Advanced Cable Tester v2 User Manual

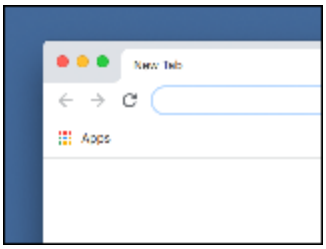
Total Phase : User Manuals : Hardware

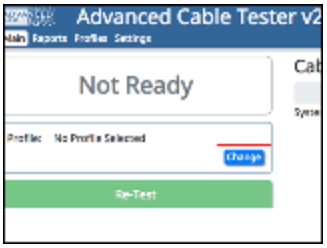
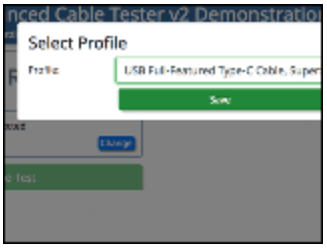
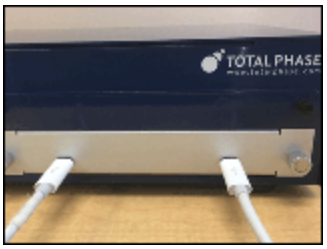
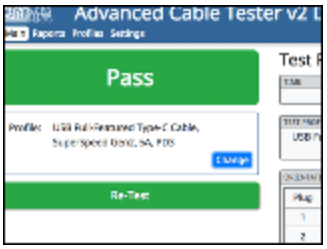
Advanced Cable Tester v2 User Manual

1 Quick Start Guide

The Advanced Cable Tester v2 was designed with the factory in mind. Once a valid cable connector module is installed and the user has selected a valid test profile, the tester is configured and ready to test. As soon as a cable is inserted, the tests defined in the test profile will start.

These are the steps to get started:

1		Connect the ACT v2 tester to the included power adapter and plug it into a power source. For optimal performance, the tester should be connected to ground using the Ground Lug.
2		Turn on the power switch to boot the tester.
3		Connect a USB cable from the ACT v2 USB port to a local computer. The ACT v2 tester uses the RNDIS driver. Please see Connectivity for more information.
4		Open a Mozilla Firefox or Google Chrome web browser window.

		
6		Install a cable connector module into the module bay of the ACT v2 tester. Once installed, the module information will be displayed in the web application.
7		Configure the tester, Click on the **Change** button to open a dialog window to show the available test profiles.
8		Select the desired profile (and enter any tag information as required) and click **Save**.
9		The tester is now ready to test cables.
10		Insert a cable into the connector modules. When the cable is detected, the tests will start. A progress bar on the LCD screen and in the web application provide feedback.
11		Once the tests complete, the cable will either Pass or Fail the test requirements. The appropriate state will be displayed on the LCD screen and the web application. To re-test the same cable, click the **Re-Test** button in the web application.

2 General Overview

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2.1 Revision History

2.1.1 Release 2.00

This release provides support for the new v2.0 hardware architecture and modular connector interface. All tests and the display of their results have been improved.

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2.2 General Description

Combining blazing fast performance with a low cost per test and a rugged design, the Advanced Cable Tester v2 enables rapid spot-checking of cables, easy-to-understand reports, with 100% test coverage for lab and production environments at a fraction of the price, time, and labor versus other solutions. Whether your application is 100% quality control in a factory or statistical process control in a laboratory, the Advanced Cable Tester v2 will provide high precision and accuracy with thorough test coverage, without expensive scopes, custom fixtures, or highly trained personnel, saving hundreds of thousands of dollars.

This document describes the Advanced Cable Tester v2 web software applications, the Advanced Cable Tester v2 Hardware and how to use both.

***Figure 1** : Advanced Cable Tester v2 Hardware*

Designed to be modular and flexible, the Advanced Cable Tester v2 has replaceable modules that are designed to support specific types of cables. Table 1 lists all the cable connector

TP820110	USB Type-C to USB Type-C
TP820210	USB 3.1 Standard-A to USB Type-C
TP820310	USB Type-C to USB 3.1 Micro-B
TP820410	USB 3.1 Standard-A to USB 3.1 Micro-B
TP820510	USB 3.1 Standard-A to USB 3.1 Standard-B
TP820610	USB Type-C to USB 3.1 Standard-B
TP821010	HDMI Type A to HDMI Type A
TP823010	USB 3.1 Standard-A to MFi Lightning USB2
TP823110	USB Type-C to MFi Lightning USB2

A complete battery of tests is performed when a cable is plugged in. These tests include:

- **Continuity/Wiring** - cable specific and customizable
- **DC Resistance** - pin and wire measurements, Rd, Rp, Ra, and more
- **Signal Integrity** - configurable from 518 MHz to 12.8 GHz on up to 5 differential pairs
- **E-Marker Verification** - PD2/PD3 verification
- **Apple MFi Mandated Tests** - Over Voltage Protection, Quiescent Current, Source Measurement Unit Tests

The Advanced Cable Tester v2 can be operated with or without a computer or tablet. The tester provides clear audio and visual feedback to test operators to indicate whether DUT passed or failed for fast processing.

Continuity testing checks all pins for continuity, preventing dangerous situations like shorts of VBUS to data signals, VBUS/GND reversal, etc., which could damage devices.

DC Resistance ("DCR") and IR Drop testing confirms that each power pin (VBUS and GND) is capable of carrying the required current to meet the applicable specification. For Type-C cables, each power pin is individually measured, then the cable as a whole is tested.

E-Marker testing reads the data from all E-Markers present on the cable, then validates the advertised data and power capabilities against the actual measured parameters of the cable.

plug power-up, over-voltage, recovery, quiescent current, and current limit testing per the Apple MFi specification. The ACT v2 tester is the only tester available that can perform the tests required by the Apple Accessory Interface Specification (R31 and greater).

3 Device Specifications

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3.1 Hardware Specifications

***Figure 2** : Advanced Cable Tester v2 Hardware*

Table 2 : Advanced Cable Tester v2 - Front

1	**Screen**	LCD screen provides pass/fail and progress information. Please see Standalone Operation Overview for more information about how to use the ACT v2 in standalone mode.
2	**Power**	Green LED indicates that the unit is powered on. Red LED indicates a power-related system fault.
3	**Speaker**	Speaker provides audio pass/fail indicator. The volume of the speaker can be set in the web application
4	**Module Bay**	The ACT v2 is designed to support replaceable connector modules. Connector modules can be full-height or half-height. When using half-height connector modules, a separate plate

***Figure 3** : Advanced Cable Tester v2 Hardware - Back*

Table 3 : Advanced Cable Tester v2 - Back

1	**USB**	The ACT v2 can be accessed locally via USB. All firmware updates must be performed via the USB port. Please see Connectivity for details.
2	**LAN**	The ACT v2 can be accessed remotely via Ethernet. Please see Connectivity for information about how to connect to the ACT v2.
3	**Product Labels**	The serial number for the ACT v2 tester and the controller are provided on these labels. The Controller serial number label provides the default USB IP address used to access the web application and the system management application.
4	**Ground Lug**	For optimal performance, the ACT v2 tester should be connected to ground using the Ground Lug. A grounding tab is provided that can be soldered to a ground wire. Simply unscrew the nut to get access to the grounding tab.
5	**Power**	The ACT v2 tester must be powered with the provided power adapter to ensure the correct voltage and current levels to reliably run the cable tests.

3.1.1 Securing the ACT v2 to a Work Surface

***Figure 4** : Advanced Cable Tester v2 Hardware with brackets installed.*

Optional mounting brackets can be installed on the ACT v2 tester so that it can be secured to a work surface. To install the brackets, simply remove the screws as shown in the diagram below. The bracket can then be attached to the ACT v2 with the provided screws.

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3.2 Software Specifications

- The web interface requires the latest version of Mozilla Firefox or Google Chrome web browser
- Test Profiles: Held in non-volatile storage on the Promira platform
- Test Results: Up to 1 million test results are stored in a circular buffer in non-volatile storage.

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3.3 Physical Specifications

- Power Supply: 100-240V 50/60Hz AC - adapter included
- Dimensions: W x D x L: 30.5 x 27.3 x 10.2 cm (12.0 x 10.8 x 4.0 in)
- Weight: 3.8 kg (8.4 lbs)
- Operating Temperature: 10° to 35° C (50° to 95° F) non-condensing

4 Advanced Cable Tester v2 Hardware

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4.1 General Operation

cable.

4.1.1 Test Limits

To ensure consistent and reliable test results, connector modules are designed to have a limited lifespan. The number of tests that can be performed on a connector module is hard-coded into the module. As the number of tests approaches this limit, the operator will be warned. Once the limit has been reached, no additional tests can be performed on that connector module. At that point, the connector module will need to be replaced to continue testing.

Similarly, the ACT v2 hardware itself also has a hardware limit on the number of times a connector module can be installed before the connector is worn. As the number of module insertions approaches this limit, the operator will be warned. Once the limit has been reached, the ACT v2 tester will need to be serviced.

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4.2 Connectivity

Communication between the end user platform and the ACT v2 is via TCP/IP over Ethernet-over-USB or via TCP/IP over Ethernet. No additional device drivers are required for using either method.

4.2.1 USB

The Advanced Cable Tester v2 uses Ethernet over USB. To use this interface, connect the device to your PC with a USB cable and follow the instructions below to set up the connection on the PC.

The Ethernet over USB connection is established using the RNDIS or ECM protocol. In this case, the ACT v2 will act as a DHCP server and provide an IP address to your computer or tablet in the 10.0.0.0/24 range. The IP address of the USB interface can be found on the labels on the back of the device.

