PSA SERIES 4

1.3GHz & 2.7GHz
Real Time Spectrum Analyzers

Measurably better value

- -131dBm DANL
- 1.4:1 VSWR (typ.)
- Improved dynamic range -120dBm to +17dBm
- Waterfall and Heatmap displays
- Real Time*, FFT Swept, Swept and Zero Span modes
- Fast display update
- Smart markers
- Truly portable, only 0.58kg
- Up to 4 hours continuous battery use



1MHz TO 1.3GHz	1MHz TO 2.7GHz	+23dBm MAX.	-131dBm DANL	VSWR 1.4:1 TYP.	PSA S4	PSA S4 plus U03	PSA S4 RT
Better than ±1dB amplitude flatness					*	*	*
Resolution and video bandwidth filters, selectable in 1:2:3:5 sequence, or auto, and variable detectors					*	*	*
Harmonics <-50dBc (typ.)					*	*	*
Spurs <-60dBc, residual spurs <-70dB below ref. level					*	*	*
IP3 <65dBc (typ.)					*	*	*
Advanced digital processing					*	*	*
Instant start up and ready for the first sweep in less than 3 seconds					*	*	*
Frequency Counter					*	*	*
FFT sweep with frequency bin resolutions selectable in 1:2:4:5:8 sequence, variable detectors and window functions					*	*	*
Data Logging						*	*
Automatic measurements: CP, ACR & OBW						*	*
Modulation waveform display						*	*
Triggering						*	*
Limits, offsets & tables						*	*
Custom presets						*	*
Remote control and analysis tools with Test Bridge PSA software						*	*
Triggering including Frequency Mask trigger						*	*
10.8MHz Real Time bandwidth							*
37.5us min. duration for 100% POI							*
Realtime acquisition with variable FFT length, count, overlap, and window functions							*
62.5ns min. detectable signal duration							*

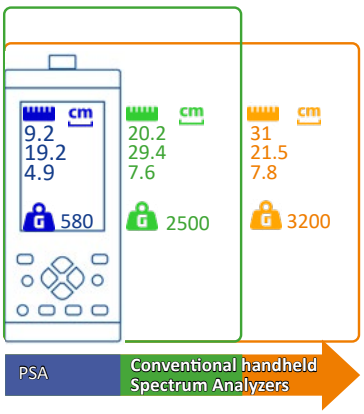
The PSA Series 4 is the latest member of the popular PSA family, delivering a comprehensive upgrade in performance, useability and display modes. It preserves the lightweight, handheld form factor that field engineers value, while adding a Real Time analysis mode* that captures transient events as they occur.

Real Time capability makes the PSA Series 4 a powerful tool for modern RF challenges, giving users a continuous, gap-free view of the spectrum for rapid detection of intermittent or fast-changing signals.

TYPICAL APPLICATIONS

- Interference analysis
- Antenna alignment and optimisation
- Signal-strength mapping
- Covert transmitter detection
- Spurious-emission checks
- EMC site and pre-compliance survey

*Real Time analysis mode available on PSA2704RT models only



SMALL SIZE...

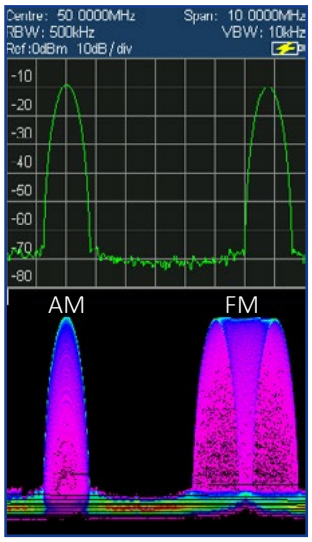
The PSA Series 4 is designed for comfortable one-handed operation.

The casing incorporates integrated rubberised bumpers on the top and bottom to protect against impact and abrasion. The adjustable tilt stand can be repositioned to the top of the instrument to provide screen protection during transport and also functions as a sun shield for improved outdoor visibility.

