



# AIM & THURLBY THANDAR INSTRUMENTS

## SHORTFORM CATALOGUE

Precision Measurement & RF Test Equipment



- Digital Multimeters • Component Meters •
- Current Measurement • Power Source Testing •
- Frequency Measurement • RF Spectrum Analysis •
- RF Signal Generation • Power & EMC Harmonics Analysis •

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Issue 5 - 2012

## Product Range

### Digital Multimeters - page 18

Bench-top multimeters with from 4¼ to 5½ digit resolution, all with true rms ac and digital control interfaces.

### Component Measurement - page 20

Precision LCR bridge, micro-ohm meter.

### I-Prober Current Probe - page 21

Innovative probe for applications that include non-contact measurement of currents in PCB tracks.

### Power Source Testing - page 22

Electronic DC Load for power supply and battery testing. Proving unit for volt-sticks.

### Frequency Measurement - page 23

Bench-top universal counter and handheld frequency meter.

### Power Analysis

See RF & EMC section (page 27)

## Precision measurement instruments

TTi has been designing and manufacturing precision measurement instruments for nearly thirty years.

Expertise in precision analog design has enabled the company to offer high performance products with advanced features at attractive prices.

TTi offers instruments for the precision measurement of all of the fundamental electronic parameters including voltage, current, resistance, capacitance, inductance, power and frequency.

The new I-prober positional current probe from Aim instruments will enable the measurement of current in situations where it was previously not possible.



## Digital Multimeters

### Bench-top DMMs versus hand-held

Low cost hand-held DMMs have replaced bench-top DMMs in many applications. Although the performance of these meters may be sufficient for some tasks, it is likely that most engineers will regularly encounter measurement problems that are beyond the capability of a hand-held unit.

### An instrument intended for serious use

A TTI bench-top DMM is a substantial instrument. It stays where you put it even with heavy test leads connected. The tilt stand ensures that the large display is always readable. The functions buttons are large and the front panel is clearly marked.

### Sensitivity, Resolution and Accuracy

Compare the performance of any TTI bench-top DMM with a good quality 4000 count hand-held DMM of 0.3% basic dcV accuracy.

Longer scale length, greater sensitivity and higher accuracy ensure that measurement uncertainty is a full order of magnitude better.

TTi bench-top DMMs maintain good accuracy on all functions including ac voltage, resistance and current. For most hand-helds, the accuracies for functions other than dc voltage are dramatically poorer.

### Wideband ac measurement and true RMS

Most hand-held DMMs have an ac frequency response specified to below 1kHz. All TTI bench-top DMMs provide excellent accuracy on all ranges throughout the audio band (40Hz to 20kHz) with a 3dB bandwidth extending well above this.

Most ac signals are not sinusoidal. However, most hand-held DMMs incorporate a mean sensing ac converter which only gives useful results on sinusoids, those that do have a True RMS converter often have insufficient bandwidth to cope with complex waveshapes. All TTI bench-top DMMs combine True RMS ac with sufficient bandwidth to ensure accurate results.

Digital Multimeters - Comparison Table			
	1604	1705 & 1705-GP	
Display Type	LED	Dual LCD	
Scale Length (Counts)	40,000	12,000	
Dual Measurement	No	Yes	
DC Voltage: Ranges	(5) 400mV to 1000V	(5) 120mV to 1000V	
Best Resolution	10µV	10µV	
Basic Accuracy	0.08%	0.04%	
AC Voltage: Ranges	(5) 400mV to 750V	(5) 120mV to 750V	
True RMS conversion	Yes	Yes	
Frequency Response	0.08%	0.04%	
DC/AC Current: Ranges	(3) 4mA to 10A	(3) 1.2mA to 10A	
Best Resolution	100nA	100nA	
Resistance: Ranges	(6) 400Ω - 40MΩ	(7) 120Ω - 20MΩ	
Best Resolution	10µΩ	10µΩ	
Frequency	Yes	Yes	
Capacitance	No	Yes	
Smart Functions	3	12	
Interfaces: RS-232	Yes *	Yes	
GPIB (IEEE-488)	No	Yes (GP version)	
Power Source	AC Line	AC Line or Battery	

### PC and System connectivity

At some point most engineers are going to want to connect their DMM to their personal computer to provide automatic measurement control or importing of data into a computer programme. Unlike a hand-held DMM, all TTI bench-top DMMs include a fully isolated RS-232 interface.

For full system applications, the 1705-GP and 1906-GP also have a GPIB (IEEE-488) interface.

### Functions & features of real value

Hand-held DMMs may offer a few "smart" features but these are rarely well enough implemented to be of real use.

TTi bench-top DMMs offer features which are of real use and not just "gimmicks". Features such as dual Measurement & display, precision frequency measurement, dBm, data logging, power and VA, to mention just a few.

\* RS232 interface on 1604 is only for use with the optional PC-1604 control and data logging software.

Full technical details for all three multimeters is available on the web site.

