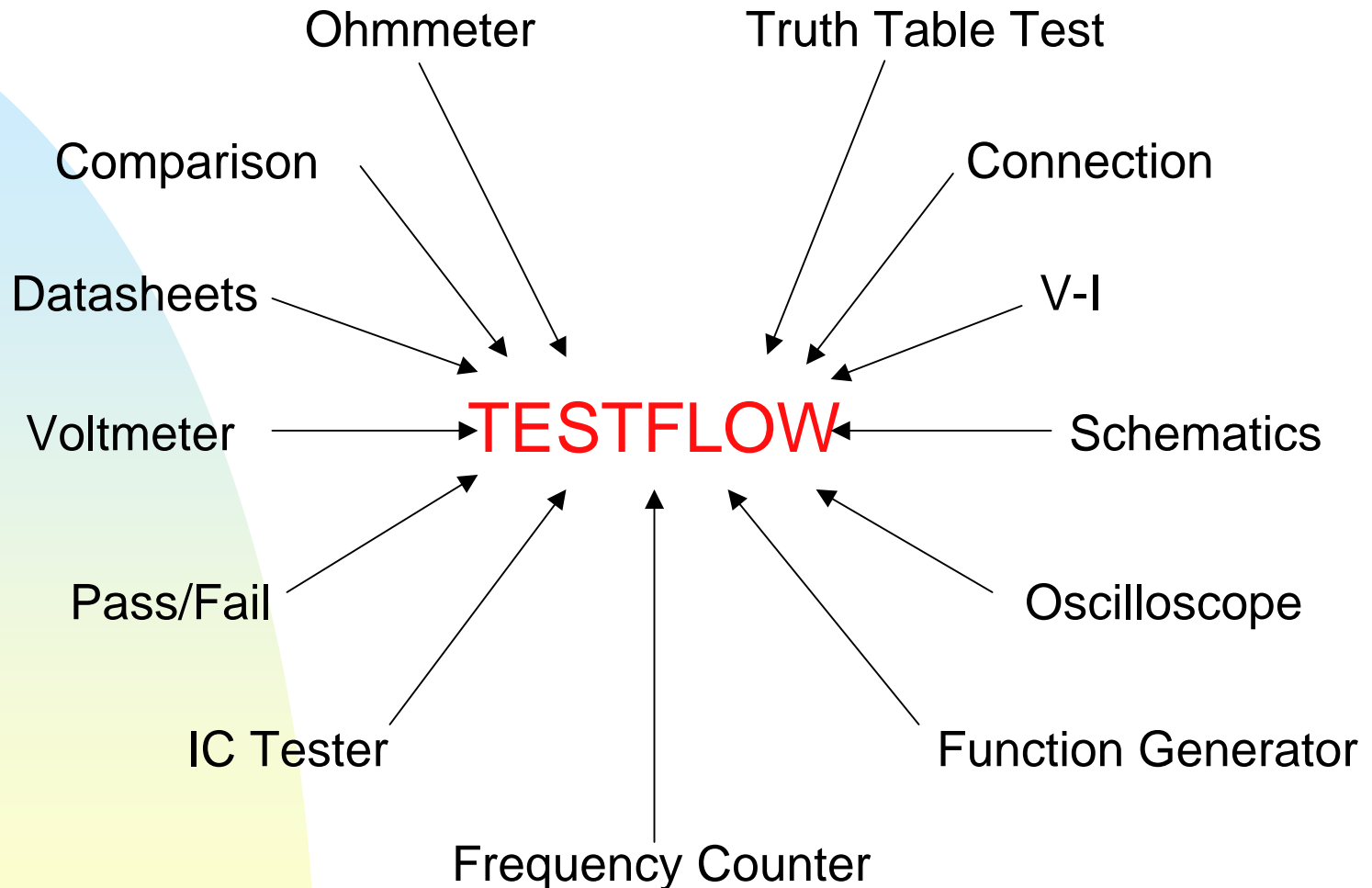


# SYSTEM 8 modules

## Multiple Instrument Station

- Digital Storage Oscilloscope
- Function Generator
- Digital Floating Multimeter
- Frequency Counter
- Universal I/O
- Fixed Power Supply

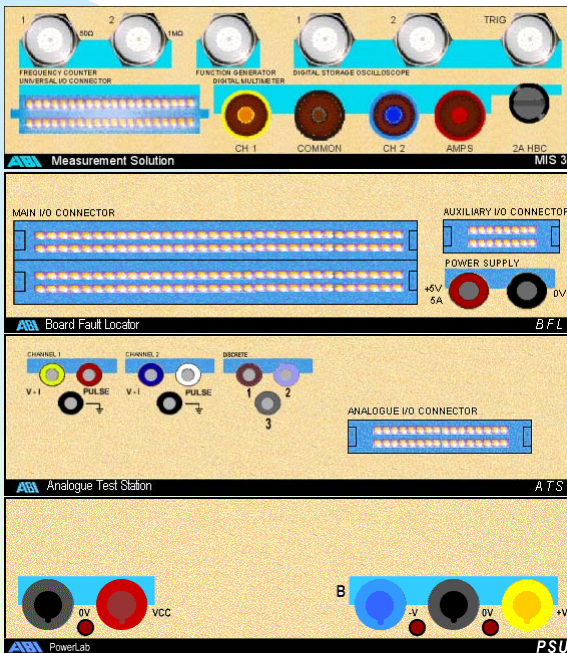
# Standard Test Techniques



# SYSTEM 8 modules

The SYSTEM 8 range contains 4 different modules offering both analogue and digital testing:

- Multiple Instrument Station (MIS)
- Board Fault Locator (BFL)
- Analogue IC Test (AICT)
- Power Supply Unit (VPS)



The BoardMaster 8000 PLUS contains all of SYSTEM 8 modules in a stand alone case

# Multiple Instrument Station

- **Digital Storage Oscilloscope**

- 2 channels plus 2 maths
- 100 MHz bandwidth
- 5 GS/s maximum sample rate
- 26 automatic measurement functions

- **Function Generator**

- 0.1 Hz to 10 MHz
- Sine, square and triangle waveforms
- Single-shot pulse
- AM, FM and pulse width modulation

- **Digital Floating Multimeter**

- 2 channels
- DC and AC current up to 2 A
- Ohms up to 20 MOhm
- Auto-ranging
- Minimum, maximum and average

- **Frequency Counter**

- 2 channels
- 2 MHz to 150 MHz
- Frequency, period, RPM and gate-width
- Event Counter
- Minimum, maximum and average

- **Universal I/O**

- 4 analogue channels
  - Voltages from -9 V to +9 V
  - Sinking and sourcing up to 20 mA
- 4 digital channels
  - Output and read back TTL logic levels

- **Fixed Power Supply**

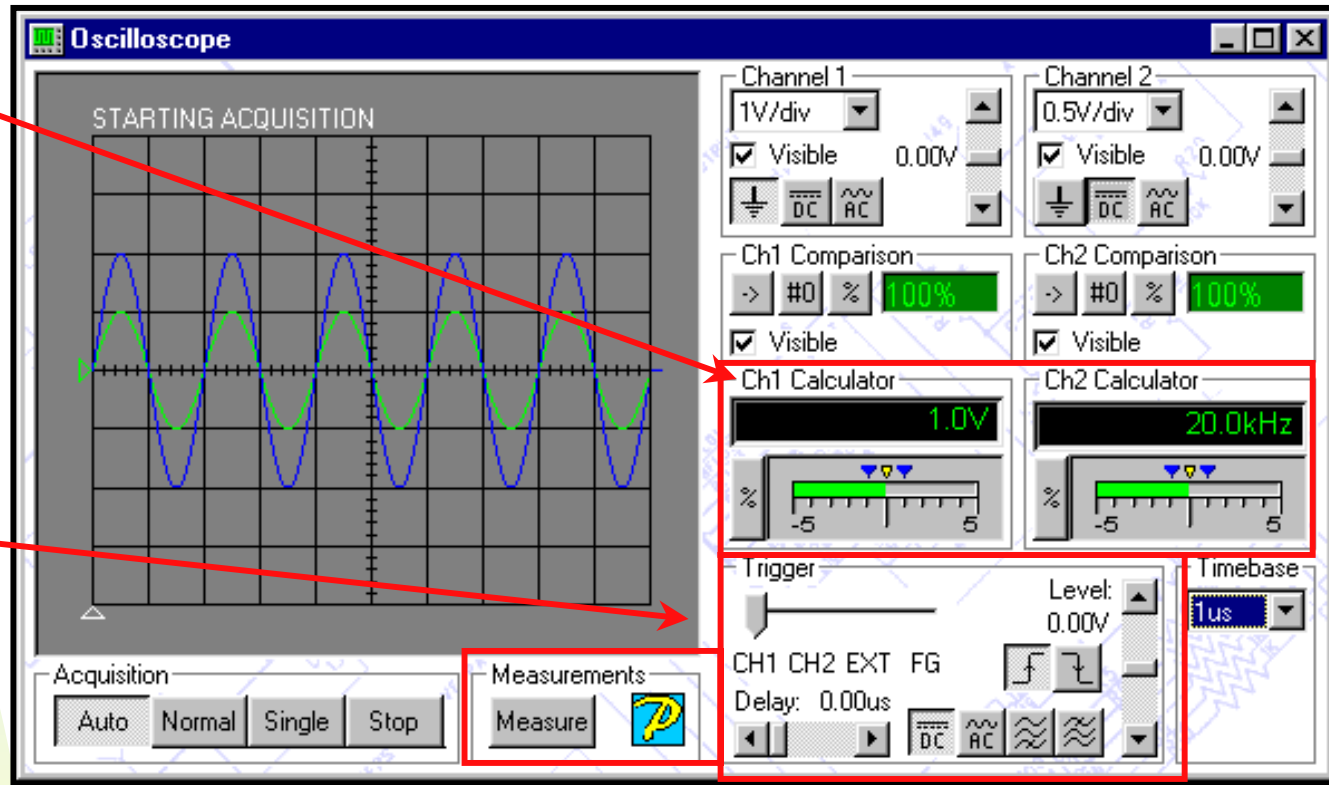
- 5 V output at 0.5 A
- +9 V output at 100 mA
- -9 V output at 100 mA
- Current monitoring



Making Light Work

# Digital Storage Oscilloscope

- Trace comparison
  - One click comparison
  - Quick set-up or user defined tolerance
- Trigger
  - 100% pre- and post trigger delay
  - Edge and level adjustment