Windows

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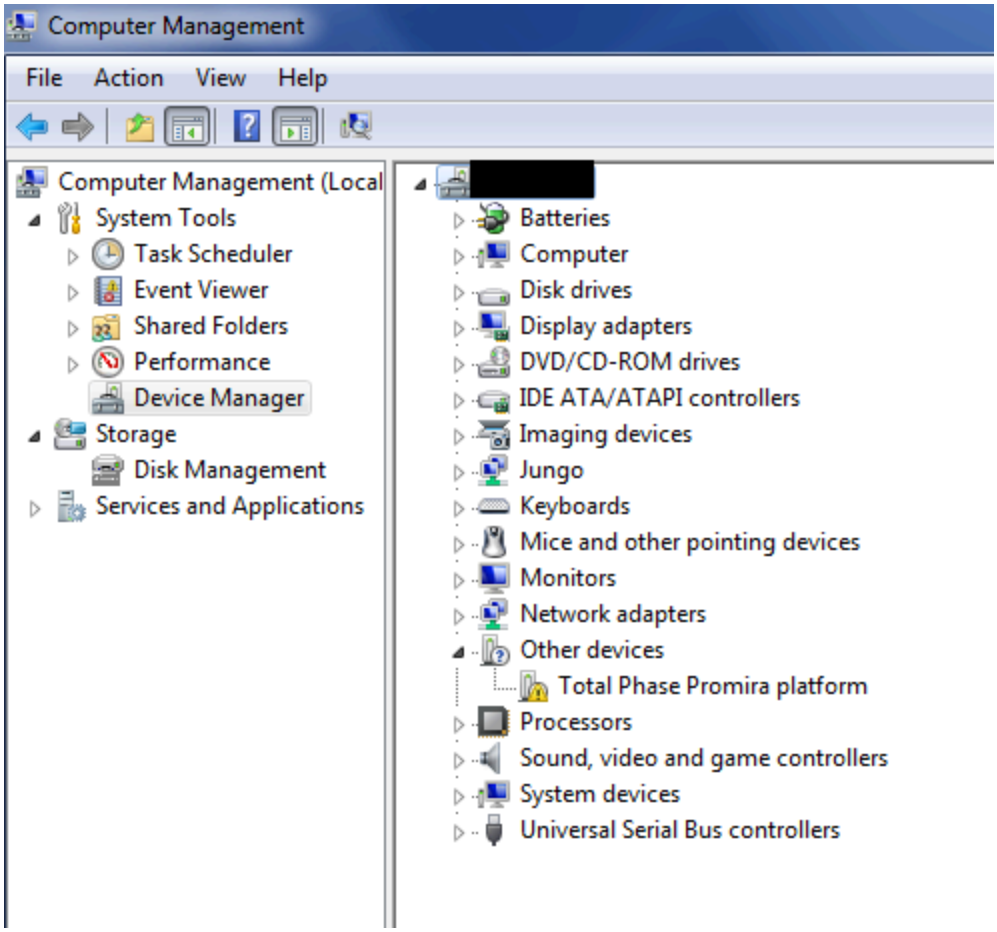
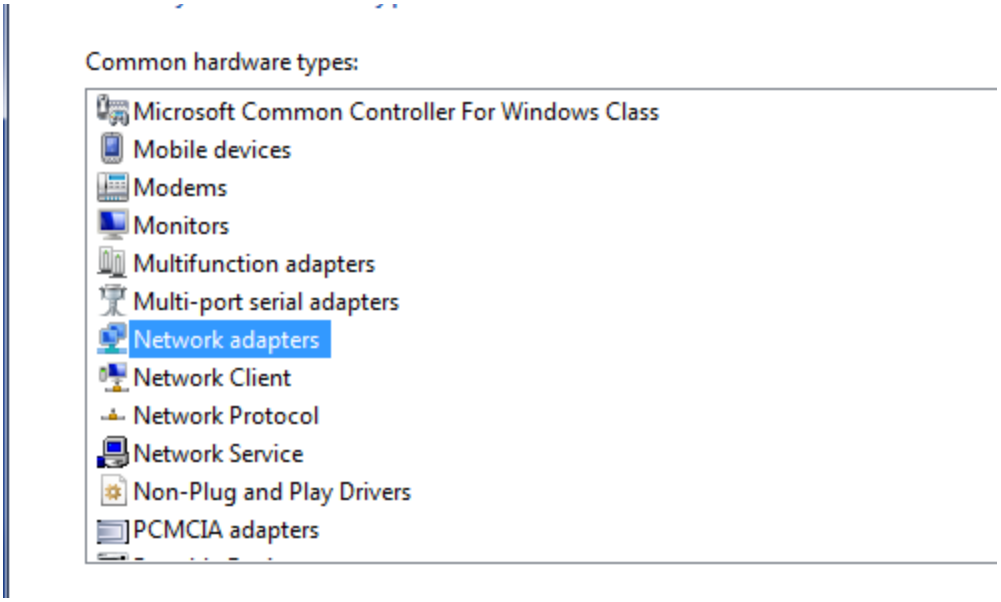
1. Connect ACT v2 to PC with USB cable.

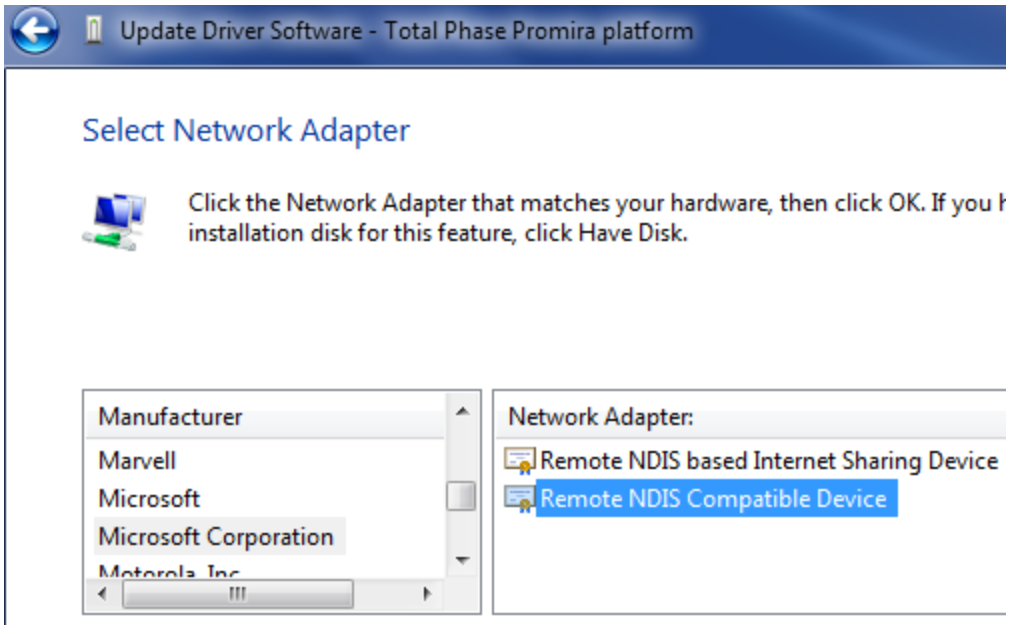


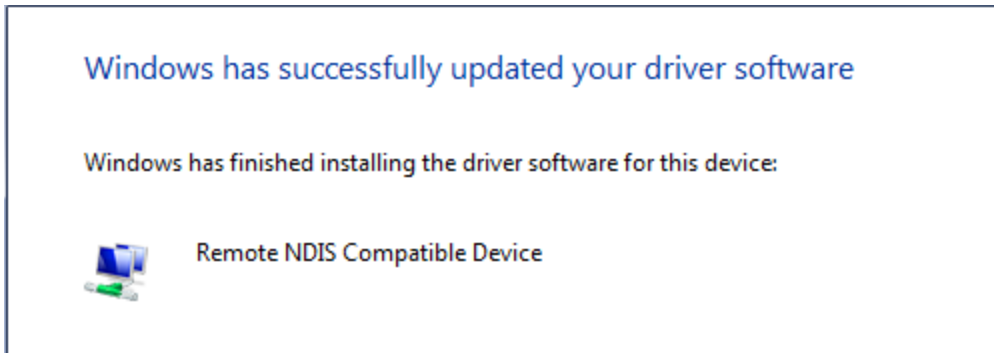
Otherwise, close this window, skip RNDIS driver installation in the next step and continue to the following step.

3. Install RNDIS driver:
    1. Right-click on **Total Phase Platform**device and select **Update Driver Software...** When prompted to choose how to search for device driver software, choose **Browse my computer for driver software**.
    2. **Browse for driver software on your computer** will come up. Select **Let me pick from a list of device drivers on my computer**.
    3. A window will come up asking to select the device type. Select **Network adapters**, as RNDIS emulates a network connection.



4. In the **Select Network Adapter** window, select **Microsoft Corporation** from the **Manufacturer** list. Under the list of **Network Adapter:**, select **Remote NDIS compatible device**.





4. From the Start menu, select **Control Panel | Network and Internet | Network and Sharing Center.**
5. Select **Change adapter settings** on the left panel.
6. Right-click on the **USB Ethernet/RNDIS Gadget** adapter, select **Properties**.

