



Dry Contact and Mechanical Relay Output Modules

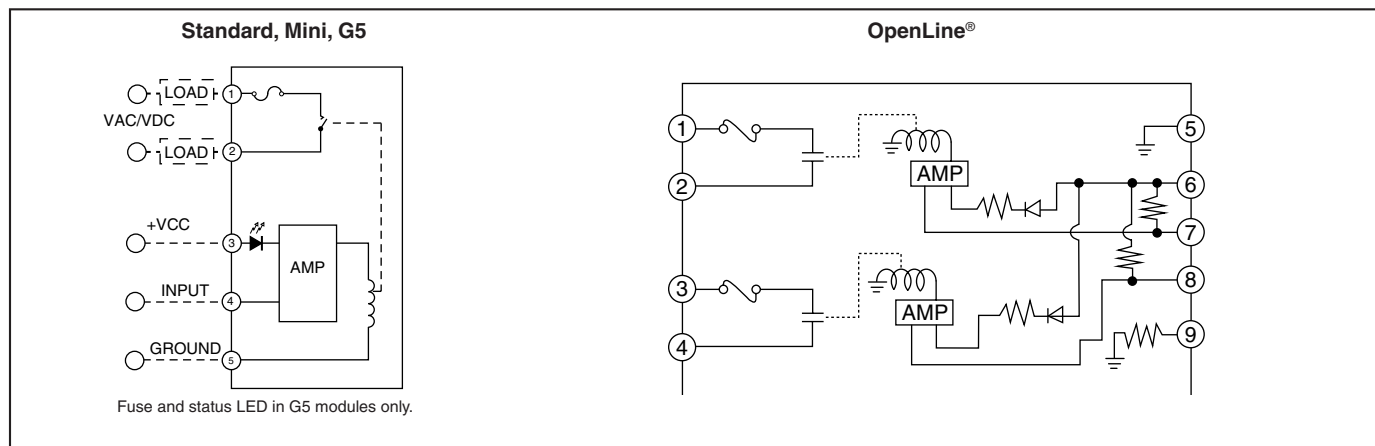
FEATURES

- SPST, Normally Open
- UL, CSA Certified
- 1500 Vac Isolation
- G5 and OpenLine® Modules Provide Replaceable 5x20mm Glass Fuse
- Built-in Status LED
- Lifetime Warranty
- Switch AC or DC with the Same Module
- Very Low Off-State Leakage Current for AC loads
- No Off-State Leakage Current for DC loads



70L-ODC5R 70G-ODCR/OACRLY 70-ODCR/OACRLY 70M-ODCR

CIRCUITRY



SPECIFICATIONS BY PACKAGE STYLE

Package Style		Std (70-)	Mini (70M-)	G5 (70G-)	OpenLine® (70L-)
Specifications	Units				
Isolation Voltage ¹	Vrms	1500	1500	1500	1500
Vibration ²		MIL-STD-202	MIL-STD-202	MIL-STD-202	IEC68-2-6
Mechanical Shock ³		MIL-STD-202	MIL-STD-202	MIL-STD-202	IEC68-2-7
Storage Temp. Range	°C	-40 to 70	-40 to 70	-40 to 70	-40 to 70
Operating Temp. Range	°C	-40 to 70	-40 to 70	-40 to 70	-40 to 70

¹ Field to logic and channel-to-channel if Grayhill racks are used.

² MIL-STD-202, Method 204, 20 G, 10-2000 Hz or IEC68-2-6, 0.15 mm/sec², 10-150 Hz.

³ MIL-STD-202, Method 213, Condition F, 1500 G or IEC68-2-27, 11 mS, 15g.



