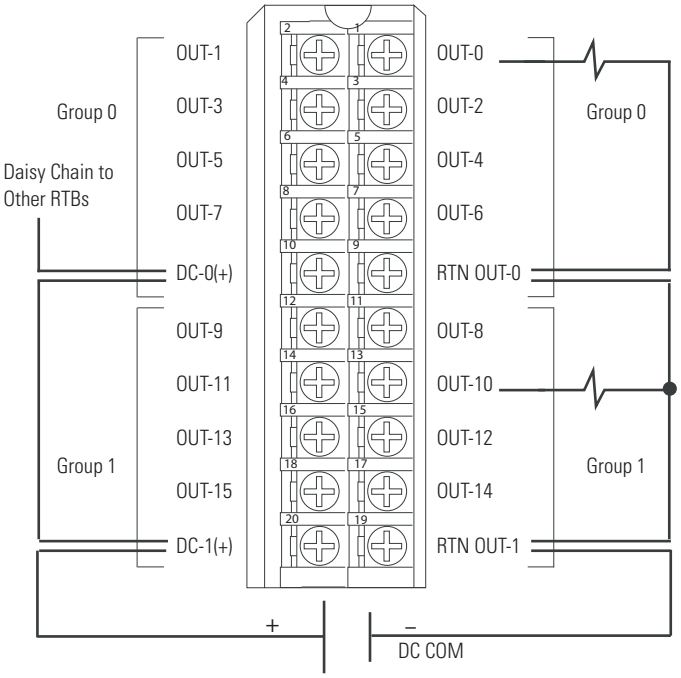
Simplified Schematic

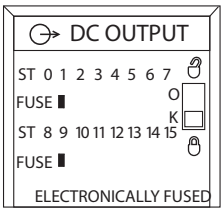


Surge Current Chart



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 ON to OFF	 70 µs nom/1 ms max 360 µs nom/1 ms max
Current draw @ 5.1V	250 mA
Current draw @ 24V	2 mA
Power dissipation, max	4.1 W @ 60 °C (140 °F)
Thermal dissipation	13.98 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	400 mV DC @ 1 A
Current per point, max	1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	2 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	3 mA per point

Attribute	1756-OB16E
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

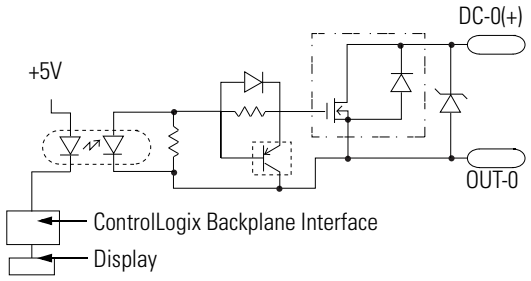
Certification[1]	**1756-OB16E**
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

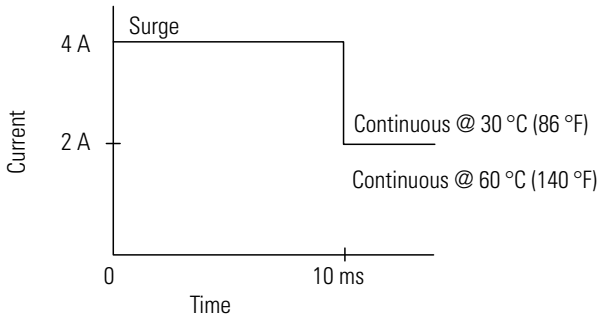
1756-OB16I

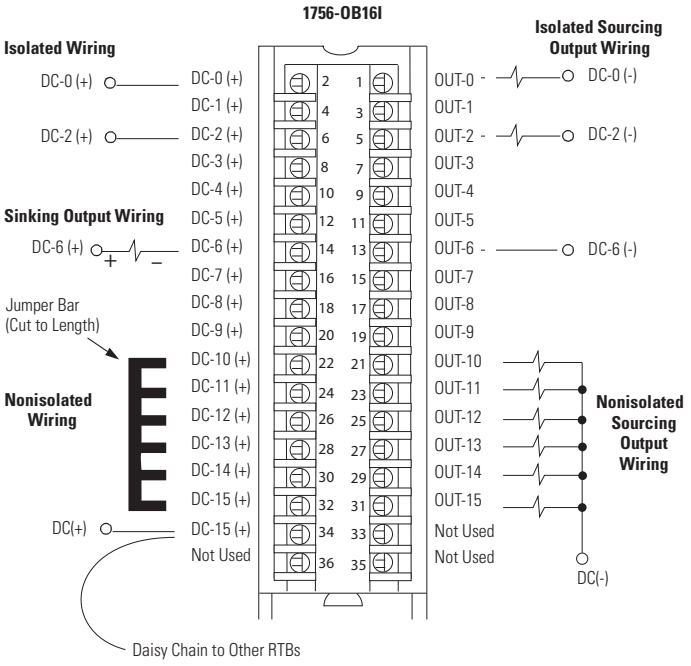
ControlLogix DC (10...30V) isolated output module

Simplified Schematic

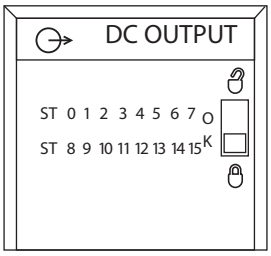


Surge Current Chart





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



Attribute	1756-OB16I
Outputs	16 individually isolated
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Output delay time OFF to ON ON to OFF	 1 ms max 2 ms max
Current draw @ 5.1V	350 mA
Current draw @ 24V	2.5 mA
Power dissipation, max	3.6 W @ 60 °C (140 °F)
Thermal dissipation	12.28 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) 1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 30 °C (86 °F) 4 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point

Attribute	1756-OB16I
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

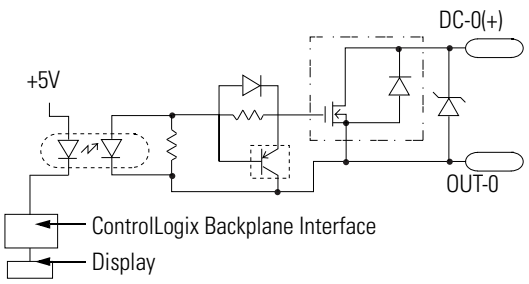
Certification[1]	1756-OB16I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

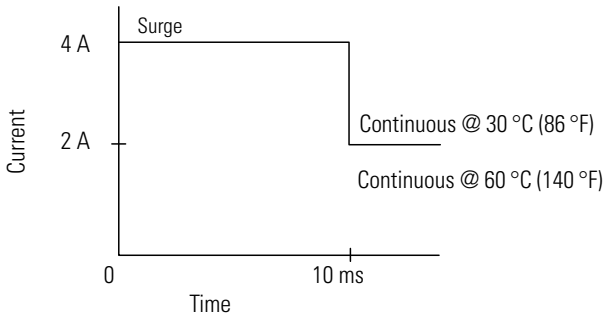
1756-OB16IS

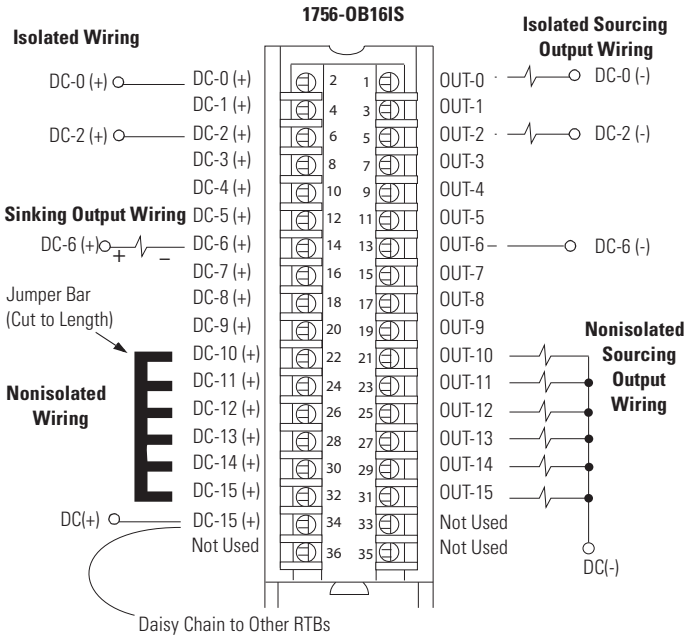
ControlLogix DC (10...30V) scheduled, isolated output module

Simplified Schematic

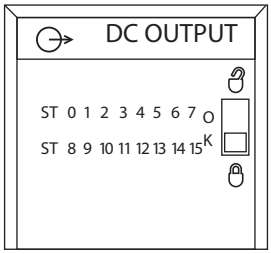


Surge Current Chart





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



Attribute	1756-OB16IS
Outputs	16 individually isolated, 8 scheduled
Voltage category	12/24V DC sink/source
Operating voltage range	10...30V DC
Output delay time OFF to ON ON to OFF	 1 ms max 2 ms max
Current draw @ 5.1V	350 mA
Current draw @ 24V	2.5 mA
Power dissipation, max	3.6 W @ 60 °C (140 °F)
Thermal dissipation	12.28 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) 1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 30 °C (86 °F) 4 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point

Attribute	1756-OB16IS
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
Wire type	Copper
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

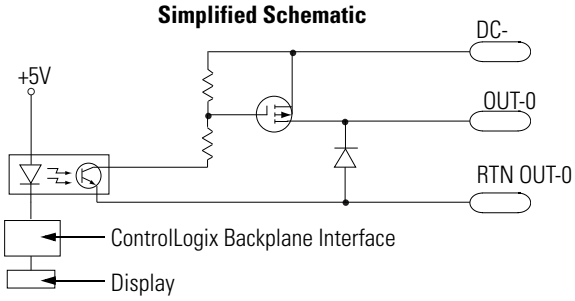
Certification[1]	1756-OB16IS
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X

