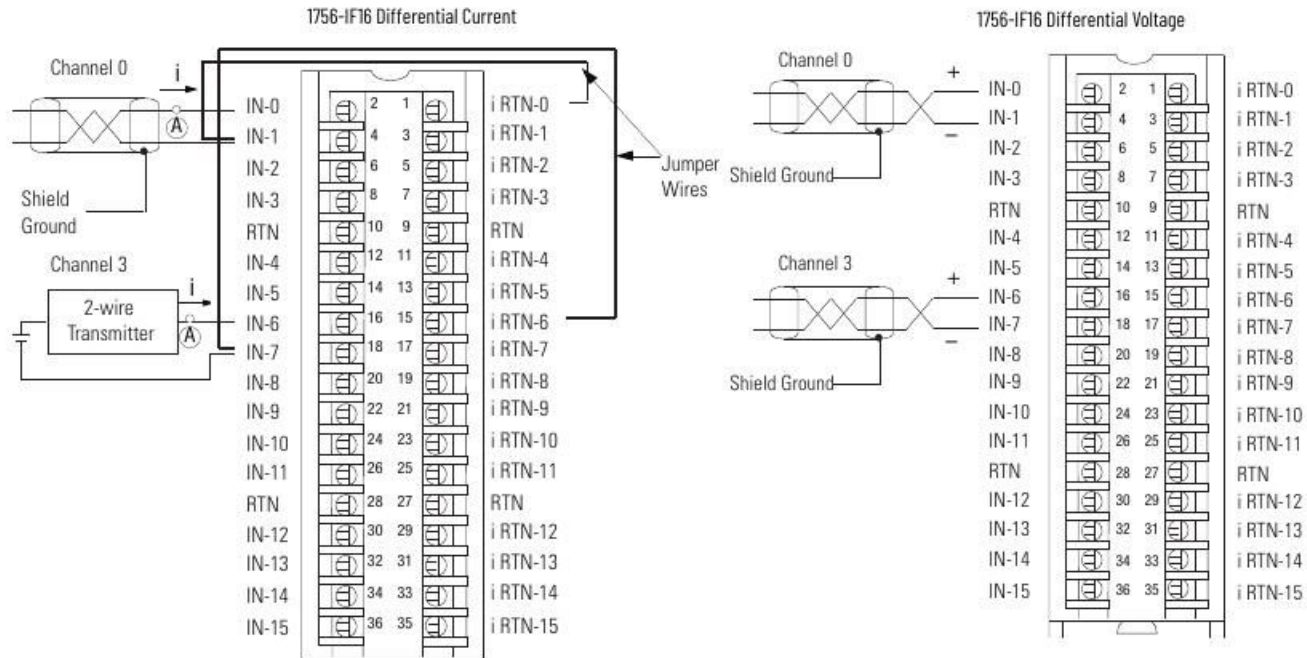


1756-IF16, 1756-IF16K

ControlLogix current/voltage analog input module



Use this table when wiring your module in Differential Current 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 an 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.

