



“The Innovators of Railway Systems Testing”

Instruction and Operation Manual

CRMS – Contact Resistance Measurement System

Model Number 16574-00

Caution!

Be sure to read and become thoroughly familiar with the entire contents of this manual before attempting to operate the “CRMS – Contact Resistance Measurement System.”

DOCUMENT NO. 16574-99 REV A

TABLE OF CONTENTS

1. General Description	3
2. System Description	3
2.1. Hardware Modules.....	3
2.2. Interconnects	3
2.3. User Interface & Controls	3
2.4. Accessory Items	3
3. System Setup.....	4
4. System Operation	4
5. Specifications.....	5
5.1. Physical Specifications	5
5.2. Electrical Specifications	5
5.3. Environmental Specifications.....	5
6. Warranty	6

1. General Description

The CRMS - Contact Resistance Measurement System is designed to test and or verify the condition of each set of Vital Signal Relay contacts. It does so by allowing the operator to energize and de-energize the object relay and selectively observe each set of relay contact conditions. Contacts can be judged open or closed by viewing LED indicators and contact resistance milliohm meter. The system can be used on the bench top or in the field wherever 120V AC is available.

2. System Description

2.1. Hardware

The CRMS - Contact Resistance Measurement System consists of the following:

(16574-00) CRMU - Contact Resistance Measurement Unit

(16575-00) MRTR - Multiple Relay Test Rack

(16623-01) Cable Assembly that connects the two units.

The MRTR utilizes standard Vital Signal Relay plug boards, and is customizable for different relay types. Primary relay types are B1, B2, PN150, & PN250. The MRTR side panels can be configured for any combination of the 4 primary types, up to four types at a time. A blank side panel can be used if a configuration of fewer than four relay panels is needed.

2.2. Interconnects

CRMU and MRTR connect by way of the 75 pin Cable assembly with connector guide pins and locking jack screws. The Cable end connector with the 90 degree bend attaches to the control box (CRMU) for better stability, while the other end connector attaches to the Test Rack panel. Relay power can be applied to the object relay by way of the CRMU variable DC power supply. 120V AC is supplied to the CRMU by way of the power cord.

2.3. User Interface and Controls

The MRTR has two toggle switches to configure relay coils to SERIES, SINGLE, or PARALLEL settings. Operator uses the CRMU control panel to provide power to the object relay on the MRTR. Operator adjusts power level and selects each pertinent contact group. CRMU will display open or closed contact condition by way of operator observing green or red LED condition and also by reading contact resistance milliohm meter value. MRTR Front, Heel, and Back jacks can be used with UTE Relay Tester with Timer to do timing tests.

2.4. Accessory Items

The CRMU is self contained in its own carrying case. An optional case with foam inserts is available for transportation and storage of the MRTR and Cable. An additional cable is available for shelf type relays, as well as a Connectivity Block Kit accessory with connectivity blocks and paddle cable for easy and quick connection of power to the relay by way of the MRTR.

3. System set up.

The typical set up procedure is as follows:

1. Determine and locate the MRTR side panel that has the type of plug board for the relay to be tested.
2. The MRTR sliding base panel has detents allowing it to be locked into the base when fully inserted, or locked in its extended position to help keep the MRTR stable while testing the relay. Locate the sliding base panel and remove it (if necessary) to place it into the slot facing the side panel that will be used to test the object relay. Slide the panel into its locked extended position.
3. Insert the two threaded relay assembly rods into the object plug board and screw them into position finger tight. Slide the relay onto and across the assembly rods until the relay plug board connections are completely inserted into the plug board. Apply a knurled nut to each end of the assembly rods to secure the relay into position.
4. Open the CRMU case lid and locate the 75 pin AMP connector. Insert the Cable assembly connector (with the 90 degree bend) into the CRMU mating connector observing the alignment of locating-pins and sockets at the connector perimeter. Secure the mating connectors together by gently pushing the cable connector fully into position and finger tighten the jackscrews.
5. Insert and secure the other end of the cable assembly into the mating connector of the object relay on the MRTR; observe proper alignment of locating-pins and sockets; finger tighten jack screws.
6. Set MRTR relay coil configuration switches to SERIES, SINGLE, or PARALLEL, based on the requirements of the object relay.
7. Decrease CRMU variable 15V DC control knob to minimum (fully counter clockwise). Confirm that the power switch is set to OFF. Connect suitable wire or cable used for Vital Signal Relays to the 15V variable power terminals of the CRMU and then to the power terminals of the MRTR plug board. The optional kit with connectivity blocks and paddle cable can be used (UTE part number: 16684-01). Insert the power supply cord into the CRMU plug connector and then into a 120V AC supply source.