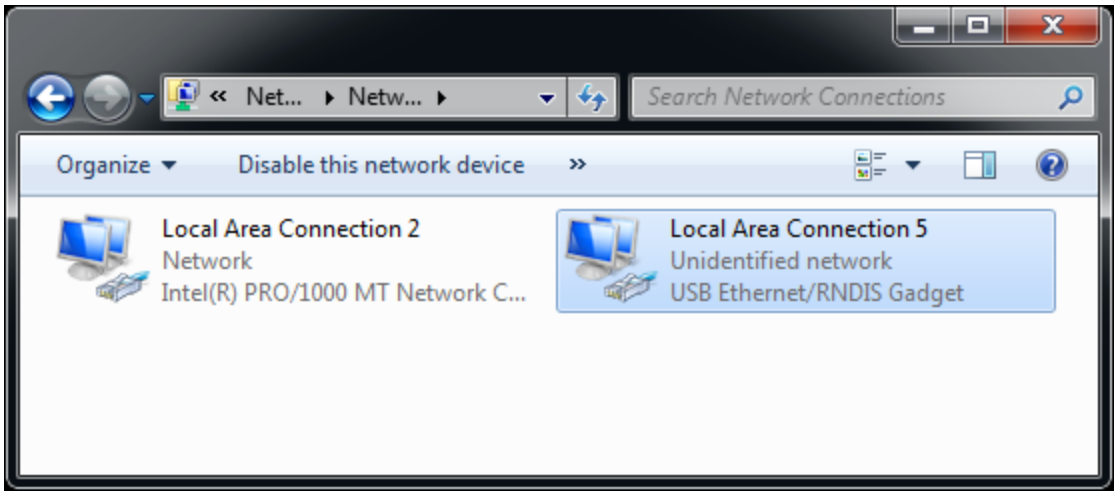


***Figure 5** : Windows Change adapter settings window.*

7. Double click on **Internet Protocol Version 4 (IPv4).**

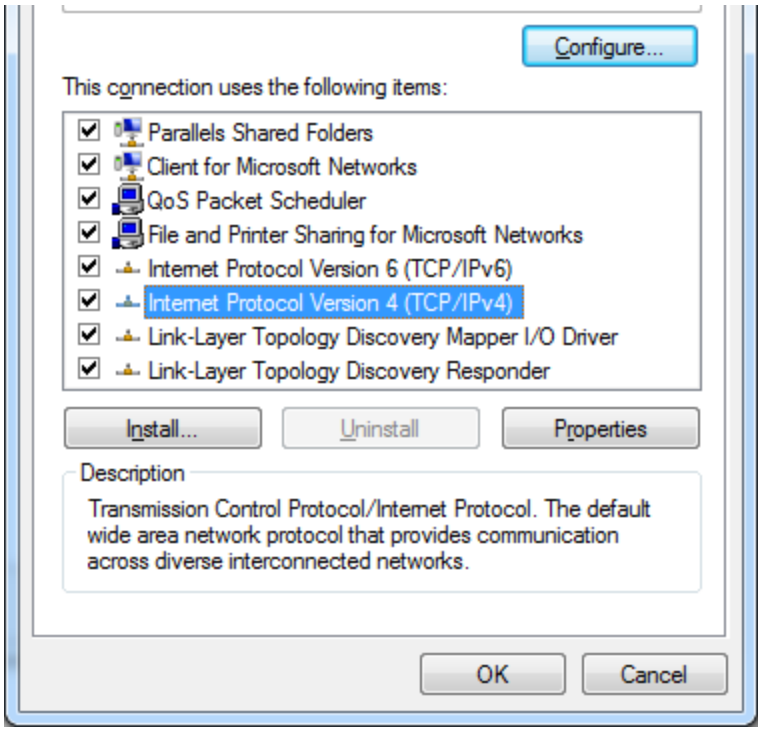


***Figure 6** : Windows Network Interface Properties dialog.*

8. Select **Obtain IP address automatically** and also select **Obtain DNS server address automatically**.

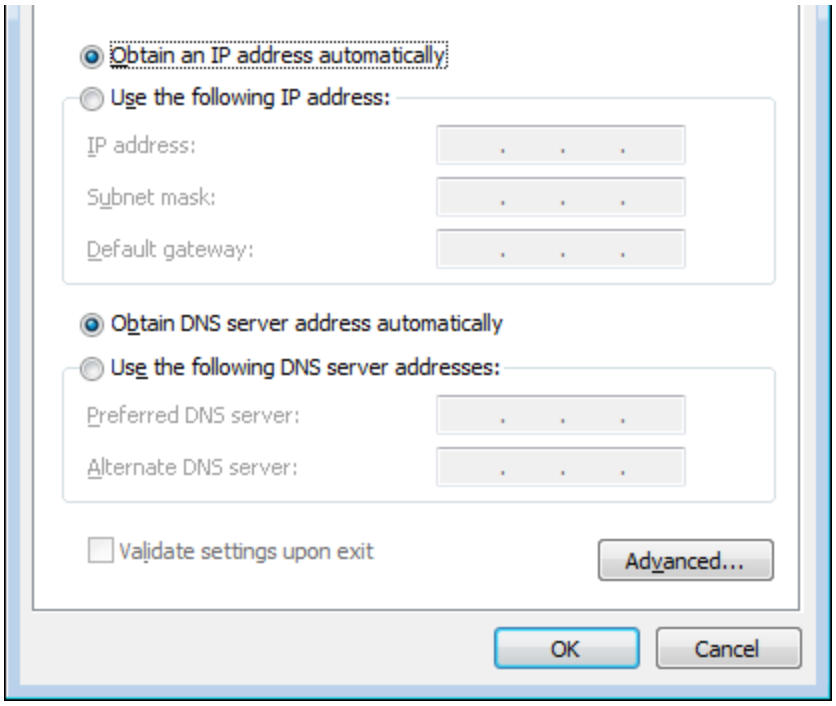


***Figure 7** : Windows IPv4 Properties dialog.*

9. Select **OK** and **Close** to dismiss the dialogs.
10. In order to make sure it is ready or to know the IP address of the Advanced Cable Tester v2, right-click on the **USB Ethernet/RNDIS Gadget** adapter, select **Status** and then select **Details...**. The IP address assigned to the network interface on the host PC is will be in the format of 10.x.x.x and is listed as the IPv4 Address. The IP address of the device will be at the preceding address. For example, the image below shows 10.1.0.2 for the host IP address. The device address will then be 10.1.0.1. This device address will also be displayed in the Control Center software and will be needed when connecting to the device using the API.

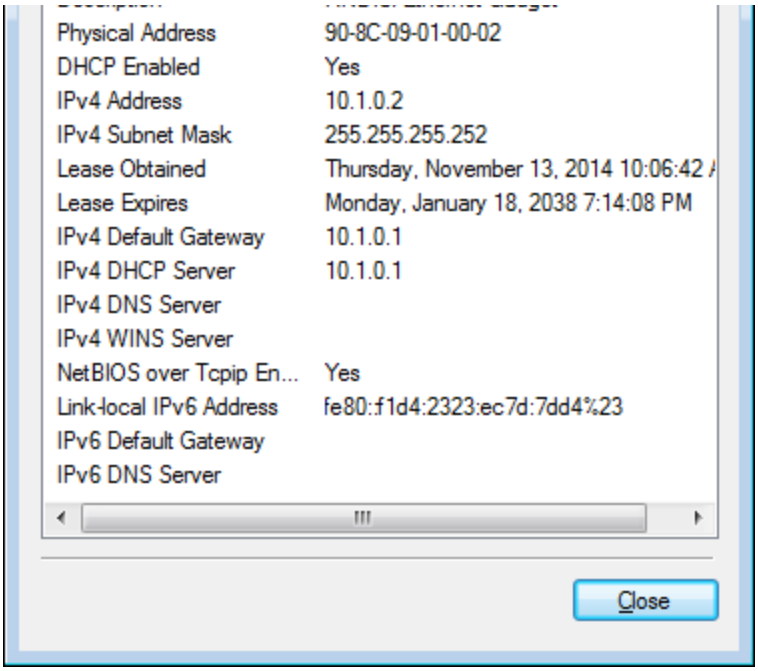


***Figure 8** : Windows Connection Details.*

11. Select **OK** and **Close** to dismiss the dialogs.

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Linux

1. Connect ACT v2 to PC with USB cable.
2. Use `ifconfig -a` to determine the network interface of ACT v2. If you do not recognize which one is the new interface, compare the lists from `ifconfig -a` before and after plugging in the device.
3. The Advanced Cable Tester v2 will be shown as tpp*x*.

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Mac OS X

1. Connect ACT v2 to PC with USB cable.
2. Select **Network** under **System Preferences.**
3. Select **Total Phase Platform**

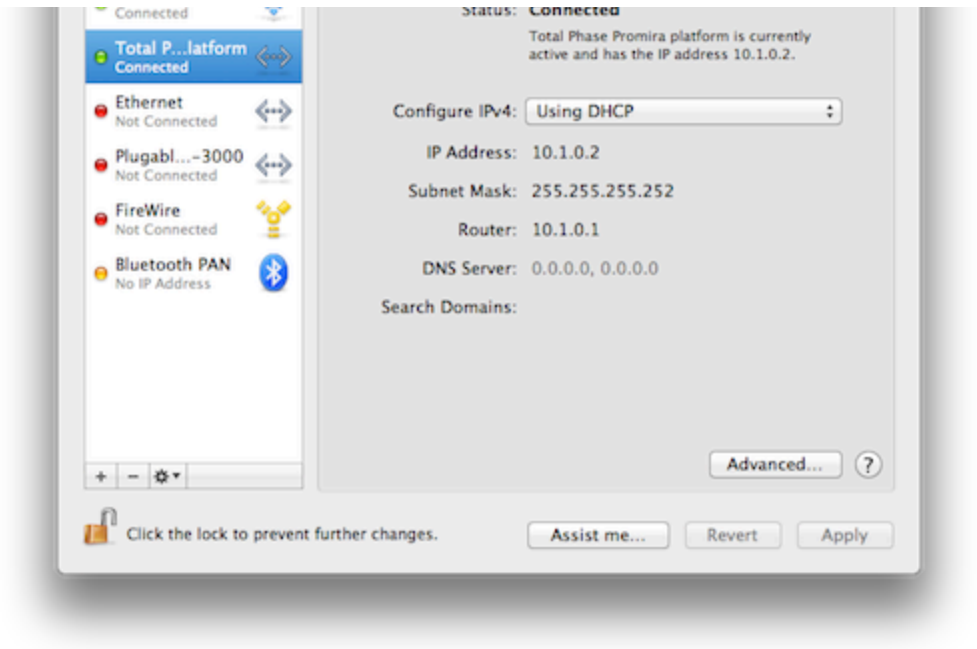

***Figure 9** : Mac OS X Network Preferences window.*

1. Select **Using DHCP** from the **Configure IPv4:** dropdown list box.
2. Select **Apply** to apply the changes.

4.2.2 Ethernet

The ACT v2 can be connected to through the Ethernet port. The ACT v2 can be configured to static IP addressing or dynamic IP addressing (DHCP). The default network preferences of the ACT v2 for Ethernet is a static address and its IP address is 192.168.11.1. The network preferences can be modified using the web management interface of the Advanced Cable Tester v2 to discover the address that was assigned. The web management interface can also be used to configure a static IP address for the ACT v2 tester.

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4.3 Web Management Interface

The Web Management Interface provides a simply way to configure and update the Advanced Cable Tester v2.

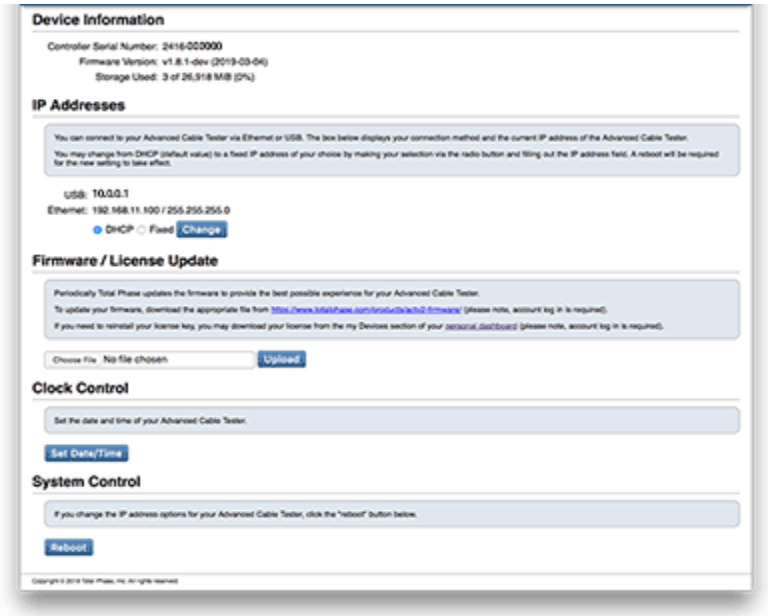

***Figure 10** : Web Management Interface*

4.3.1 Device Information

This section provides information about the ACT v2 tester including the controller's serial number (which will match the label on the rear of the device), current firmware version installed, and the amount of storage used on the device.