SPECIFICATIONS BY PART NUMBER

(all specs at 25°C unless noted otherwise)

Standard and Miniature Modules

Type/Function		Grayhill Part Number		
Miniature, Normally Open		70M-ODC5R		70M-ODC24R
Standard, Normally Open		70-ODC5R	70-OAC5RLY	70-ODC24R
Specifications	Units			
Maximum Line Voltage	Vdc/Vac	100/120	110/250	100/120
Load Voltage Range	Vdc/Vac	0-100/0-120	0-110/0-250	0-100/0-120
Maximum Contact Rating	W	10	90	10
Maximum Switching Current ¹	A	0.5	3.0	0.5
Maximum Carry Current ¹	A	1.0	5.0	1.0
Minimum Life Expectancy				
@ 10 Vdc/10 mA	Cycles	200 x 10 ⁶	—	200 x 10 ⁶
@ 48 Vdc/100 mA	Cycles	500 x 10 ³	—	500 x 10 ³
@ 120 Vac/80 mA	Cycles	500 x 10 ³	—	500 x 10 ³
@ 30 Vdc or 230 Vac/3A	Cycles	—	100 x 10 ³	—
Maximum Contact Resistance ³	mW	250	250	250
Maximum Off-State Leakage	mA	.002	.002	.002
Maximum Turn-On Time ²	mSec	1	11	1
Maximum Turn-Off Time ²	mSec	1	11	1
Nominal Logic Voltage (Vcc)	Vdc	5	5	24
Logic Voltage Range	Vdc	4.8-6.0	4.8-6.0	20-30
Maximum Logic Supply Current				
@ Nominal Vcc	mA	10	30	20
Nominal Input Resistance (Rx)	W	500	200	1700
Minimum Drop-Out Voltage	Vdc	2.5	4.8	23
Maximum Reverse Logic Voltage	Vdc	-5	-5	-5

G5 and OpenLine® Modules

Type/Function		Grayhill Part Number			
G5 Fusible, Normally Open		70L-ODC5R	70G-ODC5R	70G-OAC5RLY	70G-ODC24R
Specifications	Units				
Maximum Line Voltage	Vdc/Vac	200/200	100/120	110/250	100/120
Load Voltage Range	Vdc/Vac	0-200/0-200	0-100/0-120	0-110/0-250	0-100/0-120
Maximum Contact Rating	W	10	10	90	10
Maximum Switching Current ¹	A	0.5	0.5	3.0	0.5
Maximum Carry Current ¹	A	1.5	1.0	5.0	1.0
Minimum Life Expectancy					
@ 1Vdc/10 mA	Cycles	1000 x 10 ⁶	—	—	—
@ 10 Vdc/10 mA	Cycles	—	200 x 10 ⁶	—	200 x 10 ⁶
@ 48 Vdc/100 mA	Cycles	—	500 x 10 ³	—	500 x 10 ³
@ 120 Vac/80 mA	Cycles	500 x 10 ³	500 x 10 ³	—	500 x 10 ³
@ 30 Vdc or 230 Vac/3A	Cycles	—	—	100 x 10 ³	—
Maximum Contact Resistance ³	mW	300	250	250	250
Maximum Turn-On Time ²	mSec	1	1	11	1
Maximum Turn-Off Time ²	mSec	1	1	11	1
Max. Off-State Leakage @ Max. Line	mA	.002	.002	.002	.002
Nominal Logic Voltage (Vcc)	Vdc	5	5	5	24
Logic Voltage Range	Vdc	4.5-6.0	4.8-6.0	4.8-6.0	18-30
Max. Logic Supply Current					
@ Nominal Vcc	mA	30 max./channel	10	30	30
Nominal Input Resistance (Rx)	W	167	500	200	1200
Minimum Drop-Out Voltage	Vdc	4.5	1	1	23

¹ Inductive loads require diode suppression or RC network

² Times include debounce

³ Initial value

Available from your local Grayhill Distributor.

For prices and discounts, contact a local Sales Office, an authorized local Distributor or Grayhill.

