

1769 Compact I/O Modules Specifications

Catalog Numbers

Digital I/O Modules	1769-IA8I, 1769-IA8IK, 1769-IA16, 1769-IA16K, 1769-IM12, 1769-OA8, 1769-OA16, 1769-OA16K, 1769-IG16, 1769-IQ16, 1769-IQ16K, 1769-IQ16F, 1769-IQ32, 1769-IQ32K, 1769-IQ32T, 1769-IQ6XOW4, 1769-OB8, 1769-OB8K, 1769-OB16, 1769-OB16K, 1769-OB16P, 1769-OB32, 1769-OB32K, 1769-OB32T, 1769-OG16, 1769-OV16, 1769-OV32T
Contact I/O Modules	1769-OW8, 1769-OW8I, 1769-OW8IK, 1769-OW16, 1769-OW16K
Analog I/O Modules	1769-IF4, 1F4K, 1769-IF4I, 1769-IF4XOF2, 1769-IF4XOF2K, 1769-IF4FXOF2F, 1769-IF8, 1769-IF8K, 1769-IF16C, 1769-IF16V, 1769-IR6, 1769-IT6, 1769-OF2, 1769-OF2K, 1769-OF4, 1769-OF4K, 1769-OF4CI, 1769-OF4VI, 1769-OF8C, 1769-OF8V
Specialty Modules	1769-ARM, 1769-ASCII, 1769-BOOLEAN, 1769-HSC, 1769-SM2
Accessories	1769-ECL, 1769-ECLK, 1769-ECR, 1769-ECRK, 1769-ECL, 1769-ECLK, 1769-ECR, 1769-ECRK, 1769-CLL1, 1769-CRR1, 1769-CRL1, 1769-CLL3, 1769-CRR3, 1769-CRL3

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The 1769 Compact I/O™ modules can be used in these applications:

- With a 1769 CompactLogix™ controller
- For expansion I/O in a MicroLogix™ 1500 controller assembly
- In an assembly with a 1769-ADN DeviceNet® adapter
- In an assembly with a 1769-AENTR Ethernet adapter

Unless connected to a MicroLogix 1500 base, each bank of I/O modules must include its own power supply.

Install the I/O modules on a panel with two mounting screws or on a DIN rail. The modules mechanically lock together with a tongue-and-groove design and have an integrated communication bus that is connected from module to module by a movable bus connector.

Certifications

Certifications - 1769 Compact I/O Digital and Contact Modules

Certification ⁽¹⁾	1769-IA8I, 1769-IA8IK, 1769-IA16, 1769-IA16K, 1769-OA8, 1769-OA16, 1769-OA16K, 1769-OW8, 1769-OW8I, 1769-OW8IK, 1769-OW16, 1769-OW16K	1769-IM12, 1769-IQ6XOW4	1769-IG16, 1769-IQ16, 1769-IQ16K, 1769-IQ16F, 1769-IQ32, 1769-IQ32K, 1769-IQ32T, 1769-OB8, 1769-OB8K, 1769-OB16, 1769-OB16K, 1769-OB16P, 1769-OB32, 1769-OB32K, 1769-OB32T, 1769-OG16, 1769-OV16, 1769-OV32T
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.		
UKCA and CE	UK Statutory Instrument 2016 No. 1101 and European Union 2014/35/EU LVD Directive, compliant with: EN 61131-2; Programmable Controllers (pertinent LVD sections only) UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS Directive, compliant with: EN IEC 63000; Technical Documentation		UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical Documentation
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions		
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		
Morocco	Arrêté ministériel n° 6404-15 du 1er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436		

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

Certifications - 1769 Compact I/O Analog Modules

Certification ⁽¹⁾	1769-IF4, 1769-IF4K, 1769-IF4XOF2, 1769-IF4XOF2K, 1769-IF4XOF2F, 1769-IF8, 1769-IF8K, 1769-OF2, 1769-OF2K	1769-IF4I, 1769-IT6, 1769-OF4CI, 1769-OF4VI, 1769-OF8C, 1769-OF8V	1769-IF16C, 1769-IF16V	1769-IR6	1769-OF4, 1769-OF4K
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.	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.	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E10314. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E10314.	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E194810.	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.
UKCA and CE	UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical documentation				
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions				
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3				
Morocco	Arrêté ministériel n° 6404-15 du 1er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436				

