ACMT-5000
ATC Cabinet CMU Tester

Table of Contents

1. Explanation of Symbols, Terms, and Abbreviations

Graphical Symbols

The following symbols are used on the ACMT-5000 enclosure and in this manual. Anytime one of these symbols is encountered the user should be aware of the condition described here next to each symbol.

Caution. Risk of danger.

Caution. Risk of electric shock.

Terms and Abbreviations

The following terms and abbreviations may be used throughout this manual and on the test reports.

Term or Abbreviation	Definition
AASHTO	American Association of State Highway and Transportation Officials
ATC	Advanced Transportation Controller.
ATCC	Advanced Transportation Controller Cabinet
ATSI	Athens Technical Specialists, Inc.
CMU	Cabinet Monitor Unit
computer	Desktop or laptop computer running Windows 7 or later
frame	A digital message containing multiple bytes of data sent from or to the CMU.
HDSP	High Density Switch Pack
ITE	Institute of Transportation Engineers
mA	milliamperes (thousandths of an amp)
ms	milliseconds (thousandths of a second)
NEMA	National Electrical Manufacturers Association
SB#1	Serial Bus #1. The communication path between the ATC and the CMU
SB#3	Serial Bus #3. The communication path between the CMU and the HDSPs.
software	ACMT-5000 Test Manager Software.
tester	The ATSI ACMT-5000 ATC Cabinet CMU Tester
VDC	Volts DC
Vrms	Volts RMS (root-mean-squared)

2. Safety Information

IMPORTANT SAFETY INFORMATION!

READ BEFORE ATTEMPTING TO USE THE ACMT-5000!

The ACMT-5000 (tester) should only be used by qualified and authorized traffic signal technicians or engineers who are familiar with generally accepted electrical safety practices as well as local and national safety codes. To avoid possible electric shock, burns, or fire, read all information contained in this manual before attempting to use the tester.

- Do not use the tester around explosive gas, vapor, or dust.
- Do not use the tester in a wet environment.
- Do not attempt to open any part of the tester enclosure.
- Do not put hands or place any object other than a CMU into the slot on the front of the tester.
- Only test CMU devices that are designed in accordance with ATC Cabinet Standards.
- Only use the power cord provided with the tester.
- The tester should only be powered from 120V AC.

READ THE USER'S MANUAL BEFORE ATTMEPTING TO USE THE ACMT-5000!

3. Overview

The CMU is the primary component of the ATC Cabinet monitoring system. The CMU communicates with the ATC over Serial Bus #1. The ATC acts as the master and polls the CMU many times per second to obtain the status of field signals, permissive programming, and fault conditions. The CMU also receives information from the ATC indicating the output commands to the load switches. This allows the ATC and the CMU to perform redundant checks on each other.
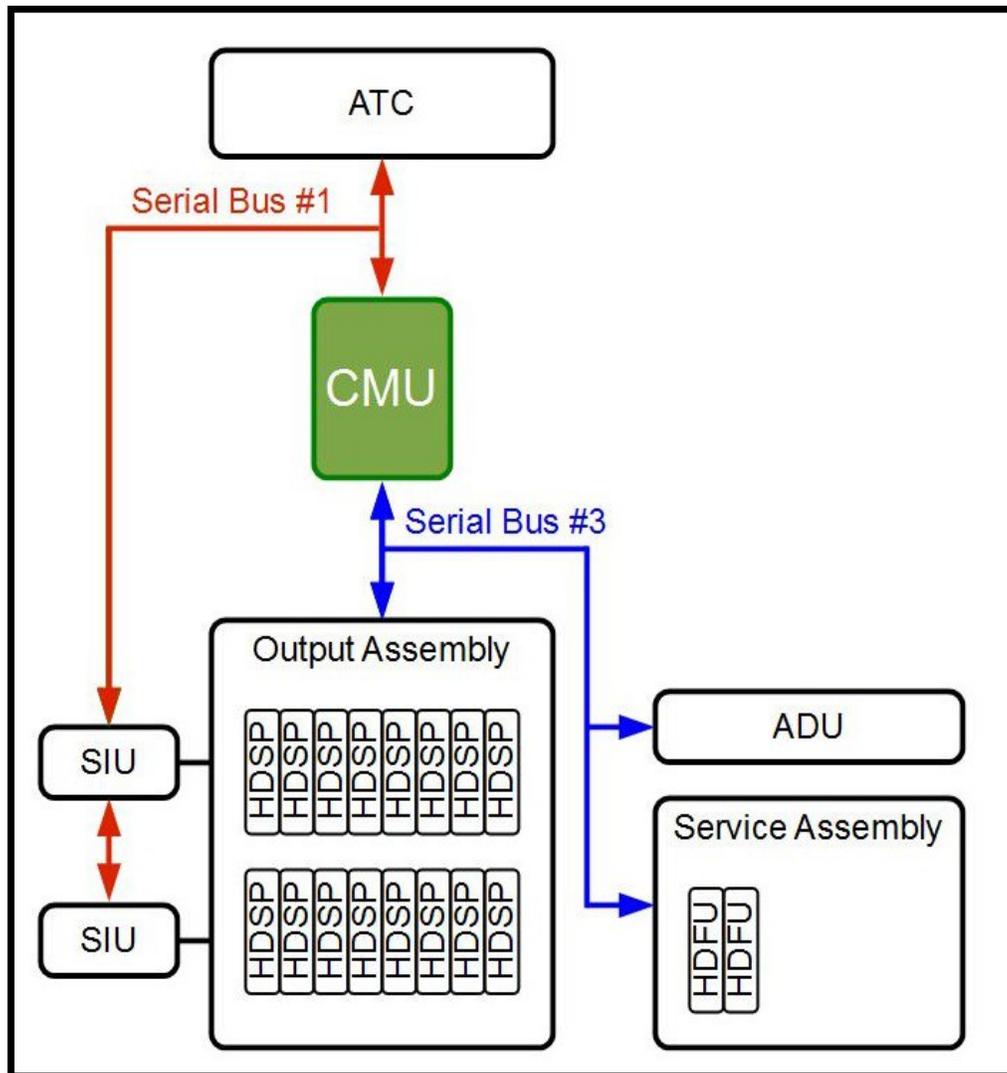
The CMU also communicates with a maximum of 16 HDSP units on Serial Bus #3. The CMU acts as the master and will poll each HDSP for its voltage and current readings many times per second. The CMU then evaluates the state of the field signals for fault conditions.

When a fault condition is detected, the CMU will enter the fault mode causing its output relay to de-energize and the contacts to open. The cabinet should be wired such that the opening of the CMU output relay contacts will cause an automatic switch of the field signals to flashing operation.

Proper functioning of the CMU is of critical importance if safe operation of the cabinet is to be maintained. If the CMU is not functioning properly, a cabinet malfunction may go undetected, putting the public at great risk. Most manufacturers also recommend that each CMU be tested at least annually. This is why it is important to conduct periodic testing of each CMU.

The ACMT-5000 (tester) will run a series of comprehensive tests on the CMU to verify that it is functioning in compliance with the ATC standard[1]. The ATC standard that defines CMU operation is a joint publication of NEMA, AASHTO and ITE. The tests are subject to the limitations of what is feasible and practical in a simulated testing environment.