Function	Ranges	Best Resolution	Best Accuracy
DC V	(5) 400mV - 1000V	10 $\mu$ V	0.08% $\pm$ 4 digits
AC V	(5) 400mV - 750V	100 $\mu$ V	0.5% $\pm$ 4 digits
Resistance	(6) 400 $\Omega$ - 40M $\Omega$	10 $\mu$ $\Omega$	0.1% $\pm$ 4 digits
DC I	(3) 4mA - 10A	0.1 $\mu$ A	0.1% $\pm$ 4 digits
AC I	(3) 1mA - 10A	1 $\mu$ A	0.1% $\pm$ 4 digits
Frequency	(2) 4kHz to 40kHz	0.1Hz	0.01% $\pm$ 1 digit

Further measurement functions: Continuity, Diode Test.  
 Smart functions: Null (Relative), Hold, T-Hold, Min/Max.  
 Interface: opto-isolated bi-directional RS-232 interface. 9600 baud.  
 Power: 230V or 115V AC nominal 50/60Hz, adjustable internally.  
 Size & weight: 260 x 88 x 235 mm (WxHxD). 2.0 kg (4.4 lb)

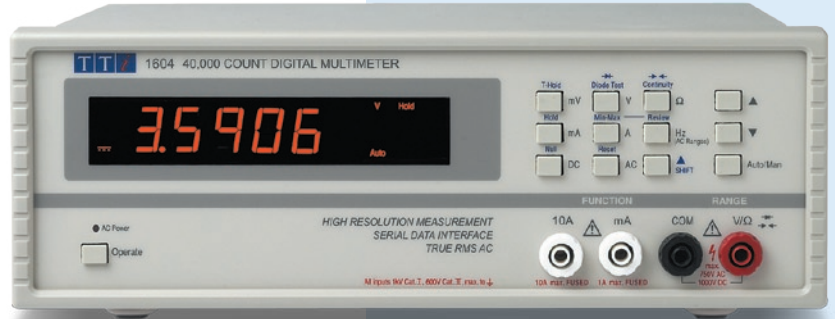
- ▶ 40,000 counts, auto or manual ranging
- ▶ Accuracy and resolution, 0.08%, 10 $\mu$ V, 10m $\Omega$
- ▶ Large and bright LED display (14mm/0.56")
- ▶ True RMS ac functions, wide ac bandwidth
- ▶ Relative, T-Hold and Min-Max functions included
- ▶ Optional PC control and logging software

The 1604 is a high quality 40,000 count bench-top multimeter with a wide range of features.

It offers automatic or manual ranging, high resolution (10 $\mu$ V, 10m $\Omega$ ) together with current measurement up to 10A.

## 1604 DMM

- ▶ 4 $\frac{3}{4}$  digit bench-top multimeter
- ▶ 0.08% basic dc-v accuracy
- ▶ True RMS ac functions
- ▶ Isolated RS-232 interface\*



Function	Ranges	Best Resolution	Best Accuracy
DC V	(5) 120mV - 1000V	10 $\mu$ V	0.04% $\pm$ 2 digits
AC V	(5) 120mV - 750V	100 $\mu$ V	0.2% $\pm$ 20 digits
Resistance	(6) 120 $\Omega$ - 20M $\Omega$	10 $\mu$ $\Omega$	0.08% $\pm$ 2 digits
DC I	(3) 1mA - 10A	0.1 $\mu$ A	0.1% $\pm$ 3 digits
AC I	(3) 1mA - 10A	0.1 $\mu$ A	0.3% $\pm$ 20 digits
Capacitance	(5) 10nF to 100nF	10pF	2% $\pm$ 5 digit

Further measurement functions: Continuity, Diode Test, Frequency  
 Smart functions: Null (Relative), Hold, T-Hold, Min/Max, dB, Ax+B, % deviation, VA.  
 Logger: 100 readings. Interfaces: RS-232 standard. GPIB (IEEE-488) optional.  
 Power: 230V or 115V AC 50/60Hz, or 6 x C cells disposable or rechargeable.  
 Size & weight: 260 x 88 x 235 mm (WxHxD). 2.0 kg (4.4 lb)

- ▶ Dual 12,000 count LCD, auto/manual ranging
- ▶ Accuracy and resolution: 0.04%, 10 $\mu$ V, 10m $\Omega$
- ▶ Dual displays & 'dual measurement' technology
- ▶ True RMS ac functions, Frequency, Capacitance
- ▶ Wide range of computing functions e.g. Ax + B
- ▶ Model with GPIB (IEEE-488) interface available
- ▶ Mains and battery operation as standard

The 1705 is a precision 4 $\frac{1}{4}$  digit bench multimeter incorporating dual displays and dual measurement technology.

The dual displays can be used either to display one measurement in two units (e.g. mV and dB) or to measure two parameters simultaneously (e.g. dc-V and ac-V).

## 1705 DMM

- ▶ Dual measurement multimeter
- ▶ 0.04% basic dc-v accuracy
- ▶ Built-in data logger
- ▶ Isolated RS-232 or GPIB
- ▶ AC line or battery operation



## LCR400 LCR bridge

- ▶ 0.1% basic accuracy
- ▶ Built-in component fixture
- ▶ Built-in limits comparator
- ▶ RS-232 interface

Note: Full technical details are available on the web site.



- ▶ 0.1% basic measurement accuracy
- ▶ Three test frequencies of 100Hz, 1kHz and 10kHz
- ▶ Automatic component recognition
- ▶ Built-in 4 terminal component fixture
- ▶ Dual 5 digit high brightness displays
- ▶ Limits comparator with multiple pass and fail bins
- ▶ RS-232 interface for PC connectivity
- ▶ Optional SMD tweezers, Kelvin Clip leads, Windows logging software



Note: accessories not to same scale as LCR400



The LCR400 is a high performance LCR meter that offers an alternative to low-cost handheld units or expensive system units.

