

# RML070

## Fully Isolated Current Loop Channel Card

### Description

The RML070 fully isolated current-loop card provides two LDM channels with added protection using both optical couplers and DC/DC power converters. It operates with LDM30 and LDM70 modules.

The RML070 is designed for full duplex, asynchronous operation over two twisted-wire pairs (4 wires) - DC-continuous, non-loaded. Through special high-speed optically coupled circuits, they may communicate at data rates up to 57,600 baud. A handshake operation is implemented over the same two-wire pairs. The modem circuits, and, consequently, the host device are protected from electrical transients due to lightning strikes or operation of heavy industrial equipment. Therefore, the connecting cables may be routed through almost any hostile environment without fear of damage. Each device features a convenient Data-Communication Equipment (DCE) to Data-Terminal Equipment (DTE) switch which reverses pins 2 and 3 of the RS-232 connector. For installation and troubleshooting, each unit has diagnostic light-emitting diodes (LEDs) on the transmit and receive lines. In addition, LEDs indicate valid carrier detect and data terminal ready.

The RS-232 connector is a female 9-pin connector. Field connection is made through a modern, solderless, screw-termination assembly. Alternatively, a convenient four-wire modular phone jack is available.

### Interface

RML070 conforms to EIA RS-232 and CCITT V.24 specifications. Pins 7 and 8 are internally connected. Pin 6, DSR, is internally tied to the valid state through a resistor. Pin 4, DTR, must be asserted by the host equipment before the RML070 can transmit data. When DTR is asserted, the RML070 or LDM70 at the other end of the communications cable will assert Receive Line Signal Detect (RLSD), pin 1, to its host equipment. This is used by host equipment to coordinate data exchanges. If a DTR signal is not available from the host equipment, an open circuit on pin 4 will be equivalent to assertion, allowing operation without handshake. Pin 5 is signal ground. Pins 2 and 3 are switch-reversible.

The relationship between RS-232 and current loop signals is shown in the RML070 logic diagram, Figure 1.

A self-test of the RML070 may be accomplished by depressing the Loopback switch, thus connecting TXD to RXD locally; then a terminal or computer may transmit data to itself as a test. Both the TXD and RXD LEDs should be off when data is not being transmitted and come on during data transmission. This test verifies that the RML unit is working properly. The loopback switch also creates a loop on the communication line side enabling testing of the cable connections.

### Data Rate and Operating Distance

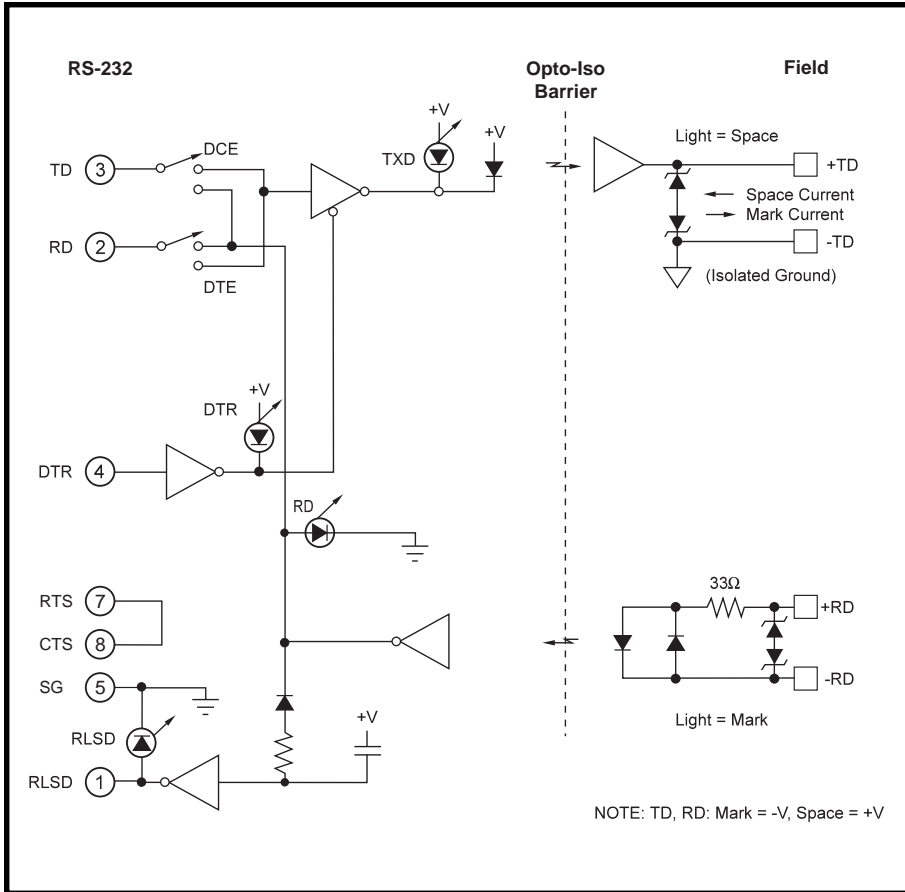
Specified distances are for the wire sizes 18-24AWG (0.82-0.20mm<sup>2</sup>) with a maximum capacitance of 25pF/ft (82pF/m). For higher capacitance cables, decrease the distance specifications for 2400 baud and above by an amount proportionate to the increase in cable capacitance. For example, shielded cable with 50pF/ft (164pF/m) would reduce the distances by 50%.

