

Application Note 030

Loop Current Detection with the TR115

Introduction

One of the functions the TR115 telecommunications relay is designed to perform is loop current detection.

Loop current detection is useful for several reasons. One of the more common applications is sensing when an incoming call has terminated. This application can be useful in FAX and answering machine design. When an incoming call is terminated by the caller, most central offices will temporarily interrupt the loop current signal. Detection of this disconnect signal can be used to reset the FAX or answering machine without it having to wait 30 seconds in order to detect that a connection is no longer made. Designing a feature such as loop current detection into a FAX machine or answering machine helps prevent the system from tying up the telephone line.

Description

Figure 1 shows Solid State's TR115 relay in a typical loop current detection circuit. For loop current sensing, the opto-coupler portion of the device is used.

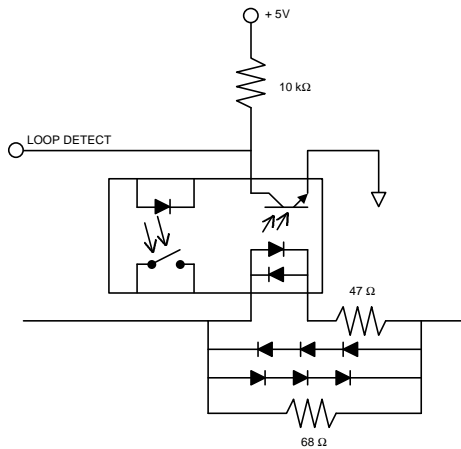


Figure 1: Loop Current Detection Circuit

The central office typically maintains loop current values of 20mA to 120mA. Since the maximum continuous current rating for the LEDs is 40mA, they must be protected. In order to assure that this value is not exceeded, six 1N4001 diodes and a 47Ω resistor are used. This configuration also provides protection against any surges across the lines. The 68Ω resistor is used to control threshold values. Because the minimum expected loop current is 20mA, the 68Ω resistor keeps any smaller currents from triggering the optocoupler.

Conclusion

The TR115 has been designed to provide multiple telecommunication functions. One of these is detecting loop current which is quite valuable when controlling FAX and answering machine systems. With several external components added, the opto-coupler portion of the device will monitor the loop current accurately and be protected from any transient currents.