Dual displays, automatic component recognition and auto-ranging make it easy to use, while its built-in test fixture and limits comparator make it suitable for applications within the laboratory, production or inspection areas.

Range and resolution limits:

- Resistance: 0.1mΩ to 990MΩ
- Inductance: 0.001μH to 9900H
- Capacitance: 0.001pF to 99000μF

## BS407 low Ohmmeter

- ▶ 0.1% basic accuracy
- ▶ 1μΩ to 20kΩ range
- ▶ Kelvin clip connection leads
- ▶ Rechargeable battery operation

Note: Full technical details are available on the web site.



- ▶ High basic accuracy of 0.1%
- ▶ Wide measurement range of 1μΩ to 20kΩ
- ▶ Current reversal switch for detecting thermal emf
- ▶ Current diversion switch for easy zero setting
- ▶ Four terminal measurement using Kelvin clip leads
- ▶ Battery operation with built-in charger
- ▶ Switchable 20mV clamp for 'dry circuit' testing

The BS407 is fully optimised for the task of accurate measurement of low resistances with a best resolution of 1μΩ.

It uses a Direct Current technique to measure true resistance, rather than the resistive component of impedance which is shown by AC excited LCR bridges. The test current for each range has been chosen to minimise heating of the sample under test while being sufficient to minimise the effects of thermal emf and noise.

This gives much greater accuracy at low resistances than can be obtained from the very low test currents used by general purpose high resolution multimeters.

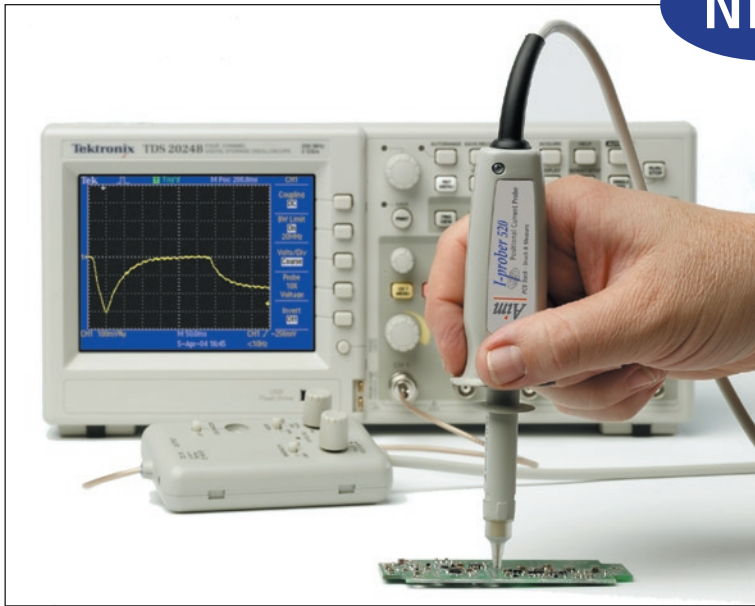




**I-prober 520**  
Positional Current Probe  
PCB Track - Touch & Measure

Note: Full technical details are available on the web site.

**NEW**



- ▶ Current measurement from non-contact probing of conductor
- ▶ Suitable for observation and measurement of current in PCB tracks, component leads and ground planes
- ▶ Wide dynamic range of 10mA to 20A peak to peak
- ▶ Wide bandwidth of DC to 5MHz
- ▶ Low noise equivalent to <math><6\text{mA rms}</math>
- ▶ Safety rated to 300V Cat II (600V Cat I)
- ▶ Suitable for connection to any oscilloscope
- ▶ High accuracy general purpose H-field probe
- ▶ Convertible into standard 'closed magnetic circuit' current probe

The I-prober 520 is supplied with a clip-on toroid assembly which converts it into a closed magnetic circuit probe for measuring current in a wire.

The toroid is open until the probe is attached, allowing insertion of the wire without disconnection.

The wide bandwidth, dynamic range and low noise of the probe are retained.



**I-prober 520**

- ▶ Current measurement by simple non-contact probing of PCB track
- ▶ DC to 5MHz bandwidth
- ▶ 10mA to 20A dynamic range
- ▶ Low noise figure



The I-prober 520 positional current probe is unlike any other current measurement device available.

Calibrated measurement of current normally requires the current to be passed through a closed magnetic loop. Typically this is done using some form of split clamp device. Whereas this is suitable for individual wires, it is of no use for measuring current in PCB tracks.

The I-prober 520 is a compact hand-held probe which is used with an oscilloscope. By placing the insulated tip of the probe onto a PCB track, the current flowing in the track can be observed and measured.

for more complete information:  
[www.aimtti.com/go/iprober](http://www.aimtti.com/go/iprober)

## LD300 dc load

- ▶ 300 watt dc electronic load
- ▶ Up to 80 volts or 80 amps
- ▶ CI, CR, CV and CP modes
- ▶ Built-in transient generator

Note: Full technical details are available on the web site.



