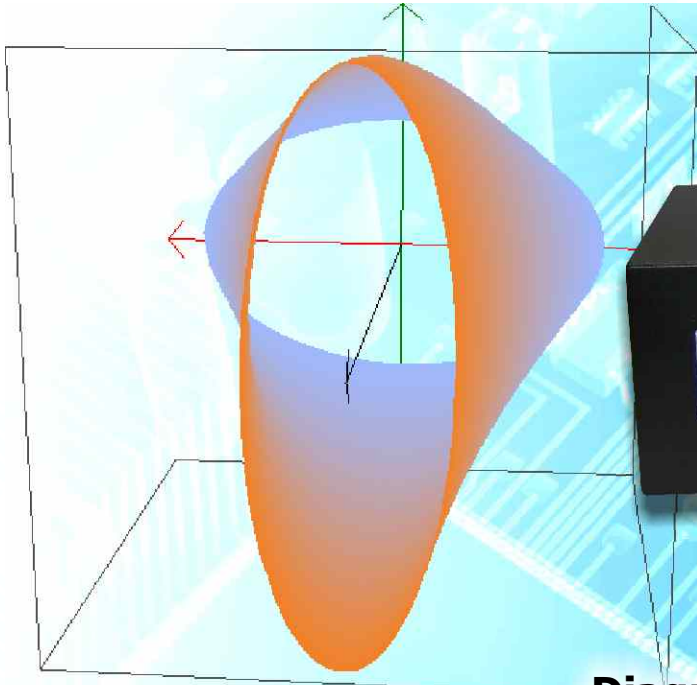# Detect more faults on PCBs by increasing test coverage

- Diagnose PCBs without applying power
- Detect internally damaged components
- Identify leaky and incorrect components
- Find inconsistent devices
- Minimise risk of damage
- Reduce testing time

SYSTEM 8 Advanced Matrix Scanner
V-I signature tester with frequency sweep

The SYSTEM 8 AMS is an innovative solution for the analysis of components and complete PCB assemblies under power off conditions.

Using a unique test technique, the AMS offers access to electrical signatures for the detection of faults including internal damage and inconsistencies.

The AMS simply increases fault coverage and, at the same time, reduces fault-finding time .

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What is V-I signature testing?

V-I signature testing is an established and reliable technique for component fault finding on both analogue and digital boards. An AC voltage is applied to a test point (via a current limiting resistor) and the resulting current is measured. The results are plotted on a voltage/current graph which displays the signature of the test point.

Analysis of a V-I signature, usually by comparison with a reference, can lead to finding faults such as:

- ✓ Leaky components
- ✓ Internally damaged components
- ✓ Incorrect value components
- ✓ Inconsistent components
- ✓ Short and open circuits

Increased fault coverage with frequency sweep

The Advanced Matrix Scanner (AMS) module increases the fault coverage by varying the frequency of the AC voltage at which the V-I signature is acquired. The resulting curve is plotted in three dimensions which allows the variations of the V-I signatures to be observed over a frequency range. This can lead to finding faults that are not visible with a standard V-I analysis.
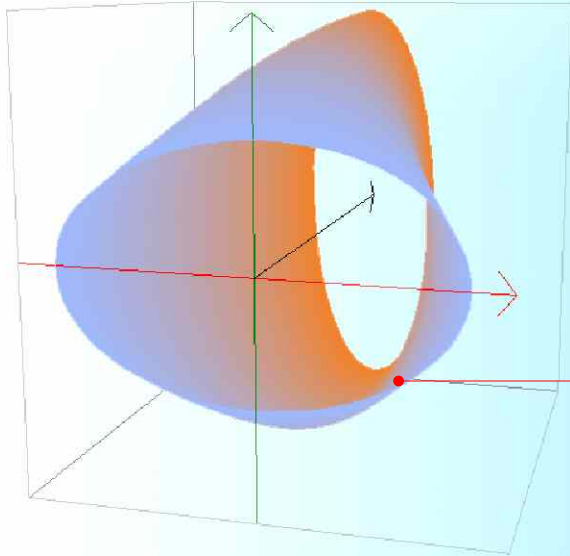
3D signature for a capacitor

V-I signature for a capacitor
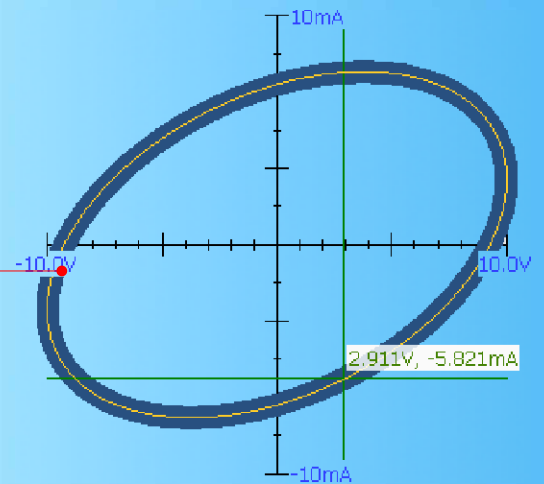
Power off = safe test

Signatures are acquired when no power is applied to the board under test. This is beneficial as it reduces the risk of damage to components during test and allows semi-skilled operators to run tests safely. More importantly, it is a major advantage as it allows even completely "dead" boards to be diagnosed.