For baud rates of 1200 and below, distances are limited by the DC voltage drop. For 2400 baud and above, distances are limited by pulse distortion. The use of low-capacitance cable can extend the distances shown. Belden 9182 and 9184 are, respectively, single and dual twisted-pair cables that are especially designed for high-speed data communications applications. With these cables

the distances can be extended by 50%. However, the DC voltage drop limited distance specified for 1200 baud may not be exceeded.

Cable capacitance for individually shielded wire pairs is usually given by manufacturers as the capacitance between the wires and the capacitance from each wire to the shield. The effective transmission line capacitance is approximately the interwire capacitance plus one-half of the wire-to-shield capacitance.

Dataforth does not authorize or warrant its products for use in life support/critical applications.



**Pin Descriptions**

Pin 1	RLSD	[8]	Receive Line Signal Detect
Pin 2	RD	[3]	Receive Data
Pin 3	TD	[2]	Transmit Data
Pin 4	DTR	[20]	Data Terminal Ready
Pin 5	SG	[7]	Signal Ground
Pin 6	DSR	[6]	Data Set Ready
Pin 7	RTS	[4]	Request To Send
Pin 8	CTS	[5]	Clear To Send

Pin numbers given are for the 9-pin connector with the 25-pin equivalent in [ ].

Figure 1: RML070 Logic Diagram (only 1 channel shown)

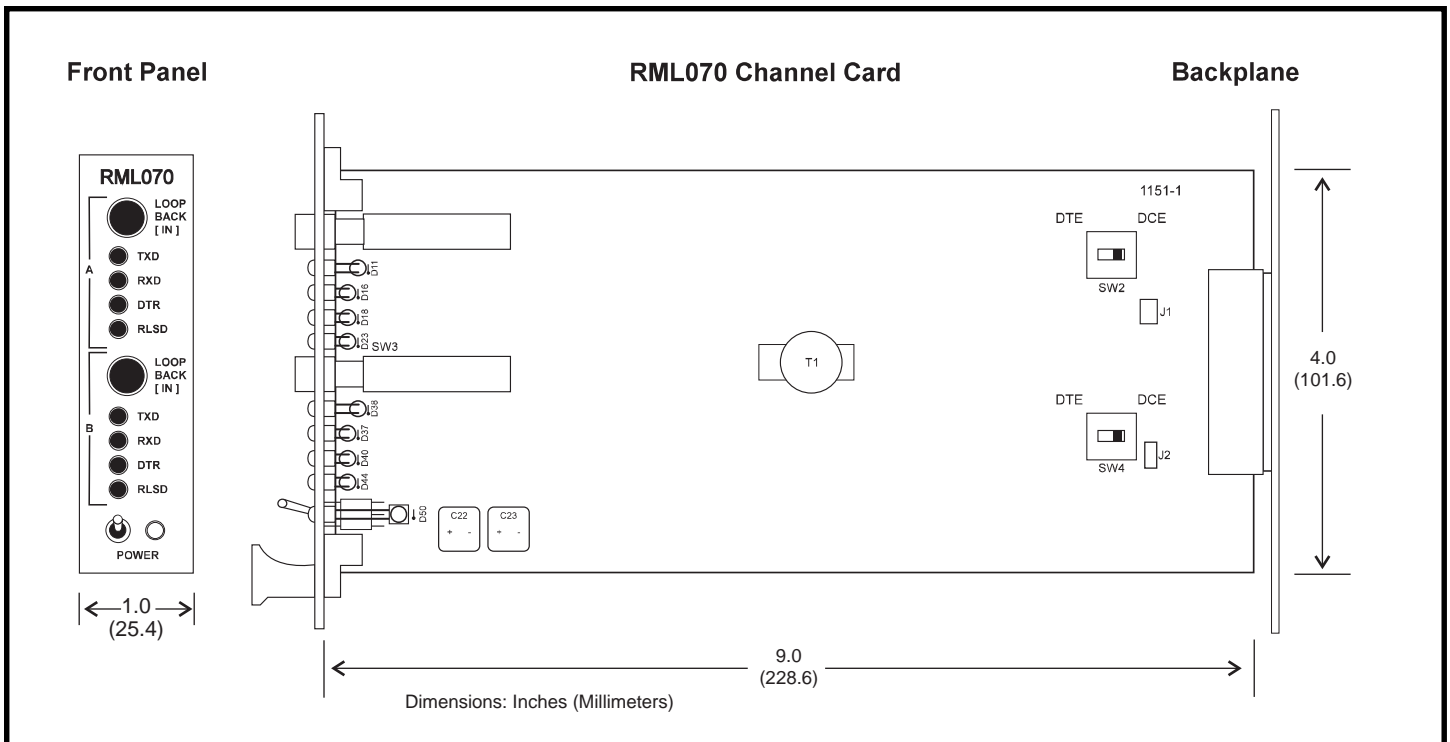


Figure 2: RML070 Mechanical Drawing