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

Certifications - Specialty Modules

Certification ⁽¹⁾	1769-ARM, 1769-ASCII, 1769-BOOLEAN	1769-HSC	1769-SM2 ⁽²⁾⁽³⁾
c-UL-us	UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E322657. UL Listed for Class I, Division 2 Group A,B,C,D Hazardous Locations, certified for U.S. and Canada. See UL File E334470.	UL Listed Industrial Control Equipment, certified for US and Canada. See UL File E59272.
UKCA and CE	UK Statutory Instrument 2016 No. 1091 and European Union 2014/30/EU EMC Directive, compliant with: EN 61000-6-2; Industrial Immunity EN 61000-6-4; Industrial Emissions UK Statutory Instrument 2012 No. 3032 and European Union 2011/65/EU RoHS, compliant with: EN IEC 63000; Technical documentation		
RCM	Australian Radiocommunications Act, compliant with: EN 61000-6-4; Industrial Emissions		
KC	Korean Registration of Broadcasting and Communications Equipment, compliant with: Article 58-2 of Radio Waves Act, Clause 3		
Morocco	Arrêté ministériel n° 6404-15 du 1er muharram 1437 Arrêté ministériel n° 6404-15 du 29 ramadan 1436		

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

(2) In a domestic environment, this product can cause radio interference in which case supplementary mitigation measures can be required.

(3) To remain CE, a ferrite core (Fair-Rite part number 2643102002) must be added to DSI communication cables longer than 10 m (33 ft.), and the core must be attached within 305 mm (12 in.) of the 1769-SM2 module.

Specialty I/O Modules

These specialty modules are available.

Cat. No.	Description	Page
1769-ARM	Compact address reserve module	53
1769-ASCII	Compact ASCII module	54
1769-BOOLEAN	Compact combination 24V DC sink input/source output Boolean control module	55
1769-HSC	Compact high-speed counter module	57
1769-SM2	Compact I/O to DSI module	60

1769-ARM

Compact address reserve module

Use a 1769-ARM module to reserve module slots. To use the 1769-ARM module, first create an I/O configuration and user program. Then you can remove and replace any module in the system with a 1769-ARM module after you inhibit the removed module in the programming software. If you inhibit a module, it creates an I/O configuration and user program that removes all references to that module.

To use the 1769-ARM module in MicroLogix systems, configure a generic module by using RSLogix 5000[®] programming software. Any user-program references to the slot position that is occupied by the 1769-ARM module must not use the parameters of another module.

Technical Specifications - 1769-ARM

Attribute	1769-ARM
Current draw @ 5.1V	60 mA
Current draw @ 24V	0 mA
Heat dissipation, max	0.3 W
Weight, approx	280 g (0.62 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
Vendor ID code	1
Product type code	7
Product code	74
Enclosure type rating	None (open style)

For **Environmental Specifications**, see [page 2](#).