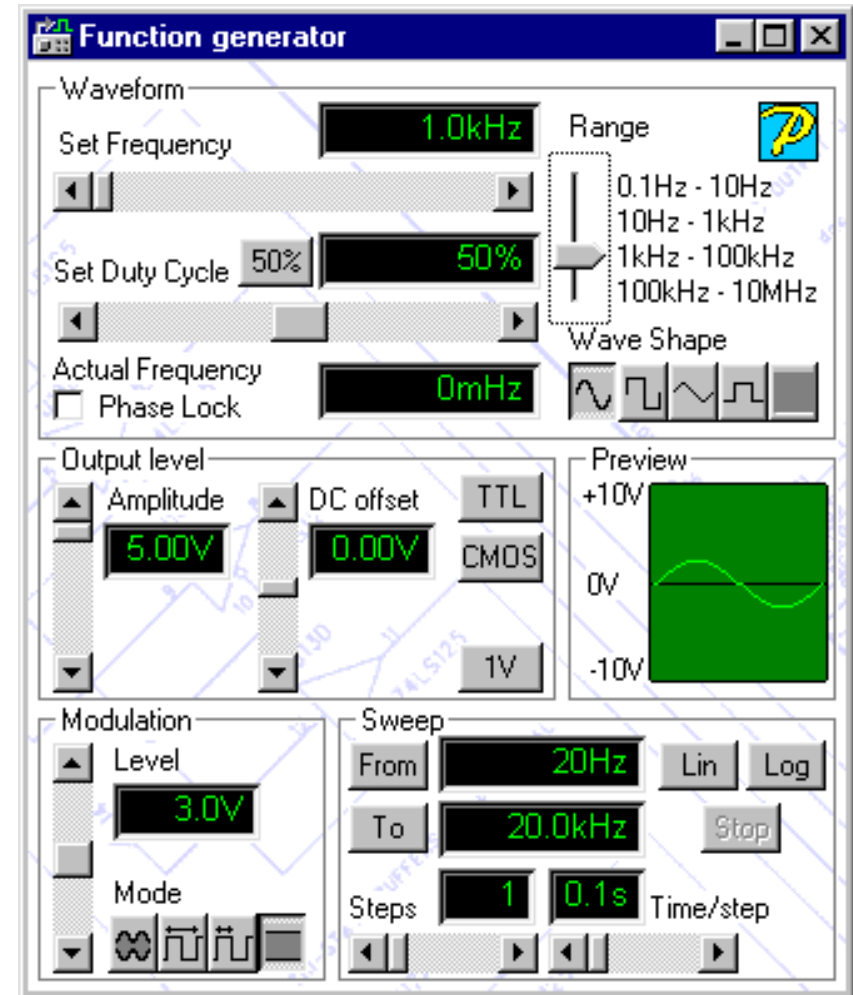
Automatic Measurements		
Amplitude	CH 1	2.00V
Top Peak	CH 1	1.00V
Undershoot	CH 1	0.00%
Period	CH 1	2.00us
Duty Cycle	CH 1	49.75%

- Auto Measurement

- Independent measurement for each channel
- Over 20 measurements to select from

# Function Generator

- Range, Frequency & Shape select
  - Simple controls and clear display
  - Sine, square, triangle and single shot pulse
- Sweep Mode
  - User defined start and stop frequency
  - Variable steps (log. or linear) variable interval
- Modulation
  - Amplitude, Frequency and Pulse width modulation
  - Variable level

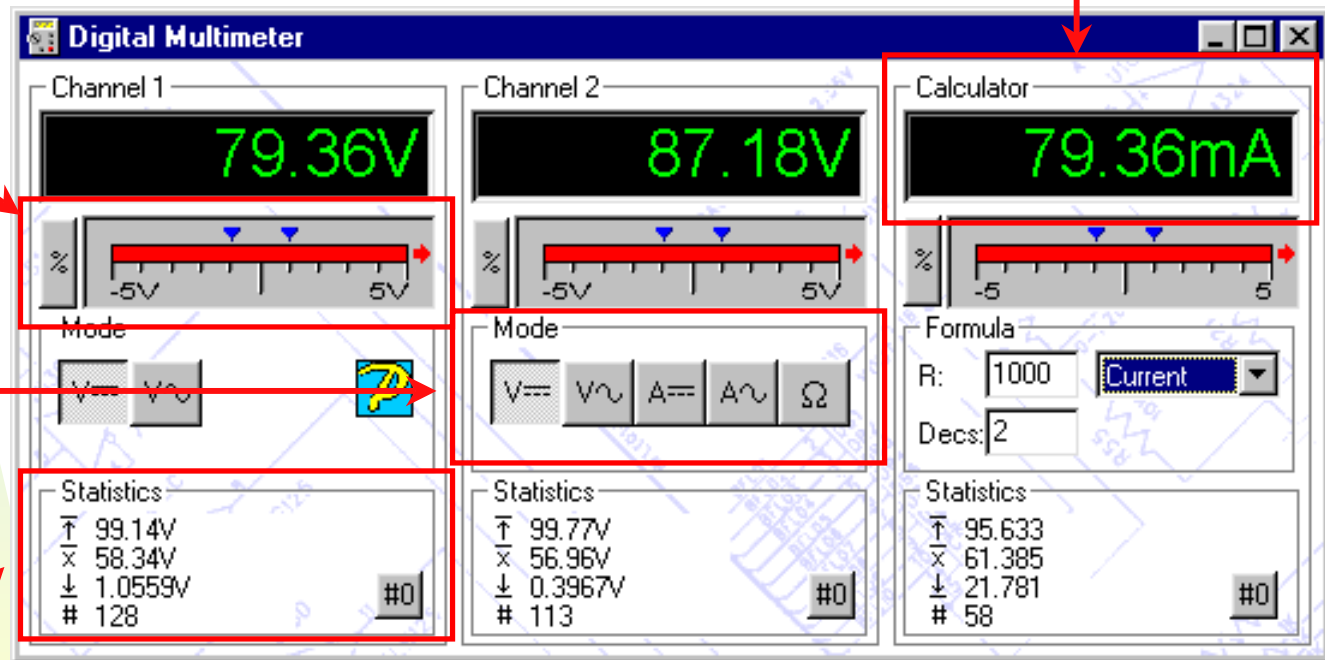


# Digital Floating Multimeter

- **Tolerance**

- Visual indication of comparison
- Quick set-up or user defined tolerance

- **Built in Calculator**



- **Channel Mode**

- DC/AC Volts & Amps and Resistance
- Floating Ground
- Auto-ranging

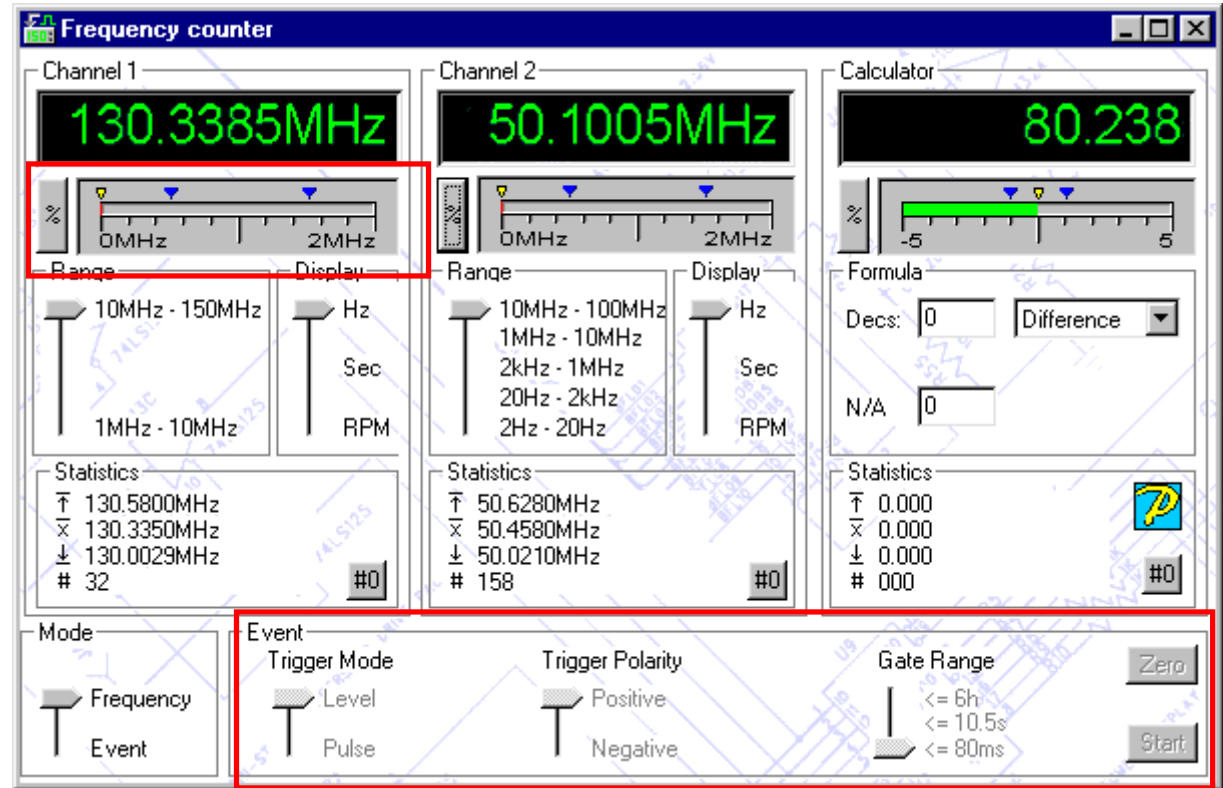
- **Statistics**

- Highest, lowest and average measurements
- Sample count reset

# Frequency Counter

- **Tolerance**

- Visual indication of comparison
- Quick set-up or user defined tolerance

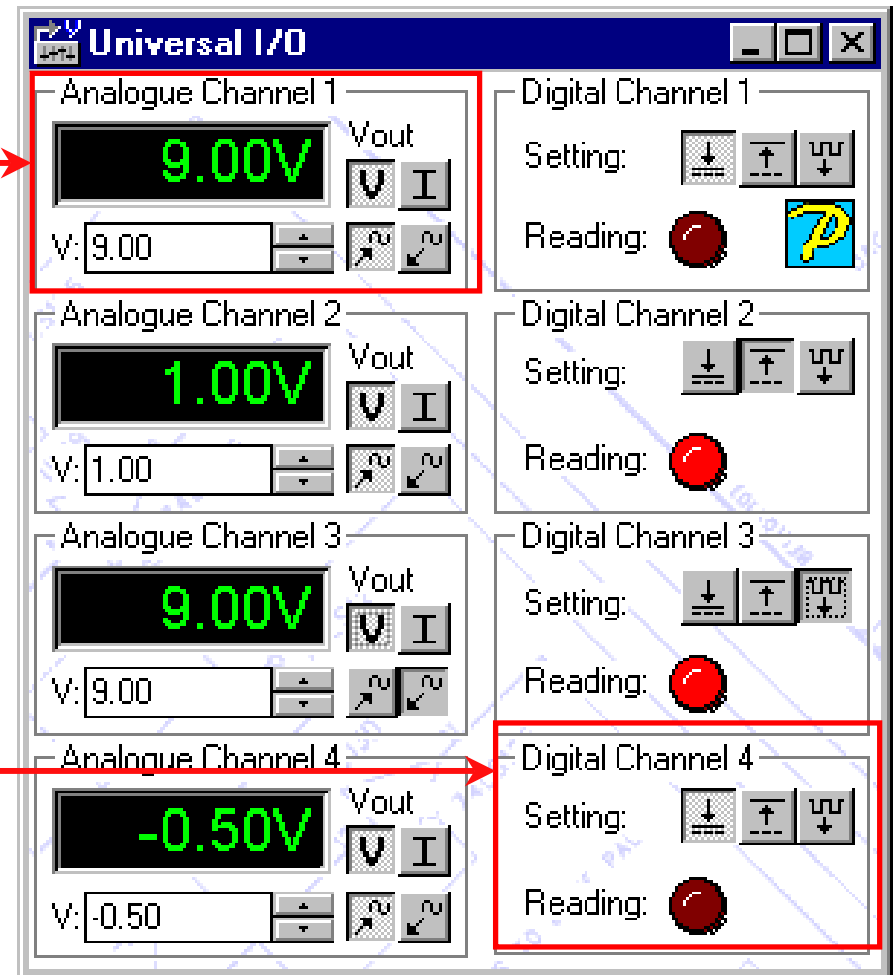


- **Event Counter**

- Trigger level or pulse setting
- Positive or negative polarity trigger
- 3 gate range to optimise for expected gate width

