

## What Are The Main Operational Differences In The Various AFI Fiber Optic Contact Closure Products



### Overview

The basic application of the AFI contact closure products is to sense a contact input closure (between 2 pins on a terminal block) at the fiber optic transmitter and reproduce this at the contact output (via a dry contact relay) of the fiber optic receiver.

AFI has contact closure products which provide 8 channels and 16 channels of uni-directional contact closure and 4 channels (each direction) and 8 channels (each direction) of bi-directional contact closure. All products are available for both multi-mode and single-mode applications.

These products use a 25 pin D-connector for the contact input and contact (relay) output connections. The contact output has both a normally open (NO) and a normally closed (NC) output available simultaneously. Thus, an 8 channel contact output would utilize 24 pins (NO, NC, common) for each channel. To facilitate making connections to the D-connector, AFI provides an adapter board that performs a D-connector to terminal block conversion (see diagrams in back).

There are 3 main types of “contact closure” products with respect to how the output relays will respond to various operating conditions such as:

- Loss of DC power to the fiber optic transmitter or receiver
- Loss of the fiber connection
- Tampering at the contact input

These operating features for these 3 types of products are summarized below.

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### **Latching Contact (Relay) Outputs:**

#### **Series 81(SL), 82(SL), 81B(SL), 82B(SL)**

Latching contact outputs are utilized if the application must insure that the contact outputs will not change state when either :

- the DC power to the fiber optic transmitter or receiver is removed or
- if the optical connection between the fiber optic transmitter and receiver is loss

In other words, the contact outputs must remain in a commanded state (determined by the contact input at the transmitter). Only when the contact input changes state will the latched contact output change state.

This is a common requirement at high security gate entrance locations where the gates must not open under any abnormal operating condition (during loss of DC power or the optical connection). They must only open when commanded to open via the contact input state.

### **Non-Latching Relay Outputs:**

#### **Series 81-280(SL), 82-280(SL), 81B-280(SL), 82B-280(SL)**

Non-latching contact outputs are utilized if the application for the contact outputs must switch to a known default when either :

- the DC power to the fiber optic transmitter or receiver is removed or
- if the optical connection between the fiber optic transmitter and receiver is loss

In other words, the contact outputs must switch to known default states which is:

- normally open (NO) outputs will switch to open states
- normally closed (NC) outputs will switch to closed states

This is a common requirement in applications that require a known “failsafe” contact output state when abnormal (loss of DC power or the optical connection) operating conditions are present.

### **Supervised External (3 State) Contact Closure Inputs**

#### **Series 88(SL)**

Supervised contact inputs are utilized when the application needs to incorporate tamper-proof protection in the system. Typically, the actual contact input switch is located at a remote location (up to several hundred feet) from the fiber optic transmitter. Therefore, an unsupervised contact closure switch could be tampered with by either shorting or opening the connection anywhere in the line between the contact input switch and the terminal block on the fiber optic transmitter.

