Allen-Bradley

1756 ControlLogix I/O Specifications

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.

Summary of Changes

This publication contains new and updated information as indicated in the following table.

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Available 1756 I/O Modules

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

Digital I/O Type	Description
Diagnostic	These modules provide diagnostic features to the point level. These modules have a **D** at the end of the catalog number.
Electronic fusing	These modules have internal electronic fusing to help 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.

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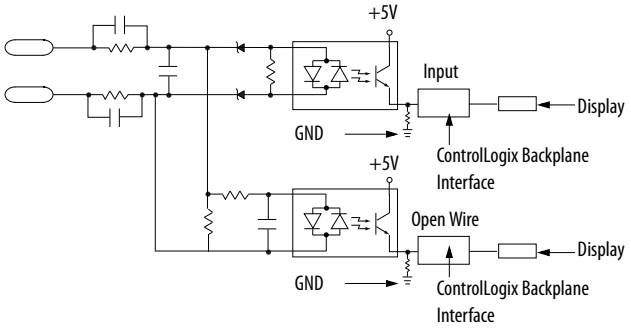
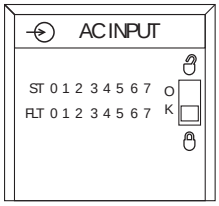
1756-IA8D

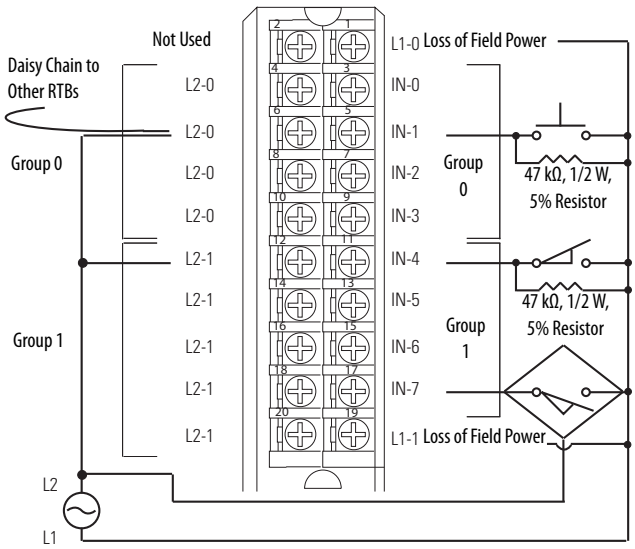
ControlLogix 120V AC diagnostic input module

Simplified Schematic





1756-IA8D



Diagnostic Specifications - 1756-IA8D

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

Technical Specifications - 1756-IA8D

Attribute	1756-IA8D
Inputs	Eight diagnostic (4 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range[1]	79…132V AC, 47…63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 ms or 2 ms Hardware delay: 8 ms max + filter time User-selectable filter time: 9 ms or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	4.5 W @ 60 °C (140 °F)
Thermal dissipation	15.35 BTU/hr

Technical Specifications - 1756-IA8D (continued)

Attribute	1756-IA8D
Off-state voltage, max	20V
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 74V AC
On-state current, max	16 mA @ 132V AC
Inrush current, max	250 mA
Input impedance, max	8.25 kΩ @ 132V AC, 60 Hz
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1200V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(2)
North American temperature code	T4A
Enclosure type	None (open-style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74…132V, 47…63 Hz.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-IA8D

Attribute	1756-IA8D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-IA8D (continued)

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

Certifications - 1756-IA8D

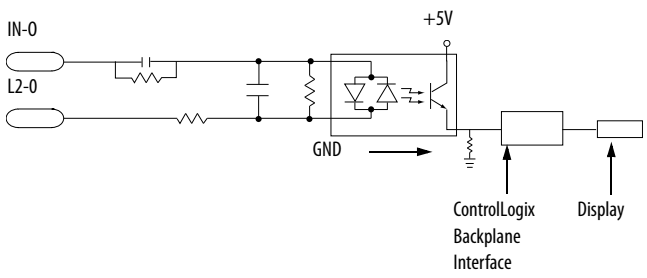
Certification[1]	1756-IA8D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

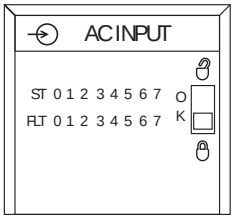
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IA16

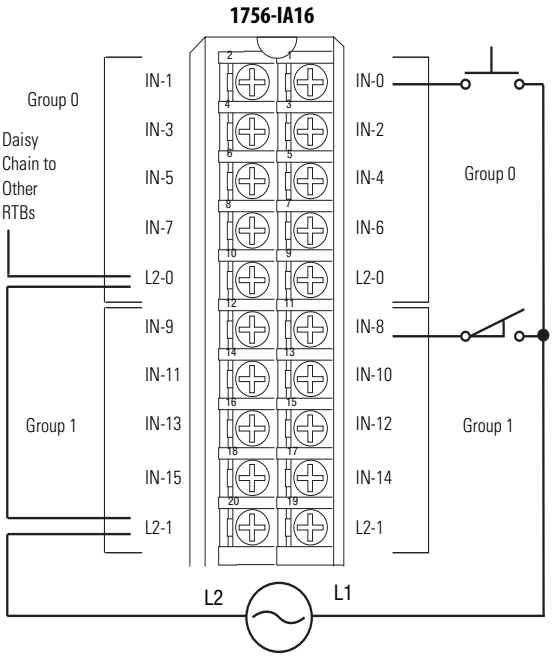
ControlLogix 120V AC input module

Simplified Schematic





1756-IA16



Technical Specifications - 1756-IA16

Attribute	1756-IA16
Inputs	16 (8 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range[1]	74…132V AC, 47…63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 ms or 2 ms Hardware delay: 8 ms max + filter time User-selectable filter time: 9 ms or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	2 mA
Total backplane power	0.58 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	18.41 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA
On-state current, min	5 mA @ 74V AC
On-state current, max	13 mA @ 132V AC
Inrush current, max	250 mA peak (decaying to <37% in 22 ms, without activation)

Technical Specifications - 1756-IA16 (continued)

Attribute	1756-IA16
Input impedance, max	10.15 kΩ @ 132V AC, 60 Hz
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	125V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1400V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(2)
North American temperature code	T4
Enclosure type	None (open-style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74…132V, 47…63 Hz.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-IA16

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

Environmental Specifications - 1756-IA16 (continued)

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	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

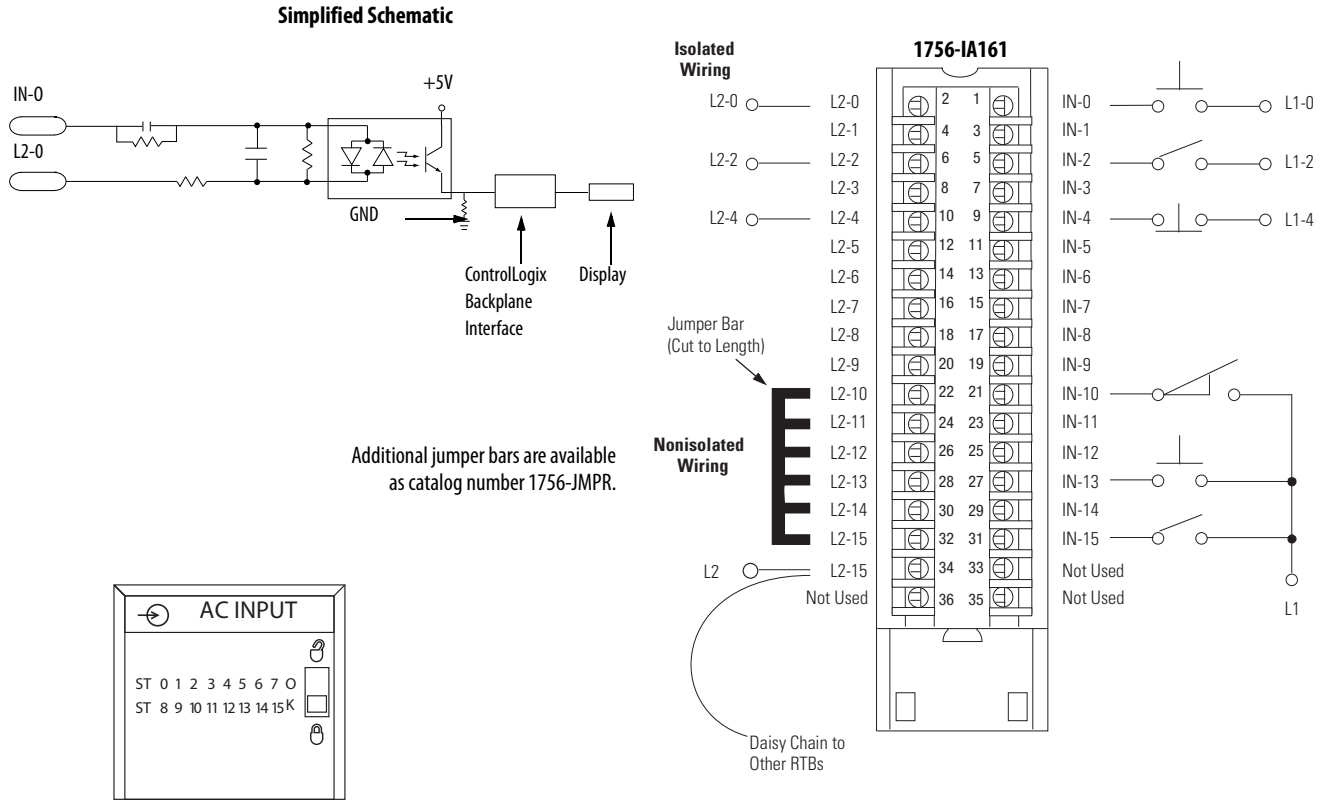
Certifications - 1756-IA16

Certification[1]	1756-IA16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-IA16I

ControlLogix 120V AC isolated input module



Technical Specifications - 1756-IA16I

Attribute	1756-IA16I
Inputs	16 individually isolated
Voltage category	120V AC 50/60 Hz
Operating voltage range[1]	79…132V AC, 47…63 Hz
Input voltage, nom	120V AC 50/60 Hz
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 ms or 2 ms Hardware delay: 8 ms max + filter time User-selectable filter time: 9 ms or 18 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	3 mA
Total backplane power	0.71 W
Power dissipation, max	4.9 W @ 60 °C (140 °F)
Thermal dissipation	16.71 BTU/hr
Off-state voltage, max	20V
Off-state current, max	2.5 mA

Technical Specifications - 1756-IA16I (continued)

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

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74…132V, 47…63 Hz.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-IA16I

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

Environmental Specifications - 1756-IA16I (continued)

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

Certifications - 1756-IA16I

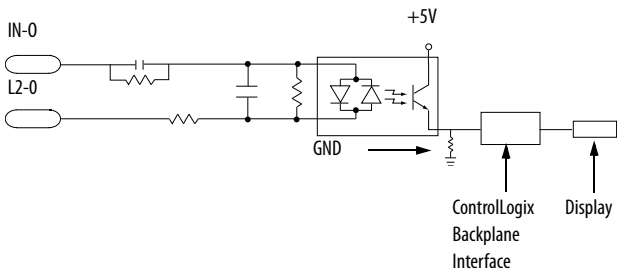
Certification(1)	1756-IA16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

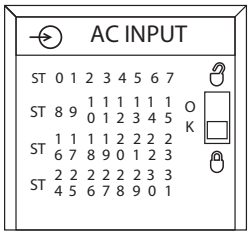
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IA32

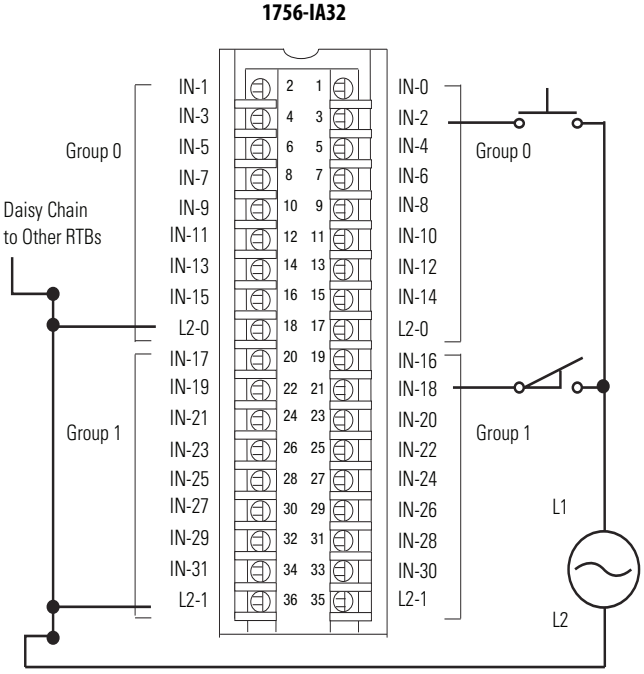
ControlLogix AC (74...132V) input module

Simplified Schematic





1756-IA32



Technical Specifications - 1756-IA32

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

Technical Specifications - 1756-IA32 (continued)

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

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

Environmental Specifications - 1756-IA32

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

Environmental Specifications - 1756-IA32 (continued)

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

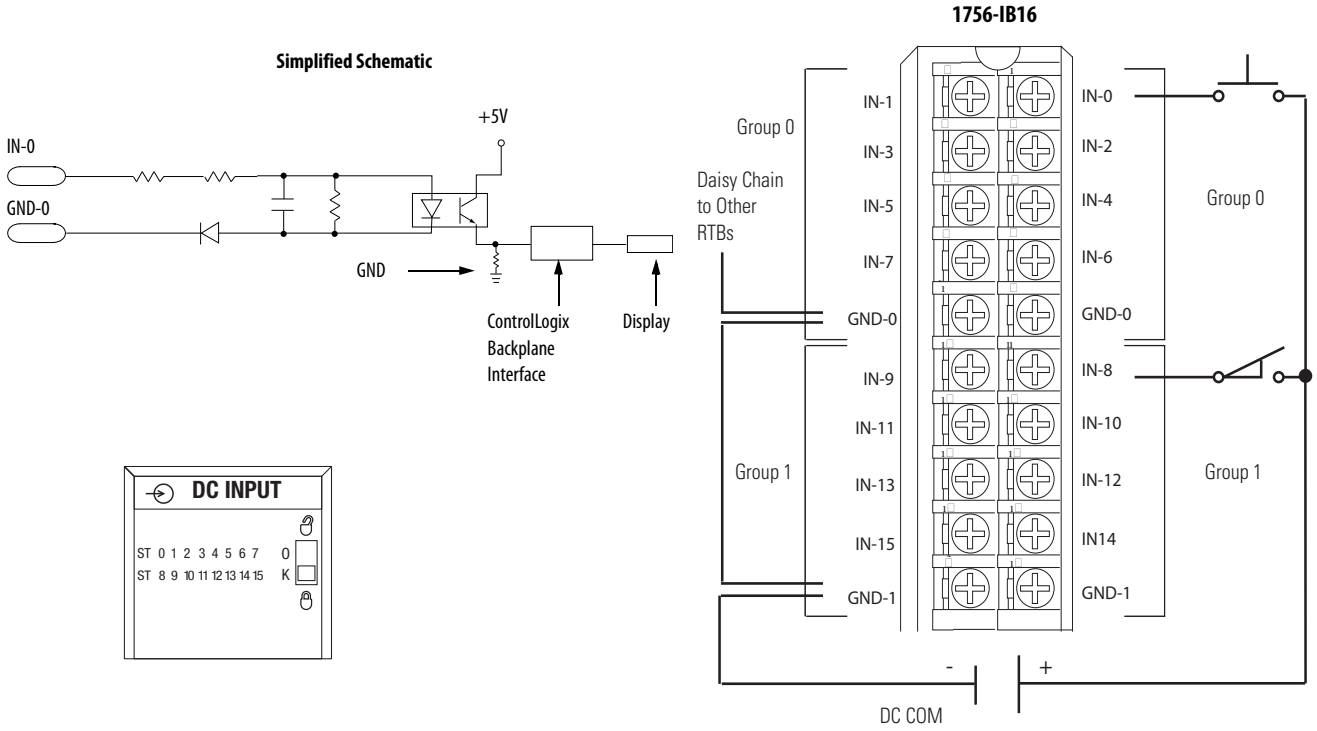
Certifications - 1756-IA32

Certification[1]	1756-IA32
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-IB16

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



Technical Specifications - 1756-IB16

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

Technical Specifications - 1756-IB16 (continued)

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

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

Environmental Specifications - 1756-IB16

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

Environmental Specifications - 1756-IB16 (continued)

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

Certifications - 1756-IB16

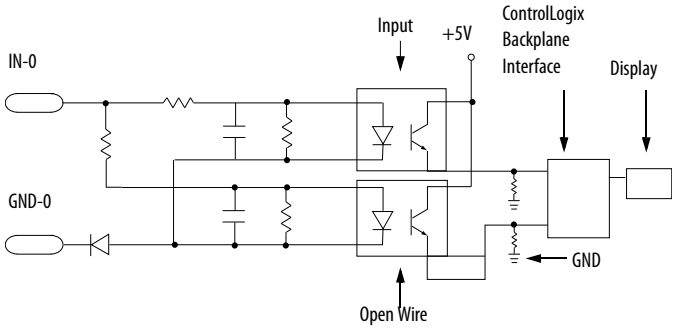
Certification(1)	1756-IB16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

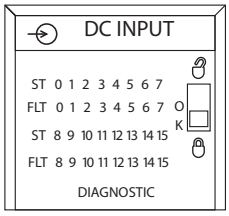
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IB16D

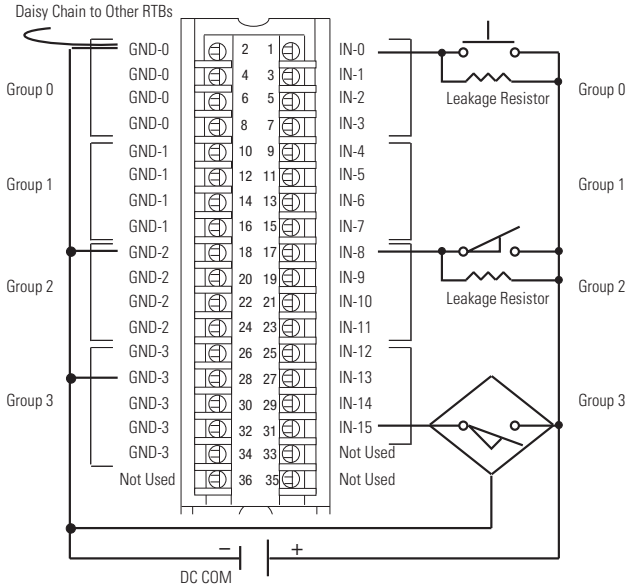
ControlLogix DC (10...30V) diagnostic input module

Simplified Schematic





1756-IB16D



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

Diagnostic Specifications - 1756-IB16D

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

Technical Specifications - 1756-IB16D

Attribute	1756-IB16D
Inputs	16 diagnostic (4 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10…30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 340 µs nom/1 ms max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 740 µs nom/4 ms max + filter time User-selectable filter time: 0 ms, 1 ms, 9 ms, or 18 ms

Technical Specifications - 1756-IB16D (continued)

Attribute	1756-IB16D
Current draw @ 5.1V	150 mA
Current draw @ 24V	3 mA
Total backplane power	0.84 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	13 mA @ 30V DC
Inrush current, max	250 mA
Input impedance, max	2.31 kΩ @ 30V DC
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IB16D

Attribute	1756-IB16D
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz

Environmental Specifications - 1756-IB16D (continued)

Attribute	1756-IB16D
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

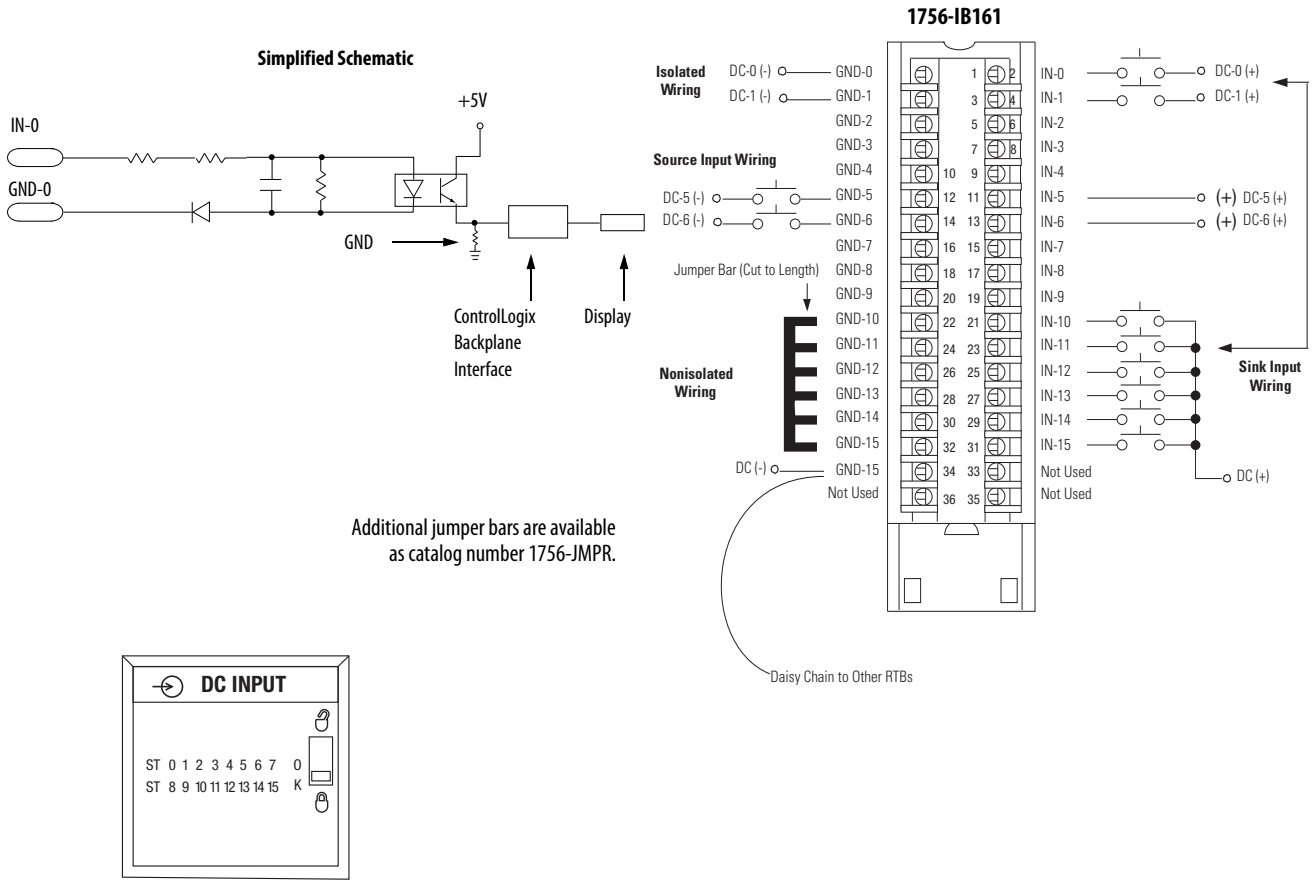
Certifications - 1756-IB16D

Certifications(1)	1756-IB16D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T3 X Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

1756-IB16I

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



Technical Specifications - 1756-IB16I

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

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

Environmental Specifications - 1756-IB16I

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

Certifications - 1756-IB16I

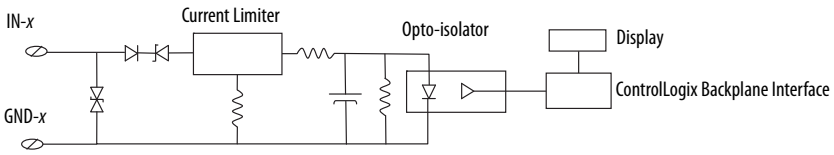
Certification[1]	1756-IB16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

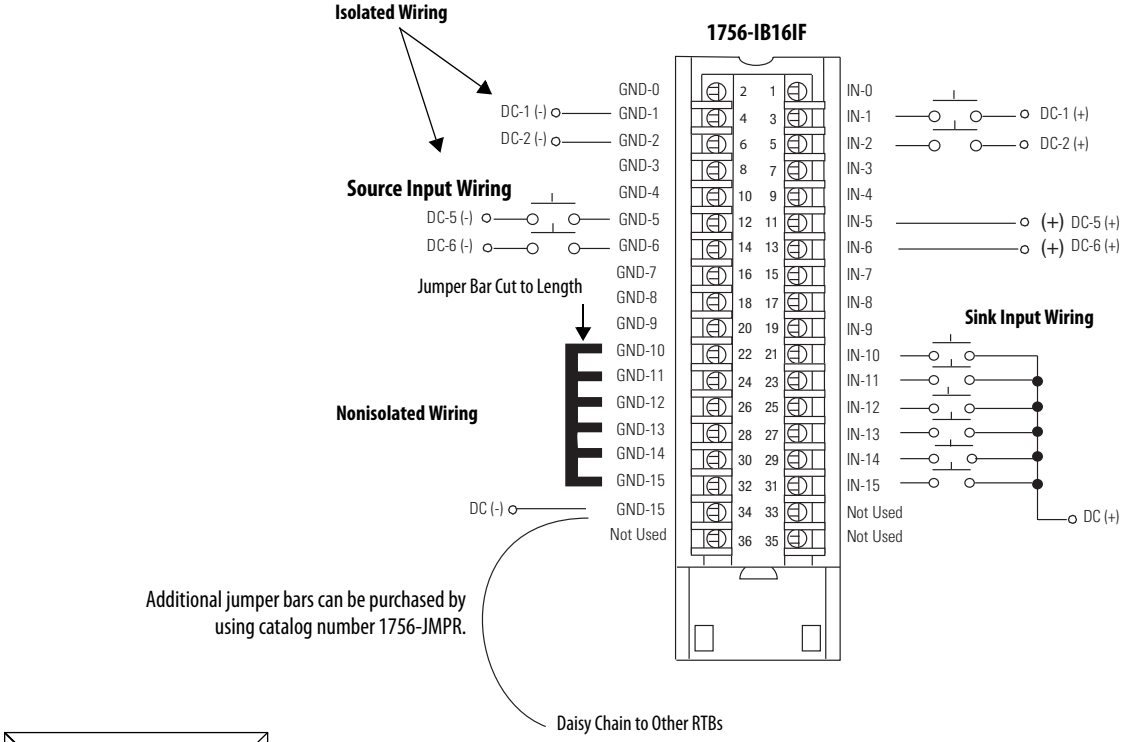
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

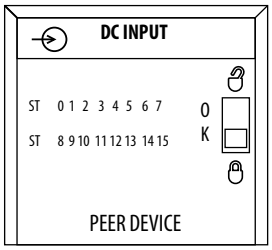
1756-IB16IF

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

Simplified Schematic







Technical Specifications - 1756-IB16IF

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

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

Environmental Specifications - 1756-IB16IF

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

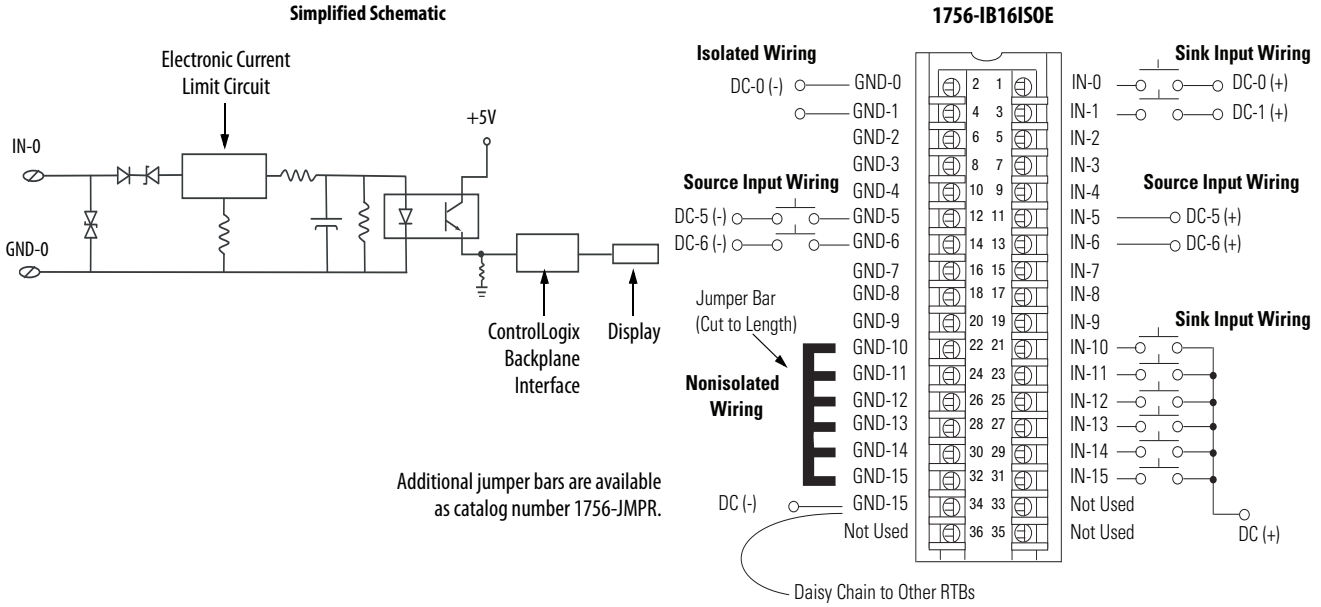
Certifications - 1756-IB16IF

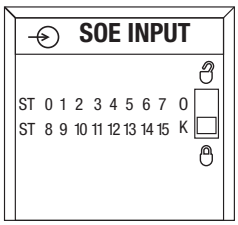
Certification(1)	1756-IB16IF
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-IB16ISOE

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





Technical Specifications - 1756-IB16ISOE

Attribute	1756-IB16ISOE
Inputs	16 individually isolated, sequence of events
Voltage category	24/48V DC sink/source
Operating voltage range	10…55V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On 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
Total backplane power	1.7 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	17.22 BTU/hr

Technical Specifications - 1756-IB16ISOE (continued)

Attribute	1756-IB16ISOE
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2.0 mA @ 9V DC
On-state current, nom	4.5 mA @ 24…31V DC
On-state current, max	5.1 mA @ 48…55V DC
Input impedance, max	10.8 kΩ @ 55V DC
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±100 µs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane 125V (continuous), basic insulation type, input-to-input Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IB16ISOE

Attribute	1756-IB16ISOE
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-IB16ISOE (continued)

Attribute	1756-IB16ISOE
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	2.5 kV

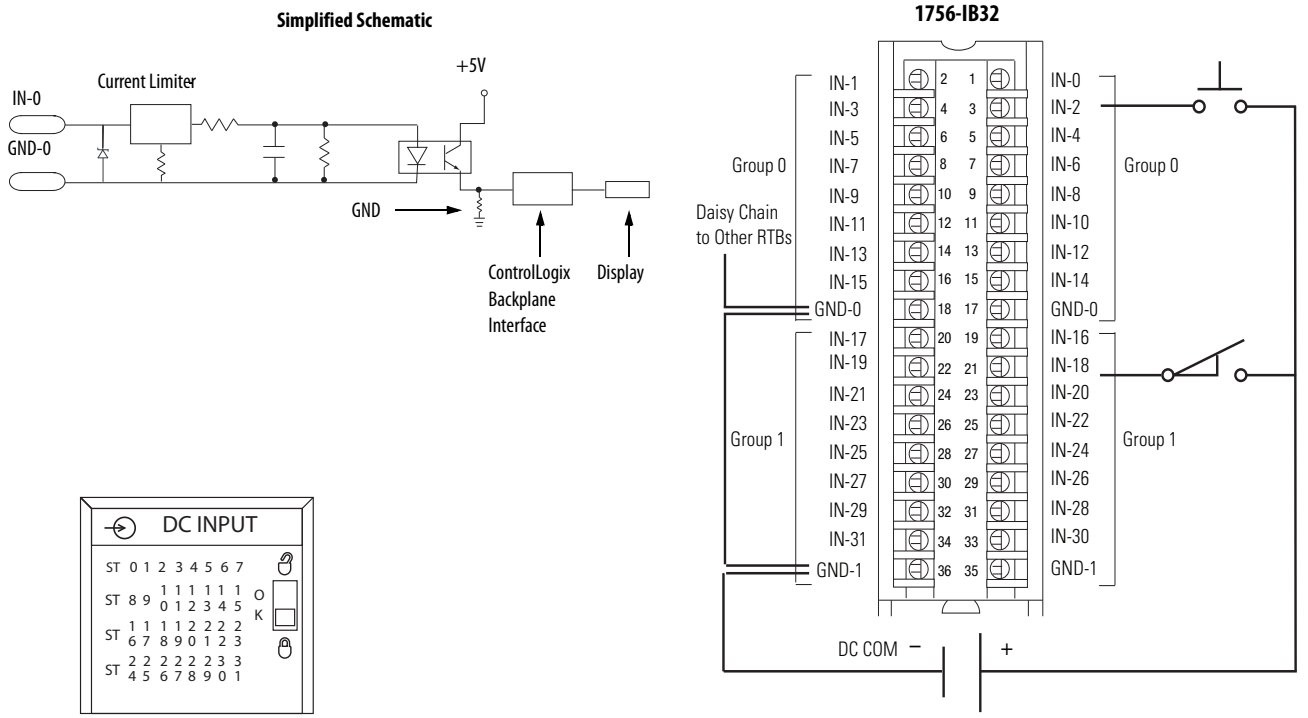
Certifications - 1756-IB16ISOE

Certification(1)	1756-IB16ISOE
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-IB32

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



Technical Specifications - 1756-IB32

Attribute	1756-IB32
Inputs	32 (16 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10…31.2V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 380 µs max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 420 µs max + filter time User-selectable filter time: 0 ms, 1 ms, 2 ms, 9 ms, or 18 ms
Current draw @ 5.1V	120 mA
Current draw @ 24V	2 mA
Total backplane power	0.66 W
Power dissipation, max	6.2 W @ 60 °C (140 °F)
Thermal dissipation	21.1 BTU/hr @ 60 °C (140 °F)
Off-state voltage, max	5V
Off-state current, max	2.27 mA
On-state current, min	4.8 mA @ 10V DC
On-state current, max	5.5 mA @ 31.2V DC
Inrush current, max	250 mA (decaying to < 37% in 22 ms, without activation)

Technical Specifications - 1756-IB32 (continued)

Attribute	1756-IB32
Input impedance, max	5.67 kΩ @ 31.2V DC
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane 250V (continuous), basic insulation type, input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 - on signal ports(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IB32

Attribute	1756-IB32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
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

Environmental Specifications - 1756-IB32 (continued)

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	10V rms with 1 kHz sine-wave 80% AM from 150 kHz...80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

Certifications - 1756-IB32

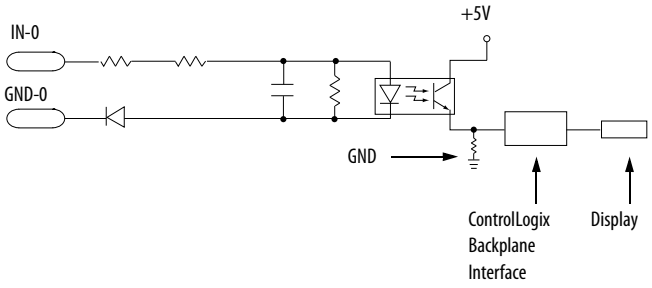
Certification[1]	1756-IB32
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

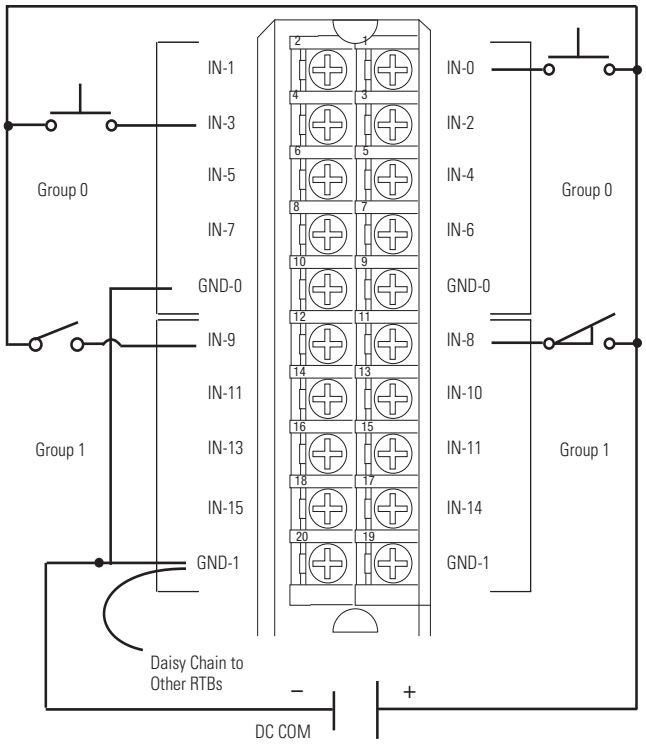
1756-IC16

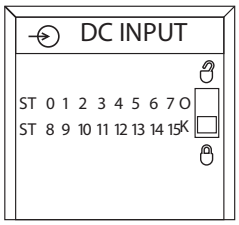
ControlLogix DC (30...60V) input module

Simplified Schematic



1756-IC16





Technical Specifications - 1756-IC16

Attribute	1756-IC16
Inputs	16 (8 points/group)
Voltage category	48V DC sink
Operating voltage range	30…55V DC @ 60 °C (140 °F) 30…60V DC @ 55 °C (131 °F)
Input voltage, nom	48V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 1 ms max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 4 ms max + filter time User-selectable filter time: 0 ms, 1 ms, 2 ms, 9 ms, or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	5.2 W @ 60 °C (140 °F)
Thermal dissipation	17.73 BTU/hr
Off-state voltage, max	10V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 30V DC
On-state current, max	7 mA @ 60V DC

Technical Specifications - 1756-IC16 (continued)

Attribute	1756-IC16
Inrush current, max	250 mA
Input impedance, max	8.57 kΩ @ 60V DC
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane 125V (continuous), basic insulation type, input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s, inputs-to-backplane Routine tested @ 924V AC for 2 s, input group-to-group
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IC16

Attribute	1756-IC16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, 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

Environmental Specifications - 1756-IC16 (continued)

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 ± 2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

Certifications - 1756-IC16

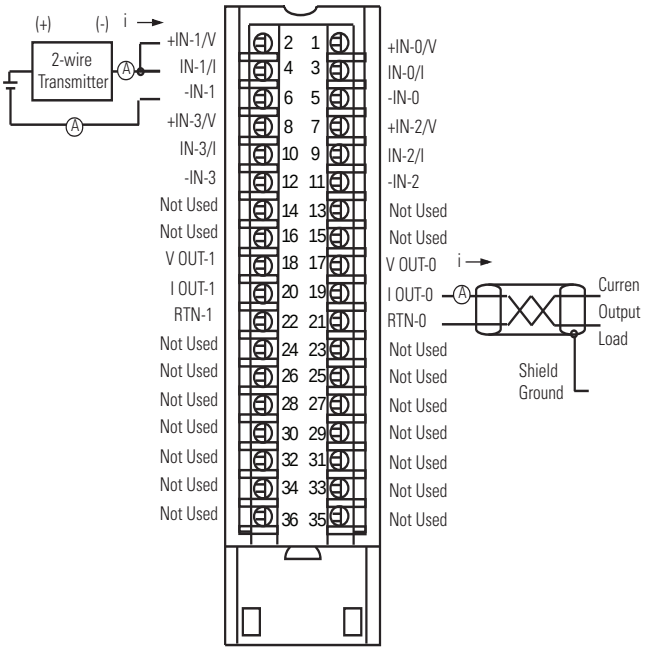
Certification[1]	1756-IC16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

1756-IF4FX0F2F

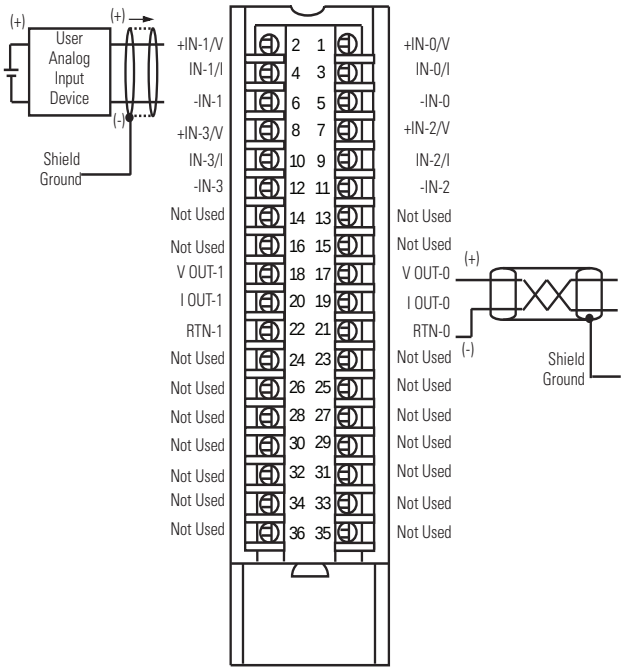
ControlLogix high-speed input/output analog module

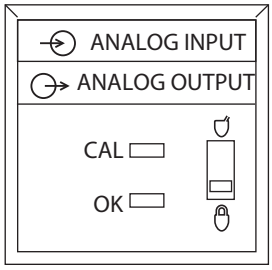
1756-IF4FX0F2F Current



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

1756-IF4FX0F2F Voltage





Technical Specifications - 1756-IF4FX0F2F

Attribute	1756-IF4FX0F2F
Current draw at 5.1V	375 mA
Current draw at 24V	100 mA
Voltage and current ratings	Backplane: 375 mA @ 5.1V DC, 100 mA @ 24V DC Analog inputs: -10…+10V, 4…20 mA Analog outputs: -10…+10V, 4…20 mA
Power consumption	4.3 W
Power dissipation	Voltage: 4.3 W Current: 4.7 W
Thermal dissipation	Voltage: 14.66 BTU/hr Current: 16.02 BTU/hr
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point

Technical Specifications - 1756-IF4FXOF2F (continued)

Attribute	1756-IF4FXOF2F
Isolation voltage	250V (continuous) Reinforced insulation type, Inputs and Outputs to Backplane No isolation between individual Inputs or Outputs Routine tested at 1800V AC for 1 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH: 0.5 Nm (4.4 pound-inches)
Wiring category(1)	2 - on signal ports
North American temp code	T4A
ATEX temp code	T4
IECEx temperature code	T4
Enclosure type	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Input Specifications - 1756-IF4FXOF2F

Attribute	1756-IF4FXOF2F
Number	4 high-speed, submillisecond, differential
Input range	± 10V 0…10V 0…5V 0…20 mA (Overrange indication when exceeded)
Resolution	Approx 14 bits across ±10.5V DC (21V total) ±10.5V range: 1.3 mV/bit, 14-bit effective 0…10.5V range: 1.3 mV/bit, 13-bit effective 0…5.25V range: 1.3 mV/bit, 12-bit effective Approx 12 bits across 21 mA 0…21 mA range: 5.25 µA/bit
Repeatability	±1 Least Significant Bit (LSB)(1)
Input impedance	Voltage: >1 MΩ Current: 249 Ω
Open circuit detection	Positive full-scale reading within 1 s
Overvoltage protection	Voltage: 30V DC Current: 8V AC/DC
Calibrated accuracy @ 25 °C (77 °F)	0.05% of range immediately after calibration Better than 0.1% of range within calibration interval
Calibration interval	12 months

Input Specifications - 1756-IF4FXOF2F (continued)

Attribute	1756-IF4FXOF2F
Gain drift with temperature	Voltage: 25 ppm/°C max Current: 35 ppm/°C max
Module error	0.2% of range
Module scan time	300 μs min(2)
Input conversion method	Successive approximation

(1) Repeatability is defined as the stability of the input channel reading when a steady state signal is applied, for example, ±1 LSB is one count (1.3 mV) from the nominal reading.
(2) 300 μs min for 1756-IF4FXOF2F/B, firmware revision 3.*x* or greater. 400 μs min for 1756-IF4FXOF2F/A, firmware revision 1.*x*.