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

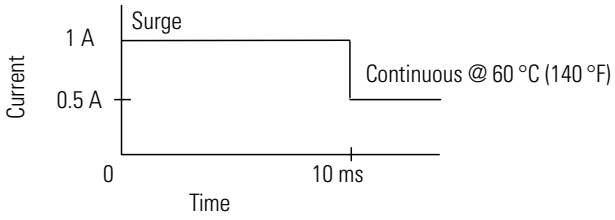
1756-OB32

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

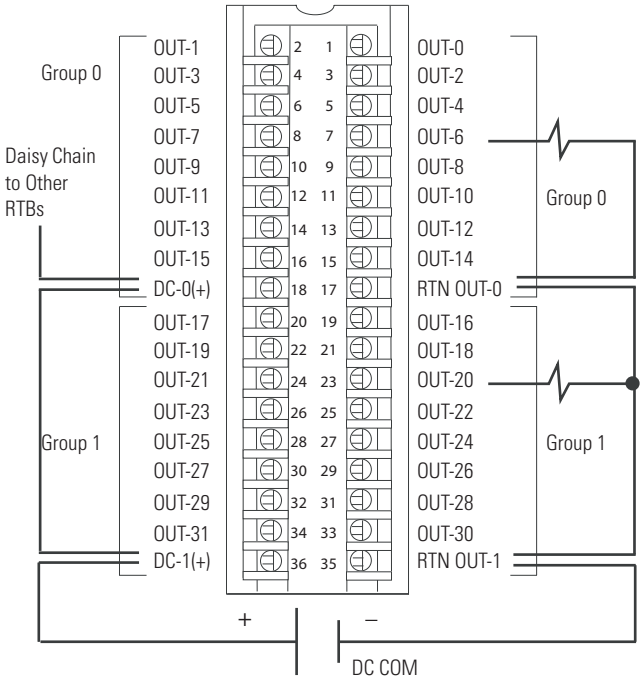
Simplified Schematic

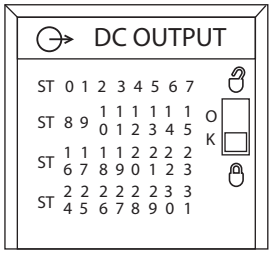


Surge Current Chart



1756-OB32





Attribute	1756-OB32
Outputs	32 (16 points/group)
Voltage category	12/24V DC source
Operating voltage range	10...31.2V DC
Output delay time OFF to ON ON to OFF	 60 μs nom/1 ms max 200 μs nom/1 ms max
Current draw @ 5.1V	300 mA
Current draw @ 24V	2 mA
Power dissipation, max	4.8 W @ 60 °C (140 °F)
Thermal dissipation	16.37 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	200 mV DC @ 0.5 A
Current per point, max	0.5 A @ 50 °C (122 °F) linear derating 0.35 A @ 60 °C (140 °F)
Current per module, max	16 A @ 50 °C (122 °F) linear derating 10 A @ 60 °C (140 °F)
Surge current per point, max	1 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	3 mA per point

Attribute	1756-OB32
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

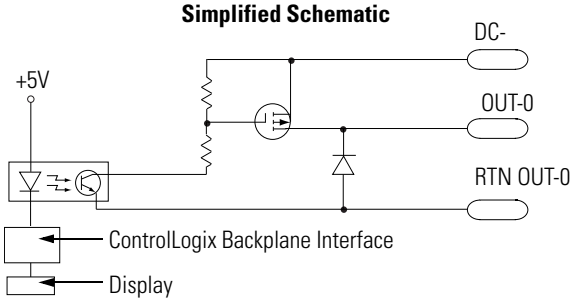
Certification[1]	1756-OB32
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

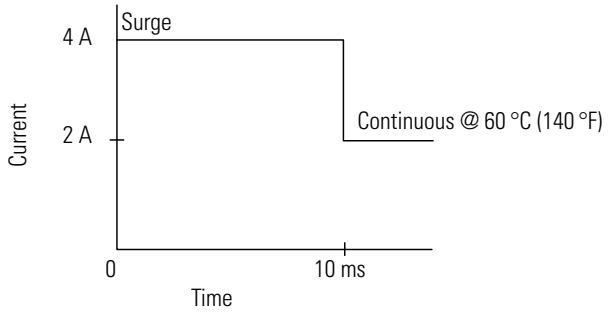
1756-OC8

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

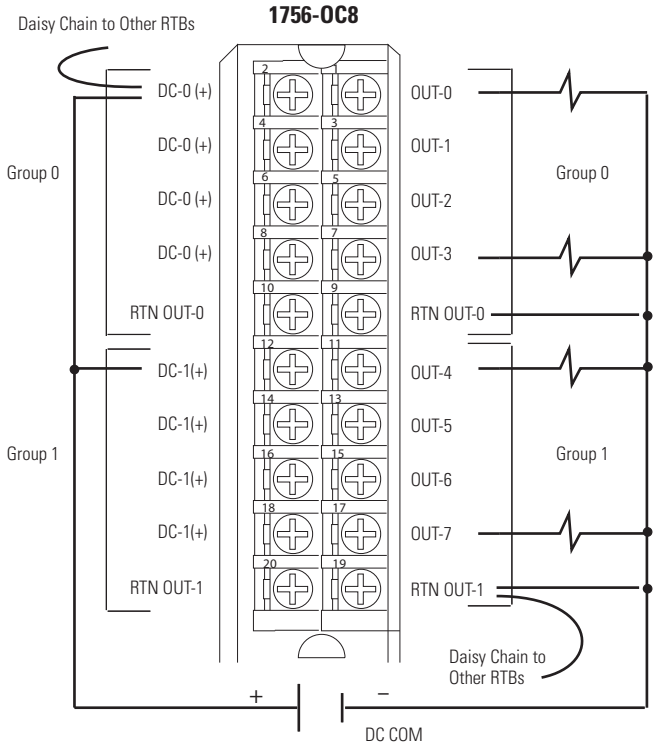
Simplified Schematic

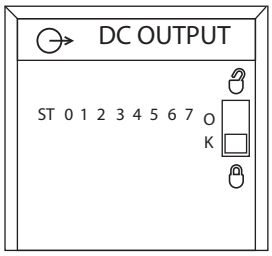


Surge Current Chart



1756-OC8





Attribute	1756-OC8
Outputs	8 (4 points/group)
Voltage category	48V DC source
Operating voltage range	30...60V DC
Output delay time OFF to ON ON to OFF	 1 ms max 2 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Power dissipation, max	4.9 W @ 60 °C (140 °F)
Thermal dissipation	16.71 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point

Attribute	1756-OC8
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OC8
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

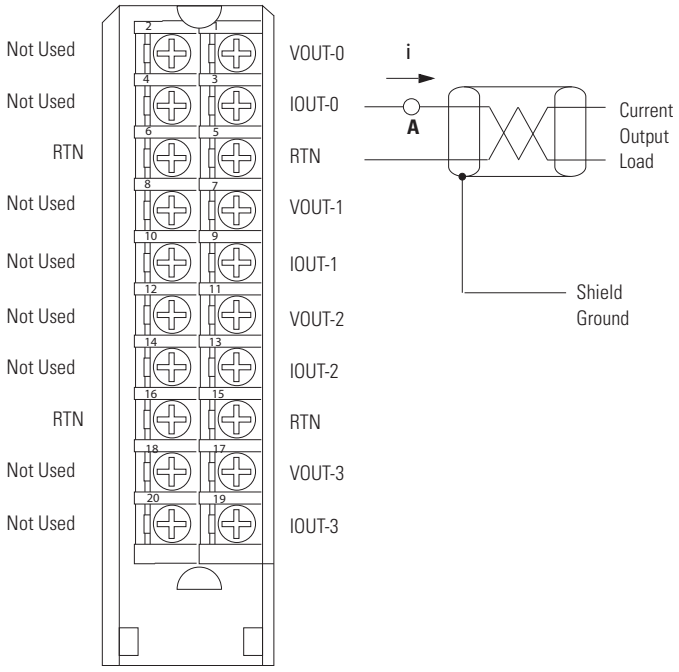
Certification[1]	1756-OC8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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

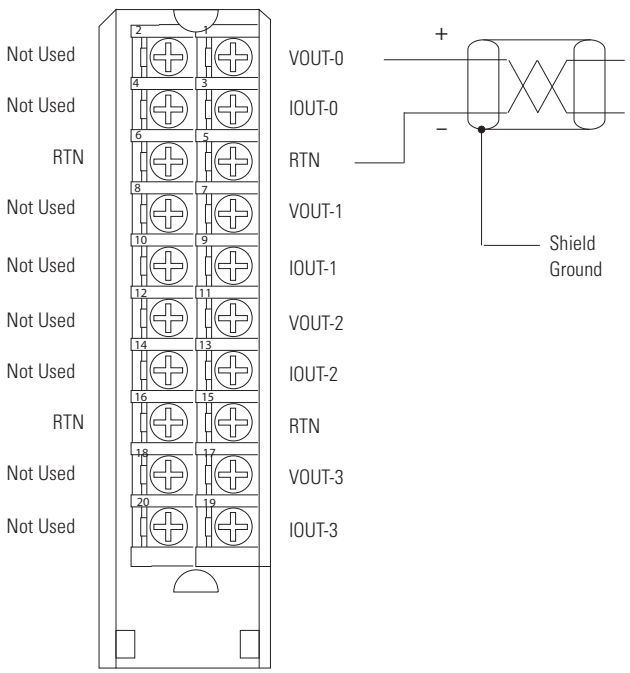
ControlLogix voltage/current output analog module

1756-OF4 Current



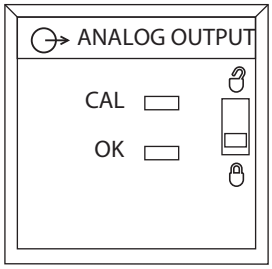
- Place additional loop devices (such as strip chart recorders) at the A location noted above.
- Do not connect more than two wires to any single terminal.
- All terminals marked RTN are connected internally.

1756-OF4 Voltage



- Do not connect more than two wires to any single terminal.
- All terminals marked RTN are connected internally.