The tester is compatible with both the high voltage and low voltage CMU models (CMU-2212-HV and CMU-2212-LV). The CMU under test plugs into a slot in the front of the tester. No external cables or fixtures are required.

The tester connects to a computer with a USB connection. During each CMU test, a detailed report is generated. The test report may be saved as a PDF file in terse (condensed) or verbose (detailed) format.

The tester is housed in a standard 19" rackmount type enclosure. An optional rugged carrying case is available for ease of transport when testing at the intersection.

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1   At the time of the writing of this manual, the standard was still in draft form. The tests ran by the tester are based off of this draft and will be updated if necessary once the final version is published.

4. Test Manager Software Installation

Before using the tester, the ACMT-5000 Test Manager software must be installed on the computer that will be connected to the tester. The computer requirements are as follows:

● Windows 7 (minimum)

● At least one available USB port. The ATSI USB driver must be installed

● A PDF file reader must be installed. Many free PDF readers can be downloaded from the web.

The tester comes with a software CD which can be used to install the software. If the CD is not available, the software can be downloaded from the Internet. To download the software visit our website: www.atsi-tester.com. Installation of the software may require administrative access to the computer.

To install the software from a CD insert it into the CD drive of the PC. A start-up screen should open automatically. In the start-up screen click the "ACMT-5000" button, then follow the instructions in the software installation wizard.

To install the software that was downloaded from our website double-click the downloaded executable file to run the installation. Follow the instructions in the software installation wizard.

> **Note:** Do not forget to install the ATSI USB driver for ACMT-5000.

To communicate with the tester an *ATSI USB driver* needs to be installed. The same driver is used with several ATSI products and is included on the software installation CD. The latest version of the driver can also be downloaded from our website: www.atsi-tester.com. The driver installation package is also copied to the computer during the software installation.

To install the USB driver, insert the software installation CD that came with your ACMT-5000. Click on the "ATSI USB Device Driver" button and follow the instructions to install the driver. If you do not have the software installation CD, the USB driver may be downloaded from www.atsi-tester.com

5. Preparing to Test

Before testing a CMU you must:

● Install the software on the computer that will be connected to the tester.

● Connect the computer to the USB port on the front of the tester using the supplied USB cable.

● Connect the supplied power cable to the rear of the tester and plug into a 120Vac, 60Hz outlet.

● Insert the CMU to be tested into the slot in the front of the tester using the card guides.

● Remove the programmed cabinet memory key (if applicable) and insert the supplied test key.

● Turn the power switch to the ON position.
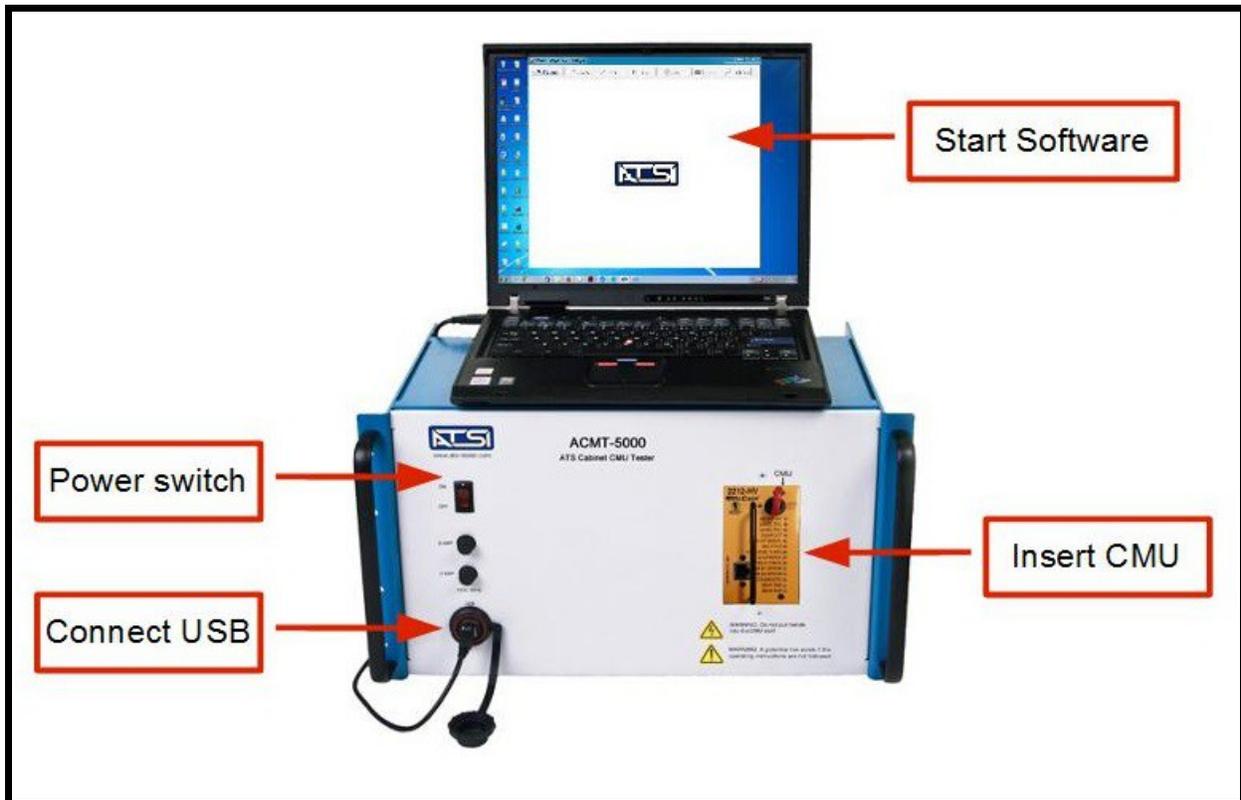
Note: Insert the supplied test key (gray color) into the CMU before starting a test.
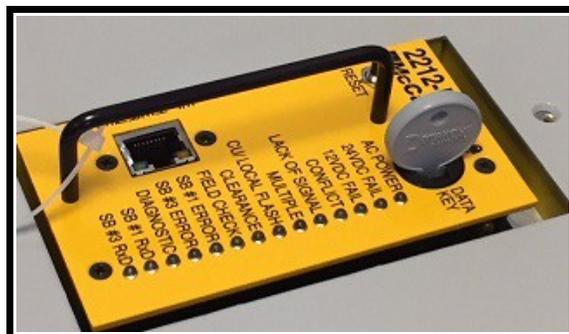
6. Starting a Test