Output Specifications - 1756-IF4FXOF2F

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

Environmental Specifications - 1756-IF4FXOF2F

Attribute	1756-IF4FXOF2F
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing

Environmental Specifications - 1756-IF4FXOF2F (continued)

Attribute	1756-IF4FXOF2F
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
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 signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IF4FXOF2F

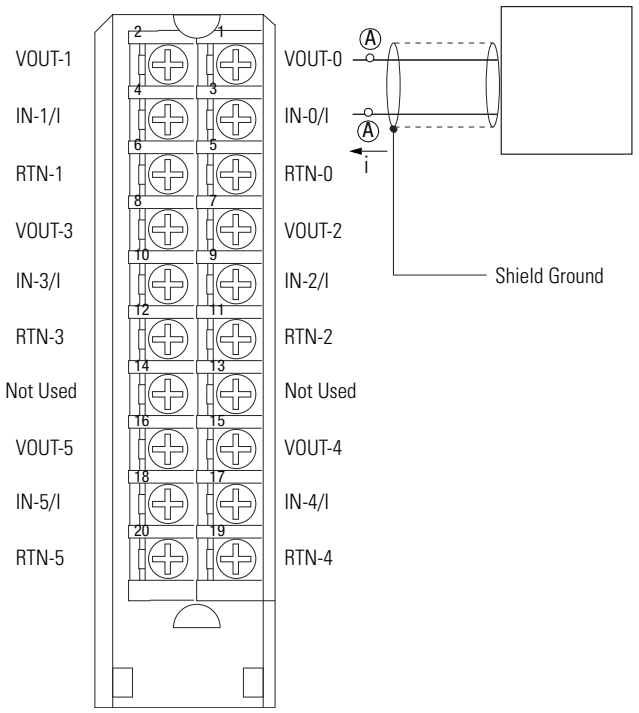
Certification(1)	1756-IF4FXOF2F
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CE	European Union 2014/30/EU 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 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

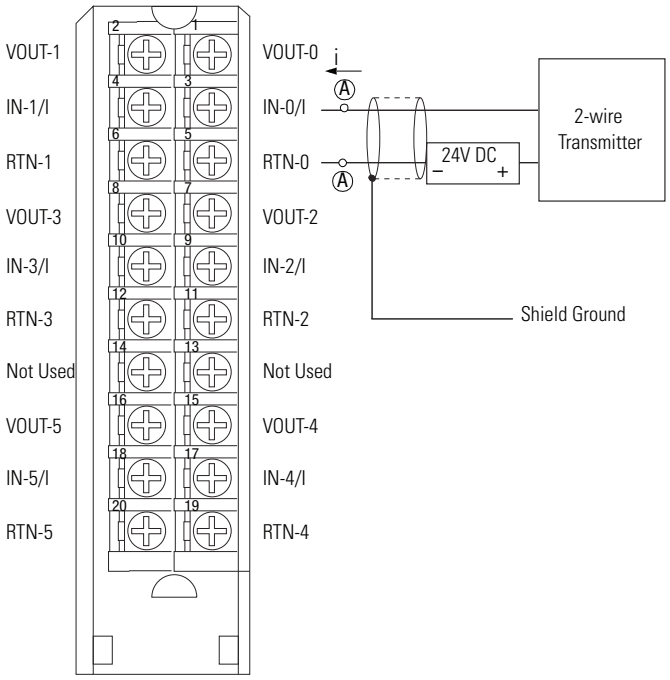
1756-IF6CIS

ControlLogix sourcing current loop analog input module

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

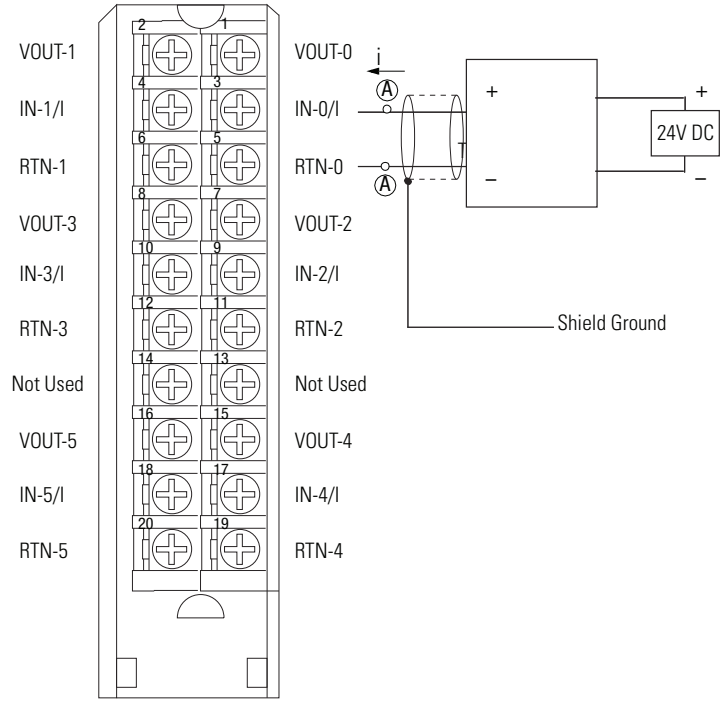


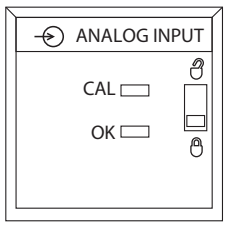
1756-IF6CIS 2-wire Transmitter Connected to the Module and an External, User-provided Power Supply Providing 24V DC Loop Power



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

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





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

Signal and User Counts - 1756-IF6CIS

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

Technical Specifications - 1756-IF6CIS

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

Technical Specifications - 1756-IF6CIS (continued)

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

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

Environmental Specifications - 1756-IF6CIS

Attribute	1756-IF6CIS
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz on shielded signal ports

Certifications - 1756-IF6CIS

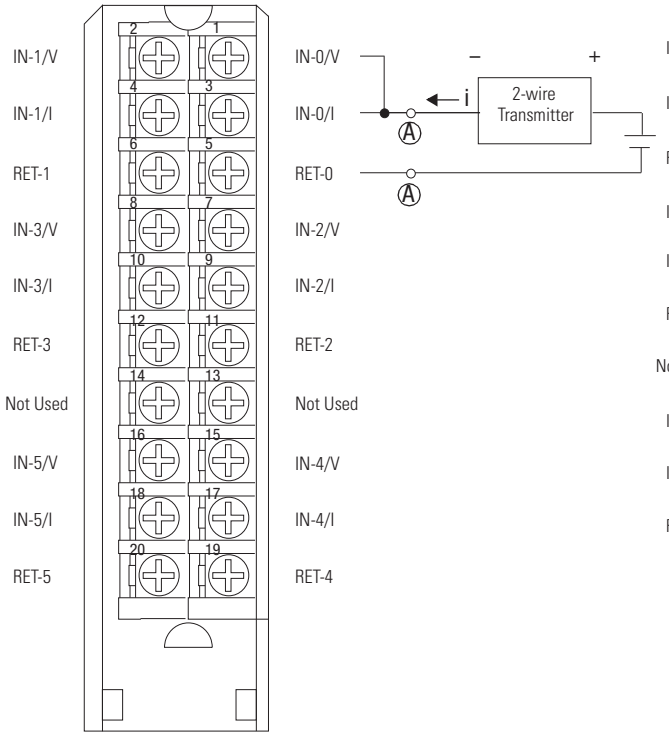
Certification[1]	1756-IF6CIS
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

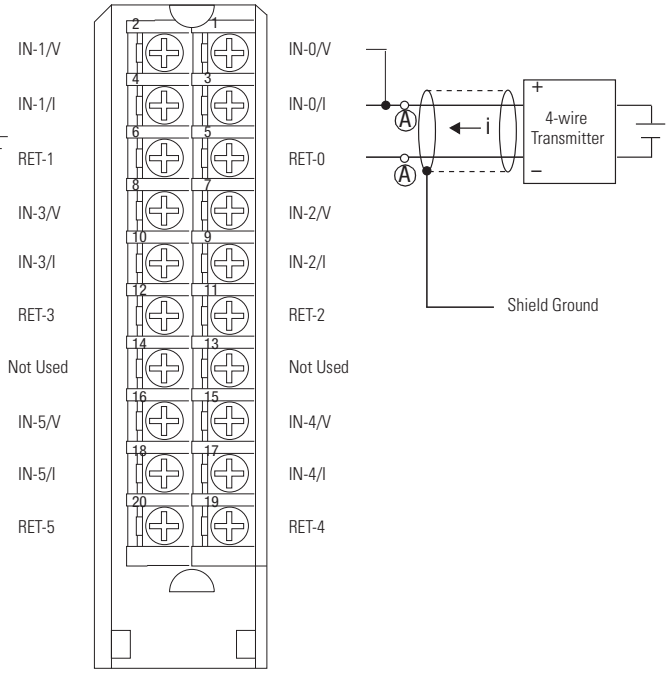
1756-IF6I

ControlLogix isolated voltage/current analog input module

1756-IF6I Current 2-wire

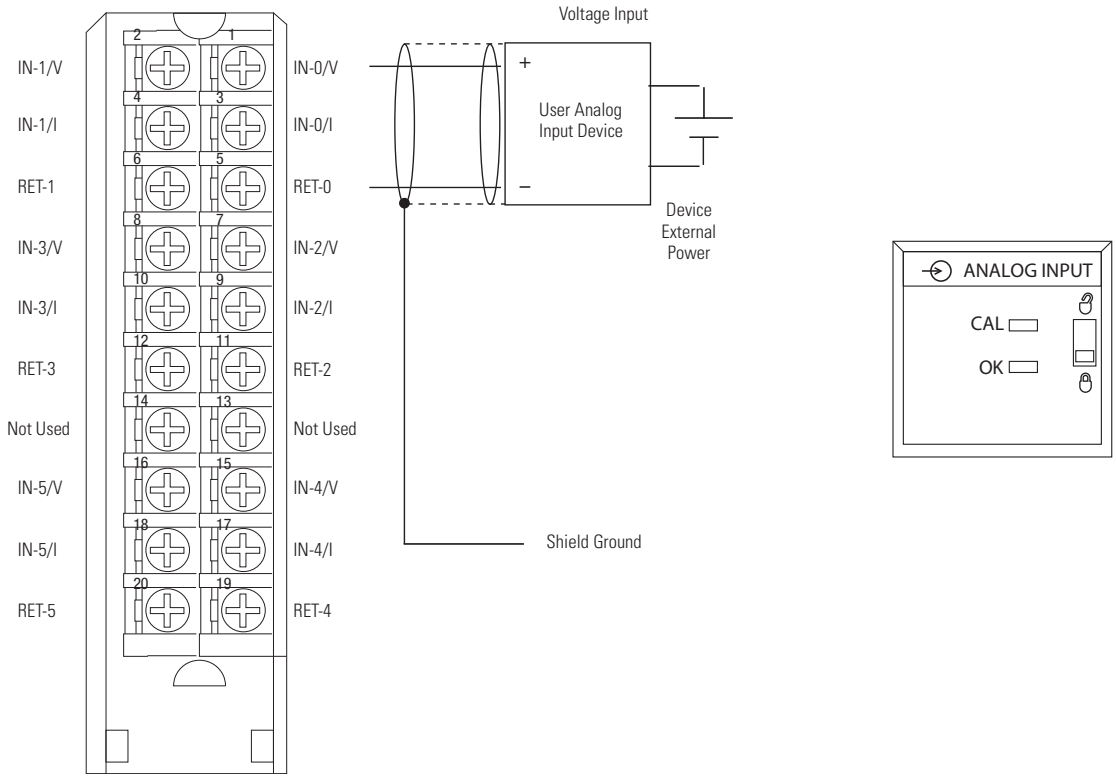


1756-IF6I Current 4-wire



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

1756-IF6I Voltage



Signal and User Counts - 1756-IF6I

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

Technical Specifications - 1756-IF6I

Attribute	1756-IF6I
Inputs	6 individually isolated
Input range	±10.5V 0…10.5V 0…5.25V 0…21 mA (Overrange indication when exceeded)
Resolution	16 bits 10.5V: 343 μV/bit 0…10.5V: 171 μV/bit 0…5.25V: 86 μV/bit 0…21 mA: 0.34 μA/bit
Current draw @ 5.1V	250 mA
Current draw @ 24V	100 mA
Total backplane power	3.7 W
Power dissipation, max	Voltage: 3.7 W Current: 4.3 W
Thermal dissipation	Voltage: 12.62 BTU/hr Current: 14.32 BTU/hr
Input impedance	Voltage: > 10 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 onboard 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)

Technical Specifications - 1756-IF6I (continued)

Attribute	1756-IF6I
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IF6I

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

Environmental Specifications - 1756-IF6I (continued)

Attribute	1756-IF6I
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz on shielded signal ports

Certifications - 1756-IF6I

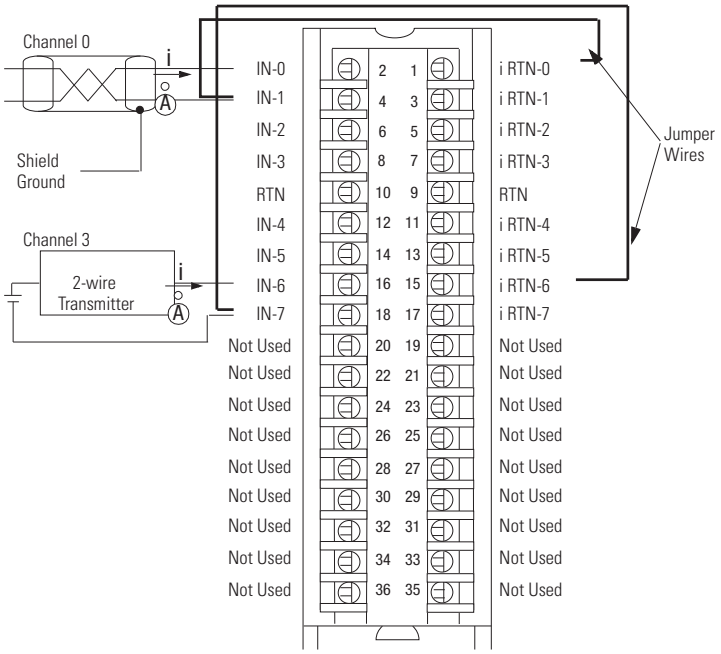
Certification(1)	1756-IF6I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

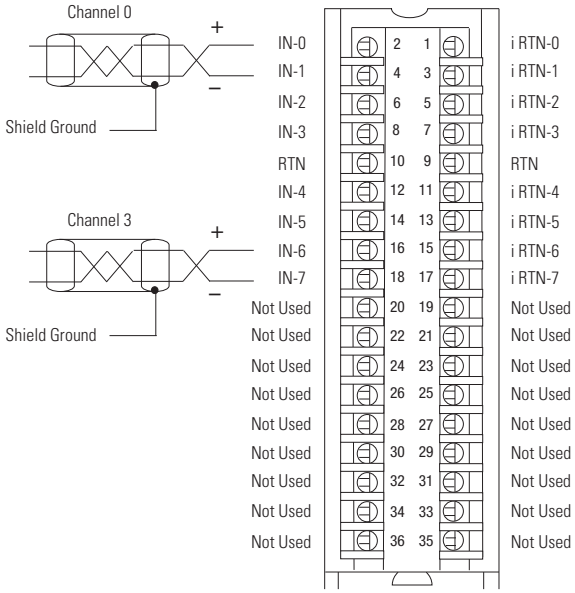
1756-IF8

ControlLogix voltage/current analog input module

1756-IF8 Differential Current



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 (-), i RTN-0
Channel 1	IN-2 (+), IN-3 (-), i RTN-2
Channel 2	IN-4 (+), IN-5 (-), i RTN-4
Channel 3	IN-6 (+), IN-7 (-), i RTN-6

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

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

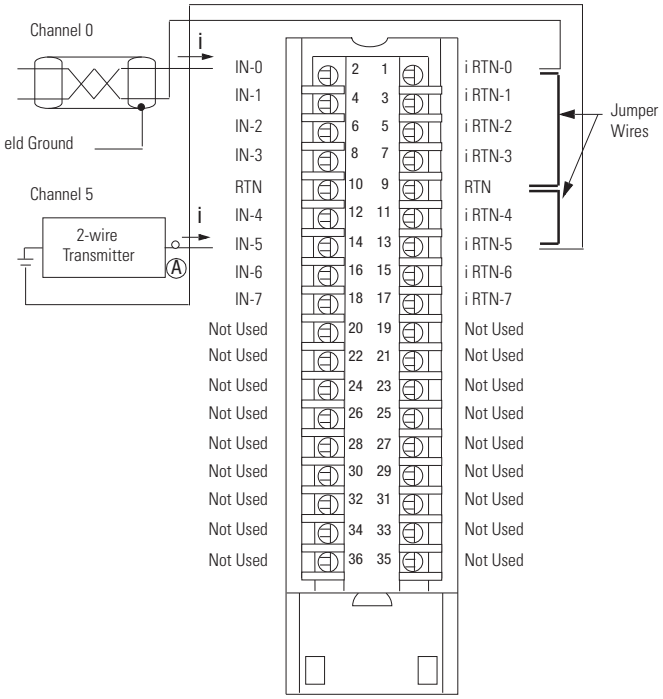
- Use this table when wiring your module in Differential mode.

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

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

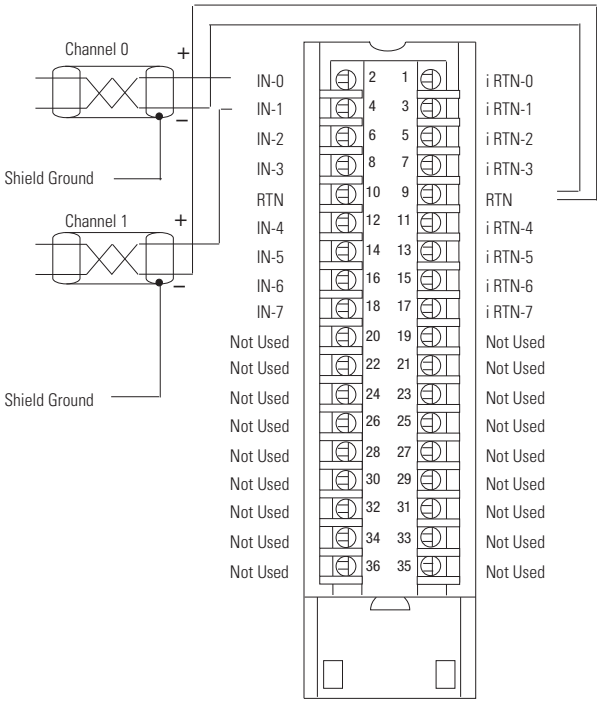
IMPORTANT: When operating in 2-channel, High-Speed mode, only use channels 0 and 2.

1756-IF8 Single-ended Current

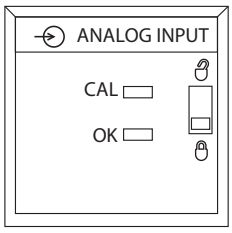


- All terminals marked RTN are connected internally.
- For current applications, all terminals marked iRTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-*x* and i RTN-*x* terminals.
- Place additional loop devices (such as strip chart recorders) at the A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

1756-IF8 Single-ended Voltage



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



Technical Specifications - 1756-IF8

Attribute	1756-IF8
Inputs	8 single-ended 4 differential 2 high-speed differential
Input range	±10V 0…10V 0…5V 0…20 mA
Resolution	±10.25V: 320 μV/count (15 bits plus sign bipolar) 0…10.25V: 160 μV/count (16 bits) 0…5.125V: 80 μ/V count (16 bits) 0…20.5mA: 0.32 μA/count (16 bits)
Current draw @ 5.1V	150 mA
Current draw @ 24V	40 mA
Total backplane power	1.73 W
Voltage and current ratings	Backplane: 5.1V DC, 150 mA max, 24V DC, 40mA max Input voltage range: -10…+10V Input current range: 4…20mA Limited to 100VA
Power consumption	1.73 W
Power dissipation	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[(2)]
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)]
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta

Technical Specifications - 1756-IF8 (continued)

Attribute	1756-IF8
Isolation voltage	250V (continuous), Reinforced insulation type, Inputs to Backplane. No isolation between individual Inputs. Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at |105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH: 0.5 N•m (4.4 lb•in)
Wiring category(1)	2 - on signal ports
North American temp code	T4A
ATEX temp code	T4
IECEx temp code	T4
Enclosure type	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) Notch filter dependent.

Environmental Specifications - 1756-IF8

Attribute	1756-IF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-IF8 (continued)

Attribute	1756-IF8
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 signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IF8

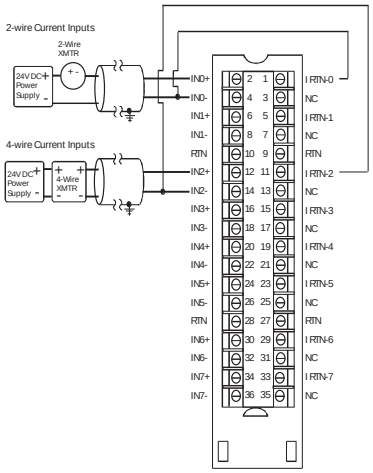
Certification[1]	1756-IF8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CE	European Union 2014/30/EU 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 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

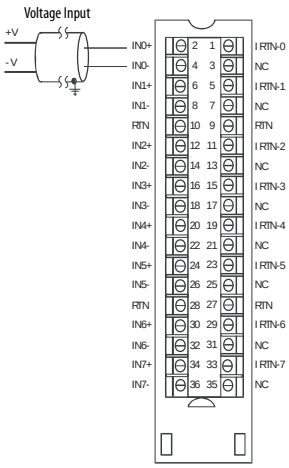
1756-IF8H

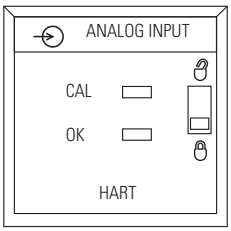
ControlLogix voltage/current analog input module with HART protocol

1756-IF8H Current



1756-IF8H Voltage





Technical Specifications - 1756-IF8H

Attribute	1756-IF8H
Inputs	Eight differential voltage or current inputs, one HART modem per module
Input range	±10V 0…5V 1…5V 0…10V 0…20 mA 4…20 mA
Resolution	16…21 bits
Voltage and current ratings	Backplane: 5.1V DC, 300mA, 24V DC, 135mA Input voltage range: -10…+10V Input current range: 0…20 mA, 4…20mA
Total backplane power	4.77 W
Power dissipation	Voltage: 3.21 W Current: 4.01 W
Thermal dissipation	Voltage: 11.0 BTU/hr Current: 13.7 BTU/hr
Input impedance	–
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
Module error	Voltage: 0.1% of range Current: 0.3% of range

Technical Specifications - 1756-IF8H (continued)

Attribute	1756-IF8H
Module HART scan time	Analog: 18...488 ms (filter dependent). HART: typically 1 s per HART channel enabled. Estimate 10 s if all 8 channels have HART enabled. Typically 1 s per HART channel enabled. Estimate 10 s if all 8 channels have HART enabled. Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	50V (continuous), Basic insulation type, input channels to backplane No isolation between individual input channels Type tested at 1500V AC for 60 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F, or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH 0.5 N•m (4.4 lb•in)
Wire category(1)	2 - on signal ports
Wire type	Copper
North American temp code	T5
ATEX temp code	T4
IECEx temp code	T4
Enclosure type rating	None (open-style)

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

Environmental Specifications - 1756-IF8H

Attribute	1756-IF8H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz

Environmental Specifications - 1756-IF8H (continued)

Attribute	1756-IF8H
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IF8H

Certification[1]	1756-IF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU 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)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4: Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO12ATEX1219040X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0109X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

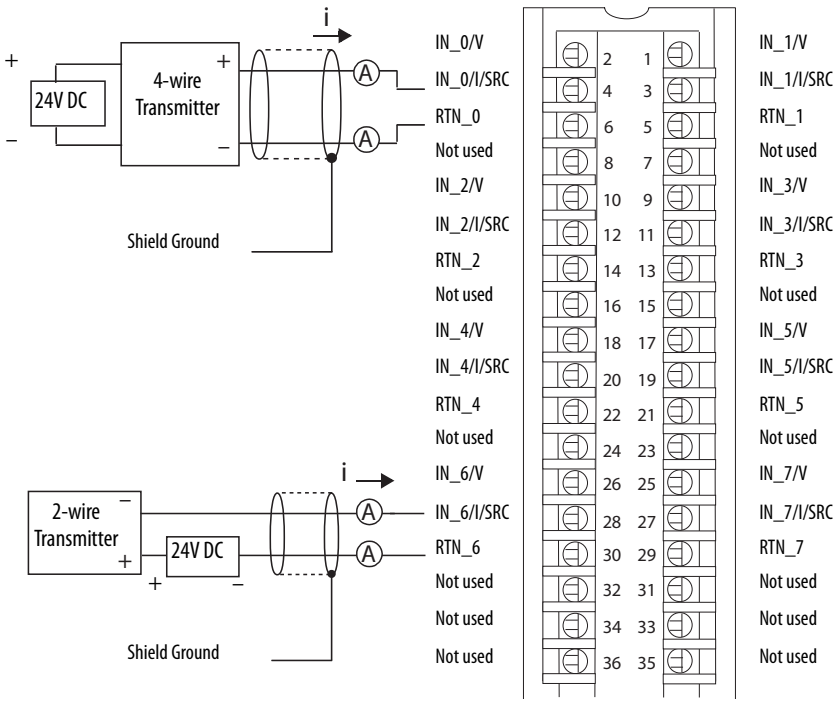
1756-IF8I

ControlLogix isolated voltage/current analog input module.

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

IMPORTANT: Remember the following:

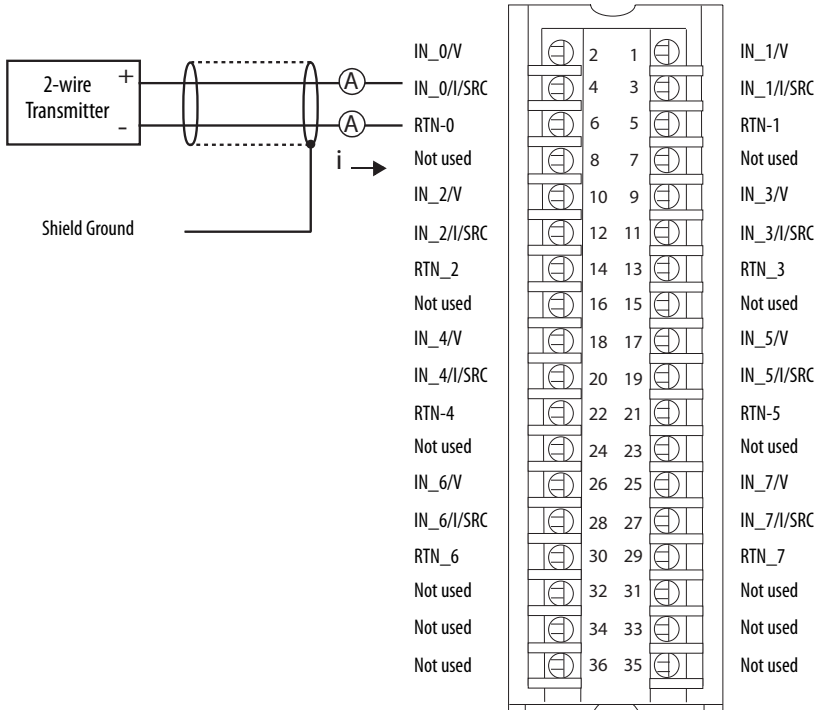
- In this wiring diagram, an external, user-provided power supply provides 24V DC loop power.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional loop devices, for example, strip chart recorders, at either 'A' location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



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

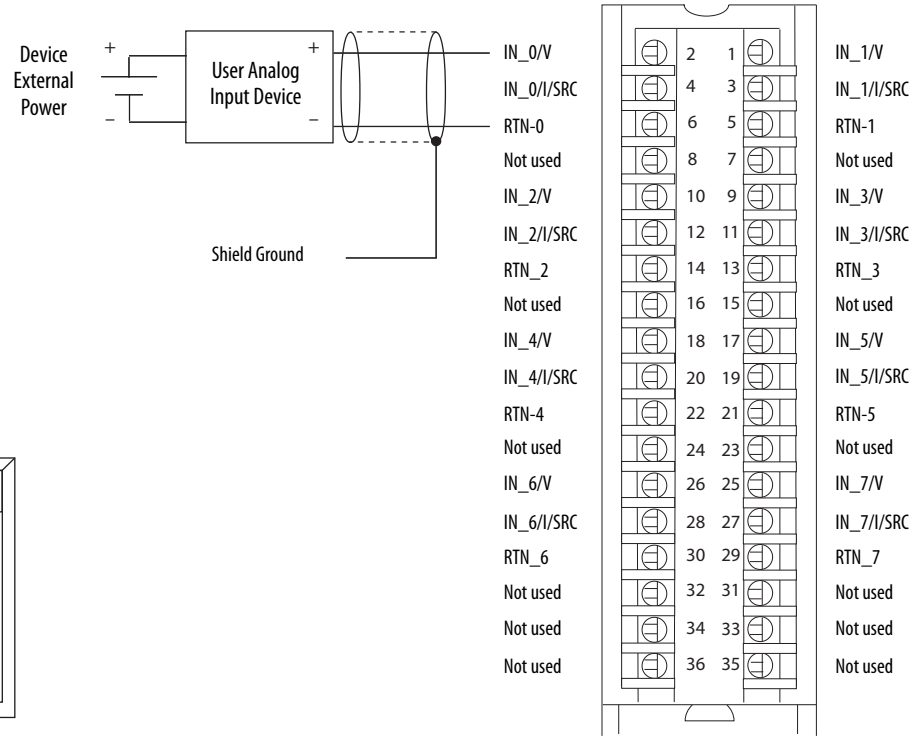
IMPORTANT: Remember the following:

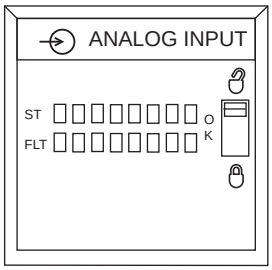
- In this wiring diagram, the module provides 24V DC loop power.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional loop devices, for example, strip chart recorders, at either 'A' location in the current loop.



1756-IF8I Module Wiring Diagram - Voltage Mode

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





Technical Specifications - 1756-IF8I

Attribute	1756-IF8I
Inputs	Eight isolated channels - Any combination of Voltage or Current mode
Input ranges	-10…10V 0…10V 0…5V 0…20 mA
Resolution	24-bit ±10.5V (1.49 µV/count) 0…10.5V (1.49 µV/count) 0…5.25V (1.49 µV/count) 0…21 mA (2.99 nA/count)
Current draw @ 5.1V	200 mA
Current draw @ 24V	Voltage/Non-sourcing Current mode: 150 mA Sourcing Current mode: 400 mA (In Sourcing Current mode, the channel provides loop power.)
Total backplane power	Voltage/Non-sourcing Current mode: 4.6 W Sourcing Current mode: 10.6 W
Power dissipation, max	Voltage mode: 4.6 W Non-sourcing Current mode: 5.1 W Sourcing Current mode: 7.3 W
Thermal dissipation	Voltage mode: 15.7 BTU/hr Non-sourcing Current mode: 17.4 BTU/hr Sourcing Current mode: 24.9 BTU/hr

Technical Specifications - 1756-IF8I (continued)

Attribute	1756-IF8I
Input impedance, approx	Voltage mode: 1 GΩ (powered); 7500 Ω (unpowered) Current mode: 125 Ω
Sourcing voltage, min	20V DC
Sourcing voltage, max	38V DC (open circuit)
Sourcing current, max	Current Limited < 45 mA (IN_x/I/SRC to RTN_x)
Open circuit detection time	5 s
Overvoltage protection, max	±30V DC
Normal mode noise rejection	80 dB @ 60 Hz(1)
Common mode noise rejection	120 dB @ 50/60 Hz
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Calibrated accuracy 25 °C (77 °F)	0.05%
Module error over full temperature range	0.1%
Module input scan time, min	1 ms
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes - Rate set by Requested Packet Interval rate
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced insulation type, inputs to backplane 250V (continuous), basic insulation type, input to input Type tested at 2300V AC for 60 s, inputs to backplane Type tested at 1500V AC for 60 s, input to input
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33…2.1 mm2 (22...14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports(2)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IF8I

Attribute	1756-IF8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

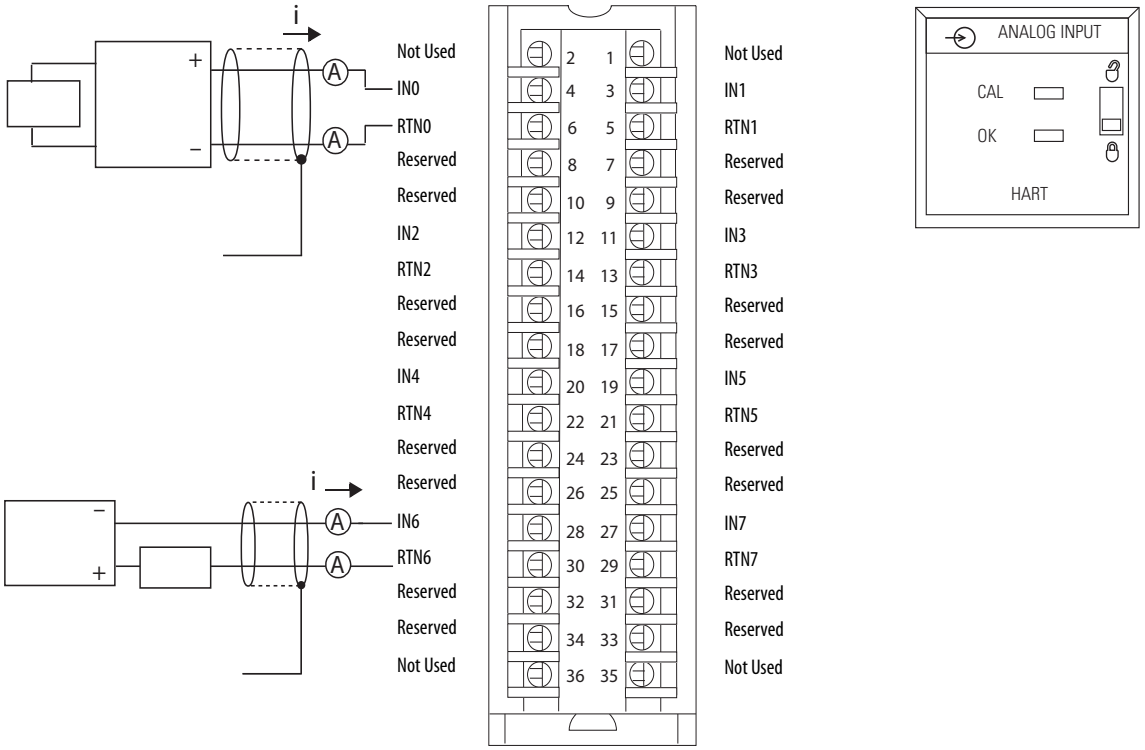
Certifications - 1756-IF8I

Certification(1)	1756-IF8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: • EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3

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

1756-IF8IH

ControlLogix isolated current analog input module with HART protocol



Technical Specifications - 1756-IF8IH

Attribute	1756-IF8IH
Inputs	Eight current inputs
Input range	0…20 mA (0…20.58 mA) 4…20 mA (3.42…20.58 mA)
Resolution	16…21 bits
Voltage and current ratings	Backplane: 210 mA @ 5.1V DC, 110 mA @ 24V DC Input voltage range: 5…30V DC Input current range: 0…20 mA, 4…20 mA
Power dissipation within module	4 W
Inrush current	400 mA @ 5V 450 mA @ 24V
Isolation voltage	250V (continuous) Reinforced Insulation Type, inputs to backplane. Basic Insulation Type, input to input, and inputs to ground. Type tested at 3535V DC for 60 s, inputs to backplane. Type tested at 2120V DC for 60 s, input to input, and inputs to ground.
Input impedance	250 Ω ±5 Ω
Open circuit detection time	5 s (4...20 mA range only)
Input overvoltage protection	+28.8V DC
Normal mode noise rejection	> 90 dB @ 50 Hz and 60 Hz with 10 Hz filter > 74 dB @ 50 Hz and 60 Hz with 15 Hz filter > 33 dB @ 50 Hz and > 90 dB @ 60 Hz with 20 Hz filter

Technical Specifications - 1756-IF8IH (continued)

Attribute	1756-IF8IH
Common mode noise rejection	> 90 dB @ 50 Hz and 60 Hz (10 Hz, 15 Hz, or 20 Hz filters only)
Calibrated accuracy at 25 °C with HART disabled	0.15…1.5% of full scale, filter dependent
Calibrated accuracy at 25 °C with HART enabled	1.5% of full scale with 250 Hz filter 0.5% of full scale with 100 Hz filter 0.2% of full scale with 50 Hz or 60 Hz filter 0.15% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibrated accuracy over full temperature range with HART enabled	1.8% of full scale with 250 Hz filter 0.8% of full scale with 100 Hz filter 0.5% of full scale with 50 Hz or 60 Hz filter 0.4% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibration interval	12 months typical
Input offset drift with temperature	<=300 μA/°C
Gain drift with temperature	20 ppm/°C
Module error over full temperature range with HART disabled	0.3% of range (all filters)
Module scan time for all channels - analog, min	18…488 ms (filter dependent)
Typical module HART dynamic variables update time for all channels	1 s typical if all channels are HART enabled Pass through messages, handheld communications, secondary masters, communication errors, or configuration changes can significantly increase the update time.
Data format	32-bit floating point
Input conversion method	Sigma-Delta ADC (24-bit converter)
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire Size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH 0.4 N•m (4. 4 lb•in)
Wire category	2 - on signal ports(1)
Wire type	Copper
North American temp code	T5
ATEX temp code	T4
IECEx temp code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IF8IH

Attribute	1756-IF8IH
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IF8IH

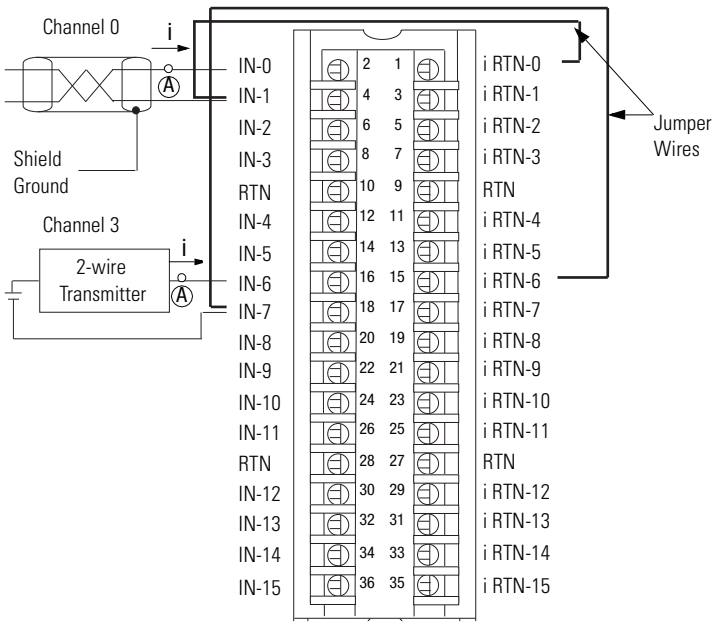
Certification[1]	1756-IF8IH
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584 UL Listed for Class I, Division 2 Group A, B, C, D Hazardous Locations, certified for US and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • 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 and B) European Union 2014/35/EU LVD, compliant with: • EN 61131-2: Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4: Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO14ATEX1238X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0110X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

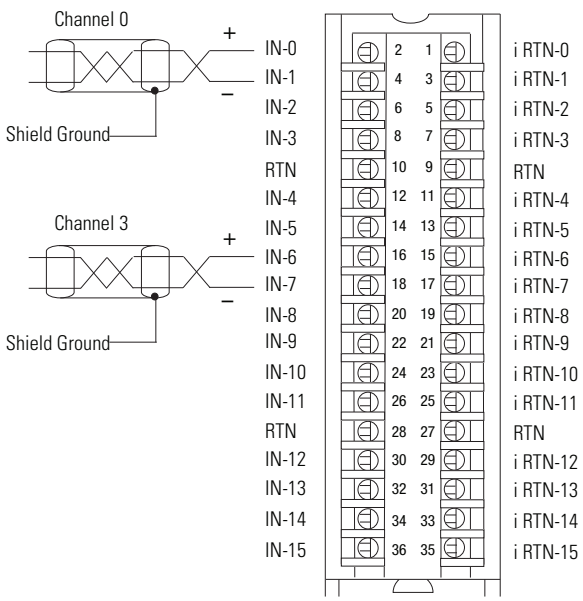
1756-IF16

ControlLogix voltage/current analog input module

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 accuracy of the module.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.