The CRMS is now ready to be powered up and used to test the object relay.

4. System Operation

After performing the set up procedure from the previous section, to power up the unit and begin testing, use the following procedure:

1. On the CRMU, Turn ON the power switch.
2. At first, keep CRMU 15V DC variable control knob at minimum setting to not energize the relay coil.
3. Set the LEFT or RIGHT selector switch:
 - a. For B1 or PN150 type relays, set switch to the LEFT position
 - b. For B2 and PN250 type relays, use LEFT or RIGHT switch settings as needed.

4. Set the CONTACT SELECTOR control knob to be able to view the desired contacts to be tested. Select and view all known contact positions to confirm the correct contact conditions.
 - a. Open contacts should show RED LED indication on the CRMU control panel, while closed contacts should show GREEN. The operator must know the normal open or closed contact condition for the relay being tested to confirm it correct.
5. As each relay contact or group is selected, observe LED indicators and milliohm meter. Any time the contact resistance is below 2 ohms, the digital display will show the resistance in milliohms.
6. Energize the relay coil by adjusting the CRMU 15V DC variable control. While the coil is energized, review the known contact positions to confirm that the contact condition is now as expected and that none are sticky or incorrect.
7. When testing is complete, reduce 15V DC control to minimum fully (counter clockwise) and turn of CRMU power switch.

5. Specifications.

The following summarizes specifications for the CRMS.

5.1. *Physical Specifications*

	CRMU	MRTR	Cable Assembly
Length	9.7"	10.125"	48"
Width	10.7"	10.125"	N/A
Height	6.9"	10.8"	N/A
Weight	8.0 lbs	17.5 lbs	2.5 lbs

5.2. *Electrical Specifications*

5.2.1 Power Input

120V AC, +15%, -10%, 60 Hz, 80 Watts Max.

5.3. *Environmental Specifications*

Operating Temperature	-20 to +60 degrees Celsius
Storage	-40 to +70 degrees Celsius
Humidity	Up to 95% non condensing
Shock	8G each axis
Vibration	1G 0-100Hz, each axis.

6. Warranty

Ultra-Tech Enterprises, Inc. (the "Company"), will repair or replace, at the Company's option, its products free of charge if such products are found to be defective in material or workmanship, for the period of one year from the date of purchase, except as follows:

Transportation charges to the Company's designated repair station for defective and replacement parts or service are the responsibility of the purchaser. This warranty does not apply, if: (i) the product has been damaged by improper connection or disconnection with any electrical device; (ii) the product has been damaged in shipping; (iv) the product has been damaged due to an act of God, accident, misuse, abuse, negligence or any other use than the product's intended use as set forth in the specifications; or (v) the device has suffered damage from an external blow or trauma. This warranty does not cover cosmetic damage and may not be transferred to any person or entity. The Company will provide warranty service as provided herein as soon, as is commercially reasonable.

THE SOLE REMEDY UNDER THIS WARRANTY IS THE REPAIR OR REPLACEMENT OF THE PRODUCT AS PROVIDED HEREIN. IN NO EVENT SHALL THE COMPANY BE LIABLE FOR ANY INCIDENTAL, INDIRECT, OR CONSEQUENTIAL DAMAGES FOR BREACH OF ANY EXPRESS OR IMPLIED WARRANTY ON THIS PRODUCT. IN ANY EVENT, IF DAMAGES ARE AWARDED, THEY WILL BE LIMITED TO THE COST OF THIS PRODUCT.

EXCEPT TO THE EXTENT PROHIBITED BY ANY APPLICABLE STATE OF FEDERAL LAW, ALL IMPLIED WARRANTIES, INCLUDING THOSE OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE ARE DISCLAIMED.

Some states do not allow the exclusion or limitation of incidental, indirect, or consequential damages, or allow limitations to the length of an implied warranty, in which case the foregoing warranty shall be extended to conform to the minimum requirement of such applicable law.

To obtain service under this warranty, it is necessary to obtain a Return Merchandise Authorization (RMA) from the Company prior to returning equipment for service. RMA numbers must be clearly marked on the outside of the shipping package in which the merchandise is returned. Failure to follow the Company's RMA procedure may result in delays in obtaining requested service and or refusal of the Company to accept packages not marked clearly with the appropriate RMA number.