Click Back when done to return to Main Menu

ACMT-5000 Test Manager

◀ Back   CMU Information

Model to Test:
CMU2212-HV

Manufacturer:
EDI

Serial Number:
5553256-AA2

Agency:
My DOT

Location:
5th and Main, MyTown

Tested By:
John Doe

Notes:
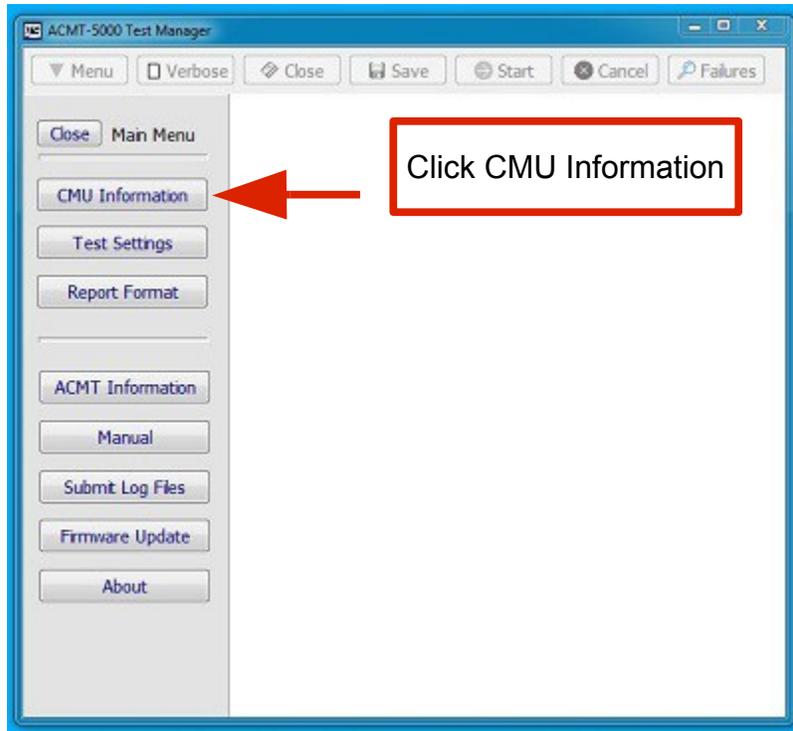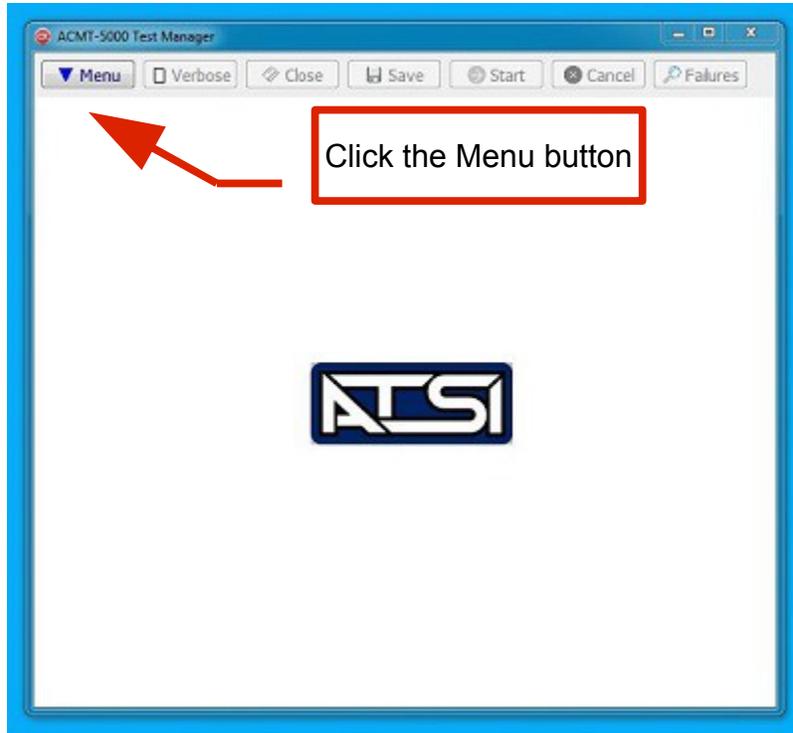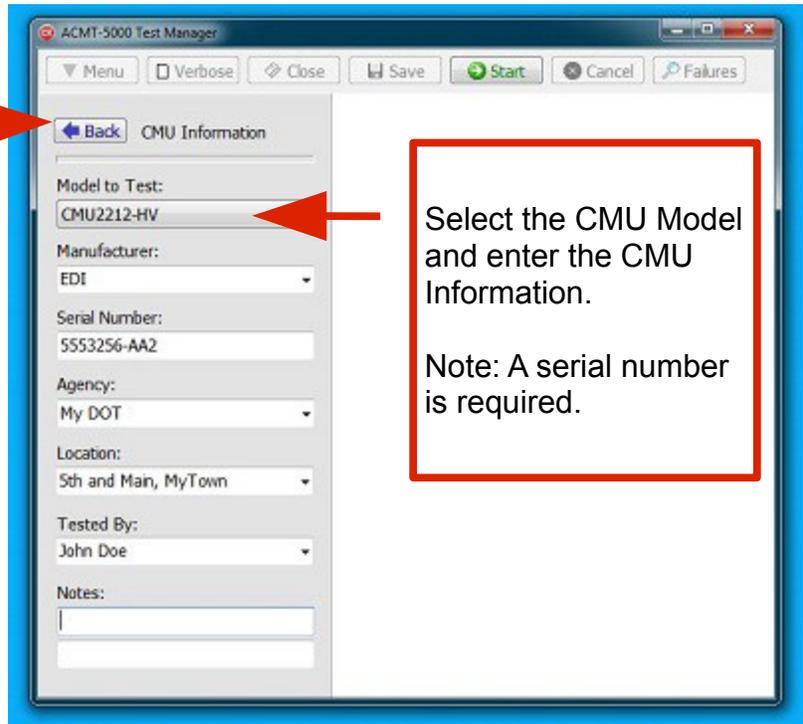
Select the CMU Model and enter the CMU Information.

Note: A serial number is required.

