

# **USB Implementers Forum E-Marker Testing Methodology**

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## Introduction:

The purpose of this document is to provide USB-IF authorized cable test labs a testing methodology for the certification testing of USB Type-C™ cables with Electronic Markers. This document will outline the necessary equipment, required tests, and testing processes for testing USB Type-C™ cables with E-Markers. This document will not provide detailed explanations as to the purpose of the tests. For more detailed and in depth explanation of the required E-Marker tests please refer to the USB Power Delivery Compliance Plan. All follow up questions may be directed to [TechAdmin@usb.org](mailto:TechAdmin@usb.org).

## Equipment:

This section outlines the required test solutions for testing E-Markers in USB Type-C™ cable assemblies. There are two Methods of Implementation required for E-marker certification. These MOIs are the:

- Communication Engine MOI
- Deterministic MOI

An E-marker must pass all applicable tests in both MOIs in order to certify. You may find a list of PD test equipment found [here](#) under USB PD Testing Equipment.

In addition to the test solutions listed above. The PD File generator program must be used. The PD File Generator program can be found at [www.usb.org](http://www.usb.org).

## Required Tests:

Required tests are listed in the PD Compliance Plan found on the [usb.org](http://usb.org) website.

## XID:

End product USB Type-C™ cable vendors that implement an E-marker in a cable assembly must use an XID associated with vendor's company. The vendor is required to complete the XID request form found at [www.usb.org/developers/compliance/cable/](http://www.usb.org/developers/compliance/cable/) and submit it to [admin@usb.org](mailto:admin@usb.org) if he or she does not already have an XID. The XID is placed in the Cert Stat VDO field of the E-Marker. The Cert Stat VDO field is pure binary format. The USB-IF assigns XIDs by request through email only to companies in good standing. The XID number assigned by the USB-IF is decimal. It is the vendor's responsibility to convert the decimal number to pure binary format. . Test lab engineers are required to confirm that the XID used in the cable under tests' E-marker matches that which the USB-IF assigns. Authorized test labs must ask the vendor to provide the email sent by the USB-IF to the vendor containing the XID of the cable under test. This should be done prior to testing. If the vendor does not provide the email from the USB-IF containing the XID of the vendor's product under test, the E-marker tests are considered a Fail.

## Required Testing Practices:

This section outlines specific testing practices required of the test engineer.

1. The test engineer shall run the E-Marker tests for all USB Type-C™ cable certifications. If a vendor states that the USB Type-C™ cable under test does not contain an E-Marker, the test engineer is required to run the tests regardless.
2. USB Type-C™ to USB Type-C™ cable assemblies are required to implement an E-Marker with the exception of the following:
  - USB 2.0 Only USB Type-C™ to USB Type-C™ cable assembly with a current rating of 3A.
3. Test engineers shall cross-reference Table 3-2 “USB Type-C Legacy Cable Assemblies” in the USB Type-C™ specification when testing USB Type-C™ to legacy cable assemblies and take careful note of the conditions when an E-marker is required.
4. Test engineers shall run E-marker tests in all orientations of the cable. USB Type-C™ to USB Type-C™ cable assemblies have 4 orientations. USB Type-C™ to Legacy cables have 2 orientations.
5. Test engineers shall follow the latest version of the USB Type-C™ cables and connector’s compliance document and perform all required tests.
6. Test engineers shall submit a completed test report to the USB-IF.

## Equipment Setup and Methodology:

Each test solution vendor will provide a specific graphic user interface (GUI) to accompany their solution. Download the graphic user interface as directed by the test solution documentation. The test setup is simply to connect the respective test solution box to the system which has its respective GUI.

The vendor of the cable under test must submit the capabilities text file for the cable under test using the [PD Vendor Info File Generator](#) and provide the test engineer with the text file. Testing of the cable cannot continue without the text file generated by the PD Vendor Info File Generator tool. If the vendor has not submitted the text file, request that the vendor download the tool and submit the text file.

Once a completed PD Vendor Info File is received, open the GUI of your E-Marker test solution and upload the PD Vendor Info File. Based on the product information provided in the PD Vendor Info File, the E-marker test solutions will auto populate the required tests. E-Marker testing is automated with few tester required interactions. Follow the user prompts of the E-Marker test solution. Save all data and log files for submission to the USB-IF. If at any time the test solutions freezes or hangs, power cycle the solution and rerun all tests.

In Summary:

1. Follow all steps listed in the “Required Testing Practices” section
2. Obtain PD Vendor Info File for the cable under test
3. Download GUI for Communication Engine MOI and Deterministic MOI test solutions

4. Select which MOI to test first
5. Once selected, connect the Communication Engine MOI or Deterministic MOI test solution
6. to the host
7. Open GUI and upload PD Vendor Info File
8. Run automated E-marker tests and follow all user prompts
9. Save all data and log files generated for submission to the USB-IF
10. Repeat for all orientations of the cable
11. Repeat all steps for MOI not selected in step 4