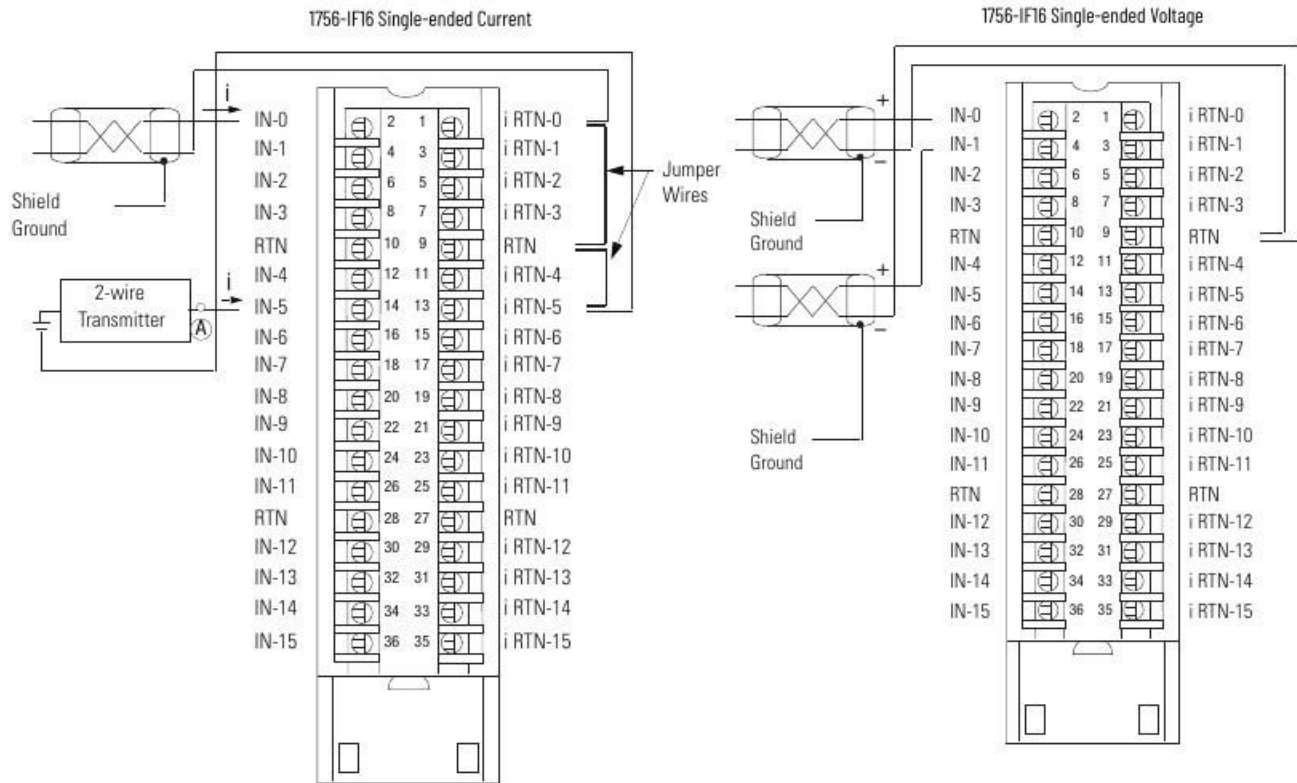
IMPORTANT: When operating in 4-channel, High-Speed mode, only use channels 0, 2, 4, and 6.

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

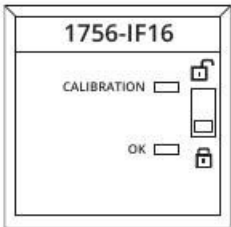
This Channel	Uses these terminals
Channel 0	IN-0 (+), IN-1 (-)
Channel 1	IN-2 (+), IN-3 (-)
Channel 2	IN-4 (+), IN-5 (-)
Channel 3	IN-6 (+), IN-7 (-)
Channel 4	IN-8 (+), IN-9 (-)
Channel 5	IN-10 (+), IN-11 (-)
Channel 6	IN-12 (+), IN-13 (-)
Channel 7	IN-14 (+), IN-15 (-)

- All terminals marked RTN are connected internally.
- If multiple (+) or multiple (-) terminals are tied together, connect that tie point to an 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.



- 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 i RTN-x terminals.
- Place additional loop devices (such as strip chart recorders) at the A location in the current loop.
- All terminals marked RTN are connected internally.
- Terminals marked i RTN are not used for single-ended voltage wiring.



Technical Specifications

Attribute	1756-IF16, 1756-IF16K
Inputs	16 single ended, 8 differential or 4 differential (high speed)
Input range	$\pm 10V$ $0 \dots 10V$ $0 \dots 5V$ $0 \dots 20 \text{ mA}$
Resolution	$320 \mu V/\text{count}$ (15 bits + sign bipolar) @ $\pm 10.25V$ $160 \mu V/\text{count}$ (16 bits) @ $0 \dots 10.25V$ $80 \mu V/\text{count}$ (16 bits) @ $0 \dots 5.125V$ $0.32 \mu A/\text{count}$ (16 bits) @ $0 \dots 20.5 \text{ mA}$
Current draw @ 5.1V	200 mA
Current draw @ 24V	35 mA
Total backplane power	1.86 W

Technical Specifications (Continued)