I/O Modules

I/O MODULES

Our line of pluggable input and output modules provide a low cost, versatile method for interconnecting real world analog and digital signals to data acquisition, monitoring, or control systems. All modules provide an optically isolated barrier between sensitive microprocessor or digital logic circuits and field power devices.

In the G5 and OpenLine® packages, analog and digital I/O modules are available with the same pin-out. This gives the flexibility of mixing and matching module types on the same mounting rack or base; making them perfect in applications which require interface to a variety of different sensors and loads.

The case color of the single point modules identify their function. The industry standard for single point I/O module case colors is:

- Digital AC Output Module = Black Case
- Digital DC Output Module = Red Case
- Digital AC Input Module = Yellow Case
- Digital DC Input Module = White Case

DIGITAL OUTPUT MODULES

Digital output modules are used to switch AC and DC loads such as solenoids, motors, or lamps from logic signal levels. Their inputs are directly compatible with TTL or CMOS interface circuitry.

AC output modules have zero voltage turn-on of the load to greatly reduce generated EMI and RFI. They are highly immune to electrical

transients, and have built-in RC snubber networks for increased capability with inductive loads.

DC output modules can operate DC loads over a wide voltage range and have built-in voltage spike protection.

DIGITAL INPUT MODULES

Digital input modules are used to monitor the status of a load or a sensor (such as a limit switch, pressure switch, or temperature switch). The output of these modules is a logic level signal which corresponds to the status of the device being monitored. A high level output signal indicates the load is off (the switch is open). A low level output signal indicates the load is on (the switch is closed). Input modules are designed to give fast, clean switching by providing filtering and hysteresis.

Input and output modules are compatible in that the output of one can drive the input of the other.

UL, CSA AND CE APPROVALS

As one of the world's leading manufacturers of I/O modules, we strive to assure that our products comply with all of the applicable international standards. In doing so, we believe your products will also be readily accepted and easily certified. All modules shown in this section have been tested to UL Standard 508 and are documented in UL file number E58632. Similarly, they have been tested to CSA

Standard 22.2 No. 14-95M and are documented in CSA file LR38763. Additionally, OpenLine® modules were tested and passed CSA 22.2 No. 213-M1987 Class I, Div. 2 Groups A, B, C and D. Parts bearing the CE logo indicate conformance with EN50082-2 and EN50081-2 (89/336/EEC EMC directive) as well as EN60950 (61010-1) for the low voltage directive. Contact Grayhill for copies of our Declaration of Conformity or visit our website. Parts bearing the TÜV logo indicate that they were the agency which performed the EN60950 evaluation.

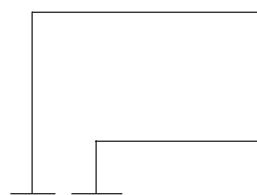
CONSTRUCTION AND LIFETIME WARRANTY

All of our I/O modules are hard potted with thermally conductive epoxy to withstand harsh industrial environments. The modules provide optical isolation, immunity to mechanical shock and vibration, and operate over a wide temperature range. The module cases are a solvent resistant thermoplastic which meets UL94-V-0 rating. The terminal pins are a tin-plated copper wire. Component selection and surface mount construction allow low operating junction temperatures for long life. Superior design, rigorous testing, and field data give us the confidence to back our I/O modules with the industry's first lifetime warranty.

I/O MODULE WIRING

Analog and digital modules can be placed at any I/O location, however, to minimize the possibility of crosstalk and noise pickup it is a good practice to group similar module types together. 14 or 16 gauge wire is typically used to wire the field devices to the I/O rack terminal block.