- ▶ Versatile solution for testing dc power sources
- ▶ Constant current, constant resistance, constant conductance, constant voltage and constant power modes
- ▶ Wide voltage and current range, 0 to 80 volts and 0 to 80 amps.
- ▶ 300 watts continuous dissipation at 40°C
- ▶ Low minimum operating voltage of <1V at 40A
- ▶ Ten turn controls for level setting
- ▶ Built-in transient generator with variable slew
- ▶ Current monitor output for waveform viewing
- ▶ Variable drop-out voltage for battery testing
- ▶ Analog remote control capability

The LD300 is an inexpensive electronic load which is suitable for testing and characterising a wide variety of dc power sources.

It can be used to investigate the behaviour of many different types of power source such as batteries, solar cells, fuel cells or wind generators, as well as electronic power supply units.

Its wide voltage/current range, multiple operating modes and built-in transient generator give it the versatility to offer test solutions from the design laboratory through to the component

## P240 proving unit

- ▶ Essential equipment for safety compliance
- ▶ Long-life battery operation
- ▶ Belt-clip mountable



The P240 is a hand-held battery powered proving unit that provides a nominal 240V dc, 2mA source intended for proving the integrity of neon type test voltage indicators.

For safety compliance, voltage indicators should be checked for correct operation from this known voltage source before and after every use.

Testing is performed by inserting the test probes of the neon tester into two recessed "touch proof" terminals on the proving unit. Insertion of the probes automatically turns the proving unit on thus eliminating the need for an on-off switch.

- ▶ 0.001Hz to 3000MHz or 6000MHz frequency range
- ▶ TCXO timebase with better than 1ppm stability
- ▶ Frequency, period, pulse width and totalise modes
- ▶ Reciprocal counting measurements
- ▶ High impedance measurement up to 125 MHz
- ▶ Low pass filter, attenuator and trigger level control
- ▶ AC or DC coupling, 1M/50Ω selection, polarity invert
- ▶ Large 10 digit LCD display with annunciators
- ▶ Operation from built-in rechargeable batteries
- ▶ Low power consumption
- ▶ Remote control and readback via USB

The TF930 is a high quality bench/portable 3GHz universal frequency counter which offers period measurement, frequency ratio, pulse width and event counting.

It uses an advanced reciprocal frequency counting technique to achieve high resolution at all frequencies. A dc coupled input enables VLF measurements to be made (down to 1mHz). The timebase uses a high quality TCXO crystal with a very low ageing rate. An external reference can also be used.

The large 10 digit LCD has a full set of annunciators. Measurement times can be set between 0.3 seconds and 10 seconds.

Pulse width measurements can be made from rising to falling or falling to rising edge with adjustable thresholds. A variable attenuator is incorporated the input impedance is switchable between 1MΩ and 50Ω.

The instrument operates from internal rechargeable NiMH batteries which give typically 24 hours operating life. The universal AC charger supplied will recharge the batteries in less than 4 hours and can be used for continuous AC operation.

Full remote control and read-back is provided via a USB interface.

*Note: Full technical details are available on the web site.*



**NEW Model**

## TF930 & TF960

- ▶ DC to 3GHz/6GHz frequency range
- ▶ Frequency, period, pulse width, ratio and event counter modes
- ▶ Rechargeable batteries
- ▶ USB interface included

The new TF960 is an extended version of the TF930 with an additional input covering <2GHz up to >6GHz.

Signal connection is via a standard N connector and high sensitivity is maintained across the frequency range.

- ▶ 3Hz to 3000MHz frequency range
- ▶ Frequency and period measurement
- ▶ High sensitivity at all frequencies
- ▶ Switchable low pass filter
- ▶ Continuous reciprocal counting measurement
- ▶ 0.001mHz low frequency resolution
- ▶ Push-to-measure function with auto power-down
- ▶ Large 8.5 digit display with full range of annunciators

*Note: Full technical details are available on the web site.*

The PFM3000 is the latest handheld frequency counter from TTI offering measurement up to 3GHz.

It provides high impedance measurement up to 125MHz and 50Ω measurement up to 3000MHz, with excellent sensitivity across all frequencies.

It can measure both frequency and period and uses a continuous reciprocal frequency counting technique which gives high resolution and accuracy at all frequencies.

Despite its wide frequency range the PFM3000 has a low power consumption enabling it to operate for many hours from a disposable battery.

A push-to-measure capability is provided to extend battery life when continuous signal monitoring is not required.

## PFM3000

- ▶ 3Hz to 3GHz frequency range
- ▶ Frequency or period display
- ▶ Continuous reciprocal measurement
- ▶ Handheld format
- ▶ Long battery life



## Product Range

### RF Power Meters - page 24

TTi-Satori ST series USB linked RF and microwave power meters up to 26.5GHz.

### Spectrum Analyzers - page 25

PSA-T series low-cost handheld spectrum analyzer, 1.3GHz and 2.7GHz.

### Signal Generators - page 26

Synthesised RF signal sources offering exceptional value for money, 1GHz and 2GHz.

### Harmonics & Flicker Measurement - page 28

Compliance quality power and harmonics analyzer and source for measurements to EN61000-3-2 and EN61000-3-3.

### Frequency Measurement

See Precision Measurement section (page 23).

## RF and EMC Test Equipment

### RF Test

The rapid growth in the use of wireless communications and the inclusion of RF elements into many electronic designs has increased the need for RF test equipment.