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

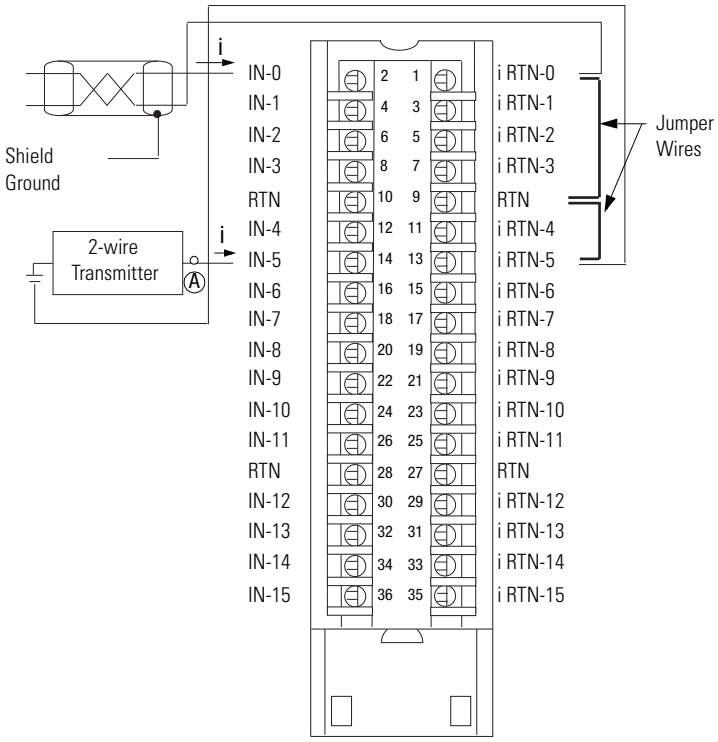
Use this table when wiring your module in Differential mode.

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

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

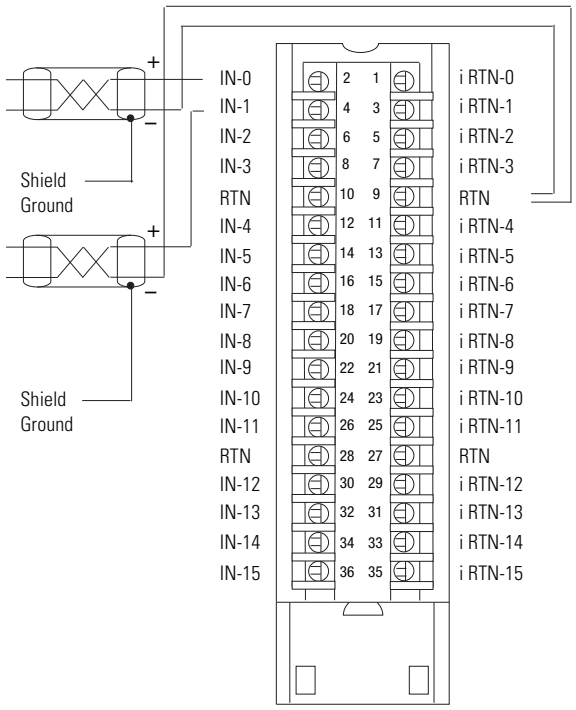
IMPORTANT: When operating in 4-channel, High-Speed mode, only use channels 0, 2, 4, and 6.

1756-IF16 Single-ended Current

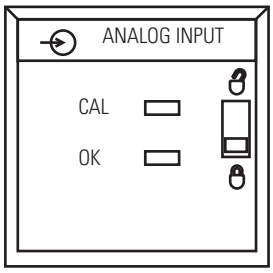


- All terminals marked RTN are connected internally.
- For current applications, all terminals marked i RTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-*x* and iRTN-*x* terminals.
- Place additional loop devices (such as strip chart recorders) at the A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

1756-IF16 Single-ended Voltage



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



Technical Specifications - 1756-IF16

Attribute	1756-IF16
Inputs	16 single ended, 8 differential or 4 differential (high speed)
Input range	±10V 0…10V 0…5V 0…20 mA
Resolution	320 µV/count (15 bits + sign bipolar) @ ±10.25V 160 µV/count (16 bits) @ 0…10.25V 80 µV/count (16 bits) @ 0…5.125V 0.32 µA/count (16 bits) @ 0…20.5 mA
Current draw @ 5.1V	150 mA
Current draw @ 24V	65 mA
Total backplane power	2.33 W
Voltage and current ratings	Backplane: 5.1V DC, 150mA max 24V DC, 65mA max Input Voltage Range: -10…+10V Input Current Range: 4…20mA Limited to 100VA
Power consumption	2.3 W
Power dissipation	Voltage: 2.3 W Current: 3.9 W
Thermal dissipation	Voltage: 7.84 BTU/hr Current: 13.3 BTU/hr
Input impedance	Voltage: >10 MΩ Current: 249 Ω
Open circuit detection time	Differential voltage - Positive full scale reading within 5 s Single-ended/differential current - Negative full scale reading within 5 s Single-ended voltage - Even-numbered channels go to positive full scale reading within 5 s, odd-numbered channels go to negative full scale reading within 5 s
Overvoltage protection, max	Voltage: 30V DC Current: 8V DC
Normal mode noise rejection	>80 dB @ 50/60 Hz[2]
Common mode noise rejection	>100 dB @ 50/60 Hz
Channel bandwidth	15 Hz (-3 dB)[1]
Settling time	<80 ms to 5% of full scale[1]
Calibrated accuracy 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Offset drift	45 µV/°C
Gain drift with temperature	Voltage: 15 ppm/°C Current: 20 ppm/°C
Module error	Voltage: 0.1% of range Current: 0.3% of range
Module input scan time, min	16 pt single-ended: 16…488 ms 8 pt differential: 8…244 ms 4 pt differential: 5…122 ms[1]
Onboard data alarming	Yes
Scaling to engineering units	Yes
Real-time channel sampling	Yes
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta

Technical Specifications - 1756-IF16 (continued)

Attribute	1756-IF16
Isolation voltage	250V (continuous), Reinforced insulation type, Inputs-to-Backplane. No isolation between individual Inputs. Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH: 0.5 N•m (4.4 lb•in)
Wire category(1)	2 - on signal ports
North American temp code	T4A
ATEX temp code	T4
IECEx temp code	T4
Enclosure type	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.
(2) Notch filter dependent.

Environmental Specifications - 1756-IF16

Attribute	1756-IF16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-IF16 (continued)

Attribute	1756-IF16
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 signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

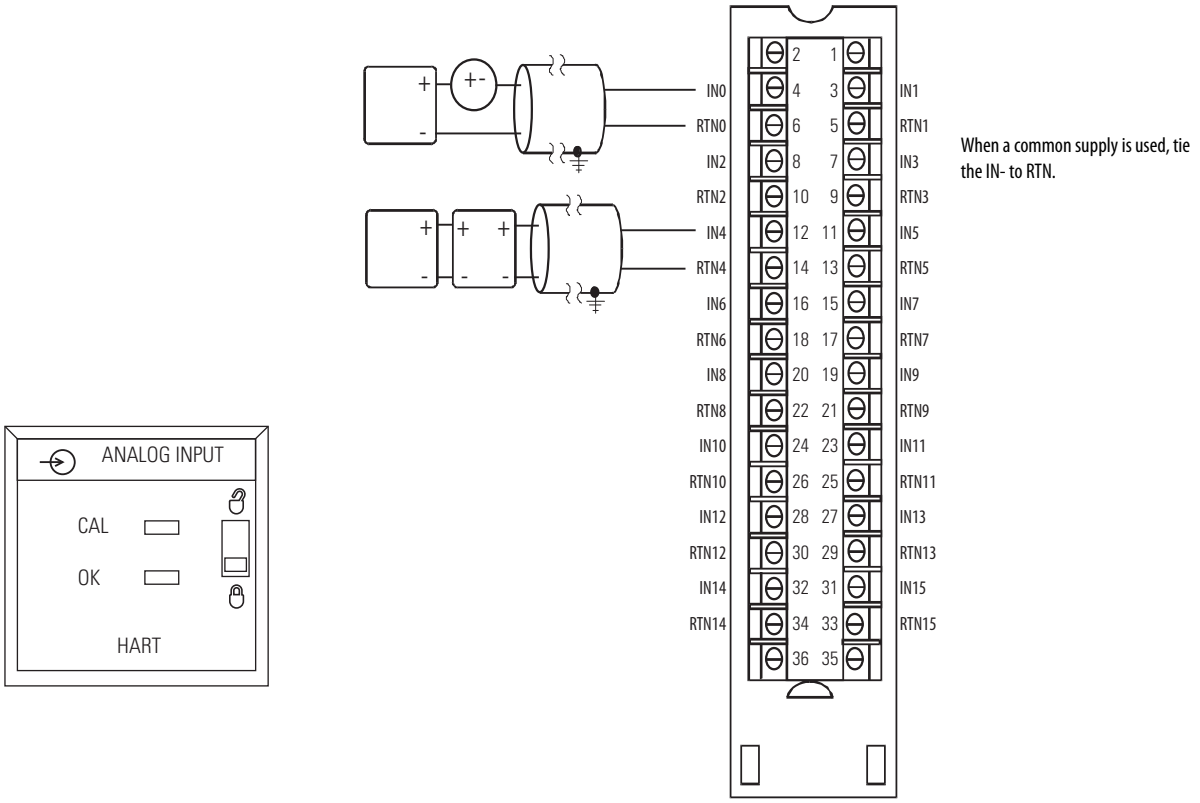
Certifications - 1756-IF16

Certification(1)	1756-IF16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CE	European Union 2014/30/EU 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 2014/35/EU LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

1756-IF16H

ControlLogix current analog input module with HART protocol



Technical Specifications - 1756-IF16H

Attribute	1756-IF16H
Inputs	16 differential, current Dedicated HART modem per channel
Input range	0…20 mA 4…20 mA
Resolution	16…21 bits
Voltage and current ratings	Backplane: 5.1V DC @ 200 mA, 24V DC @ 125 mA Input current range: 0…20 mA, 4…20 mA
Total backplane power	4.02 W
Power dissipation, max	6 W
Isolation voltage	50V (continuous), Basic insulation type, Input Channels to Backplane No isolation between individual Input Channels Type tested at 1500V DC for 60 s
Thermal dissipation	12 BTU/hr
Input impedance	249 Ω
Open circuit detection time	Positive full scale reading within 5 s
Overvoltage protection, max	8V DC
Normal mode noise rejection	74 dB @ 50/60 Hz (15 Hz filter) 90 dB @ 60 Hz (20 Hz filter)
Common mode noise rejection	> 90 dB @ 50/60 Hz (15 Hz and 20 Hz filters only)

Technical Specifications - 1756-IF16H (continued)

Attribute	1756-IF16H
Repeatability	Better than 0.01% of range (15 Hz and 20 Hz filters only)
Calibrated accuracy	Better than 0.13% of range (all filters)
Calibration interval	12 months typical
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	Estimate 1 s if all channels are HART enabled
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque spec	1756-TBCH 0.5 N•m (4.4 lb•in)
Wire category(1)	2 - on signal ports
Wire type	Copper
North American temp code	T5
ATEX temp code	T4
IECEx temp code	T4
Enclosure type rating	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-IF16H

Attribute	1756-IF16H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing

Environmental Specifications - 1756-IF16H (continued)

Attribute	1756-IF16H
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock):	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

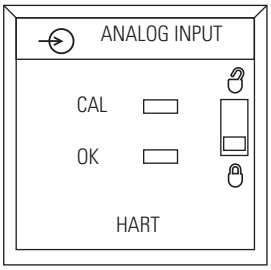
Certifications - 1756-IF16H

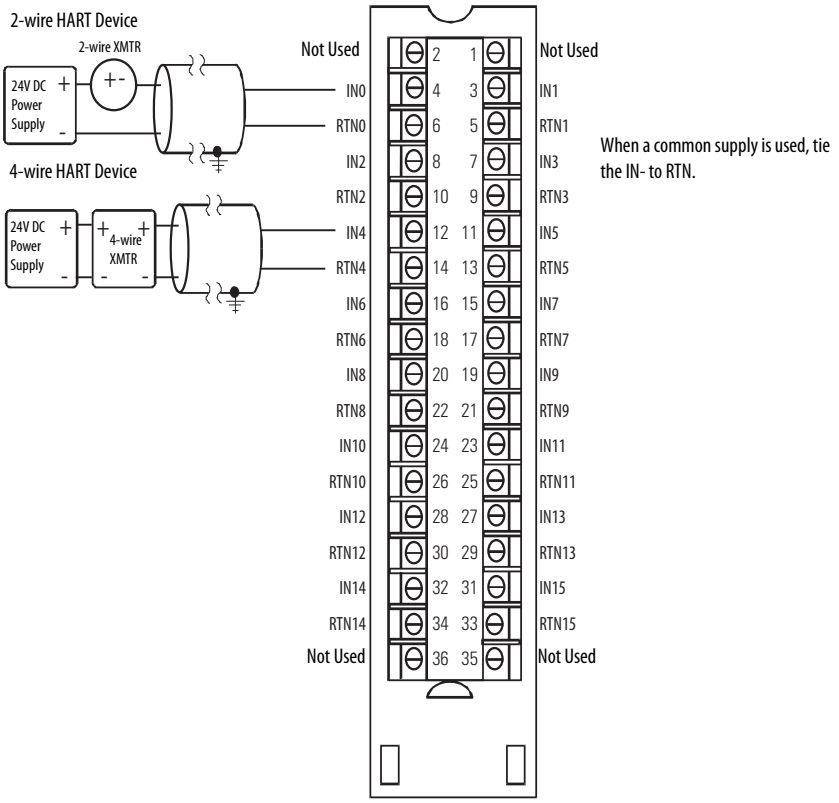
Certification(1)	1756-IF16H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • 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)
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO12ATEX1219040X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0109X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

1756-IF16IH

ControlLogix current analog input module with HART protocol





Technical Specifications - 1756-IF16IH

Attribute	1756-IF16IH
Voltage and current ratings	Backplane: 225 mA @ 5.1V DC, 200 mA @ 24V DC 16 Inputs Input current range: 0…20 mA, 4…20 mA
Resolution	16…21 bits
Power dissipation	5.30 W
Inrush current	400 mA @ 5.1V DC 450 mA @ 24V DC
Isolation voltage	250V (continuous) Reinforced Insulation Type, inputs to backplane. Basic Insulation Type, input to input, and inputs to ground
Input impedance	250 Ω (±5 Ω)
Open circuit detection time	5 s, 4…20 mA range only
Input overvoltage protection	28.8V DC
Normal mode noise rejection	90 dB @ 50/60 Hz (10 Hz filter) 74 dB @ 50/60 Hz (15 Hz filter) 33 dB @ 60 Hz, 90 dB @60 Hz (20 Hz filter)
Common mode noise rejection	> 90 dB @ 50/60 Hz (10 Hz, 15 Hz, and 20 Hz filters only)
Calibrated accuracy at 25 °C with HART disabled	0.15…1.5% of full scale, dependent on selected filter

Technical Specifications - 1756-IF16IH (continued)

Attribute	1756-IF16IH
Calibrated accuracy at 25 °C with HART enabled	1.5% of full scale with 250 Hz filter 0.5% of full scale with 100 Hz filter 0.2% of full scale with 50 Hz or 60 Hz filter 0.15% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibrated accuracy over full temperature range with HART enabled	1.8% of full scale with 250 Hz filter 0.8% of full scale with 100 Hz filter 0.5% of full scale with 50 Hz or 60 Hz filter 0.4% of full scale with 15 Hz or 20 Hz filter Monotonicity not guaranteed
Calibration interval	12 months typical
Input offset drift with temperature	300 μA/°C
Gain drift with temperature	20 ppm/°C
Module error over full temperature range with HART disabled	0.3% of range (all filters)
Module scan time for all channels - analog, min	14…428 ms (filter dependent)
Typical module HART dynamic variables update time for all channels	1 s typical with no pass through or device information messaging active
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Input conversion method	Sigma-Delta ADC (24-bit converter)
Output conversion method	Sigma-Delta ADC (24-bit converter)
Module keying	ASIC does not support module keying
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH 0.5 N•m (4.4 lb·in)
Wiring category(1)	2 - on signal ports
Wire type	Copper
North American temp code	T5
ATEX temp code	T4
IECEx temp code	T4
Enclosure type rating	None (open-style)

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

Environmental Specifications - 1756-IF16IH

Attribute	1756-IF16IH
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 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
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…6000 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IF16IH

Certification[1]	1756-IF16IH
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 2014/30/EU 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 2014/35/EU LVD, compliant with: • EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO14ATEX1238X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0110X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

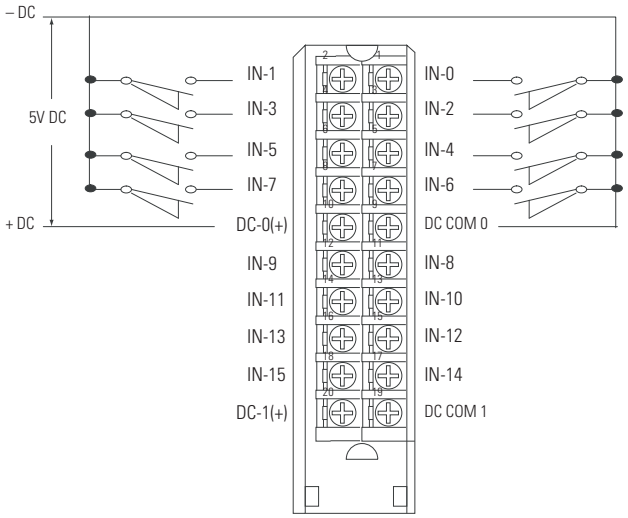
(1) When product is marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IG16

ControlLogix TTL input module

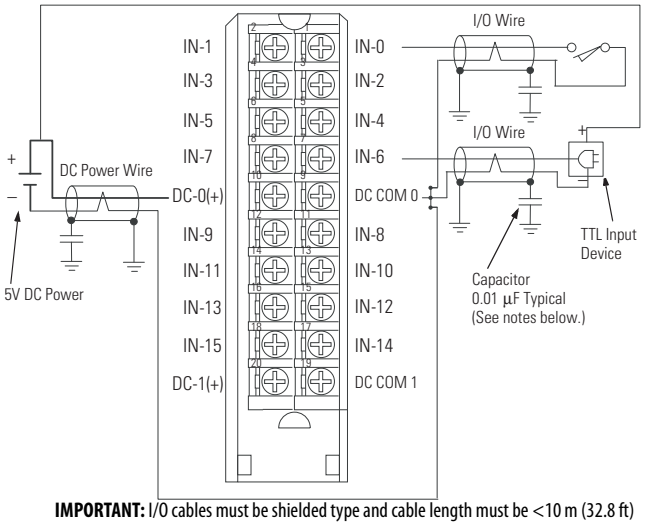
Standard Wiring

1756-IG16



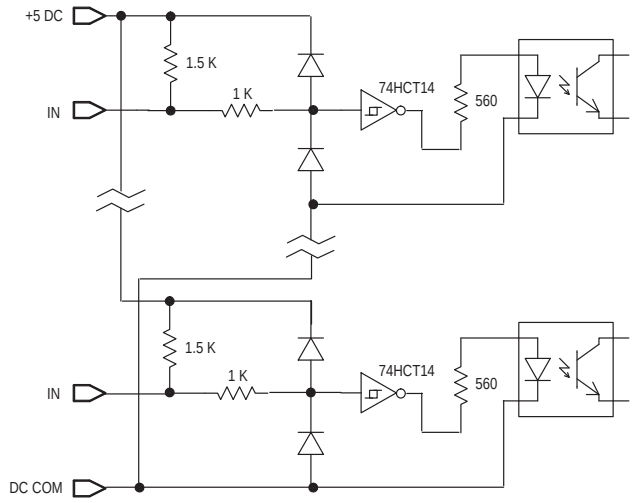
CE Compliant Wiring

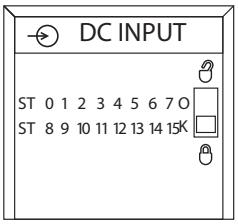
1756-IG16



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

Simplified Schematic





Low to True Format - 1756-IG16

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

Technical Specifications - 1756-IG16

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

(1) TTL inputs are inverted (-0.2 to +0.8 = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True - High logic.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-IG16

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

Certifications - 1756-IG16

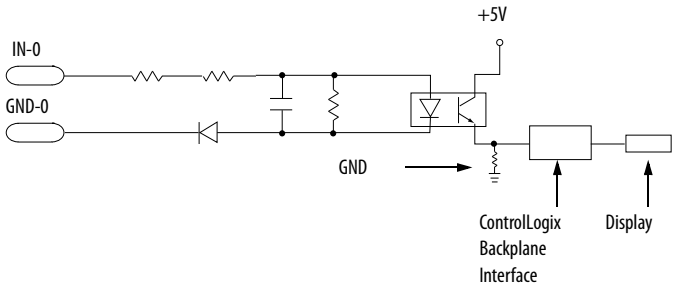
Certification(1)	1756-IG16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

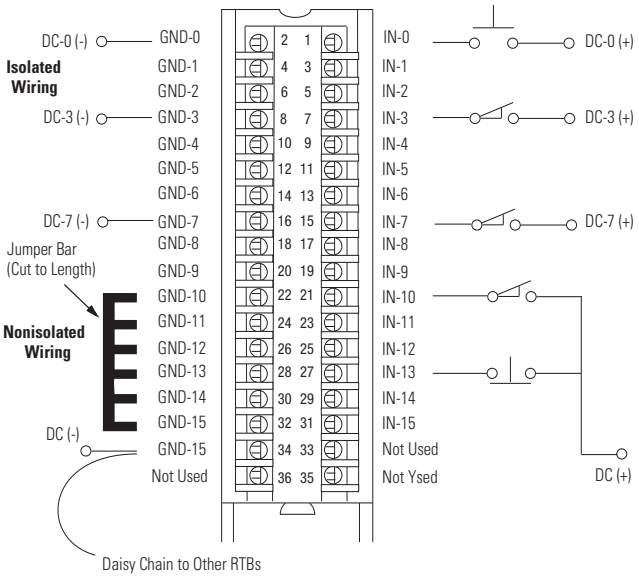
1756-IH16I

ControlLogix 125V DC isolated input module

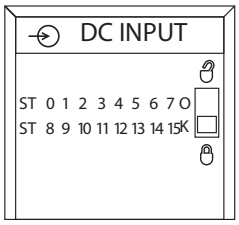
Simplified Schematic



1756-IH161



Additional jumper bars are available as catalog number 1756-JMPR.



Technical Specifications - 1756-IH16I

Attribute	1756-IH16I
Inputs	16 individually isolated
Voltage category	125V DC sink/source
Operating voltage range	90…146V DC(1)
Input voltage, nom	125V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 2 ms max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 6 max + filter time User-selectable filter time: 0 ms, 1 ms, 2 ms, 9 ms, or 18 ms
Current draw @ 5.1V	125 mA
Current draw @ 24V	3 mA
Total backplane power	0.71 W
Power dissipation, max	5 W @ 60 °C (140 °F)
Thermal dissipation	17.05 BTU/hr
Off-state voltage, max	20V DC
Off-state current, max	0.8 mA

Technical Specifications - 1756-IH16I (continued)

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

(1) UL certification for 125V nominal. Rockwell Automation specified to the following:
90…146V DC @ 50 °C (122 °F),12 channels on
90…132V DC @ 55 °C (131 °F), 14 channels on
90…125V DC @ 60 °C (140 °F), 16 channels on
90…146V DC @ 30 °C (86 °F), 16 channels on.

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

Environmental Specifications - 1756-IH16I

Attribute	1756-IH16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
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

Environmental Specifications - 1756-IH16I (continued)

Attribute	1756-IH16I
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

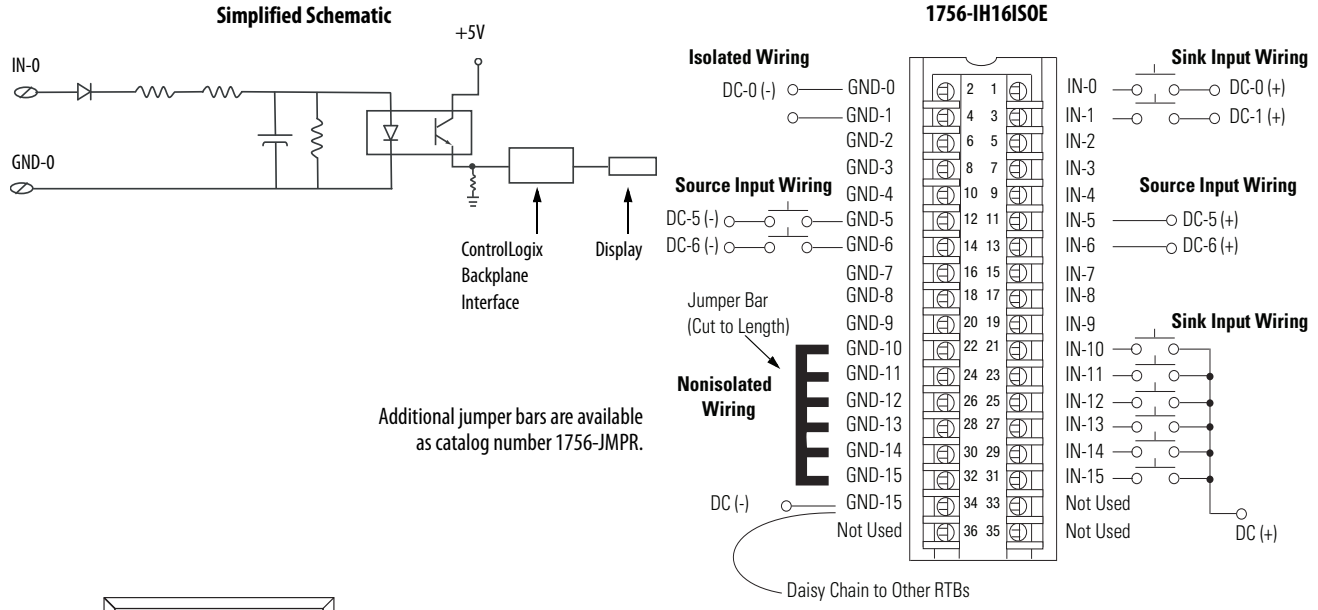
Certifications - 1756-IH16I

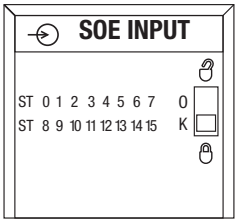
Certification(1)	1756-IH16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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





Technical Specifications - 1756-IH16ISOE

Attribute	1756-IH16ISOE
Inputs	16 individually isolated, sequence of events
Voltage category	125V DC sink/source
Operating voltage range	90…140V DC
Input voltage, nom	125V DC
Input delay time (screw to backplane) Off to On 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: 50 µs nom/75 µs max + firmware scan: up to 25 µs + filter time: 0…50 ms + ASIC delay: 175 µs (FIFO) or 625 µs (Coordinated System Time per point)
Current draw @ 5.1V	275 mA§
Current draw @ 24V	2 mA
Total backplane power	1.3 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	17.22 BTU/hr

Technical Specifications - 1756-IH16ISOE (continued)

Attribute	1756-IH16ISOE
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
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±100 µs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input-to-input Routine tested @ 1350V AC for 2 s, inputs-to-backplane
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T3C
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IH16ISOE

Attribute	1756-IH16ISOE
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-IH16ISOE (continued)

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

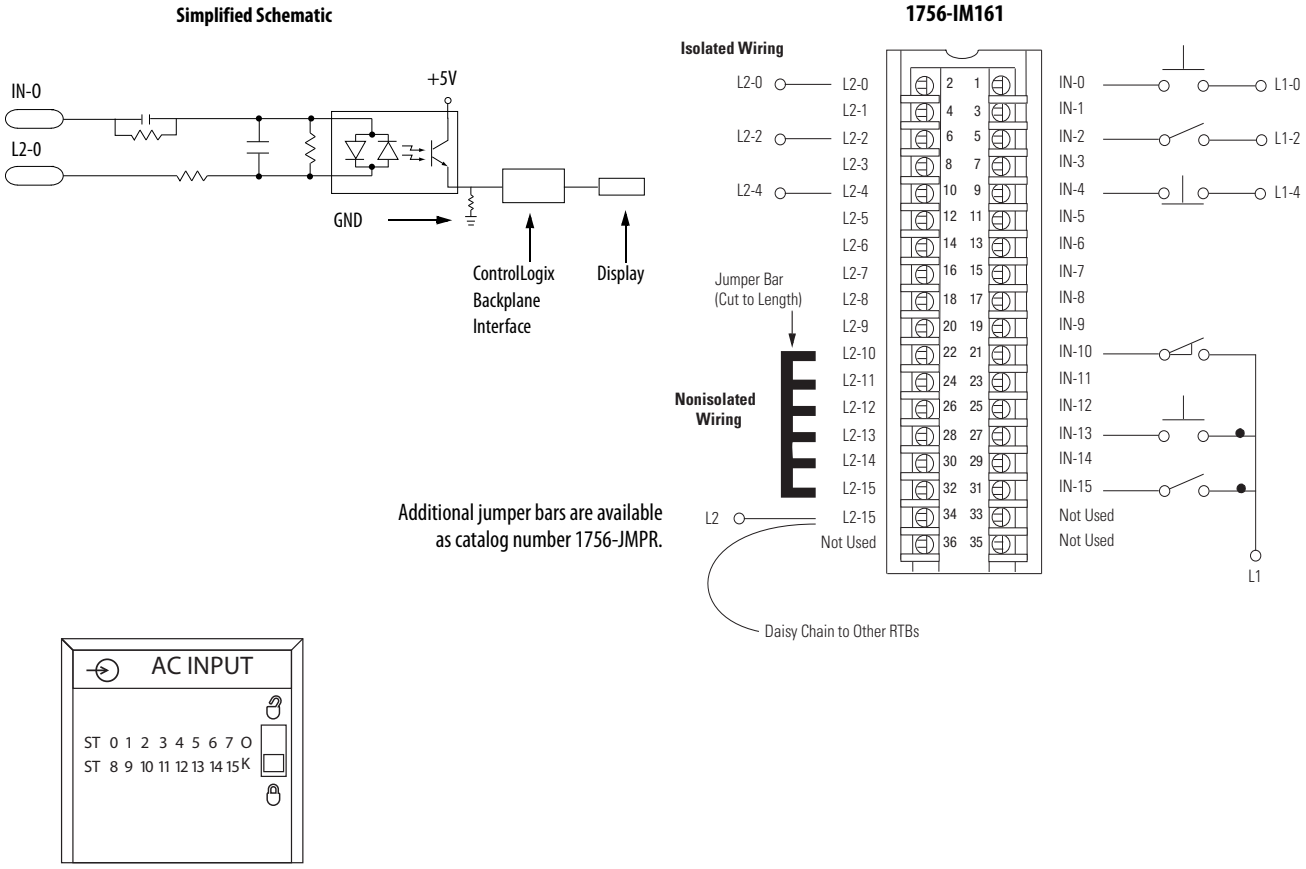
Certifications - 1756-IH16ISOE

Certification[1]	1756-IH16ISOE
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-IM16I

ControlLogix 240V AC input module



Technical Specifications - 1756-IM16I

Attribute	1756-IM16I
Inputs	16 individually isolated
Voltage category	240V AC 50/60 Hz
Operating voltage range	159…265V AC, 47…63 Hz(1)
Input voltage, nom	240V AC 50/60 Hz
Input delay time (screw to backplane) Off to On Onto Off	 Hardware delay: 10 ms max + filter time User-selectable filter time: 1 ms or 2 ms Hardware delay: 8 ms max + filter time User-selectable filter time: 9 ms or 18 ms
Current draw @ 5.1V	100 mA
Current draw @ 24V	3 mA
Total backplane power	0.58 W
Power dissipation, max	5.8 W @ 60 °C (140 °F)
Thermal dissipation	19.78 BTU/hr
Off-state voltage, max	40V
Off-state current, max	2.5 mA

Technical Specifications - 1756-IM16I (continued)

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

(1) UL certification for 240V 50/60 Hz nominal. Rockwell Automation specified to the following:
159…265V AC, 47…63Hz @ 30 °C (86 °F) all channels on
159…265V AC, 47…63Hz @ 40 °C (104 °F) 8 points on
159…253V AC, 47…63Hz @ 45 °C (113 °F) all channels on
159…242V AC, 47…63Hz @ 60 °C (140 °F) all channels on.

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

Environmental Specifications - 1756-IM16I

Attribute	1756-IM16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-IM16I (continued)

Attribute	1756-IM16I
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-IM16I

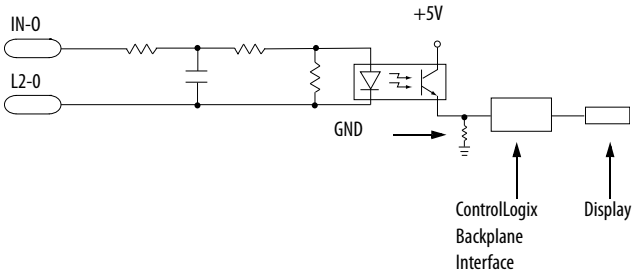
Certification[1]	1756-IM16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

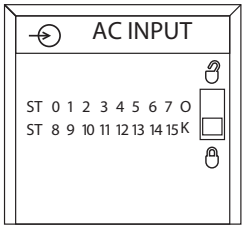
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IN16

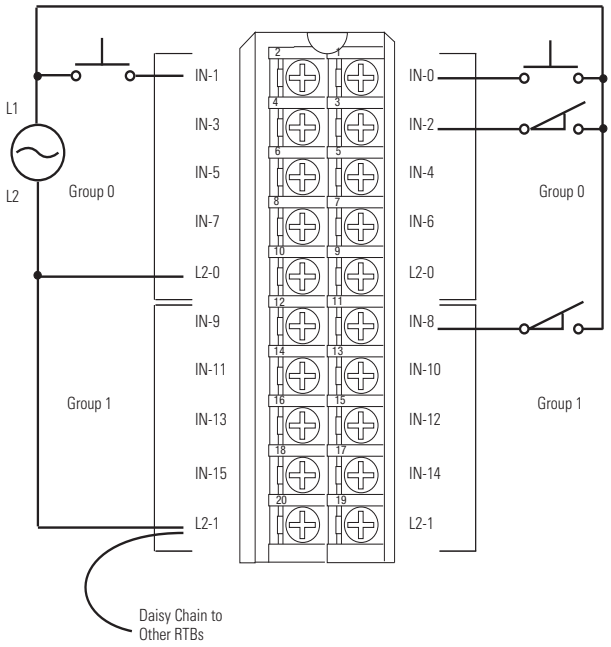
ControlLogix AC (10...30V) input module

Simplified Schematic





1756-IN16



Technical Specifications - 1756-IN16

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

Technical Specifications - 1756-IN16 (continued)

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

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

Environmental Specifications - 1756-IN16

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

Environmental Specifications - 1756-IN16 (continued)

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

Certifications - 1756-IN16

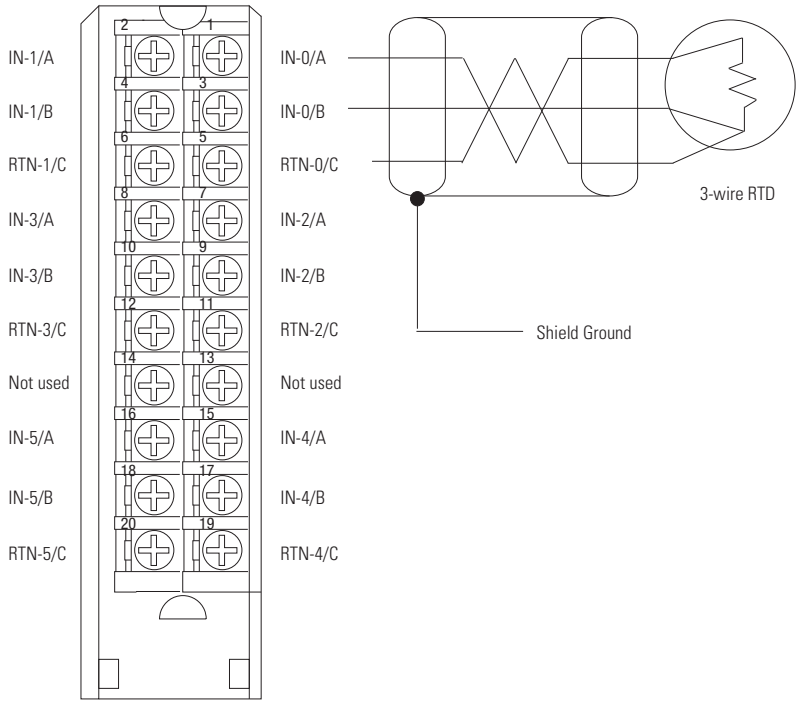
Certification[1]	1756-IN16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

1756-IR6I

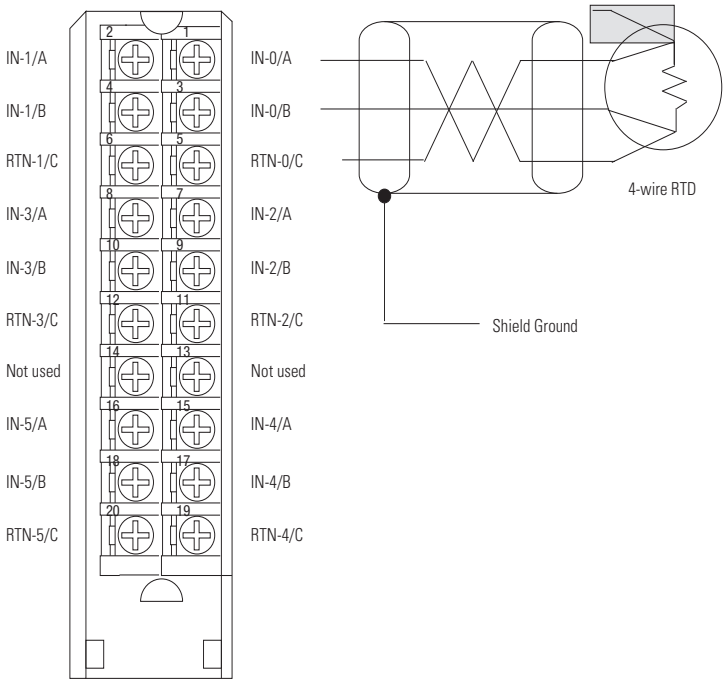
ControlLogix temperature sensing analog input module

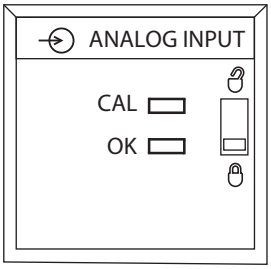
1756-IR6I 3-wire RTD



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





Signal and User Counts - 1756-IR6I

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

Technical Specifications - 1756-IR6I

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

Technical Specifications - 1756-IR6I (continued)

Attribute	1756-IR6I
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IR6I

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

Certifications - 1756-IR6I

Certification[1]	1756-IR6I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

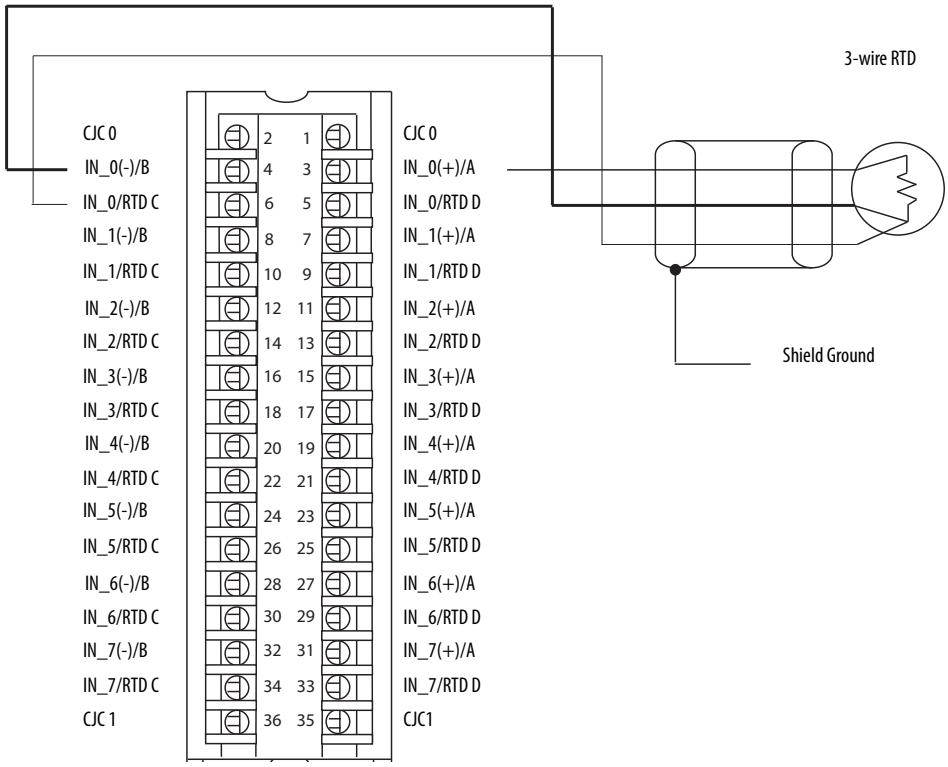
1756-IRT8I

ControlLogix isolated RTD/Thermocouple analog input module.

