



Ultra SlimPak®

RTD Input, Field Configurable Limit Alarm

Model G118-0003



Provides Relay Contact Closure(s) at a Preset RTD/Resistance Input Level

- Easy Field Configurable Input Ranges for Platinum, Nickel and Copper RTDs
- Adjustable Setpoints Programmable HI or LO and Failsafe or Non-failsafe
- Ultra Slim 17.7mm Housing Mounts on DIN Rail for High Density Installations
- LED Trip and Input Indicators
- Flexible Power Supply Accepts 9 to 30VDC
- ASiC Technology for High Reliability
- Lifetime Warranty



DESCRIPTION

The Ultra SlimPak G118 is a DIN rail mount, RTD input limit alarm with dual setpoints and two contact closure outputs. The field configurable input and alarm functions offer flexible setpoint capability. There are up to eight temperature ranges available for each RTD type to ensure accuracy and maximize setpoint resolution.

The G118 is configurable as a single or dual setpoint alarm, with HI or LO trips and failsafe or non-failsafe operation. Each setpoint has a fixed deadband and a flexible DC power supply which accepts any voltage between 9 and 30VDC.

DIAGNOSTIC LEDs

The G118 is equipped with three front panel LEDs. The first is a dual function LED labeled IN (input). This green LED indicates line power and input signal status. Active DC power is indicated by an illuminated LED. If this LED is off, check DC power and wiring connection. If the input signal is more than 110% of full scale, the LED will flash at 8 Hz. Below -10%, the flash rate is 4 Hz.

Two red LEDs indicate the relay state for each setpoint. An illuminated red LED indicates the tripped condition.

OUTPUT

The G118 is equipped with two SPST (form A) relays, rated at 120VAC at 5 amperes or 28VDC at 1 ampere. Each of these relays is independently controlled by the field configurable setpoint and deadband.

OPERATION

The field configurable G118 limit alarm setpoints can be configured for HI or LO, failsafe or non-failsafe operation. Each of the setpoints has a respective fixed HI or LO deadband. In a tripped condition, the setpoint is exceeded and the appropriate red LED will illuminate. The trip will reset only when the process falls below the HI deadband or rises above the LO deadband (see Figure 1). For proper deadband operation the HI setpoint must always be set above the LO setpoint.

In failsafe operation, the relay is energized when the process is below the HI setpoint or above the LO setpoint (opposite for non-failsafe). In the failsafe mode, a power failure results in an alarm state output. This mode is usually used for safety limit applications.

DYNAMIC DEADBAND

LSI circuitry in the G118 prevents false trips by repeatedly sampling the input. The input must remain beyond the setpoint for 100 milliseconds, uninterrupted, to qualify as a valid trip condition. Likewise, the input must fall outside the deadband and remain there for 100 milliseconds to return the alarm to an untripped condition. This effectively results in a "dynamic deadband"—based on time—in addition to the normal deadband.

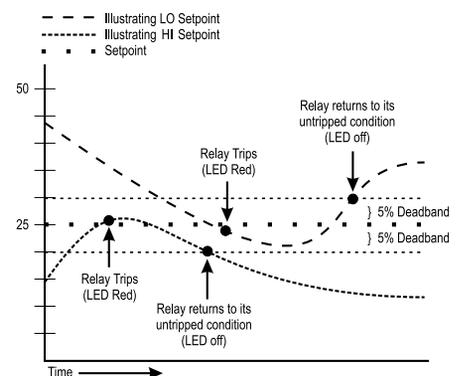


Figure 1: Limit alarm operation and effect of deadband(s).

CONFIGURATION

Unless otherwise specified, the factory presets the Model G118 as follows:

Input: Platinum (100Ω)
 Range: 0 to 100°C
 Output: Dual, SPST
 Trip: A:HI, B:HI
 Failsafe: Yes
 Deadband: A, B: 5%

The DC power input accepts any DC source between 9 and 30V; typically a 12V or 24VDC source is used (see Accessories).

For other I/O ranges, refer to Tables 1 through 3 and reconfigure switches SW1 and SW2 for the desired input type, range and function.

WARNING: Do not attempt to change any switch settings with power applied. Severe damage will result!