ACMT-5000 Test Manager

Close   Main Menu

CMU Information

Test Settings

Report Format

ACMT Information

Manual

Submit Log Files

About
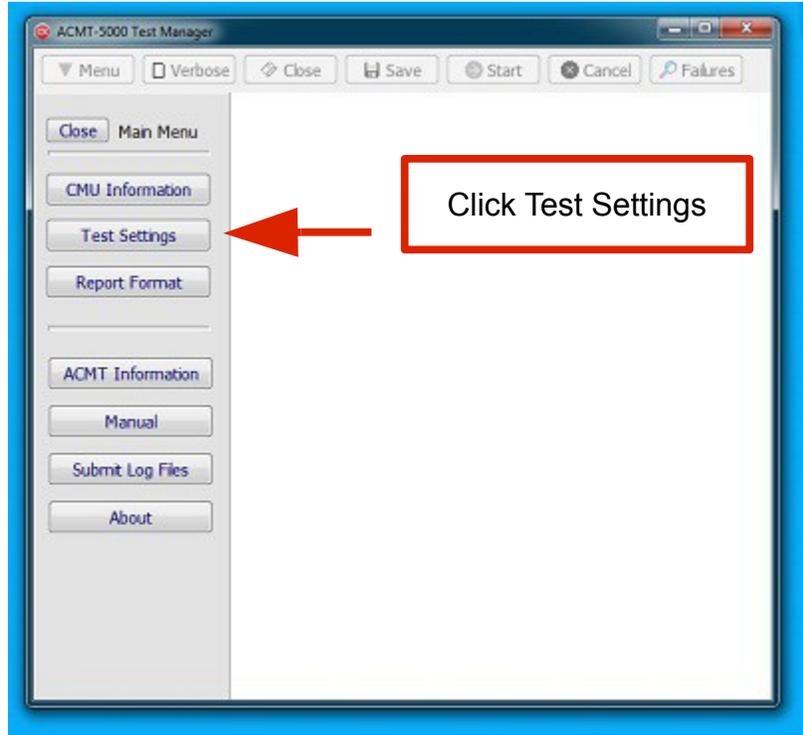
Click Test Settings

Click Back when done to return to Main Menu

If you have the key that will be used in the cabinet, check this box.
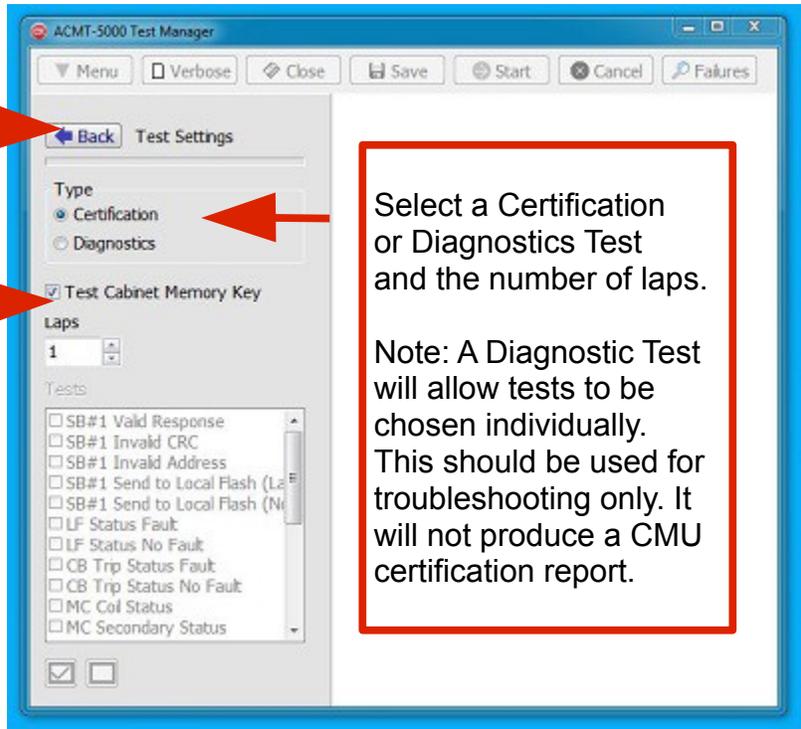
Select a Certification or Diagnostics Test and the number of laps.

Note: A Diagnostic Test will allow tests to be chosen individually. This should be used for troubleshooting only. It will not produce a CMU certification report.
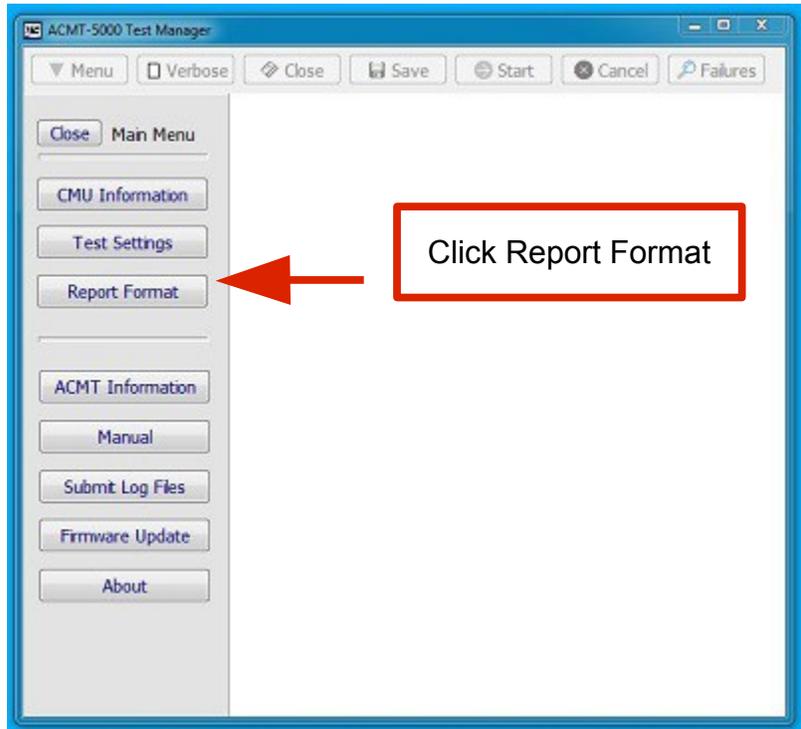
Click Report Format

Click Start Test when ready
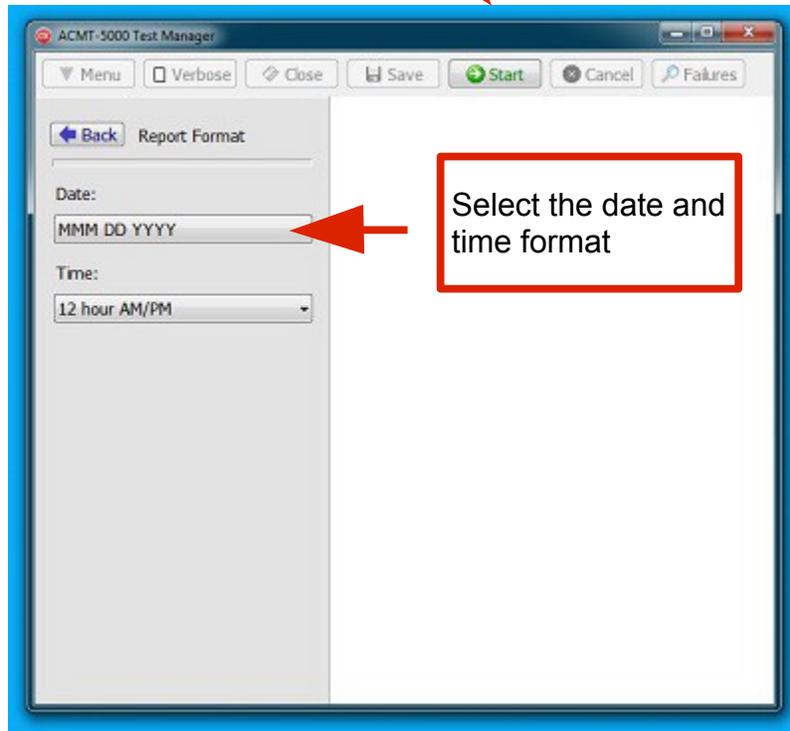
Select the date and time format

If you need to change or review any of the CMU Information or the Test Settings, simply click the Back button to return to the Main Menu. You can click the Start button at any time to begin the test. Once the Start button is clicked, you will be prompted to confirm the CMU Information and Test Settings.

The CMU Information, Test Settings and Report Format will be saved (with the exception of the CMU Serial Number). They do not need to be re-entered for every test unless there is a change. However, the CMU Serial Number will not be saved and will need to be entered for every test.

If the Start button is disabled (i.e. not green), this indicates that a CMU Serial Number has not been entered.

Note: A test cannot begin unless a CMU Serial Number is entered.

