MANUFACTURER DOCUMENT PACKAGE

Manufacturer's Manual

Reference package for procurement and maintenance review

ALLEN-BRADLEY

1769-OF4

FOUR-CHANNEL ANALOG OUTPUT MODULE

Used with the applicable Allen-Bradley CompactLogix configuration.

REFERENCE PACKAGE

OFFICIAL DOCUMENT

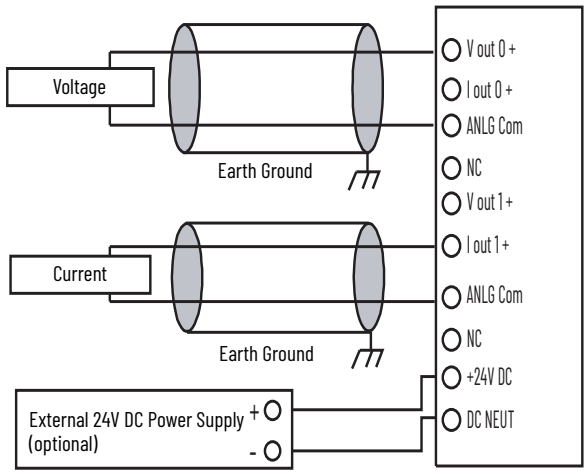
Selected official manufacturer pages follow this cover.

Source: Rockwell Automation manufacturer documentation

1769-OF2, 1769-OF2K

Compact voltage/current output analog module

Output Wiring



The external power supply must be rated Class 2, with a 24V DC range of 20.4...26.4V DC and 60 mA minimum. Series B and later modules support this option.

Technical Specifications - 1769-OF2, 1769-OF2K

Attribute	1769-OF2, 1769-OF2K
Outputs	2 single-ended
Output range	±10V 0...10V 0...5V 1...5V 0...20 mA 4...20 mA
Full-scale range(1)	±10.5V -0.5...10.5V -0.5...5.25V 0.5...5.25V 0...21 mA 3.2...21 mA
Resolution	14 bits (unipolar) 14 bits plus sign (bipolar) ±10V DC: sign + 14 bits, 0.64 mV 0...10V DC: sign + 13 bits, 0.64 mV 0...5V DC: sign + 14 bits, 0.64 mV 1...5V DC: sign + 14 bits, 1.28 µA 0...20 mA: sign + 13 bits, 0.64 mV 4...20 mA: sign + 14 bits, 1.28 µA
Current draw @ 5.1V	120 mA
Current draw @ 24V	120 mA
Converter type	Delta Sigma
Heat dissipation, max	2.63 W
Conversion rate (all channels), max	2.5 ms
Step response to 63%(2)	2.9 ms
Current load on voltage output, max	10 mA
Resistive load on current output	0...500 Ω (includes wire resistance)
Load range on voltage output	> 1 kΩ @ 10V DC
Inductive load (current outputs), max	0.1 mH
Capacitive load (voltage outputs), max	1 µF
Field calibration	None required

Technical Specifications - 1769-OF2, 1769-OF2K

Attribute	1769-OF2, 1769-OF2K
Accuracy(3)	Voltage: ±0.5% full-scale @ 25 °C (77 °F) Current: ±0.35% full-scale @ 25 ° C (77 °F)
Accuracy drift with temperature	Voltage: ±0.0086% per °C Current: ±0.0058% per °C
Output ripple(4)	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability(5)	±0.05%
Module error	Voltage: ±0.8% Current: ±0.55%
Offset error	±0.05%
Output impedance	15 Ω
Open and short-circuit protection	Yes
Short-circuit protection, max	21 mA
Output overvoltage protection	Yes
Time to detect open wire condition (current mode)	10 ms, typical 13.5 ms, max
Output response at system power-up and power down	±5V DC spike for < 5 ms
Rated working voltage(6)	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	300 g (0.65 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Optional 24V DC Class 2 power supply voltage range(7)	20.4...26.4V DC
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	32
Enclosure type rating	None (open style)

(1) The over- or underrange flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full-scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.
(7) If the optional 24V DC Class 2 power supply is used, the 24V DC current draw from the bus is 0 mA.