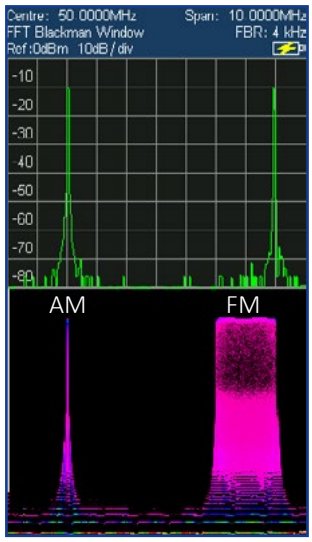
...BIG FEATURES

FAST SWEEP FFT

- Swept FFT spectrum analysis alongside conventional swept mode.
- Seamless FFT stitching delivers full-span coverage at faster sweep times (e.g. 100 MHz span with a 10kHz resultion filter in ~70 ms vs 13.5 s conventional).
- Resolution bandwidth defined by frequency bin width and selectable window functions.
- Six window functions to optimise accuracy for different applications.
- Seven detector modes for flexible and precise signal analysis.

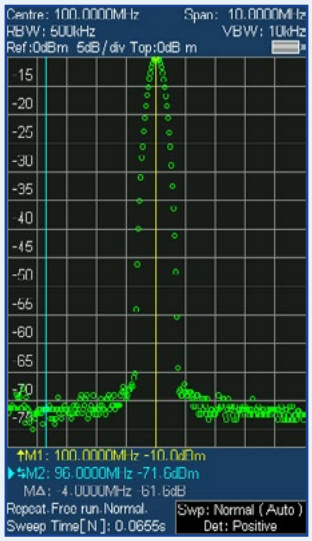


Swept

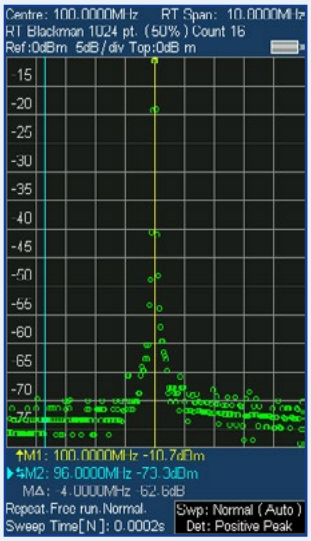


Swept FFT

PSA2704RT REAL TIME



Swept



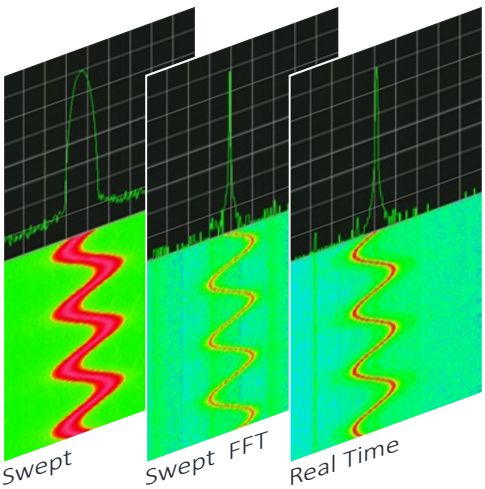
Real Time

- Signal capture - never miss a transient event.
- Up to 80,000 FFTs per second for true real time performance.
- User-selectable FFT length, count, overlap, and window functions for application flexibility.
- Four detector modes to optimise FFT combination and visibility.

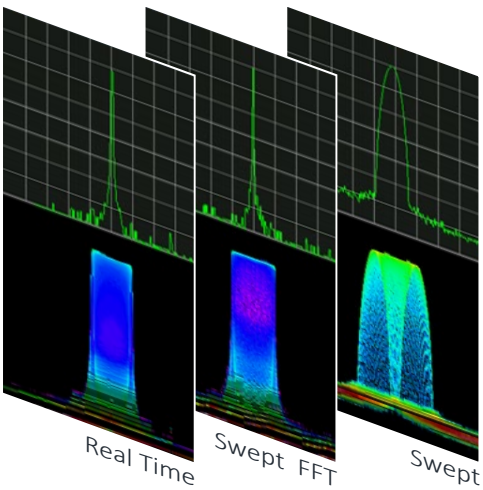
WATERFALL & HEATMAP DISPLAYS

- Flexible display modes: full, combined, or split-screen views.
- Amplitude vs. time (zero span) with trace and/or waterfall.
- Amplitude depth vs. time with trace and/or waterfall.
- Frequency deviation vs. time with trace and/or waterfall.

Waterfall (Spectogram):
Overview of the spectrum over time.



Heatmap (Density spectrum display):
Frequency and level density over time.