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

IMPORTANT: Remember the following:

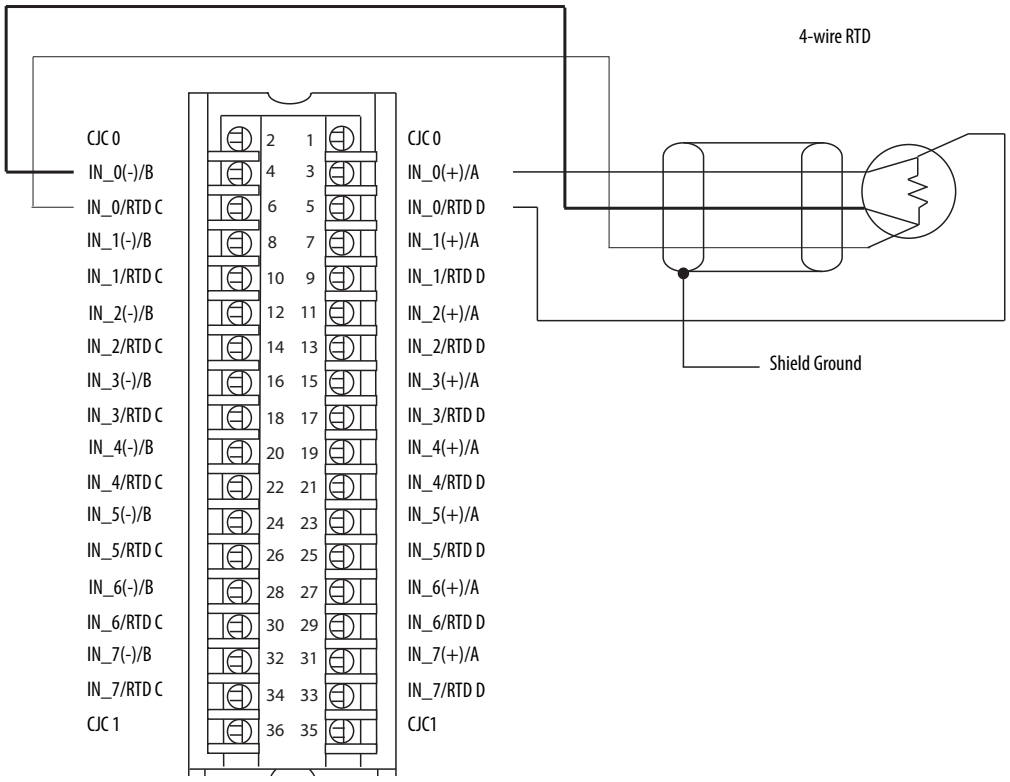
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Terminals 1, 2, 35, and 36 are not used in RTD applications.
- For 2-wire resistor applications including calibration, make sure IN_x(-)/B and IN_x/RTD C are shorted together.



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

IMPORTANT: Remember the following:

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



1756-IRT8I Module Wiring Diagram - Thermocouple Input

IMPORTANT: Remember the following:

- Connect the white end of the CJC sensor to the even-numbered terminal. Connect the orange end of the CJC sensor to the odd-numbered terminals.

  For CJC 0:

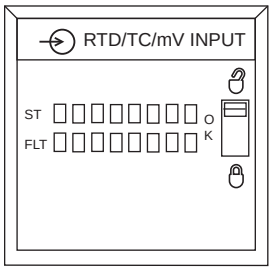
  – White end - Connected to terminal number 2

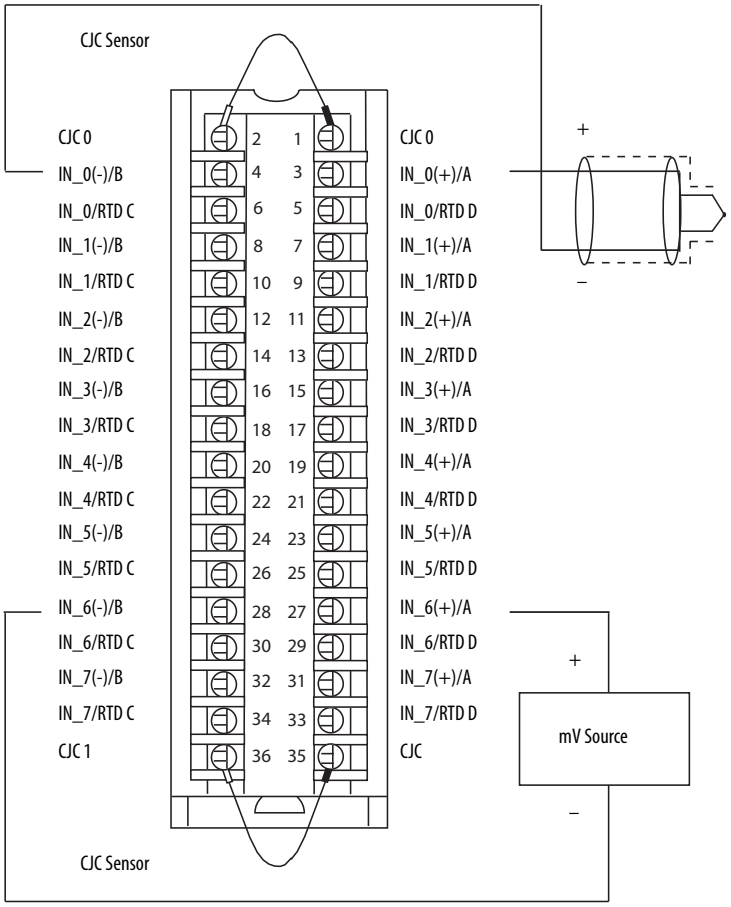
  – Orange end - Connected to terminal number 1

  For CJC 1:

  – White end - Connected to terminal number 36

  – Orange end - Connected to terminal number 35
- CJC sensors do not come with the module. You must order the sensors, product catalog number 1756-CJC, separately.
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.





Technical Specifications - 1756-IRT8I

Attribute	1756-IRT8I
Inputs	Eight isolated channels - Any combination of RTD or Thermocouple mode Two CJC sensors for Thermocouple use. The CJC sensors, product catalog number 1756-CJC, do not come with the module. You must order the sensors separately.
Input range	1…500 Ω 2…1000 Ω 4…2000 Ω 8…4000 Ω -100…100 mV
Resolution	24 bits 0…510 Ω: 0.06 mΩ/count 0…1020 Ω: 0.12 mΩ/count 0…2040 Ω: 0.25 mΩ/count 0…4080 Ω: 0.50 mΩ/count -101…101 mV: 0.01 µV/count
RTD sensors supported	100, 200, 500, 1000 Ω Platinum, alpha=385 100, 200, 500, 1000 Ω Platinum, alpha=3916 120 Ω Nickel, alpha=672 100, 120, 200, 500 Ω Nickel, alpha=618 10 Ω Copper, alpha=427
Thermocouple types	B, C, D, E, J, K, N, R, S, T, TXK/XK (L)

Technical Specifications - 1756-IRT8I (continued)

Attribute	1756-IRT8I
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA
Current draw @ 24V	150 mA
Total backplane power	4.6 W
Power dissipation, max	4.6 W
Thermal dissipation	15.7 BTU/hr
RTD excitation current	600 µA
Input impedance, approx	1 GΩ
Open circuit detection time	• Thermocouple input and 3-wire RTD input = 2 s • 4-wire RTD input = 5 s **IMPORTANT**: **No Open Circuit Detection** when wires are simultaneously disconnected from the IN_*x*/RTD C and IN_*x*/RTD D terminals on same channel; where *x* represents the channel number.
Overvoltage protection, max	±30V DC
Normal mode noise rejection	75 dB at 60 Hz(1)
Common mode noise rejection	125 dB @ 60 Hz 1000 Ω differential 120 dB @ 50 Hz 1000 Ω differential 160 dB @ 600V 100 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Calibrated accuracy @ 25 °C	0.05%
Module error over full temperature range	0.1%
Local CJC sensor accuracy	± 0.3 °C
Remote CJC sensor, accuracy	± 0.3 °C
Module input scan time, min	1 ms
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced Type tested at 2300V AC for 60 s, inputs to backplane insulation type, inputs to backplane 250V (continuous), basic insulation type, input to input Type tested at 1500V AC for 60 s, input to input
RTD sensor types/temperature range (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100 Ω PT 385 20 Ω PT 385 500 Ω PT 385 1000 Ω PT 385	-200…+870 °C (-328…+1598 °F) 73…1143 °K 132…2058 °R
100 Ω PT 3916 20 Ω PT 3916 500 Ω PT 3916 1000 Ω PT 3916	-200…+630 °C (-328…+1166 °F) 73…903 °K 132…1626 °R
10 Ω CU 427	-200…+260 °C (-328…+500 °F) 73…533 °K 132…960 °R

Technical Specifications - 1756-IRT8I (continued)

Attribute	1756-IRT8I
120 Ω NI 672	-80…+320 °C (-112…+608 °F) 193…593 °K 348…1068 °R
100 Ω NI 618 120 Ω NI 618 200 Ω NI 618 500 Ω NI 618	-60…+250 °C (-76…+482 °F) 213…523 °K 384…942 °R
Thermocouple type/temperature range	
Thermocouple Type B	21…1820 °C (68…3308 °F) 293…2093 °K 528…3768 °R
Thermocouple Type C	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type D	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type E	-270…+1000 °C (-454…+1832 °F) 3…1273 °K 6…2292 °R
Thermocouple Type J	-210…+1200 °C (-346…+2192 °F) 63…1473 °K 114…2652 °R
Thermocouple Type K	-270…+1372 °C (-454…+2502 °F) 3…1645 °K 6…2961 °R
Thermocouple Type N	-270…+1300 °C (-454…+2372 °F) 3…1573 °K 6…2832 °R
Thermocouple Type R	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R
Thermocouple Type S	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R
Thermocouple Type T	-270…+400 °C (-454…+752 °F) 3…673 °K 6…1212 °R
Thermocouple Type TXK/XK (L)	-200…+800 °C (-328…+1472 °F) 73…1073 °K 132…1932 °R
Thermocouple type/resolution, nom	
Type C, R	~0.03 °C (~0.05 °F)
Type B, S	~0.04 °C (~0.07 °F)
Type E, J, K, N, T, TXK/XK (L)	~0.01 °C (~0.02 °F)
Type D	~0.02 °C (~0.04 °F)
Module keying	Electronic, software configurable

Technical Specifications - 1756-IRT8I (continued)

Attribute	1756-IRT8I
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IRT8I

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

Certifications - 1756-IRT8I

Certification[1]	1756-IRT8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

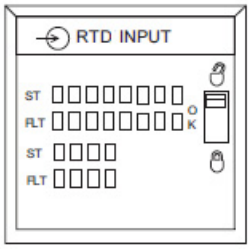
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IR12

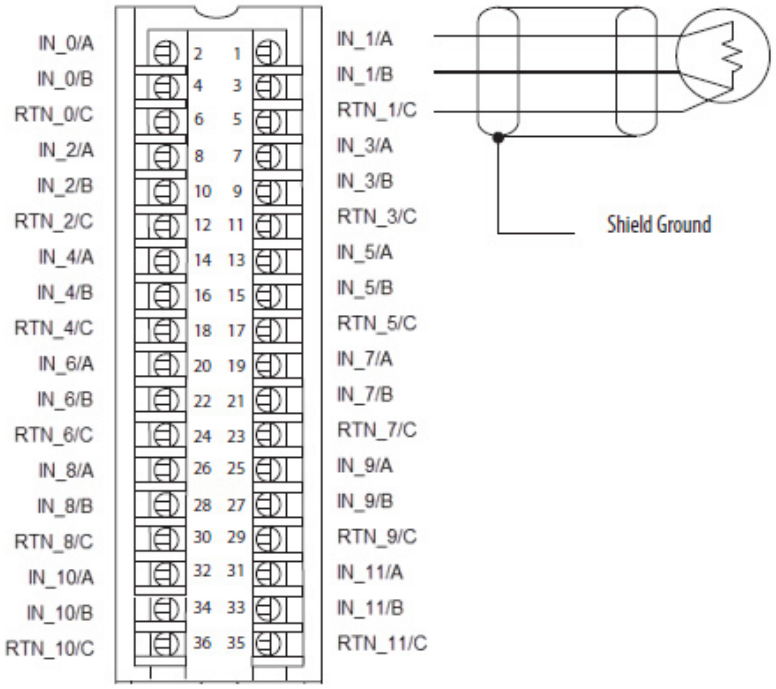
ControlLogix RTD analog input module

IMPORTANT: Remember the following:

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



1756-IR12 3-wire RTD



Technical Specifications - 1756-IR12

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

Technical Specifications - 1756-IR12 (continued)

Attribute	1756-IR12
Thermal dissipation	9.2 BTU/hr
RTD excitation current	600 µA
Overvoltage protection, max	±30V DC
Common mode noise rejection	120 dB @ 60 Hz 1000 Ω differential 100 dB @ 50 Hz 1000 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Open circuit detection	Positive full-scale reading within 2 s
Calibrated accuracy @ 25 °C	0…510 Ω range: 0.1% Other Ω ranges: 0.25%
Module error over full temperature range	0…510 Ω range: 0.2% Other Ω ranges: 0.5%
Module input scan time, min	50 ms
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation Voltage	250V (continuous), reinforced insulation type, inputs to backplane No isolation between individual inputs Type tested at 1800V AC for 60 s
RTD sensor types/temperature range (Each sensor type in a cell supports all temperature ranges in the corresponding column to the right.)	
100 Ω PT 385 20 Ω PT 385 500 Ω PT 385 1000 Ω PT 385	-200…+870 °C (-328…+1598 °F) 73…1143 °K 132…2058 °R
100 Ω PT 3916 20 Ω PT 3916 500 Ω PT 3916 1000 Ω PT 3916	-200…+630 °C (-328…+1166 °F) 73…903 °K 132…1626 °R
10 Ω CU 427	-200…+260 °C (-328…+500 °F) 73…533 °K 132…960 °R
120 Ω NI 672	-80…+320 °C (-112…+608 °F) 193…593 °K 348…1068 °R
100 Ω NI 618 120 Ω NI 618 200 Ω NI 618 500 Ω NI 618	-60…+250 °C (-76…+482 °F) 213…523 °K 384…942 °R
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1

Technical Specifications - 1756-IR12 (continued)

Attribute	1756-IR12
Wire size	0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports(1)
North American Temp Code	T4A
ATEX Temp Code	T4
IECEx Temp Code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-IR12

Attribute	1756-IR12
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions IEC 61000-6-4	CISPR 11, Class A
ESD Immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF Immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B Immunity IEC 61000-4-4	±2 kV at 5/100kHz on shielded ports
Surge Transient Immunity IEC 61000-4-5	±2 kV line-earth(CM) on shielded ports
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

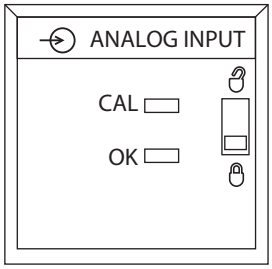
Certifications - 1756-IR12

Certification[1] (when product is marked)	Description
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: • 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 61010-2-201; Control Equipment Safety Requirements
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

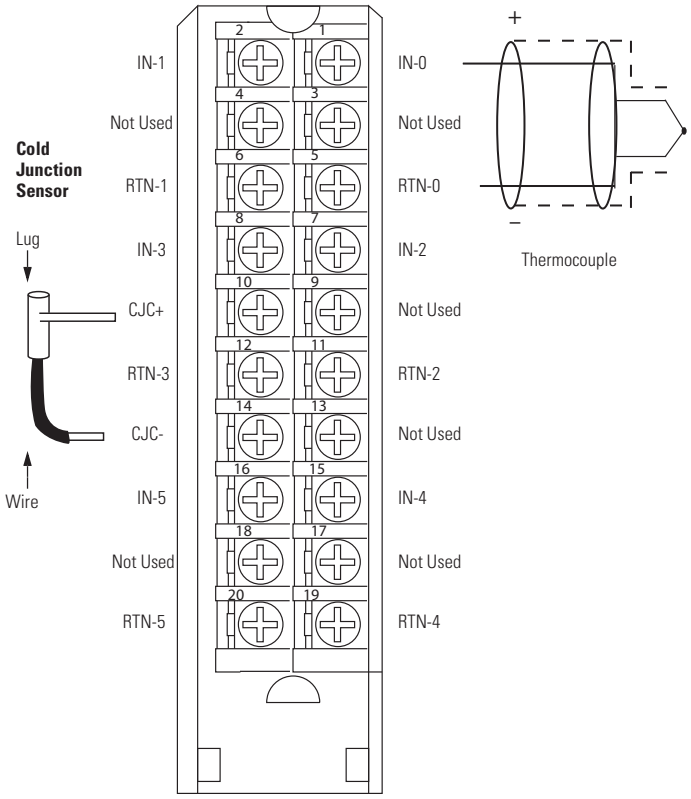
(1) See the Product Certification link at www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IT6I

ControlLogix temperature sensing analog input module



1756-IT6I



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

Signal and User Counts - 1756-IT6I

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

Technical Specifications - 1756-IT6I

Attribute	1756-IT6I
Inputs	Six individually isolated thermocouple 1 CJC
Input range	-12…78 mV -12…30 mV (high-resolution range)
Resolution	16 bits -12…78 mV: 1.4 μV/bit (typical) -12…30 mV: 0.7 μV/bit (high-resolution range)
Thermocouples	B, E, J, K, R, S, T, N, C, D, L (TXK/XK)
Thermocouple linearization	ITS-90

Technical Specifications - 1756-IT6I (continued)

Attribute	1756-IT6I
Current draw @ 5.1V	250 mA
Current draw @ 24V	125 mA
Total backplane power	4.3 W
Power dissipation, max	4.3 W
Thermal dissipation	14.66 BTU/hr
Input impedance	>10 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)
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Thermocouple Ranges - 1756-IT6I

Attribute	1756-IT6I	
Thermocouple temperature/millivolt input range	-12…78 mV range	-12…30 mV range
Thermocouple Type B	300…1820 °C (572…3308 °F)	Full range
Thermocouple Type C	0…2315 °C (32…4199 °F)	0…1725 °C (32…3137 °F)
Thermocouple Type E	-270…+1000 °C (-454…+1832 °F)	-270…+415 °C (-454…+779 °F)
Thermocouple Type J	-210…+1200 °C (-346…+2192 °F)	-210…+550 °C (-346…+1022 °F)
Thermocouple Type K	-270…+1372 °C (-454…+2502 °F)	-270…+725 °C (-454…+1337 °F)
Thermocouple Type N	-270…+1300 °C (-454…+2372 °F)	-270…+840 °C (-454…+1544 °F)
Thermocouple Type R	-50…+1768 °C (-58…+3215 °F)	Full range
Thermocouple Type S	-50…+1768 °C (-58…+3215 °F)	Full range
Thermocouple Type T	-270…+400 °C (-454…+752 °F)	Full range
Thermocouple Type D	0…2320 °C (32…4208 °F)	0…1718 °C (32…3124 °F)
Thermocouple Type L (TXK/XK)	-200…+800 °C (-328…+1472 °F)	0…200…399 °C (392…750 °F) °C (32…3124 °F)
Thermocouple resolution over temperature range, nom	-12…78 mV range	-12…30 mV range
Type B, R, S, C	~0.15 °C (~0.28 °F)	~0.08 °C (~0.15 °F)
Type E, J, K, T, N	~0.05 °C (~0.09 °F)	~0.03 °C (~0.05 °F)
Type D	~0.07 °C (~0.13 °F)	~0.03 °C (~0.05 °F)
Type TXK/XK (L)	~0.02 °C (~0.04 °F)	~0.01 °C (~0.02 °F)

Environmental Specifications - 1756-IT6I

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

Environmental Specifications - 1756-IT6I (continued)

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

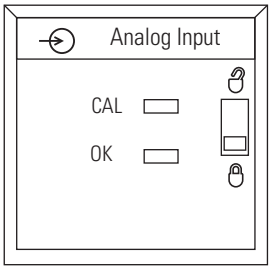
Certifications - 1756-IT6I

Certification(1)	1756-IT6I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

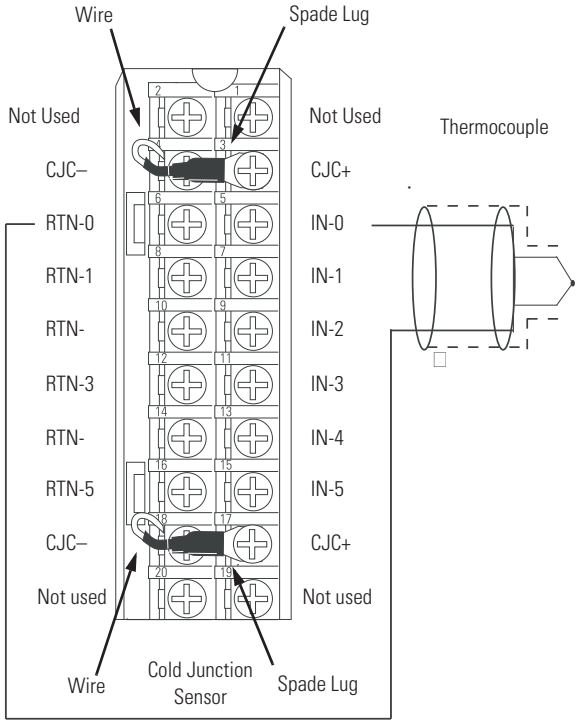
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IT6I2

ControlLogix enhanced thermocouple analog input module



1756-IT6I Cold Junction Sensor



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

Signal and User Counts - 1756-IT6I2

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

Technical Specifications - 1756-IT6I2

Attribute	1756-IT6I2
Inputs	Six 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)
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA

Technical Specifications - 1756-IT6I2 (continued)

Attribute	1756-IT6I2
Current draw @ 24V	150 mA
Total backplane power	4.6 W
Power dissipation, max	4.6 W
Thermal dissipation	15.7 BTU/hr
Input impedance	>10 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	160 dB min, tested @ 600V AC/60 Hz applied with 100 Ω differential resistance
Channel bandwidth	15 Hz(1)
Settling time	<80 ms to 5% of full scale(1)
Calibrated accuracy @ 25 °C	0.05% of full range @ 25 °C (77 °F) typical Better than 0.1% of range @ 25 °C (77 °F) worst case
Calibration interval	12 months
Local CJC sensor accuracy	±0.3 °C
Remote CJC sensor accuracy	±0.3 °C
Offset drift	0.5 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)
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), basic insulation type, input channels-to-backplane, and input channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH only
RTB keying	User-defined mechanical
Slot width	1
Wire category	2(2)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Thermocouple Ranges - 1756-IT6I2

Attribute	1756-IT6I2	
Thermocouple temperature/millivolt input range	-12…78 mV range	-12…30 mV range
Thermocouple Type B	300…1820 °C (572…3308 °F)	Full range
Thermocouple Type C	0…2315 °C (32…4199 °F)	0…1725 °C (32…3137 °F)
Thermocouple Type E	-270…+1000 °C (-454…+1832 °F)	-270…+415 °C (-454…+779 °F)
Thermocouple Type J	-210…+1200 °C (-346…+2192 °F)	-210…+550 °C (-346…+1022 °F)
Thermocouple Type K	-270…+1372 °C (-454…+2502 °F)	-270…+725 °C (-454…+1337 °F)
Thermocouple Type N	-270…+1300 °C (-454…+2372 °F)	-270…+840 °C (-454…+1544 °F)
Thermocouple Type R	-50…+1768 °C (-58…+3215 °F)	Full range
Thermocouple Type S	-50…+1768 °C (-58…+3215 °F)	Full range
Thermocouple Type T	-270…+400 °C (-454…+752 °F)	Full range
Thermocouple Type D	0…2320 °C (32…4208 °F)	0…1718 °C (32…3124 °F)
Thermocouple Type L (TXK/XK)	-200…+800 °C (-328…+1472 °F)	0…200…399 °C (392…750 °F) °C (32…3124 °F)
Thermocouple resolution over temperature range, nom	-12…78 mV range	-12…30 mV range
Type B, R, S, C	~0.15 °C (~0.28 °F)	~0.08 °C (~0.15 °F)
Type E, J, K, T, N	~0.05 °C (~0.09 °F)	~0.03 °C (~0.05 °F)
Type D	~0.07 °C (~0.13 °F)	~0.03 °C (~0.05 °F)
Type TXK/XK (L)	~0.02 °C (~0.04 °F)	~0.01 °C (~0.02 °F)

Environmental Specifications - 1756-IT6I2

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

Environmental Specifications - 1756-IT6I2 (continued)

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

Certifications - 1756-IT6I2

Certification[1]	1756-IT6I2
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

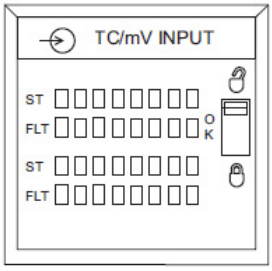
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-IT16

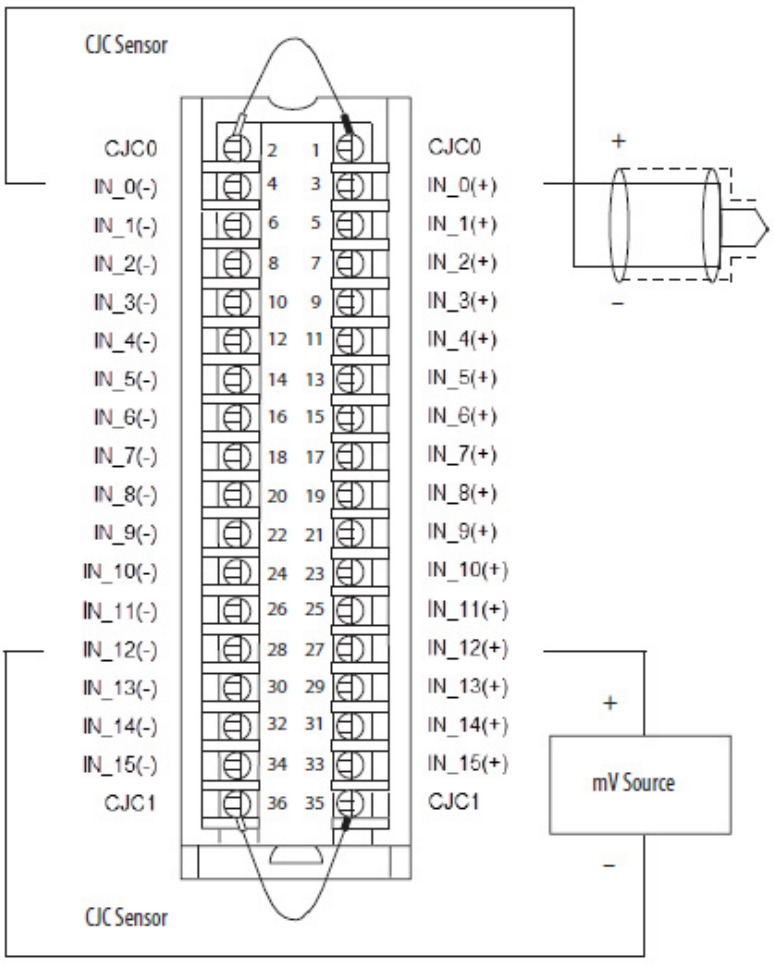
ControlLogix thermocouple analog input module.

IMPORTANT: Remember the following:

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



1756-IT16



1756-IT16 - Technical Specifications

Attribute	1756-IT16
Inputs	16 channels, thermocouple mode Two CJC sensors for Thermocouple use. The CJC sensors, product catalog number 1756-CJC, do not come with the module. You must order the sensors separately.
Input range	-100…100 mV max 5VA
Resolution	24 bits -101…101 mV: 0.01 µV/count
Thermocouple types	B, C, D, E, J, K, N, R, S, T, TXK/XK (L)
Thermocouple linearization	ITS-90
Current draw @ 5.1V	200 mA
Current draw @ 24V	80 mA
Total backplane power	3 W
Power dissipation, max	3 W

1756-IT16 - Technical Specifications (continued)

Attribute	1756-IT16
Thermal dissipation	9.9 BTU/hr
Input impedance, approx	1 GΩ
Overvoltage protection, max	±30V DC
Normal mode noise rejection	75 dB at 60 Hz[1]
Common mode noise rejection	120 dB @ 60 Hz 1000 Ω differential 100 dB @ 50 Hz 1000 Ω differential
Channel bandwidth	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Settling time	Notch Filter configuration dependent See publication 1756-UM540 for possible values.
Open circuit detection	Positive full-scale reading within 2 s
Calibrated accuracy @ 25 °C	0.1%
Module error over full temperature range	0.2%
Local CJC sensor accuracy	± 0.3 °C
Remote CJC sensor, accuracy	± 0.3 °C
Module input scan time, min	50 ms
Data format	IEEE 32-bit floating point
Module conversion method	Sigma-Delta
Isolation voltage	250V (continuous), reinforced insulation type, inputs to backplane No isolation between individual inputs Type tested at 1800V AC for 60 s
Thermocouple type/temperature range	
Thermocouple Type B	21…1820 °C (68…3308 °F) 293…2093 °K 528…3768 °R
Thermocouple Type C	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type D	0…2320 °C (32…4208 °F) 273…2593 °K 492…4668 °R
Thermocouple Type E	-270…+1000 °C (-454…+1832 °F) 3…1273 °K 6…2292 °R
Thermocouple Type J	-210…+1200 °C (-346…+2192 °F) 63…1473 °K 114…2652 °R
Thermocouple Type K	-270…+1372 °C (-454…+2502 °F) 3…1645 °K 6…2961 °R
Thermocouple Type N	-270…+1300 °C (-454…+2372 °F) 3…1573 °K 6…2832 °R
Thermocouple Type R	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R

1756-IT16 - Technical Specifications (continued)

Attribute	1756-IT16
Thermocouple Type S	-50…+1768 °C (-58…+3215 °F) 223…2041 °K 402…3674 °R
Thermocouple Type T	-270…+400 °C (-454…+752 °F) 3…673 °K 6…1212 °R
Thermocouple Type TXK/XK (L)	-200…+800 °C (-328…+1472 °F) 73…1073 °K 132…1932 °R
Thermocouple type/resolution, nom	
Type C, R	~0.03 °C (~0.05 °F)
Type B, S	~0.04 °C (~0.07 °F)
Type E, J, K, N, T, TXK/XK (L)	~0.01 °C (~0.02 °F)
Type D	~0.02 °C (~0.04 °F)
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on shielded signal ports(2)
North American Temp Code	T4A
ATEX Temp Code	T4
IECEx Temp Code	T4
Enclosure type	None (open-style)

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

1756-IT16 - Environmental Specifications

Attribute	1756-IT16
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz

1756-IT16 - Environmental Specifications (continued)

Attribute	1756-IT16
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions IEC 61000-6-4	CISPR 11, Class A
ESD Immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF Immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM at 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B Immunity IEC 61000-4-4	±2 kV at 5/100kHz on shielded ports
Surge Transient Immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Enclosure Type Rating	None (open-style)

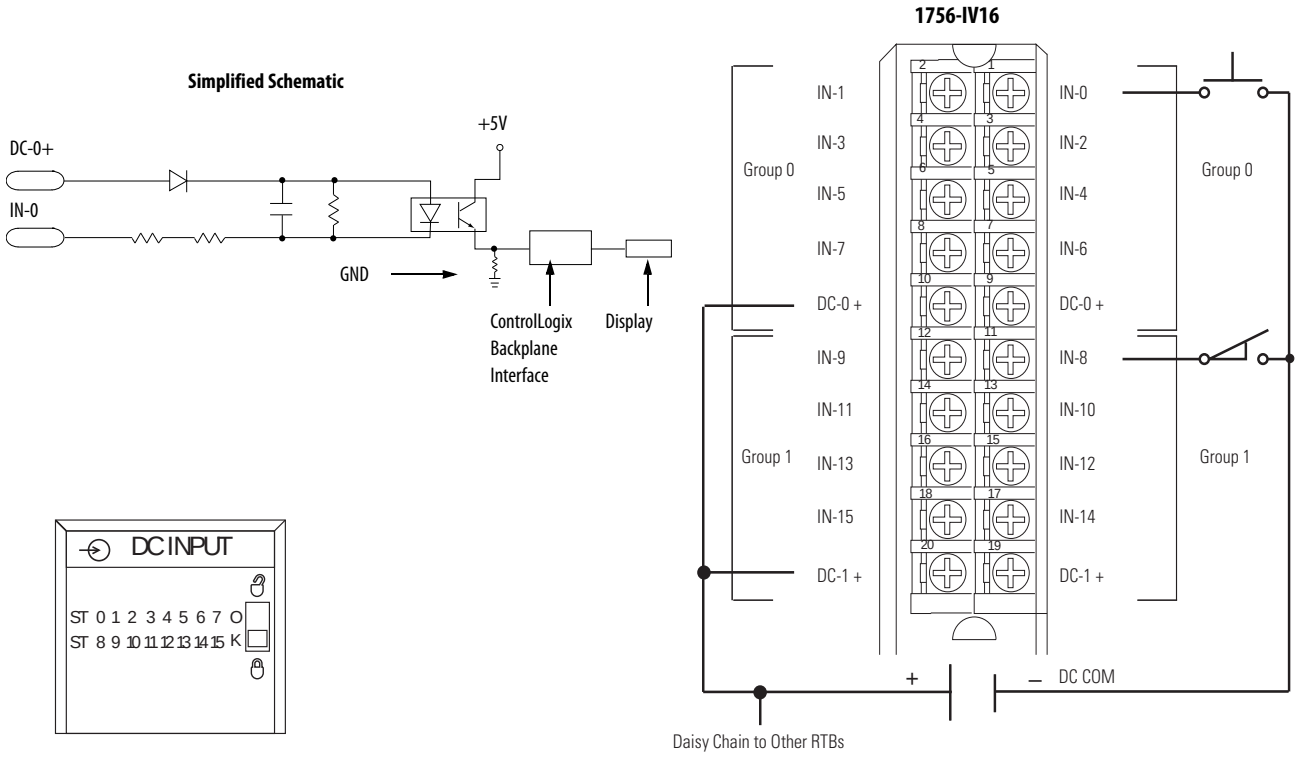
Certifications - 1756-IT16

Certification(1)	Description
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/EC EMC Directive, compliant with: • 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 61010-2-201; Control Equipment Safety Requirements
RCM	Australian Radiocommunications Act, compliant with: • EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" II 3 G Ex nA IIC T4 Gc IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: • Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

1756-IV16

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



Technical Specifications - 1756-IV16

Attribute	1756-IV16
Inputs	16 (8 points/group)
Voltage category	12/24V DC source
Operating voltage range	10…30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 280 µs nom/1 ms max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 540 µs nom/2 ms max + filter time User-selectable filter time: 0 ms, 1 ms, 2 ms, 9 ms, or 18 ms
Current draw @ 5.1V	110 mA
Current draw @ 24V	2 mA
Total backplane power	0.61 W
Power dissipation, max	5.41 W @ 60 °C (140 °F)
Thermal dissipation	18.47 BTU/hr
Off-state voltage, max	5V DC
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	10 mA @ 30V DC
Inrush current, max	250 mA

Technical Specifications - 1756-IV16 (continued)

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

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

Environmental Specifications - 1756-IV16

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

Environmental Specifications - 1756-IV16 (continued)

Attribute	1756-IV16
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

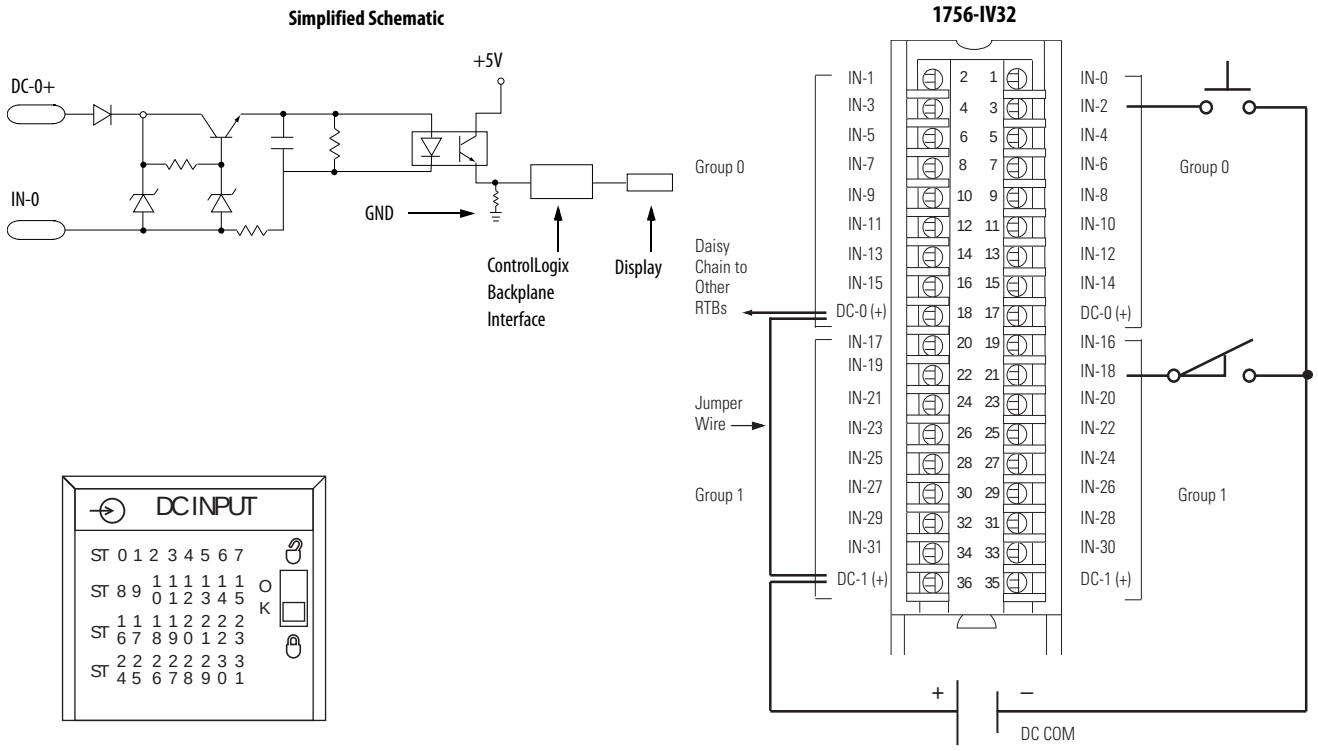
Certifications - 1756-IV16

Certification[1]	1756-IV16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

1756-IV32

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



Technical Specifications - 1756-IV32

Attribute	1756-IV32
Inputs	32 (16 points/group)
Voltage category	12/24V DC source
Operating voltage range	10…30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On On to Off	 Hardware delay: 350 µs nom/1 ms max + filter time User-selectable filter time: 0 ms, 1 ms, or 2 ms Hardware delay: 540 µs nom/2 ms max + filter time User-selectable filter time: 0 ms, 1 ms, 2 ms, 9 ms, or 18 ms
Current draw @ 5.1V	120 mA
Current draw @ 24V	2 mA
Total backplane power	0.66 W
Power dissipation, max	4.1 W @ 60 °C (140 °F)
Thermal dissipation	14 BTU/hr @ 60 °C (140 °F)
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	3.5 mA @ 30V DC
Inrush current, max	250 mA (decaying to <37% in 22 ms, without activation)

Technical Specifications - 1756-IV32 (continued)

Attribute	1756-IV32
Input impedance, max	8.6 kΩ @ 30V DC
Cyclic update time	200 µs…750 ms
Change of state	Software configurable
Time stamp of inputs	±200 µs
Isolation voltage	250V (continuous), basic insulation type, inputs-to-backplane, and input group-to-group No isolation between individual group inputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 - on signal ports(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-IV32

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

Environmental Specifications - 1756-IV32 (continued)

Attribute	1756-IV32
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

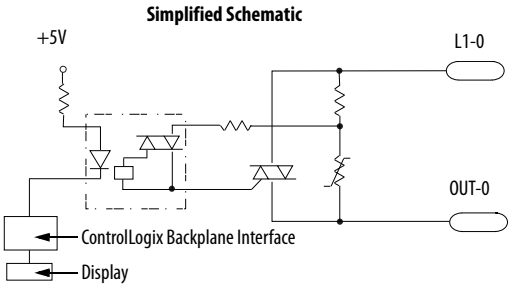
Certifications - 1756-IV32

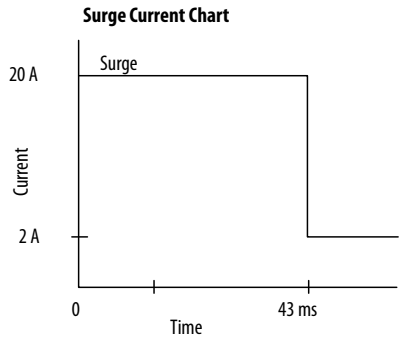
Certification[1]	1756-IV32
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

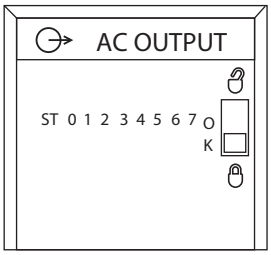
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

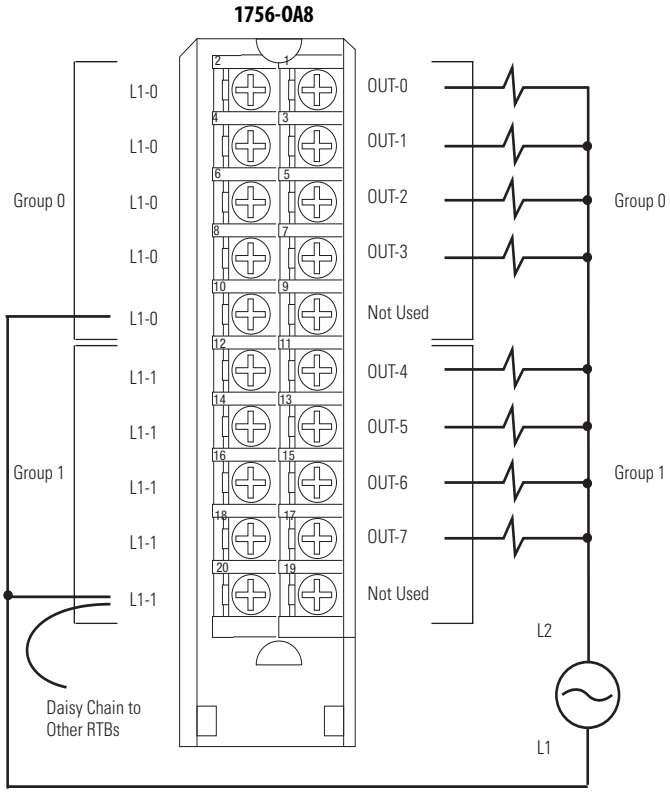
1756-OA8

ControlLogix 120/240V AC output module









Technical Specifications - 1756-OA8

Attribute	1756-OA8
Outputs	8 (4 points/group)
Pilot duty	2 A
Voltage category	120/240V AC 50/60 Hz
Operating voltage range[1]	74…265V AC 47…63 Hz
Output delay time Off to On 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
Total backplane power	1.07 W

Technical Specifications - 1756-OA8 (continued)

Attribute	1756-OA8
Power dissipation, max	5.1 W @ 60 °C (140 °F)
Thermal dissipation	17.39 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ <50 mA
Current per point, max	2 A @ 60 °C (140 °F) linear derating
Current per module, max	5 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/µs for loads > 50 mA 0.2V/µs for loads < 50 mA(2)
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(3)
North American temperature code	T4A
Enclosure type	None (open style)

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

(2) The commutating dv/dt of the output voltage (OUTPUT to L2) should not exceed 0.2V/µs for loads under 50 mA. The commutating dv/dt rating of the module for loads 50…500 mA (OUTPUT to L2) is 4V/µs maximum. If the commutating dv/dt rating of the TRIAC is exceeded, the TRIAC could latch on. If the commutating dv/dt rating is exceeded in the 10…50 mA range, a resistor can 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 dissipates (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 that the waveform is a good sinusoid, void of any anomalies such as distorted or flattened sections.