Multiple channels = faster test

The AMS module is equipped with 64 test channels (expandable) to allow acquisition of signatures on high pin count components and even complete board assemblies (via a connector for instance). This drastically reduces the time needed to acquire data and enables PCBs to be diagnosed quickly without manually checking each pin.
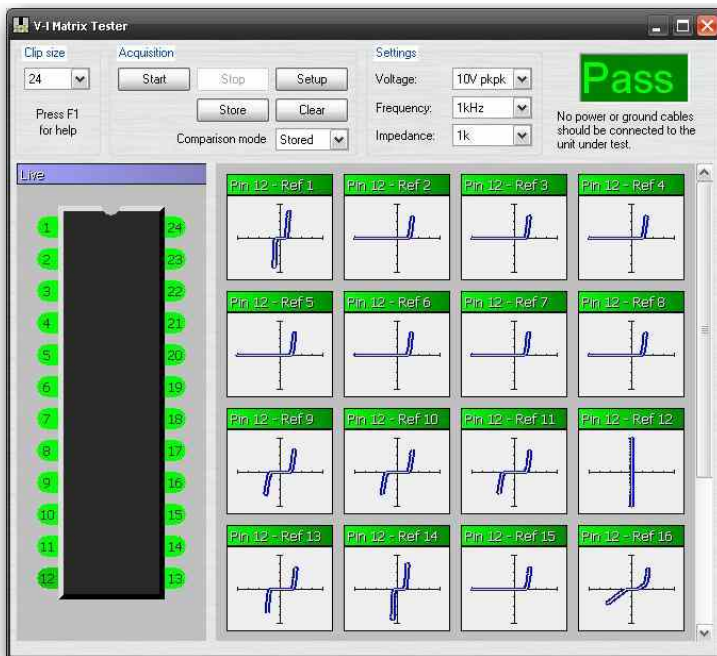
Increased fault coverage with matrix V/I

The AMS module also increases fault coverage by acquiring V-I signatures in Matrix mode. In this configuration, the module acquires the V-I signatures of each pin of a component or board with reference to all the other pins available (as opposed to a single reference pin in standard V-I testing). This generates an unprecedented set of data (400 signatures for a 20 pin device) that allows the most elusive faults to be detected.

Test capabilities

The Advanced Matrix Scanner (AMS) offers various forms of the V-I signature test with configurable parameters to extend its range of applications and increase test coverage:

- V-I signature tests with frequency sweep
- V-I signature tests with configurable frequency
- Matrix V-I tests with multiple reference
- Dynamic V-T tests with pulse outputs

Technical specifications

Number of test channels:	64 channels + 4 probes per module (expandable to 2,048 channels)
Test voltage:	2 V to 50 V peak to peak
Voltage resolution:	12 bits output waveform, 10 bits acquisition waveform
Test frequency (static):	1 Hz to 10 kHz
Test frequency (swept):	100 Hz to 10 kHz
Test current:	1 µA to 250 mA
Source impedance:	100 Ohm to 1 MOhms
Waveform modes:	V-I, V-T
Waveform display:	Multi-plot with single waveform zoom
Waveform display 3D:	3D projection with frequency plane
Waveform comparison:	Automatic comparison mask
Comparison tolerance (mask):	User adjustable, 2% to 25% of scale
Comparison tolerance (overall):	User adjustable, 40% to 95%
Waveform comparison mode:	Live, stored
Data storage:	To file with multiple sets per file
Package support:	Probes, DIL, SOIC
Number of pulse outputs:	4
Pulse cycles per channel:	Up to 4, user definable
Pulse amplitude:	Adjustable to +/-10 V
Channel compensation:	At user's request
PC requirements (minimum):	DirectX 9.0, 1GB RAM

Accessories

Standard:	2 x 32 way test cables
	1 x 64 way test cable
	4 x Ground leads
	4 x Pulse leads
	2 x single V-I probes
	2 x hook clips with cable
Optional:	EZ Prober
	Multiprobes
	Penprobes

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