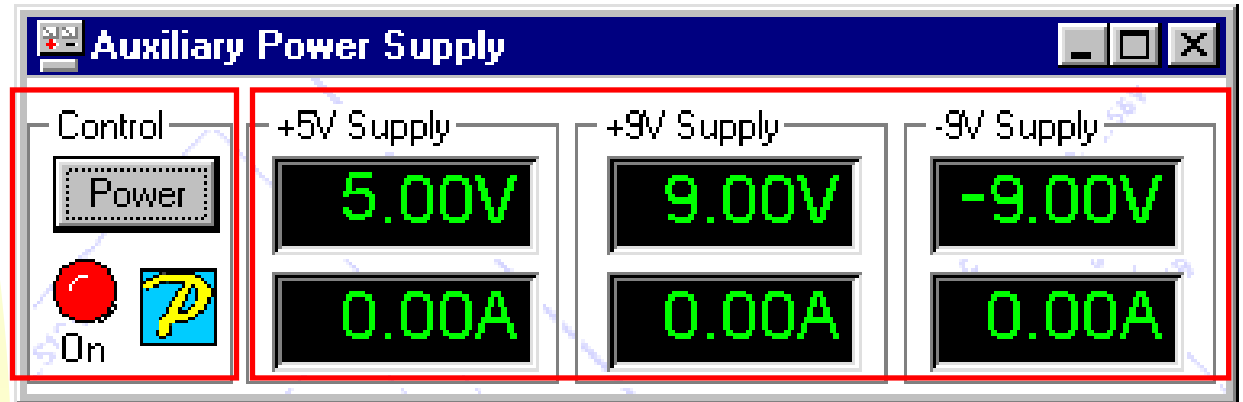
# Universal I/O

- Analogue
  - Variable +/-9 V output or input measurement
  - Variable 20 mA current output
- Digital
  - Individually set for logic Low or High
  - TTL input detection displayed on LED



# Auxiliary Power Supply

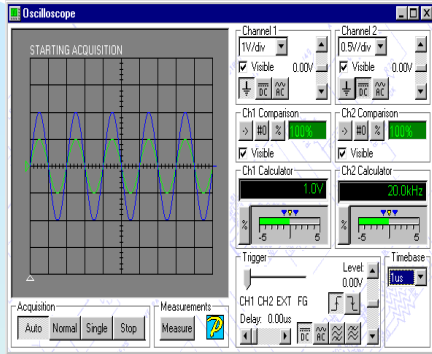
- Triple outputs
  - Clear display of 5 V, +9 V & -9 V
  - Current readout for each supply
- Control
  - Simple On/Off with status LED



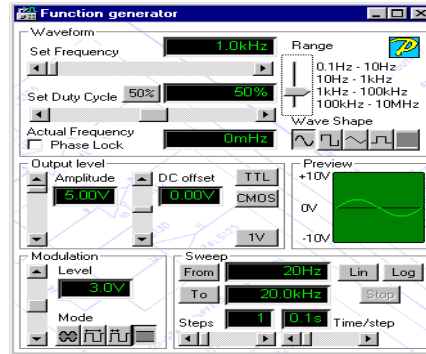


Making Light Work

Digital Storage Oscilloscope

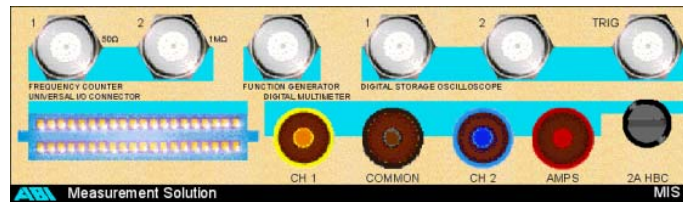
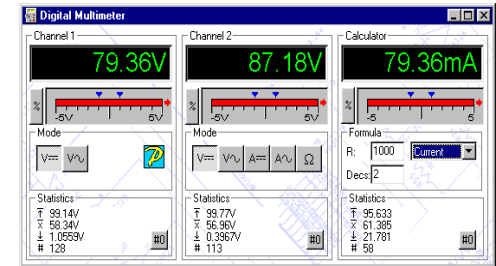


Function Generator



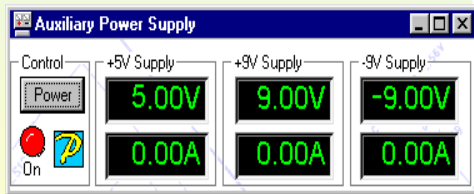
# Summary

Digital Floating Multimeter

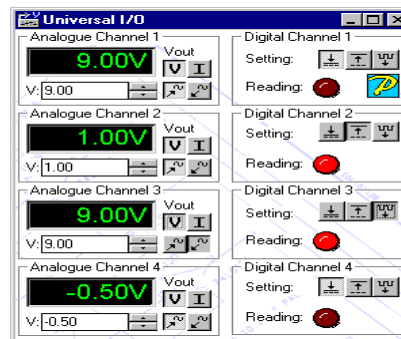


## Multiple Instrumentation Station

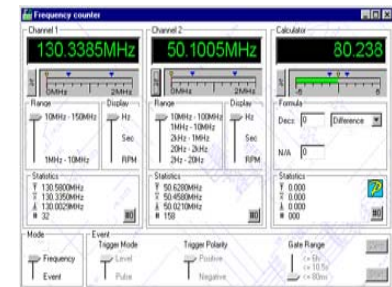
Auxiliary Power Supply



Universal I/O



Frequency Counter



# Board Fault Locator

- Digital IC Tester
- Live Comparison
- Graphical Test Generator
- Digital IC Identifier
- Short Locator
- EPROM Verifier

# Board Fault Locator

- **Digital IC Tester**
- 64 test channels per module
- 4 bus disable outputs per module
- 5 V/5 A power supply
- Truth table, voltage, connections, thermal and V-I tests

- **Live Comparison**
- Compare characteristics from good and bad boards simultaneously
- Alter board conditions and track changes in results through automatic comparison
- 2 Board Fault Locator modules required

- **Graphical Test Generator**
- 64 channels
- Graphically programmable for PCB setup and test
- Vectors can be saved, loaded and compared

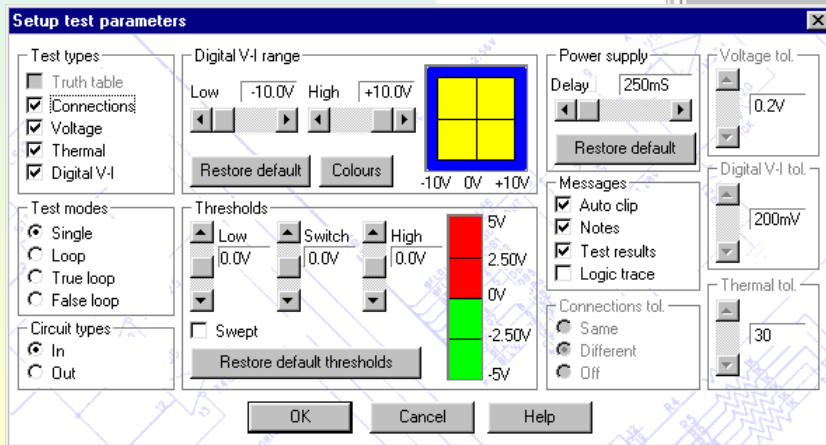
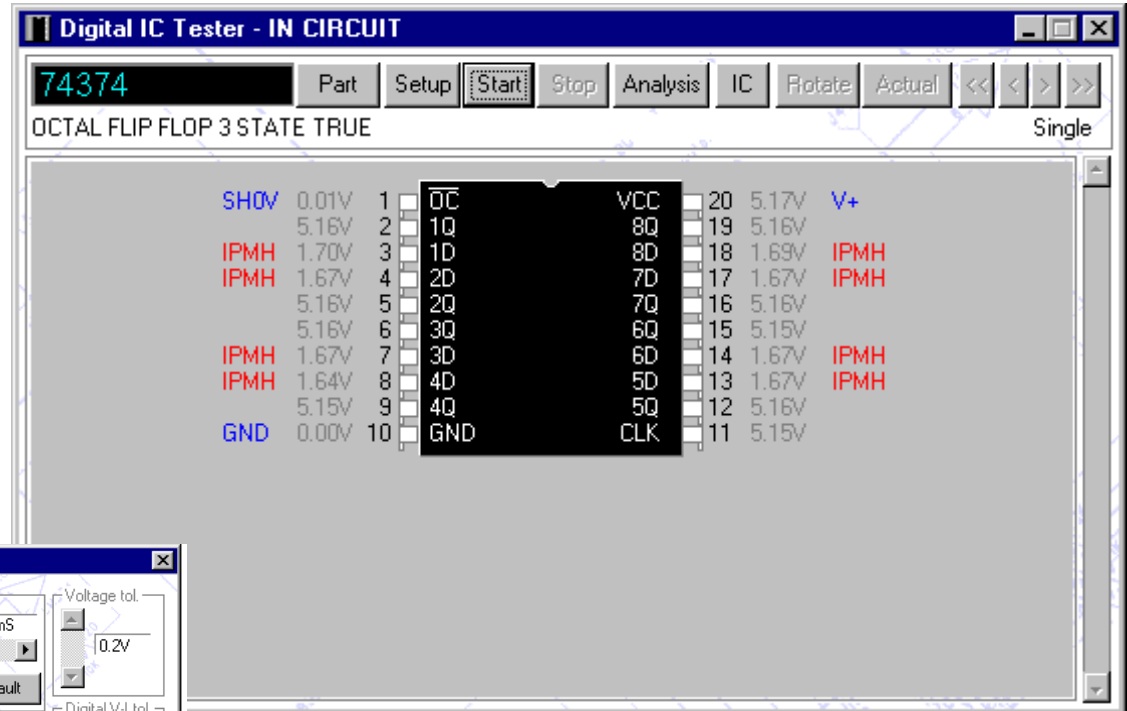
- **Digital IC Identifier**
- Unknown, illegible or house coded ICs
- Full library search by size
- In-circuit
- Out-of-circuit with adapter

- **Short Locator**
- 3 resistance ranges
- Audible and visual indications of proximity to short
- Audible continuity checker

- **EPROM Verifier**
- Read EPROMs in and out of circuit
- Save data to file
- Display CheckSum
- Compare data against Master file

# Digital IC Tester

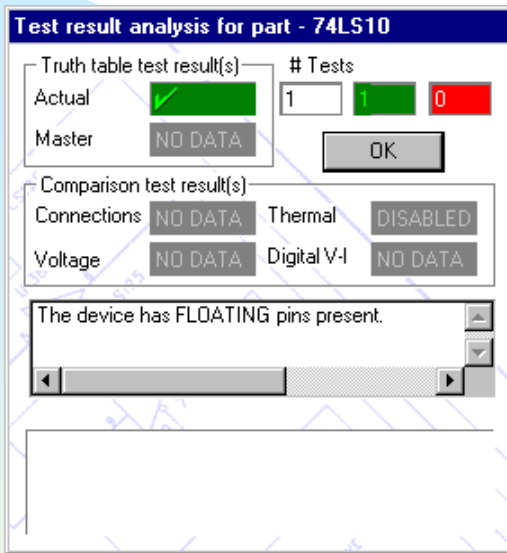
- Expandable to 256 test channels in 64 channel steps
- 4 bus disable outputs for guarding signals
- Loop modes for intermittent faults