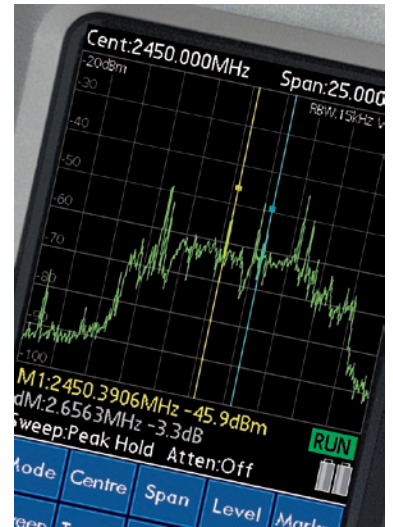
The high cost of products from the major producers in this area has led TTI to develop lower cost alternatives for the essential RF tools such as signal generators and spectrum analyzers.

RF products from TTI are designed to offer the essential elements required by engineers at significantly lower costs.

### EMC Test

Most countries have now implemented legislation requiring products to comply with standards for radiated and conducted emissions.

TTi has produced equipment capable of compliance quality measurements, enabling users to self-certify for current harmonics and flicker.



## Satori ST Series

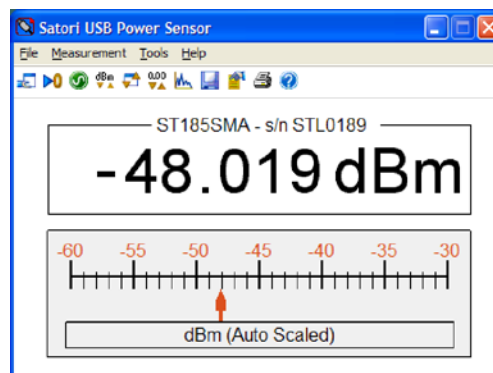
- ▶ USB linked power meters
- ▶ 12.4GHz, 18.5GHz or 26.5GHz
- ▶ -50 dBm to +20 dBm range
- ▶ Very low power consumption



The power meter is controlled by the TTI- Satori software loaded on a Windows PC. This is a virtual power meter with basic measurement functions for the PC workstation.

A software toolkit is supplied to control the power sensors via the PC. It includes a DLL (dynamic link library) for individualized use of the entire sensor functionality with Windows and the user interface.

*Note: Full technical details are available on the web site.*



- ▶ Three models 12.4GHz, 18.5GHz or 26.5GHz
- ▶ Measurement down to 10MHz
- ▶ Measurement range from -50 dBm to +20 dBm
- ▶ Replacement solution for conventional power meter and sensor combination
- ▶ Simple USB connection to laptop or PC
- ▶ Use multiple sensors on one computer
- ▶ Very low power consumption (50mA)
- ▶ No reference calibrator required
- ▶ Lightweight and easy to use
- ▶ Robust construction with excellent reliability
- ▶ Convenient for production test and field service

Model	Frequency Range
ST124SMA	10MHz to 12.4GHz
ST185SMA	10MHz to 18.5GHz
ST265SMA	10MHz to 26.5GHz

Size and weight:  
34mm high x 43mm wide x 125mm long; 83 grams

The TTI-Satori ST series power sensors are complete miniature RF & Microwave power meters. They contain a CPU which controls the sensor, processes the measurement results and operates the interface.

All measurement data and settings are transmitted via a USB interface to and from a PC. The supplied virtual power meter software for Windows creates a classic microwave power meter.



Model	Frequency Range
PSA1302	1 MHz to 1300 MHz
PSA2702	1 MHz to 2700 MHz
Size and weight: 190mm high x 92mm wide x 49mm deep 560 grams!	

The PSA1302 and PSA2702 are low-cost, highly portable RF spectrum analyzers.

They incorporate the features most needed in a portable spectrum analyzer without the size, weight and complexity of more expensive products.

- ▶ 1MHz to 1300MHz or 2700MHz frequency range
- ▶ Resolution bandwidths of 1MHz, 280kHz or 15kHz
- ▶ -96dBm typical noise floor at -20dBm reference level
- ▶ Measurement in dBm or dBμV, mV or μW
- ▶ Zero span mode with AM and FM audio demodulation
- ▶ Trace modes of normal, peak hold and trace average
- ▶ Live, View and Reference traces in contrasting colours
- ▶ Twin markers with readout of absolute & difference values
- ▶ Smart marker movement with selectable peak tracking
- ▶ Frequency presets and independent state storage
- ▶ Auto-find automatically sets sweep parameters for the highest signal found
- ▶ Unlimited storage for waveforms, set-ups and screens
- ▶ User assignable file names, file stamping from real-time clock
- ▶ USB interfaces for Flash drives and PC connection
- ▶ Comprehensive status and context sensitive help screens
- ▶ More than 8 hours continuous operation from a charge
- ▶ Smaller and lighter than other spectrum analyzers (weight only 0.56 kg)

**further features with option U01 installed:**

- ▶ Limit lines and limit patterns with limits comparator
- ▶ Data logging of peak values, complete traces or screen images from timer, external trigger or limits comparator
- ▶ Sweep triggering from external trigger or limits comparator
- ▶ Compensation tables, fixed offsets and 75Ω compensation
- ▶ Capability to show screen contents on a PC

## PSA Series II

- ▶ True handheld spectrum analyzers
- ▶ 1.3 GHz and 2.7 GHz models
- ▶ 4.3" colour touch-screen
- ▶ More than 8hrs per charge



**NEW**

to see a full product information tour:  
[www.aimtti.com/go/psa](http://www.aimtti.com/go/psa)

The small size, low weight and long battery life of the PSA Series II make it the ideal tool for RF field measurements.

