

**INSTALLATION INSTRUCTIONS FOR M302(A)  
TWO-WIRE CONVENTIONAL DETECTOR MONITOR MODULE**

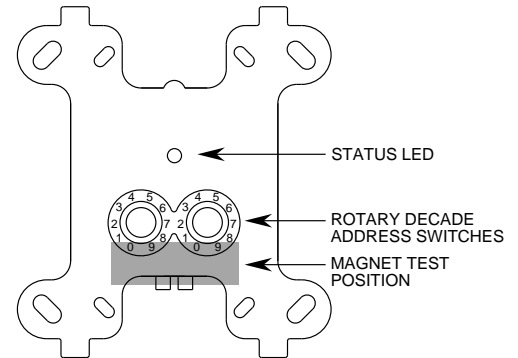
This information is included with the modules as a quick reference installation guide. Refer to the appropriate Fire-Lite product manual for detailed system information. If the modules will be installed in an existing operational system, inform the operator and local authority that the system will be temporarily out of service. Disconnect power to the control panel before installing the modules.

**GENERAL DESCRIPTION**

The M302(A) monitor module allows addressable panels to interface and monitor two-wire conventional smoke detectors. All two-wire detectors being monitored must be UL compatible with the module.

The module is addressed through the communication line (SLC) of addressable systems. When the module is interrogated, it transmits the status of one zone of two-wire detectors to an addressable control panel. Status conditions are reported as NORMAL, OPEN, or ALARM. The monitor module supervises the zone of detectors and the connection of a power source.

Two rotary decade switches allow setting module addresses from 00–99. A status LED indicator is provided and is controlled by code command from the control panel. The module provides a magnetically activated test switch for testing the module's electronics and connections to the control panel (see Figure 1).



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**FIGURE 1.  
MODULE CONTROLS AND INDICATORS**

**COMPATIBILITY REQUIREMENTS**

To insure proper operation, this module shall be connected to compatible Fire-Lite addressable control panels only.

Conventional two-wire smoke detectors must be UL compatible with the UL listed monitor module. For the ULC listed monitor module, the conventional 2-wire smoke detectors must be ULC compatible with the monitor module. A list of compatible two-wire conventional detectors is available from Fire-Lite (P/N 15384).

**PACKAGE CONTENTS**

- (1) Two-wire monitor module, P/N M302
- (1) 3.9K ohm end-of-line resistor (A2143-10)
- (1) Off-white cover plate
- (1) Screw pack for cover plate

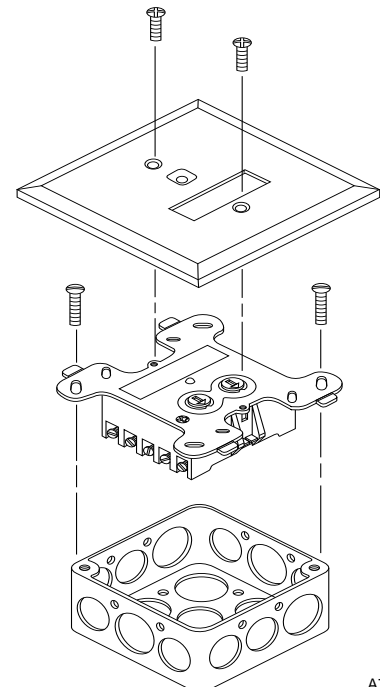
**MOUNTING**

The M302(A) monitor module mounts directly to a 4 inch square electrical box as shown in Figure 2. The box must have a minimum depth of 2-1/8 inches.

**WIRING**

**NOTE:** All wiring must conform to applicable local codes, ordinances and regulations.

1. Install module wiring in accordance with the job drawings and appropriate wiring diagrams (Figures 3 – 5).
2. Set the address on the module per job drawings.
3. Secure the module to the electrical box (supplied by installer), as shown in Figure 2.
4. Perform steps one, two, and three for all modules.



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**FIGURE 2.  
EXPLODED VIEW OF TYPICAL MODULE  
DETAILING MOUNTING ARRANGEMENT**

**TESTING**

The M302(A) monitor module can be tested with a test magnet available from Fire-Lite (M02-04-00, see Figure 1). The magnet test checks the module's electronics and connections to the control panel. Interfaced two-wire detectors must be tested independently. Test two-wire detectors per manufacturer's installation instructions.

