



FAQ: Frequently Asked Questions

A better understanding of the Hilevel CurveMaster can be gained by browsing the questions and answers below.

Q: *What is the CurveMaster?*

A: The CurveMaster is a full-featured state-of-the-art curve tracer. It is a high-precision DC parametric tool with up to 64 SMU's. It can also perform extremely fast continuity tests to insure all pins of the die are connected within the device package, and verify that pins are not shorted internally. You'll also be able to verify that all power pins are connected to the common power rail, even if there are multiple power rails for different power sources.

Q: *What kinds of tests can be performed?*

A: There are basically three types of tests available:

1. VI or IV characteristic plot
2. Pin to pin connect test (verify all power pins connect to the power rail)
3. Continuity test
4. Batch tests together to "automate" testing

But there are features that set the CurveMaster apart from other curve tracers.

Q: *What are the major features of the Curve Master?*

A: Here is a brief overview:

1. IV and VI characteristics measurement: basic purpose of the CurveMaster.
2. Batch processing: multiple tests can be combined into one test suite and executed with a single button click.
3. Power pins: define up to 30 power pin groups and set a fixed voltage during the test for device setup.
4. Golden Pin or rather golden device: an ideal plot that the current device can be compared with, and set a programmable maximum deviation.
5. Go/No-Go testing in batch mode, exact failing points are shown in the interactive mode.
6. Apply a voltage on a pin or group of pins while curve tracing other pins.

Q: *Why are these features important?*

A: For multiple pin devices, taking IV and VI characteristics become more and more important tests for packaged devices. Functional testing is commonly done at wafer level, and after packaging a simple continuity test or IV/VI plots are taken to ensure good bonding. Standard curve tracers require an additional switching matrix, very often in-house designed with a number of switches operated manually. Our solution gives a software-based device configuration and concurrent multiple pins measurement feature with high accuracy and resolution. Automatic result reporting and a GUI interface makes it perfect for those applications.



Q: *What kinds of venues would benefit from the CurveMaster?*

A: Good applications for the CurveMaster would include (but be not limited to):

1. FA departments
2. Test houses
3. Device packaging service companies
4. Receiving Inspection
5. Final test in Production

Q: *How large of a device can be tested?*

A: The full-size, fully-loaded CurveMaster can test up to 2,048 pins. The CurveMaster Mini can accommodate up to 1,024-pin devices. Our system is targeted for multi-pin device testing, but it also has a banana plug setup for sequential, "one-pin-at-a-time" testing as well, without special fixtures. But the primary target for the CurveMaster is testing large devices *fast*.

Q: *Is the CurveMaster expensive?*

A: Generally you will find the CurveMaster significantly less costly than other curve tracers, with more features and faster throughput. Naturally the total price is directly dependant on how many channels you install (increments of 128 channels per board). Contact Hilevel for pricing on a specific configuration that will suit your needs.

Q: *Can the device be powered by the CurveMaster?*

A: Yes. In fact, it is unwise to leave power pins floating as unknown states may occur and yield unexpected results. Other curve tracers may not catch these conditions because they are slow and sometimes they "average" the measurements. The high-speed precision CurveMaster reveals what is *really* going on inside the device.

Q: *How long does it take to setup a test on the CurveMaster?*

A: Fast, fast, fast! The entire test and pin assignments can be defined offline in a simple ASCII text file using your favorite editor. Then just load the Setup file and start testing. Also, any setup parameters can be easily modified within the CurveMaster software and then simply saved to the Setup file.

Q: *My curve tracer is slow. Does the CurveMaster take long to execute?*

A: Again, it's FAST. We have multiple SMUs. The system can have from 4 to 64 SMUs installed and can measure multiple pins in parallel. This reduces test time for multiple pin devices dramatically. For example, a continuity test takes about 300ms for 800 pins on a device we tested, and a regular IV plot about 30 seconds for all 800 pins. We have a 20 pin demo device tested using only 8 SMUs and the complete VI plot is 13 seconds, that's about 800ms per pin.

Q: *Will it take long to learn how to use it?*

A: About 1-2 hours generally. You can get training from us, or even download training videos from YouTube or hilevel.com and train yourself! It's that easy.



Q: *How do I interface to my device?*

A: Use a Hilevel DUT board (Device Under Test). We can design a custom board for you to match your socket, or you can design it yourself (we provide the generic Gerber files). You can also use one of our universal DUT boards and hand-wire to your socket.

Q: *Can the CurveMaster determine if the curve plots are correct?*

A: Certainly. Start with a known-good device (i.e., "golden") and save the curve trace results. Using the Golden Pin feature, you set the desired tolerance that is acceptable for these devices. Then every subsequent device can be compared to the golden device *automatically*. CurveMaster reports PASS or FAIL. This is a great time-saver when you have a lot of devices to test, such as in Receiving Inspection or Production.

Q: *Will I be able to save CurveMaster plots for my documentation?*

A: There are two ways to save the results. You can easily save the curve plot on the screen as a graphic file. Supported formats are .BMP, .JPG, and .PNG. you can also save the measured data at all sample points and import it into your favorite tool, such as Excel, and generate plots of your own.

Q: *Is the CurveMaster considered portable?*

A: Yes. It can be operated on a benchtop or in a rack. For the full-size CurveMaster that is fully populated, we recommend our mobile lab cart.

Q: *Can the CurveMaster perform a Family of Curves trace on a single transistor junction?*

A: Yes, Family of Curves is standard in all CurveMaster models.

If you have a question that has not been addressed here, please contact Hilevel. We may expand our FAQ's to include it!