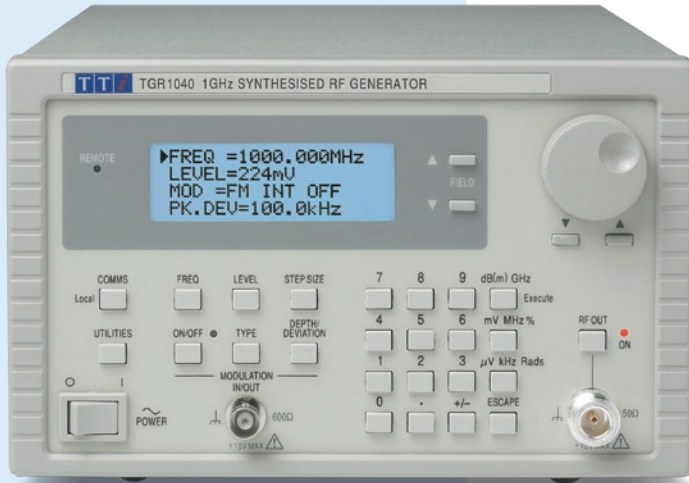
However, its surprisingly low cost provides every engineer with the potential to own a spectrum analyzer, whether they work in the RF field or not.

The PSA Series II will find applications within development, servicing and production as well as field use.

## TGR1040

- ▶ 1 GHz signal generator
- ▶ -127dBm to +7dBm
- ▶ RS-232, optional GPIB
- ▶ Low cost

*Note: Full technical details are available on the web site.*



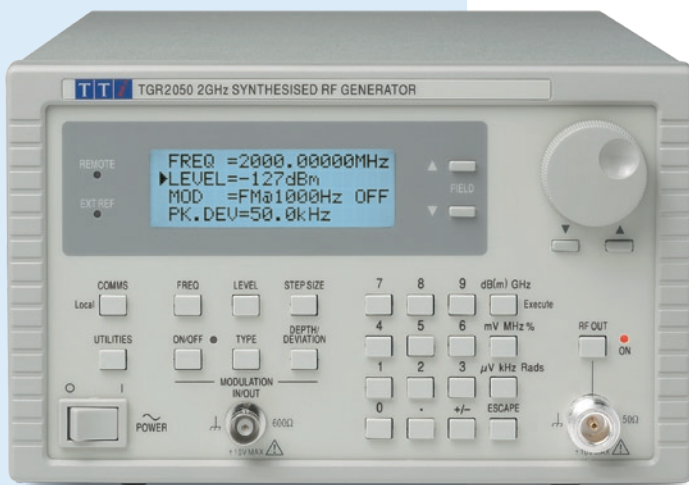
- ▶ 10MHz to 1000MHz frequency range
- ▶ Accuracy better than 1 ppm over 15°C to 30°C
- ▶ Ageing better than 1 ppm over one year
- ▶ Low phase noise and low leakage
- ▶ -127dBm to +7dBm amplitude, 0.1dB steps
- ▶ Amplitude entry in dBm or  $\mu$ V / mV
- ▶ FM modulation, internal or external
- ▶ Four line back-lit dot matrix LCD display
- ▶ Keyboard and rotary encoder control
- ▶ Non-volatile storage for 9 generator set-ups
- ▶ Full remote control through RS232 or optional GPIB
- ▶ Significantly lower cost than other synthesized RF generators

The TGR1040 is the low cost solution for RF engineers who require a basic RF generator of high stability and wide amplitude range. It has good phase noise and low leakage and offers FM modulation, internal or external.

## TGR2050

- ▶ 2 GHz signal generator
- ▶ -127dBm to +7dBm
- ▶ AM, FM & phase modulation
- ▶ RS-232 and GPIB standard

*Note: Full technical details are available on the web site.*



- ▶ 150kHz to 2000MHz frequency range
- ▶ 10Hz frequency setability
- ▶ Locking to external frequency standard
- ▶ Accuracy better than 1 ppm over 15°C to 30°C
- ▶ Ageing better than 1 ppm over one year
- ▶ Low phase noise and low leakage
- ▶ -127dBm to +7dBm amplitude, 0.1dB steps
- ▶ Amplitude entry in dBm or  $\mu$ V / mV
- ▶ FM, Phase and AM modulation, internal or external
- ▶ Keyboard and rotary encoder control
- ▶ Non-volatile storage for 9 generator set-ups
- ▶ Full remote control through RS232 and GPIB
- ▶ Exceptional price/performance ratio

The TGR2050 offers a wide frequency range with a setability of 10Hz. It has 1ppm internal stability and can be locked to an external standard.

Modulation facilities of FM, Phase and AM are included.