PART NUMBER EXPLANATION: Digital I/O Modules



Module Type

- 70 = Digital Module, Standard Package
- 70G = Digital Module, G5 Package
- 70L = Digital Module, OpenLine® Package
- 70M = Digital Module, Mini Package

Function

- OAC = Digital Output AC
- ODC = Digital Output DC
- IAC = Digital Input AC
- IDC = Digital Input DC

Suffix

- | | | | |
|-------------|--------------------------------|-------------------------------|--------------------------|
| AC Inputs: | Blank = 120 Vac | A = 220 Vac | |
| DC Inputs: | Blank = 3-32 Vdc | B = Fast Switching | NP = 15-32 Vac/10-32 Vdc |
| | G = 35-60 Vac/Vdc | D = 2.5-28 Vdc | K = 2.5-16 Vdc |
| | L = Inductive loads | S = Dry Contacts | |
| AC Outputs: | Blank = 120 Vac | A = 220 Vac | A-11 = Non-Zero Cross |
| | MA = 120 Vac, Manual Override | A-5 = Normally Closed | |
| | AMA = 240 Vac, Manual Override | | |
| DC Outputs: | Blank = 3-60 Vdc Fast | A = 4-200 Vdc R = Dry Contact | |
| | MA = 3-60 Vdc, Manual Override | B = 3-60 Vdc, Low Leakage | |

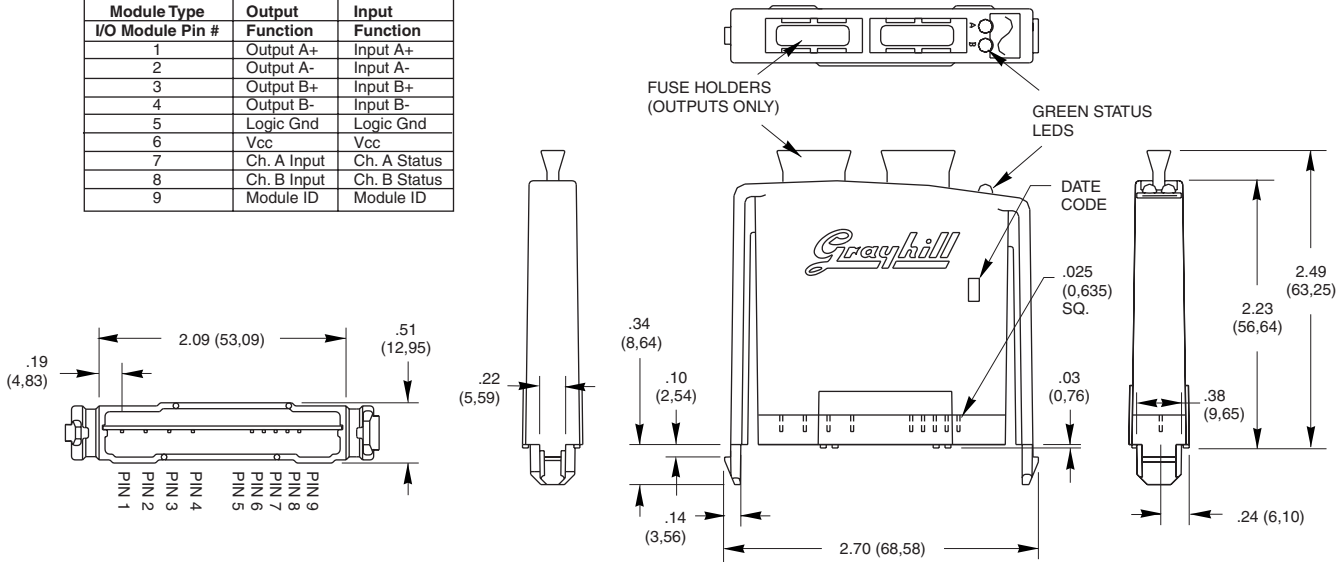
Logic Supply Voltage or Range

- Digital Modules: Blank = 4.5-28 Vdc (OpenLine®)
5 Vdc, 15 Vdc, 24 Vdc = Logic Supply Voltage (Standard, Mini, G5)
- Analog Modules: 4.75-5.25 Vdc

DIMENSIONS: OpenLine® Digital Modules

Dimensions shown in inches (and millimeters).
Tolerances are ± .010 (0,25) unless indicated otherwise.