**M302(A) MONITOR MODULE WIRING DIAGRAMS**

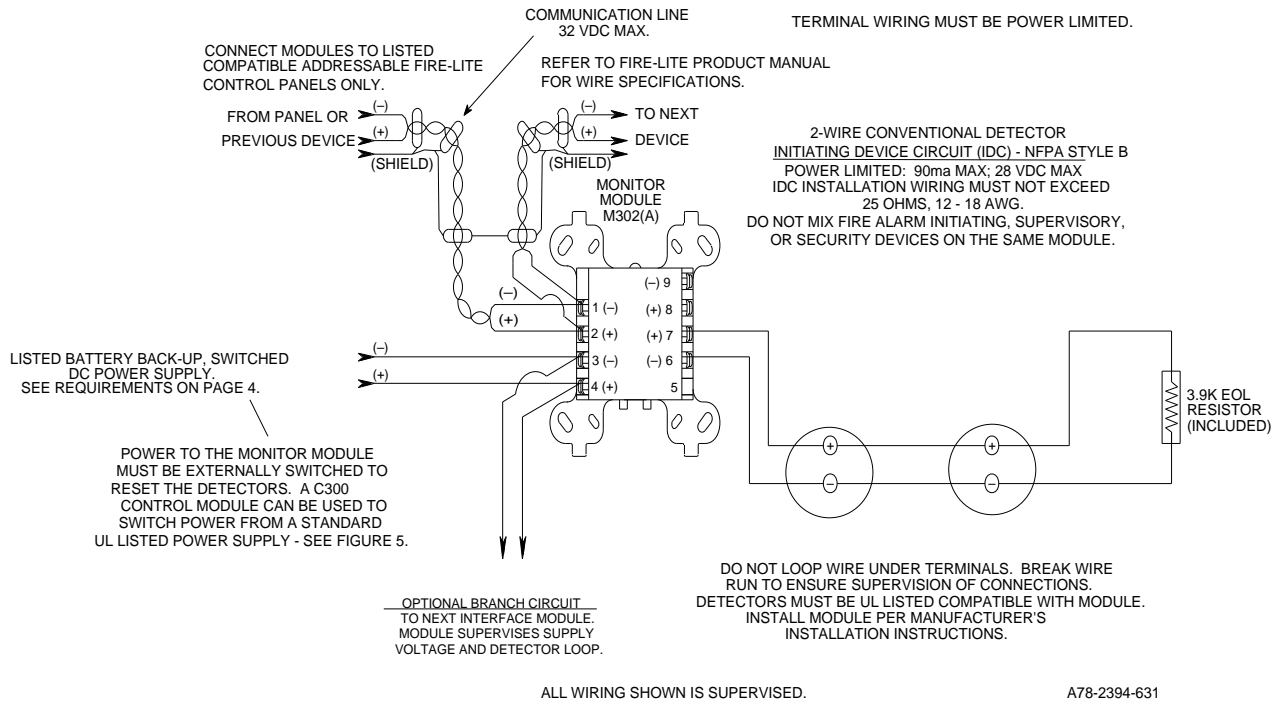


Figure 3. INTERFACE TWO-WIRE CONVENTIONAL DETECTORS, NFPA STYLE B

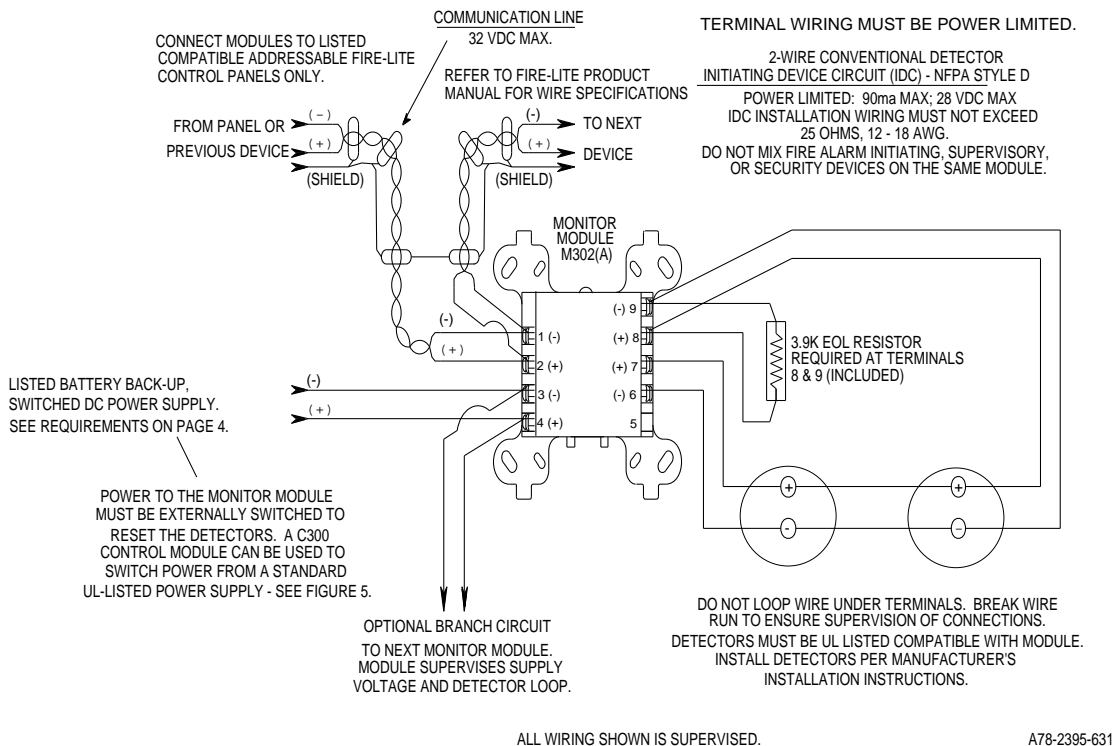