7. Test Report

Toggle the view
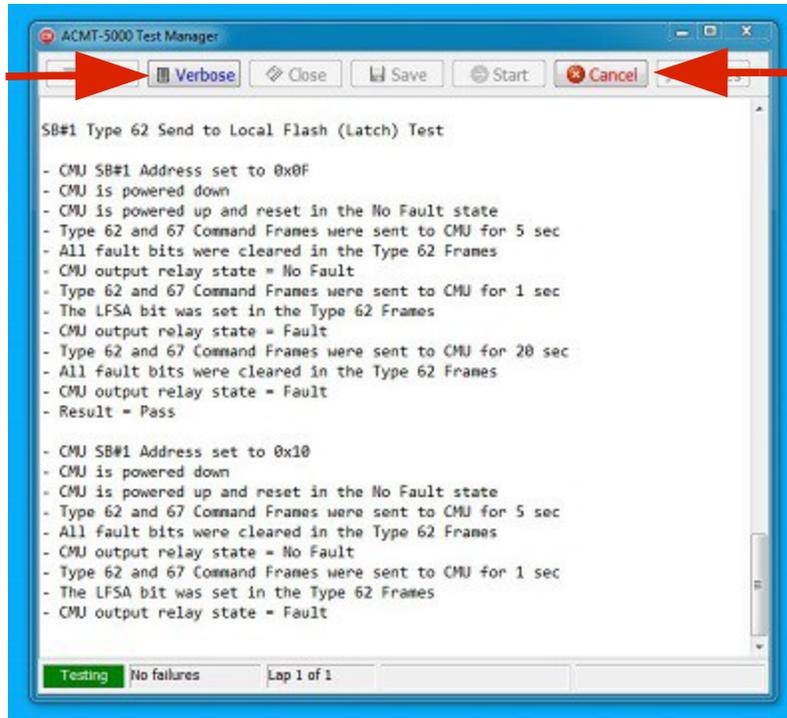
Click the cancel button if you need to cancel the test

Toggle the view
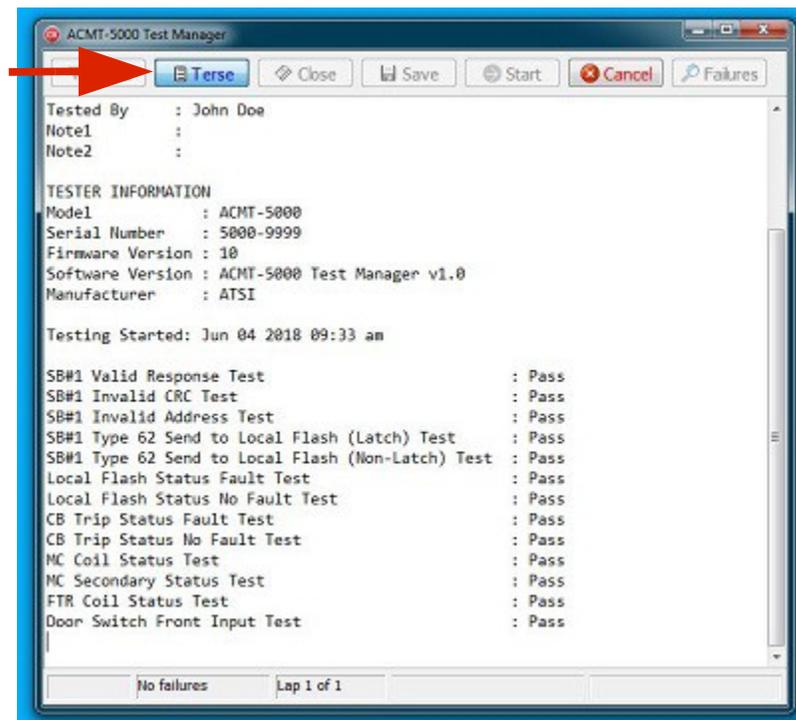
Once the test is started, the progress will be shown in the test report window. At the bottom of the window, a status bar will show the failure count and the lap count. A flashing green button will indicate that a test is in progress. If necessary, the test may be canceled by clicking the Cancel button. The test report may be toggled between the verbose and terse view at any time. The verbose view will show a listing of all the steps of each test. The terse view will only show the name of the test and the pass or fail result.

Close the report

Save the report

Jump to the next Failure

Saved status
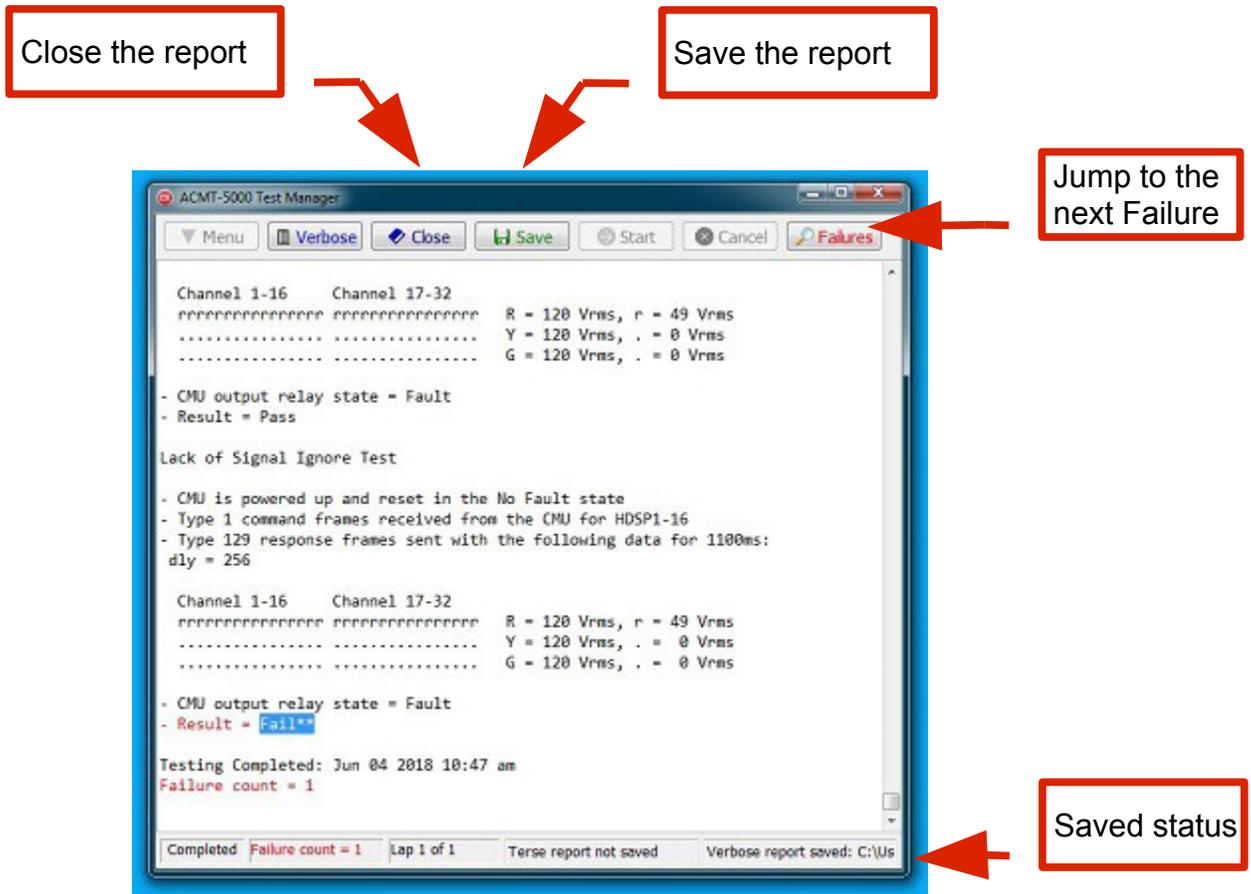
At the end of the test, you will be prompted to remove the test key from the CMU and insert the programmed cabinet memory key if you have checked the box in the Test Settings.