Input

1. With DC power off, position input switches 1 through 6 on "SW2" for RTD type (see Table 1).

2. Set position 1 through position 4 of input range switch "SW1" for the desired RTD type and input temperature range (Table 3).

3. Set position 5 and 6 of input range switch "SW1" to ON for a HI trip setpoint or OFF for a LO trip setpoint (Figure 4).

4. Set position 7 of input range switch "SW1" to ON for non-failsafe operation or OFF for failsafe operation (e.g. alarm trips upon power failure).

CALIBRATION

1. After configuring the DIP switches, connect the input to a calibrated RTD source or a resistance decade box and apply power. (Figure 6).

NOTE: To maximize thermal stability, final calibration should be performed in the operating installation, allowing approximately 1 to 2 hours for warm up and thermal equilibrium of the system.

2. Setpoint Calibration: With the desired trip RTD resistance input applied, adjust setpoint pot until the relay trips. For HI trip calibration, start with the setpoint pot above the desired trip (20 turns clockwise). For LO trip calibration, start with the setpoint pot below the desired trip (20 turns counter clockwise).

Once the calibration is complete, the setpoint potentiometer **must be sealed (GLYPTOL)** from further field change.

3. Deadband is fixed at 5%.

FACTORY ASSISTANCE

For additional information on calibration, operation and installation please contact Action's Technical Services Group. Call toll-free:

800-767-5726

Table 1: RTD Input Type switch settings (SW2 - 1 through 6)

	SW2					
	1	2	3	4	5	6
Cu 10	■				■	■
Pt 100, Cu 100				■		
Pt 500, NiFe 604	■	■				
Pt 1000	■					
Ni 120				■		

Table 2: Setpoint Function switch settings (SW1 - 5 through 8)

	SW1			
	5	6	7	8
TRIP B HI	■			
TRIP A HI		■		
NON-FAILSAFE				■

KEY ■ = ON

Table 3: Input Range switch settings (SW1-1 through 4)

Pt 100, 500, 1000 (α :00385)	SW1				Resistance
	1	2	3	4	*Pt 100 (Ω)
0 to 50°C (32 to 122°F)	■	■	■	■	100 to 119.4
-50 to 50°C (-58 to 122°F)	■	■			80.3 to 119.4
0 to 100°C (32 to 212°F)			■	■	100 to 138.5
-100 to 100°C (-148 to 212°F)			■		60.2 to 138.5
0 to 250°C (32 to 482°F)	■			■	100 to 194.1
-200 to 250°C (-328 to 482°F)	■				18.5 to 194.1
0 to 550°C (32 to 1022°F)	■	■	■	■	100 to 297.4
0 to 850°C (32 to 1562°F)	■	■	■		100 to 390.3
Cu10	1	2	3	4	Cu 10 (Ω)
25 to 70°C (77 to 158°F)		■	■	■	10.0 to 11.74
-30 to 70°C (-22 to 158°F)		■	■		7.876 to 11.74
25 to 120°C (77 to 248°F)			■	■	10.0 to 13.67
-70 to 120°C (-94 to 248°F)			■		6.318 to 13.67
25 to 260°C (77 to 500°F)	■		■	■	10.0 to 19.116
-200 to 260°C (-328 to 500°F)	■		■		1.058 to 19.116
Cu 100	1	2	3	4	Cu 100 (Ω)
25 to 75°C (77 to 167°F)		■	■	■	100.0 to 115.5
-25 to 75°C (-13 to 167°F)		■	■		80.7 to 115.5
25 to 150°C (77 to 302°F)	■			■	100 to 148.3
-100 to 150°C (-148 to 302°F)	■				51.3 to 148.3
25 to 260°C (77 to 500°F)	■		■	■	100 to 191.2
-200 to 260°C (-328 to 500°F)	■		■		10.6 to 191.2
Ni 120	1	2	3	4	Ni 120 (Ω)
-30 to 30°C (-22 to 86°F)			■	■	99.4 to 142.1
-80 to 30°C (-112 to 86°F)			■		66.6 to 142.1
-30 to 100°C (-22 to 212°F)	■			■	99.4 to 200.6
-30 to 200°C (-22 to 392°F)	■				99.4 to 303.5
-30 to 320°C (-22 to 608°F)	■	■	■	■	99.4 to 471.2
NiFe 604	1	2	3	4	NiFe 604 (Ω)
-40 to 0°C (-40 to 32°F)		■	■	■	499.1 to 604.0
-40 to 50°C (-40 to 122°F)		■		■	499.1 to 751.8
-200 to 50°C (-328 to 122°F)	■			■	245.3 to 751.8
-200 to 100°C (-328 to 212°F)	■		■		245.3 to 917.3
-200 to 240°C (-328 to 464°F)	■	■			245.3 to 1475.6