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



Attribute	1756-OF4
Outputs	8 voltage or current
Output range	±10.4V 0…21 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

Attribute	1756-OF4
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OF4
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating Damp Heat)	5…95% noncondensing

Attribute	1756-OF4
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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

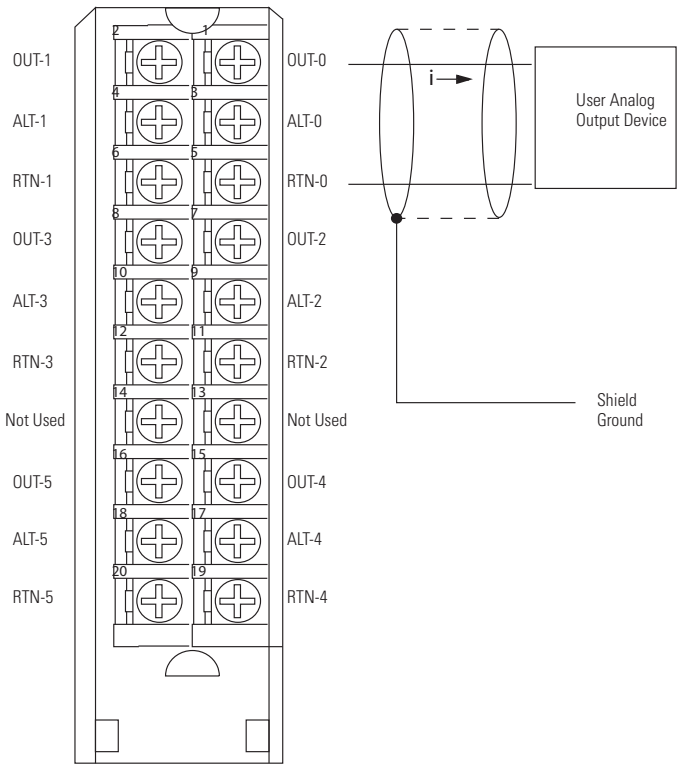
Certification(1)	1756-OF4
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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-OF6CI

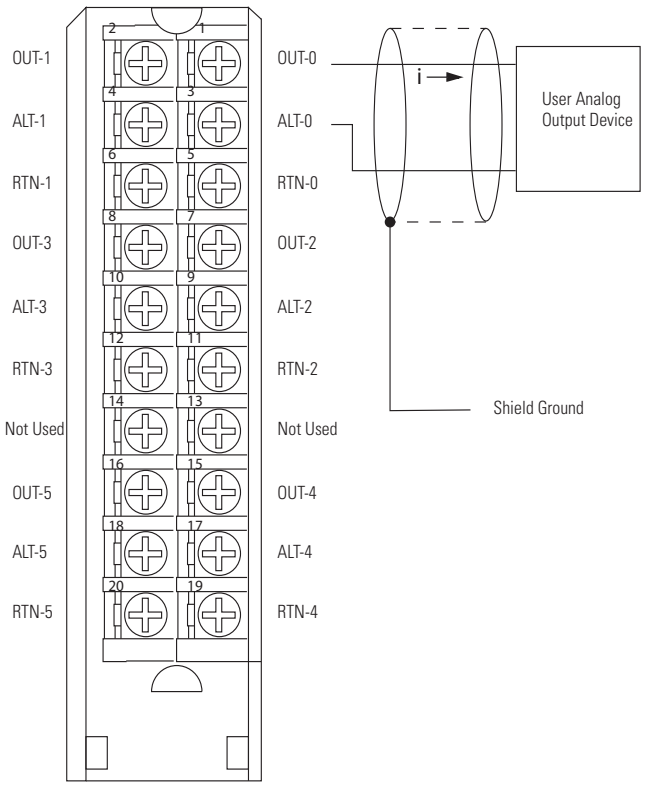
ControlLogix current loop output analog module

1756-OF6CI 0...550 Ω



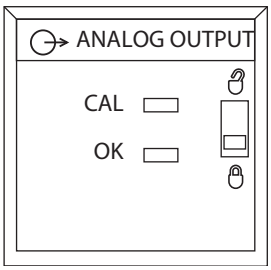
- Place additional devices anywhere in the loop.
- Do not connect more than two wires to any single terminal.

1756-OF6CI 551...1000 Ω



- Place additional devices anywhere in the loop.
- Do not connect more than two wires to any single terminal.

Range	Low Signal and User Counts	High Signal and User Counts
0...20 mA	0 mA -32768 counts	21.074 mA 32767 counts



Attribute	1756-OF6CI
Outputs	6 individually isolated
Output range	0…21 mA
Resolution	13 bits across 21 mA (2.7 μA)
Current draw @ 5.1V	250 mA for 0...550 W loads terminated on OUTs and RTNs (Total backplane power in this range 6.7 W) 250 mA for 551...1000 W loads terminated on OUTs and ALTs (Total backplane power in this range 8.5 W)

Attribute	1756-OF6CI
Current draw @ 24V	225 mA for 0...550 W loads terminated on OUTs and RTNs (Total backplane power in this range 6.7 W) 300 mA for 551...1000 W loads terminated on OUTs and ALTs (Total backplane power in this range 8.5 W)
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 21mA 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 °C (77 °F)	Better than 0.1% of range from 4…21 mA
Calibration interval	6 months typical
Offset drift	1 μA/°C typical
Gain drift with temperature, nom	60 ppm/°C
Gain drift with temperature, max	100 ppm/°C
Module error	0.6% of range
Module scan time, max	25 ms floating point 10 ms integer
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OF6CI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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)

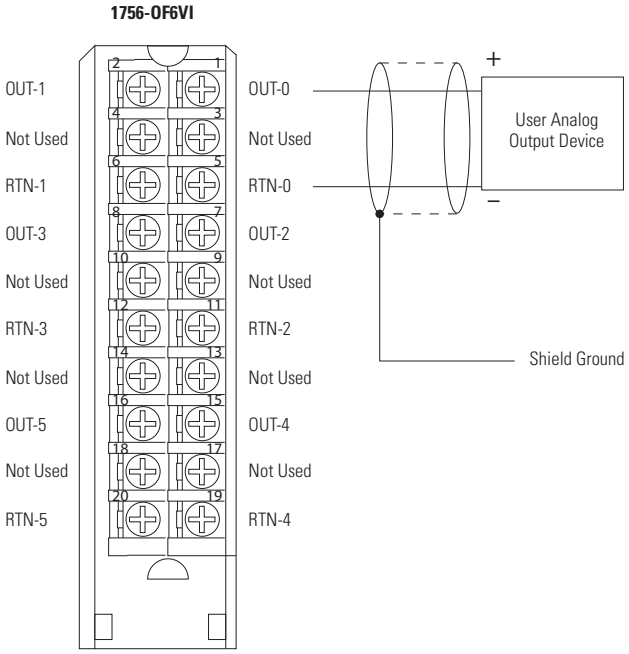
Attribute	1756-OF6CI
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Nonoperating Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification[1]	1756-OF6CI
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

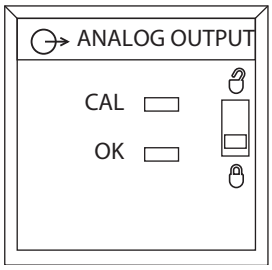
1756-OF6VI

ControlLogix voltage loop output analog module



- Place additional devices anywhere in the loop.
- Do not connect more than two wires to any single terminal.

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



Attribute	1756-OF6VI
Outputs	6 individually isolated
Output range	± 10.5V
Resolution	14 bits across 21V (1.3 mV) (13 bits across 10.5V +sign bit)
Current draw @ 5.1V	250 mA
Current draw @ 24V	175 mA
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

Attribute	1756-OF6VI
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.1% of range
Calibration interval	6 months typical
Offset drift	60 μV/ °C typical
Gain drift with temperature, nom	50 ppm/°C
Gain drift with temperature, max	80 ppm/°C
Module error	0.5% of range
Module scan time, max	25 ms floating point 10 ms integer
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure	None (open-style)

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

(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.

Attribute	1756-OF6VI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-OF6VI
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

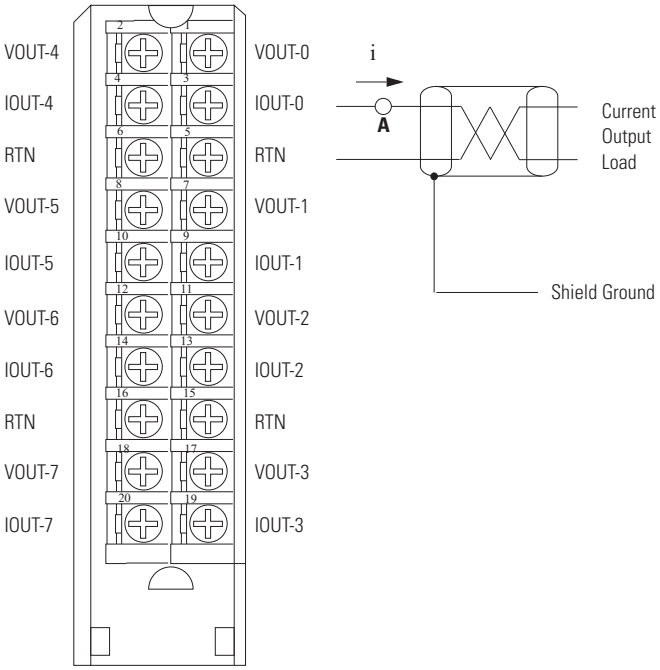
Certification[1]	1756-OF6VI
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

1756-OF8

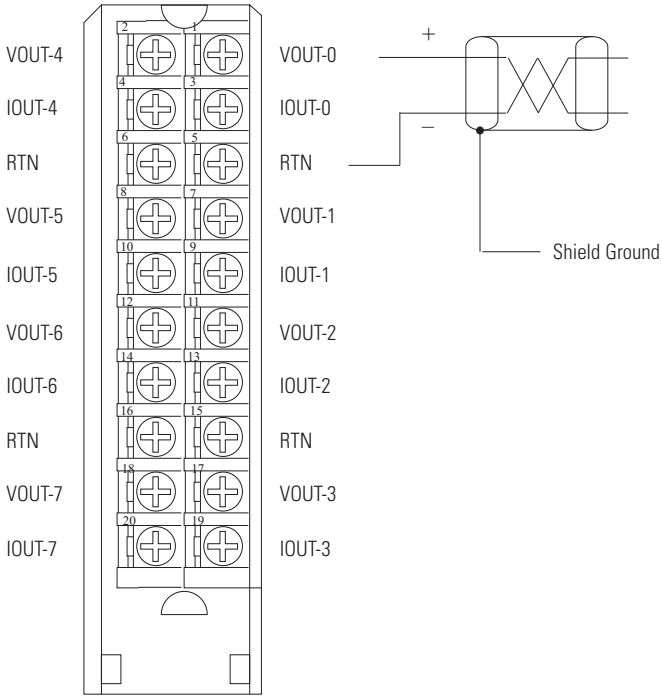
ControlLogix voltage/current output analog module

1756-OF8 Current



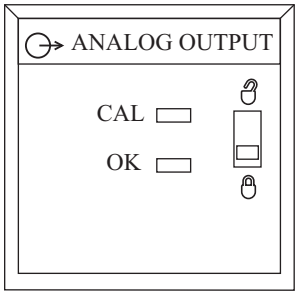
- Place additional loop devices (such as strip chart recorders) at the A location noted above.
- Do not connect more than two wires to any single terminal.
- All terminals marked RTN are connected internally.