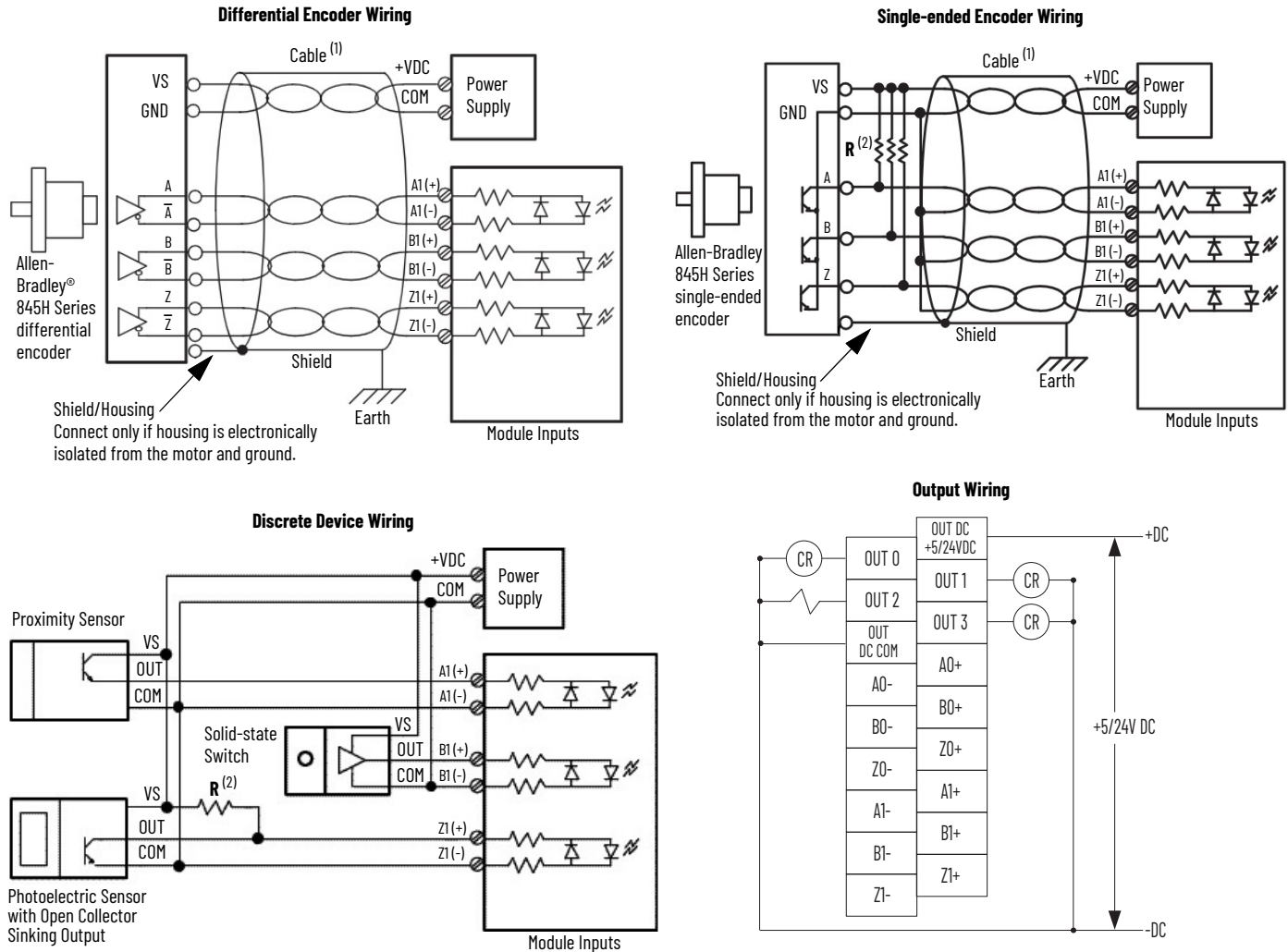
For **Certifications**, see [page 3](#).

1769-HSC

Compact high-speed counter module

Use the 1769-HSC module when you need:

- A counter module that can react to high-speed input signals.
- To generate rate and time-between-pulses (pulse interval) data.
- One or two channels of quadrature or four channels of pulse/count inputs.



- (1) See the encoder manual for proper cable type. Use a twisted-pair, individually shielded cable with a maximum length of 300 m (1000 ft).
 (2) External resistors are required if they are not internal to the encoder. The pull-up resistor (R) value depends on the power supply value. To calculate the maximum resistor value, use this formula:

$$R = \frac{(V_{dc} - V_{min})}{I_{min}}$$

where:

- R = maximum pull-up resistor value
- VDC = power supply voltage
- Vmin = 2.6V DC
- min = 6.8 mA

Power Supply Voltage (V DC)	Pull-up Resistor Value Max (R) ⁽¹⁾
5V DC	352 Ω
12V DC	1382 Ω
24V DC	3147 Ω

(1) Resistance values can change, depending upon your application.

The minimum resistor (R) value depends on the current sinking capability of the encoder. See the documentation for your encoder for more information.

Technical Specifications – 1769-HSC

Attribute	1769-HSC
Bus current draw	425 mA, 5V DC 0 mA, 24V DC
Heat dissipation, max	6.21 W, the watts per point, plus the min watts, with all points energized
Isolation voltage	75V (continuous), reinforced insulation type, channel-to-system and channel-to-channel Type tested at 1200V AC for 2 s
Weight, approx	309 g (0.681 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	4 modules
Terminal screw torque	0.68 N·m (6 lb·in)
Retaining screw torque	0.46 N·m (4.1 lb·in)
Wire size	0.32...2.1 mm ² (22...14 AWG) solid copper wire 0.32...1.3 mm ² (22...16 AWG) stranded copper wire rated at 90 °C (194 °F) insulation max
Wire type	Cu-90 °C (194 °F)
Recommended cable	Individually shielded, twisted-pair cable (or the type recommended by the encoder or sensor manufacturer)
Wiring Category ⁽¹⁾	2 - on signal ports
Vendor ID code	1
Product type code	109
Product code	19
Enclosure type rating	None (open-style)

(1) Use this Conductor Category information to plan conductor routing. See the Industrial Automation Wiring and Grounding Guidelines, publication [1770-4.1](#).