*Note: Resistance values for Pt 500(Ω) and Pt 1000(Ω) are 5 and 10 times the resistance value of Pt100 (Ω), respectively.

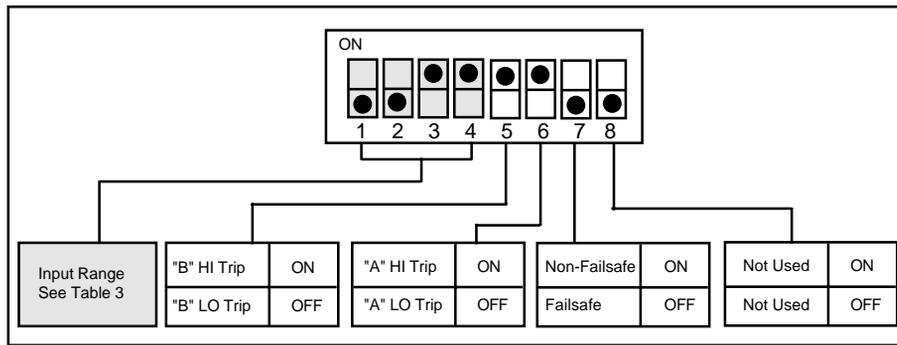


Figure 4: G118 Input Range/Function Selection (SW1) Factory Default Settings

RELAY PROTECTION AND EMI SUPPRESSION

When switching inductive loads, maximum relay life and transient EMI suppression is achieved using external protection (see Figures 2 and 3). Place all protection devices directly across the load and minimize all lead lengths. For AC inductive loads, place a properly-rated MOV across the load in parallel with a series RC snubber. Use a 0.01 to 0.1µF pulse film capacitor (foil polypropylene recommended) of sufficient voltage, and a 47Ω, 1/2W carbon resistor. For DC inductive loads, place a diode across the load (PRV > DC supply, 1N4006 recommended) with (+) to cathode and (-) to anode (the RC snubber is an optional enhancement).

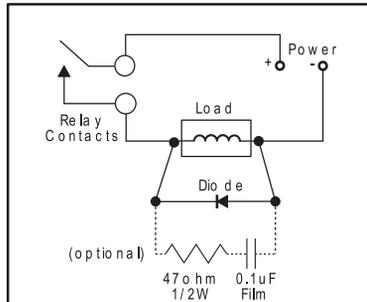


Figure 2: DC Inductive Loads

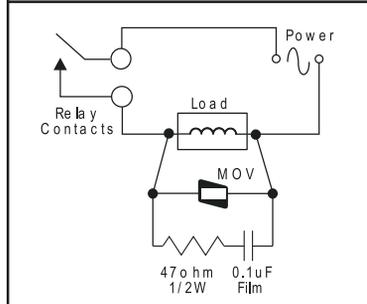


Figure 3: AC Inductive Loads

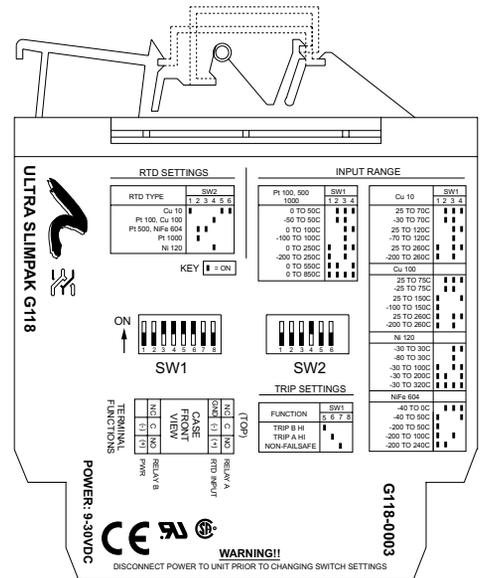


Figure 5: G118 Factory Calibration; 0-100°C (Pt 100), A-HI/B-HI, Non-Failsafe

Warning: Do not attempt to change any switch settings with power applied. Severe damage may occur!