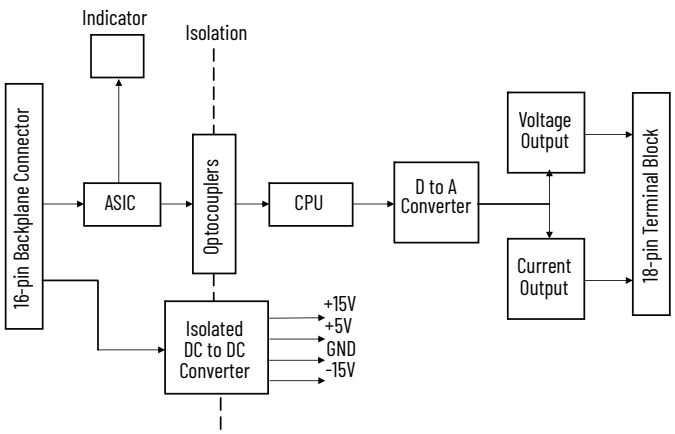
For **Environmental Specifications**, see page 2.

For **Certifications**, see page 3.

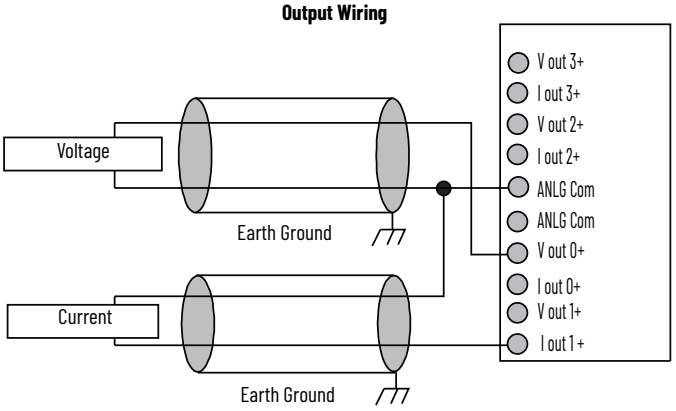
1769-OF4

Compact voltage/current output analog module

Simplified Schematic



Output Wiring



Technical Specifications - 1769-OF4, 1769-OF4K

Attribute	1769-OF4, 1769-OF4K
Outputs	4 single-ended
Output range	±10V 0…10V 0…5V 1…5V 0…20 mA 4…20 mA
Full-scale range(1)	±10.5V -0.5…10.5V -0.5…5.25V 0.5…5.25V 0…21 mA 3.2…21 mA
Resolution	15 bits plus sign unipolar and bipolar
Current draw @ 5.1V	120 mA
Current draw @ 24V	170 mA
Heat dissipation, max	2.86 W
Conversion rate (all channels), max	Interrupts not enabled: 2.5 ms Interrupts enabled: 3.8 ms
Step response to 63%(2)	2.9 ms
Resistive load	Current: 0…600 Ω (includes wire resistance) Voltage: 1 KΩ or greater

Technical Specifications - 1769-OF4, 1769-OF4K

Attribute	1769-OF4, 1769-OF4K
Inductive load, max	0.1 mH (current load) 1.0 µF (voltage load)
Field calibration	None required
Accuracy(3)	0.5% full-scale at 25 °C (77 °F)
Accuracy drift with temperature	±0.0086% of full-scale per °C
Output ripple(4)	±0.05% @ 0…50 kHz
Nonlinearity	±0.05%
Repeatability(5)	±0.05%
Module error 0…60 °C (32…140 °F)	+/-0.8% of full-scale
Output impedance	Voltage output: < 1 Ω Current output: > 1 MΩ
Open and short-circuit protection	Yes
Short-circuit protection, max	40 mA
Output overvoltage protection	Yes
Output response at system power-up and power down	2.5…-1.0V DC spike for < 15 ms
Rated working voltage(6)	30V AC/30V DC
Isolation voltage	510V AC or 720V DC for 1 minute (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	280 g (0.61 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22…14 AWG) solid (22…16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	48
Input words	5
Output words	5
Configuration words	32
Enclosure type rating	None (open style)

(1) The over- or underrange flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full-scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, drift, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the output module to reproduce output readings when the same controller value is applied to it consecutively, under the same conditions and in the same direction.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a10V DC input signal and 20V DC potential above ground at the input terminal.