When submitting a support request, please make sure that this information is included in your request as it will help the Total Phase support team more rapidly diagnose any potential problems.

4.3.2 IP Addresses

The USB IP address is a fixed address and cannot be changed. This address will match the USB IP address printed on the label on the rear of the tester.

The Ethernet IP address can either be a static IP address or a DHCP assigned address. The web management interface can be used to select between the two options. To select either DHCP or Fixed, simply select the appropriate radio button and click the **Change** button.

If the ACT v2 is set to DHCP, the assigned IP address will be displayed if it has been assigned. This address will only appear if the tester has been connected to the network and has

4.3.3 Firmware/License Update

Firmware and license updates are easy to perform through the web management interface. Both types of updates will be provided as a PMU file from Total Phase. To install the PMU:

1. Click on **Choose File** and select a PMU file on your local file system
2. Click on **Upload**. Once the PMU file has been uploaded, it will be verified.
3. You must confirm the installation of the update by click **Yes** on the update page. Clicking on **Cancel** will return you to the management interface.
4. Once the firmware has been updated, the ACT v2 will reboot and return you to the management interface after a successful installation.

After updating the firmware, please be sure to force a refresh of your web browser cache to ensure that the latest web application is loaded when operating the tester.

4.3.4 Clock Control

The ACT v2 tester has a real-time clock to ensure that all cable tests are appropriately time stamped. To set the date and time, simply click the **Set Date/Time** button. The subsequent page will display the current time in the ACT v2 and the current time of the local computer. Updating the date/time is a convenient single click to synchronize the ACT v2 with the local computer.

4.3.5 System Control

It is possible to remotely reboot the ACT v2 using the management interface. To do so, simply click the **Reboot** button.

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4.4 Powering the Advanced Cable Tester v2

To ensure consistent and reliably tests, the ACT v2 tester must be powered by the included power adapter. If another power adapter is used, the Advanced Cable Tester v2 device may not have enough power to operate properly.

is complete, once the cable is removed from the Advanced Cable Tester v2, it is ready to start a test as soon as the next cable is installed.

In order to better understand the operation of the Advanced Cable Tester v2, please consider following state diagram in Figure 11.

***Figure 11** : Advanced Cable Tester v2 Operational State Diagram*

When the tester first boots up, it will be in the **Not Ready** state. In this state, the Advanced Cable Tester v2 requires an operator to configure the tester to be ready for a test. There are a number of actions that are needed to move to the next state:

1. A valid connector module must be correctly installed in the Advanced Cable Tester v2,
2. a test profile that matches the module must be selected by an operator, and
3. some test profiles require additional information that must be entered by an operator and will be saved in the test report for better tracking. For example, some profiles require "SKU" and "Customer" information.

Once these requirements are met, the Advanced Cable Tester v2 can be started which will put the tester in the **Ready** state. As soon as the tester detects that a cable has been inserted between the two receptacles, it will enter the **Testing** state.

In the **Testing** state, the Advanced Cable Tester v2 will test the cable against the parameters defined in the selected test profile. Once the test is complete and the test report is saved in the internal database, the tester will be in the **Done** state.

return to the **Not Ready** state. One example of a possible error is that the connector module was removed during testing. The reason that the tester returns to the **Not Ready** state is because the tester requires operator input to restore it to the **Ready** state.

6 Standalone Operation

Once the ACT v2 tester has been configured with a test profile via the web interface, it can be operated directly without a computer or tablet. The on-board LCD screen and audio will provide the operator with feedback on the current state of the tester and the pass/fail status of the inserted DUT. The meaning of the icons on the LCD screen are explained in Table 4.

Table 4 : LCD Screens

	**Not Ready** Initial state of the ACT v2 when it is first powered on. In this state, the tester must be configured with a test profile via the web application.
	**Ready** The ACT v2 has been properly configured and is ready to test. Testing will begin as soon as a cable is inserted.
	**Testing** The ACT v2 is actively testing a cable. The arrows will grow and a progress bar will show the current state of the test.

	upon successful completion of the tests.
	**Fail** The inserted cable has failed one or more of the test requirements. Detailed test results can be accessed via the web application. A fail audio cue will also play upon completion of the tests.
	**Error** An unexpected error has occurred. The tester needs to be accessed via the web application to get more information about the error and to reconfigure the tester to restore normal operation.

7 Connector Modules

The Advanced Cable Tester supports testing a large variety of cables via a system of easily interchangeable modules. Each module is rated for 10,000 tests, guaranteeing cost effective and accurate cable test results.

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7.1 Physically Installing Connector Modules

Connector modules are available in full-height and half-height sizes. When using half-height connector modules, an included plate must be used to close off the module bay to prevent accidental intrusions.

The sides of the module bay provides slots to guide and position the connector module to ensure a proper and secure connection to the tester hardware. When installing the module, ensure that the connector module PCB is lined up with the slot that is second from the bottom as shown in figure 12. The top and bottom slots are designed to hold the faceplate of the module securely in the module bay.

***Figure 12** : Installing Connector Module*
When installing the connector module, be sure to align the PCB of the module with the second slot.

When installing the module, press the connector module in firmly until the module is flush with the chassis. You will hear and feel a click when the module engages. The module has retention features to ensure that the module remains firmly connected to the tester while cables are tested.

Modules with a metal faceplate have quarter-turn fasteners. To secure the module once seated in the tester, simply push the fasteners into the tester and turn it clock-wise until they lock. To remove the module, simply turn the fasteners counter-clockwise until the fasteners until the pop out. Once both fasteners have been unlocked, the module can be removed by pulling on the fasteners.

Modules with a plastic faceplate have push-lock pins. To secure the module once seated in the tester, simply push the pins into the tester until they both lock. To remove the module, simply pull on the pins until the unlock. Once both fasteners have been unlocked, the module can be removed by pulling on the fasteners.

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7.2 Multiple Connector Module

All connector modules are rated for at least 10,000 insertions. Unfortunately, not all connectors are rated for the same number of insertion cycles. In these situations, a connector module may have multiple connectors per side so that in total the module will meet the 10k insertion standard. For example, USB 3.1 Standard-A connectors are rated for 5,000 insertions, which is why there are 2 of these connectors on one side of a connector module.

***Figure 12** : Multiple Connector Module*
In order to meet the 10,000 insertion standard, some connector modules are

used when testing. This is to ensure that a worn connector is not used for testing. Once the Advanced Cable Tester v2 has been configured with a test profile and is in the READY state, the LED under the connector to use will be illuminated. The ACT v2 will only detect cable insertion on the illuminated port to start a test.

8 User Interface Overview

The Advanced Cable Tester Application v2 is simply accessed via HTTP from an HTML5-compatible web browser. This could be a mobile phone, tablet, or most often a PC. Please consult the Quick Start Guide at the end of this manual.

Features:

- **Responsive design:** Single web interface is compatible with mobile browsers, tablets, and PCs.
- **Test profiles: stored on the device. Test profiles can be imported and exported to share between devices.**
- **Test reports:** up to 1 million reports can be stored on the device. The test reports are stored in a circular buffer. If the results storage is full, then the oldest test reports will automatically be cleared to make room for the new test reports.

Please note that since this ACT v2 application is accessed through a web browser, it is possible that the web browser can lose connection to the tester hardware. In these situations, the web application will attempt to reconnect as best as it is able to. Please note that there will be situation where the web application will not be able to re-synchronize successfully with the hardare. In these cases, a browser refresh should restore the synchronization.

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8.1 Navigation

The top navigation bar provides quick and easy access to the high-level functionality of the Advanced Cable Tester v2.

Table 5 : Navigation Header

1	**Device Name**	The device name provides a way to differentiate individual ACT v2 testers. The name of the device can be set in the Settings section
2	**Navigation Tabs**	The tabs provides quick access ot the main sections of the Advanced Cable Tester v2. Each tab is discussed further in this manual.
3	**Current Module**	The currently installed module and its current test count.
4	**Language Selection**	The Advanced Cable Tester v2 application supports multiple languages which can be changed instantly by selecting a language in this drop-down menu. The application will remember the last language selected. This language is global to the unit for all users.
5	**Volume Control**	The volume of the Advanced Cable Tester v2 internal speaker can be toggled between three settings: Loud, Quiet, and Mute. The application will remember the last volume settings.

8.1.1 Language Support

The Advanced Cable Tester v2 application currently supports the following languages:

- 中文（中国) / Simplified Chinese
- 中文（台灣) / Traditional Chinese
- 日本語 / Japanese
- 한국어 / Korean

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8.2 Main

Similar to the LCD screen on the Advanced Cable Tester v2, the sidebar on the left side of the screen displays the current state of the tester.