Module Type	Output	Input
I/O Module Pin #	Function	Function
1	Output A+	Input A+
2	Output A-	Input A-
3	Output B+	Input B+
4	Output B-	Input B-
5	Logic Gnd	Logic Gnd
6	Vcc	Vcc
7	Ch. A Input	Ch. A Status
8	Ch. B Input	Ch. B Status
9	Module ID	Module ID

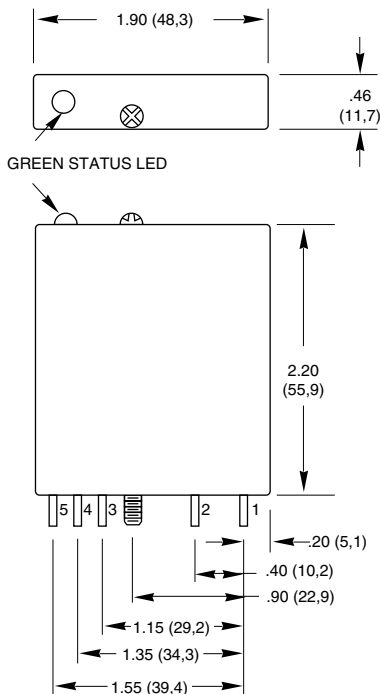


Note: For PC board layout information, request Bulletin #745

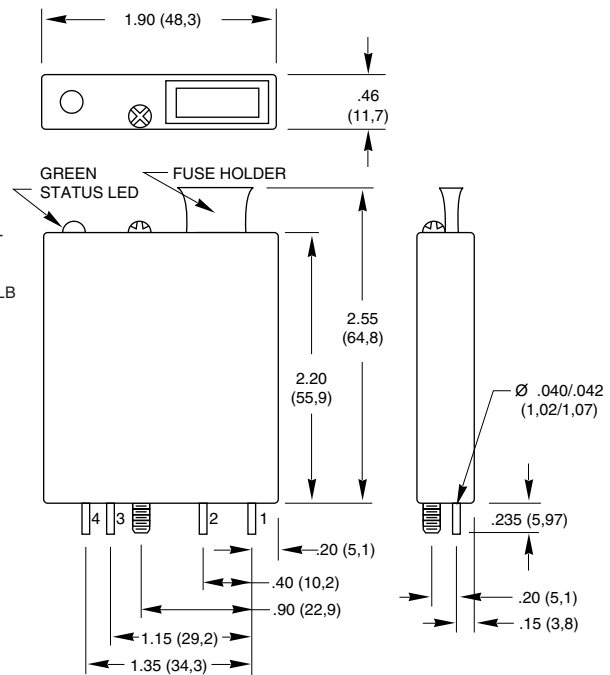
DIMENSIONS: G5 Digital Modules

Dimensions shown in inches (and millimeters).
Tolerances are ± .010 (0,25) unless indicated otherwise.

Input Modules



Output Modules

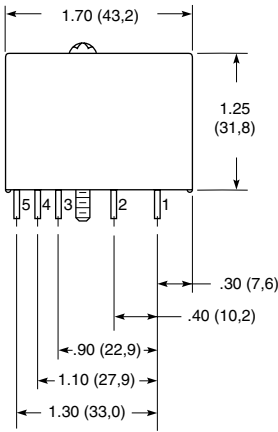
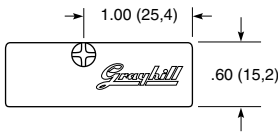


4-40 X 2-1/2" PHILLIPS HOLD-DOWN SCREW INCLUDED WITH EACH MODULE
MAXIMUM TORQUE = 5 FT-LB

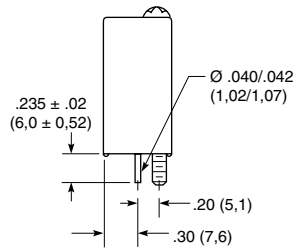
DIMENSIONS: Standard and Miniature Digital Modules

Dimensions shown in inches (and millimeters).
Tolerances are $\pm .010$ (0,25) unless indicated otherwise.