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

Environmental Specifications - 1756-OA8

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

Certifications - 1756-OA8

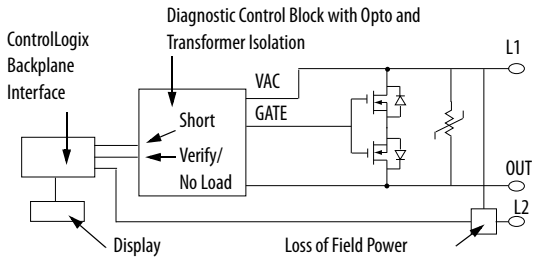
Certification(1)	1756-OA8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

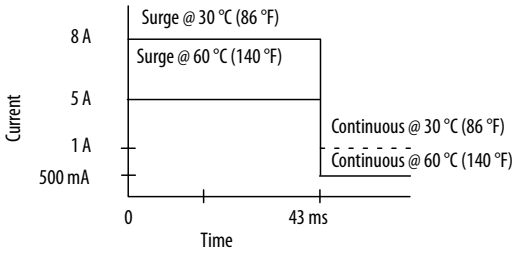
1756-OA8D

ControlLogix 120V AC diagnostic output module

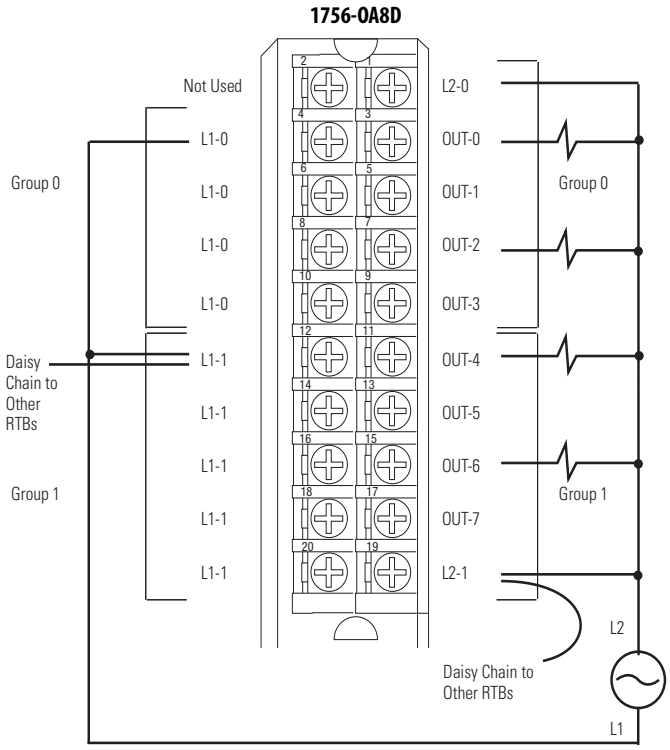
Simplified Schematic

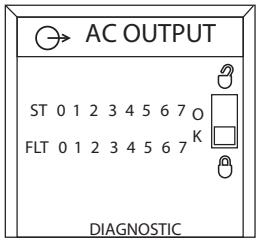


Surge Current Chart



1756-OA8D





Diagnostic Specifications - 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

Technical Specifications - 1756-OA8D

Attribute	1756-OA8D
Outputs	8 diagnostic, electronic fusing (4 points/group)
Voltage category	120V AC 50/60 Hz
Operating voltage range[1]	74…132V AC 47…63 Hz
Output delay time Off to On 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
Total backplane power	6.89 W
Power dissipation, max	5.3 W @ 60 °C (140 °F)
Thermal dissipation	18.0 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	2.5V peak @ 0.5 A 3V peak @ 1 A
Current per point, max	1 A @ 30 °C (86 °F) linear derating 0.5 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	8 A for 43 ms per point, repeatable every 2 s @ 30 °C (86 °F) 5 A for 43 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	125V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1200V AC for 2 s
Inhibit voltage, max	Zero crossing 25V peak
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1[2]
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120V 50/60 Hz nominal. Rockwell Automation specified to 74…132V, 47…63 Hz.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OA8D

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

Certifications - 1756-OA8D

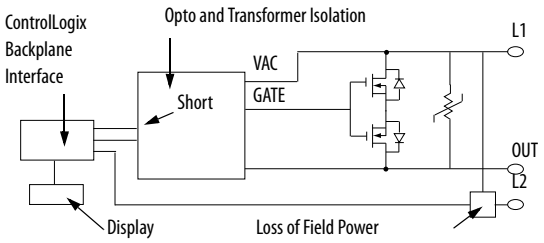
Certification(1)	1756-OA8D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

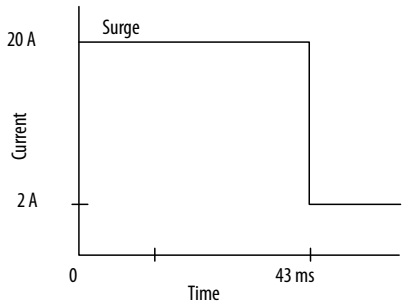
1756-OA8E

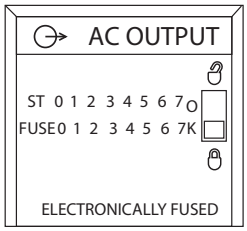
ControlLogix 120V AC electronically fused output module

Simplified Schematic

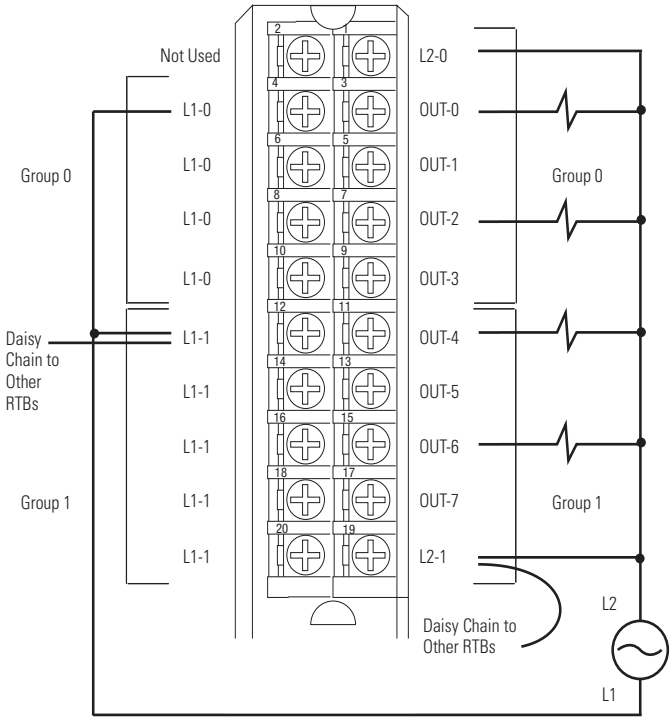


Surge Current Chart





1756-OA8E



Diagnostic Specifications - 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

Technical Specifications - 1756-OA8E

Attribute	1756-OA8E
Outputs	Eight electronic fusing (four points/group)
Pilot duty	Yes
Voltage category	120V AC 50/60 Hz
Operating voltage range[1]	74…132V AC 47…63 Hz
Output delay time Off to On 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
Total backplane power	7.02 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)
Thermal dissipation	18.76 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	4V peak @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per group, max	4 A @ 30 °C (86 °F) linear derating 2 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (default is Off)
States in Program mode per point	Hold last state, On or Off (default is Off)
Isolation voltage	125V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1200V AC for 2 s
Inhibit voltage, max	Zero crossing 25V peak
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1[2]
North American temperature code	T4A
Enclosure type	None (open style)

(1) UL certification for 120V 50/60Hz nominal. Rockwell Automation specified to 74…132V, 47…63 Hz.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OA8E

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

Certifications - 1756-OA8E

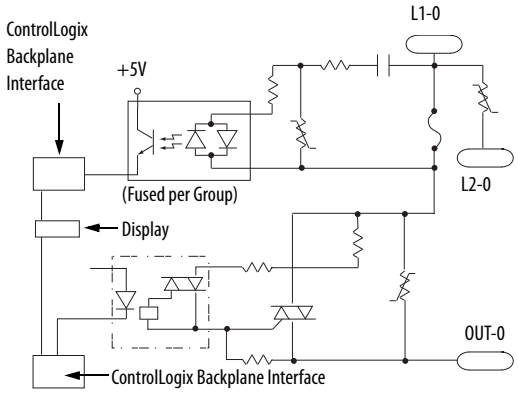
Certification(1)	1756-OA8E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

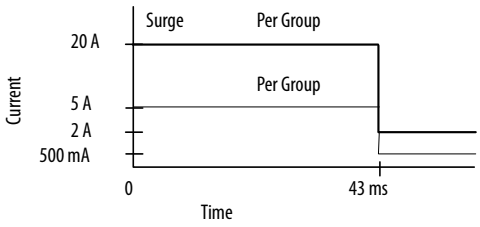
1756-OA16

ControlLogix 120/240V AC output module

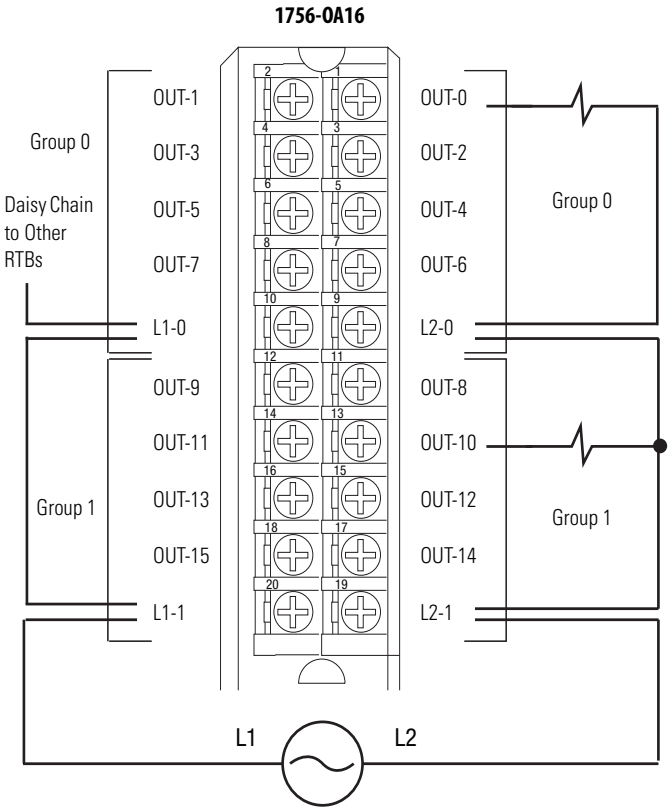
Simplified Schematic

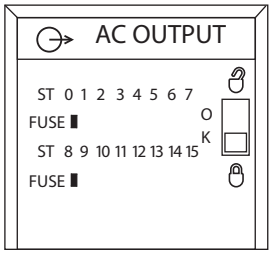


Surge Current Chart



1756-OA16





Diagnostic Specifications - 1756-OA16

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

Technical Specifications - 1756-OA16

Attribute	1756-OA16
Outputs	16 mechanically fused/group (8 points/group)
Pilot duty	0.5 A
Voltage category	120/240V AC 50/60 Hz
Operating voltage range[1]	74…265V AC 47…63 Hz
Output delay time Off to On 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	400 mA
Current draw @ 24V	2 mA
Total backplane power	2.1 W
Power dissipation, max	6.5 W @ 60 °C (140 °F)
Thermal dissipation	22.17 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V @ 0.5 A 5.7V @ load current < 50 mA
Current per point, max	0.5 A @ 60 °C (140 °F)
Current per group, max	2 A @ 60 °C (140 °F)
Current per module, max	4 A @ 60 °C (140 °F)
Surge current per point	5 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Surge current per group	15 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/µs for loads > 50 mA 0.2V/µs for loads < 50 mA[2]
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1400V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Mechanically fused/group, 3.15 A @ 250V AC slow blow, 1500 A interruption current, Littelfuse p/n H2153.15
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1

Technical Specifications - 1756-OA16 (continued)

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

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

Environmental Specifications - 1756-OA16

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

Certifications - 1756-OA16

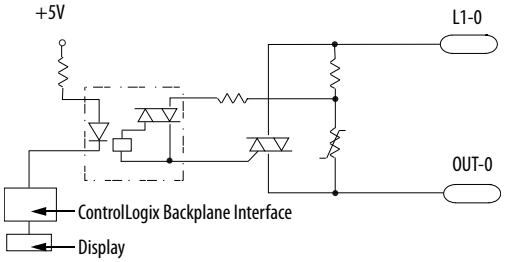
Certification[1]	1756-OA16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

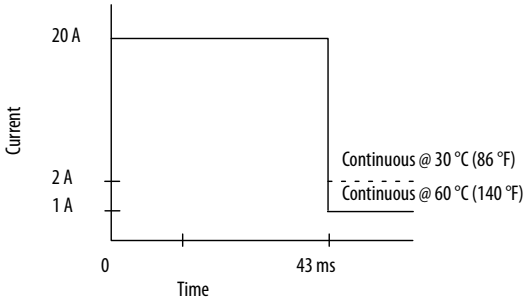
1756-OA16I

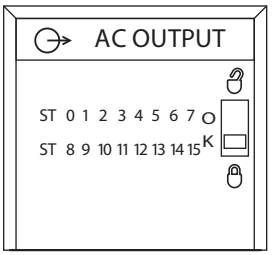
ControlLogix 120/240V AC isolated output module

Simplified Schematic

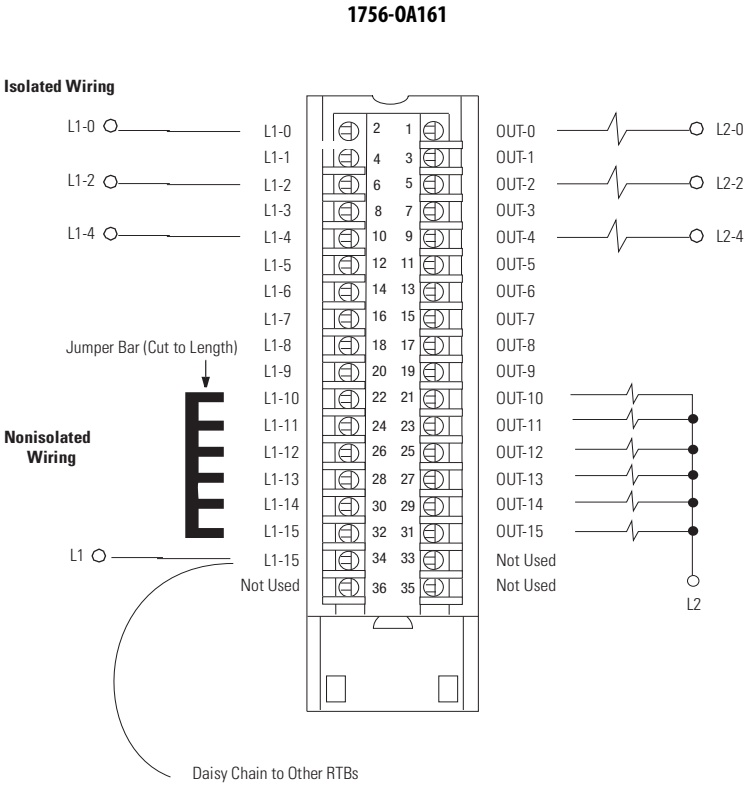


Surge Current Chart





1756-OA16I



Additional jumper bars are available as catalog number 1756-JMPR.

Technical Specifications - 1756-OA16I

Attribute	1756-OA16I
Outputs	16 individually isolated
Pilot duty	Yes
Voltage category	120/240V AC 50/60 Hz
Operating voltage range[1]	74…265V AC 47…63 Hz
Output delay time Off to On 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
Total backplane power	1.59 W
Power dissipation, max	5.5 W @ 60 °C (140 °F)

Technical Specifications - 1756-OA16I (continued)

Attribute	1756-OA16I
Thermal dissipation	18.76 BTU/hr
Off-state leakage current, max	3 mA per point
On-state voltage drop, max	1.5V peak @ 2 A 6V peak @ load current < 50 mA
Current per point, max	2 A @ 30 °C (86 °F) linear derating 1 A @ 60 °C (140 °F) linear derating
Current per module, max	5 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	20 A for 43 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	10 mA per point
Commutating voltage	4V/µs for loads > 50 mA 0.2V/µs for loads < 50 mA(2)
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Inhibit voltage, max	Zero crossing 60V peak
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(3)
North American temperature code	T4A
Enclosure type	None (open style)

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

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

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

Environmental Specifications - 1756-OA16I

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, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing

Environmental Specifications - 1756-OA16I (continued)

Attribute	1756-OA16I
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

Certifications - 1756-OA16I

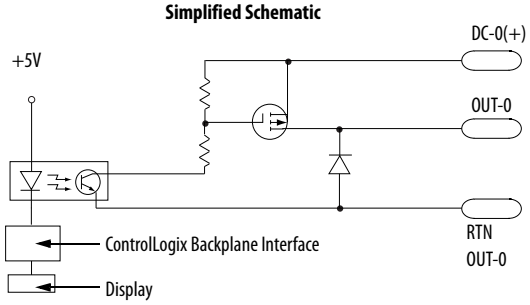
Certification[1]	1756-OA16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

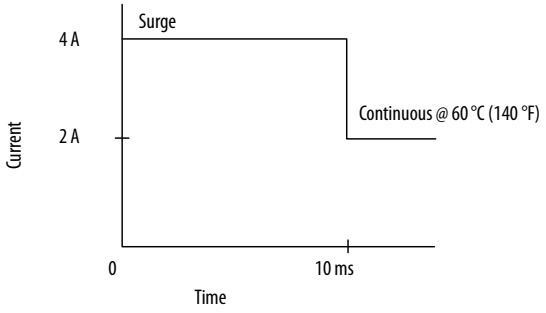
1756-OB8

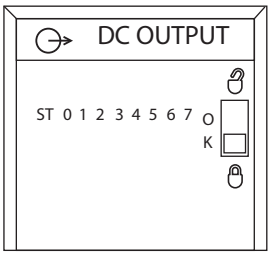
ControlLogix DC (10...30V) output module

Simplified Schematic

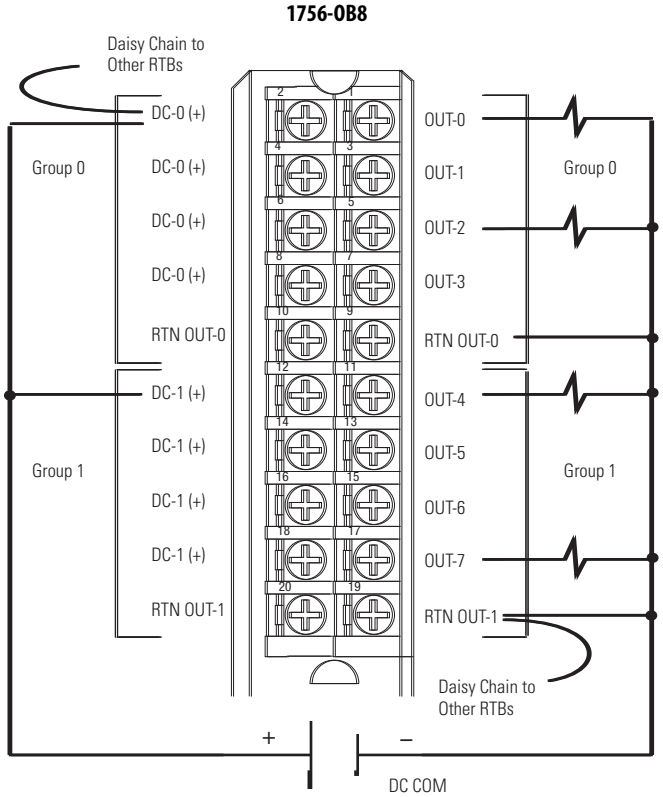


Surge Current Chart





1756-OB8



Technical Specifications - 1756-OB8

Attribute	1756-OB8
Outputs	8 (4 points/common)
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10…30V DC
Output delay time Off to On On to Off	 1 ms max 2 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	2.5 W @ 60 °C (140 °F)
Thermal dissipation	8.53 BTU/hr

Technical Specifications - 1756-OB8 (continued)

Attribute	1756-OB8
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	1.2V DC @ 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 each, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OB8

Attribute	1756-OB8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-OB8 (continued)

Attribute	1756-OB8
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OB8

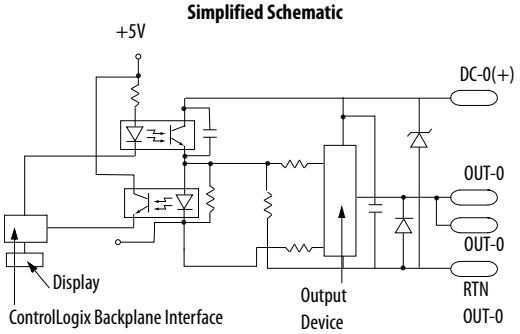
Certification[1]	1756-OB8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

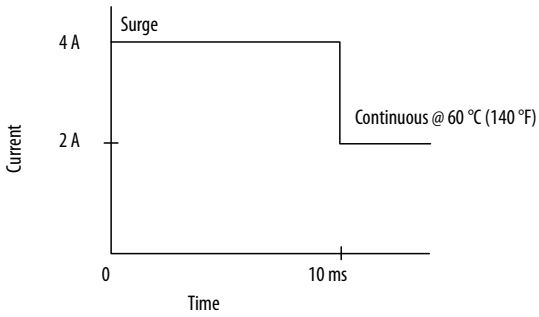
1756-OB8EI

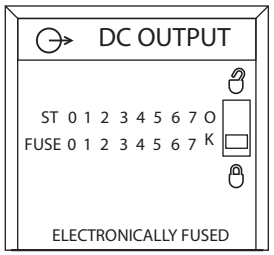
ControlLogix DC (10...30V) electronically fused, isolated output module

Simplified Schematic

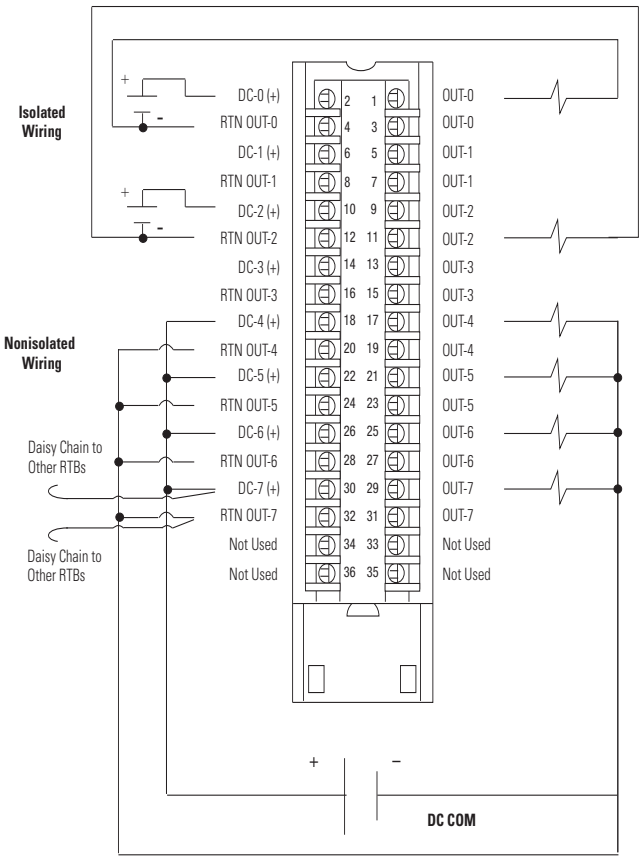


Surge Current Chart





1756-OB8EI



Diagnostic Specifications - 1756-OB8EI

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)
Time stamp of diagnostics	±1 ms

Technical Specifications - 1756-OB8EI

Attribute	1756-OB8EI
Outputs	8 individually isolated
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10…30V DC

Technical Specifications - 1756-OB8EI (continued)

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

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

Environmental Specifications - 1756-OB8EI

Attribute	1756-OB8EI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)

Environmental Specifications - 1756-OB8EI (continued)

Attribute	1756-OB8EI
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

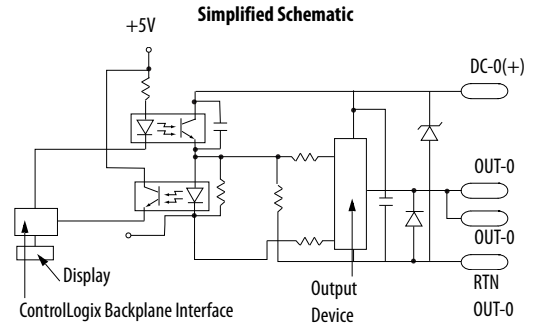
Certifications - 1756-OB8EI

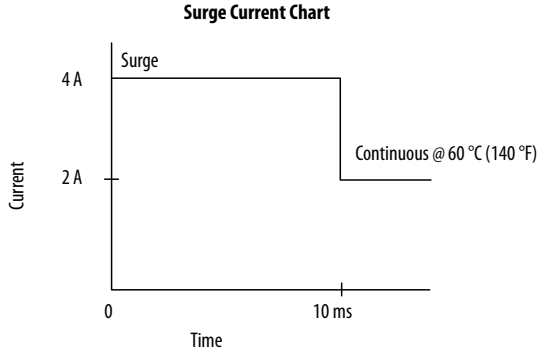
Certification(1)	1756-OB8EI
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

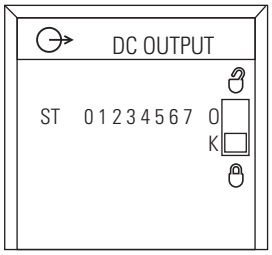
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

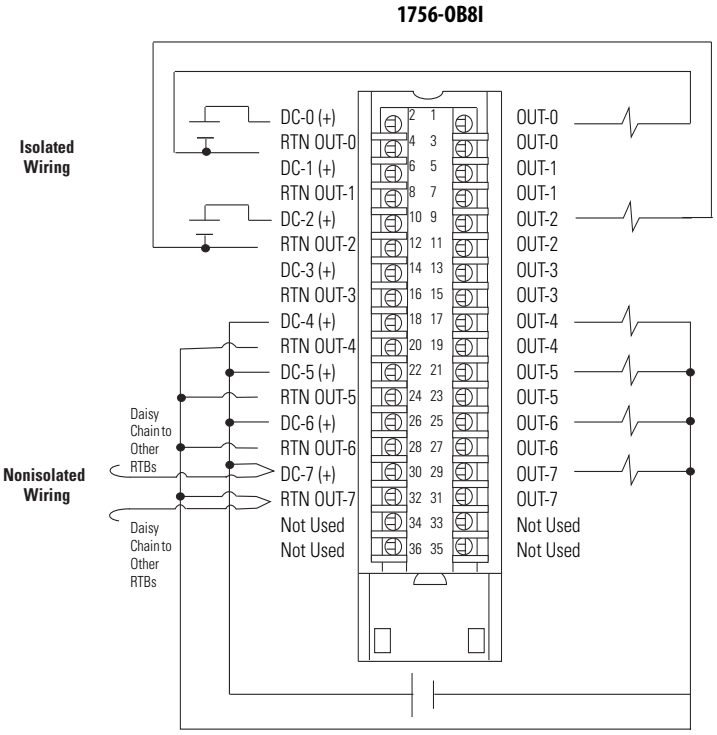
1756-OB8I

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









Technical Specifications - 1756-OB8I

Attribute	1756-OB8I
Outputs	8 individually isolated
Pilot duty	Yes
Voltage category	12/24V DC source
Operating voltage range	10…30V DC
Output delay time Off to On On to Off	 1 ms max 2 ms max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	4.6 W @ 60 °C (140 °F)
Thermal dissipation	15.70 BTU/hr

Technical Specifications - 1756-OB8I (continued)

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

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

Environmental Specifications - 1756-OB8I

Attribute	1756-OB8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8k V air discharges

Environmental Specifications - 1756-OB8I (continued)

Attribute	1756-OB8I
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1k Hz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OB8I

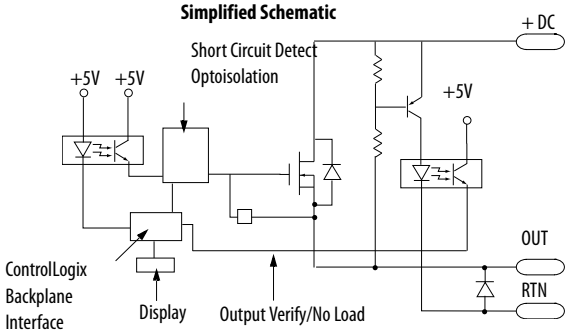
Certification(1)	1756-OB8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

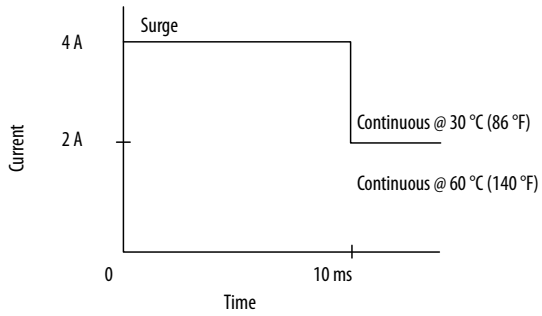
1756-OB16D

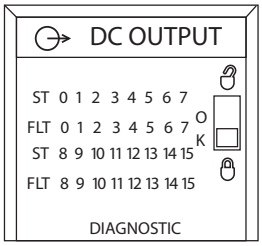
ControlLogix DC (19.2...30V) diagnostic output module

Simplified Schematic

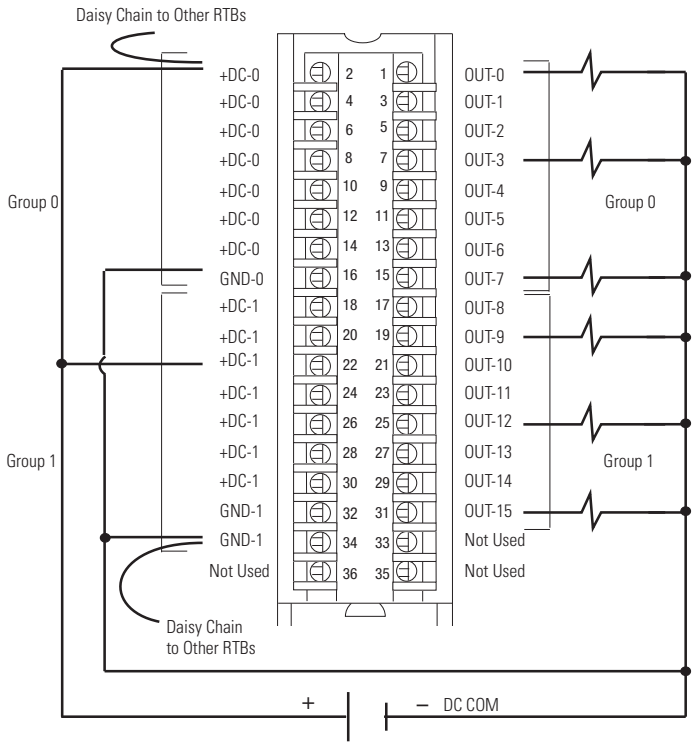


Surge Current Chart





1756-OB16D



Diagnostic Specifications - 1756-OB16D

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

Technical Specifications - 1756-OB16D

Attribute	1756-OB16D
Outputs	16 diagnostic (8 points/group)
Pilot duty	2 A (DC-13SQ)
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
Total backplane power	4.64 W
Power dissipation, max	3.3 W @ 60 °C (140 °F)
Thermal dissipation	11.25 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) linear derating 1 A @ 60 °C (140 °F) linear derating
Current per module, max	8 A @ 30 °C (86 °F) linear derating 4 A @ 60 °C (140 °F) linear derating
Surge current per point	4 A for 10 ms per point, repeatable every 1 s
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OB16D

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

Certifications - 1756-OB16D

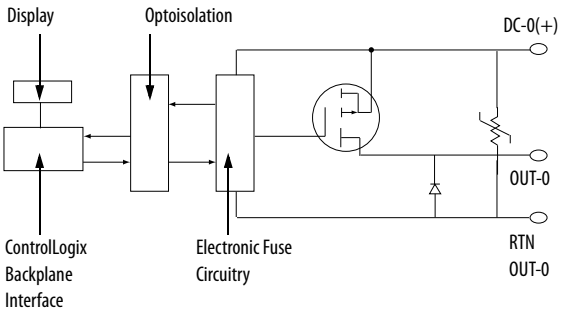
Certification[1]	1756-OB16D
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

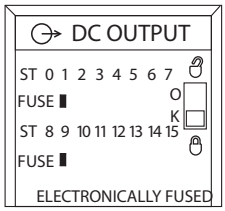
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-OB16E

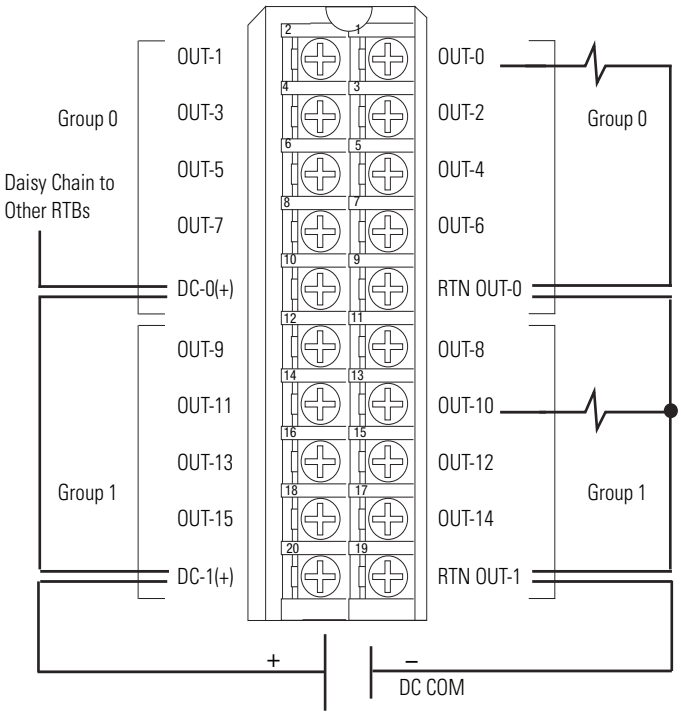
ControlLogix DC (10...31.2V) electronically fused output module

Simplified Schematic

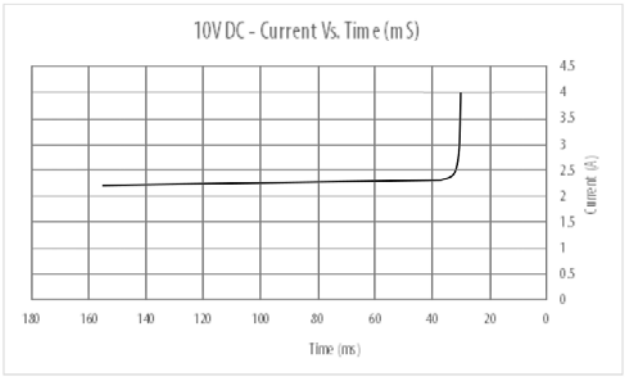


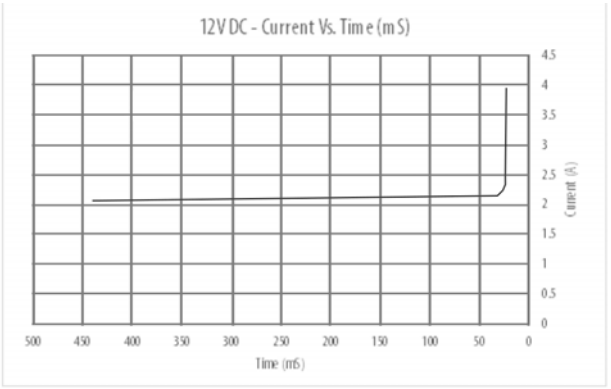


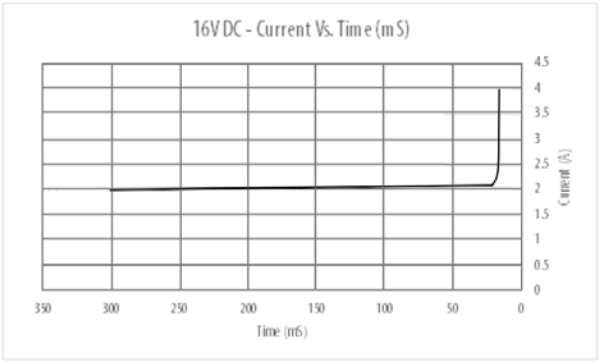
1756-OB16E

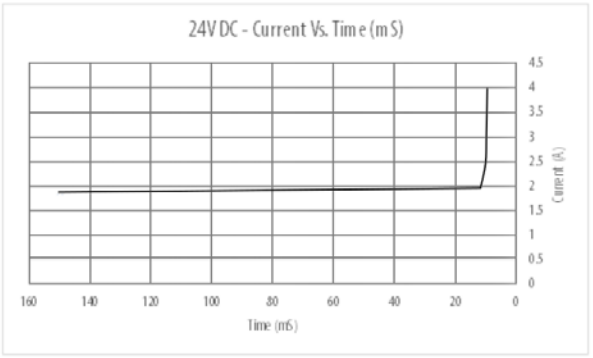


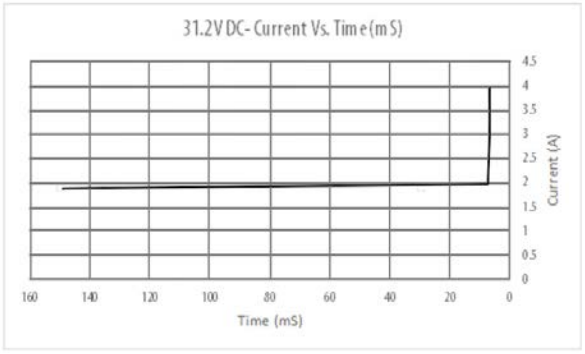
Surge Current Charts











Technical Specifications - 1756-OB16E

Attribute	1756-OB16E
Outputs	16 electronically fused (8 points/group)
Voltage category	12/24V DC source
Operating voltage range	10…31.2V DC
Output delay time Off to On 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
Total backplane power	1.32 W
Power dissipation, max	4.1 W @ 60 °C (140 °F)
Thermal dissipation	13.98 BTU/hr

Technical Specifications - 1756-OB16E (continued)

Attribute	1756-OB16E
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	400 mV DC @ 1 A
Current per point, max	1 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point, typical	2 A for 10 ms per point, repeatable every 2 s @ 0 °C (32 °F) @ 24V DC
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per group
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OB16E

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

Environmental Specifications - 1756-OB16E (continued)

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

Certifications - 1756-OB16E

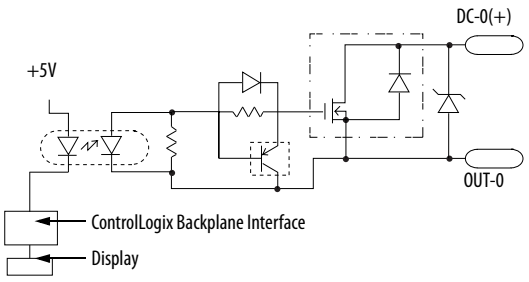
Certification[1]	1756-OB16E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

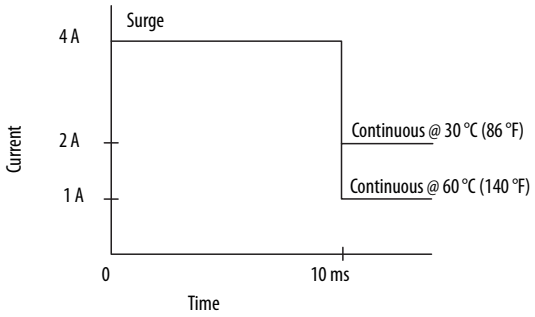
1756-OB16I

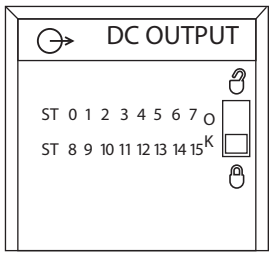
ControlLogix 24V DC isolated output module

Simplified Schematic

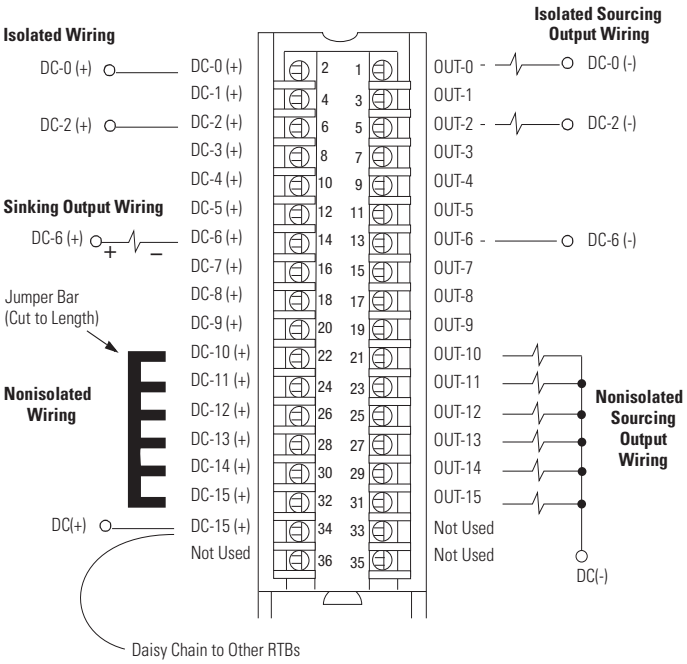


Surge Current Chart





1756-OB16I



Additional jumper bars are available as catalog number 1756-JMPR.