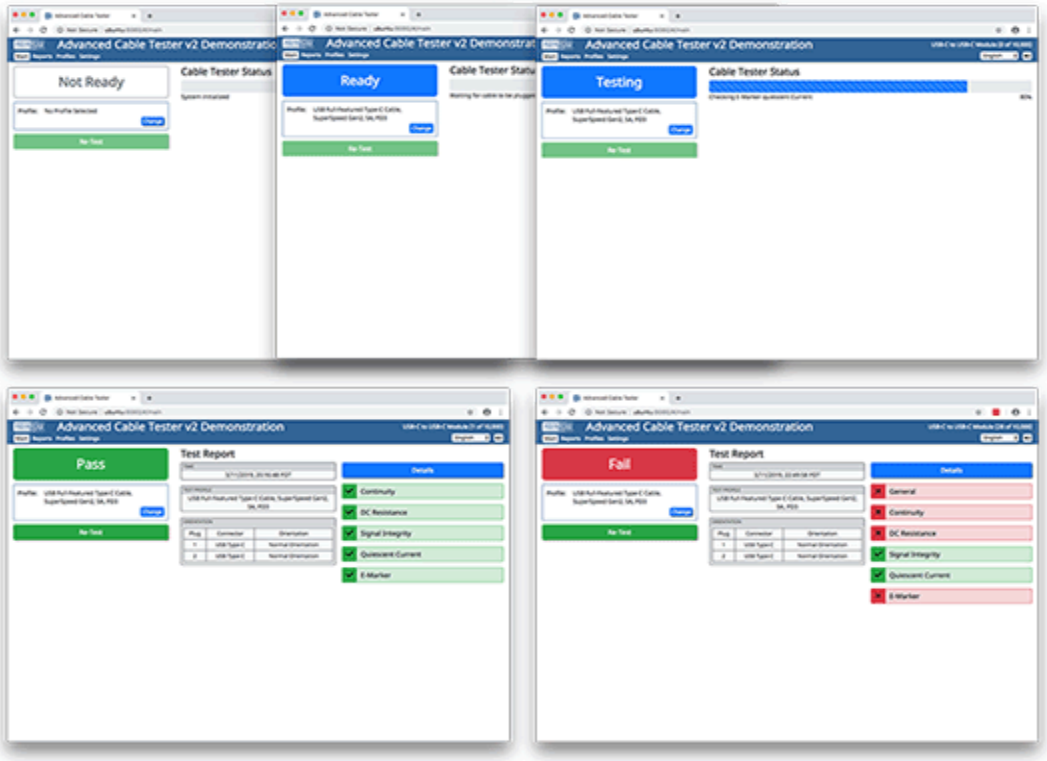


***Figure 15** : Web Application - Sidebar Status*

Table 6 : States of the Advanced Cable Tester v2

Not Ready	The Not Ready state indicates that the Advanced Cable Tester v2 requires user input in order to begin testing. When a cable connector module is removed, the ACT v2 will return to the Not Ready state because the user will need to select a test profile to continue testing.
Ready	Once a valid cable connector module has been installed and a valid test profile has been selected, the ACT v2 will be in the Ready state. Once in the Ready state, the ACT v2 will run a test profile as soon as a cable has been detected.

	remain displayed until the cable removal is detected. A high-level summary of the test results are displayed on the left.

8.2.1 Installing a Connector Module

The functionality of the Advanced Cable Tester v2 application will be limited until a module is physically installed in the tester. If there is no module, the header will indicate "No Module" and the following message will be displayed in the application:

***Figure 16** : Web Application - No Module Message*

After the module is physically installed, the software will detect its presence and verify that the module is valid and get the connector modules current usage count. While the module is being detected, the following message will be displayed in the application:

***Figure 16** : Web Application - Detecting Module Message*

If there are any problems with the detected module, the following "Invalid Module" error message will be displayed in the application:

***Figure 16** : Web Application - Invalid Module Message*

8.2.2 Test Profile

Below the status indicator is the current test profile section. In the example below, the current test profile is "USB Full-Featured Type-C Cable, SuperSpeed Gen2, 5A, PD3."

***Figure 19** : Web Application - Current Test Profile*

Additionally, if custom tags are defined by the profile, they will be displayed here. For example, some profiles may require Lot or SKU information. The label and the user entered information will be displayed here. In the example below, the current profile is "USB Type-C to Lightning USB2, Cable > 0.5 meter." This profile has three custom tags: PPID, SKU, and Customer.

***Figure 20** : Web Application - Current Test Profile with Additional Custom Tags*

Changing Test Profile

Top

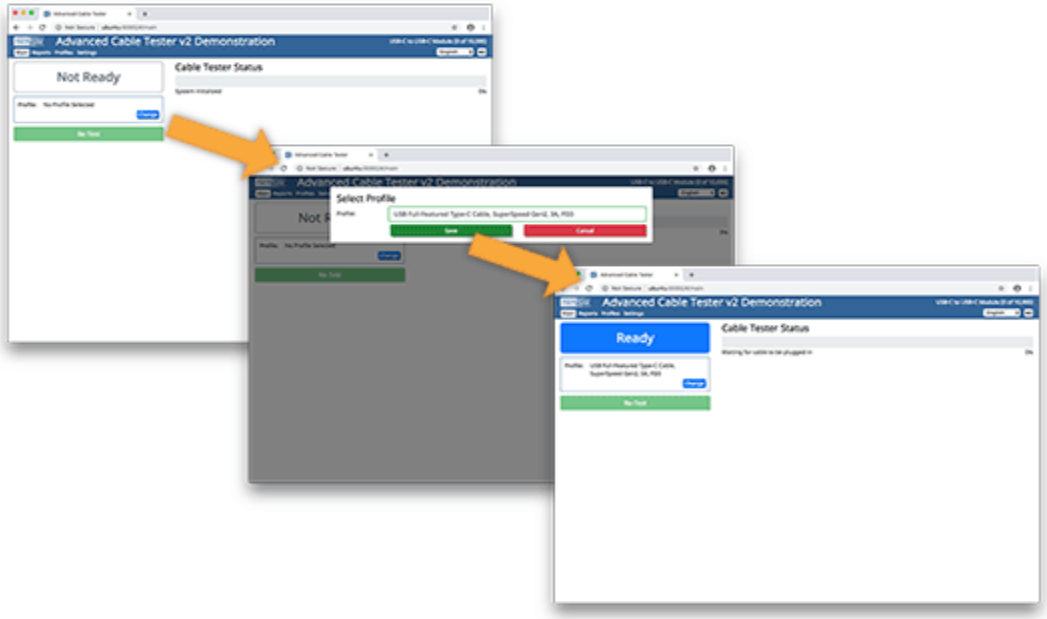


***Figure 21** : Web Application - Workflow to change test profile.*

Click on **Save** to save the selected profile. If a cable is inserted in the ACT v2 when a test profile is selected and saved, it will immediately begin a new test run.

Click on **Cancel** to cancel the selection profile selection process. if a profile was previously defined, it will continue to be the selected profile is the process is cancelled.

Some test profiles contain pre-defined custom tags. These custom tags are text fields that must be defined before the test profile will be accepted. Examples of these custom tags are SKU or Lot. These custom tags provides the factory the ability to attached custom text fields to test reports.

8.2.3 Cable Testing

While actively testing, a progress bar will show what tests are currently being run.

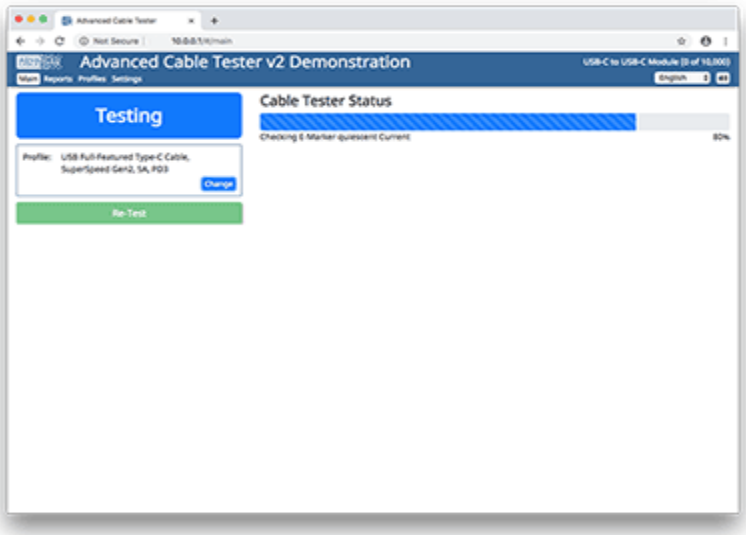


***Figure 22** : Web Application - Test Progress*

Once a test is complete, a test report summary is displayed. In general, the test summary displays when the test was run, the test profile that defined the test parameters, any custom tags defined, the detected cable terminations (and their orientation if applicable), and the test results for each major test subsection. Any failures in a particular subsection will be displayed in Red and prefixed with an X.

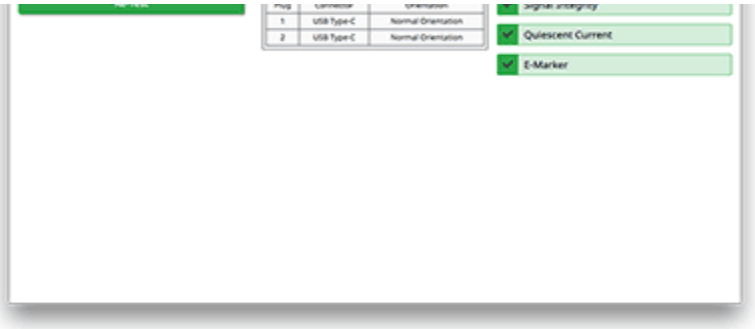


***Figure 23** : Web Application - Passing Cable Test*

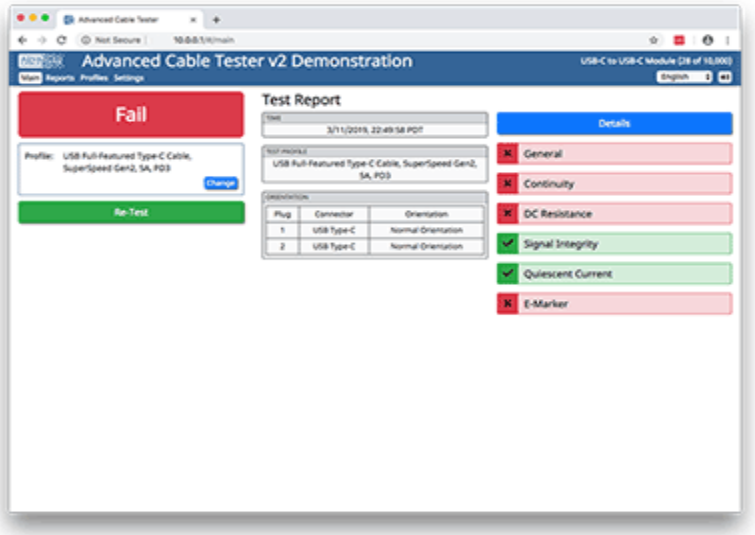


***Figure 24** : Web Application - Failing Cable Test*

Click on the **Details** button to see the detailed test report. Additionally, it is possible to click on a test subsection to jump down to that specific area in the test report.

Re-testing a Cable

Top

After a cable test is complete, it is possible to re-test the cable by clicking on the "Re-Test" button.