Figure 4. INTERFACE TWO-WIRE CONVENTIONAL DETECTORS, NFPA STYLE D

## C300 SERIES CONTROL MODULE SWITCHING POWER SUPPLY

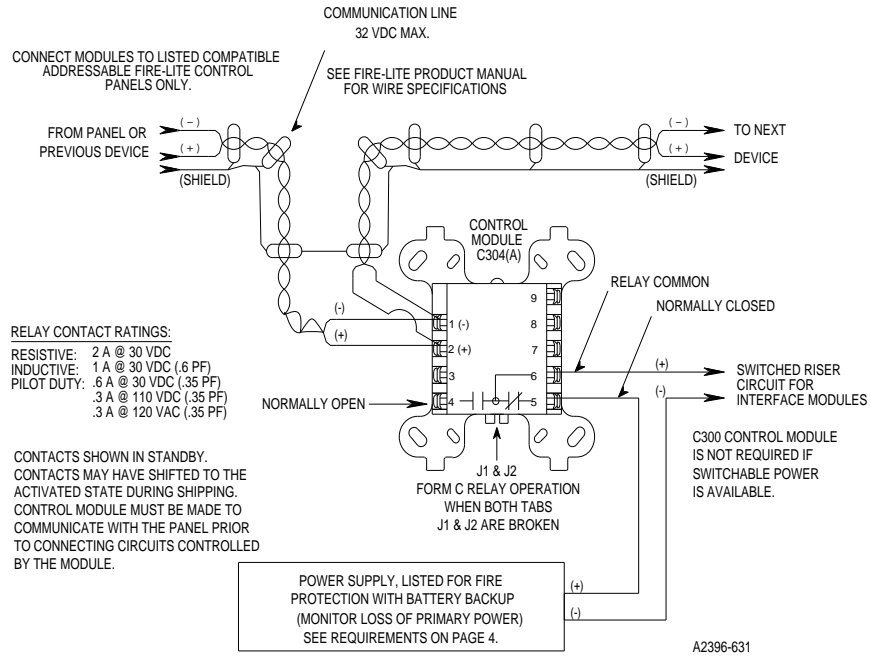


Figure 5.