Technical Specifications - 1756-OB16I

Attribute	1756-OB16I
Outputs	16 individually isolated
Pilot duty	2 A (DC-13SQ)
Voltage category	12/24V DC sink/source
Operating voltage range[1]	10…30V DC
Output delay time Off to On On to Off	 1 ms max 2 ms max
Current draw @ 5.1V	350 mA
Current draw @ 24V	2.5 mA
Total backplane power	1.8 W
Power dissipation, max	3.6 W @ 60 °C (140 °F)

Technical Specifications - 1756-OB16I (continued)

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

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10…30V DC.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OB16I

Attribute	1756-OB16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g

Environmental Specifications - 1756-OB16I (continued)

Attribute	1756-OB16I
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

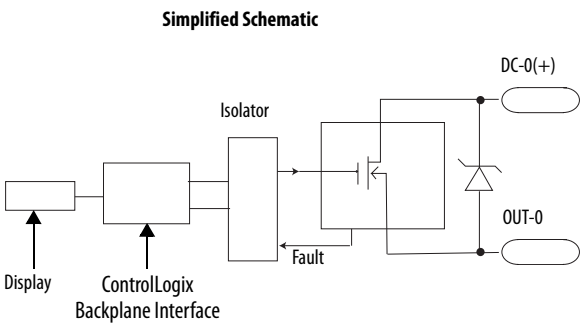
Certifications - 1756-OB16I

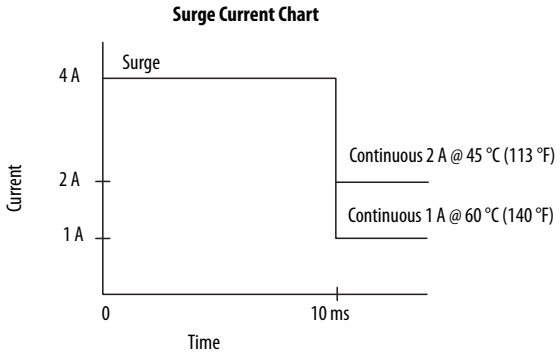
Certification(1)	1756-OB16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

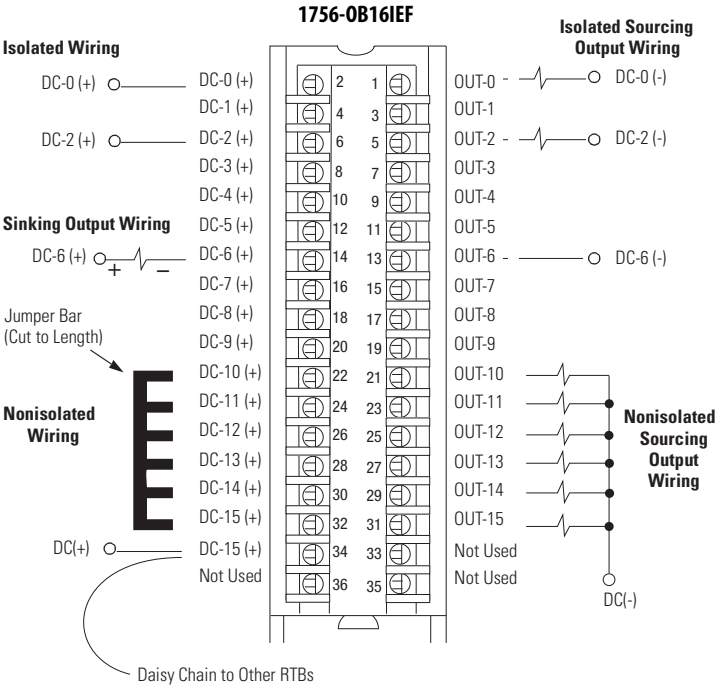
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-0B16IEF

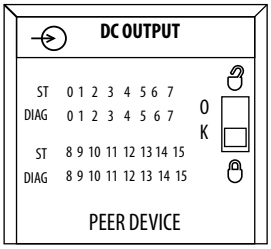
ControlLogix DC (10...30V) electronically protected, sinking or sourcing, isolated, fast output module







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



Technical Specifications - 1756-0B16IEF

Attribute	1756-0B16IEF
Outputs	16 individually isolated
Pilot duty	4 A inrush
Voltage category	12/24V DC sink/source
Operating voltage range	10…30V DC
Output delay time (backplane to screw) Off to On On to Off	 14 µs nom/23 µs max 14 µs nom/23 µs max
PWM cycle time	1 ms min/1 hour max
PWM On time	200 µs min/1 hour max
PWM On time accuracy	± 20 µs
Current draw @ 5.1V	320 mA

Technical Specifications - 1756-OB16IEF (continued)

Attribute	1756-OB16IEF
Current draw @ 24V	3 mA
Total backplane power	1.7 W
Power dissipation	4.9 W max (16 channels @ 1 A or 4 channels @ 2 A)
Thermal dissipation	16.71 BTU/hr
Off-state leakage current per point, max	< 0.1 mA per point
On-state voltage drop, max	0.2V DC @ 1 A 0.4V DC @ 2 A
Current per point, max	2 A @ 45 °C (113 °F) 4 channels max 1 A @ 60 °C (140 °F)
Current per module, max	16 A @ 60 °C (140 °F) 1 A max per channel 8 A @ 45 °C (113 °F) 2 A max per channel
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	CIP Sync only
States in Fault mode per point	Hold last state, On or Off (Off is default)
Duration of Fault mode per point	1, 2, 5, 10 s, Forever (Forever is default)
Final state after Fault mode duration per point	On or Off (default is Off)
States in Program mode per point	Hold last state, On or Off (default is Off)
Isolation voltage	250V (continuous), reinforced insulation type, outputs-to-backplane 250V (continuous), basic insulation type, output-to-output Type tested at 2300V AC for 60 s outputs-to-backplane Type tested at 1500V AC for 60 s output-to-output
Module keying	Electronic, software configurable
Fusing	Electronically fused per point
Reverse polarity protection	No
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OB16IEF

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

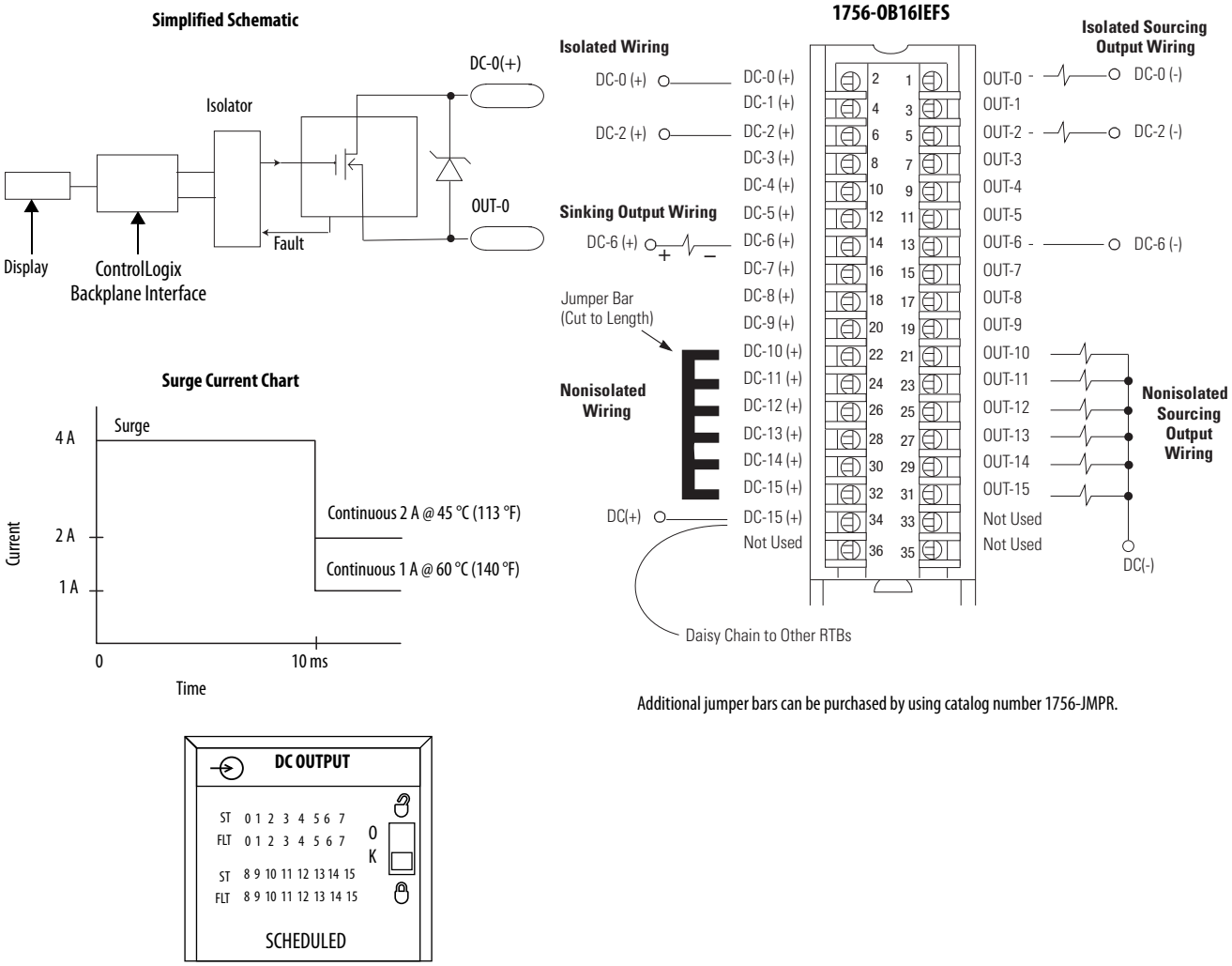
Certifications - 1756-OB16IEF

Certification(1)	1756-OB16IEF
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-0B16IEFS

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



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

Technical Specifications - 1756-0B16IEFS

Attribute	1756-0B16IEFS
Outputs	16 scheduled, individually isolated
Pilot duty	4 A inrush
Voltage category	12/24V DC sink/source
Operating voltage range	10…30V DC
Unscheduled output delay time (backplane to screw) Off to On On to Off	 14 µs nom/23 µs max 14 µs nom/23 µs max
Schedule accuracy	± 10 µs nom when all components are synchronized to the current CIP Sync Grandmaster
PWM cycle time	1 ms min/1 hour max
PWM On time	200 µs min/1 hour max
PWM On-time accuracy	± 20 µs

Technical Specifications - 1756-OB16IEFS (continued)

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

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

Environmental Specifications - 1756-OB16IEFS

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

Certifications - 1756-OB16IEFS

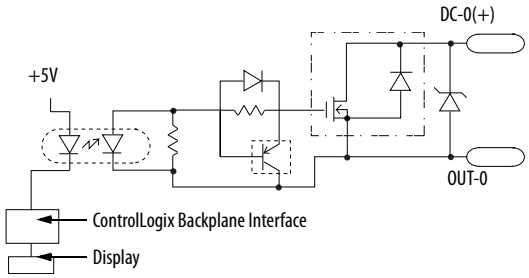
Certification[1]	1756-OB16IEFS
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

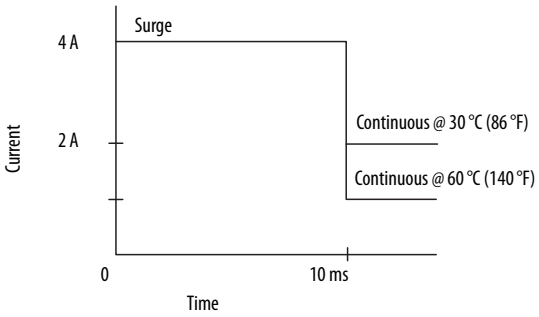
1756-OB16IS

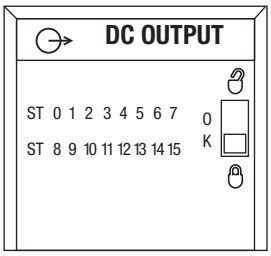
ControlLogix 24V DC scheduled, isolated output module

Simplified Schematic

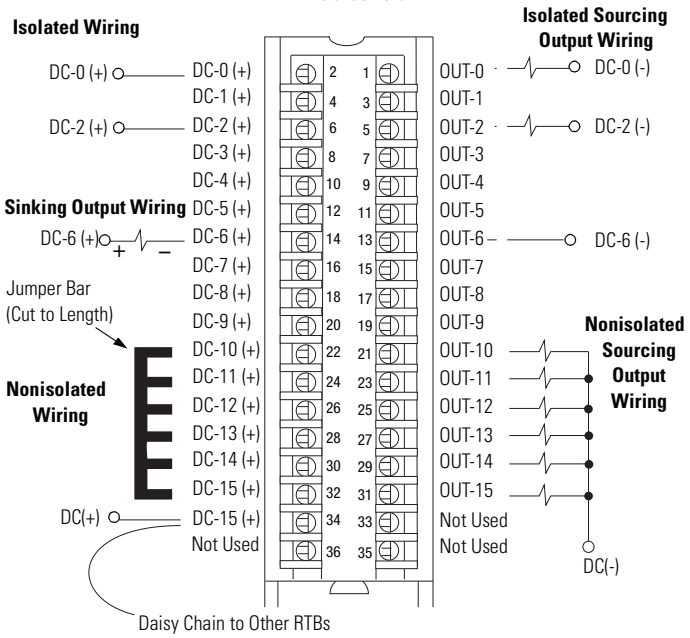


Surge Current Chart





1756-OB16IS



Additional jumper bars are available as catalog number 1756-JMPR.

Technical Specifications - 1756-OB16IS

Attribute	1756-OB16IS
Outputs	16 individually isolated, 8 scheduled
Pilot duty	2 A (DC-13SQ)
Voltage category	12/24V DC sink/source
Operating voltage range[1]	10…30V DC
Output delay time Off to On On to Off	 1 ms max 2 ms max
Current draw @ 5.1V	350 mA
Current draw @ 24V	2.5 mA
Total backplane power	1.8 W
Power dissipation, max	3.6 W @ 60 °C (140 °F)
Thermal dissipation	12.28 BTU/hr
Off-state leakage current per point, max	0.5 mA per point

Technical Specifications - 1756-OB16IS (continued)

Attribute	1756-OB16IS
On-state voltage drop, max	1.2V DC @ 2 A
Current per point, max	2 A @ 30 °C (86 °F) 1 A @ 60 °C (140 °F) (linear derating)
Current per module, max	8 A @ 30 °C (86 °F) 4 A @ 60 °C (140 °F) (linear derating)
Surge current per point	4 A for 10 ms per point, repeatable every 2 s
Load current, min	1 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM can be used to help protect outputs. See publication 1492-TD008. However, the ControlLogix system has been agency certified using only the ControlLogix RTBs, that is, 1756-TBCH, 1756-TBNH, 1756-TBSH, and 1756-TBS6H. Any application that requires agency certification of the ControlLogix system that uses other wiring termination methods can require application-specific approval by the certifying agency.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(2)
Wire type	Copper
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

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

Environmental Specifications - 1756-OB16IS

Attribute	1756-OB16IS
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0...60 °C (32...140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40...+85 °C (-40...+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5...95% noncondensing
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

Environmental Specifications - 1756-OB16IS (continued)

Attribute	1756-OB16IS
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OB16IS

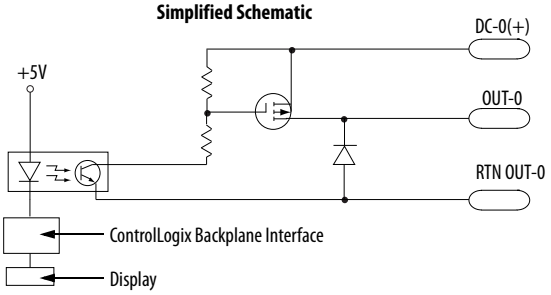
Certification(1)	1756-OB16IS
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

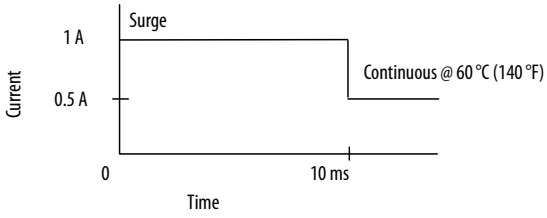
1756-0B32

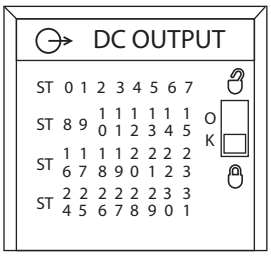
ControlLogix DC (10...31.2V) output module

Simplified Schematic

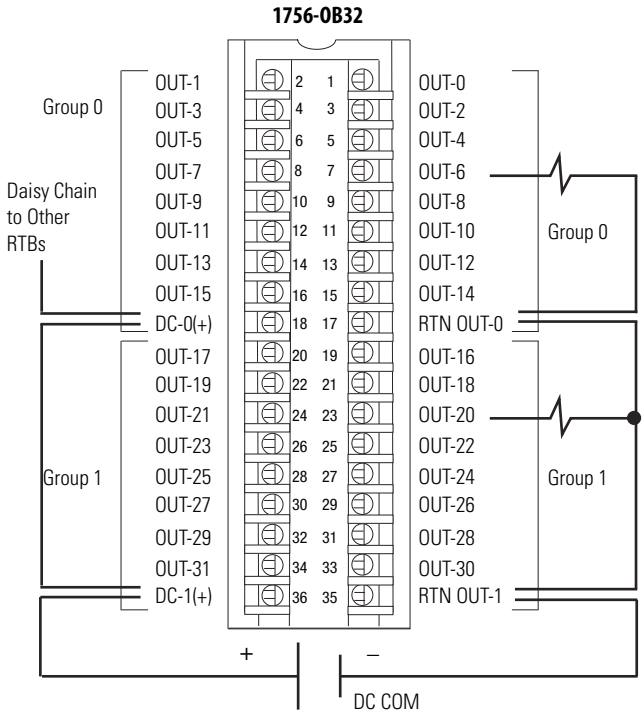


Surge Current Chart





1756-0B32



Technical Specifications - 1756-0B32

Attribute	1756-0B32
Outputs	32 (16 points/group)
Voltage category	12/24V DC source
Operating voltage range	10…31.2V DC
Output delay time Off to On 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
Total backplane power	1.58 W
Power dissipation, max	4.8 W @ 60 °C (140 °F)
Thermal dissipation	16.37 BTU/hr
Off-state leakage current per point, max	0.5 mA per point
On-state voltage drop, max	200 mV DC @ 0.5 A

Technical Specifications - 1756-OB32 (continued)

Attribute	1756-OB32
Current per point, max	0.5 A @ 50 °C (122 °F) linear derating 0.35 A @ 60 °C (140 °F)
Current per module, max	16 A @ 50 °C (122 °F) linear derating 10 A @ 60 °C (140 °F)
Surge current per point, max	1 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	3 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM can be used to help protect outputs. See publication 1492-TD008. However, the ControlLogix system has been agency certified using only the ControlLogix RTBs, that is, 1756-TBCH, 1756-TBNH, 1756-TBSH, and 1756-TBS6H. Any application that requires agency certification of the ControlLogix system that uses other wiring termination methods can require application-specific approval by the certifying agency.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T3C
IEC temperature code	T3
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OB32

Attribute	1756-OB32
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-OB32 (continued)

Attribute	1756-OB32
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OB32

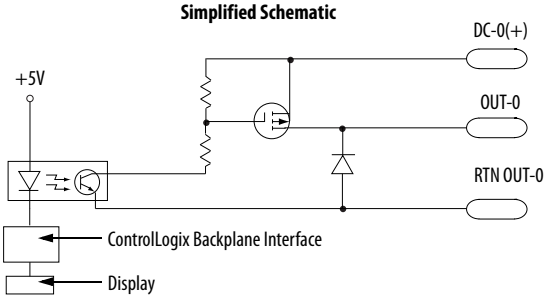
Certification(1)	1756-OB32
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

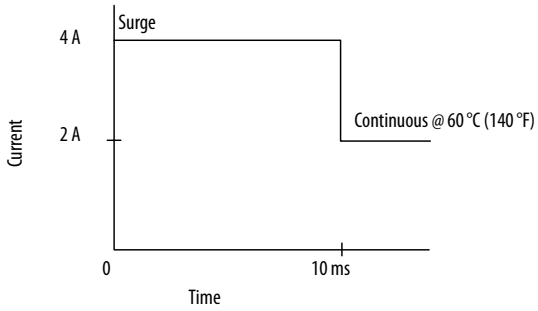
1756-0C8

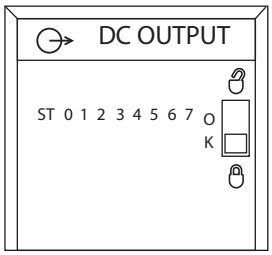
ControlLogix DC (30...60V) output module

Simplified Schematic

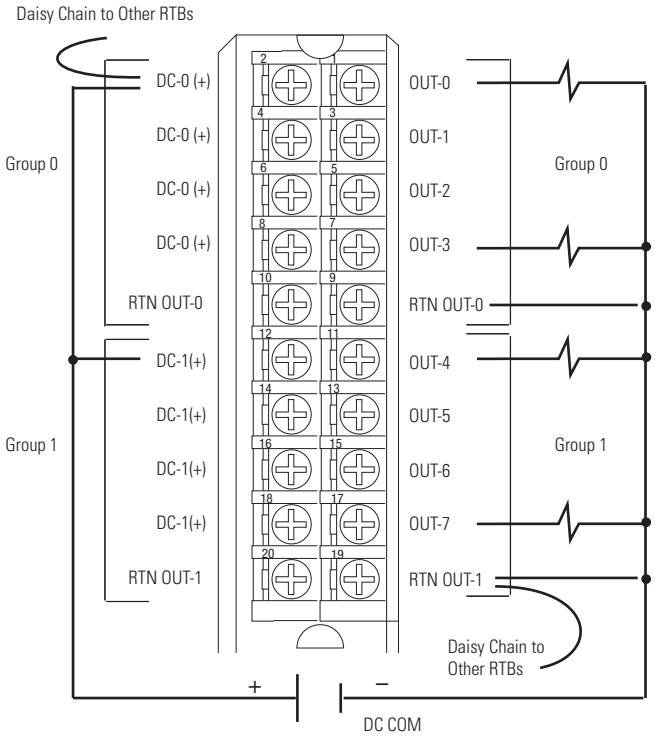


Surge Current Chart





1756-0C8



Technical Specifications - 1756-0C8

Attribute	1756-0C8
Outputs	8 (4 points/group)
Pilot duty	2 A
Voltage category	48V DC source
Operating voltage range	30…60V DC
Output delay time Off to On On to Off	 1 ms, max 2 ms, max
Current draw @ 5.1V	165 mA
Current draw @ 24V	2 mA
Total backplane power	0.89 W
Power dissipation, max	4.9 W @ 60 °C (140 °F)

Technical Specifications - 1756-OC8 (continued)

Attribute	1756-OC8
Thermal dissipation	16.71 BTU/hr
Off-state leakage current, max	1 mA per point
On-state voltage drop, max	2V DC @ 2 A
Current per point, max	2 A @ 60 °C (140 °F)
Current per module, max	8 A @ 60 °C (140 °F)
Surge current per point	4 A for 10 ms per point, repeatable every 1 s @ 60 °C (140 °F)
Load current, min	2 mA per point
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OC8

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, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-OC8 (continued)

Attribute	1756-OC8
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OC8

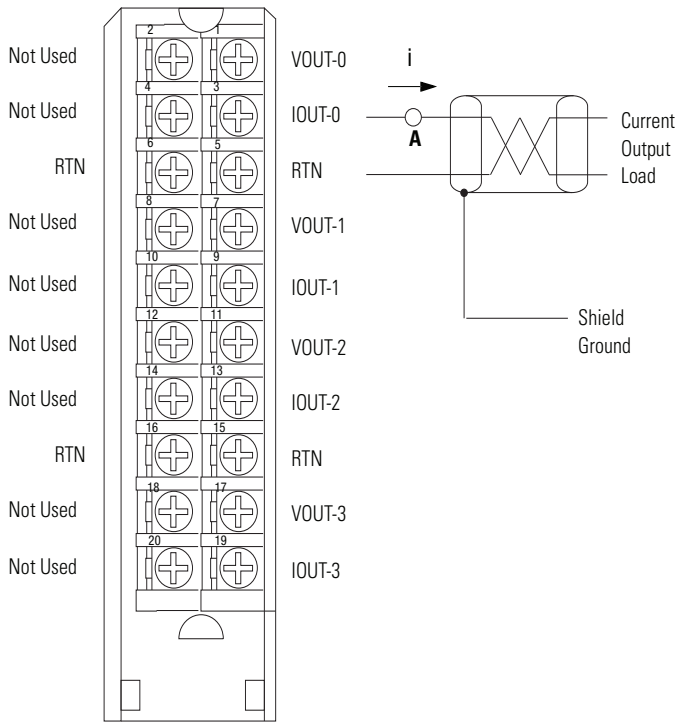
Certification[1]	1756-OC8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

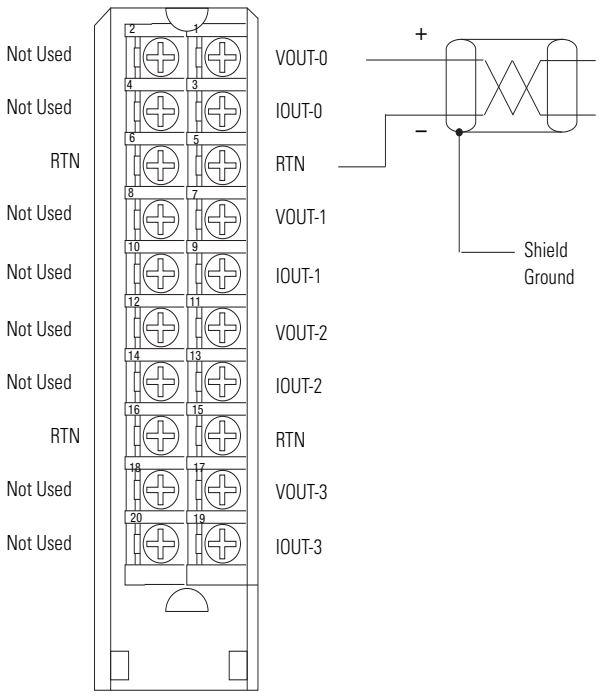
1756-0F4

ControlLogix voltage/current output analog module

1756-0F4 Current

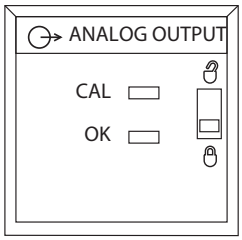


1756-0F4 Voltage



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

All terminals marked RTN are connected internally.



Signal and User Counts - 1756-0F4

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

Technical Specifications - 1756-OF4

Attribute	1756-OF4
Outputs	Four voltage or current outputs
Output range	±10V 4…20 mA
Resolution	Voltage: 15 bits across 10.5V, 320 μV/bit Current: 15 bits across 21 mA, 650 nA/bit
Voltage and current ratings	Backplane: 5.1V DC, 150 mA max 24V DC, 210 mA max Output voltage: -10…+10V Output current: 4…20 mA
Current draw @ 5.1V	150 mA
Current draw @ 24V	120 mA
Total backplane power	5.8 W
Power consumption	3.7 W backplane power
Power dissipation, max	3.7 W to 2.4 W; 0 to 750 ohm load
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 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	Better than 0.05% of range from 4…21 mA, -10.4…10.4V
Calibration interval	12 months typical
Offset drift	50 μV/ °C 100 nA/°C
Gain drift with temperature	Voltage: 25 ppm/°C, 520 μV/°C Current: 50 ppm/°C, 1050 μA/°C
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module scan time	12 ms floating point 8 ms integer
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), Reinforced insulation type, Output Channels to Backplane No isolation between individual Output Channels Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1

Technical Specifications - 1756-0F4 (continued)

Attribute	1756-0F4
Wire size	1756-TBNH Single wire connection: 0.33…2.1 mm² (22…14 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Double wire connection: 0.33…1.3 mm² (22…16 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Do not wire more than two conductors on any terminal. 1756-TBSH Single wire connection: 0.33…2.1 mm² (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Do not wire multiple conductors on any terminal.
Terminal block torque specs	1756-TBNH: 1.36 N•m (12 lb•in)
Wiring category(1)	1 - on signal ports
North American temp code	T4A
ATEX temp code	T4
IECEx temp code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-0F4

Attribute	1756-0F4
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < 60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OF4

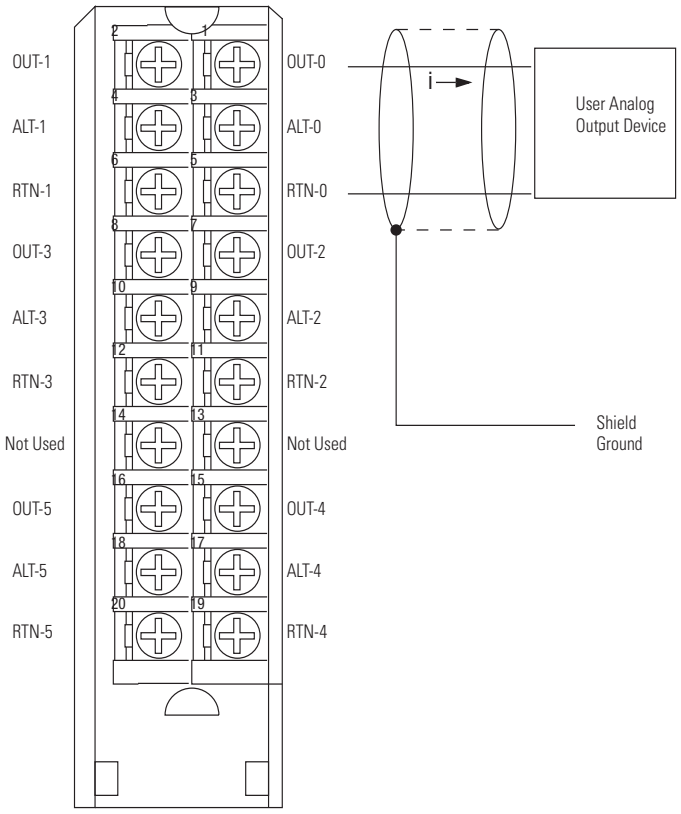
Certification[1]	1756-OF4
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-0F6CI

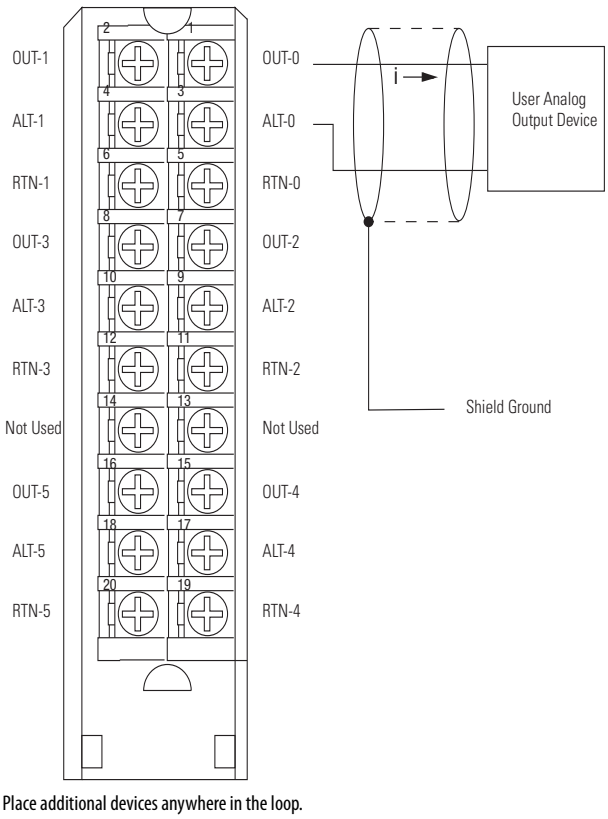
ControlLogix current loop output analog module

1756-0F6CI
0…550 Ω

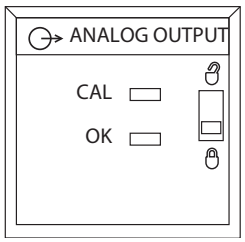


Place additional devices anywhere in the loop.

1756-0F6CI
551…1000 Ω



Place additional devices anywhere in the loop.



Signal and User Counts - 1756-0F6CI

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

Technical Specifications - 1756-OF6CI

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 Ω loads terminated on OUTs and RTNs 250 mA for 551…1000 Ω loads terminated on OUTs and ALTs
Current draw @ 24V	225 mA for 0…550 Ω loads terminated on OUTs and RTNs 300 mA for 551…1000 Ω loads terminated on OUTs and ALTs
Total backplane power	6.7 W for 0…550 Ω range 8.5 W for 551…1000 Ω range
Power dissipation, max	5.5 W (0…550 Ω loads) 6.1 W (551…1000 Ω loads)
Thermal dissipation	18.76 BTU/hr (0…550 Ω loads) 20.80 BTU/hr (551…1000 Ω loads)
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	0…1000 Ω Separate field terminations for 0…550 Ω and 551…1000 Ω
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °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
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OF6CI

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

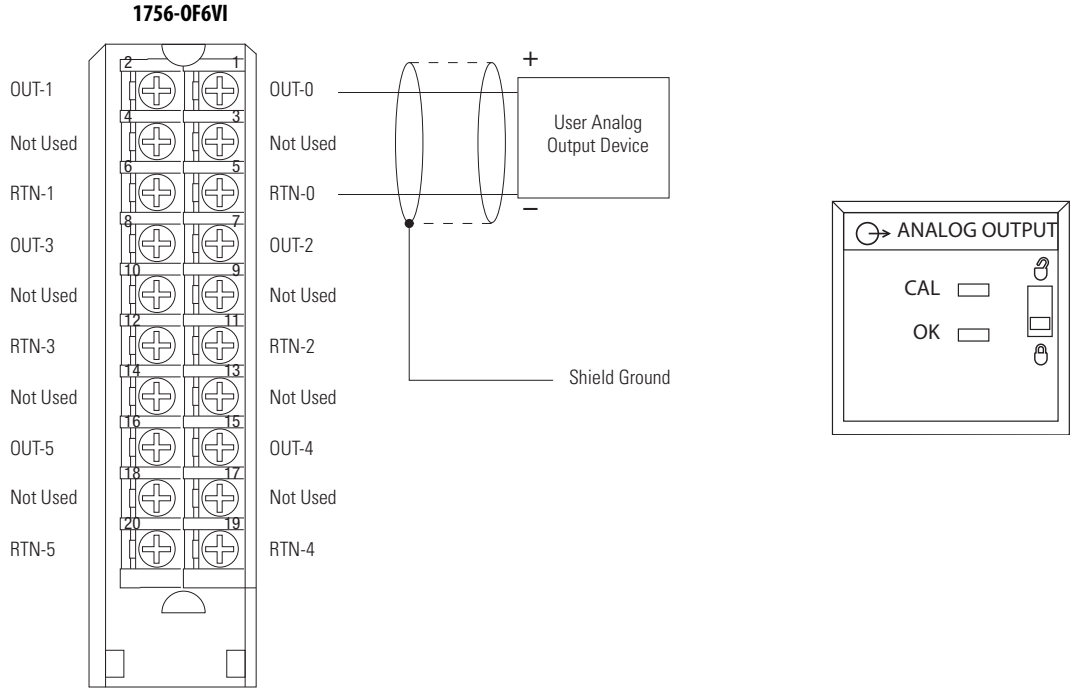
Certifications - 1756-OF6CI

Certification[1]	1756-OF6CI
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-0F6VI

ControlLogix voltage loop output analog module



Place additional devices anywhere in the loop.

Signal and User Counts - 1756-0F6VI

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

Technical Specifications - 1756-0F6VI

Attribute	1756-0F6VI
Outputs	6 individually isolated
Output range	± 10.5V
Resolution	14 bits across 21V (1.3 mV) (13 bits across 10.5V +sign bit)
Current draw @ 5.1V	250 mA
Current draw @ 24V	175 mA
Total backplane power	5.5 W
Power dissipation, max	4.85 W
Thermal dissipation	16.54 BTU/hr
Output impedance	<1 Ω
Open circuit detection	None
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited
Drive capability	> 1000 Ω loads, 10 mA

Technical Specifications - 1756-OF6VI (continued)

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
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), basic insulation type, output channels-to-backplane, and output channel-to-channel Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure	None (open-style)

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

Environmental Specifications - 1756-OF6VI

Attribute	1756-OF6VI
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A

Environmental Specifications - 1756-OF6VI (continued)

Attribute	1756-OF6VI
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF Immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz on shielded signal ports

Certifications - 1756-OF6VI

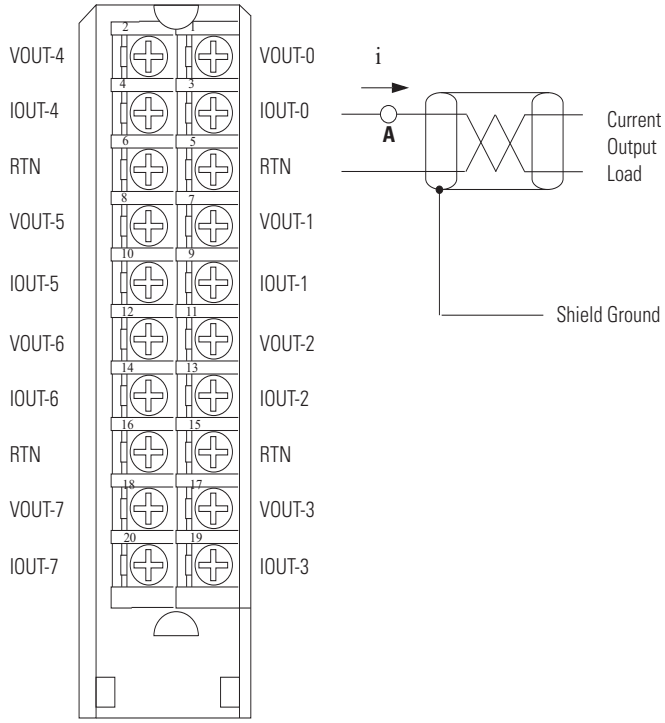
Certification(1)	1756-OF6VI
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

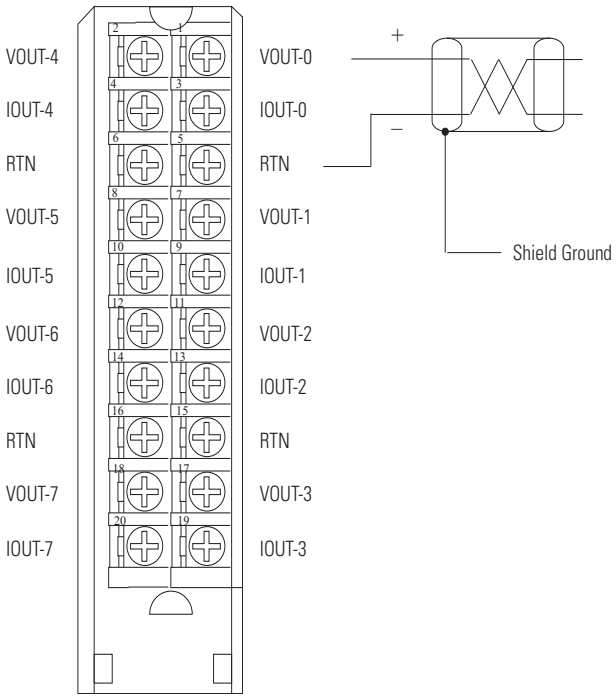
1756-0F8

ControlLogix voltage/current output analog module

1756-0F8 Current

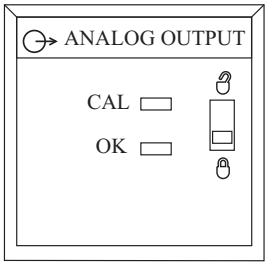


1756-0F8 Voltage



All terminals marked RTN are connected internally.