8.2.4 Test limit warning

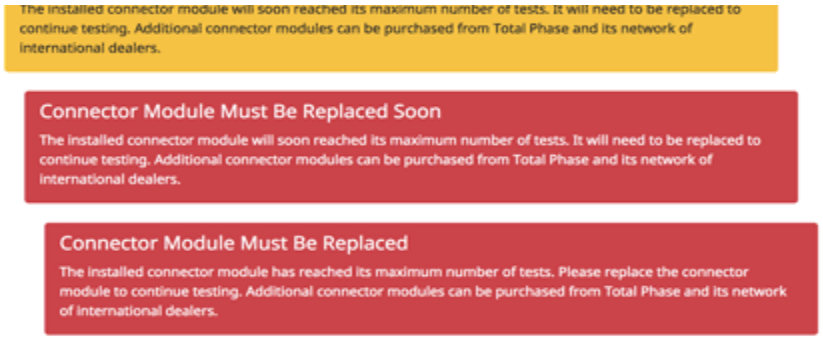


***Figure 25** : Connector Module Limit Warning Messages*

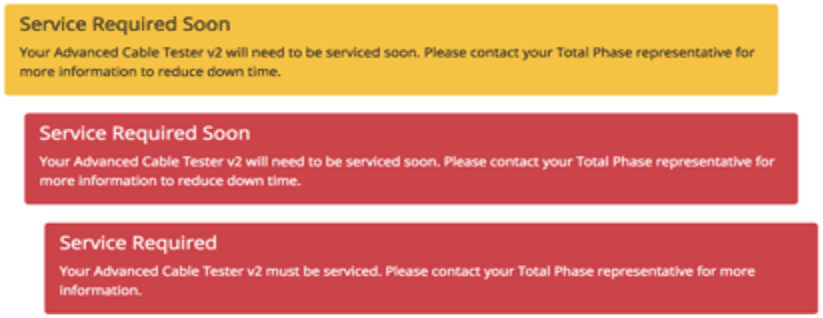


***Figure 26** : Connector Module Insertion Limit Warning Messages*

Top

8.3 Reports

All cable test stored on the ACT v2 are accessible in the Reports section and are listed in a table format. Individual test reports can be viewed by clicking on the test report of interest.

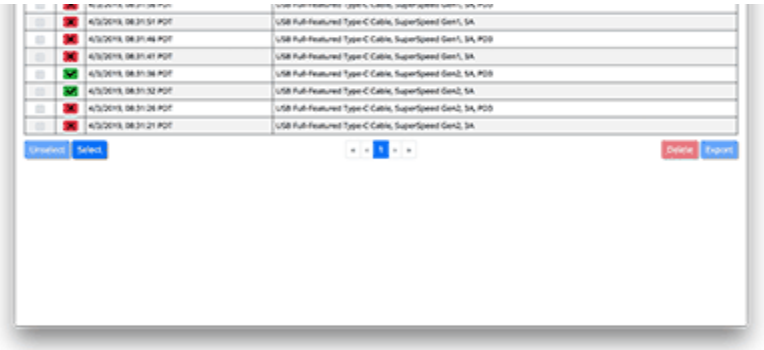


***Figure 27** : Web Application - All Test Reports*

The test report table provides the status of the test, when the test was run and which test profile was used. The total number of tests is listed at the top of the page. The number of tests displayed can be changed by using the **Rows** drop-down menu to change the number of rows visible.

8.3.1 Reports Management

Two actions are available to users to manage test reports in the list view: Delete and Export. These actions are accessible from the buttons above and below the table of test reports.

Select/Unselect

Top

Individual test reports can be select and unselected by toggling the checkbox next to the test report. Additionally, all visible test reports can be selected or unselected by clicking the **Select** or **Unselect** buttons. These buttons will only select or unselect the visible page of test reports.

Delete

Top

One or more selected test reports can be deleted by clicking the **Delete** button. A confirmation dialog will appear to confirm the number of reports that will be deleted. The user will need to confirm to delete the reports. Please be careful because once a test reports is deleted, it is not possible to recover it.

Export

Top

One or more selected reports can be exported by clicking the **Export** button. All selected test reports will be exported in a single JSON data file.

profile. General information about when the test was run, the test profile used, and any custom tags specified will be available at the top of the report.

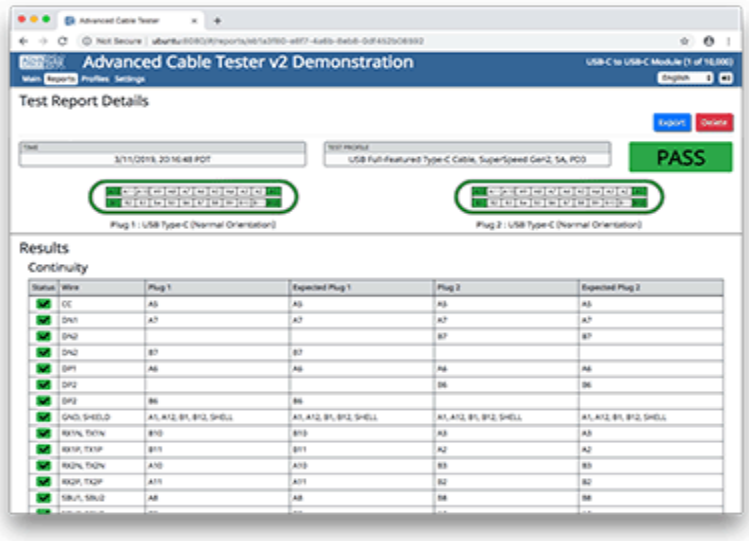


***Figure 28** : Web Application - Individual Test Report*

8.4.1 Report Management

Users also have the ability to Export or Delete the report directly in the individual test report view. The export and delete functionality is the same as on the Reports page.

Delete

Top

The current test report can be deleted by clicking the **Delete** button. A confirmation dialog will appear to confirm that the deletion. Please be careful because once a test reports is deleted, it is not possible to recover it.

Export

Top

The current test reports can be exported by clicking the **Export** button. The test report will be exported in a JSON data file.

8.4.2 Connector Diagrams

As a convenience, graphics of the cable terminations are provided to help visualize the pins involved in a specific test. The pins related to the test under the cursor will be highlighted in

	In tests where there is a source and sink, green pins indicate the source pin or pins on a passing test.
Light Green	In tests where there is a source and sink, light green pins indicate the sink pin or pins on a passing test.
Red	Red pins were the pins involved in a failing test. In tests where there is a source and sink, red pins indicate the source pin or pins on a failing test.
Light Red	In tests where there is a source and sink, light green pins indicate the sink pin or pins on a failing test.
Gray	In Continuity tests, gray pins indicate an expected pin that was not found to be continuous.

8.4.3 Continuity Tests

Continuity or wiring tests checks to see if pins from one connector is continuous with a pin on the other connector. The report table provides the following information:

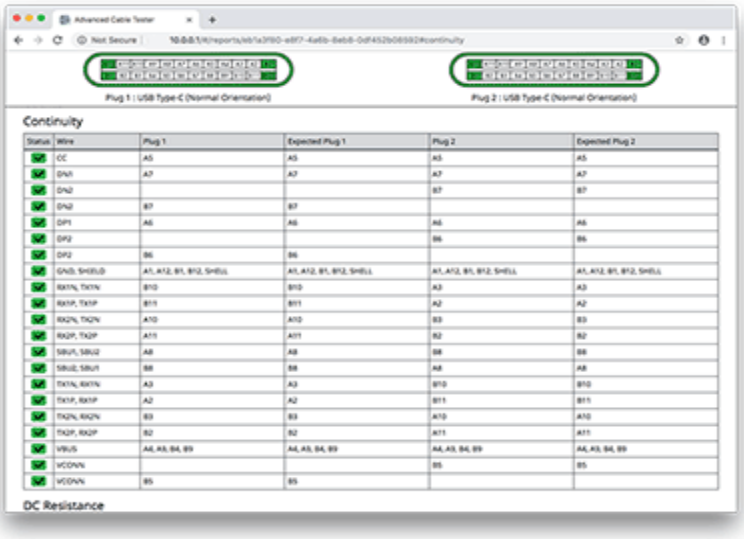


***Figure 29** : Web Application - Individual Test Report - Continuity Section*

Table 8 : Continuity Test Report

	wire/signal.
Expected Plug 1	The pins on Plug 1 that are expected to be associated with this wire/signal.
Plug 2	The pins on Plug 2 that are actually to be associated with this wire/signal.
Expected Plug 2	The pins on Plug 2 that are expected to be associated with this wire/signal.

In the case of **Shorts**, more pins will appear than expected in either Plug 1 or Plug 2 columns. This short will appears across all rows that are shorted together.

In the case of **Opens**, fewer pins will appear than expected in either Plug 1 or Plug 2 columns. Opens will manifest in additional rows because non-continuous pins are treated as separate rows in the test report.

8.4.4 DC Resistance Tests

DC Resistance (DCR) tests checks the resistance of the individual pin or wire. In the case of pin DCR, the source will be a single pin and the sinks will be all other bused pins. In the case of wire DCR, the source will be all pins from one plug bused to all the pins on the other plug. The report table provides the following information:

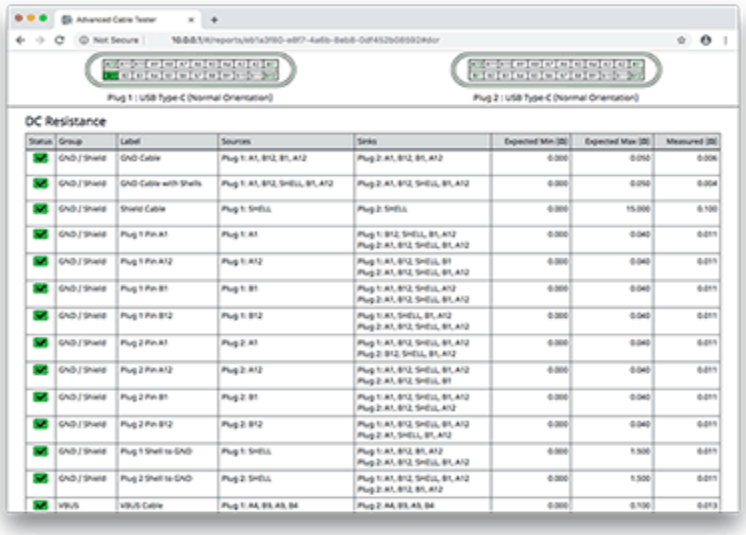


***Figure 30** : Web Application - Individual Test Report - DC Resistance Section*

Label	Human readable name for the pin/wire being measured
Sources	Pins on the source side of the measurement
Sinks	Pins on the sink side of the measurement
Expected Min (Ω)	Minimum acceptable resistance
Expected Max (Ω)	Maximum acceptable resistance
Measured (Ω)	Actual measured resistance

