

ControlLogix I/O Modules Specifications

Bulletin 1756

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

Summary of Changes

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

Topic	Page
Updated Technical Specifications for Series C 1756-0F4 and 1756-0F4K modules	176
Updated Technical Specifications for Series C 1756-0F8 and 1756-0F8K modules	180

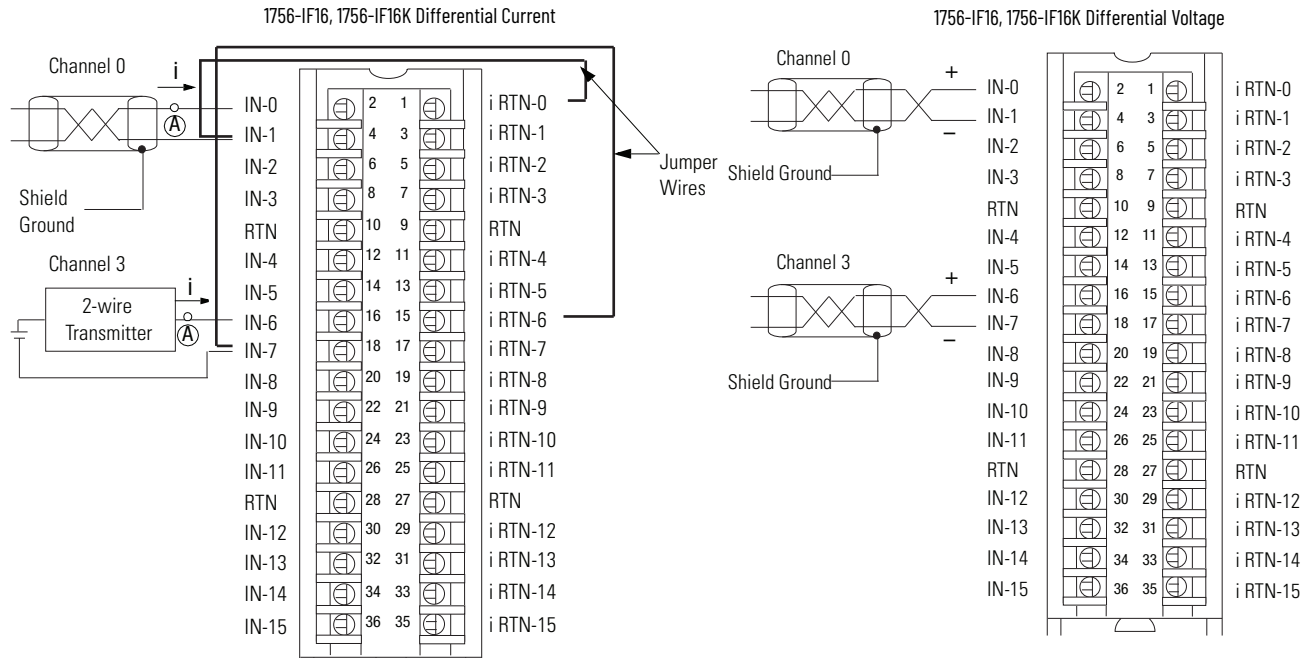
Rockwell Automation recognizes that some of the terms that are currently used in our industry and in this publication are not in alignment with the movement toward inclusive language in technology. We are proactively collaborating with industry peers to find alternatives to such terms and making changes to our products and content. Please excuse the use of such terms in our content while we implement these changes.