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



Signal and User Counts - 1756-0F8

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

Technical Specifications - 1756-OF8

Attribute	1756-OF8
Outputs	Eight voltage or current
Output range	± 10V 0…20 mA
Resolution	15 bits across 21 mA - 650 nA/bit 15 bits across 10.4V - 320 μV/bit
Current draw @ 5.1V	150 mA
Current draw @ 24V	210 mA
Total backplane power	5.8 W
Voltage and current ratings	Backplane: 5.1V DC, 150mA max, 24V DC, 210mA max Output Voltage: -10…+10V Output Current: 4…20mA
Power consumption	5.8 W backplane power
Power dissipation	5.8 W to 3.15 W; 0 to 750 ohm loads
Thermal dissipation	16.78 BTU/hr
Open circuit detection	Current output only (Output must be set to >0.1 mA)
Overvoltage protection	24V DC
Short circuit protection	Electronically current limited to 21 mA or less
Drive capability	Voltage: > 2000 Ω Current: 0…750 Ω
Settling time	< 2 ms to 95% of final value with resistive loads
Calibrated accuracy @ 25 °C (77 °F)	Better than 0.05% of range from 4…21 mA, -10.4…10.4V
Calibration interval	12 months typical
Offset drift	50 μV/°C typical (Voltage mode) 0.1 μA/°C typical (Current mode)
Gain drift with temperature, max	Voltage: 25 ppm/°C max Current: 50 ppm/°C max
Module error	Voltage: 0.15% of range Current: 0.3% of range
Module scan time, min	12 ms floating point 8 ms integer
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), Reinforced insulation type, Output Channels to Backplane No isolation between individual Output Channels Routine tested at 1350V AC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1

Technical Specifications - 1756-OF8 (continued)

Attribute	1756-OF8
Wire size	1756-TBNH Single wire connection: 0.33…2.1 mm² (22…14 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Double wire connection: 0.33…1.3 mm²(22…16 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max. Do not wire more than two conductors on any terminal. 1756-TBSH Single wire connection, 0.33…2.1 mm² (22…14 AWG) solid or stranded shielded copper wire rated at 105 °C (221 °F), or greater, 1.2 mm (3/64 in.) insulation max. Do not wire multiple conductors on any terminal.
Terminal block torque specs	1756-TBNH: 1.36 N•m (12 lb•in)
Wiring category(1)	1 - on signal ports
North American temp code	T4A
ATEX temp code	T4
IECEx temp code	T4
Enclosure type	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OF8

Attribute	1756-OF8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
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

Environmental Specifications - 1756-OF8 (continued)

Attribute	1756-OF8
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OF8

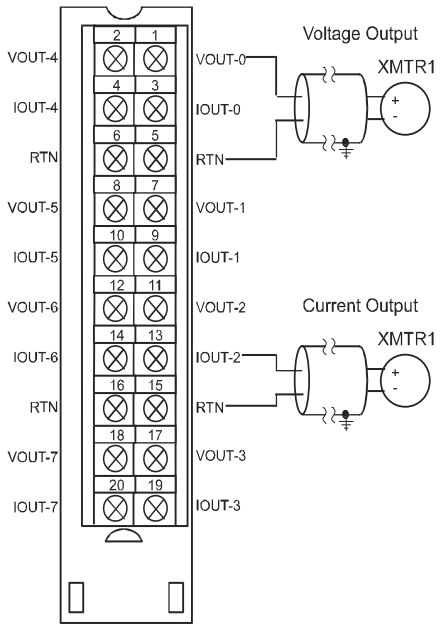
Certification[1]	1756-OF8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
CE	European Union 2014/30/EU 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 2014/35/EU LVD, compliant with: • EN 61010-2-201; Control Equipment Safety Requirements
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO15ATEX1482X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 15.0053X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

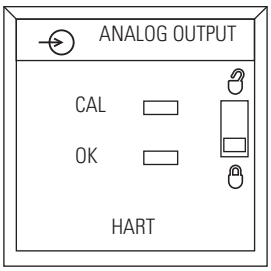
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-OF8H

ControlLogix voltage/current output analog module with HART protocol

1756-OF8H





Signal and User Counts - 1756-OF8H

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

Technical Specifications - 1756-OF8H

Attribute	1756-OF8H
Outputs	Eight voltage or current, one HART modem per module
Output range	±10V 0…20 mA 4…20 mA
Resolution	15…16 bits for all ranges
Voltage and current ratings	Backplane: 5.1V DC, 230 mA, 24V DC, 230 mA Output voltage range: -10…10.4V Output current range: 0…20 mA, 4…20 mA
Total backplane power	6.54 W
Power dissipation	4.92 W
Thermal dissipation	16.78 BTU/hr
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
Output impedance	–

Technical Specifications - 1756-OF8H (continued)

Attribute	1756-OF8H
Open circuit detection time	Current output only (output must be set to < 0.1 mA)
Overvoltage protection, max	±24V DC
Drive capability	–
Load reactance, max	Voltage: 1 μF Current: 10 μH
Settling time	Current (no HART): < 23 ms to 95% with resistive loads Current (with HART): < 37 ms to 95% with resistive loads Voltage: < 8.5 ms to 95% with resistive loads
Calibrated accuracy @ 25 °C (77 °F) with HART disabled	Voltage: Better than 0.1% 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 HART scan time	Analog: 12 ms, min, floating point. HART: typically 1 s per HART channel enabled. Estimate 10 s if all 8 channels have HART enabled. Pass through messages, handheld communicators, secondary masters, communication errors, or configuration changes can significantly increase the update time
Data format	Integer mode (left justified, 2 s complement) IEEE 32-bit floating point
Input conversion method	Successive approximation
Output conversion method	R-Ladder DAC, monotonicity with no missing codes
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBNH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max Double wire connection: 0.33…1.3 mm^2 (22…16 AWG) solid or stranded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBSH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBNH 1.36 N•m (12 lb·in)
Wire category(1)	2 - on signal ports
Wire type	Copper
North American temp code	T4
ATEX temp code	T4
IECEx temp code	T4
Enclosure type rating	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OF8H

Attribute	1756-OF8H
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OF8H

Certification[1]	1756-OF8H
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU 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)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4: Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO12ATEX1219040X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0109X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

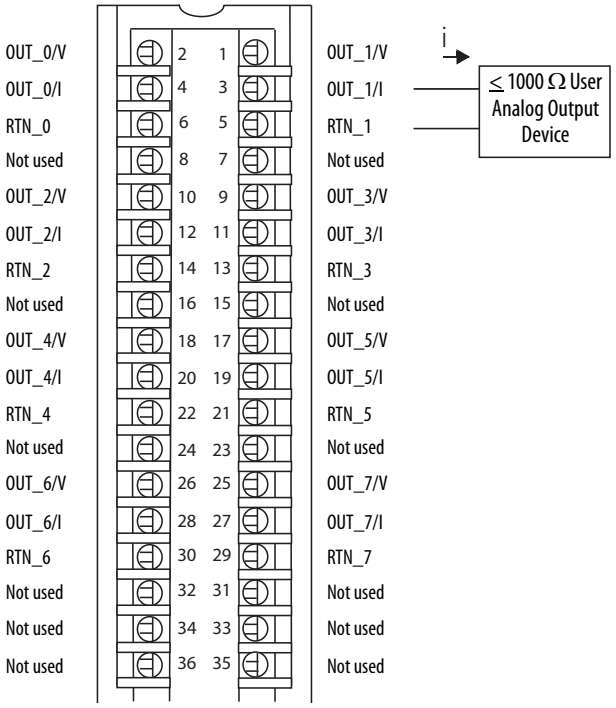
1756-OF8I

ControlLogix isolated voltage/current output analog module.

1756-OF8I Module Wiring Diagram - Current Mode

IMPORTANT: Remember the following:

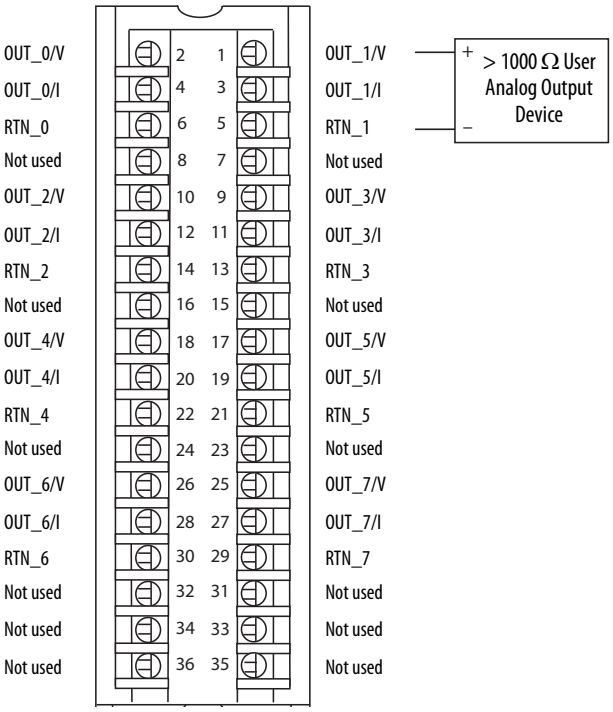
- If separate power sources are used, do not exceed the specific isolation voltage as listed in the specifications.
- Place additional devices anywhere in the loop.

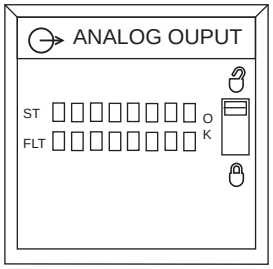


1756-OF8I Module Wiring Diagram - Voltage Mode

IMPORTANT: Remember the following:

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





Technical Specifications - 1756-OF8I

Attribute	1756-OF8I
Outputs	Eight isolated channels - Any combination of voltage or current mode
Output range	-10…10V 0…10V 0…5V 0…20 mA
Resolution	16-bit ±10.5V (0.32 mV/count) 0…10.5V (0.16 mV/count) 0…5.25V (0.08 mV/count) 0…21 mA (0.32 µA/count)
Current draw @ 5.1V	200 mA
Current draw @ 24V	Voltage or Current mode with 250 Ω loads = 220 mA Current mode with 500 Ω loads = 275 mA Current mode with 750 Ω loads = 340 mA Current mode with 1000 Ω loads = 385 mA
Total backplane power	Voltage mode = 6.3 W Current mode with 250 Ω loads = 6.3 W Current mode with 500 Ω loads = 7.6 W Current mode with 750 Ω loads = 9.2 W Current mode with 1000 Ω loads = 10.2 W
Power dissipation, max	Voltage mode = 5.4 W Current mode with 250 Ω loads = 5.4 W Current mode with 500 Ω loads = 5.8 W Current mode with 750 Ω loads = 6.5 W Current mode with 1000 Ω loads = 6.7 W
Thermal dissipation	Voltage mode = 18.4 BTU/hr Current mode with 250 Ω loads = 18.4 BTU/hr Current mode with 500 Ω loads = 19.8 BTU/hr Current mode with 750 Ω loads = 22.2 BTU/hr Current mode with 1000 Ω loads = 22.9 BTU/hr
Output impedance	46 Ω (Current output)
Open circuit detection	Current output = Yes
Short circuit detection	Voltage output = Yes
Overvoltage protection	±30V DC (voltage/current)
Drive capability	Current output = 0…1000 Ω Voltage output = >1000 Ω
Settling time	< 2 ms to 95% of final value with Resistive loads
Calibrated accuracy @ 25 °C (77 °F)	0.05%
Module error over full temperature range	0.1%
Module scan time, min	1 ms
Data format	IEEE 32-bit floating point
Module conversion method	R-Ladder DAC, monotonicity with no missing codes
Isolation voltage	250V (continuous), reinforced insulation type, outputs to backplane 250V (continuous), basic insulation type, output to output Type tested at 2300V AC for 60 s, outputs to backplane Type tested at 1500V AC for 60 s, output to output
Module keying	Electronic, software configurable

Technical Specifications - 1756-OF8I (continued)

Attribute	1756-OF8I
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max
Wire category	2 on signal ports(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OF8I

Attribute	1756-OF8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80… 2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on shielded signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

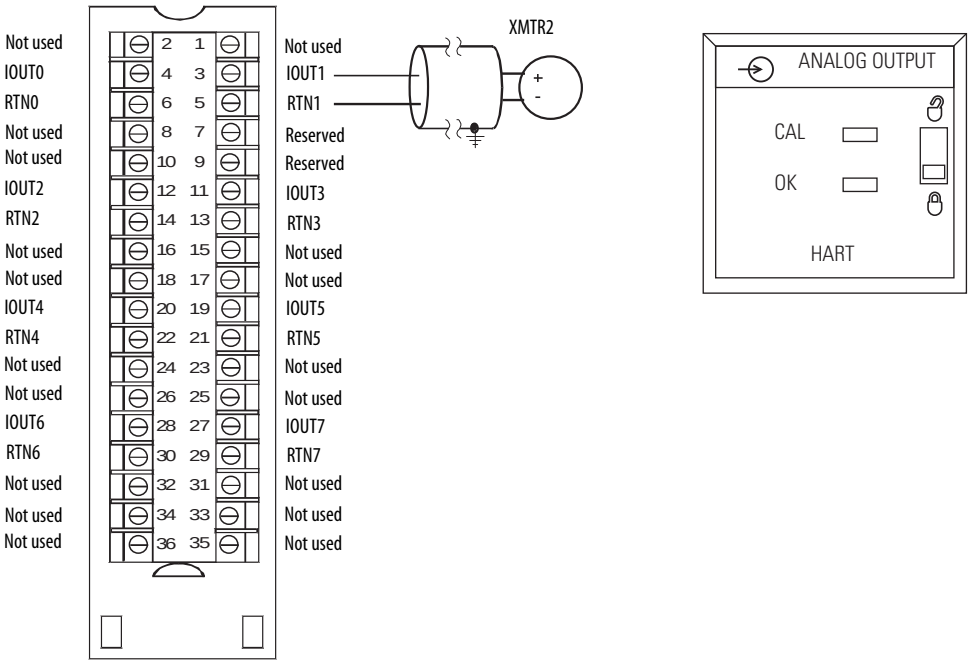
Certifications - 1756-OF8I

Certification[1]	1756-OF8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 94/9/EC ATEX Directive, compliant with: • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • EN 60079-0; General Requirements II 3 G Ex nA IIC T4 Gc X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-OF8IH

ControlLogix isolated HART current analog output module



Signal and User Counts - 1756-OF8IH

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

Technical Specifications - 1756-OF8IH

Attribute	1756-OF8IH
Outputs	8 current
Output range	0…20 mA 4…20 mA
Resolution	15 bits across 24 mA, 732 nA per bit
Voltage and current ratings	Backplane: 220 mA @ 5.1V DC, 360 mA @ 24V DC Output voltage range: 5…30V DC Output current range: 0…20 mA, 4…20 mA
Current draw @ 24V	400 mA (estimated)
Power dissipation, max	6.5 W nominal (< 6.4 W with 50 Ω load on all channels) (<6.5 W with 250 Ω load on all channels) (<6.7 W with 750 Ω load on all channels)
Open circuit detection	Current output only (output must be set >= 0.1 mA)
Overvoltage protection, max	±24V DC
Output short circuit protection	Current electronically limited to <= 21 mA with no damage
Drive capability	50…750 Ω with short circuit survival
Load reactance, max	10 µH
Settling time	HART not enabled: < 23 ms to 95% with resistive loads HART enabled: < 100 ms to 95% with resistive loads

Technical Specifications - 1756-OF8IH (continued)

Attribute	1756-OF8IH
Calibrated accuracy @ 25 °C (77 °F)	0.15% @ 4…20 mA
Calibration interval	12 months typical
Offset drift	±3 ppm of full scale range/°C (72 nA/°C typical)
Gain drift with temperature	±4 ppm of full scale range/°C
Module error	0.3% @ 4…20 mA
Module scan time	Estimate 1 s if all channels are HART enabled Pass through messages, handheld communications, secondary masters, communication errors, or configuration changes can significantly increase the update time.
Data format	IEEE 32-bit floating point
Output conversion method	R-Ladder DAC
Isolation voltage	250V (continuous) Reinforced Insulation Type, outputs to backplane. Basic Insulation Type, output to output, and outputs to ground. Type tested at 3535V DC for 60 s, outputs to backplane. Type tested at 2120V DC for 60 s, output to output, and outputs to ground.
Module keying	Electronic, software configurable
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire size	1756-TBCH Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max 1756-TBS6H Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded shielded copper wire, rated at 105 °C (221 °F) or greater, 1.2 mm (3/64 in.) insulation max
Terminal block torque specs	1756-TBCH 0.5 N•m (4.4 lb•in)
Wiring category(1)	2 - on signal ports
Wire type	Copper
North American temp code	T4A
ATEX temp code	T4
IECEx temp code	T4
Enclosure type rating	None (open-style)

(1) Use this Conductor Category information for planning conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OF8IH

Attribute	1756-OF8IH
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0 °C < Ta < +60 °C (+32 °F < Ta < +140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock	-40…+85 °C (-40…+185 °F)

Environmental Specifications - 1756-OF8IH (continued)

Attribute	1756-OF8IH
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration (operating) IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Emissions	IEC 61000-6-4
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz square wave 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz square wave 50% Pulse 100% AM @ 1890 MHz 10V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±2 kV @ 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±2 kV line-earth (CM) on shielded ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OF8IH

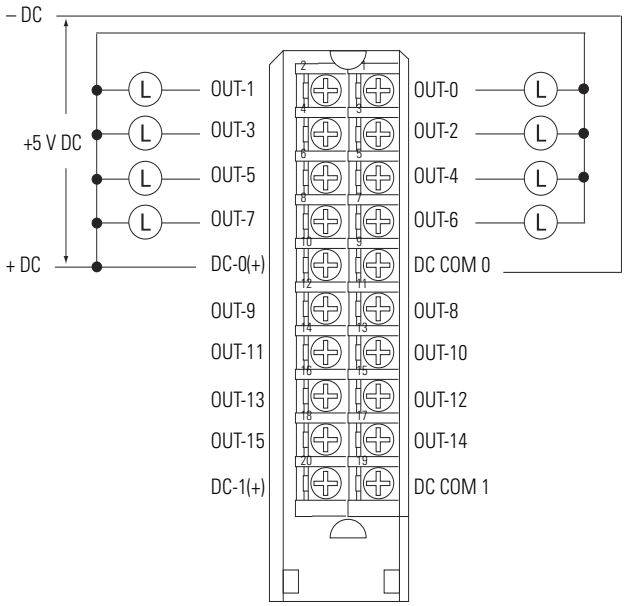
Certification(1)	1756-OF8IH
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2014/30/EU EMC Directive, compliant with: • 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 and B) European Union 2014/35/EU LVD, compliant with: • EN 61131-2; Programmable Controllers (Clause 11)
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions
Ex	European Union 2014/34/EU ATEX Directive, compliant with: • EN 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO14ATEX1238X
IECEx	IECEx System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEx UL 16.0110X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3
EAC	Russian Customs Union TR CU 020/2011 EMC Technical Regulation Russian Customs Union TR CU 004/2011 LV Technical Regulation

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

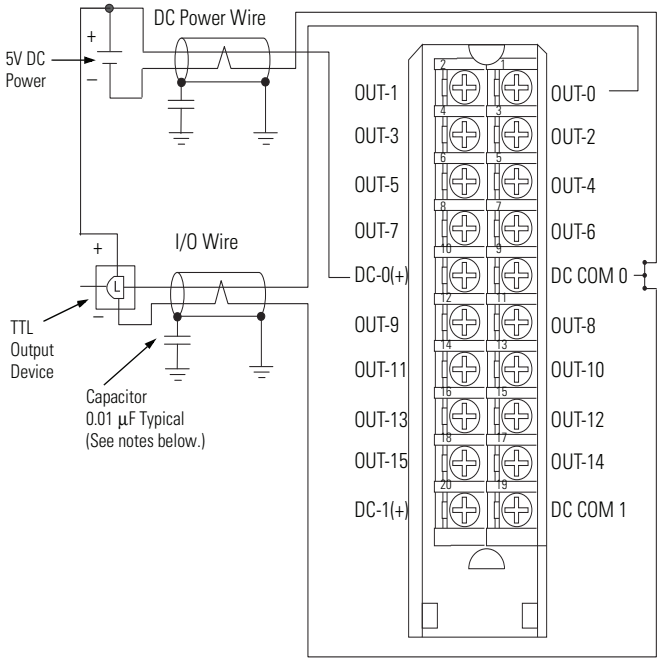
1756-OG16

ControlLogix TTL output module

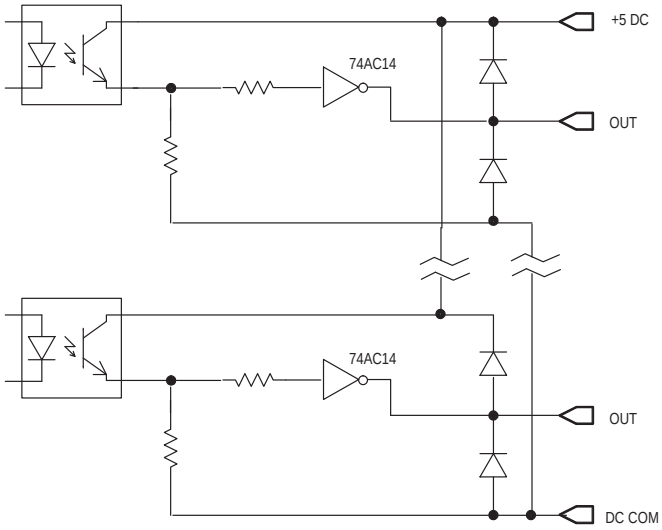
1756-OG16 Standard Wiring



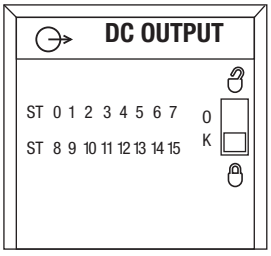
1756-OG16 CE Compliant Wiring



Simplified Schematic



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



Low to True Format - 1756-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

Technical Specifications - 1756-OG16

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/700 µs max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Total backplane power	1.12 W
Power dissipation, max	1.5 W @ 60 °C (140 °F)
Thermal dissipation	5.2 BTU/hr @ 60 °C (140 °F)
Off-state leakage current per point, max	0.1 mA per point
On-state voltage drop, max	0.4V DC
Continuous current, max	24 mA
Load current per point, max	24 mA
Load current per module, max	384 mA
Load current	0.15 mA
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs.
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1
Wire category	2[2]
North American temperature code	T5
IEC temperature code	T5
Enclosure type	None (open-style)

(1) TTL outputs are inverted (0 to +0.4V DC = low voltage = True = On.) Use a NOT instruction in your program to convert to traditional True - High logic.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Environmental Specifications - 1756-OG16

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

Certifications - 1756-OG16

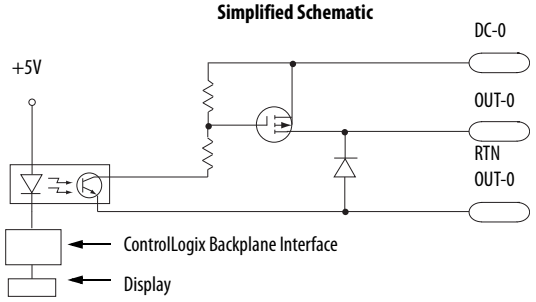
Certification(1)	1756-OG16
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

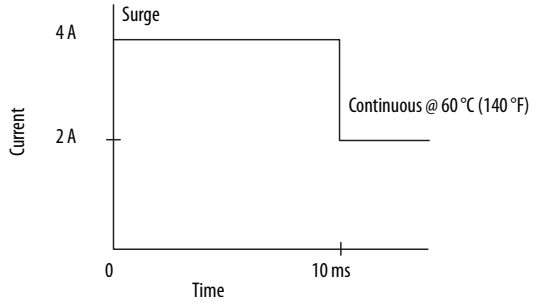
1756-0H8I

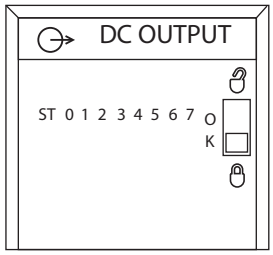
ControlLogix DC (90...146V) isolated output module

Simplified Schematic



Surge Current Chart

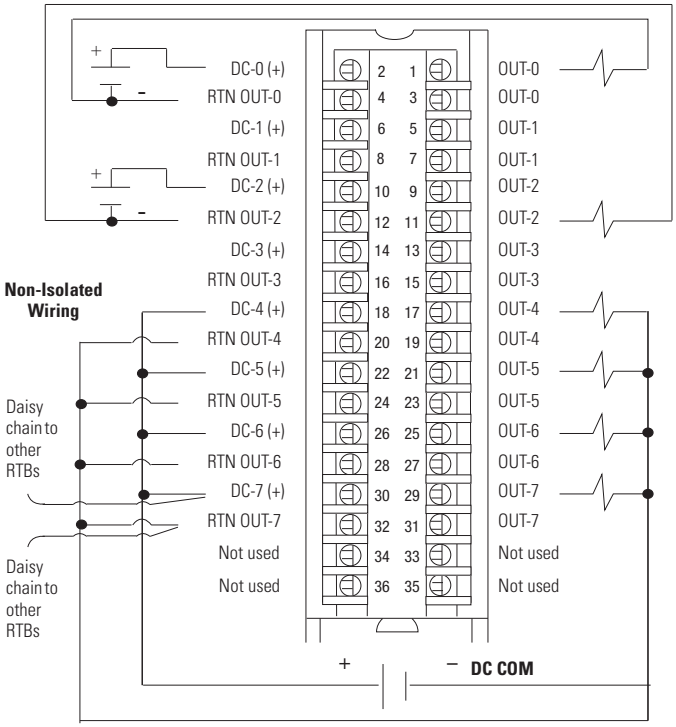




1756-0H81

Isolated Wiring

Non-Isolated Wiring



Technical Specifications - 1756-0H8I

Attribute	1756-0H8I
Outputs	8 individually isolated
Voltage category	120V DC sink/source
Operating voltage range	90…146V DC
Output delay time Off to On On to Off	 2 ms max 2 ms max
Current draw @ 5.1V	210 mA
Current draw @ 24V	2 mA
Total backplane power	1.11 W
Power dissipation, max	3.3 W @ 60 °C (140 °F)
Thermal dissipation	11.25 BTU/hr
Off-state leakage current, max	1 mA per point

Technical Specifications - 1756-OH8I (continued)

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

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

Environmental Specifications - 1756-OH8I

Attribute	1756-OH8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-OH8I (continued)

Attribute	1756-OH8I
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 1V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-OH8I

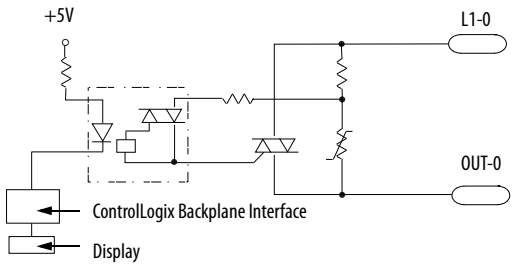
Certification(1)	1756-OH8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC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

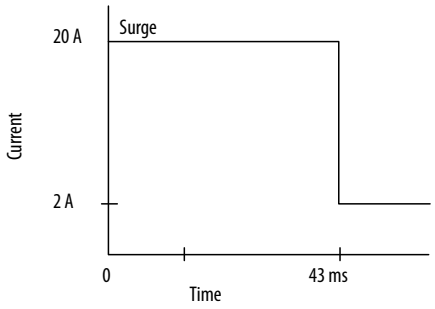
1756-ON8

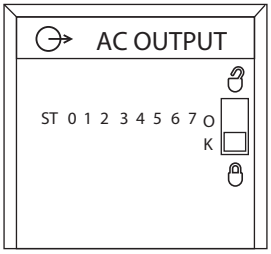
ControlLogix 24V AC output module

Simplified Schematic

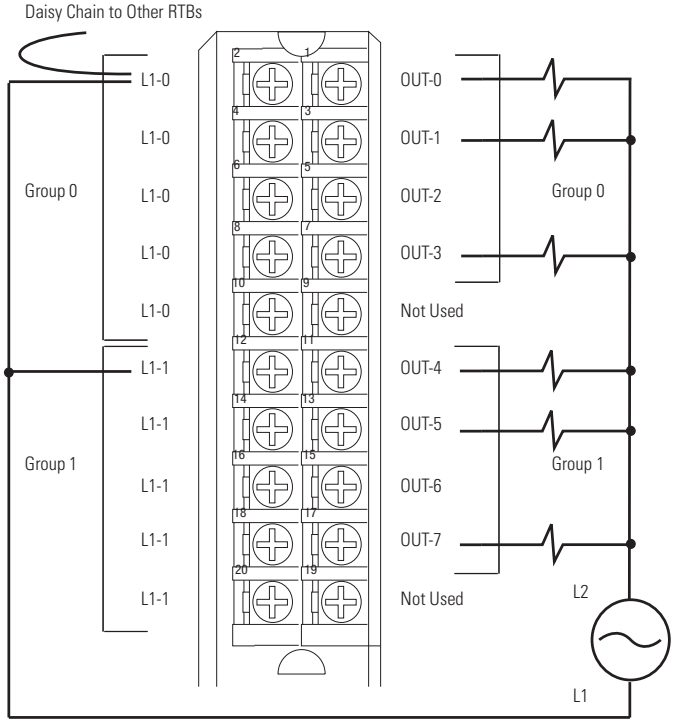


Surge Current Chart





1756-ON8



Technical Specifications - 1756-ON8

Attribute	1756-ON8
Outputs	8 (4 points/group)
Voltage category	24V AC 50/60 Hz
Operating voltage range[1]	10…30V AC, current >50 mA, 47…63Hz 16…30V AC, current <50 mA, 47…63Hz
Output delay time Off to On 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
Total backplane power	1.07 W

Technical Specifications - 1756-ON8 (continued)

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

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

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

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

Environmental Specifications - 1756-ON8

Attribute	1756-ON8
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)

Environmental Specifications - 1756-ON8 (continued)

Attribute	1756-ON8
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

Certifications - 1756-ON8

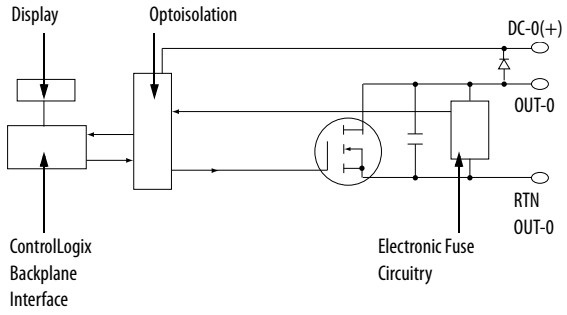
Certification(1)	1756-ON8
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

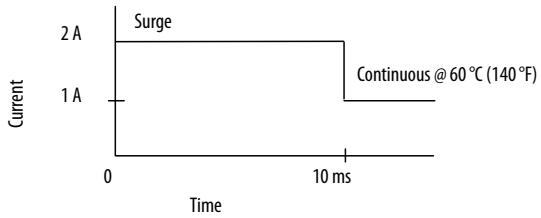
1756-0V16E

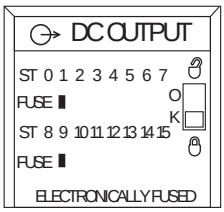
ControlLogix DC (10...30V) electronically fused, sinking output module

Simplified Schematic

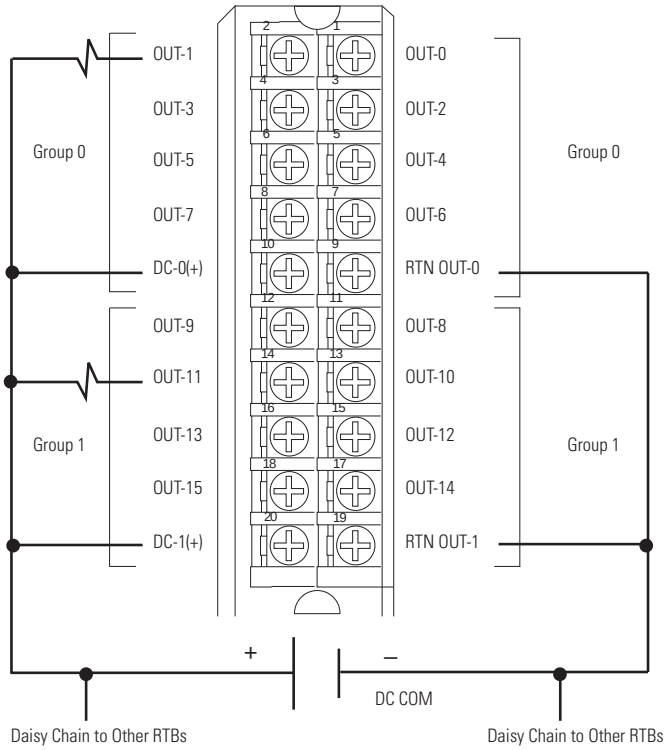


Surge Current Chart





1756-0V16E



Diagnostic Specifications - 1756-0V16E

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

Technical Specifications - 1756-OV16E

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

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

Environmental Specifications - 1756-OV16E

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

Certifications - 1756-OV16E

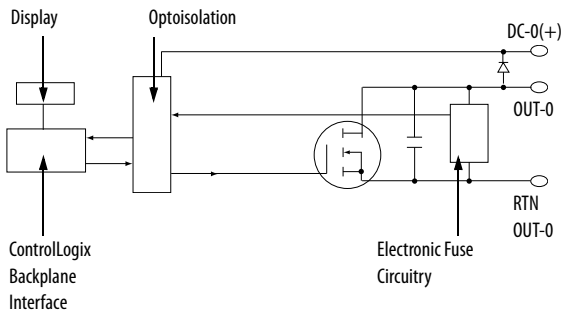
Certification[1]	1756-OV16E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

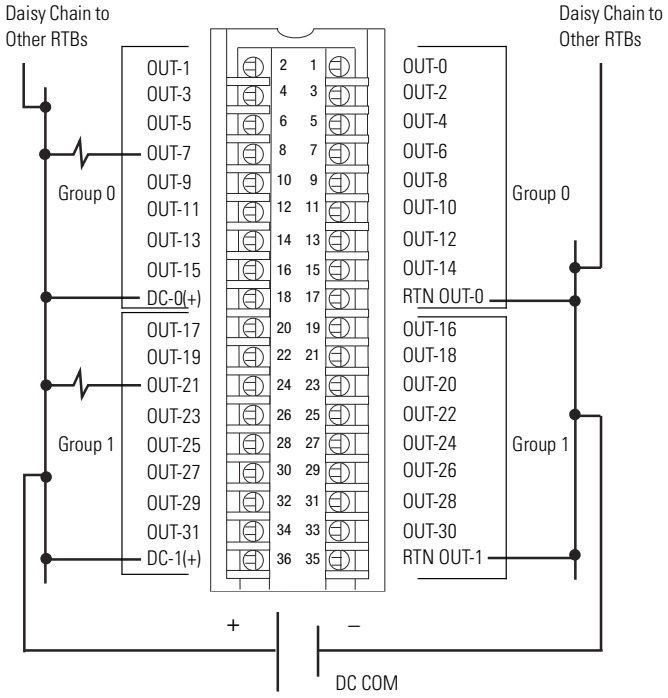
1756-0V32E

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

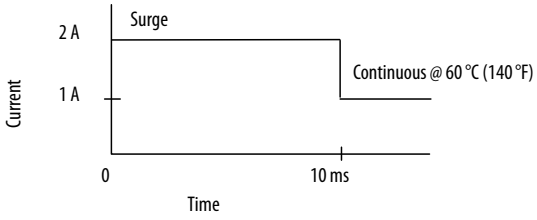
Simplified Schematic

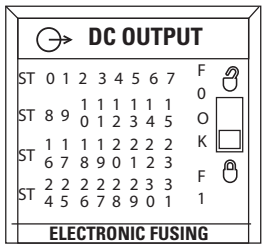


1756-0V32E



Surge Current Chart





Diagnostic Specifications - 1756-0V32E

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

Technical Specifications - 1756-0V32E

Attribute	1756-0V32E
Outputs	32 electronically fused (16 points/group)
Voltage category	12/24V DC sink
Operating voltage range	10…30V DC
Output delay time (24V to 0V DC transition) Off to On On to Off	 75 µs nom/300 µs max 230 µs nom/1 ms max
Current draw @ 5.1V	390 mA

Technical Specifications - 1756-OV32E (continued)

Attribute	1756-OV32E
Current draw @ 24V	2 mA
Total backplane power	2.04 W
Power dissipation, max	5.88 W @ 60 °C (140 °F)
Thermal dissipation	20.1 BTU/hr
Off-state leakage current per point, max	1 mA per point
On-state voltage drop, max	350 mV DC @ 0.5 A
Current per point, max	0.5 A @ 50 °C (122 °F) linear derating 0.35 A @ 60 °C (140 °F)
Current per group, max	8 A @ 50 °C (122 °F) linear derating 5 A @ 60 °C (140 °F)
Current per module, max	16 A @ 50 °C (122 °F) linear derating 10 A @ 60 °C (140 °F)
Surge current per point	2 A for 10 ms per point, repeatable every 2 s @ 60 °C (140 °F)
Load current, min	2 mA per output
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output group-to-group No isolation between individual group outputs Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Electronically fused per group
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-OV32E

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, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing

Environmental Specifications - 1756-0V32E (continued)

Attribute	1756-0V32E
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

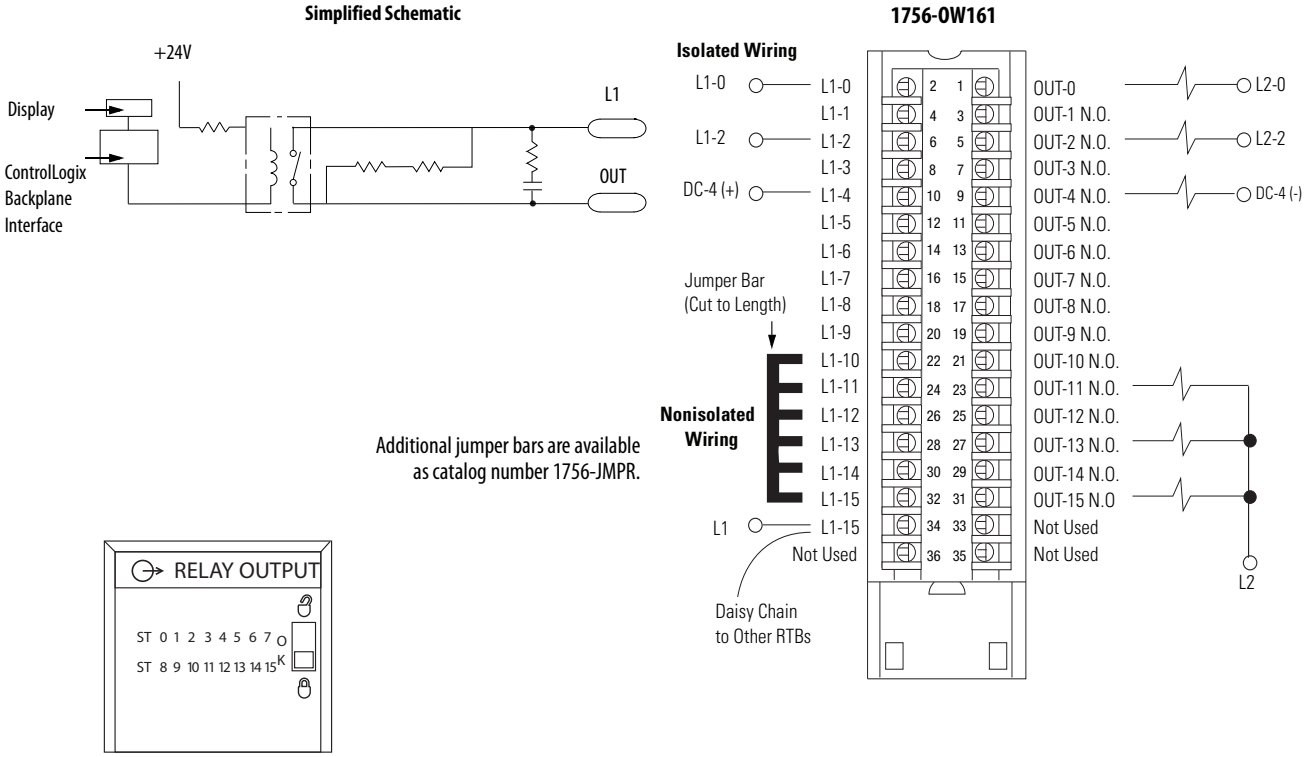
Certifications - 1756-0V32E

Certification[1]	1756-0V32E
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-0W16I

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



Technical Specifications - 1756-0W16I

Attribute	1756-0W16I
Outputs	16 N.O. individually isolated
Pilot duty	C300/R150
Operating voltage range	5…125V DC 10…240V AC
Output voltage range (load dependent)	1 A @ 5…30V DC 0.5 A @ 48V DC 0.22 A @ 125V DC 1.5 A @ 120V AC 50/60 Hz 0.75 A @ 240V AC 50/60 Hz
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
Total backplane power	4.4 W
Power dissipation, max	4.5 W @ 60 °C (140 °F)
Thermal dissipation	15.35 BTU/hr
Off-state leakage current per point, max	1.5 mA per point
Minimum load current	10 mA per point
Initial contact resistance, max	100 mΩ @ 6V 1 A

Technical Specifications - 1756-OW16I (continued)

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

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

Environmental Specifications - 1756-OW16I

Attribute	1756-OW16I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges

Environmental Specifications - 1756-0W16I (continued)

Attribute	1756-0W16I
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

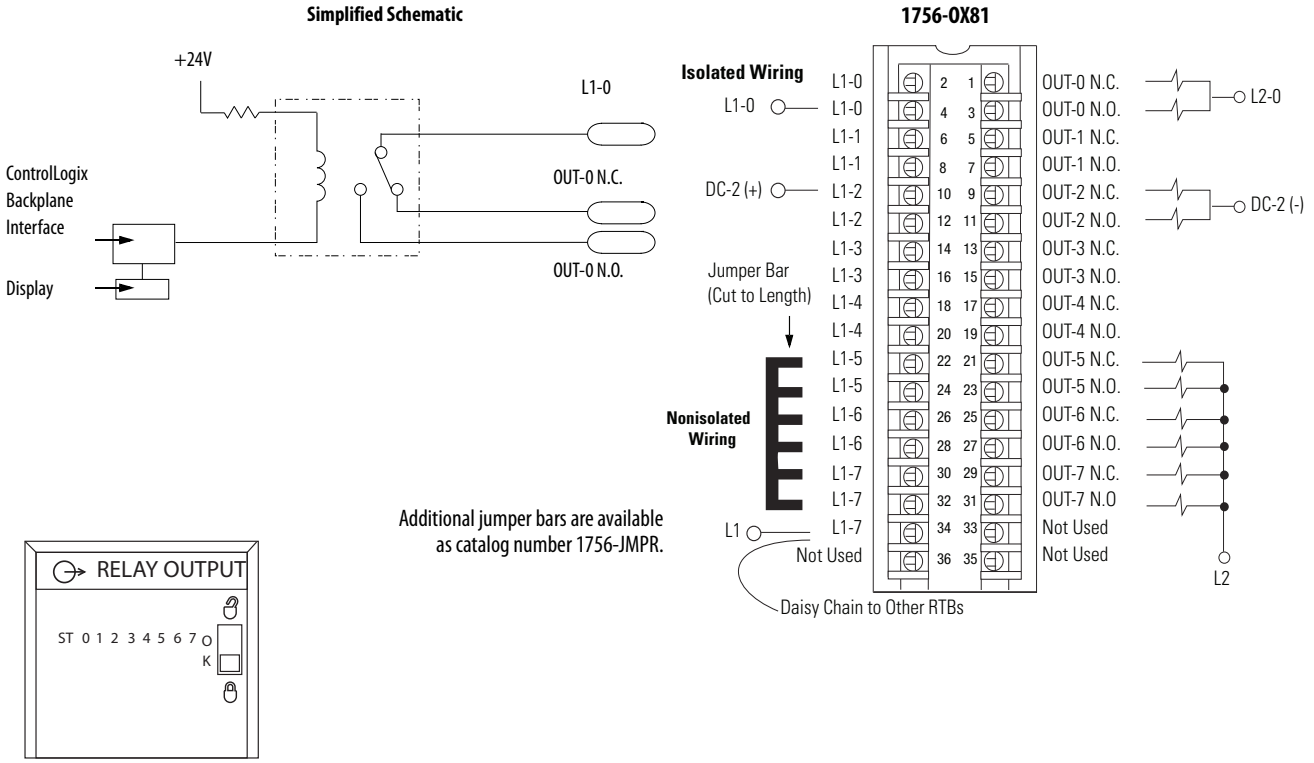
Certifications - 1756-0W16I

Certification[1]	1756-0W16I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

1756-0X8I

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



Technical Specifications - 1756-0X8I

Attribute	1756-0X8I
Outputs	8 N.O. 8 N.C. individually isolated (two points per group)
Pilot duty	C300/R150
Operating voltage range	5…125V DC 10…240V AC
Contact current rating	1 A @ 5…30V DC 0.5 A @ 48V DC 0.22 A @ 125V DC 1.5 A @ 120V AC 50/60 Hz 0.75 A @ 240VAC 50/60 Hz
Output delay time Off to On On to Off	 13 ms max 13 ms max
Current draw @ 5.1V	100 mA
Current draw @ 24V	100 mA
Total backplane power	2.9 W
Power dissipation, max	3.1 W @ 60 °C (140 °F)
Thermal dissipation	10.57 BTU/hr
Off-state leakage current per point, max	0 mA
Minimum load current	10 mA per point
Initial contact resistance, max	100 mΩ @ 6V 1 A