Once the test is completed the failure count will be shown on the status bar. If the report contains failures, clicking the Failures button will jump the cursor to the next failure listed in the report.

Note: If there are failures the CMU should be taken out of service until they can be resolved.

The report may be saved by clicking the Save button. The report may be saved in verbose, terse, or both formats. The view that is currently shown in the window is the one that will be saved when the button is clicked. The report is saved as a PDF file. The software will assign a default filename. This name may be changed if necessary. The reports may be viewed using any PDF viewer. Many free PDF viewers are available for download from the web.

When you are finished viewing the report click the Close button to return to the main software window. If the report has not been saved, you will be prompted to confirm that you want to close without saving.

Finally, if you have not done so already, remove the test key (gray color) from the CMU and re-insert the programmed cabinet key if applicable. Remove the CMU from the slot and you are now ready to continue testing additional CMUs.

8. ACMT Information
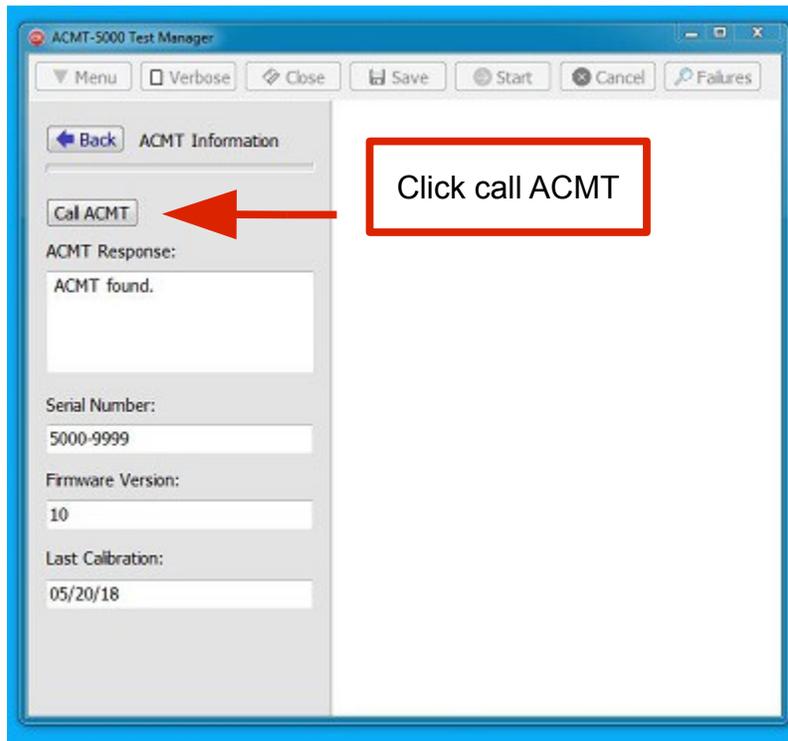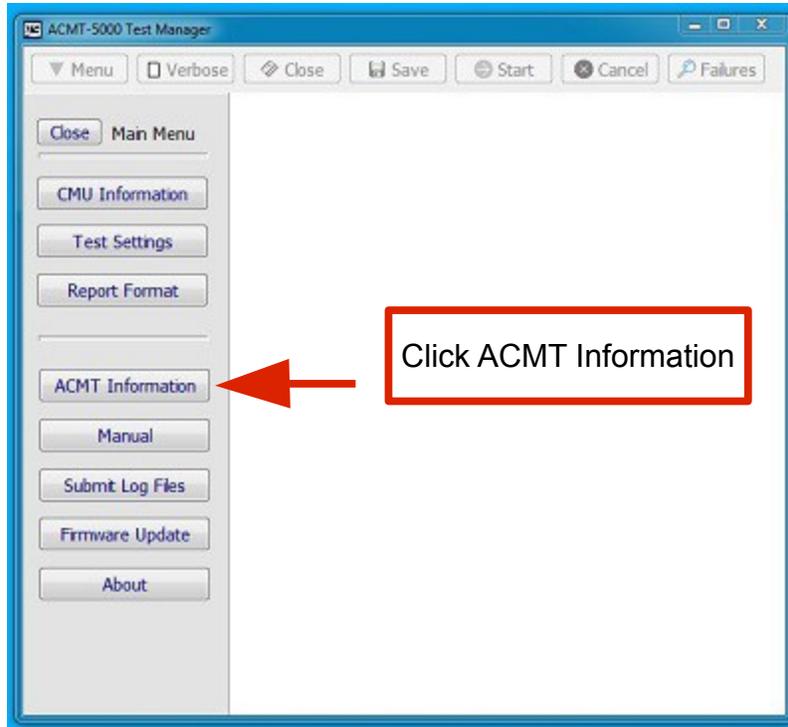
Click the Call ACMT button to get the tester Serial Number, Firmware Version, and Last Calibration date. If the tester is overdue for calibration, a warning message will appear.

The Call ACMT button is also useful to verify that the USB connection is functioning properly. If the computer is not able to connect to the tester, an error message will appear in the ACMT Response.