Available 1756 I/O Modules

Module Type	Input Module Catalog Number	Page	Output Module Catalog Number	Page	
AC Digital I/O Modules	1756-IA8D	5	1756-OA8	23	
	1756-IA16, 1756-IA16K	8	1756-OA8D	26	
	1756-IA16I, 1756-IA16IK	11	1756-OA8E	29	
	1756-IA32, 1756-IA32K	14	1756-OA16, 1756-OA16K	32	
	1756-IM16I, 1756-IM16IK	17	1756-OA16I, 1756-OA16IK	35	
	1756-IN16	20	1756-ON8	38	
DC Digital I/O Modules	1756-IB16, 1756-IB16K	41	1756-OB8	77	
	1756-IB16D, 1756-IB16DK	44	1756-OB8EI	80	
	1756-IB16I, 1756-IB16IK	47	1756-OB16D, 1756-OB16DK	83	
	1756-IB16IF, 1756-IB16IFK	50	1756-OB16E, 1756-OB16EK	86	
	1756-IB16ISOE, 1756-IB16ISOEK	53	1756-OB16I	90	
	1756-IB32, 1756-IB32K	56	1756-OB16IEF, 1756-OB16IEFK	93	
	1756-IC16	59	1756-OB16IEFS	96	
	1756-IG16	62	1756-OB16IS	99	
	1756-IH16I	65	1756-OB32, 1756-OB32K	102	
	1756-IH16ISOE	68	1756-OC8	105	
	1756-IV16, 1756-IV16K	71	1756-OG16	108	
	1756-IV32, 1756-IV32K	74	1756-OH8I	111	
				1756-OV16E	114
				1756-OV32E	117
Safety I/O Modules	1756-IB16S, 1756-IB16SK	121	1756-OBV8S, 1756-OBV8SK	128	
Contact I/O Modules			1756-OX8I	137	
			1756-OW16I	140	
Analog I/O Modules	1756-IF4FXOF2F, 1756-IF4FXOF2FK	143	1756-OF4, 1756-OF4K	176	
	1756-IF8, 1756-IF8K	147	1756-OF8, 1756-OF8K	180	
	1756-IF8I, 1756-IF8IK	152	1756-OF8I, 1756-OF8IK	184	
	1756-IF16, 1756-IF16K	157			
	1756-IRT8I, 1756-IRT8IK	162			
	1756-IR12, 1756-IR12K	168			
	1756-IT16, 1756-IT16K	172			
HART I/O Modules	1756-IF8H, 1756-IF8HK	189	1756-OF8H, 1756-OF8HK	201	
	1756-IF8IH, 1756-IF8IHK	192	1756-OF8IH, 1756-OF8IHK	204	
	1756-IF16H, 1756-IF16HK	195			
	1756-IF16IH, 1756-IF16IHK	198			
Compute Modules	1756-CMEE1Y1	207			
	1756-CMS1B1, 1756-CMS1C1, 1756-CMS1D1, 1756-CMS1H1, 1756-CMS1B4	209			
Specialty I/O Modules	1756-CFM	211	1756-LSC8XIB8I, 1756-LSC8XIB8IK	225	
	1756-CMS1B4, 1756-HIST2G	217	1756-PLS	229	
	1756-HSC	219			

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.

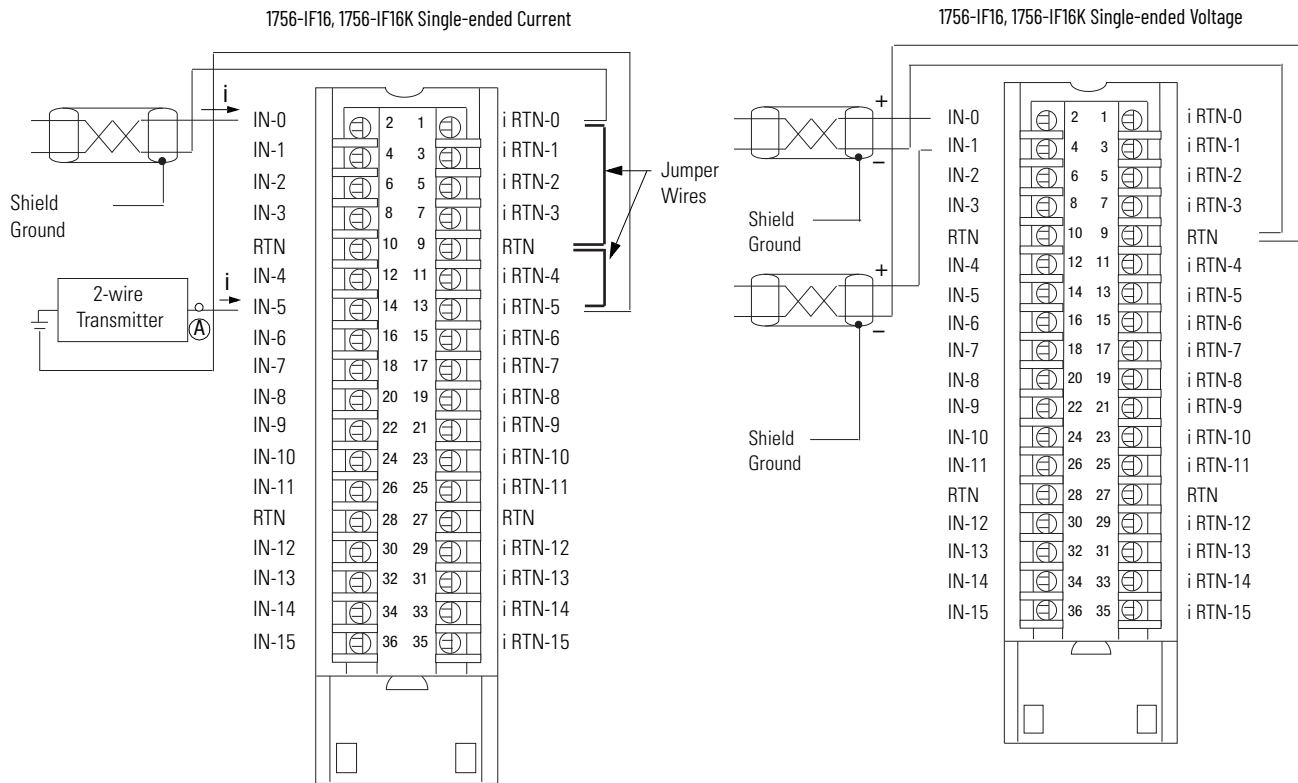
IMPORTANT: When operating in 4-channel, High-Speed mode, only use channels 0, 2, 4, and 6.

