

Technical Practice

Issue 2, April, 1988

MODEL 501 CONTACT CLOSURE

Contents

Section 1	General Description
Section 2	Applications
Section 3	Installation
Section 4	Circuit Description
Section 5	Specifications
Section 6	Incorrect Operation

1. General Description

1.1 PRODUCT OVERVIEW The Model 501 Contact Closure is designed to produce a nominally one second relay contact closure upon cessation of loop current flowing in a telephone line. The telephone line can be loop or ground start, in- or out-WATS, DID, or other types that utilize loop current when off-hook. 20/30Hz ringing signals, reverse battery conditions, etc. are not affected by the Model 501.

1.2 FEATURES The Model 501 contains four identical circuits. For maintenance and troubleshooting purposes, an LED indicator lights when the one second contact closure occurs.

1.3 POWER REQUIREMENTS The Model 501 requires -24Vdc, filtered, 120mA maximum for operation.

1.4 DESCRIPTION The Model 501 consists of a precision fabricated printed circuit board that is compatible with Tellabs Type 10 Mounting Shelves. Each Model 501 requires one position of a Type 10 shelf.

2. Applications

2.1 PRIMARY APPLICATION The primary application of the Model 501 is for use in conjunction with equipment requiring a momentary contact closure upon cessation of

telephone line loop current. Equipment requiring this function may include automatic answering systems, call duration timers, and special monitoring equipment.

3. Installation

3.1 CHECKING FOR DAMAGE The Model 501 should be inspected for damage immediately upon receipt. If damage is found, a claim should be filed with the shipper. A replacement Model 501 should be ordered if necessary.

3.2 MOUNTING Each Model 501 requires one position of a Tellabs Type 10 mounting shelf.

3.3 POWER SOURCE The power supply selected to furnish the Model 501 with filtered -24Vdc must contain current limiting provisions, minimizing the chance of damage, such as fire, from occurring due to a short in the Model 501 or associated wiring. The power supply must contain internal fuses and/or electronic protectors to limit the maximum output current.

3.4 Model 501 CONNECTIONS All connections to the Model 501 are made via the 56-pin card edge connector contained in the Tellabs Type 10 mounting shelf selected to house the Model 501. The card edge connector should be wired according to Figure 1 and checked prior to inserting the Model 501 into the mounting shelf.

3.5 DAMAGE PREVENTION To prevent damage to the Model 501's circuitry, the -24Vdc power source must be disconnected prior to inserting or removing the Model 501 from the card edge connector in the mounting shelf.

4. Circuit Description

4.1 GENERAL This circuit description is intended to familiarize you with the Model 501 for engineering and applications use.

4.2 LOGIC CIRCUITRY The following description is representative of four identical circuits on the Model 501. A bidirectional optical coupler serves to monitor the current flowing through the tip side of the telephone line. An inverter circuit converts the output of the optical coupler into a CMOS type logic signal. Logic low represents current flowing in the telephone line, i.e., an off-hook signal. A CMOS 555 type timer, configured as a one-shot, produces a one second logic high signal when its input, the on-hook/off-hook signal, goes from a logic low to a logic high state. A change from logic high to logic low does not produce a one-shot output. The output of the one-shot drives a relay driver integrated circuit, which is connected to a sealed, communications type relay. An LED is connected in series with the relay coil to give a visual indication of the relay status. A normally open contact from the relay is the final output of the circuit. Filters are contained in the circuitry to shunt ringing voltage around the loop detection circuitry, preventing false triggering of the one-shot. This filter does not interfere with the transmission of ringing voltage through the Model 501. A filter in the circuitry also prevents pulse dialing from triggering the one-shot.

4.3 POWER SUPPLY A 3-pin integrated circuit voltage regulator converts the incoming -24Vdc to -9Vdc for use by the logic circuitry.

5. Specifications

NUMBER OF CHANNELS

4

TELEPHONE LINE TYPE

Compatible with loop or ground start, in- or out-WATS, DID or other lines that provide loop current during off-hook

LOOP CURRENT

For correct operation loop current must be between 15 and 120mA

POWER REQUIREMENT

-24Vdc, filtered, 120mA maximum

RELAY CONTACT RATINGS

1A max. at 30Vdc or 100Vac (resistive)

DIMENSIONS

5.6 inches high (14.2cm)

0.9 inches wide (2.3cm)

5.9 inches deep (15.0cm)

WEIGHT

6 ounces (0.2kg)

MOUNTING

One position of Tellabs Type 10 mounting shelf

6. Incorrect Operation

6.1 APPLICATION LIMITATIONS The Model 501 was designed to operate correctly with most types of telephone lines that utilize loop current. However, Gordon Kapes, Inc. does not guarantee that the Model 501 is compatible with all of these types of lines, or specific lines within the types. The functions of the installed Model 501 should be thoroughly tested before being placed into service.

Specifications and information contained in this technical practice subject to change without notice.

Figure 1 Terminal Strip Connection Diagram for the Model 501

All connections made to 56-pin card edge connector in Tellabs Type 10 mounting shelf selected to contain Model 502 Automatic Trunk Disconnect.

Pin Number	Connection	
55	T	From CO or Other Common Carrier
53	R	From CO or Other Common Carrier
51	T	To Local Terminal Device
49	R	To Local Terminal Device
		Circuit 1
43	T	From CO or Other Common Carrier
41	R	From CO or Other Common Carrier
39	T	To Local Terminal Device
37	R	To Local Terminal Device
		Circuit 2
29	T	From CO or Other Common Carrier
27	R	From CO or Other Common Carrier
25	T	To Local Terminal Device
23	R	To Local Terminal Device
		Circuit 3
15	T	From CO or Other Common Carrier
13	R	From CO or Other Common Carrier
11	T	To Local Terminal Device
9	R	To Local Terminal Device
		Circuit 4
17	Ground	Power
35	-24Vdc, Filtered and Regulated	

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