

FaultFinder

Electronic Troubleshooting System (ETS)

Component-level diagnostics and fault finding in a compact form factor

The FaultFinder Electronic Troubleshooting System (ETS) condenses extensive circuit card troubleshooting capabilities into a compact design. Tailored for user convenience, it places essential tools right at the technician's fingertips and streamlines repairs while capturing vital data necessary for addressing complex circuit card faults.

FaultFinder is a configurable system and can be expanded to meet application requirements.

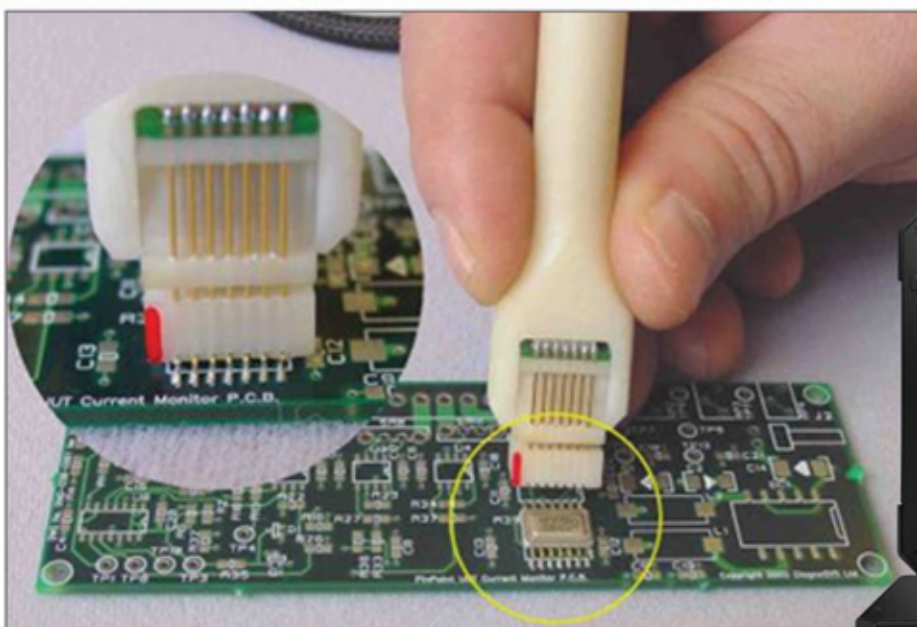


System Specifications

- USB: 3.1
- Input Power: 85 – 264 VAC (47 – 63 Hz)
- Fuse: T3.15A HRC
- Software: TestVue (requires Windows 10 or later)
- Dimensions:
 - » Width: 328 mm (13")
 - » Depth: 213mm (8.4")
 - » Base unit height: 143mm (5.6")
 - » Option Module height: 33mm (1.3")

CAPABILITIES

- Full quadrature Signature Analysis with Pulse mode for gate fired devices
- LCR bridge for accurate testing of passive components both in and out of circuit
- Parametric Measurement Unit for testing of discrete components and circuits, e.g. hFE of transistors & input leakage
- Shorts Locator to identify the exact point at which a short circuit is located
- DMM (2 and 4 wire), AC/DC, Resistance, Diode, etc.





Signature Analysis

Digitally Synthesized Waveforms

- Sine, Square, Triangle, Saw-tooth waveforms (5 Hz to 200 kHz)

Standard Range

- 5 Hz to 15 kHz: 0.1 Hz resolution.
- 0.2 Volt to 50 Volt Peak-Peak: 0.1 Volt resolution

Extended Range (Optional)

- 15 Hz to 200 kHz: 1.0 Hz resolution.
- 0.2 Volt to 5 Volt Peak-Peak: 0.1 Volt resolution
- 256 Point: 8 bit Comparison architecture

Discernible differences

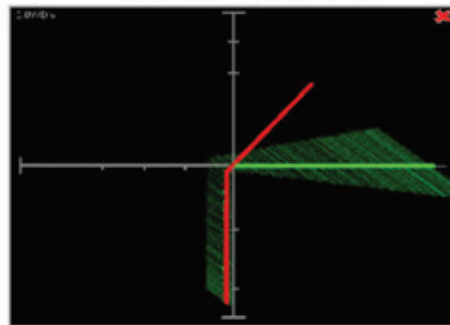
- 7pF, 7uH, 0.5Ω: on the most sensitive ranges
- 0.3F, 300kH, 2MΩ: on the highest ranges

16 Current Ranges

- 200 mA Max
- Dual Contact Detection circuits for both AC and DC detection
- Pulse Mode – Dual Channel.
- Programmable to ± 10 Volts. Peak, Peak to Peak and Programmable Duty Cycle
- VI and Pulse Generators multiplexed to internal rows A-B and can be accessed from the front panel by means of the Matrix Module.