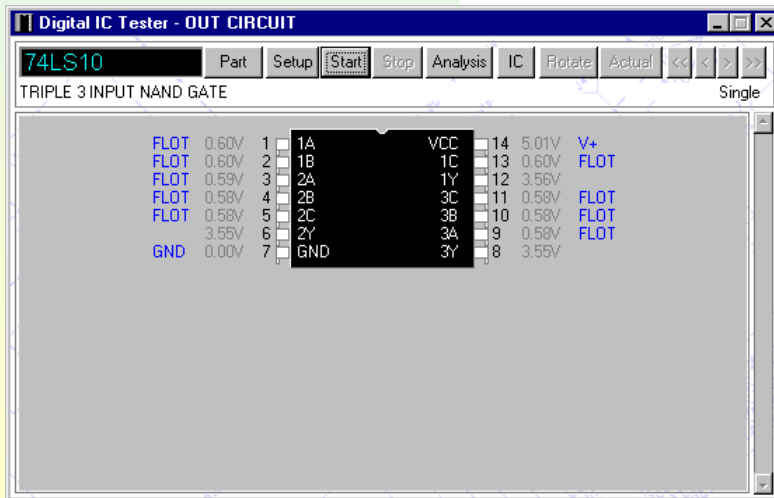
- Circuit compensation allows 'as wired' testing for fast fault-finding

- Programmable logic thresholds
- Logic trace mode to analyse test waveforms
- Automatic clip positioning

# Live Comparison

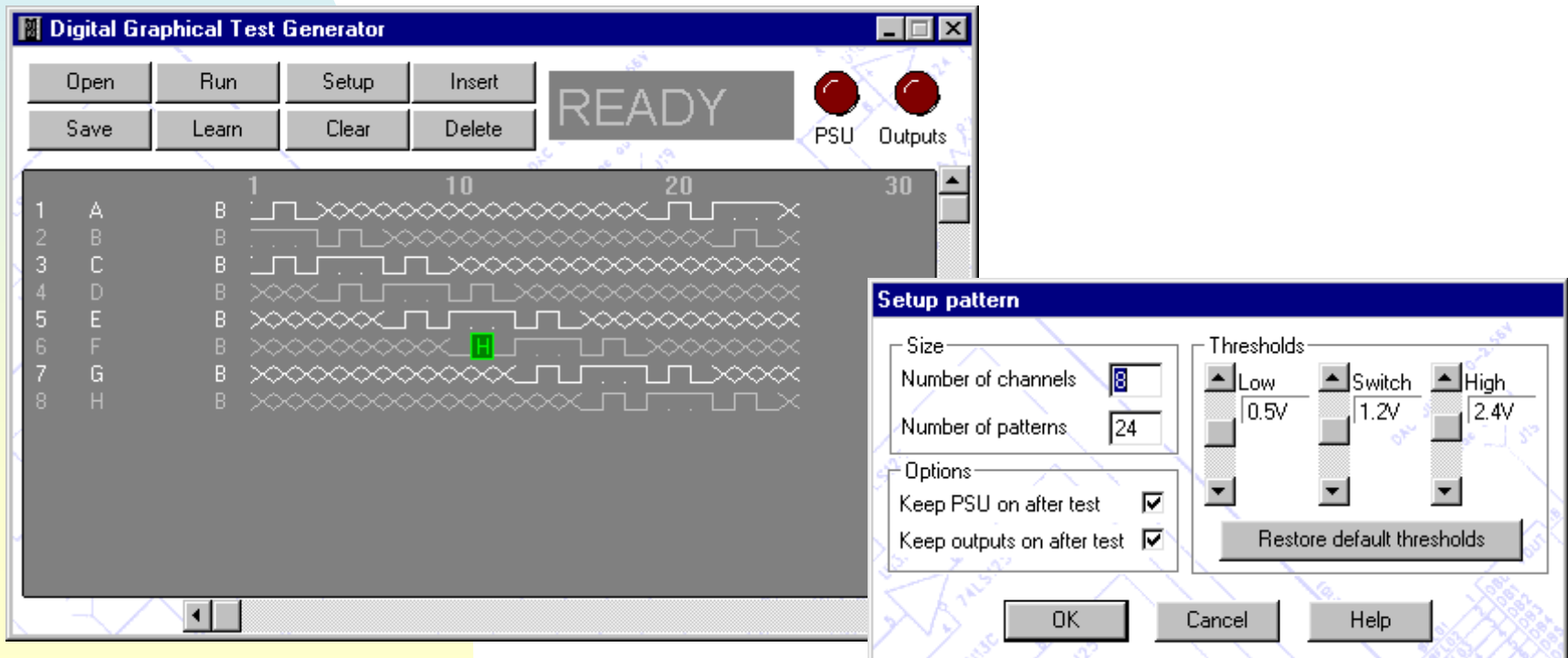


- Compare a faulty PCB with a known good board for both digital and analogue devices
- Compare results from a suspect PCB and a known good PCB at the same time
  - Vary conditions on the good PCB and track changes against the faulty PCB
  - Quickly identify a wide range of faults by comparing both power-on and power-off results



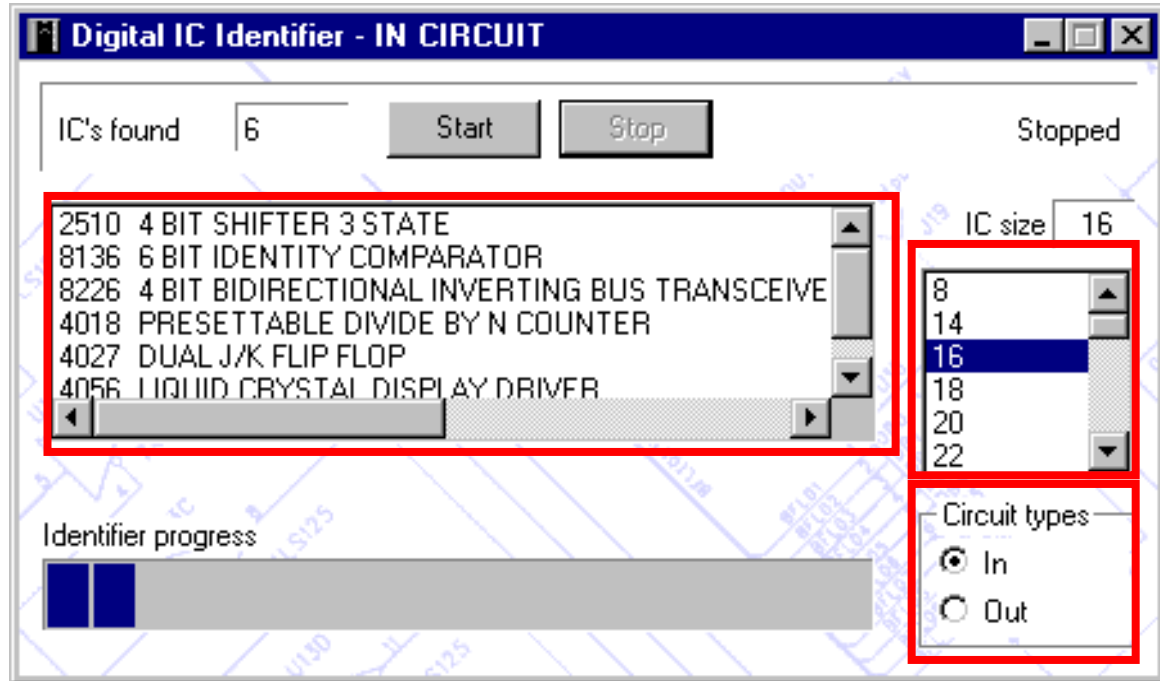
# Graphical Test Generator

- Allows a direct graphical interface with available test channels
- User programmable test vectors through use of the mouse
- Auto-learn simplifies the test generation process
- Vectors can be saved to file, loaded and run in TestFlows



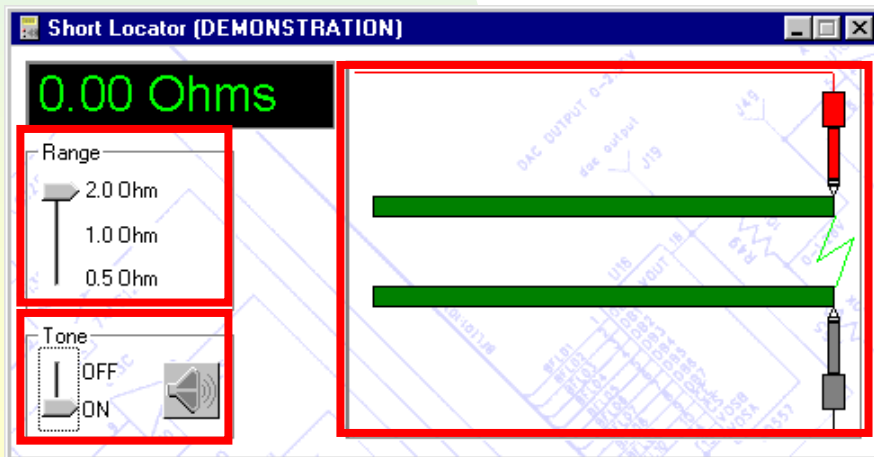
# Digital IC Identifier

- Full library search by size
- In-circuit, accounting for all logical connections
- Out-of-circuit with adapter
- Equivalent devices listed (where available) for unknown or illegible ICs
- House coded ICs are normally standard types and easily found within the library



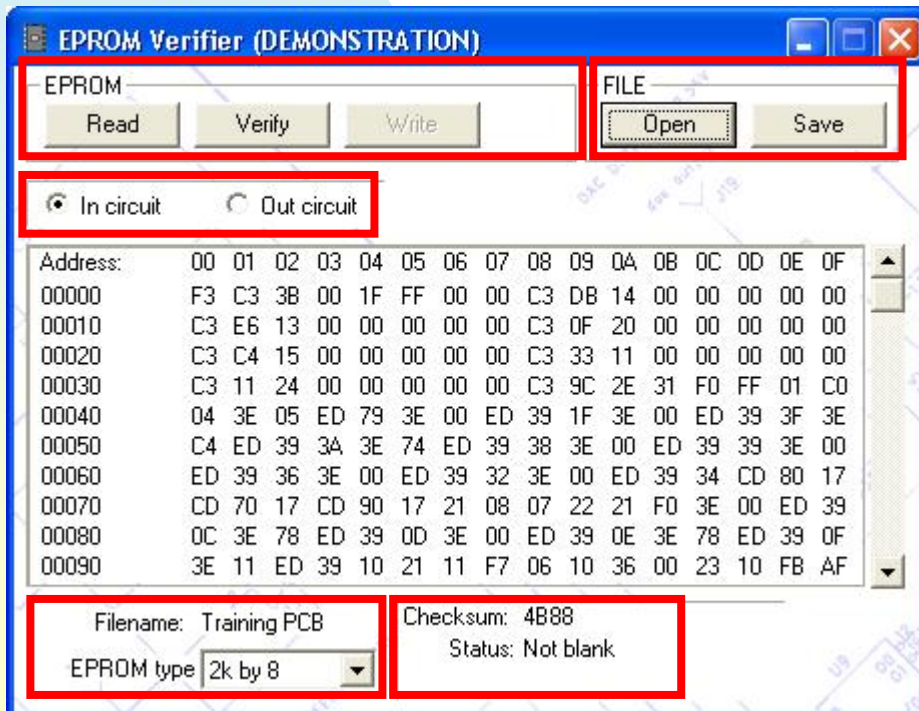
# Short Locator

- 3 resistance ranges
- Audible indication of proximity to short
- Audible continuity checker
- Visual indication of proximity to short
- Automatic probe calibration