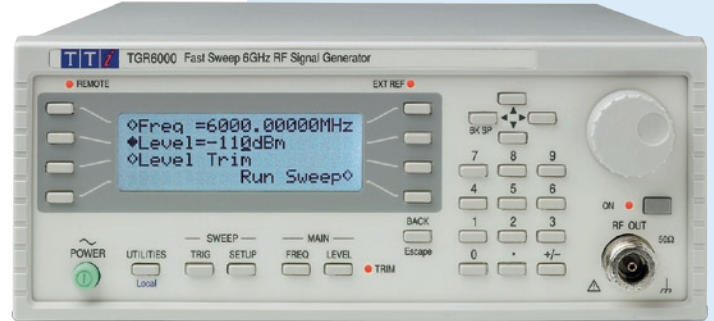
## TGR6000

**NEW**

*Note: Full technical details are available on the web site.*

- ▶ 6 GHz signal generator
- ▶ -110dBm to +7dBm
- ▶ High speed sweep
- ▶ USB, RS-232, GPIB & LAN

- ▶ 10MHz to 6000MHz frequency range
- ▶ Accuracy better than 1ppm over 15°C to 30°C
- ▶ Ageing better than 1 ppm over one year
- ▶ Low phase noise and low leakage
- ▶ -110dBm to +7dBm amplitude, 0.1dB steps
- ▶ Amplitude entry in dBm,  $\mu\text{V}$  / mV, or dB $\mu\text{V}$
- ▶ User compensation tables for specific test set-ups
- ▶ Fast stepping sweep with dwell times down to 10ms
- ▶ Internal or externally triggered sweep, lin or log, up or down
- ▶ List sweep of up to 1000 points of amplitude versus frequency
- ▶ Non-volatile storage for 12 generator set-ups and 16 sweep lists
- ▶ Compact half-rack 2U casing uses minimum bench space
- ▶ Full remote control through RS232, USB, GPIB and LAN
- ▶ Significantly lower cost than other 6GHz generators



The TGR6000 is a highly cost effective solution for engineers requiring a high quality generator operating up to 6GHz.

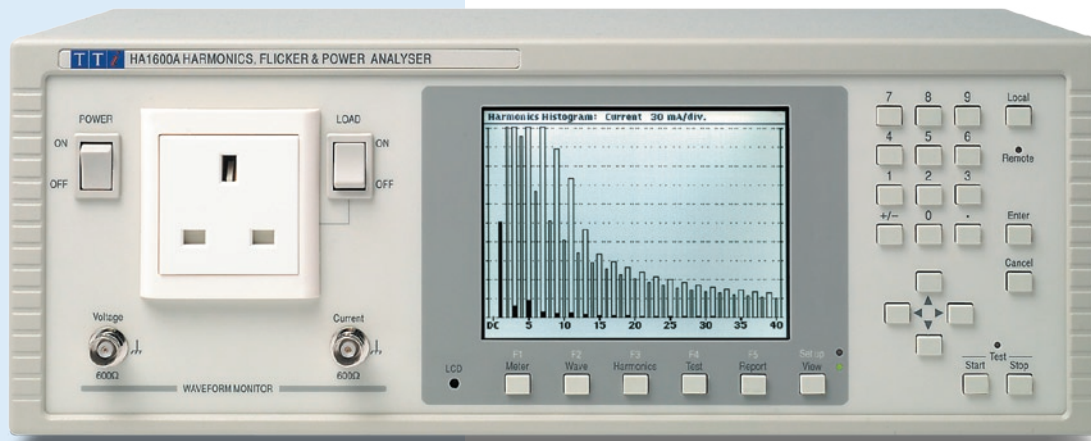
No modulations are incorporated, but rapid settling times enables a fast stepped sweep.

Level trim allows amplitude to be adjusted at various frequencies to match the requirements of specific test set-ups.

List sweep enables up to 1000 points of amplitude versus frequency to be defined.

## HA1600A

- ▶ Compliance measurements to EN61000-3-2 & EN61000-3-3
- ▶ Tabular and histogram display of harmonics
- ▶ Continuous analysis with real-time graphical update
- ▶ Full power analyzer features
- ▶ PC software supplied
- ▶ Compliance quality current harmonics measurements to EN61000-3-2 when using compliant source (such as AC1000A)
- ▶ Tabular and histogram display of harmonics
- ▶ Continuous analysis with real-time graphical update
- ▶ Compliance quality fluctuations and flicker measurements to EN61000-3-3
- ▶ Full power analyzer measuring Watts, VA, Vrms, Vpk, Arms, Apk, A-inrush, CF, THD, PF, Hz
- ▶ Real-time voltage and current waveform displays
- ▶ Wide range of national power connectors available
- ▶ Parallel printer port plus RS232 and USB interfaces
- ▶ Windows PC control and documentation software supplied



Note: Full technical details are available on the web site.

The HA1600A is a fast, easy to use power and harmonics analyzer with a large and high resolution graphical display, capable of continuous real-time analysis.

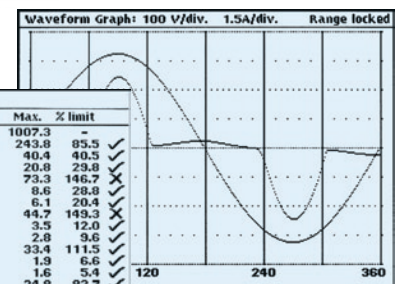
The HA1600A is intended primarily as a dedicated harmonics and flicker analyzer for compliance quality measurements, but it can also be used as a general purpose power analyzer.

The unit is available with range of power connectors to suit different national standards.

A printer interface is included along with RS-232 and USB interfaces for PC connectivity.

It is suitable for both the product development environment, and for production line test verification.