FREQUENCY MEASUREMENT

FREQUENCY RANGE:

Frequency Range:	PSA1304	Conventional Sweep and Demodulation	1MHz to 1300MHz
		FFT Sweep	10MHz to 1300MHz
	PSA2704	Conventional Sweep and Demodulation	1MHz to 2700MHz
		FFT Sweep	10MHz to 2700MHz
	PSA2704RT	Conventional Sweep and Demodulation	1MHz to 2700MHz
		FFT Sweep and Real Time	10MHz to 2700MHz
Frequency Accuracy:	See Reference Frequency		

PHASE NOISE

Phase Noise at 500MHz:	Conventional Sweep:	100kHz offset	-88dBc/Hz (Typ.)
		1MHz offset	-115dBc/Hz (Typ.)
	FFT Sweep (Blackman Harris Window):	100kHz offset	-91dBc/Hz (Typ.)
		1MHz offset	-120dBc/Hz (Typ.)

REFERENCE FREQUENCY

Initial Accuracy:	<± 1ppm at 20°C
Stability:	<± 1ppm over 10°C to 30°C
Ageing:	<± 1ppm per year

AMPLITUDE MEASUREMENT

AMPLITUDE RANGE

Units:	Selectable as dBm or dBµV
[1]Reference Level:	Selectable between-70dBm and +20dBm (37dBµV to 127dBµV) in 1dB steps
Display Range:	90dB from [1]reference level
Magnification:	Stepped between x1 and x10 per division

AMPLITUDE ACCURACY

Calibration Level Accuracy:	Better than ± 1dB at 10dB below [1]reference level 1350MHz (20°C ± 5°C).
Flatness:	Better than ± 1dB relative to 1350MHz over the full operating frequency range
Linearity:	Better than ± 1dB over 60dB range down from the [1]reference level

DISPLAYED AVERAGE NOISE LEVEL (DANL)

DANL: (sweep mode, ref. level =-70dBm, RBW = 1kHz, VBW = 300 Hz, span 0.027MHz)	1MHz to 10MHz:	<-121dBm
	> 10MHz to 2700MHz:	<-131dBm
Noise per Hz:	1MHz to 10MHz:	<-161dBm/Hz equivalent
	> 10MHz to 2700MHz:	<-171dBm/Hz equivalent

DISTORTION AND SPURII

3rd Order Intermodulation:	<-60dBc for two signals at 10dB below reference level, (500MHz and 502MHz); [2]Typically, <-65dBc
Harmonic:	<-50dBc at 10dB below [1]reference level (100MHz)
Other Signal Related Spurii:	<-45dBc for signals 10dB below the [1]reference level
Residual Spurii:	<-70dB below the [1]reference level
Signal Image:	<-55dBc, [2]Typically <-60dBc

SWEEP

Sweep Modes:	Conventional or FFT		
Sweep Method:	Detection for 271 points per sweep. The amplitude value (as determined by the detection mode) from each sub-span is stored (sub-span = span/270)		
Signal Detection Modes:	Alternate Peak (default), Positive Peak, Negative Peak, Sample, Linear Average, Log Average or RMS		
Sweep Time:	Sweep time is an automatic function of span and RBW/VBW in conventional sweep, or span and frequency bin resolution in FFT sweep. A speed-up function enables the time to be reduced by a factor of up to ten.		
Sweep Control:	Repeat (continuous) or Single Shot or Triggered (Triggered only with option U03).		
Sweep Trigger (PSA2704RT standard, U03 option):	Trigger Source:	Free run, Frequency Mask (Pattern), Time Domain (for demodulation), Internal system event, External input or Limits Comparator	
	Frequency Mask Triggering:	Trigger Level Resolution:	1dB
		Minimum necessary mask distance to floor:	30dB
		Dynamic range:	0 to 90dB (with respect to [1]reference level)
		Trigger conditions:	Enter / leave mask area
		Trigger modes:	Rearm or stop on
		Trigger mask length:	3 to 271 points
		Trigger mask frequency resolution:	Span/270
Automatic measurements**:	Automatic measurement calculation of Channel Power, Adjacent Channel Power Ratio, and Occupied Bandwidth.		