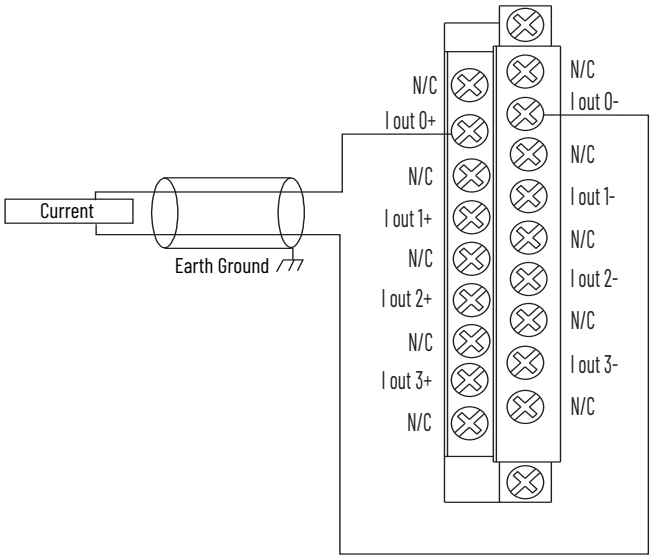
For **Environmental Specifications**, see page 2.

For **Certifications**, see page 3.

1769-OF4CI

Compact current output, individually isolated analog module

Output Wiring



Technical Specifications - 1769-OF4CI

Attribute	1769-OF4CI
Outputs	4 differential, individually isolated
Output range	0...20 mA 4...20 mA
Full-scale range(1)	0...21 mA 3.2...21 mA
Resolution	16 bits (unipolar) 0...20 mA: 15.91 bits, 0.323 µA/bit 4...20 mA: 15.59 bits, 0.323 µA/bit
Bus current draw	5V DC, 145 mA 24V DC, 120 mA
Heat dissipation, max	2.68 W
Conversion rate (all channels), max	110 ms
Limited voltage/current(2)	< 2.9 ms
Resistive load on current output	0...500 Ω (includes wire resistance)
Inductive load (current outputs), max	0.1 mH
Field calibration	None required
Accuracy(3)	±0.35% full-scale @ 25 °C (77 °F)
Accuracy drift with temperature	±0.0058% FS per °C
Output ripple(4)	±0.05% @ 0...50 kHz
Nonlinearity	±0.05%
Repeatability(5)	±0.05%
Module error	±0.55%
Output impedance	>1 MΩ
Open and short-circuit protection	Yes
Short-circuit protection, max	21 mA

Technical Specifications - 1769-OF4CI

Attribute	1769-OF4CI
Output overvoltage protection	Yes
Output response at system power-up and power down	No current glitch
Rated working voltage(6)	30V AC/30V DC
Isolation voltage	500V AC or 710V DC for 1 min (qualification test), output group to bus 30V AC/30V DC working voltage (IEC Class II reinforced insulation)
Weight, approx	270 g (0.60 lb)
Dimensions (HxWxD), approx	118 x 35 x 87 mm (4.65 x 1.38 x 3.43 in.) Height with mounting tabs 138 mm (5.43 in.)
Slot width	1
Module location	DIN rail or panel mount
Power supply	1769-PA2, 1769-PB2, 1769-PA4, 1769-PB4
Power supply distance rating	8 modules
Terminal screw torque	0.68 N•m (6 lb•in)
Retaining screw torque	0.46 N•m (4.1 lb•in)
Wire size	(22...14 AWG) solid (22...16 AWG) stranded
Wire type	Cu-90 °C (194 °F)
Recommended cable	Belden 8761 (shielded)
Replacement terminal block	1769-RTBN18 (1 per kit)
Replacement door label	1769-RL2 (2 per kit)
Replacement door	1769-RD (2 per kit)
Vendor ID code	1
Product type code	10
Product code	45
Input words	6
Output words	5
Configuration words	32
Enclosure type rating	None (open style)

(1) The over- or underrange flag comes on when the normal operating range (over/under) is exceeded. The module continues to convert the analog input up to the maximum full-scale range. The flag automatically resets when within the normal operating range.
(2) Step response is the time between when the D/A converter was instructed to go from minimum to full range until the device is at 63% of full range.
(3) Includes offset, gain, nonlinearity, and repeatability error terms.
(4) Output ripple is the amount that a fixed output varies with time, which assumes a constant load and temperature.
(5) Repeatability is the ability of the input module to register the same reading in successive measurements for the same input signal.
(6) Rated working voltage is the maximum continuous voltage that can be applied at the input terminal, including the input signal and the value that floats above ground potential. For example, a 10V DC input signal and 20V DC potential above ground at the input terminal.

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