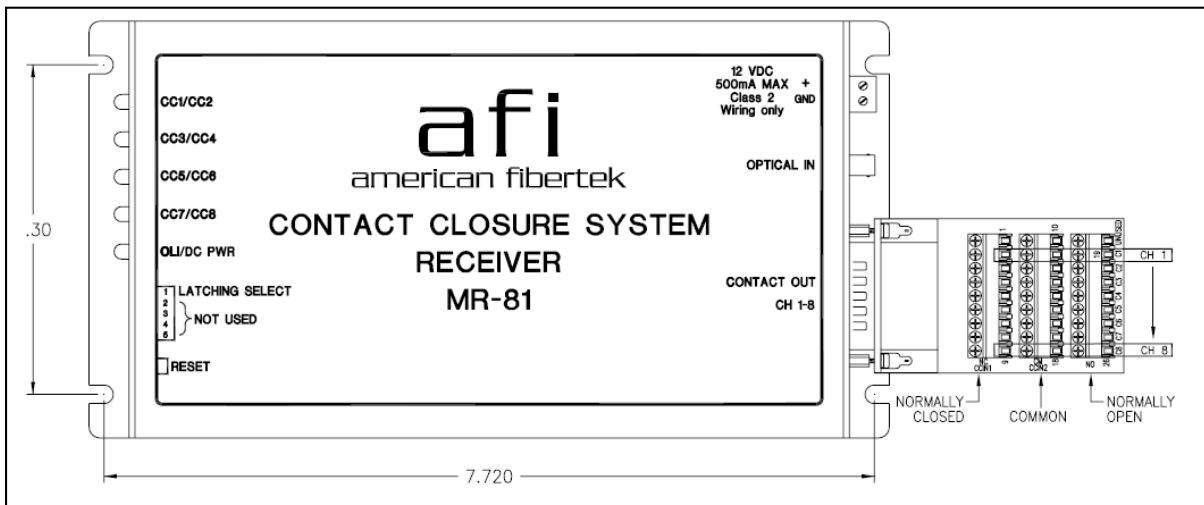
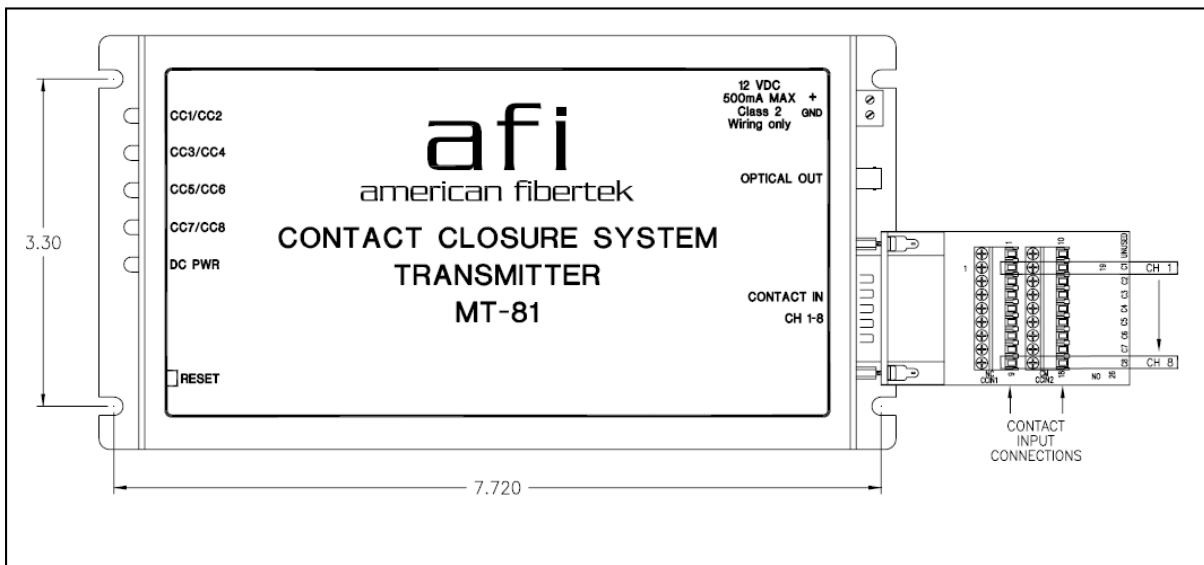
A supervised contact input will detect either an open connection or a shorted connection as an alarm. The alarm condition is removed only when the contact input voltage (at the

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fiber optic transmitter terminal block) falls within a predetermined range (3 state detection).

This requires installing an external 1k ohm resistor near the remote contact switch. The resistor is in series with the switch for a normally closed switch. For a normally open switch, the resistor is in parallel with the switch.

Failsafe operation is further provided such that, if the optical power is loss or the transmitter or receiver dc power is loss, the normally open contact outputs will go to the default open states (off).



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