

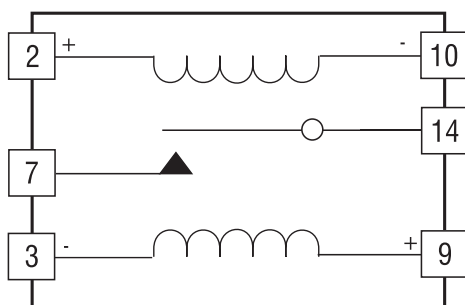
### Features

- Meets UL and British Standard specifications
- Designed for use with FCC Part 68 certified equipment
- Temperature ranges from -25° to 70°C
- Senses telephone line current from 15 to 200 mA
- Includes a 1-Form-A relay contact
- Achieves excellent longitudinal balance
- Meets high-voltage isolation requirements up to 4,000 volts
- Filters common-mode noise through dual coils

### Applications

- Telephone Exchange Products
- PBX and Key Systems
- Station Message Detail Reporting (SMDR) Systems

**Figure 1. Electrical Configuration**



### Description

The M-949-11 Line Sense Relay is a small, PCB-mounted loop current detector with the safety and reliability features required for UL and British Standard (BSI) regulated telephone applications.

The M-949-11 is designed for both North American and international use, and offers superior protection against voltage surges such as lightning strikes.

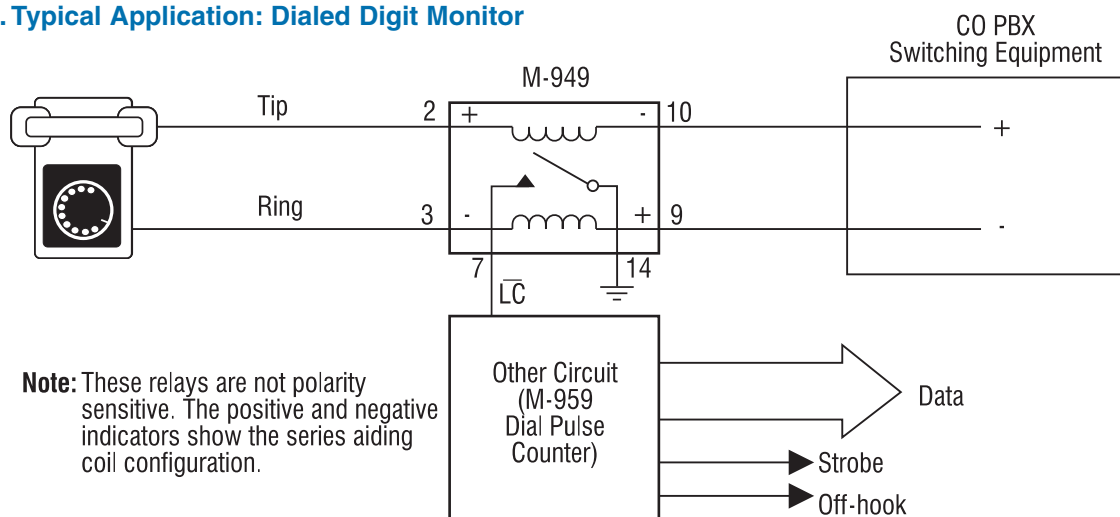
When connected to the voice pair (tip and ring) of an ordinary telephone line, the M-949-11 provides a 1-Form-A relay closure in response to current flowing through the wires. This closure can be used with control circuitry for on-hook/off-hook monitoring, switch hook flash detection, and rotary dial pulse counting.

The M-949-11 is ideally suited for use with the Teltone M-959 Dial Pulse Counter and other loop-current applications, including microprocessor-based designs.

### Ordering Information

Part #	Description
M-949-11	Loop Current Sensing Relay

**Figure 2. Typical Application: Dialed Digit Monitor**



### Absolute Maximum Ratings

Parameter	Ratings	Units
DC Supply Voltage	6	V
Any Input Voltage Relative to $V_{DD}$	+0.3	V
Any Input Voltage Relative to $V_{SS}$	-0.3	V
Operating Temperature Range	-40 to +85	°C
Storage Temperature Range	-55 to +125	°C

*Absolute Maximum Ratings are stress ratings. Stresses in excess of these ratings can cause permanent damage to the device. Functional operation of the device at conditions beyond those indicated in the operational sections of this data sheet is not implied.*