1756-OF8 Voltage



- Do not connect more than two wires to any single terminal.
- All terminals marked RTN are connected internally.

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



Attribute	1756-OF8
Outputs	8 voltage or current
Output range	± 10.4V 0…21 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

Attribute	1756-OF8
Power dissipation, max	4.92 W, 4 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 100 nA/°C1 μA/°C typical
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating Damp Heat)	5…95% noncondensing

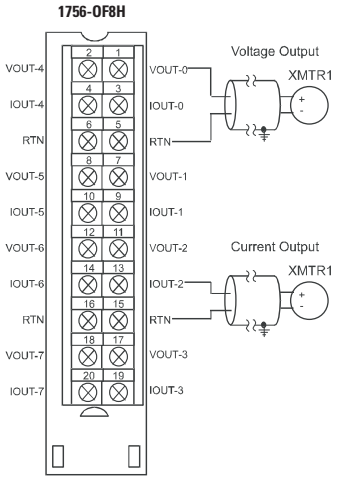
Attribute	1756-OF8
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification(1)	1756-OF8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. 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: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

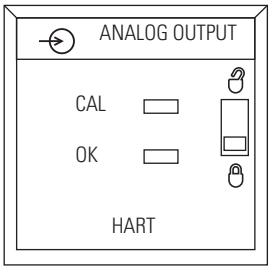
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-OF8H

ControlLogix voltage/current output analog module with HART protocol



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



Attribute	1756-OF8H
Outputs	8 voltage or current
Output range	±10.4V 0…20 mA 4…20 mA
Resolution	15…16 bits
Current draw @ 5V	200 mA
Current draw @ 24V	230 mA
Power dissipation, max	4.92 W, 8 channel current
Thermal dissipation	16.78 BTU/hr
Output impedance	Voltage: >2 kΩ @ 10.4V Current: 50…750 Ω drive
Open circuit detection time	Current output only (output must be set to < 0.1mA)
Overvoltage protection, max	±24V DC
Drive capability	Voltage: > 2000 Ω @ 10.4V Current: 50…750 Ω with short circuit survival current
Load reactance, max	Voltage: 1 μF Current: 10 μH
Settling time	Current (no HART): < 23 ms to 95% with resistive loads Current (with HART): < 37 ms to 95% with resistive loads Voltage: < 8.5 ms to 95% with resistive loads

Attribute	1756-OF8H
Calibrated accuracy @ 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Calibration interval	12 months typical
Offset drift	100 μV/°C typical 200 nA/°C typical
Gain drift with temperature	Voltage: 20 ppm/°C Current: 35 ppm/°C
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module output scan time, min	12 ms floating point
Module HART scan time	Typically 1 s per HART channel enabled Estimate 10 s if all 8 channels have HART enabled Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Isolation voltage	50V (continuous), basic insulation type, output channels-to-backplane No isolation between individual output channels Type tested at 1500V AC for 60 s
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OF8H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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

Attribute	1756-OF8H
Emissions	CISPR 11: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

Certification(1)	1756-OF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR101622C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

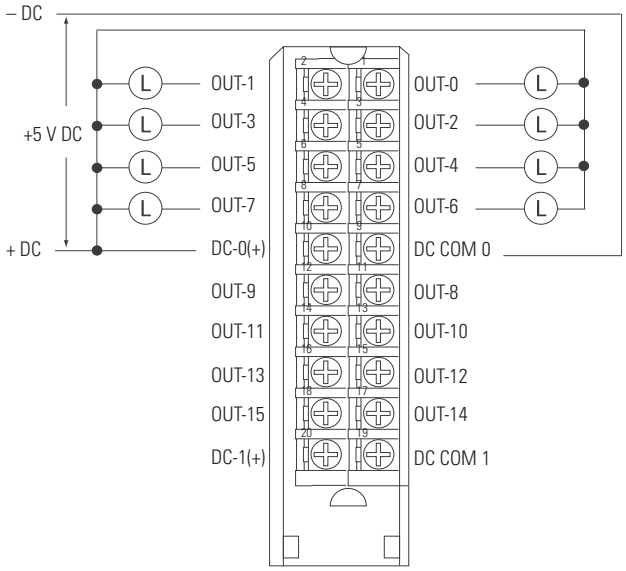
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-OG16

ControlLogix TTL output module

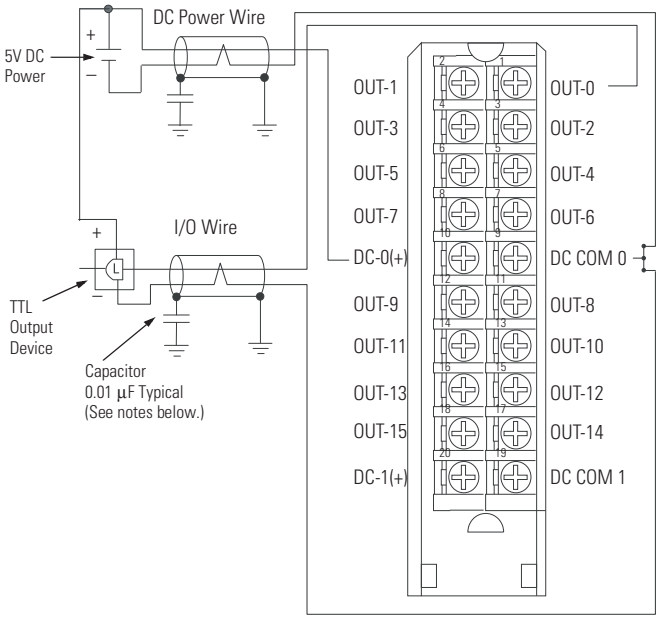
Standard Wiring

1756-OG16

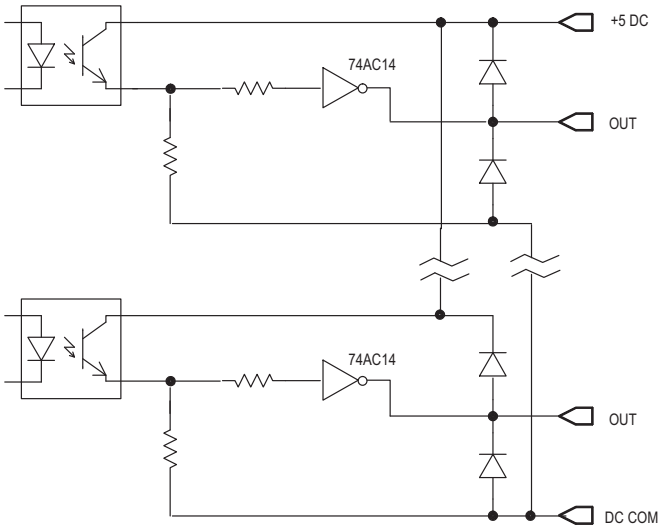


CE Compliant Wiring

1756-OG16

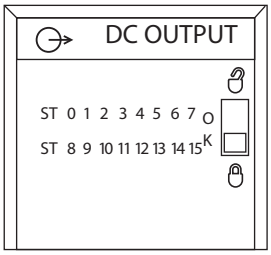


Simplified Schematic



Low to True Format - 1756-OG16

- 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



Attribute	1756-OG16
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) ON to OFF (0V-to-5V DC transition)	 45 µs nom/450 µs max 145 µs nom/700µs max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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[2]
Wire category	2[3]
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) Maximum wire size requires extended housing, catalog number 1756-TBE.

(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.

Attribute	1756-OG16
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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
Conducted RF immunity IEC 61000-4-6	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

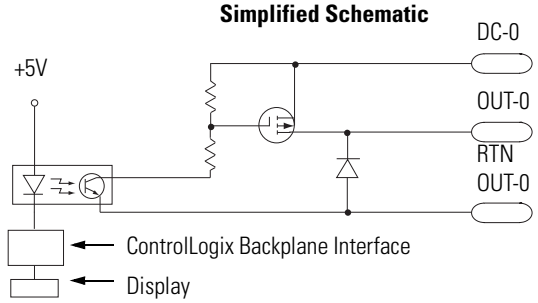
Certification(1)	1756-OG16
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T5 X