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.

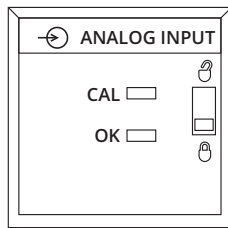
IMPORTANT: When operating in 4-channel, High-Speed mode, only use channels 0, 2, 4, and 6.



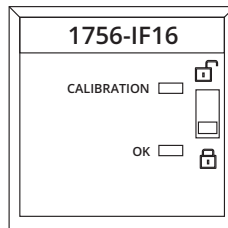
- All terminals marked RTN are connected internally.
- For current applications, all terminals marked i RTN must be wired to terminals marked RTN.
- A 249 Ω current loop resistor is located between IN-x and i RTN-x terminals.
- Place additional loop devices (such as strip chart recorders) at the A location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

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

Series A



Series B



Technical Specifications

Attribute	1756-IF16/A, 1756-IF16K/A	1756-IF16/B, 1756-IF16K/B
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	200 mA
Current draw @ 24V	65 mA	35 mA
Total backplane power	2.33 W	1.86 W

Technical Specifications (Continued)

Attribute	1756-IF16/A, 1756-IF16K/A	1756-IF16/B, 1756-IF16K/B
Voltage and current ratings	Backplane: 5.1V DC, 150 mA max 24V DC, 65 mA max Input Voltage Range: -10...+10V Input Current Range: 4...20mA Limited to 100VA	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: 2.33 W Current: 4.00 W	Voltage: 1.86 W Current: 3.53 W
Thermal dissipation	Voltage: 7.93 BTU/hr Current: 13.65 BTU/hr	Voltage: 6.35 BTU/hr Current: 12.06 BTU/hr
Input impedance	Voltage: $\geq 10 \text{ M}\Omega$ 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	$>80 \text{ dB @ } 50/60 \text{ Hz}^{(1)}$	
Common mode noise rejection	$>100 \text{ dB @ } 50/60 \text{ Hz}$	
Channel bandwidth	15 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/ $^\circ\text{C}$ Current: 20 ppm/ $^\circ\text{C}$	
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), Reinforced insulation type, Inputs-to-Backplane. No isolation between individual Inputs.	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/A, 1756-IF16K/A	1756-IF16/B, 1756-IF16K/B
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, 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	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	

Certifications

Certification (when product is marked) ⁽¹⁾	1756-IF16/A, 1756-IF16K/A	1756-IF16/B, 1756-IF16K/B
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 60079-0; General Requirements • EN 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • DEMKO15ATEX1482X	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 60079-15; Potentially Explosive Atmospheres, Protection "n" • II 3 G Ex nA IIC T4 Gc • IECEX UL 15.0053X	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	

Certifications (Continued)

Certification (when product is marked) ⁽¹⁾	1756-IF16/A, 1756-IF16K/A	1756-IF16/B, 1756-IF16K/B
UKex	N/A	In conformity with the following UKex Statutory Instruments and their amendments: <ul style="list-style-type: none"> • 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	N/A	In conformity with the following UK Statutory Instruments and their amendments: <ul style="list-style-type: none"> • 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	N/A	In conformity with the following regulations: <ul style="list-style-type: none"> • 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	N/A	CCC 202012230911830, 202012230911998, 2020122309113868 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) See the Product Certification link at rok.auto/certifications for Declarations of Conformity, Certificates, and other certification details.