### Electrical Characteristics

	Parameter	Conditions	Min	Max	Units	Notes
Dual Coils	Pick-Up Current	-25°C to 70°C Ambient	15	-	mA	1
	Drop-Out Current	-	-	5	mA	1
	Continuous Coil Current	20°C Ambient	-	200	mA	2
	Coil Resistance - Each Coil	-	8.1	9.9	$\Omega$	-
	Coil Inductance - Each Coil	-	-	1.5	mH	3
	Coil Inductance - Both Coils in Series	-	-	6	mH	3
	Longitudinal Balance	-	63	-	dB	4
	Coil to Coil Capacitance (at 1kHz)	-	-	2500	pF	-
	Excitation to Closure Time (Including Bounce)	-	-	0.5	ms	5
	Excitation Removal to Open Time	-	-	0.1	ms	-
Relay Contact	Voltage Rating	-	-	90	$V_{DC}$	-
	Current Rating	-	-	500	mA	-
	Power (Resistive) Rating	-	-	10	W	6
	Rated Life	-	-	$10^6$	operations	7
		-	-	$10^8$	operations	8
Dielectric Strength	Open Contacts	-	100	-	$V_{DC}$	-
	Coil to Coil	-	250	-	$V_{DC}$	-
	Coil to Contact	-	4000	-	$V_{DC}$	-
Ambient Temperature	Operating	85%	-25	70	°C	9
	Non-Operating (Storage)	95%	-40	85	°C	9

<sup>1</sup> With coils in series-aiding configuration.

<sup>2</sup> With the current continuously applied.

<sup>3</sup> At 1kHz.

<sup>4</sup> With current of 15-200mA at 1kHz.

<sup>5</sup> With current of 15mA and coils in series-aiding configuration.

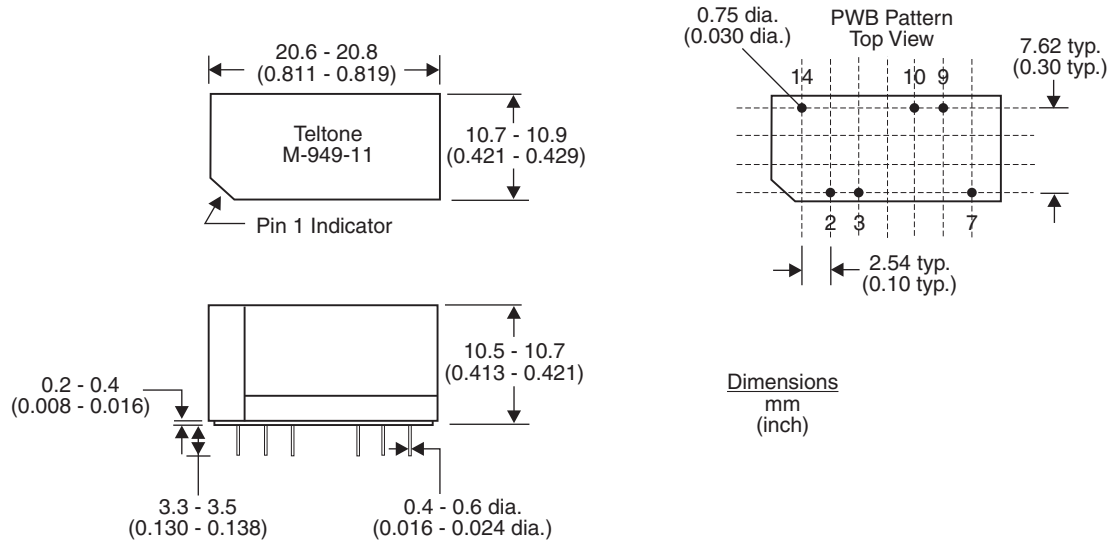
<sup>6</sup> Maximum initial contact resistance  $\leq 1\Omega$

<sup>7</sup> 10° at 10W (resistive).

<sup>8</sup> 10° at 5W (resistive).

<sup>9</sup> Relative humidity.

## MECHANICAL DIMENSIONS



**For additional information please visit our website at: [www.clare.com](http://www.clare.com)**

Clare, Inc. makes no representations or warranties with respect to the accuracy or completeness of the contents of this publication and reserves the right to make changes to specifications and product descriptions at any time without notice. Neither circuit patent licenses nor indemnity are expressed or implied. Except as set forth in Clare's Standard Terms and Conditions of Sale, Clare, Inc. assumes no liability whatsoever, and disclaims any express or implied warranty, relating to its products including, but not limited to, the implied warranty of merchantability, fitness for a particular purpose, or infringement of any intellectual property right.

The products described in this document are not designed, intended, authorized or warranted for use as components in systems intended for surgical implant into the body, or in other applications intended to support or sustain life, or where malfunction of Clare's product may result in direct physical harm, injury, or death to a person or severe property or environmental damage. Clare, Inc. reserves the right to discontinue or make changes to its products at any time without notice.