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

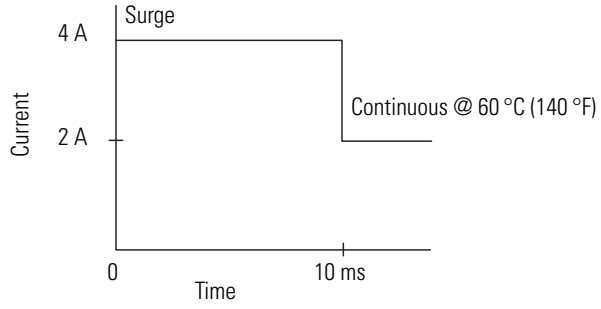
1756-OH8I

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

Simplified Schematic



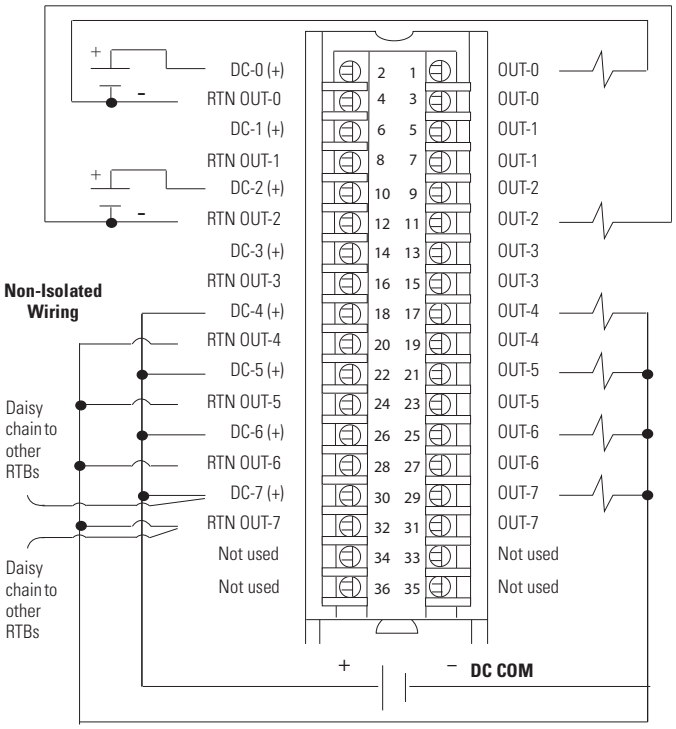
Surge Current Chart

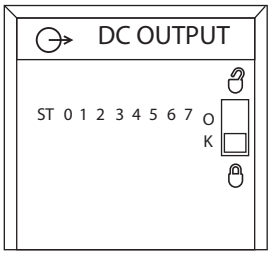


1756-OH8I

Isolated Wiring

Non-Isolated Wiring





Attribute	1756-OH8I
Outputs	8 individually isolated
Voltage category	120V DC sink/source
Operating voltage range	90...146V DC
Output delay time OFF to ON ON to OFF	 2 ms max 2 ms max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Power dissipation, max	3.3 W @ 60 °C (140 °F)
Thermal dissipation	11.25 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point

Attribute	1756-OH8I
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

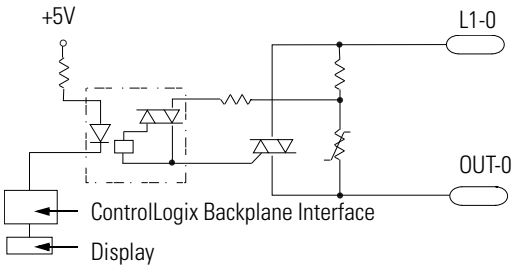
Certification[1]	1756-OH8I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

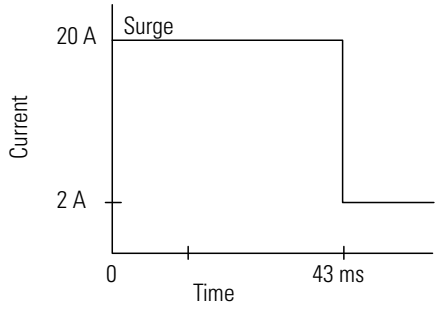
1756-ON8

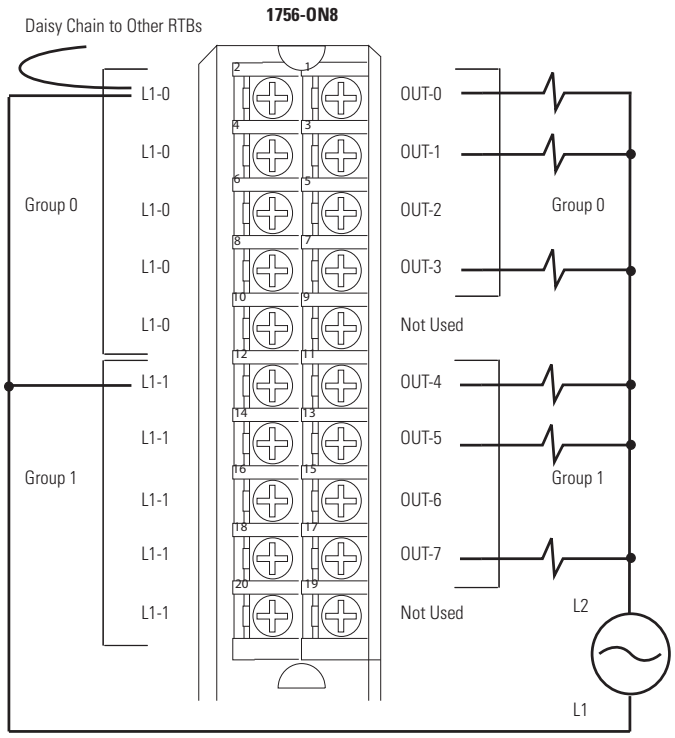
ControlLogix AC (10...30V) output module

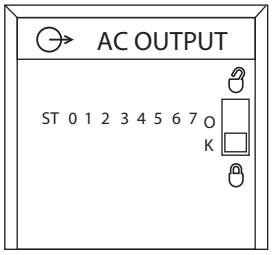
Simplified Schematic



Surge Current Chart







Attribute	1756-ON8
Outputs	8 (4 points/group)
Voltage category	24V AC
Operating voltage range	10…30V AC, current >50 mA, 47…63Hz 16…30V AC, current <50 mA, 47…63Hz
Output delay time OFF to ON ON to OFF	 9.3 ms @ 60 Hz 11 ms @ 50 Hz 9.3 ms @ 60 Hz 11 ms @ 50 Hz
Current draw @ 5.1V	200 mA
Current draw @ 24V	2 mA
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)

Attribute	1756-ON8
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(1)
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(2)
Wire category	1(3)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open style)

(1) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/ms for loads under 50 mA. The commutating dv/dt rating of the module for loads 50…500 mA (OUTPUT to L2) is 4V/ms 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 ross 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.

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

(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.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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

Attribute	1756-ON8
Emissions	CISPR 11: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

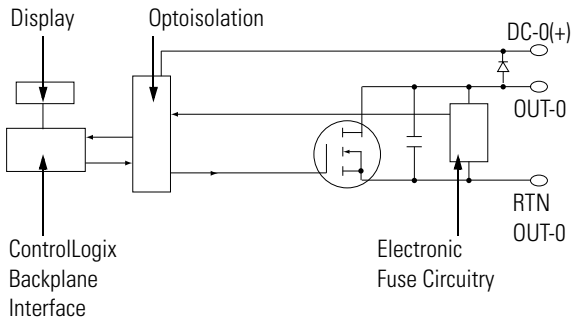
Certification(1)	1756-ON8
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

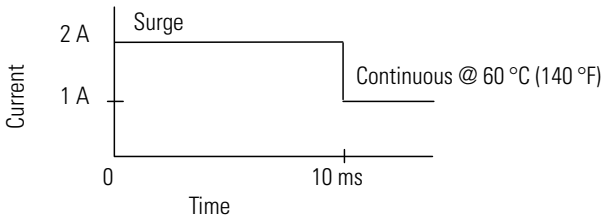
1756-OV16E

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

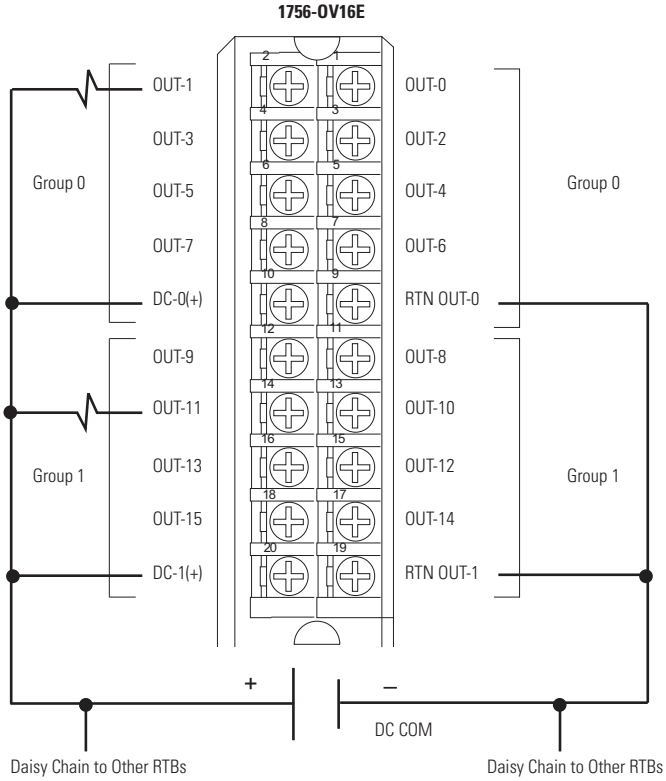
Simplified Schematic



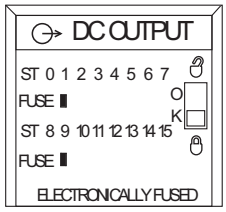
Surge Current Chart



1756-OV16E



Attribute	1756-OV16E
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



Attribute	1756-OV16E
Outputs	16 electronically fused (8 points/group)
Voltage category	12/24V DC sink
Output delay time OFF to ON ON to OFF	 75 µs nom/1 ms max 360 µs nom/1 ms max
Operating voltage range	10...30V DC
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Power dissipation, max	6.72 W @ 60 °C (140 °F)
Thermal dissipation	22.94 BTU/hr

Attribute	1756-OV16E
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
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
Removable terminal block	1756-TBNH 1756-TBSH
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OV16E
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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

Attribute	1756-OV16E
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

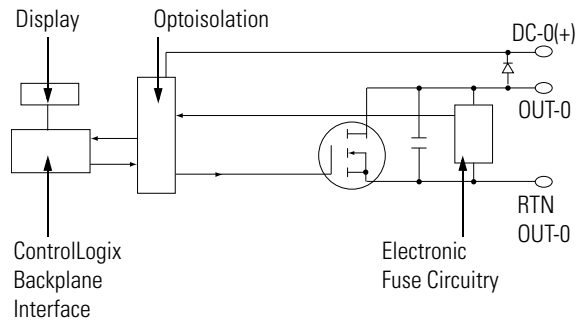
Certification[1]	1756-OV16E
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X
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.