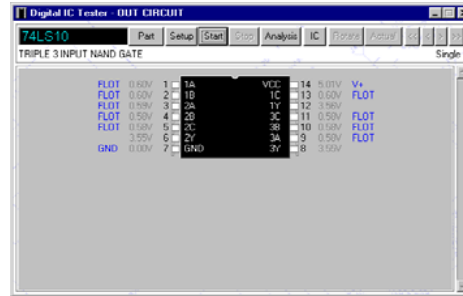


# EPROM Verifier

- Read / Verify EPROM file
- Load / Save file
- In / Out Circuit testing
- 16k to 2M EPROMs
- Checksum and Status

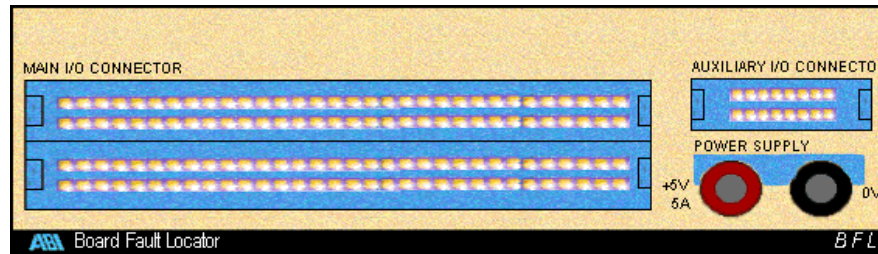
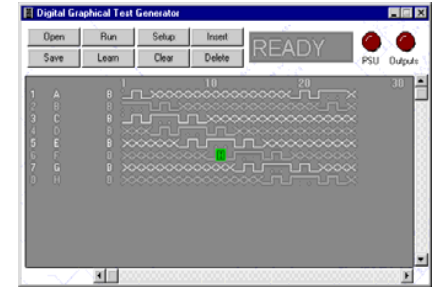


### Live Comparison

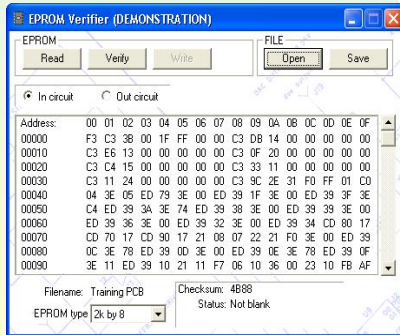


# Summary

### Graphical Test Generator

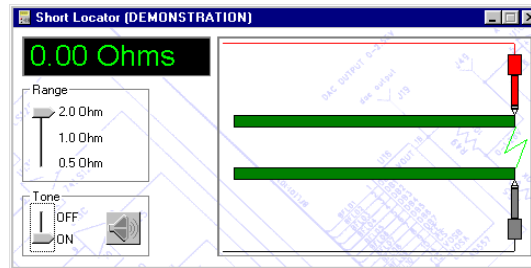


### EPROM Verifier

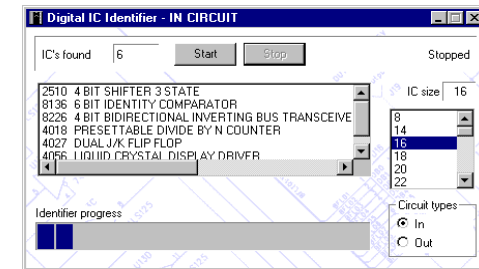


# Board Fault Locator

### Short Locator



### Digital IC Identifier



# Analogue Test Station

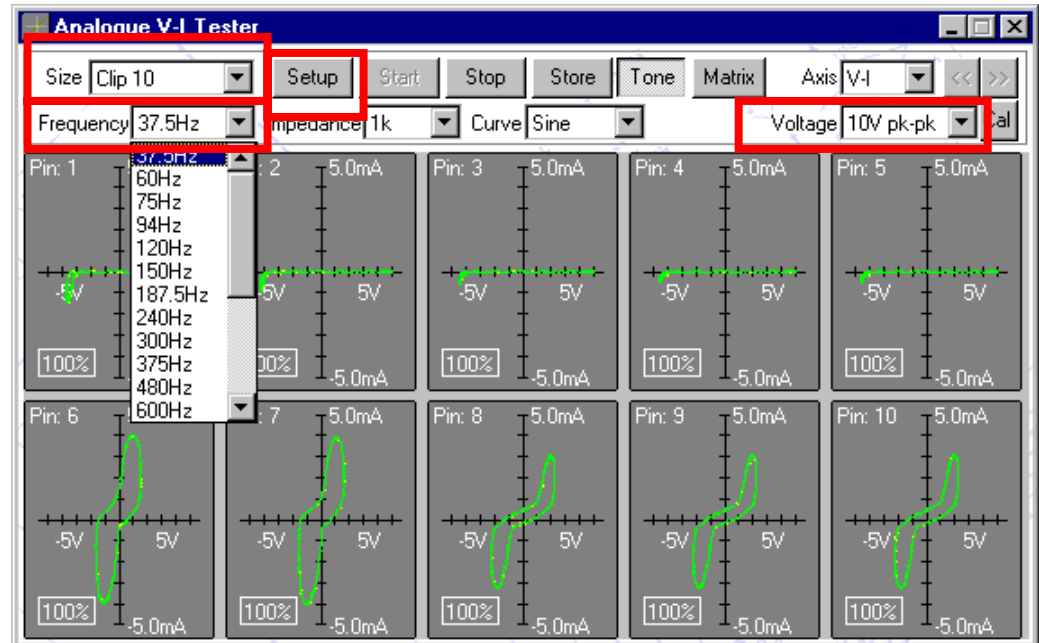
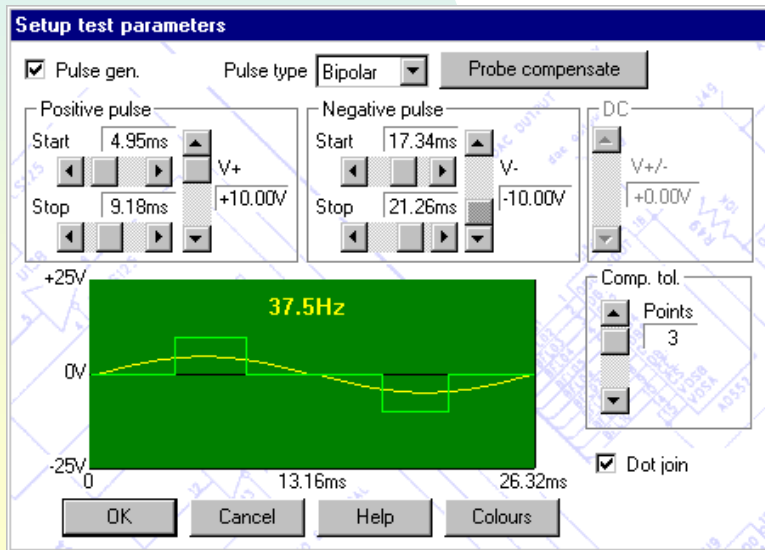
- **Analogue V-I Tester**
- 24 channels
- 2 probes for live comparison
- Variable test signal parameters
- Variable pulse output

- **Analogue IC Tester**
- 24 analogue channels
- 3 discrete channels
- Optimized for analogue components

- **Matrix V-I**
- 24 channels
- Rotating reference
- Multi-plot display
- Charge voltage protection

# Analogue V-I Tester

- Provides optimum settings for each component
- Dual probe mode for live comparison
- Audible tone, trace overlay and percentage comparison readout for all channel combinations
- Pulse facility with variable start position, pulse width and amplitude



# Analogue IC Tester

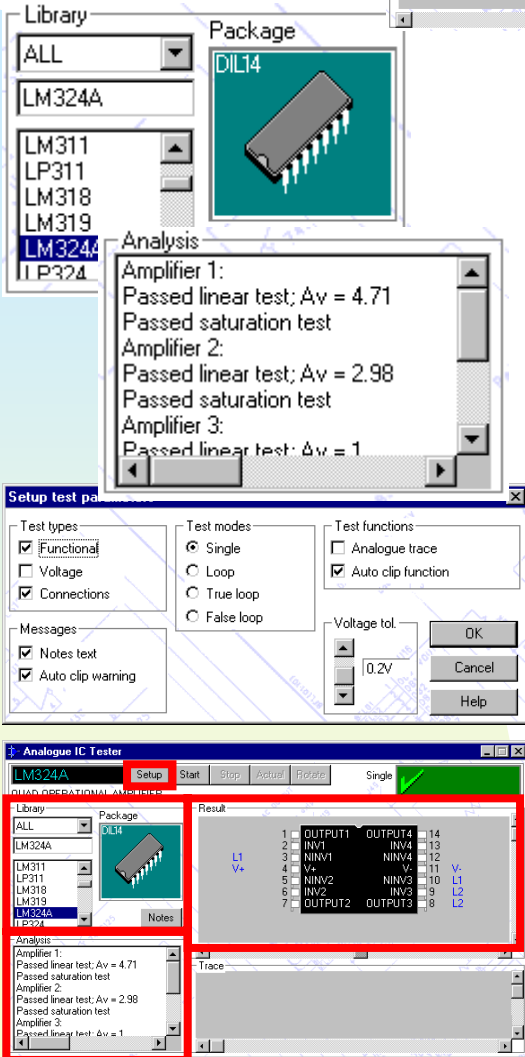
Result

1	OUTPUT1	OUTPUT4	14
2	INV1	INV4	13
3	NINV1	NINV4	12
4	V+	V-	11
5	NINV2	NINV3	10
6	INV2	INV3	9
7	OUTPUT2	OUTPUT3	8

L1 V+

V- L1 L2 L2

- 24 channels for voltage and current drive/sense
- 3 special channels for transistor and diode testing
- Library driven tests for op amps, transistors, comparators, optos, diodes and special function devices
- Automatic clip positioning
- Circuit compensation allows 'as wired' testing for fast fault-finding
- Simple pass/fail indication and more complex analysis for each test



Library: ALL, LM324A, LM311, LP311, LM318, LM319, LM324A, LP324

Package: DIL14

Analysis:

Amplifier 1:  
Passed linear test;  $A_v = 4.71$   
Passed saturation test

Amplifier 2:  
Passed linear test;  $A_v = 2.98$   
Passed saturation test

Amplifier 3:  
Passed linear test;  $\Delta v = 1$

Setup test parameters:

Test types:  Functional,  Voltage,  Connections

Test modes:  Single,  Loop,  True loop,  False loop

Test functions:  Analogue trace,  Auto clip function

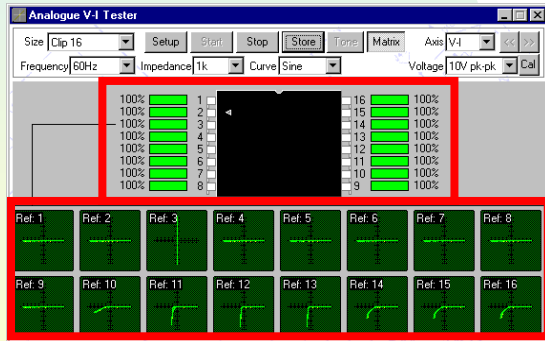
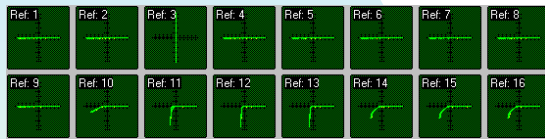
Voltage tol: 0.2V