Digital Multimeter (DMM)

- 2-Terminal or 4-Terminal options available
- Display Digits: 4½ (5½ Digit Optional)
- Display Count: 20,000 (or 200,000 Optional)



- Conversion Rates: 2, 2.5, 4, 5, 10, 20
- Maximum input voltage: 200V
- Maximum floating voltage: 200V
- Maximum input current: 2A continuous (3A for 30 Seconds)

Overload protection:

DC Voltage

- Range: 200mV, 2V, 20V, 200V
- Accuracy: (% + 10 counts) $\pm$ 0.1%

AC Voltage

- V range: 200mV, 2V, 20V, 200V



DMM Virtual Instrument

- Accuracy: (% + 40 counts)
 - » 50 to 100Hz: $\pm$ 0.1%
 - » >100Hz to 1KHz: $\pm$ 2.5%
 - » >1KHz to 10KHz: $\pm$ 3.5%
 - » >10KHz to 20KHz: $\pm$ 5.0%

- Bandwidth: 20KHz

- Input Impedance: 10M
Paralleled by 100pF

Current

- AC and DC Ranges: 2A
- DC accuracy: (% + 10 counts) $\pm$ 0.5%

AC accuracy (% + 40 counts)

- » 50 to 100Hz: $\pm$ 1.0%
- » >100 to 1 KHz: $\pm$ 2.5%

- Bandwidth: $\leq$ 1KHz

Resistance

- Ranges: 20Ω, 200Ω, 2KΩ, 20KΩ, 2MΩ, 20MΩ

- Accuracy
 - » Ω (% + 10 counts): 0.2%
 - » 200Ω: 1.0%
 - » 20MΩ: 5.0%

Diode test

- Test current: 10mA
- Test voltage: $\leq$ 10V

Capacitance

- Ranges: 200nF, 2uF, 20uF, 200uF, 2,000uF, 20,000uF
- Accuracy: $\pm$ 1.0%



LCR Bridge

- Measures secondary characteristics (D factor, Q, ESR).
- Series / Parallel equivalent circuits.
- Kelvin measurement system

Measurement Range

- Inductance: 1uH to 1000H
- Capacitance: 1pF to 1F
- Resistance: 10mΩ to 100MΩ
- Test frequency range: 1Hz to 50kHz

Measurement Uncertainty*:

- Inductance: <1% + 1uH
- Capacitance: <0.5% + 1pF
- Resistance: <0.1% + 10mΩ

*Uncertainties depend on component type, value, test frequency and measurement duration.

Open and short circuit trims can be used to reduce the effects of fixture impedance.

Shorts Locator

The Shorts Locator provides an interactive tool that enables you to determine the exact point at which a short has occurred in the circuit being tested.

- 500mV max o/c voltage
- 1A max s/c current
- 2mV o/c voltage setting resolution
- 4mA s/c current setting resolution
- 3 sense ranges (x1, x10, x100)
- User selectable audio frequency output



DC Source Virtual Instrument

Parametric Measurement Unit (PMU)

Four discrete channels dedicated to precision DC voltage and current sources. These channels can be used for functional testing of discrete components both in and out of circuit, for example:

- » hFE of transistors.
- » Output drive levels of devices or circuits - For example VOL.
- » Input leakage of devices or circuits at edge connectors - For example IIL, IIH.
- » Semiconductor junction forward voltage.
- » Static protection diodes, detect short or open circuit conditions
- » Testing Hybrid devices.
- » Tri-state leakage currents.
- 4 independent channels.
- Programmable Voltage and Current on each channel.

- Each channel can be programmed independently to source or sink current or source voltage.
- Channels are calibrated automatically to internal references.
- Voltage and current read-back on each channel.

Specifications

- +/- 10V voltage
- +/- 20mA current
- 2.5mV voltage resolution
- 5uA current resolution
- 10mV voltage accuracy
- 50uA current accuracy



Analog Module

Analog Module

Adding analog capability to the FaultFinder ETS increase fault coverage for applications and allows each instrument to be used individually or combined and as part of an integrated test routine. The analog module includes a Frequency Timer / Counter an Arbitrary Waveform generator and a Dual Channel Oscilloscope.