Power Meter		Hold	
<b>Supply Voltage</b>			
229.8 V <sub>rms</sub>	0.1% THD	Frequency 50.04 Hz	
325.1 V <sub>pk</sub>	at 89.4°	Crest Factor 1.414	
<b>Load Power</b>			
47.64 w	64.03 va	Power Factor 0.744	
<b>Load Current</b>			
278.6 mA <sub>rms</sub>	49.9% THD	90.7% under Class D mask	
586.0 mA <sub>pk</sub>	Phase 12.5°	Crest Factor 2.103	
<b>Harmonic Summary</b>			
Load detected Class A by waveform.			
Load passes Harmonic levels.			
Supply meets IEC requirements.			
	Limit	Average	% limit
7	30.0	229.1	80.4
3	285.0	229.1	80.4
5	30.0	3.5	11.7
7	30.0	5.9	19.5
9	30.0	1.9	6.3
11	30.0	1.5	5.1
13	30.0	2.2	7.4
15	30.0	1.1	3.7
17	30.0	1.0	3.4
19	30.0	18.1	60.3
21	30.0	0.8	2.7
23	30.0	0.7	2.4
25	30.0	15.2	50.8
27	30.0	94.9	315.7
29	30.0	43.4	144.7
31	30.0	45.7	152.3
33	30.0		
35	30.0		
37	30.0		
39	30.0		
P	48.7	94.9	45.7



## AC1000A

- ▶ 1 kW low-distortion source
- ▶ Suitable for EN61000-3-2

Note: Full technical details are available on the web site.



The AC1000A is an innovative, low cost, pure power source designed specifically for use with a harmonics analyser such as the TTI HA1600A.

It permits compliance quality measurements to EN61000-3-2 in situations where the quality of the AC supply is poor or variable.

The AC1000A has a power rating of 1000 watts at 230 volts. Maximum continuous rms current is 4.4A with a peak current capability of 10A.



Thurlby Thandar Instruments (TTi) is one of Europe's leading manufacturers of test and measurement instruments. Products are sold under two brand names - TTI and Aim. The full product range is promoted under the Aim-TTI banner..



## About this Short Form Catalogue

### Products included

This Precision Measurement and RF Test Equipment catalogue is an extract from the main Aim-TTI shortform catalogue which covers all product groups and can be downloaded from the web site.

### New product introductions and changes

Aim-TTI regularly introduces new products and some may have been added since this catalogue was printed. For the latest information please visit our web site.

Products are subject to continuous development and changes to some detailed specifications or to cosmetic appearance may have taken place since the catalogue was printed.

### Detailed product information

This catalogue contains only limited product information.

Fully detailed information for each product is available from the web site. Alternatively contact Aim-TTI or the local distributor in your country to request detailed information.

### Product illustrations

The illustrations within this catalogue are representative of the products at the time of printing. The main illustration for each product is at approximately 42% (linear) of actual size in order to enable size comparisons.

Further illustrations within the product description area are at a variable scaling to fit the available space.

## About Thurlby Thandar Instruments

### Excellence through experience

Thurlby Thandar Instruments is one of Europe's leading manufacturers of test and measurement instruments.

The company has wide experience in the design and manufacture of advanced test instruments and power supplies built up over more than thirty years

TTi is based in the United Kingdom, and all products are built at the company's facility in Huntingdon, close to the famous university city of Cambridge.

### Traceable quality systems



TTi is an ISO9001 registered company operating fully traceable quality systems for all processes from design through to final calibration.  
ISO9001:2008  
Certificate number FM 20695

## The Aim-TTI Web Site

This catalogue provides only limited information on each product.

### The Aim-TTI Web sites

Detailed product information is provided on the Aim-TTI web site, together with support information and price lists.

There are three web sites relating to your geographic location: international, UK and USA (see below):

The screenshot shows the Aim-TTI website interface. At the top, it features the Aim TTI logo and the tagline 'advanced electronic test instruments & power supplies'. Below this, it identifies the company as 'AIM & THURLBY THANDAR INSTRUMENTS' and describes itself as 'TTi - the Home of Test and Measurement Electronic Test Instruments and Power Supplies from TTI - Thurlby Thandar Instruments'. A navigation bar includes links for 'Contact TTI', 'About TTI', 'What's New', 'Support', 'Where to Buy', 'Price Lists', 'Site Map', and 'UK Customers'. It also lists contact information: 'www.tti-test.com', 'Tel: +44 1480 412451', 'info@tti-test.com', and 'Fax: +44 1480 450409'. A section for 'DETAILED TTI PRODUCT INFORMATION' lists four main groups: 'Laboratory Power Supplies', 'Waveform Generators', 'Precision Measurement Instruments', and 'RF and EMC Test Equipment'. Below this, there are four product categories with images: 'Laboratory Power Supplies' (Bench and Bus programmable), 'Waveform Generators' (Function, Pulse and Arbitrary), 'Precision Measurement' (DMMs, Counters, LCR, DC Loads, EMC, Logic Analysis), and 'RF and EMC Test Equipment' (Spectrum Analysers, RF Generators, Harmonics Analysis). At the bottom, there are two alternative links: 'VIEW A SUMMARY OF ALL TTI PRODUCTS' and 'VIEW THE VERY LATEST PRODUCTS FROM TTI'.

[aimtti.com](http://aimtti.com)

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Note that not all products are available in the USA.

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