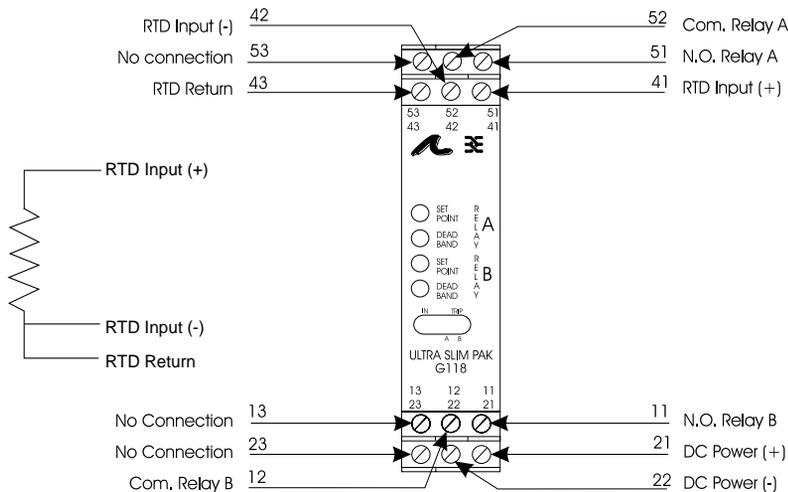


Figure 6: Wiring Diagram for G118

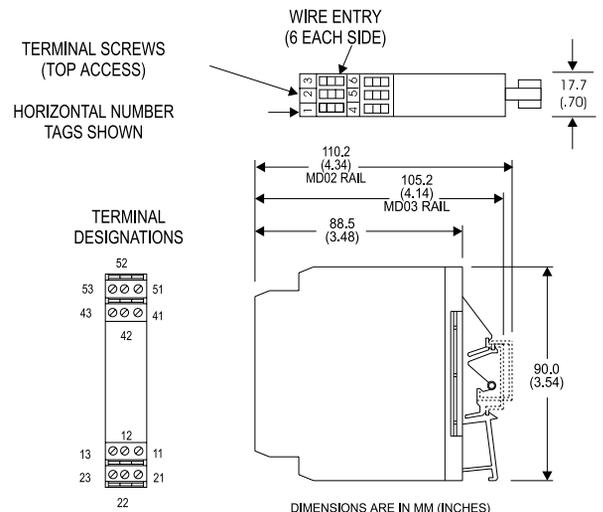


Figure 7: Mechanical Dimensions for G118

SPECIFICATIONS

Inputs

Sensor Types: Pt100, Pt500,
Pt1000 (0.00385Ω/Ω/°C);
Cu10, Cu100; Ni120, NiFe604
Sensor Connection: 3-wire.
Input Ranges: see table 1.

Excitation Current (Maximum)

<2mA for Pt100, Pt500, Pt1000,
Ni120, Cu100 or NiFe604
<10mA for Cu10

Leadwire Resistance

40% of base sensor resistance or
100Ω (whichever is less), maximum
per lead.

Leadwire Effect

Less than 1% of selected span
over entire leadwire resistance
range.

Input Protection

Normal Mode: Withstands ±5VDC.
Common Mode (Input to Ground):
1800VDC, max.

LED Indicators

Input Range (Green)
>110% input: 8Hz flash
>-10% input: 4Hz flash
Setpoint (Red)
Tripped: Solid red
Safe: Off

Limit Differentials (Deadbands)

5% of span

Response Time

Dynamic Deadband: Relay status
will change when proper
setpoint/process condition
exists for 100msec.

Normal Mode (analog filtering):
<250mSec, (10-90%)

Setpoints

Effectivity: Setpoints are adjust-
able over 100% of the selected
input span
Repeatability (constant temp.):
±0.2% of full scale

Stability

Line Voltage: ±0.01%/%, max.
Temperature: ±0.05% of full
scale/°C, max.