Messages:  Notes text,  Auto clip warning

Analogue IC Tester: LM324A, Setup, Start, Stop, Abort, Repeat, Single

Result: (Same as top table)

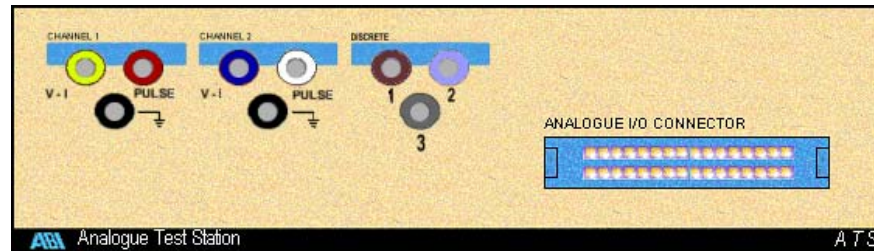
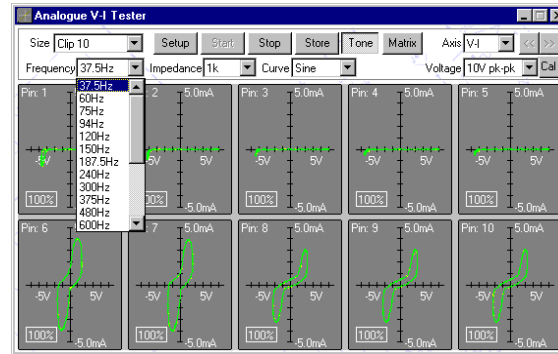
# Matrix V-I



- Performs a V-I test between every pair of pins on a device and in every single combination
- Data for each pin is collated and displayed in a graphical format to greatly improve fault coverage
- Up to 576 characteristics per device compared with 24 on standard V-I test
- No ground reference required
- Finds faults that could be missed with standard V-I test

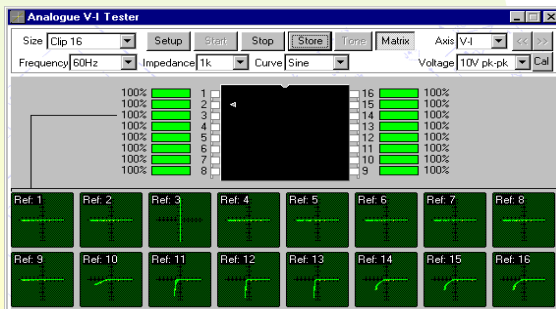
## Analogue V-I Tester

# Summary

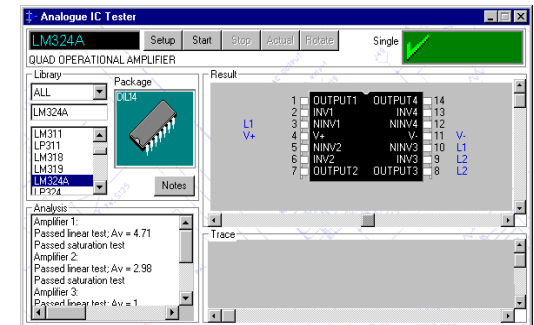


## Analogue IC Tester

### Matrix V-I



### Analogue IC Tester



# Power Supply Unit

- Variable Logic Supply

- Low voltage output for digital circuits
- 2.5 V to 6 V programmable in 10 mV steps
- 5 A in 10 mA steps

- Variable Positive Supply

- Positive voltage output for analogue circuits
- 0 V to 24 V programmable in 10 mV steps
- Maximum 1.5 A in 10 mA steps

- Variable Negative Supply

- Negative voltage output for analogue circuits
- 0 V to -24 V programmable in 10 mV steps
- Maximum 1.5 A in 10 mA steps

# Power Supplies

- Auto Measurements for voltage and current
- Variable current limit for +/- 24 V supplies
- Over voltage protection on Logic Supply
- Adjustable current trip
- Short circuit protection with unlimited duration and auto recovery

### Board Fault Locator (BFL)

- Digital IC Tester
- Live Comparison
- Graphical Test Generator
- Digital IC Identifier
- Short Locator
- EPROM Verifier

# Summary

### Analogue IC Tester (AICT)

- Analogue V-I Tester
- Analogue IC Tester
- Matrix V-I

### Variable Power Supply (VPS)

- Variable Logic Supply
- Variable Positive Supply
- Variable Negative Supply

← **SYSTEM 8** →

### Multiple Instrumentation Station (MIS)

- Digital Storage Oscilloscope
- Digital Floating Multimeter
- Auxiliary Power Supply
- Function Generator
- Universal I/O
- Frequency Counter

# Summary

The BoardMaster  
a wide variety of test tools  
compacted into a stand-  
alone unit to give  
unrivalled flexibility in the  
field of fault finding



# SYSTEM 8

---

**SYSTEM 8**  
**Premier**  
**2001**

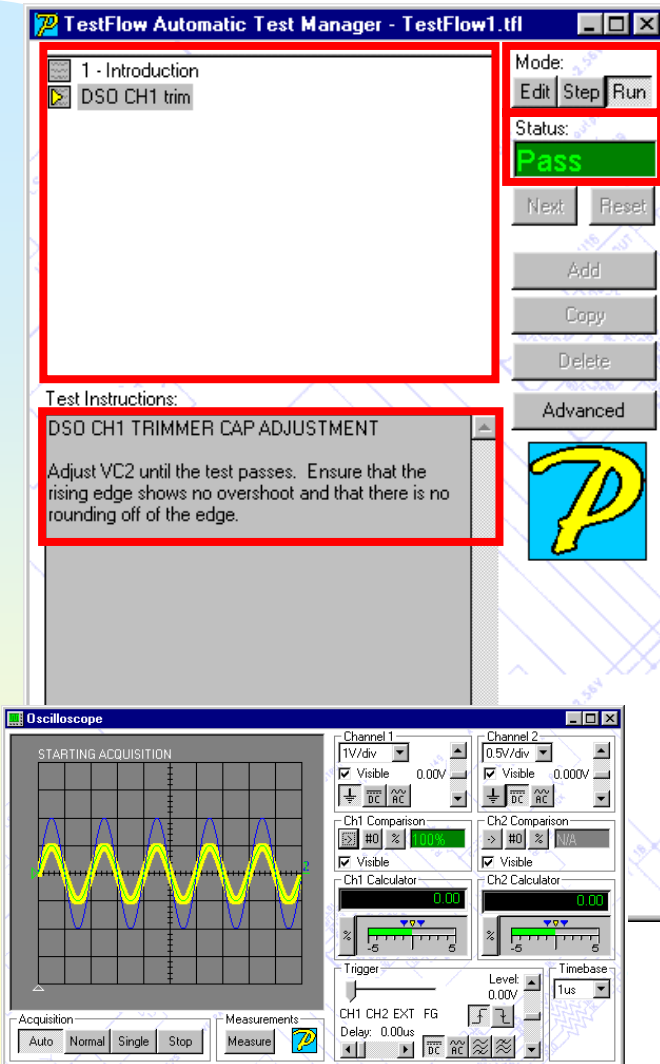


# Premier Software version 3.00

- Advanced control software
- Utility management systems
- Custom instrument design
- Automatic test procedures
- User definable logging,  
comparison and control facility

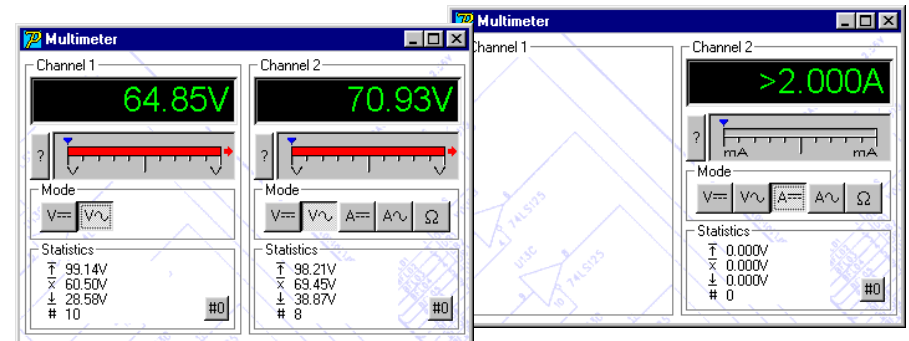
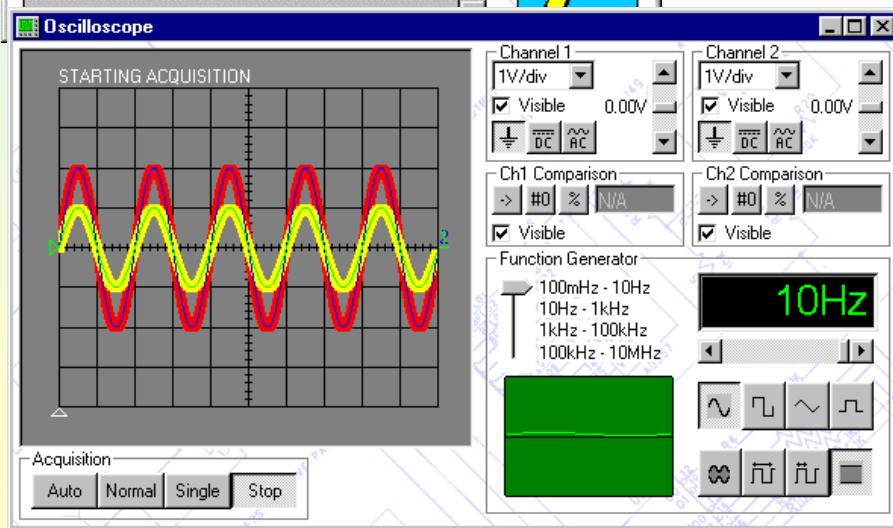
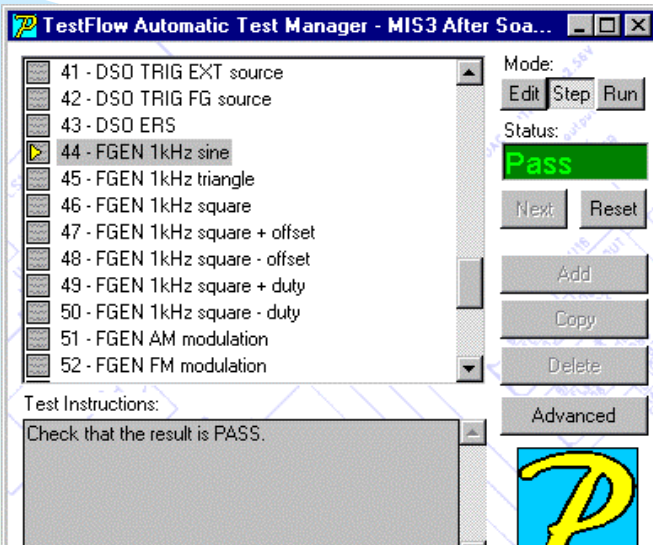
# Standard TestFlow

- Action buttons control the edit and run processes
- Change the order of items in the step list by dragging and dropping
- Instructions can be given for each step
- Pass/Fail flag gives a status for the whole test
- Instrument layouts settings and positions are saved in the TestFlow



# Custom TestFlow

- One custom instrument can be created and used in one, some or all steps
- Controls can be added or removed between steps
- Access to controls can be restricted
- Edit mode allows restricted controls to be altered by mirroring standard instruments



# TestFlow Example

TestFlow Automatic Test Manager - BFL Trai...