Technical Specifications - 1756-0X8I (continued)

Attribute	1756-0X8I
Switching frequency, max	1 operation/3 s (0.3 Hz at rated load)
Bounce time, mean	1.2 ms
Expected contact life	300 kHz resistive 100 kHz inductive
Scheduled outputs	Synchronization within 16.7 s max, reference to the Coordinated System Time
States in Fault mode per point	Hold last state, On or Off (Off is default)
States in Program mode per point	Hold last state, On or Off (Off is default)
Isolation voltage	250V (continuous), basic insulation type, outputs-to-backplane, and output-to-output Routine tested @ 1350V AC for 2 s
Module keying	Electronic, software configurable
Fusing	Not protected. A fused IFM is recommended to help protect outputs.
Removable terminal block	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1(1)
North American temperature code	T4A
Enclosure type	None (open-style)

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

Environmental Specifications - 1756-0X8I

Attribute	1756-0X8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
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

Environmental Specifications - 1756-0X8I (continued)

Attribute	1756-0X8I
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz
Oscillatory surge withstand IEEE C37.90.1	3 kV

Certifications - 1756-0X8I

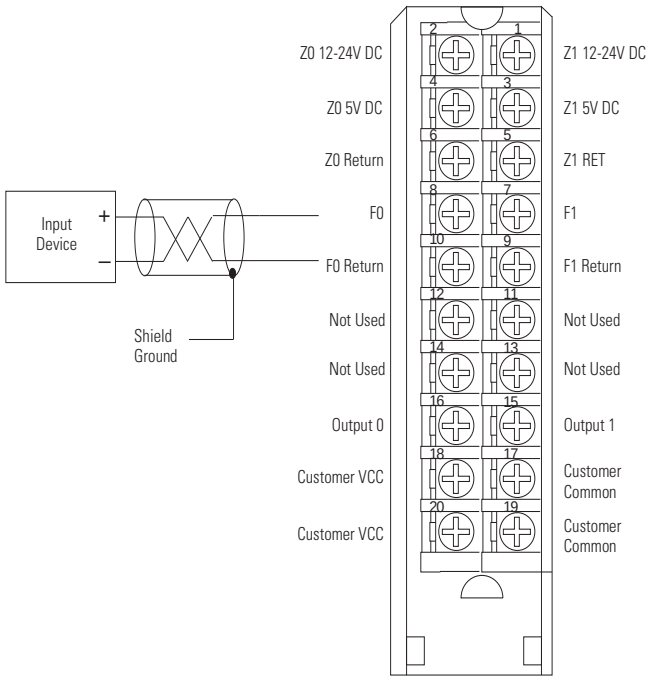
Certification(1)	1756-0X8I
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
FM	FM Approved Equipment for use in Class I Division 2 Group A,B,C,D Hazardous Locations

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

1756-CFM

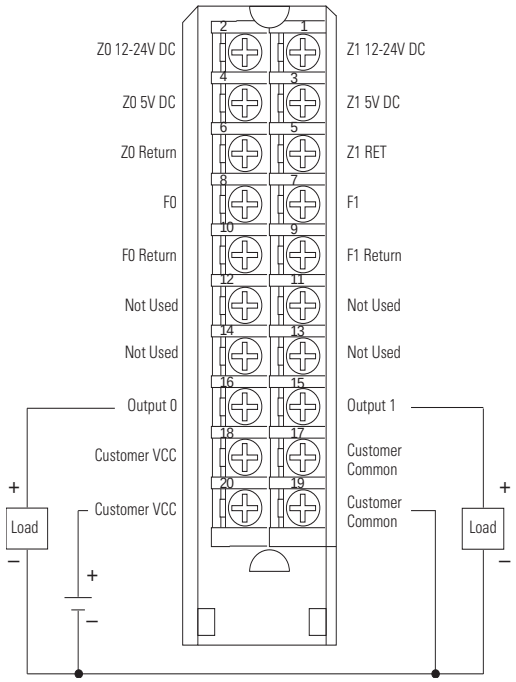
ControlLogix configurable flowmeter module

1756-CFM Standard Magnetic Pickup



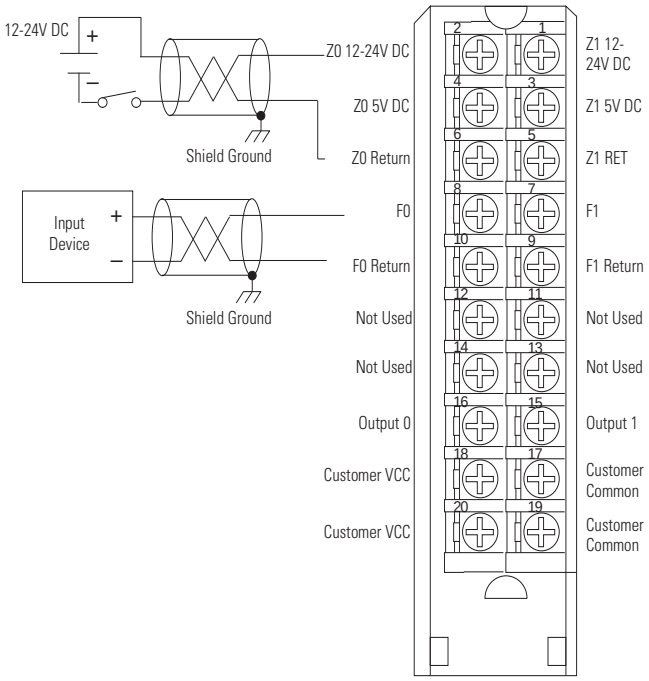
This wiring diagram can be used in applications with 50 mV (magnetic pickup), 1.3V (TTL), or 4V (preamp level) thresholds. You must use RSLogix 5000® software to choose the appropriate threshold level for your specific application.

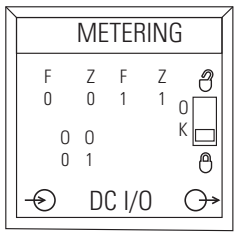
1756-CFM Standard Output



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

1756-CFM Standard Prover/Store Count





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

Technical Specifications - 1756-CFM

Attribute	1756-CFM
Inputs	4 (2 per channel)
Inputs per channel	Two flowmeter (F) inputs used for all modes Two gate inputs used in Totalizer mode for prover/store count
Outputs	2 current sourcing
Current draw at 5.1V	300 mA
Current draw at 24V	16 mA
Total backplane power	1.7 W
Power dissipation, max	6 W @ 60 °C (140 °F)
Thermal dissipation	20.4 BTU/hr
Isolation voltage	250V (continuous), reinforced insulation type, I/O-to-backplane 250V (continuous), basic insulation type, I/O group-to-group Routine tested at 1900V DC for 2 s
Module keying	Electronic, software configurable
Removable terminal block	1756-TBNH 1756-TBSH
RTB keying	User-defined mechanical
Slot width	1

Technical Specifications - 1756-CFM (continued)

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

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

Input Specifications - 1756-CFM

Attributes	1756-CFM
Inputs	4 (2 per channel)
Inputs per channel	Two flowmeter (F) inputs used for all modes Two gate inputs used in Totalizer mode for prover/store count
Count range, max	2, 147, 483, 647
Input frequency, max	100 kHz @ flowmeter inputs (overrange occurs at 100 kHz)
Flowmeter input voltage	±30V, selectable input thresholds of 50 mV, 1.3V, and 4V: • ±30V peak unterminated open circuit voltage, magnetic pickup • TTL compatible, input voltage >1.3V DC is Logic 1 and -0.7…1.3V DC is Logic 0 • 12…24V DC powered preamp output, 4V DC threshold
Flowmeter input impedance	5 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…26.4V DC
Gate input on-state current, min	4 mA
Gate input on-state current, nom	15 mA
Mechanical filter debouncing (Z0 & Z1 Inputs)	Software selectable
Input sampling period	User selectable

Output Specifications - 1756-CFM

Attribute	1756-CFM
Outputs	2 current sourcing
Output voltage source	Customer supplied
Output voltage range, nom(1)	5V operation: 4.5…5.5V DC for 3…20 mA load per point 12/24V operation: 10…31.2V DC for 40 mA…1 A load per point
Output type	IEC 1 A 24V DC
Output Current per point(1)	1 A @ 10…31.2V DC 20 mA @ 4.5…5.5V DC(2)
Surge current	2 A for 50 ms, repeatable every 2 s
Off-state leakage current, max	< 300 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 two 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 <1 ms
Overload current	Electronic (< 4 A)
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 can be permanently disabled.)

(1) UL rating for 24V DC, 24VA.
(2) All outputs can be on simultaneously without derating.

Environmental Specifications - 1756-CFM

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

Environmental Specifications - 1756-CFM (continued)

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

Certifications - 1756-CFM

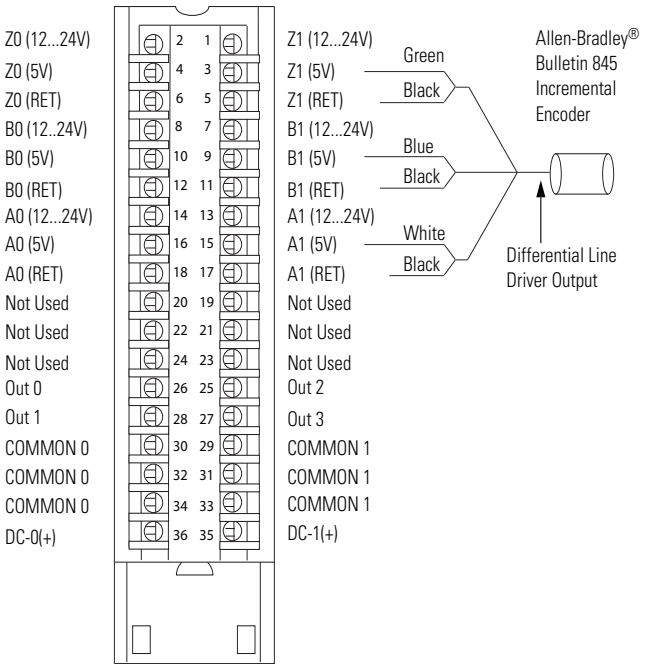
Certification[1]	1756-CFM
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • EN 61326-1; Meas./Control/Lab., Industrial Requirements • EN 61000-6-2; Industrial Immunity • EN 61000-6-4; Industrial Emissions • EN 61131-2; Programmable Controllers (Clause 8, Zone A & B) European Union 2006/95/EC LVD, compliant with: EN 61131-2; Programmable Controllers (Clause 11)
C-Tick	Australian Radiocommunications Act, compliant with: AS/NZS CISPR 11; Industrial Emissions
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

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

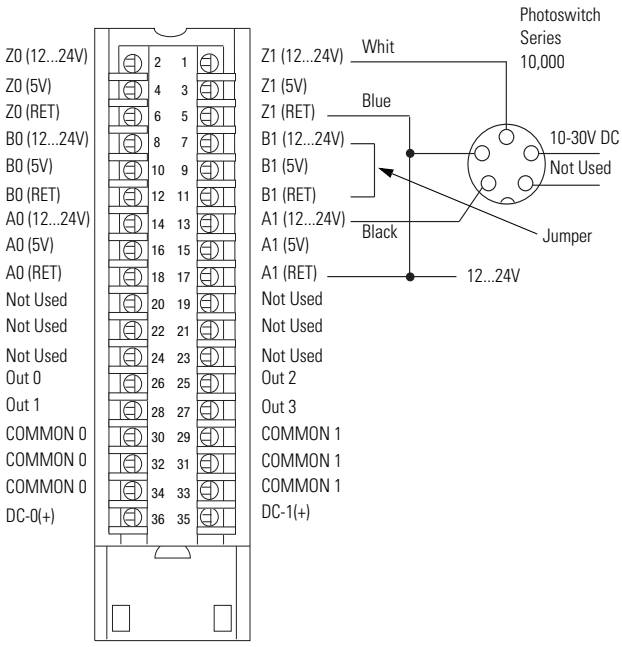
1756-HSC

ControlLogix high-speed counter module

1756-HSC to Allen-Bradley® 845 Incremental Encoder

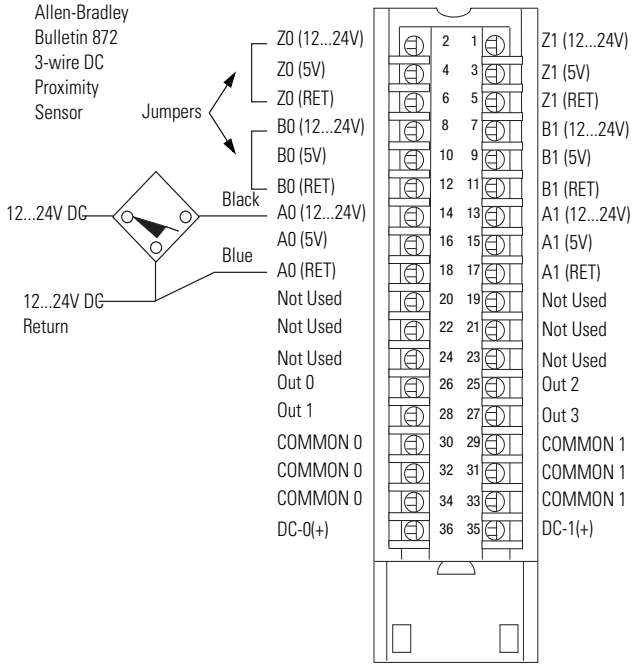


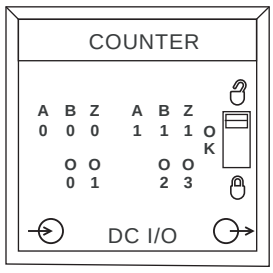
1756-HSC to Allen-Bradley Series 10,000 Photoelectric Sensor



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

1756-HSC to Allen-Bradley 872 3-wire DC Proximity Sensor





Technical Specifications - 1756-HSC

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

(1) UL rating is 24V DC.
(2) Use this conductor category information for planning conductor routing as described in the system-level installation manual. See the Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1.

Input Specifications - 1756-HSC

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

Output Specifications - 1756-HSC

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

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

Environmental Specifications - 1756-HSC

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

Environmental Specifications - 1756-HSC (continued)

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

Certifications - 1756-HSC

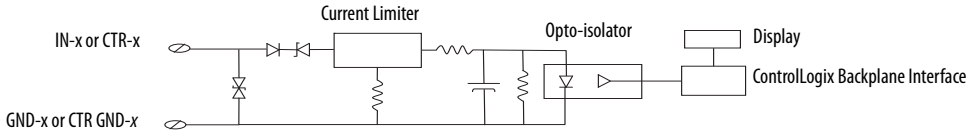
Certification(1)	1756-HSC
UL	UL Listed Industrial Control Equipment. See UL File E65584.
CSA	CSA Certified Process Control Equipment. See CSA File LR54689C. CSA Certified Process Control Equipment for Class I, Division 2 Group A,B,C,D Hazardous Locations. See CSA File LR69960C.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3

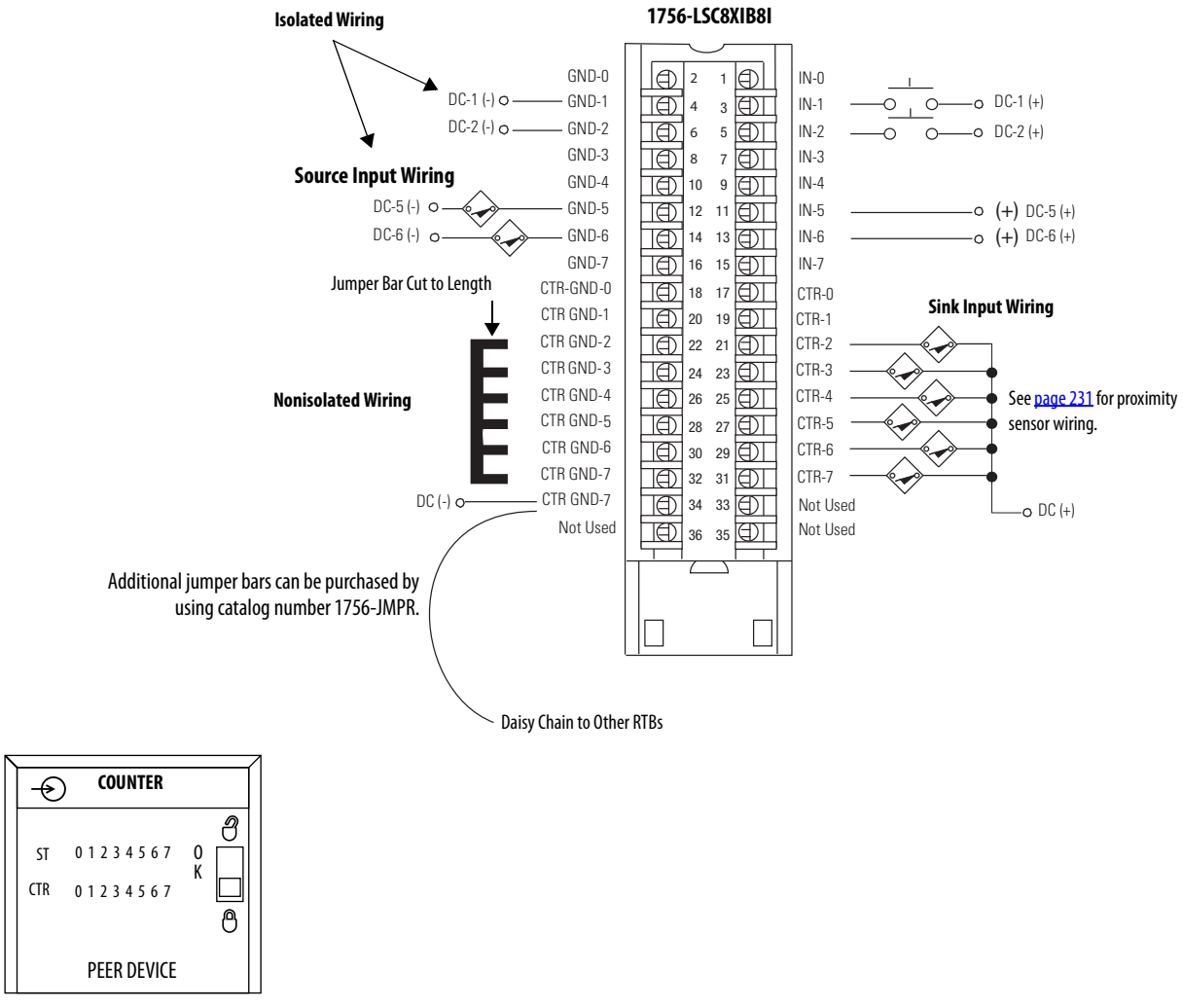
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-LSC8XIB8I

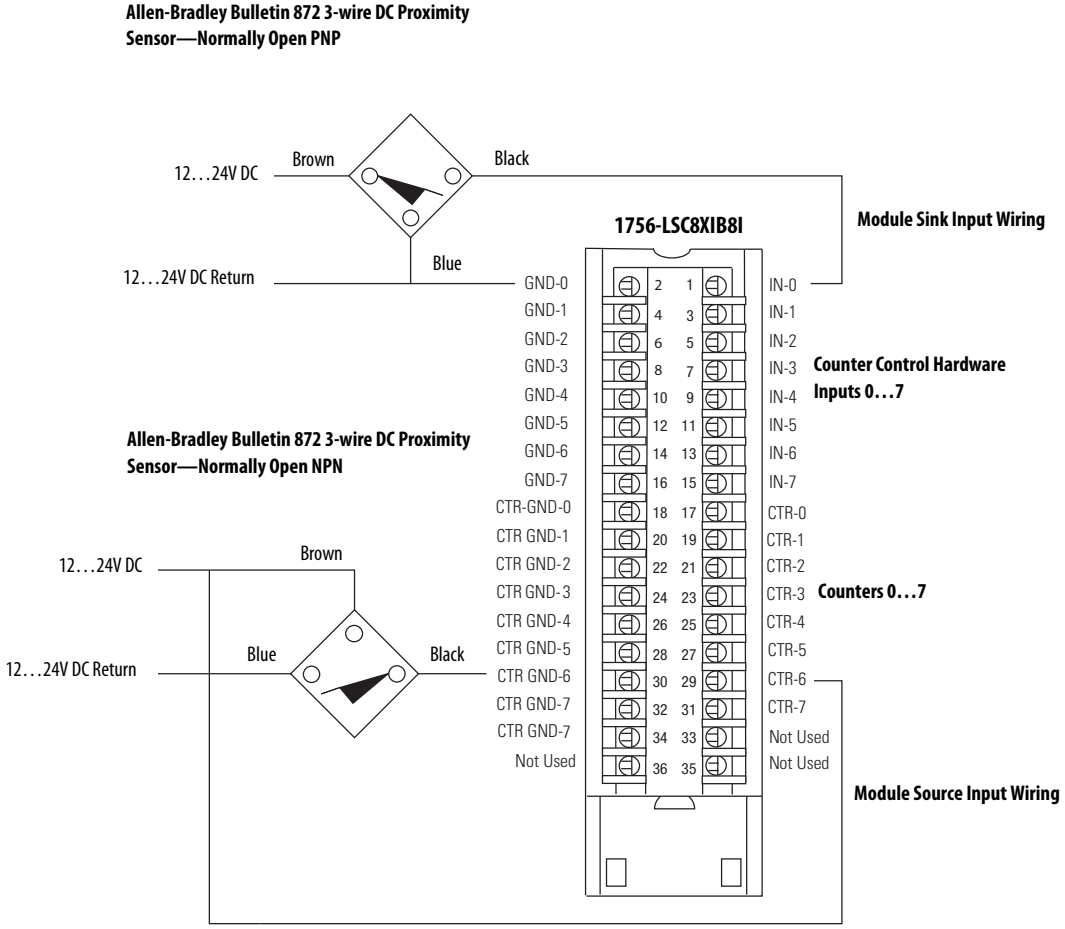
ControlLogix 10...30V low-speed counter module

Simplified Schematic





The following diagram shows how to wire a proximity sensor to the module's eight counters or eight hardware inputs. Counters use incoming pulses for counts and frequency with two user-configurable On/Off windows per counter. Hardware inputs provide standard input or counter-control functionality.



Counter Specifications - 1756-LSC8XIB8I

Attribute	1756-LSC8XIB8I
Number of counters	8 individually isolated
Counting frequency, max	40 kHz
Count range	0…2,147,483,648 (31-bit counter)
Voltage category	12/24V DC sink/source
Operating voltage range	10…30V DC
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	5 mA @ 30V DC
Change of state	Enter or exit user-configurable windows

Hardware Input Specifications - 1756-LSC8XIB8I

Attribute	1756-LSC8XIB8I
Inputs	8 individually isolated, standard input or counter-control functionality
Voltage category	12/24V DC sink/source
Operating voltage range	10…30V DC
Input voltage, nom	24V DC
Input delay time (screw to backplane) Off to On On to Off	 14 µs nom/23 µs max + user-configurable filter time of 0…30,000 µs 14 µs nom/23 µs max + user-configurable filter time of 0…30,000 µs
Off-state voltage, max	5V
Off-state current, max	1.5 mA
On-state current, min	2 mA @ 10V DC
On-state current, max	5 mA @ 30V DC
Change of state	Any transition

Module Specifications - 1756-LSC8XIB8I

Attribute	1756-LSC8XIB8I
Current draw @ 5.1V	275 mA
Current draw @ 24V	3 mA
Total backplane power	1.47 W
Power dissipation	3.8 W @ 60 °C (140 °F)
Thermal dissipation	12.97 BTU/hr
Input impedance, max	Six k Ω @ 30V DC
Cyclic update time	200 µs…750 ms
Isolation voltage	250V (continuous), reinforced insulation type, inputs-to-backplane 250V (continuous), basic insulation type, input-to-input Type tested @ 2300V AC for 60 s inputs-to-backplane Type tested @ 1500V AC for 60 s input-to-input
Module keying	Electronic, software configurable
Removable terminal block housing	1756-TBCH 1756-TBS6H
RTB keying	User-defined mechanical
Slot width	1
Wire category	1 on signal ports(1)
North American temperature code	T4A
IEC temperature code	T4
Enclosure type	None (open-style)
Reverse polarity protection	Yes

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

Environmental Specifications - 1756-LSC8XIB8I

Attribute	1756-LSC8XIB8I
Temperature, operating IEC 60068-2-1 (Test Ad, Operating Cold), IEC 60068-2-2 (Test Bd, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Thermal Shock)	0…60 °C (32…140 °F)
Temperature, surrounding air, max	60 °C (140 °F)
Temperature, nonoperating IEC 60068-2-1 (Test Ab, Unpackaged Nonoperating Cold), IEC 60068-2-2 (Test Bb, Unpackaged Nonoperating Dry Heat), IEC 60068-2-14 (Test Na, Unpackaged Nonoperating Thermal Shock)	-40…+85 °C (-40…+185 °F)
Relative humidity IEC 60068-2-30 (Test Db, Unpackaged Damp Heat)	5…95% noncondensing
Vibration IEC 60068-2-6 (Test Fc, Operating)	2 g @ 10…500 Hz
Shock, operating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	30 g
Shock, nonoperating IEC 60068-2-27 (Test Ea, Unpackaged Shock)	50 g
Emissions	CISPR 11, Class A
ESD immunity IEC 61000-4-2	6 kV contact discharges 8 kV air discharges
Radiated RF immunity IEC 61000-4-3	10V/m with 1 kHz sine-wave 80% AM from 80…2000 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 900 MHz 10V/m with 200 Hz 50% Pulse 100% AM @ 1890 MHz 3V/m with 1 kHz sine-wave 80% AM from 2000…2700 MHz
EFT/B immunity IEC 61000-4-4	±4 kV at 5 kHz on signal ports
Surge transient immunity IEC 61000-4-5	±1 kV line-line (DM) and ±2 kV line-earth (CM) on signal ports
Conducted RF immunity IEC 61000-4-6	10V rms with 1 kHz sine-wave 80% AM from 150 kHz…80 MHz

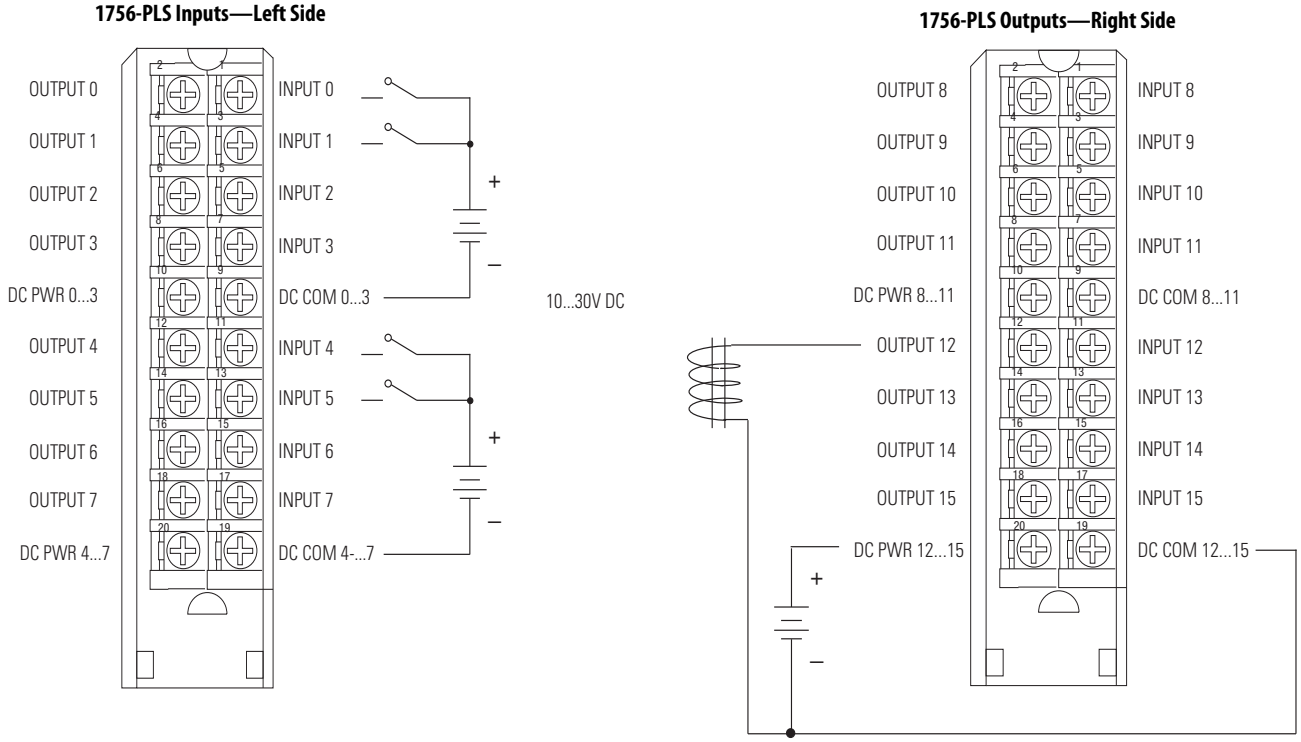
Certifications - 1756-LSC8XIB8I

Certification(1)	1756-LSC8XIB8I
c-UL-us	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E65584. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.
CE	European Union 2004/108/IEC EMC Directive, compliant with: • 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 Gc
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3

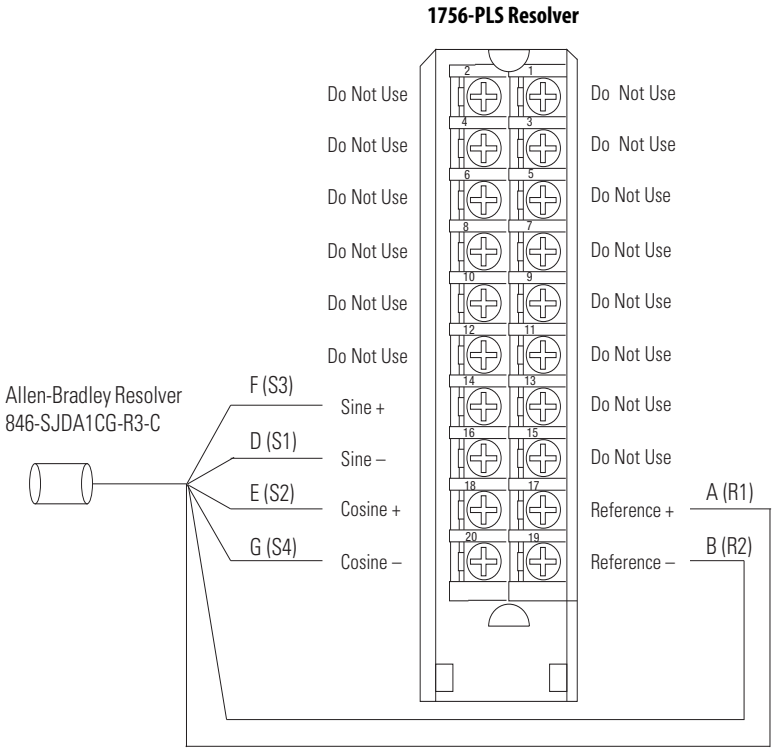
(1) When marked. See the Product Certification link at http://www.ab.com for Declarations of Conformity, Certificates, and other certification details.

1756-PLS

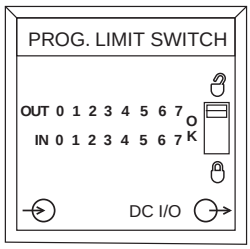
ControlLogix programmable limit switch module



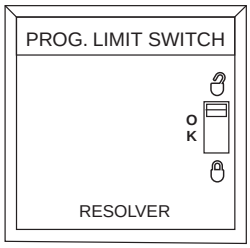
The 1756-PLS module supports enhanced packaging applications. The module requires three contiguous slots in the chassis.



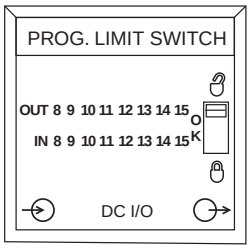
Indicator for Left Slot I/O Module



Indicator for Left Resolver Module



Indicator for Right Slot I/O Module



Technical Specifications - 1756-PLS

Attribute	1756-PLS
Module configuration	Left section: Two groups of four outputs and four inputs each Center section: resolver interface and I/O control Right section: Two groups of four outputs and four inputs each
Current draw at 5.1V	1 A
Current draw at 24V	125 mA
Total backplane power	8.1 W
Power dissipation, nom	22.62 W @ 30 °C (86 °F) 18.22 W @ 60 °C (140 °F)
Power dissipation, max	25.7 W @ 30 °C (86 °F) 21.3 W @ 60 °C (140 °F)
Thermal dissipation, nom	77.23 BTU/hr @ 30 °C (86 °F) 62.2 BTU/hr @ 60 °C (140 °F)
Thermal dissipation, max	87.74 BTU/hr @ 30 °C (86 °F) 72.72 BTU/hr @ 60 °C (140 °F)
Isolation voltage	250V (continuous), basic insulation type, I/O-to-backplane, I/O group-to-group, resolver-to-backplane, and resolver-to-I/O Routine tested at 1900V DC for 2 s
Removable terminal block	Requires 3 RTBs: 1756-TBNH or 1756-TBSH
RTB keying	User-defined mechanical
Slot width	3
Wire category	2 on signal ports 1 on power ports(1)
North American temperature code	T4
IEC temperature code	T4
Enclosure type	None (open style)

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

Resolver Specifications - 1756-PLS

Attribute	1756-PLS
Resolver location	Center section
Compatible resolver	Allen-Bradley resolver 846-SJ*xxxx*-R3-*x* (*x* = customer options)
Resolver interface	2V rms, reference output (differential pair) 2V rms, sine and cosine inputs (two 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

Input Specifications - 1756-PLS

Attribute	1756-PLS
Inputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range(1)	10.8…31.2V DC
Input delay time (screw to backplane) Off to On 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

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

Output Specifications - 1756-PLS

Attribute	1756-PLS
Outputs	16 (2 groups of 4 per I/O section)
Voltage category	12/24V DC
Operating voltage range[1]	10…31.2V DC
Output delay time Off to On 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)
Output power dissipation/slot thermal dissipation	3.2 W @ 60 °C (140 °F) 10.93 BTU/hr @ 60 °C (140 °F)
Off-state leakage current per point, nom	<10 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[2] (86 °F)
Current per group, max	4 A @ 30 °C[3] (86 °F)
Current per module, max	8 A @ 30 °C[4] (86 °F)
Current limit	< 4 A
Surge current per point	2 A for 10 ms every 1 s @ 60 °C (140 °F)
Load current per point, min	40 mA
Output switching time	Switching 1 A @ 24V DC
Short circuit protection	Electronic (No indication of fault. Remove load and toggle on/off to restore.)
Reverse polarity protection	Yes, current limited. (If wired incorrectly, outputs can be permanently disabled.)

(1) UL certification for 24V DC nominal. Rockwell Automation specified to 10.8…31.2V DC.
(2) Derate 16.7 mA/ °C above 30 °C (86 °F): 0.5 A @ 60 °C (140 °F).
(3) Derate 66.8 mA/ °C above 30 °C (86 °F): 2 A @ 60 °C (140 °F).
(4) Derate 133.6 mA/ °C above 30 °C (86 °F): 4 A @ 60 °C (140 °F).

Environmental Specifications - 1756-PLS

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

Certifications - 1756-PLS

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

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

ControlLogix I/O Accessories

Place 1756 I/O modules in any slot in a 1756 chassis. Each chassis requires a power supply.

Product	Cat. No.
Chassis	1756-A4, 1756-A7, 1756-A10, 1756-A13, 1756-A17
Power supply, standard	1756-PA72/C, 1756-PA75/B, 1756-PB72/C, 1756-PB75/B, 1756-PC75/B, 1756-PH75/B
Power supply, redundant	1756-PA75R, 1756-PB75R, 1756-PSCA2 1756-CPR2 cable

- For more information on chassis specifications, see ControlLogix Chassis Specifications Technical Data, publication 1756-TD006.
- For more information on power supply specifications, see ControlLogix Power Supply Specifications Technical Data, publication 1756-TD005.
- For more information on how to choose the right power supply for your application, see the additional product documentation, for example, a user manual, for your 1756 ControlLogix I/O module.

1756 Removable Terminal Blocks

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

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

ATTENTION: If separate power sources are used, do not exceed the specified isolation voltage: referring to the specifications for each individual module on the preceding pages.

RTB Specifications - 1756-TBNH, 1756-TBSH, 1756-TBCH, 1756-TBS6H, 1756-TBE

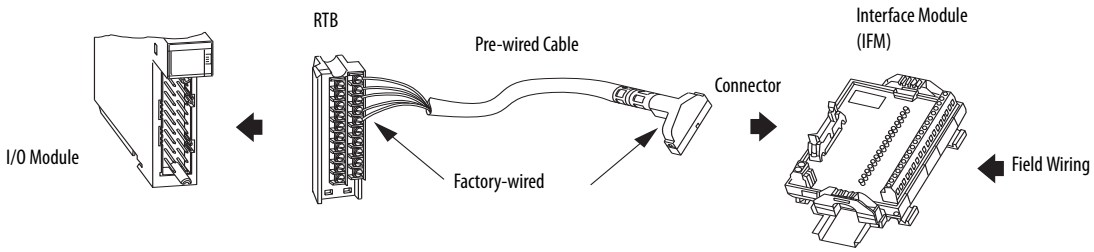
Attribute	1756-TBNH	1756-TBSH	1756-TBCH	1756-TBS6H	1756-TBE
Description	20-position NEMA screw-clamp removable block	20-pin spring-clamp removable terminal block with standard housing	36-pin cage-clamp removable terminal block with standard housing	36-pin spring-clamp removable terminal block with standard housing	Extended depth terminal block housing
Screw torque	1.36 N•m (12 lb•in)	–	0.5 N•m (4.4 lb•in)	–	–
Wire size(1)	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire multiple conductors on any single terminal.	Single wire connection: 0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Double wire connection: 0.33…1.3 mm^2 (22…16 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire more than two conductors on any single terminal.	0.33…2.1 mm^2 (22…14 AWG) solid or stranded copper wire, rated at 90 °C (194 °F) or greater, 1.2 mm (3/64 in.) insulation max Do not wire multiple conductors on any single terminal.	
Screwdriver width	8 mm (5/16 in.) max	–	3.2 mm (1/8 in.)	–	–

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

Wiring Systems

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

- Interface modules (IFMs) that provide the output terminal blocks for digital I/O modules. Use the pre-wired cables that match the I/O module to the IFM.
- Analog interface modules (AIFMs) that provide the output terminal blocks for analog I/O modules. Use the pre-wired cables that match the I/O module to the AIFM.
- I/O module-ready cables. One end of the cable assembly is an RTB that plugs into the front of the I/O module. The other end has individually color-coded conductors that connect to a standard terminal block.



Additional Resources

These documents contain additional information concerning related products from Rockwell Automation.

Resource	Description
ControlLogix System User Manual, publication 1756-UM001	Provides information on how to use a ControlLogix system.
ControlLogix 5580 Controllers User Manual, publication 1756-UM543	Provides information on how to use a ControlLogix 5580 controllers.
Industrial Automation Wiring and Grounding Guidelines, publication 1770-4.1	Provides general guidelines for installing a Rockwell Automation industrial system.
Product Certifications website, http://www.ab.com	Provides declarations of conformity, certificates, and other certification details.

You can view or download publications at http://www.rockwellautomation.com/literature/. To order paper copies of technical documentation, contact your local Allen-Bradley distributor or Rockwell Automation sales representative.

Rockwell Automation Support

Use the following resources to access support information.

Technical Support Center	Knowledgebase Articles, How-to Videos, FAQs, Chat, User Forums, and Product Notification Updates.	www.rockwellautomation.com/knowledgebase
Local Technical Support Phone Numbers	Locate the phone number for your country.	www.rockwellautomation.com/global/support/get-support-now.page
Direct Dial Codes	Find the Direct Dial Code for your product. Use the code to route your call directly to a technical support engineer.	www.rockwellautomation.com/global/support/direct-dial.page
Literature Library	Installation Instructions, Manuals, Brochures, and Technical Data.	www.rockwellautomation.com/literature
Product Compatibility and Download Center (PCDC)	Get help determining how products interact, check features and capabilities, and find associated firmware.	www.rockwellautomation.com/global/support/pcdc.page

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Rockwell Automation maintains current product environmental information on its website at http://www.rockwellautomation.com/rockwellautomation/about-us/sustainability-ethics/product-environmental-compliance.page.

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