8.4.5 Signal Integrity

Signal integrity tests measure the quality of the differentially paired wires through the cable. Each tested pair will result in a result block. The result block provides the following information:

***Figure 31** : Web Application - Individual Test Report - Signal Integrity Section*

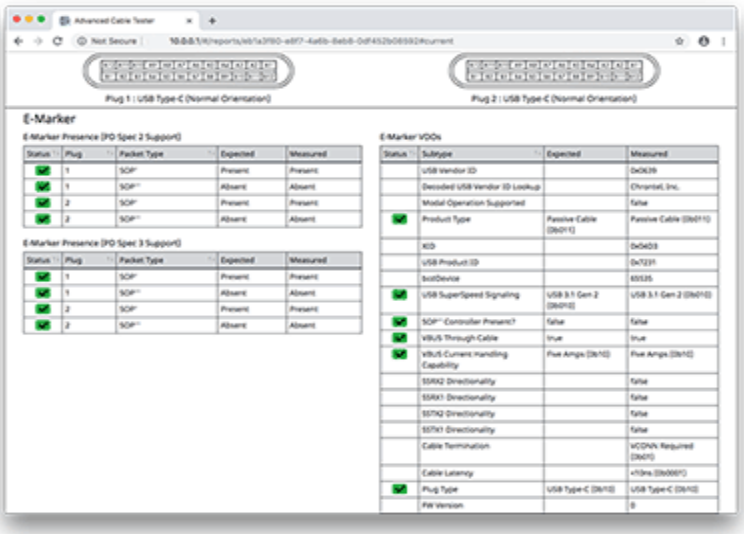
Table 10 : Signal Integrity Test Report

Data Rate	Speed of the data signal used in the test in Mbits per second
Transmit Pair	Transmitter plug and pins

	widest section. The Expected is the minimum open percentage that will pass the test and is generated based on the insertion loss curve specified in the test profile. The Measured is the actual percentage open.
VEO	Vertical Eye Opening is a percentage value that indicates what percentage of the reference frame of the eye is open across the widest section. The Expected is the minimum open percentage that will pass the test and is generated based on the insertion loss curve specified in the test profile. The Measured is the actual percentage open.
Eye Image	If lock was achieved on the indicated differential pair, the eye image will be displayed. The eye image will include the mask to provide a reference for the HEO and VEO values. If lock was not achieved, a no-lock image will be displayed.

8.4.6 E-Marker

E-Marker tests check for the presence or absence of E-Marker chip(s) in USB Type-C connectors. The Advanced Cable Tester v2 supports Power Delivery Specification, Revision 2 (PD2) and Power Delivery Specification, Revision 3 (PD3). The presence/absence test reports are grouped by PD specification and present the following information:



	test report is informational only and was not used in determining if the cable passed or failed.
Plug	Origination of the SOP* request
Packet Type	SOP' or SOP'' request
Expected	Expected presence or absence of an E-Marker response
Measured	Actual presence or absence of an E-Marker response

If an E-Marker is found to be present, the ACT v2 will query the device to read all available Vendor Data Objects (VDOs). Well constructed USB Type-C cables with E-Markers are expected to have the same VDO data. To simplify the test results, only a single set of VDOs will be displayed if available. Table 12 explains the information displayed for the results of the E-Marker VDO query.

Table 12 : E-Marker VDO Test Report

Status	Pass/fail status of the test. If there is no pass/fail indicator, the test report is informational only and was not used in determining if the cable passed or failed.
Subtype	Type of VDO data
Expected	Expected VDO value
Measured	Actual VDO value

8.4.7 Lightning Plug

This test report is only available to unit that have been licensed for MFi members. This report will indicate what type of Lightning connector was found in the cable under test.

8.4.8 Over Voltage Protection

This test report is only available to unit that have been licensed for MFi members. This test the cables over voltage protection. The report table provides the following information:

***Figure 33** : Web Application - Individual Test Report - Over Voltage Protection Section*

Table 13 : Over Voltage Protection Test Report

Status	Pass/fail status of the test.
Subtype	The scenario being tested, this is specific to the specification of the cable.
Sources	Pins on the source side of the measurement
Sinks	Pins on the sink side of the measurement
Voltage Ramp	Starting and ending voltage testing range
Cutoff Range	Expected range for the cutoff

8.4.9 Quiescent Current

This test is applicable to USB Type-C cables with an E-Marker and Apple MFI Lightning cables. The MFI Lightning test report is only available to unit that have been licensed for MFi members. This tests the current draw of the cable under different scenarios. The report table provides the following information:

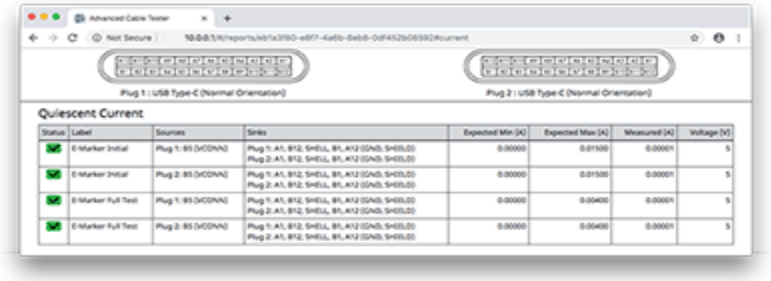


***Figure 34** : Web Application - Individual Test Report - Quiescent Current Section*

Table 14 : Quiescent Current Test Report

	the cable.
Sources	Pins on the source side of the measurement
Sinks	Pins on the sink side of the measurement
Expected Min (A)	Minimum acceptable current
Expected Max (A)	Maximum acceptable current
Measured (A)	Actual measured current
Voltage (V)	Voltage level of the test

8.4.10 Source Measurement Unit

This test report is only available to unit that have been licensed for MFi members. This tests the current limit of the cable in different scenarios with a source measurement unit (SMU). The report table provides the following information:

***Figure 35** : Web Application - Individual Test Report - Source Measurement Unit Section*

Table 13 : Source Measurement Unit Test Report

Status	Pass/fail status of the test.
Group	High-level grouping of measurements, e.g. Current Limit Test
Label	The scenario being tested, this is specific to the specification of the cable.

Measured (A)	Actual measured current

8.4.11 Equipment

The equipment section displays information about the ACT v2 tester at the time of the test for traceability.

Top

8.5 Profiles

Tests performed on cables are defined by test profiles. By default, the ACT v2 ships with standard test profiles that conform to the expected cable standards. These standard test profiles are not editable so that the user has a pre-defined set of tests for each particular cable variant. While users cannot modify the standard set of test profiles, test profiles can be copied and customized to suit each customers specific needs. Details associated with a test profile can be viewed by clicking on the test profile.

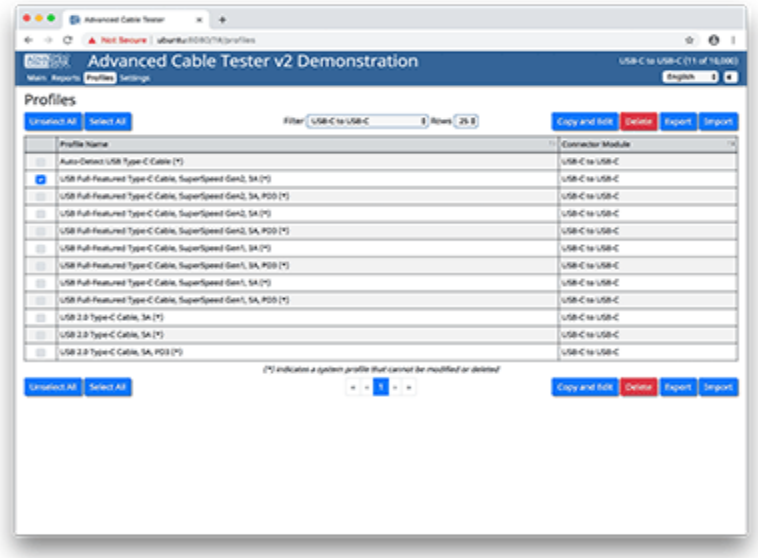


***Figure 36** : Web Application - All Test Profiles*

The test profiles table is a list of the names of all test profiles available on the ACT v2 and the module associated with the test profile. The number of test profiles displayed can be changed by using the **Rows** drop-down menu to change the number of rows visible. Additionally, the

Four actions are available to users to manage test profiles in the list view. The user can Copy, Delete, Export, and Import profiles. These actions are accessible from the buttons above and below the table of profiles.

Select/Unselect

Top

Individual test profiles can be select and unselected by toggling the checkbox next to the Profile Name. Additionally, all profiles can be selected or unselected by clicking the **Select All** or **Unselect All** buttons. These buttons will select or unselect all filtered profiles on all pages.

Copy and Edit

Top

Only one profile can be copied at a time. The user selected profile will be copied when the **Copy and Edit** button is clicked. The new profile will have " COPY" and a timestamp appended to the Profile Name. Once the profile has been copied, the application will automatically open this profile in edit mode.

Delete

Top

It is not possible to delete system test profiles. Only user generated test profiles can be deleted.

One or more selected profiles can be deleted by clicking the **Delete** button. A confirmation dialog will appear to confirm the number of profiles that will be deleted. The user will need to confirm to delete the profiles. Please be careful because once a test profile is deleted, it is not possible to recover it.

Export

Top

One or more selected test profiles can be exported by clicking the **Export** button. All selected test profiles will be exported in a single JSON data file. This data file generated is suitable for uploading to other ACT v2 testers.

Import

Top

A JSON file containing one or more test profiles can be imported by clicking the **Import** button. Please note that Profile Names must be unique. If a profile in the JSON has a duplicated name, the importation process will stop at that test profile. All other test profiles defined in the JSON up to that point will have been imported.

depend on the cable under test and the specifications defined for that type of cable. When a test profile is initially opened, it is in view mode. This is a concise view that shows a compact list of test parameters.