- 1 - Welcome
- 2 - Using TestFlow
- 3 - Identify Training PCB
- 4 - Digital IC Tester
- 5 - Device Library Selection
- 6 - Board Fault Locator (BFL) Supply
- 7 - Voltage Test
- 8 - Test Result Analysis
- 9 - Connections Test
- 10 - Vcc Detection
- 11 - Ground Detection
- 12 - Auto-clip positioning

Mode:  
Edit Step Run

Status:  
N/A

Next Reset

Add

Copy

Delete


Advanced

Test Instructions:

**ACTION**  
Make sure the training board is version TRN-003. Identify the Power Supply lead. Both items are pictured in SCHEMATIC.

**DESCRIPTION**  
The purpose of the Training Board is to demonstrate all the functions of BOARDMASTER or SYSTEM 8 modules. By providing examples of circuit and fault conditions the techniques of fault with the equipment will be highlighted. The PCB includes simple circuits for training in basic electronic principles.

The PCB is designed in sections to give optimum coverage for each aspect of the equipment. Circuit and fault conditions are applied by making a switch connected to a PIC which in turn energises relays that switch in components to alter the circuit.




Comment

Close

Due to the design of the control circuitry it is advised that the PIC and associated devices are not used. Normal operation of the circuit will be disrupted.

# TestFlow Example

TestFlow Automatic Test Manager - BFL Trai...

- 1 - Welcome
- 2 - Using TestFlow
- 3 - Identify Training PCB
- 4 - Digital IC Tester
- 5 - Device Library Selection
- 6 - Board Fault Locator (BFL) Supply
- 7 - Voltage Test
- 8 - Test Result Analysis
- 9 - Connections Test
- 10 - Vcc Detection
- 11 - Ground Detection
- 12 - Auto-clip positioning

Mode:  
Edit Step Run

Status:  
N/A

Next Reset

Add

Copy

Delete


Advanced

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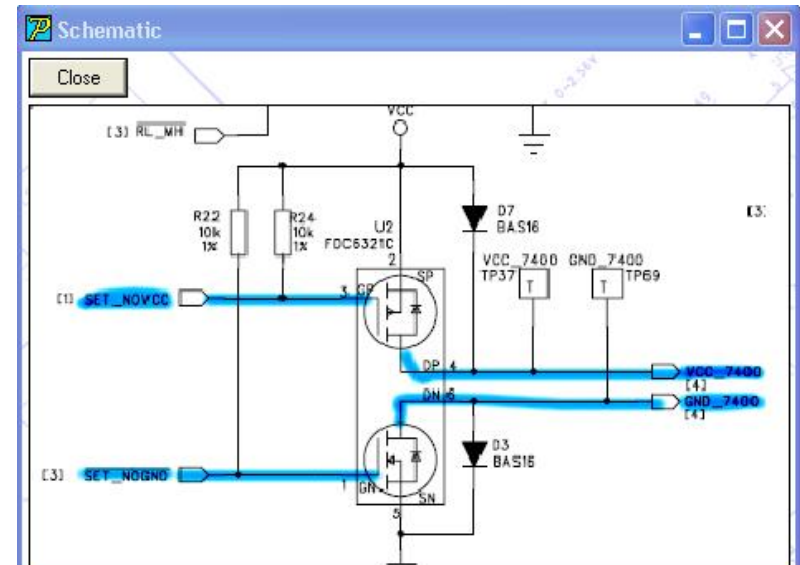


Digital IC Tester - IN CIRCUIT (DEMONSTRATION)

74LS00 Part [Setup] Start Stop Analysis IC Rotate Actual << < > >>

QUAD 2 INPUT NAND GATE Cal Loop 0

1	1A	VCC	14
2	1B	4B	13
3	1Y	4A	12
4	2A	4Y	11
5	2B	3B	10
6	2Y	3A	9
7	GND	3Y	8



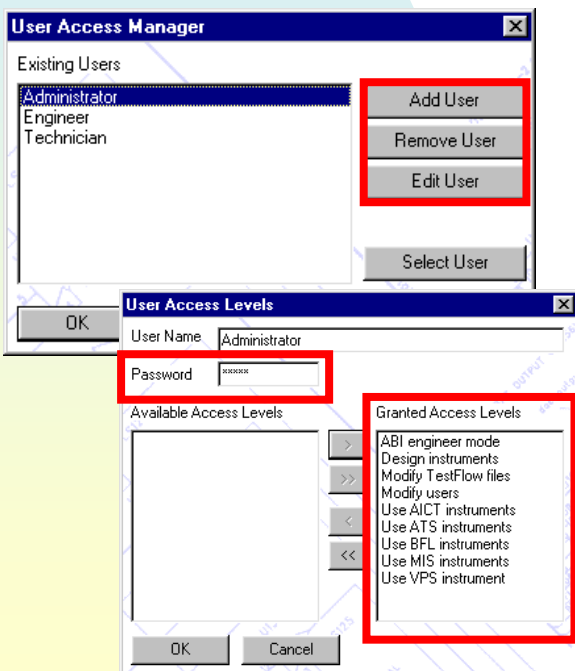
# User Access Manager

- Add, remove and edit users
- Assign user passwords
- Configure user access

- Operators can be given access that is appropriate to their skill levels

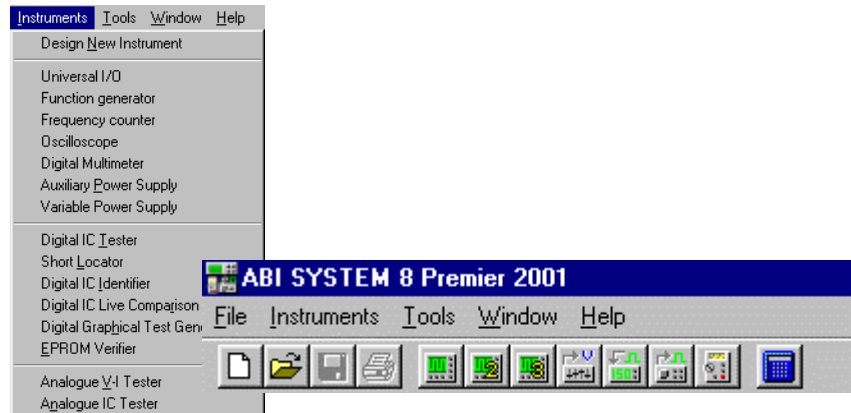
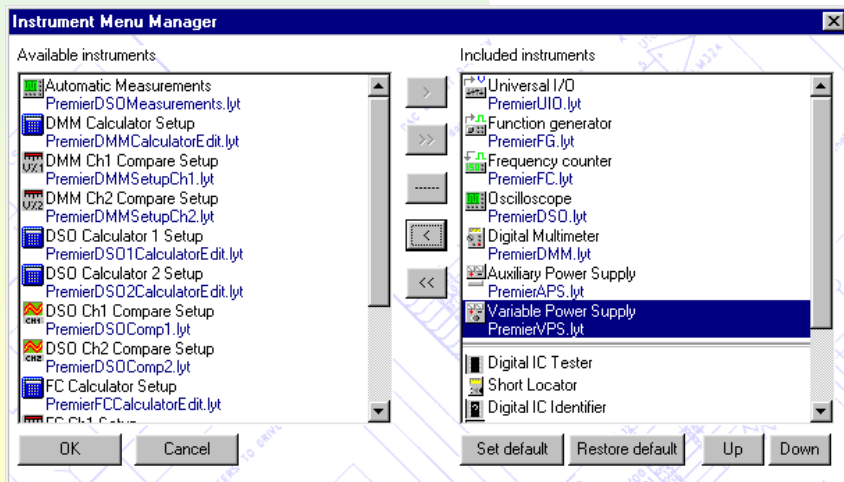
- Restrict access to instrument design, automated test procedures, instrument menus and user configurations

- Restricted access avoids confusion, giving the operator only the controls necessary for the test



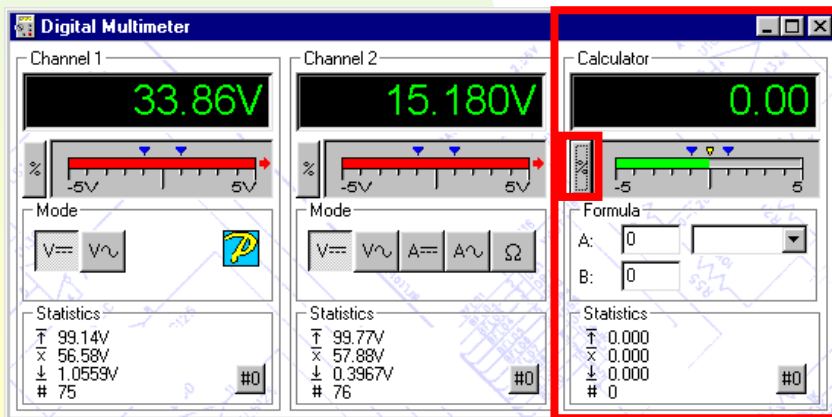
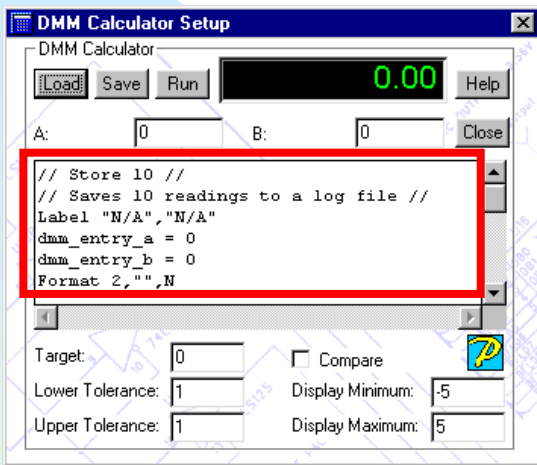
# Instrument Menu Manager

- Configure Speedbar and instruments menu for easy access
- Include custom instruments on Speedbar and instrument menu
- Instrument menu settings can be saved for each user

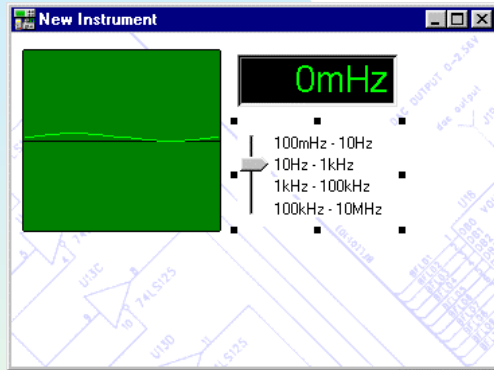


# Calculator

- User programmable calculators each with readout display, comparison and statistics functions
- Use basic instrument measurements to perform further calculations and display or log the results
  - Simple to use, but flexible FormulaPlus control language allows user to develop application specific equations



# DESIGN MODE



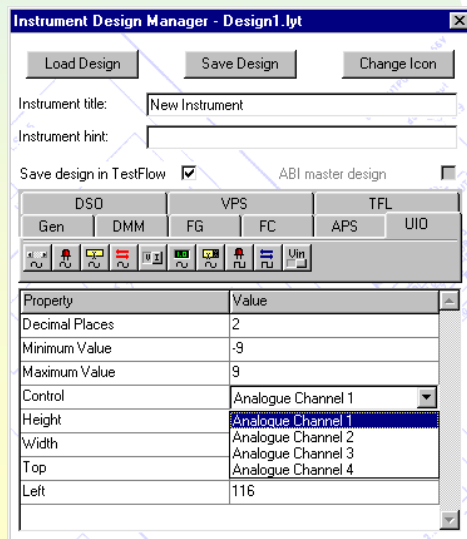
## What is Design Mode?