Attribute	1756-IF16, 1756-IF16K
Voltage and current ratings	Backplane: 5.1V DC, 200 mA max 24V DC, 35 mA max Input Voltage Range: -10...+10V Input Current Range: 0...20mA Limited to 100VA
Power consumption	2.33 W
Power dissipation	Voltage: 1.86 W Current: 3.53 W
Thermal dissipation	Voltage: 6.35 BTU/hr Current: 12.06 BTU/hr
Input impedance	Voltage: $\geq 10\text{ M}\Omega$ Current: $249\ \Omega$
Open circuit detection time	Differential current or differential voltage: Positive full-scale reading within 5 s Single-ended current or 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	$>80\text{ dB @ }50/60\text{ Hz}^{(1)}$
Common mode noise rejection	$>100\text{ dB @ }50/60\text{ Hz}$
Channel bandwidth	$15\text{ Hz }(-3\text{ dB})^{(1)}$
Calibrated accuracy 25 °C (77 °F)	Voltage: Better than 0.05% of range Current: Better than 0.15% of range
Offset drift	$45\ \mu\text{V}/^\circ\text{C}$
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 ⁽¹⁾	16 pt single-ended: 16...488 ms 8 pt differential: 8...244 ms 4 pt differential: 5...122 ms
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 ⁽²⁾ insulation type, Inputs-to-Backplane. No isolation between individual Inputs.
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. 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-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 ⁽³⁾	2 - on signal ports
Enclosure type	None (open-style)
Temperature code	T4

(1) Notch filter dependent.

(2) Series A modules were specified to Reinforced Insulation based on UL508 terminology. Series B modules are type-type tested to the same Dielectric strength voltage as series A modules but use updated terminology based on IEC 61010-1, Basic Insulation.

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

Environmental Specifications

Attribute	1756-IF16, 1756-IF16K
Temperature, operating IEC 60068-2-1 (Test Ae, Operating Cold), IEC 60068-2-2 (Test Be, Operating Dry Heat), IEC 60068-2-14 (Test Nb, Operating Variation of Temperature)	0 °C ≤ Ta ≤ +60 °C (+32 °F ≤ Ta ≤ +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
Conformal Coated ⁽¹⁾	Yes
Corrosive Atmosphere ⁽¹⁾ ASTM B845-97 Method H Accelerated Test (20-Day Exposure)	Severity Level G3 ⁽²⁾ per ANSI/ISA 71.04-2013, Airborne Contaminants—Gases Severity Level CX ⁽²⁾⁽³⁾ per IEC 60721-3-3:2019, Chemically Active Substances
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)	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 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

(1) Only applicable to modules that end with a 'K' or 'XT'.

(2) The module and the corresponding RTB must remain installed at all times and the RTB door must remain closed, for the product to maintain its corrosive atmosphere rating.

(3) Up to 9.6 microns per year, corrosion rate of copper.

Certifications

Certification ⁽¹⁾	1756-IF16, 1756-IF16K
cULus	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.
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 IEC 60079-0; General Requirements • EN IEC 60079-7; Potentially Explosive Atmospheres, Protection "e" • II 3 G Ex ec IIC T4 Gc • UL 22 ATEX 2772X
IECEX	IECEX System, compliant with: • IEC 60079-0; General Requirements • IEC 60079-7; Potentially Explosive Atmospheres, Protection "e" • II 3 G Ex ec IIC T4 Gc • IECEx UL 22.0039X
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with Article 58-2 of Radio Waves Act, Clause 3
UKex	In conformity with the following UKex Statutory Instruments and their amendments: • Schedule 1 of the UKEX Regulation 2016 No. 1107 • Equipment protection by increased safety "e", reference certificate number UL22UKEX2499X • Zone 2 classification according to UKEX Regulation 2016 No. 1107
UKCA	In conformity with the following UK Statutory Instruments and their amendments: • 2016 No. 1091, Electromagnetic Compatibility Regulations • 2016 No. 1101, Electrical Equipment (Safety) Regulations • 2016 No. 1107, Equipment and Protective Systems Intended for Use in Potentially Explosive Atmospheres Regulations • 2012 No. 3032, Restriction of the Use of Certain Hazardous Substances in Electrical and Electronic Equipment
Morocco	In conformity with the following regulations: • Arrêté ministériel n° 6404-15 du 1^{er} muharram 1437 (15 octobre 2015) Équipements électriques destinés à être utilisés sous certaines limites de tension • Arrêté ministériel n° 6404-15 du 29 ramadan 1436 (16 juillet 2015) Compatibilité électromagnétique des équipements
CCC	CCC 202012230911998 CNCA-C23-01 强制性产品认证实施规则 防爆电气 CNCA-C23-01 CCC Implementation Rule Explosion-Proof Electrical Products

(1) When product is marked. See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.