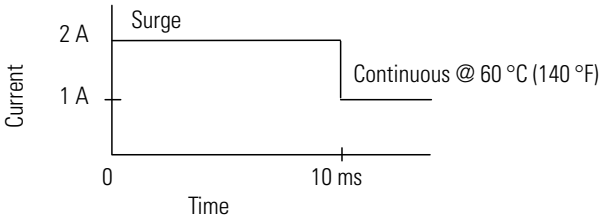
1756-OV32E

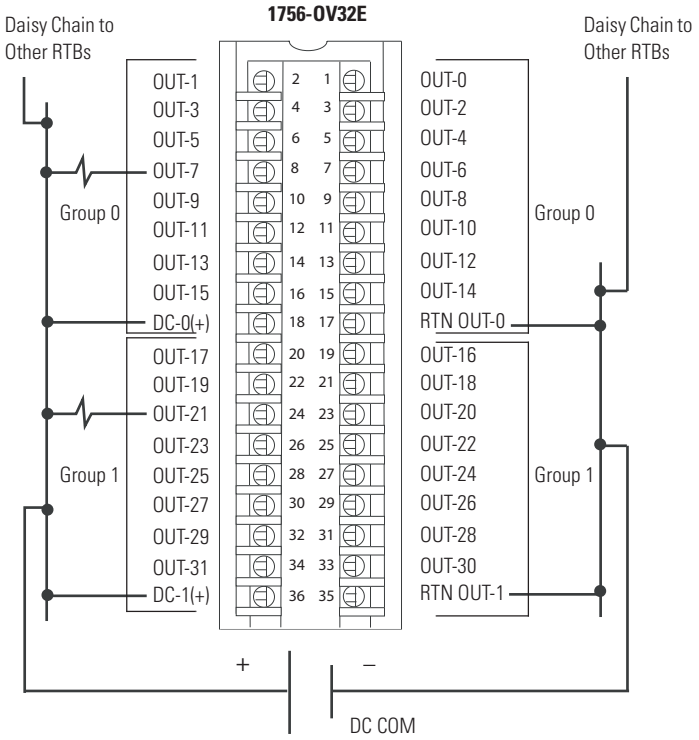
ControlLogix DC (10...30V) electronically-fused, sinking output module

Simplified Schematic

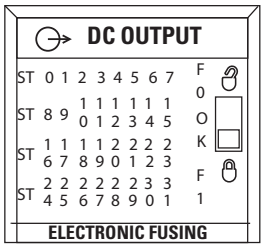


Surge Current Chart





Attribute	1756-OV32E
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



Attribute	1756-OV32E
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 ON to OFF	 75 µs nom/300 µs max 230 µs nom/1 ms max
Current draw @ 5.1V	390 mA
Current draw @ 24V	2 mA
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

Attribute	1756-OV32E
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
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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OV32E
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 1, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Attribute	1756-OV32E
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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz

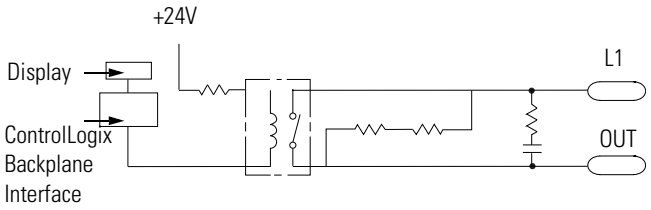
Certification[1]	1756-OV32E
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X

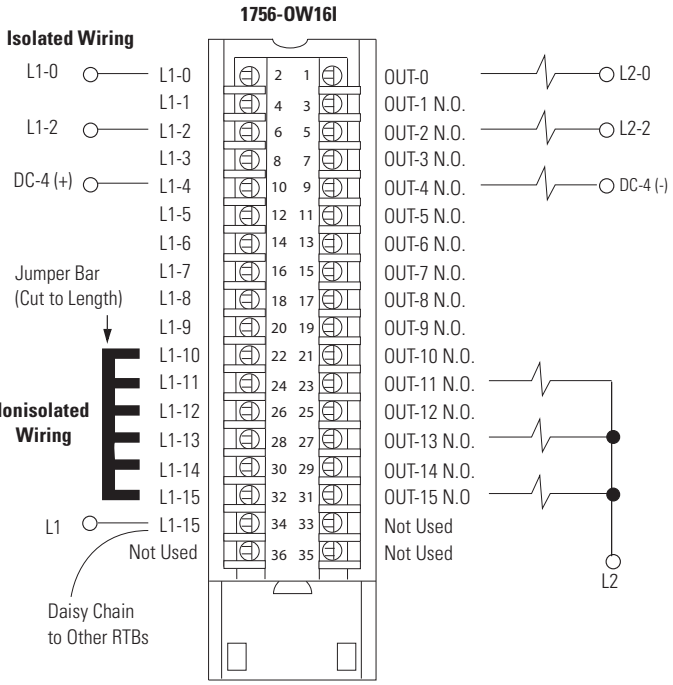
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-OW16I

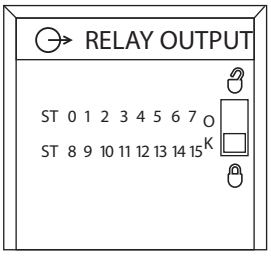
ControlLogix AC (10...265V) DC (5...150V) isolated contact module

Simplified Schematic





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



Attribute	1756-OW16I
Outputs	16 N.O. individually isolated
UL module rating	UL C300 R150
Operating voltage range	5...150V DC 10...265V AC
Contact current rating	2 A @ 5…30V DC 0.5 A @ 48V DC 0.25 A @ 125V DC 2 A @ 125/240V AC
Output delay time OFF to ON ON to OFF	 10 ms max 10 ms max
Current draw @ 5.1V	150 mA
Current draw @ 24V	150 mA
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
Initial contact resistance, max	100 mΩ
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

Attribute	1756-OW16I
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OW16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

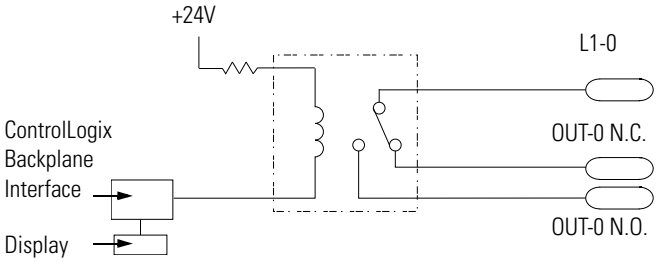
Certification[1]	1756-OW16I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

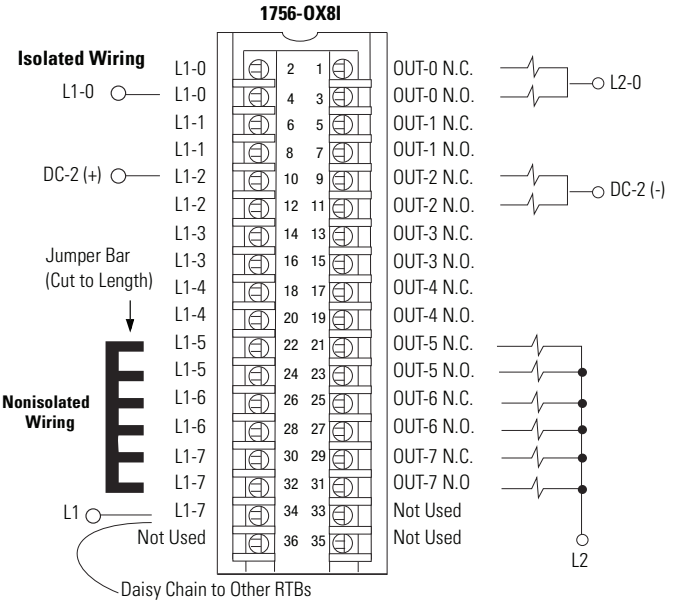
1756-OX8I

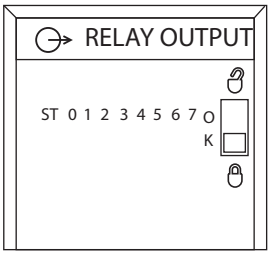
ControlLogix AC (10...265V) DC (5...150V) isolated contact module

Simplified Schematic



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





Attribute	1756-OX8I
Outputs	8 N.O. 8 N.C. individually isolated (2 points/group)
UL module rating	UL C300 R150
Operating voltage range	5...150V DC 10...265V AC @ 47…63 Hz
Contact current rating	2 A @ 5…30V DC 0.5 A @ 48V DC 0.25 A @ 125V DC 2 A @ 125/240V AC
Output delay time OFF to ON ON to OFF	 13 ms max 13 ms max
Current draw @ 5.1V	100 mA
Current draw @ 24V	100 mA
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
Initial contact resistance, max	100 mΩ @ 6V 1 A
Switching frequency, max	1 operation/3 s (0.3 Hz at rated load)
Bounce time, mean	1.2 ms
Expected contact life	300 K cycles resistive 100 K cycles inductive
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s

Attribute	1756-OX8I
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(1)
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

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

(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.