9. Submit Log Files
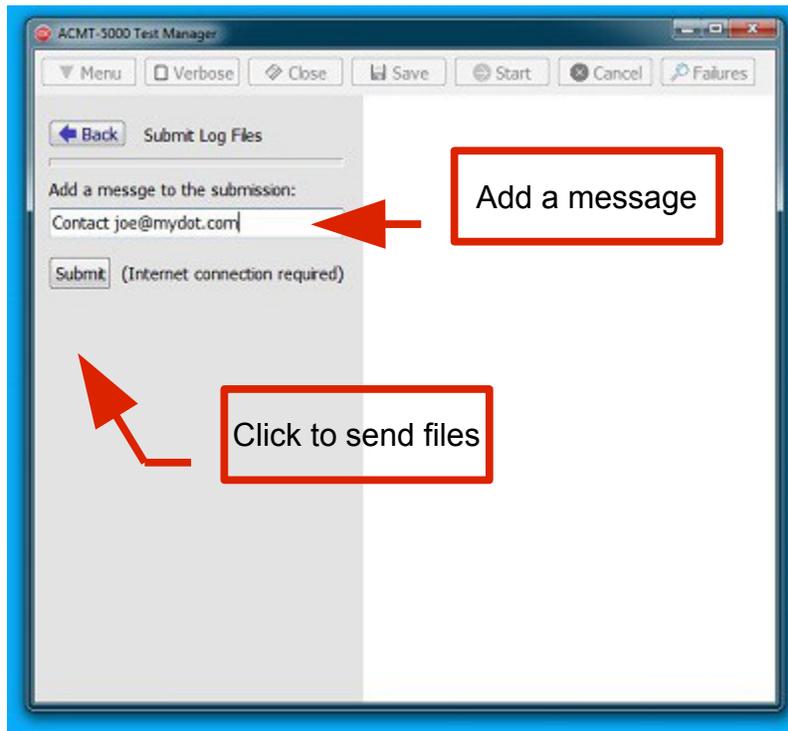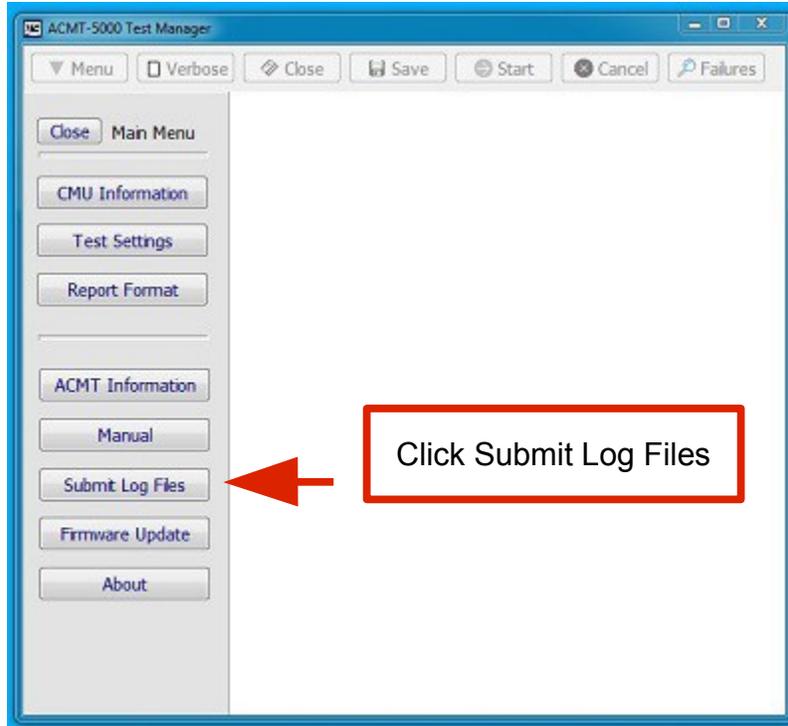
Click Submit Log Files

Add a message

Click to send files

Before contacting ATSI for technical support, please submit the tester log files if possible (an Internet connection is required). These files will contain the current test settings and any internal error messages that may have been generated by the software. These files will help the support technicians to resolve your issue quickly.

10. Firmware Update

Click Firmware Update

Select the file

Start the update
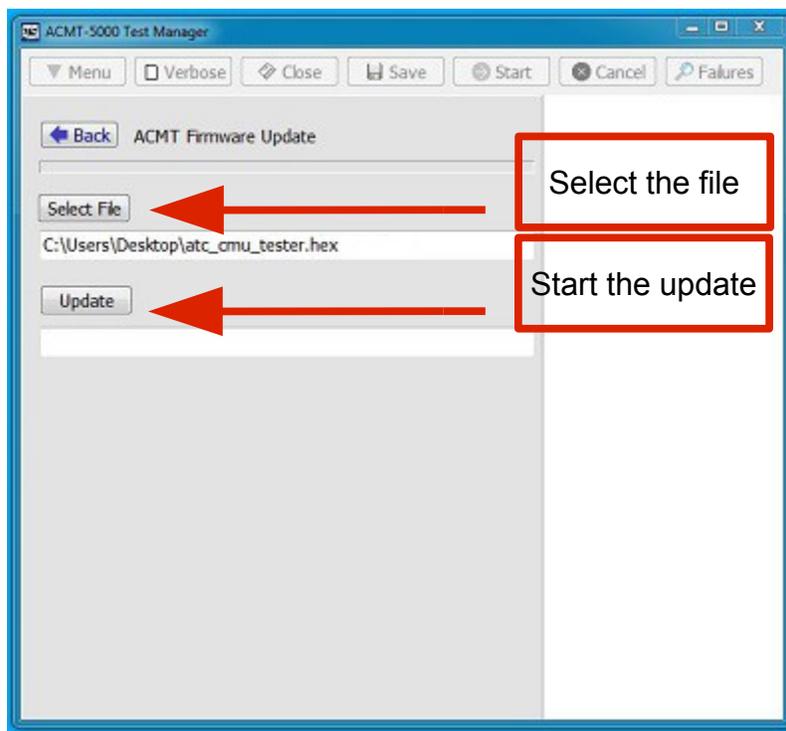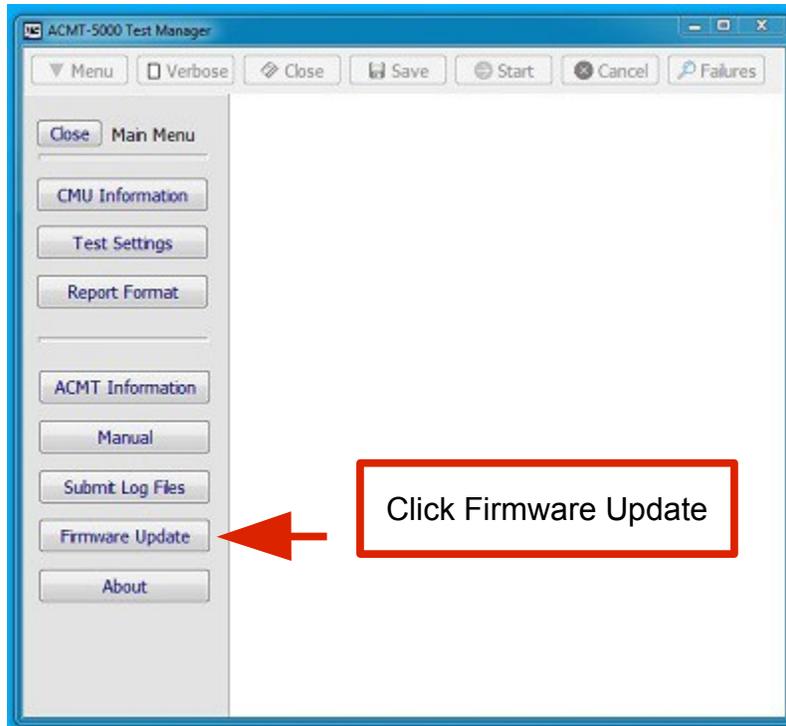
The firmware is the operating code that is programmed into the tester to make it function. From time to time new tests or features may be added that will require the tester firmware to updated. These firmware updates will be made available at www.atsi-tester.com.

In order to update the firmware, click the Select File button to browse to the location where the file resides on your computer. Once the file has been located, click the Update button to begin the process. Once the process is complete you will be prompted to power cycle the tester.

11. Tech Support and Troubleshooting

For tech support call 866-325-8175 or 740-592-2874 Monday – Friday from 8:00 – 5:00 pm, US EST.

You may also go to www.atsi-tester.com and fill out the *Contact Us* form.

Before contacting ATSI for technical support, please submit the tester log files if possible (an Internet connection is required).   These files will help the support technicians to resolve your issue quickly.