## RISER POWER SUPPLY AND WIRE RESISTANCE CALCULATIONS

The power source must be capable of supplying a minimum amount of current to a riser circuit of monitor modules. It is acceptable in some jurisdictions to supply the minimum current required to allow a percentage of monitor modules to be in the alarm state while the remaining monitor modules are in the standby state. The formulas below are provided for calculating the maximum current required from a power supply ( $I_{max}$ ) to support a riser circuit of monitor modules with a percentage of monitor modules in the alarm state.

$$I_{max} = V_{max}/R_{min}$$

$$R_{min} = 2060/(2.68 * N_a) + (N)$$

Where:

- ( $N_a$ ) is the number of monitor modules required to be supported in the alarm state; and
- ( $N$ ) is the total number of monitor modules on a given riser circuit.

Example:  $N_a = 5$ ,  $N = 15$

$$R_{min} = 72.5 = 2060/(2.68 * 5) + (15)$$

The constants were derived by reducing equations that utilize the internal resistances of the module under worst case conditions.

Designing a system where it is permitted to support a percentage of modules in the alarm state allows a longer wire run for the riser circuit. The following formula is provided for calculating the maximum resistance ( $R_{lmax}$ ) of the wire run for the riser circuit.

$$R_{lmax} = .085(R_{min})$$

The constant was derived by reducing equations that were written from a low battery supply voltage of 20.4 VDC and the minimum supply voltage of 18.8 VDC required for proper operation of the module.

The following table is provided for calculating the maximum cable length allowed for a given riser circuit if Belden cable is used.

Resistance of a pair of conductors in 1000 feet of Belden cable:

Belden 9571 (18 AWG solid copper, twisted pair)	12.6 $\Omega$
Belden 9574 (18 AWG solid copper, twisted-shielded pair)	12.4 $\Omega$
Belden 9572 (16 AWG solid copper, twisted pair)	8.2 $\Omega$
Belden 9575 (16 AWG solid copper, twisted-shielded pair)	8.2 $\Omega$
Belden 9580 (14 AWG solid copper, twisted pair)	5.0 $\Omega$
Belden 9581 (14 AWG solid copper, twisted-shielded pair)	5.0 $\Omega$
Belden 9582 (12 AWG solid copper, twisted pair)	3.2 $\Omega$
Belden 9583 (12 AWG solid copper, twisted-shielded pair)	4.0 $\Omega$

## **SPECIFICATIONS**

Temperature: 32° to 120° F (0° to 49° C)  
Humidity: 10% to 93% Noncondensing  
Weight: .5 lbs (232 gm)  
Dimensions: 4-1/2" H, 4" W, 1-1/4" D  
(Mounts to 4" square by 2-1/8" deep electrical boxes.)

Test Features: Magnetically activated reed switch.

Accessories: SMB500 Surface Mount Box for 300 series modules  
M02-04-00 Test Magnet for testing devices

### Communication Line – Terminals 1 & 2

Voltage: 15 – 32 VDC  
Current: 200  $\mu$ A Max (Standby)  
1.3 mA Max (Style D enabled)  
5.1 mA Max @ 24V (LED latched on)

Communication Line  
Loop Impedance: 40  $\Omega$  Max

### External Power Supply Requirements – Terminals 3 & 4

Voltage: 22.2 – 25.5 VDC (Filtered, Regulated, and Power-Limited)  
Ripple: 100mV RMS Max  
Current: 90 mA per module

**Power must be interrupted to reset detectors. The monitor module must have a minimum of 18.8 VDC at terminals 3 and 4 to function properly.** Minimum supply current and maximum wire resistance formulas are provided for a riser circuit on page 3. Ground fault detection must be accomplished by the control panel.

### Initiating Device Circuit (IDC) – Terminals 6, 7, 8, & 9

Voltage: 16 – 28 VDC (Ripple: 100mV RMS Max)  
Current: 90 mA Max  
IDC Loop Impedance: 25  $\Omega$  Max

Standby Current: 10.0 mA Max  
Detector Current in Standby: Up to 2.4 ma  
Alarm Current: 20 mA minimum  
Style: Style B (class B) / Style D (class A)  
EOL Resistance: 3.9K ohm nominal

**Detector loop current is sufficient to ensure operation of one alarmed detector per zone.** For compatible detectors refer to the Fire-Lite detector compatibility chart.