Counter timer

- 1.5GHz input to perform Frequency, Period, Time A-B, Unit Count, and Frequency Ratio measurements. Input voltage range AC coupled

Ranges

- Ch A / B: DC to 30MHz (can be routed to the backplane)
- HI-FREQ: 100kHz to 1.5GHz (restricted to frequency only)

Input Impedance

- Ch A / B: 1M Ω paralleled by 20pF (each input has a 50 Ω Impedance switch)
- HI-FREQ: 1M Ω paralleled by 20pF with DC bias circuit to power external probes Accuracy
- Timing: $\pm 0.01\%$ +100ns
- Threshold level (Ch A / B): $\pm 1\%$



CTMR Virtual Instrument

Arbitrary Waveform Generator: 2 Channels

The arbitrary waveform generators can be programmed to provide Sine, Square, Triangle and Sawtooth waveforms as well as DC offset levels and user defined waveforms.

- Output voltage range: $\pm 12V$
- Maximum floating voltage: 300V (floating channels only)

Waveform generation

- Types: Sine, Square, Triangle, Sawtooth, Pulse, DC Offset, User (arbitrary).
- Signal frequency: 0.1Hz to 10MHz, $\approx 0.1Hz$ resolution
- Function: Offset, Skew / Duty cycle adjustment
- Sync mode: Channel - Channel
- Burst: 1-65,534 cycles in one shot
- Trigger: Hard trigger from backplane or by software command
- Completion signal: Signal to backplane at end of burst

Waveform source

- Resolution: 16 bit
- Sample rate: 50MS/s for standard waveforms, 25MS/s for user defined
- Frame Depth: 32kB

Accuracy

- Voltage level: $\pm 0.5\%$
- Timing: $\pm 0.01\%$

Current Limit.

- Analog Output : 25 mA continuous
- In-Circuit Mode: 350 mA for < 25 mS

Modes:

- Pre-conditioning states
- Run, Reset, Stop



ARB Virtual Instrument

2 Channel Oscilloscope

- 10 MHz Bandwidth: Rise time 35ns
- Vertical resolution: 8 bits
- Enhanced vertical resolution: Up to 12 bits
- Up to 1GS/s sampling rate
- Input ranges: ± 50 mV, ± 100 mV, ± 200 mV, ± 500 mV, ± 1 V, ± 2 V, ± 5 V, ± 10 V, ± 20 V
- Input Coupling: AC/DC
- Over voltage protection: ± 100 V (DC + AC peak)





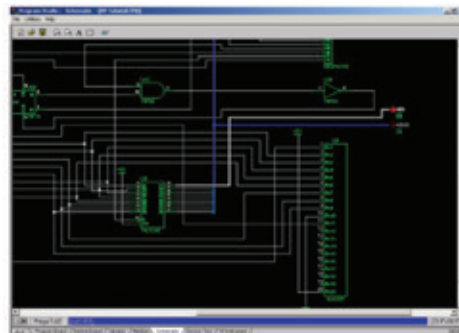
Scanner Pod (Add on 96 Channel multiplexer)

The Scanner pod is a 2 Row x 96 Column relay matrix and provides switching resources for routing internal instruments (DMM, V/I and Net Engine) to the UUT automatically. Scanner Pods can be stacked to increase the pin count in increments of 96. The Scanner Pod is hugely beneficial for measuring and testing pins on edge connectors and components and greatly simplifies the Net List Generation process.

- Max Contact Resistance <0.15Ω
- Max Switching Current <500mA
- Max Carry Current <1.0A
- Max switching voltage <200V

Reverse Engineering

Generating schematics for undocumented boards can be a key advantage in the battle for creating diagnostic and test capability for electronic assemblies. FaultFinder ETS provides tools for capturing nets and displaying them as an electronic schematic that interacts with the Test program or can simply be printed in pdf or exported to other formats or editing tools such as OrCAD.



ORDERING INFO

For additional details, please contact Astronics Test Systems.

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Net	Value	Pin	Component	Value	Pin	Component
[00004]	+12V	13	U1	12V	13	U1
[00005]	-12V	14	U1	-12V	14	U1
[00016]	0V	15	U1	0V	15	U1
[00017]	0V	16	U1	0V	16	U1
[00018]	0V	17	U1	0V	17	U1
[00019]	0V	18	U1	0V	18	U1
[00020]	0V	19	U1	0V	19	U1

