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Engineering Specification
AUTOMATED CONFLICT MONITOR TESTER
MODEL PCMT 2500

1. The Tester shall be capable of automated testing of Conflict Monitor Units (CMU) as defined by NEMA TS1, NEMA TS2, FHWA/CalTrans System 170, and ODOT/TXDOT 2070 Standards. The Tester shall include all required hardware and software to perform testing of CMUs when the proper cables are provided. Cables to be provided with this Tester are specified in Section 2.

2. The Tester shall include Tester-to-CMU cables for the following CMU types (check boxes below):

NEMA TS1: ☐ 3-channel ☐ 6-channel ☐ 12 channel ☐ 18 channel
NEMA TS2: ☐ 8-channel (MMU-8RM) ☐ 16 channel (MMU)
System 170: ☐ 16/18 channel
System 2070: ☐ 16/18 channel

3. The Tester shall require a Microsoft Windows-based computer (PC) to process the supervisory software during testing process. The PC operating system must be Windows 95, 98, 2000, ME, NT or XP and include a HTML browser. The minimum PC hardware specification shall be Pentium (or equivalent) processor at 150 MHz, 32 MB RAM, 1.0 GB hard drive, 4X CDROM drive (for software installation), one RS232 serial port, and 640 X 480 monitor resolution.

NOTE: The PC for use with this Tester ☐ IS ☐ IS NOT a part of this equipment specification.

4. The supervisory software running on the PC shall provide the user interface for the Tester, allowing test setup, data entry, test report storage, retrieval, and review. The supervisory software shall automatically sequence the Tester through the selected tests, accumulate results and assemble the test report. The testing process shall proceed automatically after the initial test setup, visual confirmation of the CMU indicators, and the manual testing of the CMU operating voltage thresholds (brownout tests) where applicable. The user interface shall provide for selection of CMU standard, CMU type, manufacturer, model, and other information pertinent to the test via menus that list the available options for each selection. The test report shall be stored automatically on disk as a standard text file at the conclusion of the test sequence. The supervisory software shall automatically sense the PC port used by the Tester hardware.

5. The available test modes shall include Certification testing, Diagnostic testing, Single and Multiple-lap testing, and for Pause-on-error testing. Diagnostic test groups shall include, System/Timing tests, Conflict/Voltage tests, and Optional tests.

6. The Tester shall utilize the “window” testing method to determine that the voltage thresholds of the CMU under test conform to the NEMA TS1 and TS2 Standards. “Window” testing is defined as providing test conditions to the CMU that lie outside of the voltage threshold ranges defined by the standard. The Tester shall provide test voltages which are less than and greater than the proper voltage threshold limits, and determine if the CMU under test is in compliance with the appropriate standard.

7. The Tester shall be built into a portable suitcase-type housing measuring not more than 14"x21"x7" and weighing not more than 20 pounds. The housing shall contain the Tester hardware, space for the controlling PC (9.5"x12.5"x2.25" max), and space for the CMU cables.

8. The Tester supervisory software shall be capable of creating and storing a test report detailing the nature and number of tests applied to the monitor. The test report shall include; the beginning time of the test; a readily understood English text description of tests failed by the monitor; and the number of tests passed and the number of tests failed. The report shall include operator-entered text for the name of the jurisdiction, agency, or firm that is responsible for the testing; the CMU under test by model, manufacturer, and serial number; the person performing the test, and the location where the tests were performed. Additional text fields for Device ID (30 characters), and comments or notes (max. 64K) will be available. The system shall allow for entry of this data at the time of test initiation without aborting and restarting the test sequence. The test report shall form a self-sufficient, easily understood document that can be interpreted without the use of separate instruction sets or code explanation tables.

9. During actual testing, the controlling PC's display shall show the following information pertinent to the test in progress:

- The monitor standard being used as the test basis.
- The make, model, type, and serial number of monitor being tested.
- The date and time of the beginning of the test.
- The Tester serial number and firmware version number.
- The test results of completed tests and title of the current test.
- The value of the reference voltage.
- The number of laps completed in the continuous testing mode.
- The number of tests passed and tests failed.

10. The Tester shall perform the following pre-testing measures:

- Voltage self-test and timing self-test of the Tester to assure the accuracy of the test conditions and response measurement.
- Pre-test the CMU for the presence of incorrect return voltages that could damage the Tester.

If these tests are not passed, the Tester shall alert the operator and halt the testing process.

11. The Tester shall include an Operating Manual describing all steps in the setup and operation of the Tester, a Training CDROM disc that illustrates the actual setup and operation of the Tester, and unlimited telephone technical support for the purchasing agency or firm. The Tester shall provide extensive on-screen prompting and Help files to extend ease of use to novice or infrequent operators.

12. The purchaser's interest in the Tester shall be protected by a one-year limited warranty on parts and labor. The continuing utility of the Tester shall be further protected by the availability of repair, update, recalibration, and extended warranty services from the manufacturer.