Standard Module

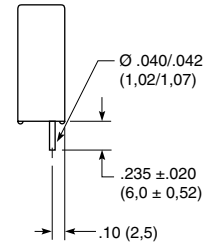
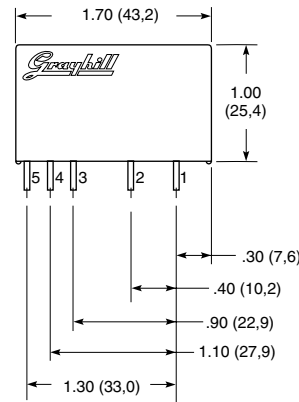


4-40 X 1-1/2" PHILLIPS HOLD-DOWN SCREW INCLUDED WITH EACH MODULE
MAXIMUM TORQUE = 5 FT-LB



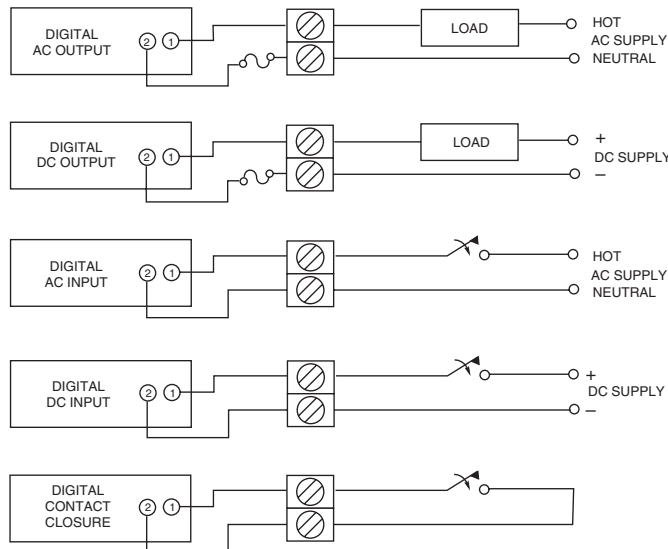
OUTPUT MODULES HAVE ONLY TERMINALS NUMBER 1-4

Miniature Module



OUTPUT MODULES HAVE ONLY TERMINALS NUMBER 1-4

WIRING DIAGRAM: Digital I/O Modules



I/O MODULE SIZE



Miniature
Saves 35% Space



Standard
Compatible Industry Size



G5
Fused Outputs,
Integral LED



OpenLine®
Two Channel,
Fused Outputs,
Integral LED

FUNCTION

(Check Specifications for Input and Output combinations, Feature or Option availability.)



Digital AC Output	Load 120 Vac 220 Vac	Control Vcc 5 Vdc 15 Vdc 24 Vdc 4.5-28 Vdc	Unique Options Random Turn-on Normally Closed Manual Override Inductive Load
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Digital DC Output	Load 60 Vdc 200 Vdc	Control Vcc 5 Vdc 15 Vdc 24 Vdc 4.5-28 Vdc	Unique Options Dry Contacts Manual Override
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Digital AC Input	Supply Vcc 5 Vdc 15 Vdc 24 Vdc 4.5-28 Vdc	Input Voltage 120 Vac 220 Vac	Unique Options High DC Voltage Input
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Digital DC Input	Supply Vcc 5 Vdc 15 Vdc 24 Vdc 4.5-28 Vdc	Input Voltage 3 to 32 Vdc	Unique Options 10 to 32 Vdc/ 15 to 32 Vac 8 KHz Switching 35 to 60 Vac/Vdc Contact Closure
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I/O Modules