Common Mode Rejection

DC to 60Hz: 120dB
>60Hz: 100dB

Isolation

1800VDC between contacts,
input and power

EMC Compliance (CE Mark)

Emissions: EN50081-1
Immunity: EN50082-2
Safety: EN50178

Humidity (Non-Condensing)

Operating: 15 to 95% (@45°C)
Soak: 90% for 24 hours (@65°C)

Temperature Range

Operating: -15 to 55°C
(5 to 131°F)
Storage: -25 to 75°C
(-13 to 158°F)

Power

Consumption: 1.5W typical,
2.5W max.
Supply Range: 9 to 30VDC,
inverter isolated

Relay Contacts

2 SPST (2 form A) Relays

1 Relay per setpoint

Current Rating (resistive)

120VAC: 5A

240VAC: 2A

28VDC: 1A

Electrical Life: 10⁵ operations at rated
load

*Note: External relay contact
protection is required for use with
inductive loads (see Figures 2 & 3).*

Mechanical Life: 10⁷ operations

Weight

0.56lbs.

Agency Approvals

CSA certified per standard C22.2,
No. 0-M91 and 142-M1987 (File No.
LR42272) UL recognized per standard
UL508 (File No.E99775), UL991 and
UL873. CE Compliance per EMC
directive 89/336/EEC and low voltage
73/23/EEC.

PIN CONNECTIONS

11 N.O. Relay B
12 Com. Relay B
13 No Connection
21 DC Power (+)
22 DC Power (-)
23 No Connection
41 RTD Input (+)
42 RTD Input (-)
43 RTD Return
51 N.O. Relay A
52 Com. Relay A
53 No Connection

ACCESSORIES

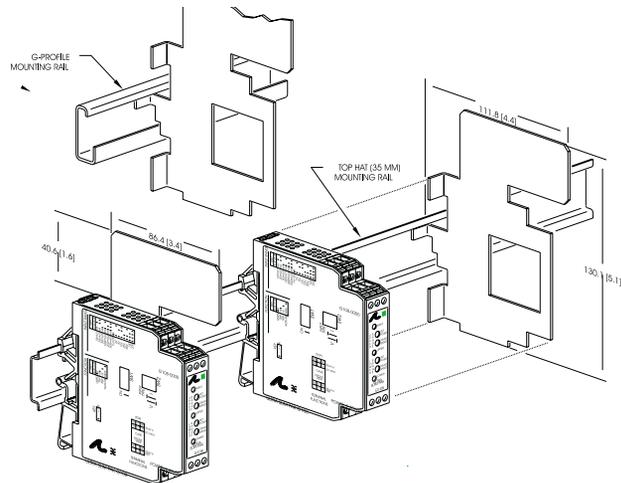
All SlimPak "G" series modules will mount on stan-
dard TS32 (model MD02) or TS35 (model MD03)
DIN rail and includes heat sink (model HS01). In
addition, the following accessories are available:

HS01 Heat Sink
MD03 TS35 x 7.5 DIN Rail
G905 24VDC Power Supply (0.5 Amp)
H910 24VDC Power Supply (1Amp)
H915 24VDC Power Supply (2.3 Amp)
MB03 End Bracket for MD03
C664 I/O Descriptive Tags

ORDERING INFORMATION

Specify:

1. Model: **G118-0003**
2. Accessories: (see Accessories)
3. Optional Custom Factory Calibration;
specify **C620** with desired input and
output range.



Note 1: All Ultra SlimPak modules are designed and tested to operate in ambient temperatures from 0 to 55°C, when mounted on a horizontal DIN rail. When five or more modules are mounted on a vertical rail, circulating air or model HS01 Heat Sink is recommended. Please refer to HS01 Technical Bulletin (#721-0549-00) or contact factory for assistance.

All Prices and Specifications subject to change without notice.

For order entry, applications or customer service assistance, call toll-free 800-767-5726

United States

Action Instruments, Inc.
8601 Aero Drive, San Diego, CA 92123
Phone: 858-279-5726 FAX: 858-279-6290
www.actionio.com
721-0651-00-D 2/01


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