Attribute	1756-OX8I
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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

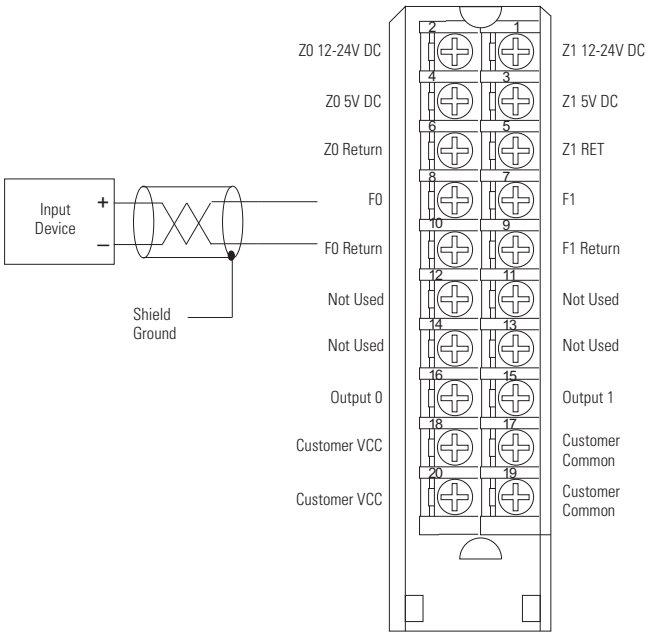
Certification[1]	1756-OX8I
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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
TÜV	TÜV Certified for Functional Safety: Capable of SIL 2

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

1756-CFM

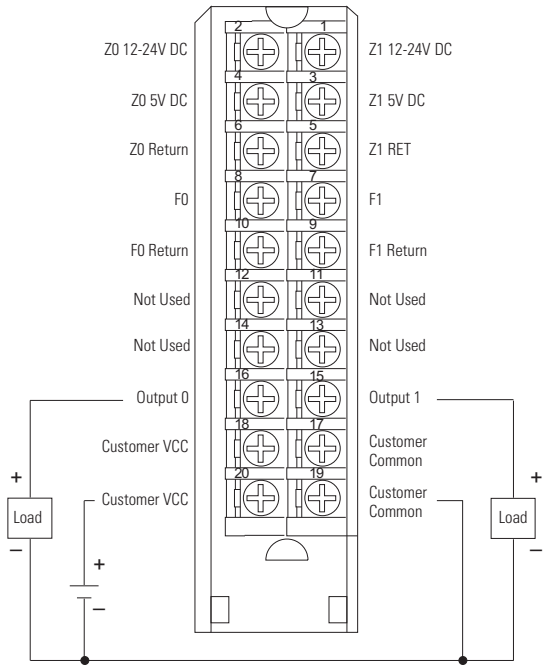
ControlLogix configurable flow meter module

1756-CFM Standard Magnetic Pickup



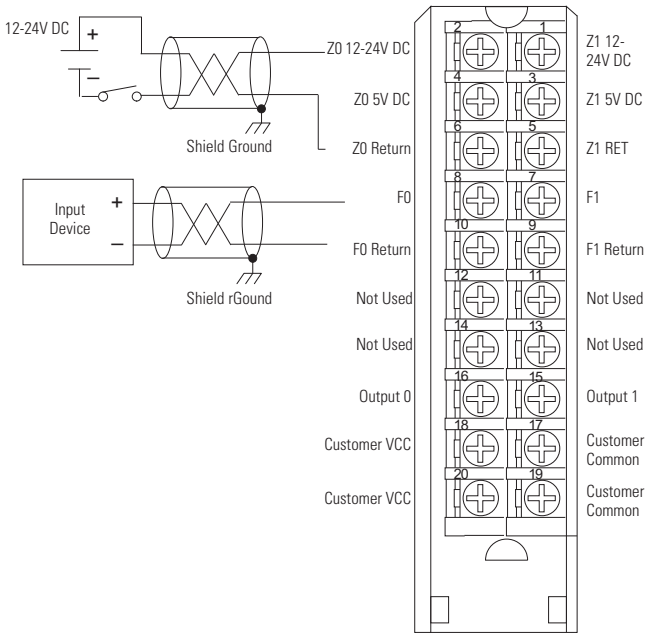
- This wiring diagram can be used in applications with 50 mV (magnetic pickup), 1.3V (TTL), or 4V (preamp level) thresholds. You must use RSLogix 5000 software to choose the appropriate threshold level for your specific application.
- If separate power sources are used, do not exceed the specified isolation voltage.

1756-CFM Standard Output

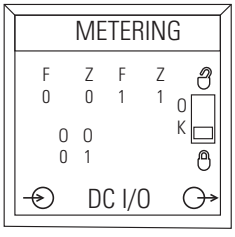


If separate power sources are used, do not exceed the specified isolation voltage.

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).
- If separate power sources are used, do not exceed the specified isolation voltage.



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	6 mA
Backplane power, total	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
Removable terminal block	1756-TBNH 1756-TBSH

Attribute	1756-CFM
Slot width	1
Wire size	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(1)
Wire category	2 on signal ports 1 on power ports(2)
North American temperature code	T4
Enclosure type	None (open-style)

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

(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.

Attributes	Value
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
Input type	IEC Type 2 (6…30 mA) @ 24V DC
Count range, max	2,147,483,647
Input frequency, max	100 kHz @ flowmeter inputs (overrange occurs at 100 kHz)
Flowmeter input voltage	±30V, selectable input thresholds of 50 mV, 1.3V and 4V: • ±30V peak unterminated open circuit voltage, magnetic pickup • TTL compatible, input voltage >1.3V DC is Logic 1 and -0.7…1.3V DC is Logic 0 • 12…24V DC powered preamp output, 4V DC threshold
Flowmeter input impedance	5 kΩ ±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…31.2V 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

Attribute	Value
Outputs	2 current sourcing
Output voltage source	Customer supplied
Output voltage range, nom	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 A @ 10…31.2V DC 20 mA @ 4.5…5.5V DC(1)
Surge current	2 A for 50 ms, repeatable every 2 s
Off-state leakage current, max	< 300 μA @ 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 μs turn on, <300 μs 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) All outputs can be on simultaneously without derating.

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating 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: Group 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 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

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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

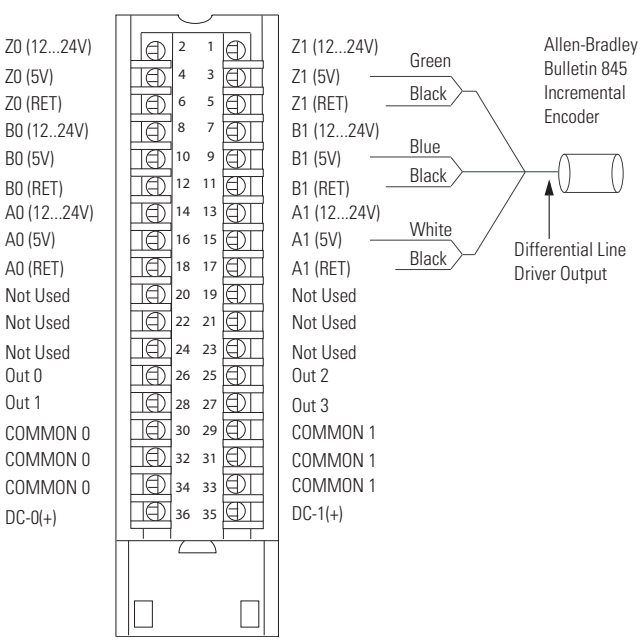
Certification[1]	1756-CFM
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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.

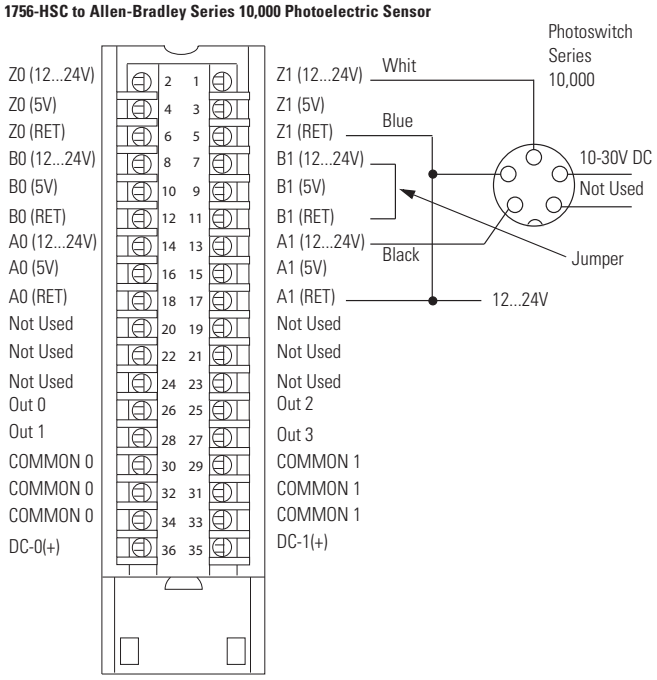
1756-HSC

ControlLogix high-speed counter module

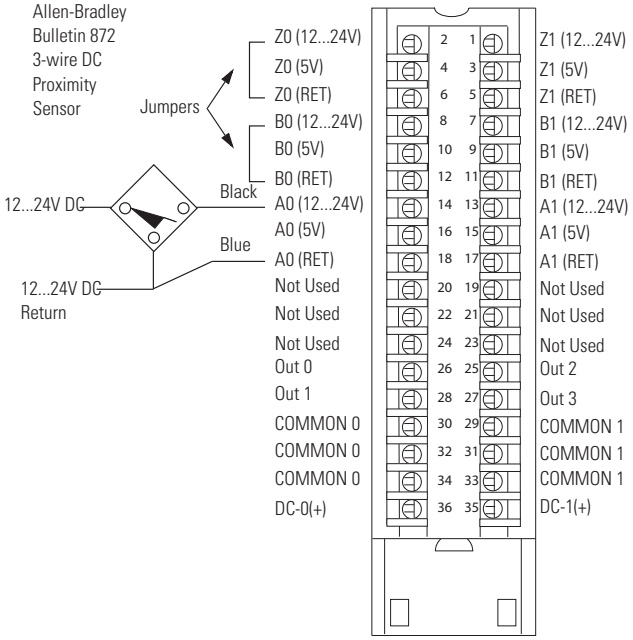
1756-HSC to Allen-Bradley 845 Incremental Encoder

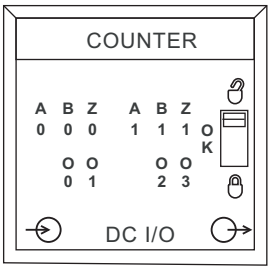


1756-HSC to Allen-Bradley Series 10,000 Photoelectric Sensor



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





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	5V operation: 4.5…5.5V DC 12/24V operation: 10…31.2V DC
Current draw at 5.1V	300 mA
Current draw at 24V	3 mA
Backplane power, total	1.9 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
Removable terminal block	1756-TBCH 1756-TBS6H
Slot width	1
Wire size	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(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) Maximum wire size requires extended housing, catalog number 1756-TBE.

(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.

Attribute	Value
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

Attribute	Value
Outputs	4 (2 per common)
Output delay time OFF to ON ON to OFF	 20 μs nom/50 μs max 60 μs nom/300 μs max
Off-state leakage current per point, max	300 μA
On-state voltage drop, max	0.55V
Output current rating, per point	20 mA @ 4.5…5.5V DC 1.0 A @ 10…31.2V DC
Current limit	< 9 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	Any number of output channels is assignable to each counter channel Each output can have 2 '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.)