There are also additional training videos available at www.atcc-testing-course.com

12. Service and Calibration

> **Note:** The ACMT-5000 has no user serviceable parts.

Under no circumstances should the user attempt to open the enclosure. If the tester appears to be malfunctioning, contact ATSI to make arrangements for repair. See the _Limited Warranty and Liability_ section of this manual for details.

> **Note:** ATSI strongly recommends that each tester be calibrated annually.

An annual calibration will verify that your tester is operating within the original manufacturers specifications and provide you with a detailed calibration report for documentation.

Please visit www.atsi-tester.com for the latest pricing of calibration services and extended maintenance plans.

When shipping your tester back to ATSI for annual calibration or service, proper packing will help insure that the tester arrives without damage.

Preparing Your Tester for Shipment

● It is highly recommended to keep the original shipping box and foam for use when shipping the tester back to ATSI.

● If the original packing materials are not available, place the tester inside of a large cardboard box with at least two inches of cushioning on all sides.

● UPS recommends a MINIUMUM of two inches of cushioning on all sides of the box. If UPS determines the package was insufficiently packed, they will not pay for damages.

● Fill out the Equipment Service and Calibration form at www.atsi-tester.com

13. Electrical and Mechanical Specifications
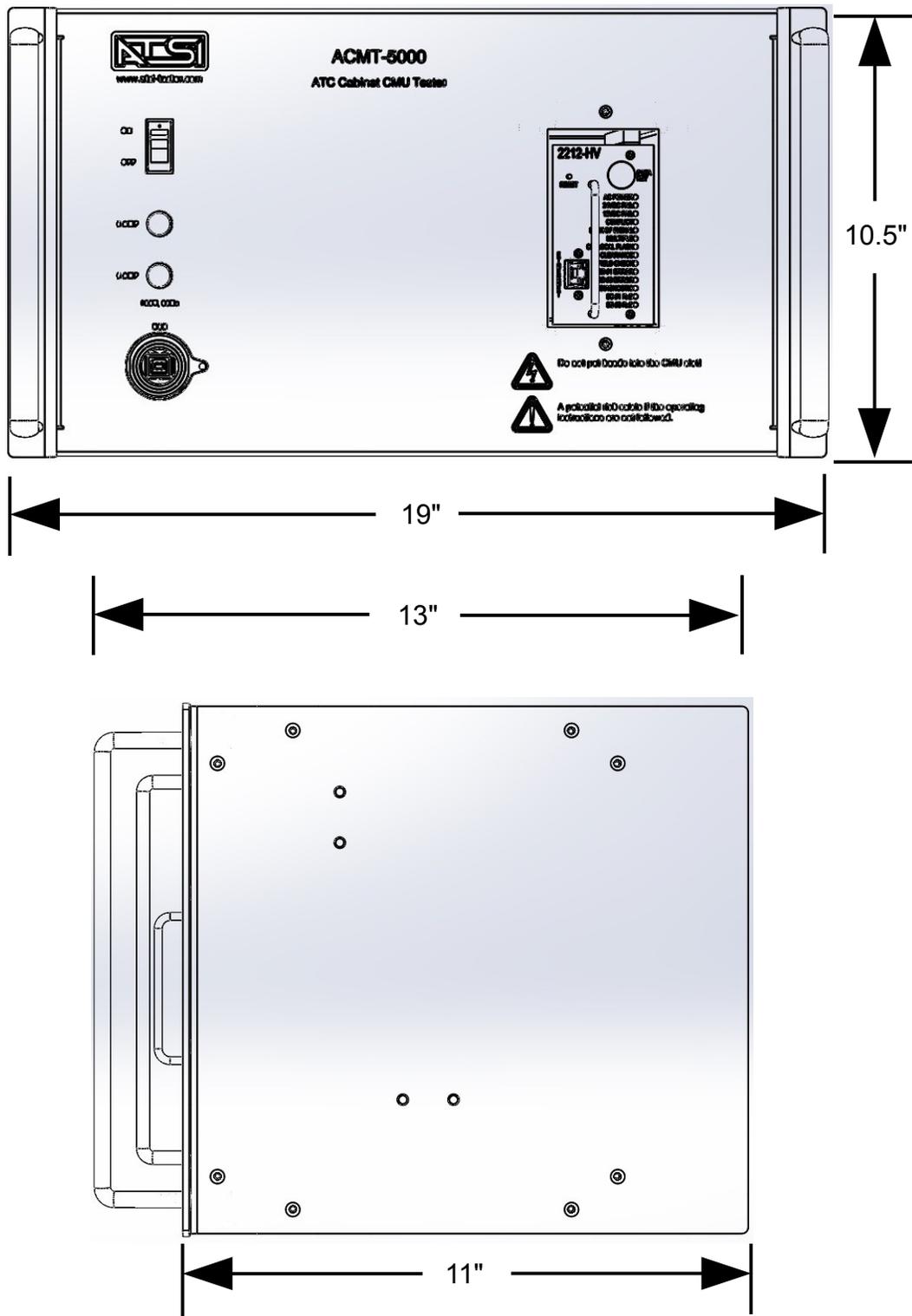
Dimensions +,- 0.125". Drawing not to scale.

Electrical

Operating voltage: 120 VAC, 60 Hz

Operating current: 2 Amps (maximum)

Connectivity: USB 2.0 Full Speed compatible

Mechanical:

Enclosure: 6U rackmount type

Dimensions: 19" x 10.5" x 11"

Operating Temperature: 32ºF to 110ºF ambient air temperature

14. Limited Warranty and Liability

The **ACMT-5000 ATC Cabinet CMU Tester** (Product), distributed by Athens Technical Specialists, Inc. (ATSI), is warranted to the original purchaser (Purchaser) to be free of defects in materials and workmanship for a period of one year from the purchase date stated on the invoice. Within this period, in the event of a defect, malfunction, or other failure of the Product while in the custody of the Purchaser, ATSI will remedy the defect or cause of failure without charge to the Purchaser. The Purchaser's sole remedy is restoration of product operation. ATSI accepts no liability for incidental or related expenses. Under no circumstances will ATSI's liability exceed the purchase price for items claimed to be defective.

This Limited Warranty does not extend to any Product that has been damaged or rendered defective as a result of accident, misuse, abuse, modification of the product, or service by anyone other than ATSI.

EXCEPT AS EXPRESSLY SET FORTH IN THIS WARRANTY, ATSI MAKES NO OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICUALR PURPOSE OF THE PRODUCT AND ANY DEVICE TESTED BY THE PRODUCT. ATSI EXPRESSLY DISCLAIMS ALL WARRANTIES NOT STATED IN THIS LIMITED WARRANTY. ANY IMPLIED WARRANTIES THAT MAY BE IMPOSED BY LAW ARE LIMITED TO THE TERMS OF THIS EXPRESS LIMITED WARRANTY.

Warranty Repair

To return the Product for repairs covered under the Limited Warranty :

Request a Return Merchandise Form by phone, fax, or email from the ATSI Service Department or complete the form at www.atsi-tester.com. Return the Product along with the completed form with prepaid postage to :

ATSI
8157 US Hwy 50
Athens, OH 45701

Phone: (740) 592 - 2874

Fax: (740) 594 - 2875

Email: service@atsi-tester.com