Custom controls

Text changes

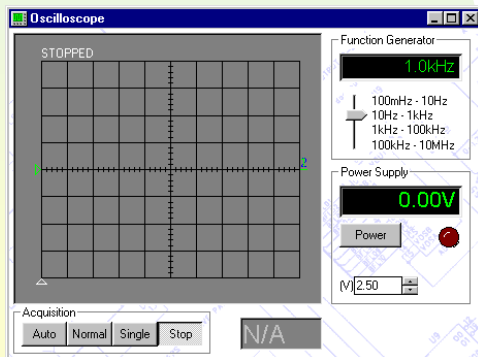
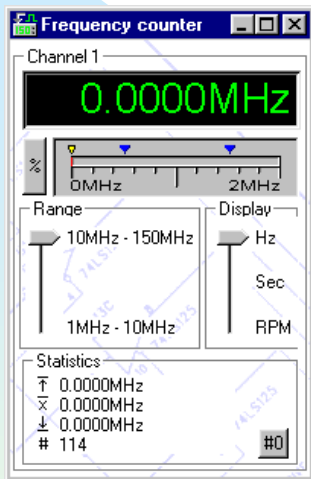
Create new instruments

Size and positional changes

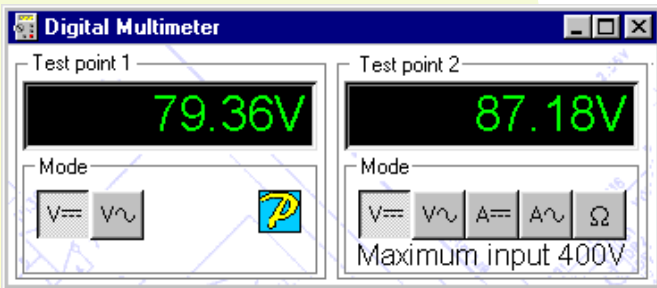
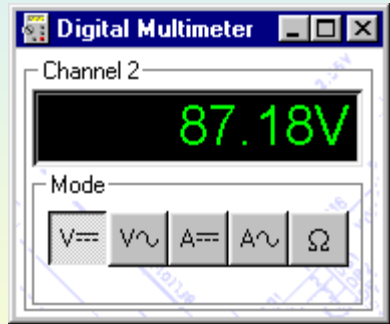
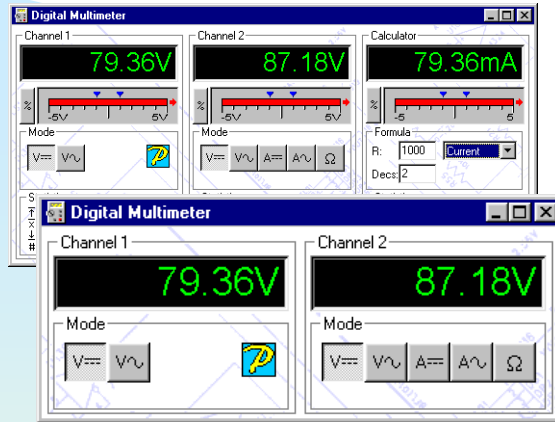


# The benefits

- Simplified instruments for operators
- Limit number of errors through incorrect settings
- Save time by having all relevant displays in view
- Emphasise important controls by enlarging or by descriptive text

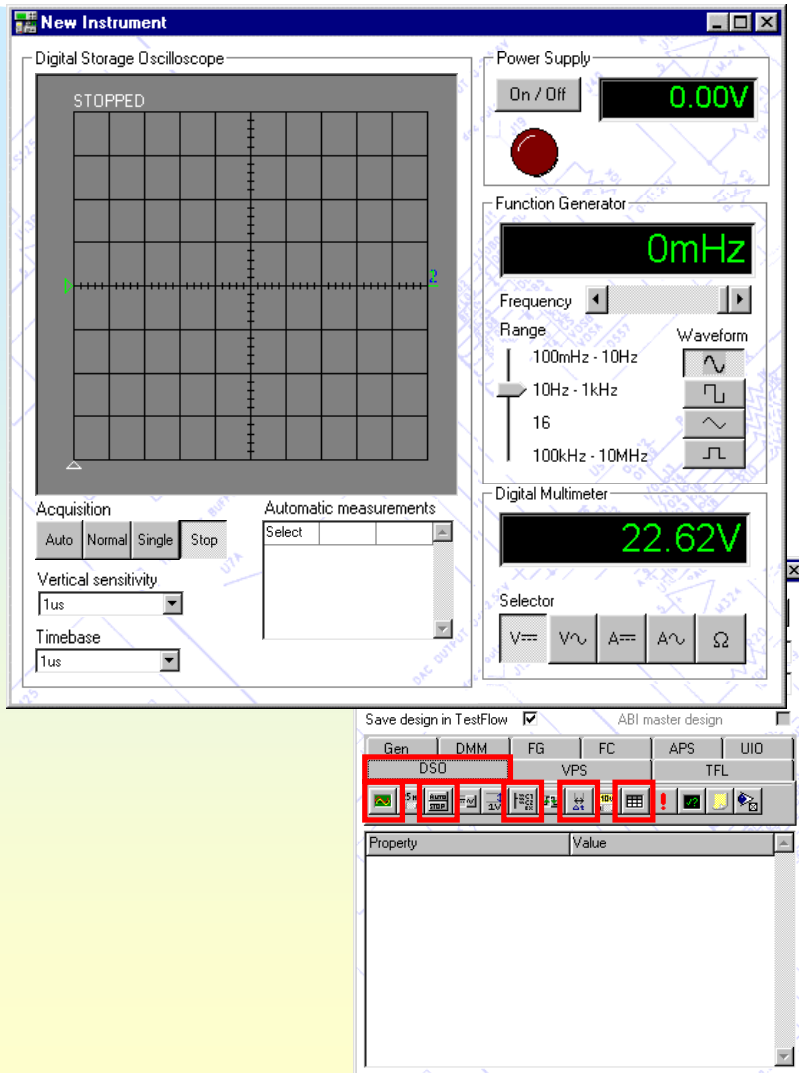


# Adapting standard instruments



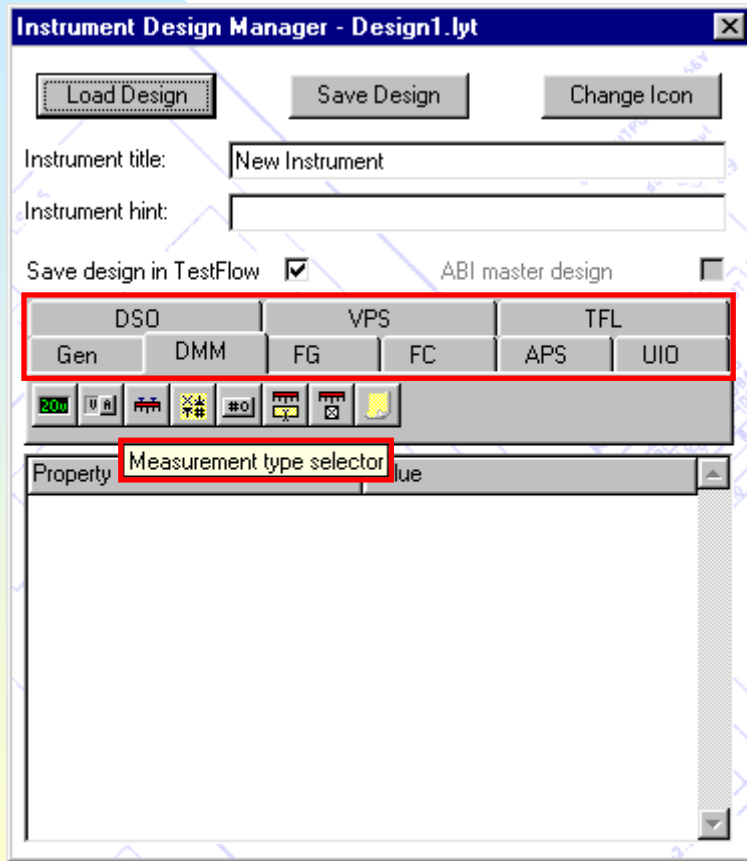
- Remove display elements
  - Delete tolerance bars and statistics if not used
- Remove control elements
  - Channels and their controls can be removed if not used
- Change text
  - Alter existing group box or control text
  - Add text to aid in the use of instrument

# Create new instruments



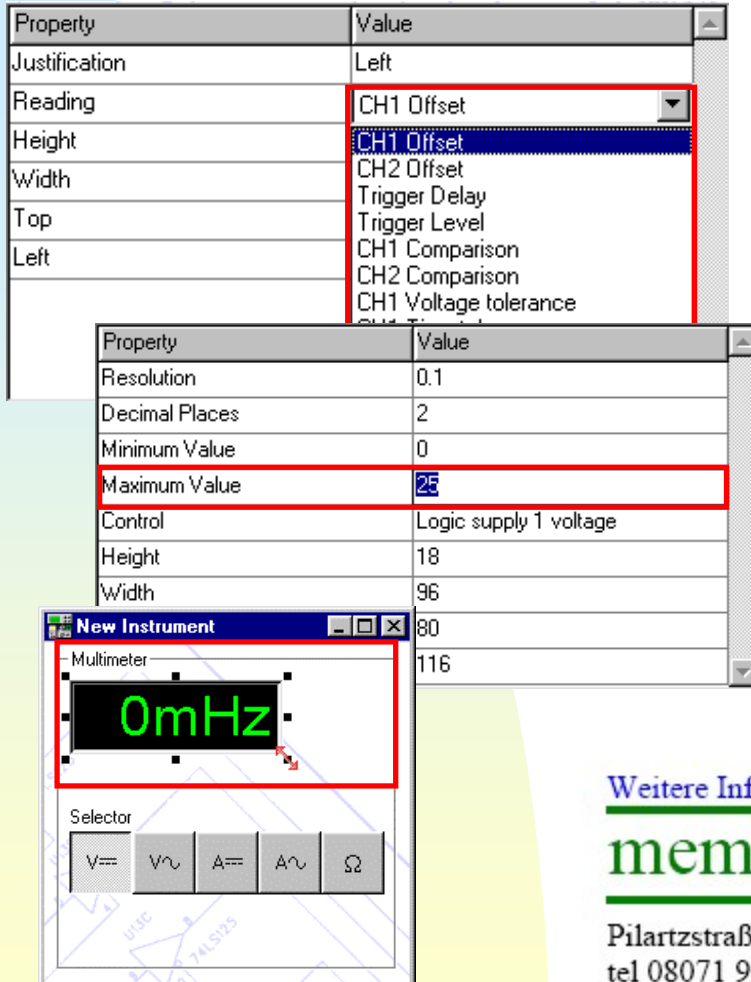
- Select 'Design New Instrument' from 'Instruments' menu
- In our example we will start by adding a DSO display
- Add some controls to the DSO from the DSO tab
- Add text labels to the controls from the Generic tab
- Group boxes keep instrument controls together
- Build other instruments such as a Power Supply, Function Generator and Multimeter

# Instrument Design Manager



- Access IDM via the Instrument menu or right click on an empty area of an instrument window
- Use the IDM window to change or add new instrument features
- Selecting an instrument tab shows the controls and displays available
- Callout descriptions are available for Speedbar buttons

# Instrument Design Manager



- Alter the instrument display properties from a drop down menu
- Size and position can be changed by entering new values or by using the mouse
- Calibration access controlled through IDM

Weitere Informationen, Beratung, Verkauf und technische Betreuung unter:

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