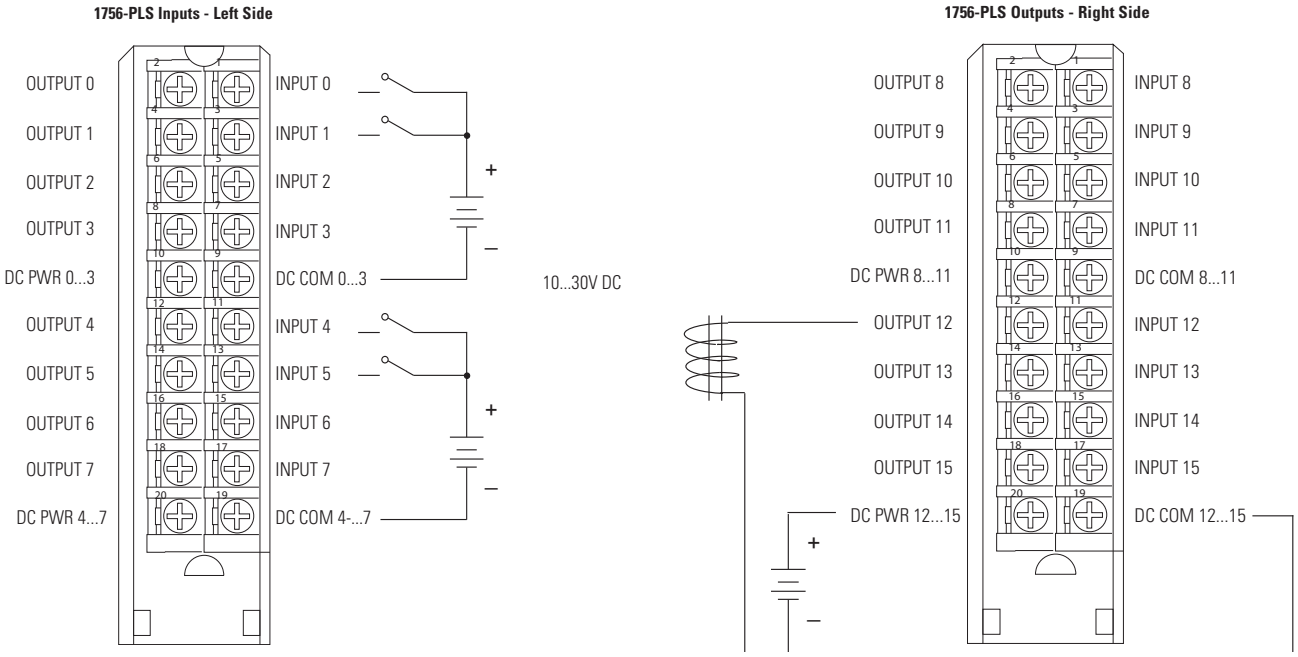
Attribute	1756-HSC
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air	60 °C (140 °F)
Temperature, storage IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating 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 Nonoperating 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: Group 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 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

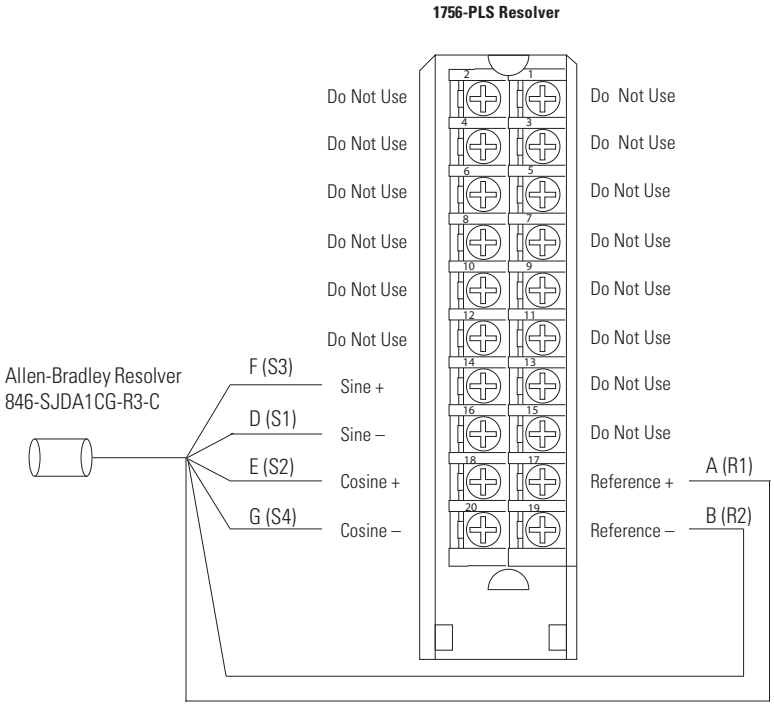
Certification[1]	1756-HSC
UL	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 X

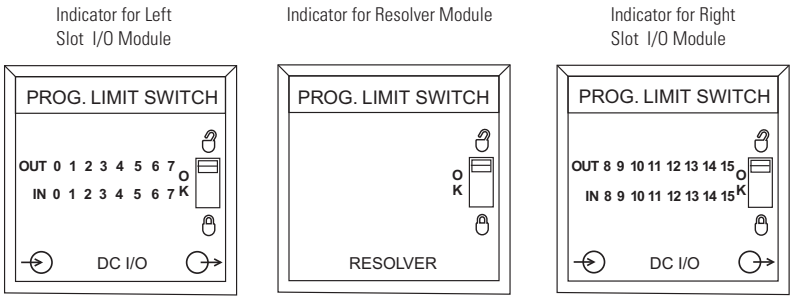
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-PLS

ControlLogix programmable limit switch module







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	1000 mA
Current draw at 24V	125 mA
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
Slot width	3
Wire size	Center: Alpha Cable #6054C (use 3 of 4 twisted pairs) Left and right: 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(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) Maximum wire size requires extended housing, catalog number 1756-TBE.

(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.

Attribute	Value
Resolver location	Center section
Compatible resolver	Allen-Bradley resolver 846-SJxxxx-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 ±20%
Reference frequency	5 kHz ±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	±0.0488% of full scale
Accuracy	±0.0976% of full scale

Attribute	Value
Inputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range	10.8…31.2V DC
Input delay time OFF to ON ON to OFF	 < 15 μs @ 30 °C (86 °F) < 150 μs @ 60 °C (140 °F) < 30 μs @ 30 °C (86 °F) < 200 μs @ 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 kΩ @ 24V DC
Reverse polarity protection	Yes

Attribute	Value
Outputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range	10…31.2V DC

Attribute	Value
Output delay time OFF to ON ON to OFF	 < 15 µs @ 60 °C (140 °F) < 25 µs @ 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)
Off-state leakage current per point, nom	<10 µA @ 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(1) (86 °F)
Current per group, max	4 A @ 30 °C(2) (86 °F)
Current per module, max	8 A @ 30 °C(3) (86 °F)
Current limit	< 4A
Surge current per point	2 A for 10 ms every 1s @ 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) Derate 16.7 mA/ °C above 30 °C (86 °F): 0.5 A @ 60 °C (140 °F).

(2) Derate 66.8 mA/ °C above 30 °C (86 °F): 2 A @ 60 °C (140 °F).

(3) Derate 133.6 mA/ °C above 30 °C (86 °F): 4 A @ 60 °C (140 °F).

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	60 °C (140 °F)
Temperature, storage 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 Nonoperating Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz

Attribute	1756-PLS
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: Group 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 200Hz 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	10Vrms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz on shielded signal ports

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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, see ControlLogix Chassis Specifications Technical Data, publication 1756-TD006.

For more information on power supplies, see ControlLogix Power Supply Specifications Technical Data, publication 1756-TD005.

1756 Removable Terminal Blocks

Removable terminal blocks (RTBs) provide a flexible interconnection between your plant wiring and 1756 I/O modules. The RTB plugs into the front of the I/O module. The type of module determines which RTB you need. You can choose screw-clamp or spring-clamp RTBs.

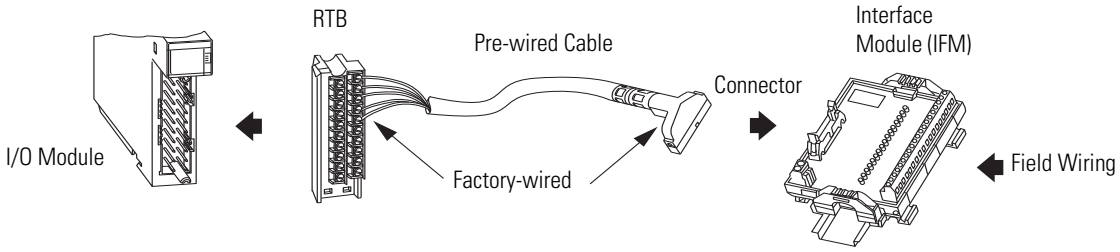
RTBs are not shipped with I/O modules. You must order them separately. The standard housing on the front of the wiring arm is not deep enough for 2.5 mm^2 (14 AWG) wiring. If you plan to use 2.5 mm^2 (14 AWG) wiring, also order the extended housing.

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	0.8…1 N•m 7…9 lb•in		0.4 N•m 4.4 lb•in		—
Screwdriver width	8 mm (5/16 in.) max				

Wiring Systems

As an alternative to buying RTBs and connecting the wires yourself, you can buy a wiring system of:

- 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.



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 manuals, a knowledge base of FAQs, technical and application notes, sample code and links to software service packs, and a MySupport feature that you can customize to make the best use of these tools.

For an additional level of technical phone support for installation, configuration, and troubleshooting, we offer TechConnect support programs. For more information, contact your local distributor or Rockwell Automation representative, or visit http://www.rockwellautomation.com/support/.

Installation Assistance

If you experience an anomaly 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/support/americas/phone_en.html, or contact your local Rockwell Automation representative.

New Product Satisfaction Return

Rockwell Automation tests all of its products to 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.

Documentation Feedback

Your comments will help us serve your documentation needs better. If you have any suggestions on how to improve this document, complete this form, publication RA-DU002, available at http://www.rockwellautomation.com/literature/.

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Publication 1756-TD002C-EN-E - September 2010
Supersedes 1756-TD002A-EN-P - May 2010