1769-HSC Input Specifications

Attribute	1769-HSC
Inputs	2 quadrature (ABZ) differential inputs
Input voltage range ⁽¹⁾	2.6...30V DC
On-state voltage, max	30V DC
On-state voltage, min	2.6V DC
On-state current, min	6.8 mA
Off-state voltage, max	1.0V DC
Off-state current, max	1.5 mA
Off-state leakage current, max	1.5 mA
Input current, max	15 mA
Input current, min	6.8 mA
Input impedance	1950 Ω
Pulse width, min	250 ns
Phase separation, min	131 ns
Input frequency, max	1 MHz
Isolation voltage	Verified by one of these dielectric tests: 1200V AC or 1697V DC for 1 s, input to bus and input to input 75V DC working voltage (IEC Class II reinforced insulation)

(1) See Compact I/O Modules Installation Instructions, publication [1769-IN088](#).

1769-HSC Output Specifications

Attribute	1769-HSC
Outputs	16 total, 4 physical and 12 virtual
Output voltage range	5...30V DC
On-state voltage, max	User power - 0.1V DC
On-state output current per point, max	1 A, 30V DC, 40 °C 0.5 A, 5V DC, 60 °C
On-state output current per module, max	4 A, 30V DC, 40 °C 2 A, 5V DC, 60 °C
On-state output current, min	1 mA
On-state voltage drop, max	0.5V DC
Off-state leakage current, max	5 μA
Turn-on time, max	400 μs ⁽¹⁾
Turn-off time, max	200 μs
Reverse polarity protection	30V DC
Isolation voltage	Verified by one of these dielectric tests: 1200V AC or 1697V DC for 1 s, output to bus 75V DC working voltage (IEC Class II reinforced insulation)

(1) Maximum turn-on time applies to an output voltage range of 5...7V DC. For output voltages greater than 7V DC, the maximum turn-on time is 200 μs.

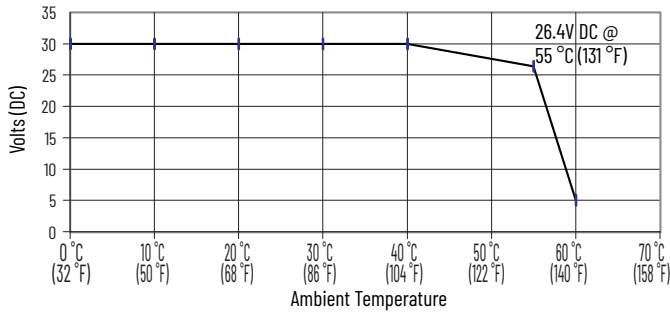
For **Temperature Derating**, see [page 59](#).

For **Environmental Specifications**, see [page 2](#).

For **Certifications**, see [page 3](#).

Temperature Derating - 1769-HSC

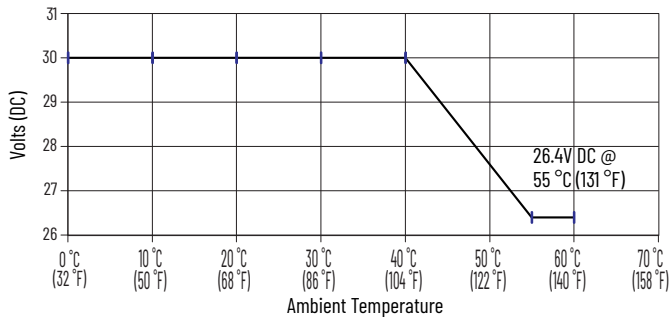
Maximum Input Voltage - 24V DC Operation
Voltage Derating Based on Temperature



Temperature	Derated Voltage ⁽¹⁾
0...40 °C (32...104 °F)	30V DC
55 °C (131 °F)	26.4V DC
60 °C (140 °F)	5V DC