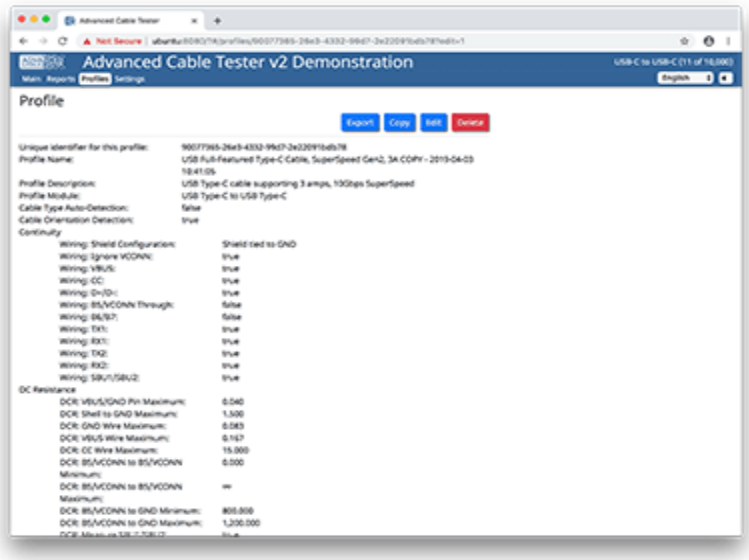


***Figure 37** : Web Application - Individual Profile*

8.6.1 Profile Management

Four actions are available to users to manage test profiles in the list view. The user can Export, Copy, Edit, and Delete the profile.

Export

Top

The test profile can be exported by clicking the **Export** button and will be exported to a JSON data file. This data file generated is suitable for uploading to other ACT v2 testers.

Edit

Top

It is not possible to edit system test profiles. The **Edit** button will only appear on user generated test profiles.

Clicking the **Edit** button will change the view to Edit mode. This mode is explained in further detail below.

Copy

Top

It is not possible to delete system test profiles. The **Delete** button will only appear on user generated test profiles.

The test profile can be deleted by clicking the **Delete** button. A confirmation dialog will appear to confirm the deletion. Please be careful because once a test profile is deleted, it is not possible to recover it.

8.6.2 Test Parameters

The majority of the test parameters are specific to the cable type. However, some parameters are common to all test profiles.

- **Unique identifier for this profile** this global unique identifier is assigned by the ACT v2 when the test profile is created. This field is immutable after it is assigned.
- **Profile Name** is a user assignable name for the test profile. The Profile Name must be unique and the comparison is case insensitive.
- **Profile Description** is an open text field for the user to add descriptive information about the test for reference.
- **Profile Module** is the physical connector module associated with the test profile. This field is immutable.
- **Custom Tags** are user defined text fields that can be used to save additional information about test runs. For example, a "Lot" custom tag could be entered so that at test time the lot information about the cable can be saved to the test report.

Information about the cable-specific test parameters are available in the application web interface when editing a test profile.

8.6.3 Test Profile Editing

A user defined test profile can be edited by clicking the **Edit** button at the bottom of the test profile page.

***Figure 38** : Web Application - Individual Profile - Edit Mode*

In the edit interface, required fields are marked with an asterisk (*). All these fields must be entered in order to save the test profile. Optional fields have checkboxes next to them. If an optional field is not checked, it will not be part of the pass/fail test criteria. Checking an optional field will enable the entry of data in the form field.

Each test profile field has a title and a description to explain the purpose of the field. There are different types of entry fields: boolean, text, number, drop-down, and insertion loss.

Boolean field

Top

A boolean field allows the user to select true or false. The selected option will be highlighted in dark grey. If the field is required, either true or false must be selected. Otherwise, no selection is required and neither option will be highlighted.

Text field

Top

Text fields support entry of Unicode text.

Number field

Top

Data in number fields can be entered in all common formats: binary, octal, decimal, hexadecimal. Binary strings must be prefixed with "0b", octal strings must be prefixed with "0o", and hexadecimal strings much be prefixed with "0x". Number fields also accept accept scientific notation such as 1.2e3 for 1200. Infinity can be a valid option for a number field. Infinity can be specified by entering "Infinity" or "1e9999" in the form field.

Figure 39 : Web Application - Individual Profile - Validating Input

Drop-down field

Top

Drop-down fields provide a specific and limited set of options.

Insertion Loss field

Top

An insertion loss field is a list of frequency (in MHz) and dB loss pairs that define an insertion loss curve. The insertion loss curve is used to generate the horizontal eye opening (HEO) and the vertical eye opening (VEO) pass/fail criteria.

A table of the pairs (sorted first by frequency and then by dB loss) and a graph of the curve is displayed in this field. As the values in the table are changed, the chart will be updated to show the latest. Please note that while the chart may be updated, the actual values will not be saved until the entire profile is saved.

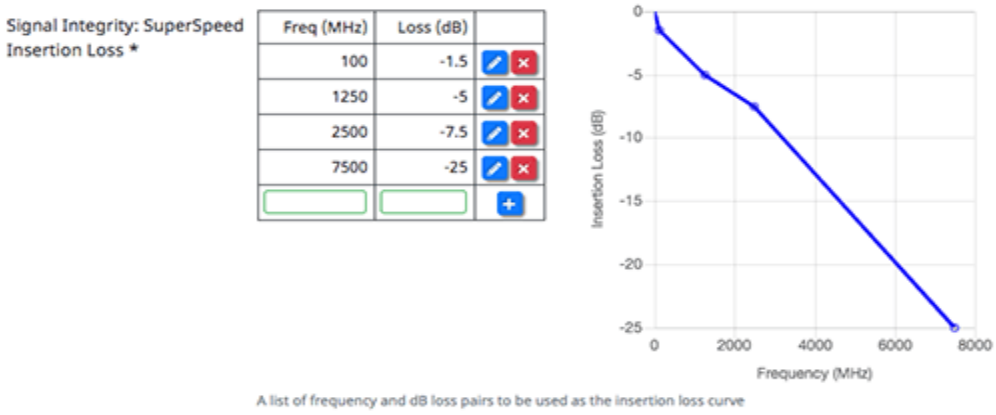


Figure 39 : Web Application - Individual Profile - Insertion Loss Field

To add a new frequency and dB loss pair, simply enter the data into the blank fields at the bottom of the table and click the **+** button. The new data pair will be added as a new row in the table at the appropriate location. Valid frequency values are between 0 MHz and 100,000 MHz and valid dB loss values are between 0 dB and -100 dB. If the data is invalid, the entry fields will be highlighted in red. If the data is invalid or missing, clicking the **+** button will not add a new row.

resorted if needed.

To remove an existing frequency and dB loss pair, click on the **Red X** icon to delete that row.

Duplicate frequency and dB loss pairs are not allowed. If a added pair or edited pair results in a duplicated data pair, a warning message will appear and no new row will be added to the table.

Saving or Cancelling Changes

Top

To save the changes made in the profile, click on the **Save** button. If any field fails client-side validation, the form will scroll to that field to be corrected.

***Figure 41** : Web Application - Individual Profile - Input Required*

It is possible that a submitted test profile will fail server-side validation. In that event, an error message will be displayed at the top of the form. If the test profile is successfully saved, the user will be returned to the test profile page with the updated values.

To cancel the changes made, click on the **Cancel** button. Please note that any changes made will be lost and are not recoverable.

Top

8.7 Settings

The Settings section provides general information about the Advanced Cable Tester v2 and the ability to change core settings.

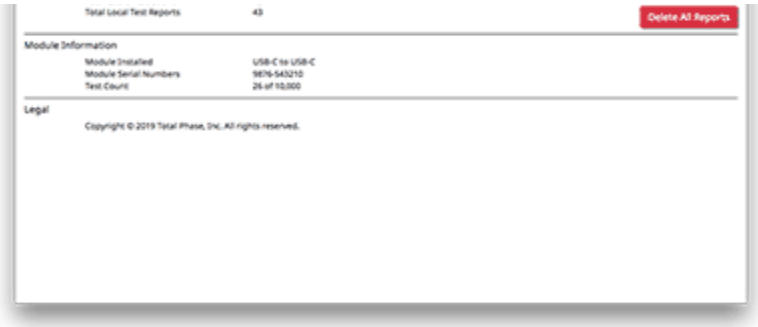


***Figure 42** : Web Application - Settings*

8.7.1 Device Information

This section displays information specific to the Advanced Cable Tester v2 device.

Device Name

Top

The Device Name appears in the main navigation header throughout the Advanced Cable Tester v2 web application. If multiple ACT v2 tester are in use, it provides an easy way to differentiate the devices. To change the name of the tester, simply enter the new name and click the **Update** button.

Other device information

Top

Additional information available in this section is described in Table 16.

Table 16 : Device Information

Firmware Version	Current version of software installed on the Advanced Cable Tester v2.
Hardware Version	Current version of hardware installed on the Advanced Cable Tester v2.
Serial Number	Serial number of the Advanced Cable Tester v2. This serial number should match the label on the rear of the tester.
Module Insertion	The cable test modules use an edge connector system to interface with replaceable connector interfaces. The edge

Total Cable Test Count	The total number of cable tests that have been performed by this unit over its lifetime.
Total Local Test Reports	The total number of test reports that are currently in the non-volatile storage of the Advanced Cable Tester v2. The tester has a circular buffer and will maximize the number of tests that can be stored. Once the test starts to approach the limit, it will automatically delete the oldest tests. It is also possible to purge all the test on the tester by using the **Delete All Reports** feature. Please be careful because once the test reports are deleted, it is not possible to recover them.

8.7.2 Device Information

This section displays information specific to the cable connector module that is currently installed in the Advanced Cable Tester v2. The ACT v2 detects when a module has been inserted or removed and will update the information displayed here. If no cable module is installed, the interface will indicate that "No Module Installed." Additional information available in this section is described in Table 17.

Table 17 : Module Information

Module Installed	The type of Connector Module that is installed in the Advanced Cable Tester v2.
Module Serial Number	The serial number of the currently installed Connector Module.
Test Count	The total number of cable tests that have been performed on the Connector Module. A Connector Module is rated for up to 10,000 cable tests at which point the wear on the connectors make test results unreliable. Once a cable module reaches the maximum number of tests, it will no longer be usable by the Advanced Cable Tester v2.

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9.2 Life Support Equipment Policy

Total Phase products are not authorized for use in life support devices or systems. Life support devices or systems include, but are not limited to, surgical implants, medical systems, and other safety-critical systems in which failure of a Total Phase product could cause personal injury or loss of life. Should a Total Phase product be used in such an unauthorized manner, Buyer agrees to indemnify and hold harmless Total Phase, its officers, employees, affiliates, and distributors from any and all claims arising from such use, even if such claim alleges that Total Phase was negligent in the design or manufacture of its product.

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9.3 Contact Information

act_v2-v2.0.0.pdf (1 MB)