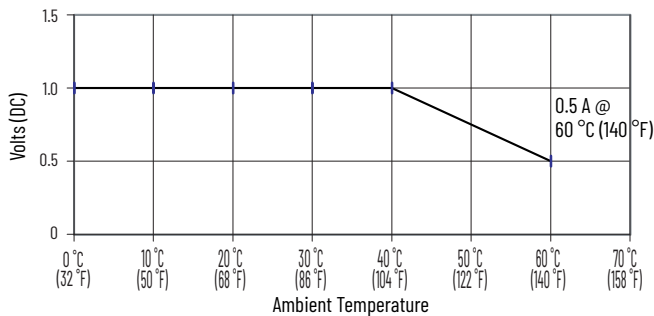
(1) Input voltage derating between 55...60°C is achieved by using a dropping resistor. For 24V DC input voltage, use a 2.4 kΩ, ½ Watt resistor. For input voltages other than 24V DC, use a ½ Watt resistor with value: 125 x (V_{in} - 5V).

Maximum Output Voltage - 24V DC Operation
Voltage Derating Based on Temperature



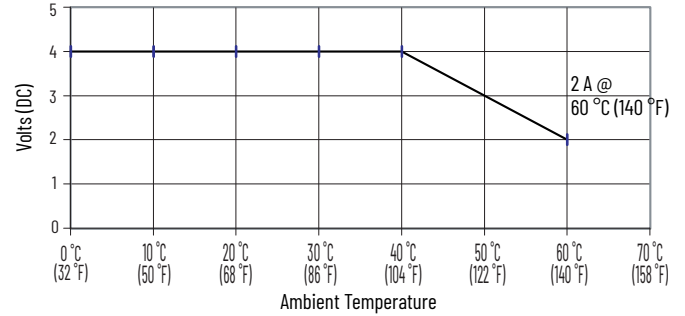
Temperature	Derated Voltage
0...40 °C (32...104 °F)	30V DC
55...60 °C (131...140 °F)	26.4V DC

Maximum Output Current per Point - 5V DC Operation
Voltage Derating Based on Temperature



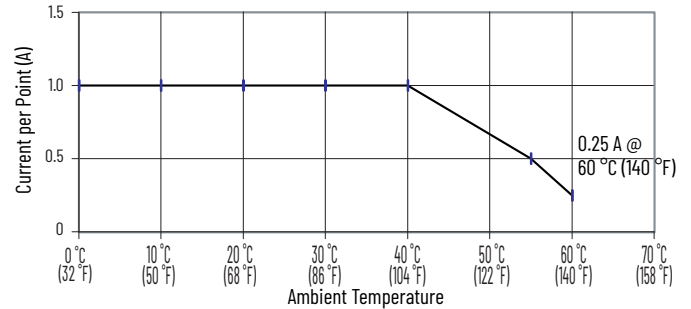
Temperature	Derated Current
0...40 °C (32...104 °F)	1 A
60 °C (140 °F)	0.5 A

Maximum Output Current per Module - 5V DC Operation
Voltage Derating Based on Temperature



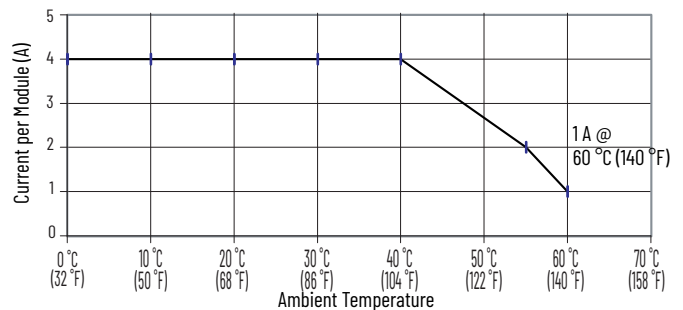
Temperature	Derated Current
0...40 °C (32...104 °F)	4 A
60 °C (140 °F)	2 A

Maximum Output Current per Point - 24V DC Operation
Current Derating Based on Temperature



Temperature	Derated Current
0...40 °C (32...104 °F)	1 A
55 °C (131 °F)	0.5 A
60 °C (140 °F)	0.25 A

Maximum Output Current per Module - 24V DC Operation
Current Derating Based on Temperature



Temperature	Derated Current
0...40 °C (32...104 °F)	4 A
55 °C (131 °F)	2 A
60 °C (140 °F)	1 A