MEASUREMENT

FREQUENCY SPAN:

Setting Modes:	Centre frequency plus Span, or Start frequency plus Stop frequency		
Maximum Span:	PSA1304	Conventional Sweep and Demodulation	1299MHz
		FFT Sweep	1290MHz
	PSA2704	Conventional Sweep and Demodulation	2699MHz
		FFT Sweep	2690MHz
	PSA2704RT	Conventional Sweep and Demodulation	2699MHz
		FFT Sweep and Real Time	2690MHz
Minimum Span:	Conventional and FFT Sweep		2.7kHz
	Real Time		1.35kHz
Setting Resolution:	100Hz at any frequency		

RESOLUTION BANDWIDTH

RBW:	Conventional:	Selectable between 10MHz and 300Hz. Selectable in 1:2:3:5 sequence, or Auto.	
	FFT:	Frequency bin resolution:	Selectable between 40kHz and 10Hz. Selectable in 1:2:4:5:8 sequence, or Auto.
		FFT Window:	Selectable between Blackman Harris, Flattop, Gaussian, Rectangular, Hanning, and Kaiser
Video Filtering:	Conventional	Selectable between 10MHz and 300Hz. Selectable in 1:2:3:5 sequence, or Auto	
	FFT	Not applicable	

MARKERS

No. of Markers:	One, Two (or None)	
Resolution:	Frequency	0.1kHz at all frequencies
	Amplitude	0.1dB
	Trace	Available for waterfall history. Trace number selects the scanned trace from history.
	Count	Available for heatmap display. Displays the occurrence of the selected frequency-amplitude marker point. User selectable pixels included in the count (1,5,13, or 25).
Marker Frequency Accuracy:	1/271st of Span ±10Hz plus reference frequency accuracy.	
Readout:	The frequency, level, time and count at the marker points, and the frequency, level, and time differences are displayed	
Amplitude Displayed Units:	dBm, dBuV, mV or uW	
Functions:	Normal (Scroll Mode) and Peak Find Mode (as standard) Peak Track Mode and Frequency Measurement (as standard)	

MARKER FREQUENCY COUNTER:

Frequency counted at the current active marker (M1 or M2) in sweep or zero-span mode (not available in real-time mode)

Resolution:	1Hz, 10Hz, 100Hz or 1kHz
Accuracy:	Reference Frequency Accuracy ±1 count for signal > noise level +25dB

CHANNEL MARKERS: **

Channel markers are a special case of Limit Patterns (see Amplitude Limits). Channel markers are vertical lines at frequency points defined within a file. Most commonly they will be used to mark channel centre frequencies or channel boundaries.

Number of Points:	Up to two files, each containing up to 49 points, can be displayed in differing colours.
Marker Files:	Files are created using Test Bridge PSA software. Up to 999 files can be stored.

AMPLITUDE LIMITS**

Limit Types:	Limit lines from numeric values or limit patterns from files.
Number of Limits:	Up to two limits can be displayed in differing colours.
Limit Patterns:	Pattern files are created using Test Bridge PSA software. Patterns are linearly interpolated from up to 40 frequency/amplitude points. Up to 999 patterns can be stored.
Limits Comparator:	Conditions of above, below, inside or outside of limits, creating actions of message, beep, stop sweep, log sweep and pulse out.

AMPLITUDE COMPENSATION **

Offset:	Amplitude can be offset by up to +/-50dB to compensate for external attenuation or gain.
75 Ω Compensation:	Compensation can be made for inputs from 75Ω source impedance.
Tables:	Linearly interpolated compensation tables of up to 40 frequency- amplitude points can be used. Up to 999 tables can be stored. Table files are created using Test Bridge PSA software.

DATA LOGGING **

Data Types:	Peak level, Centre Level, Full Trace or Screen Image.
Data Entries:	Up to 25,000 entries per file (2500 for Images).
Trigger Source:	Entries can be made every sweep or in response to Manual Trigger key, External Trigger, Internal Timer or Limits Comparator
Internal Timer:	Adjustable from 2 secs. to 100 mins per entry.

DEMODULATION (ZERO SPAN MODE)

AUDIO DEMODULATION

Modes:	AM or FM
Internal Audio:	Internal loudspeaker with adjustable volume and mute.
Audio Out:	30mW into 32Ω mono or stereo headphones, adjustable volume, 3.5mm jack socket
Audio Filter:	Switchable 3kHz low pass filter
Carrier Display:	Horizontal line at carrier level.

WAVEFORM DEMODULATION **

Display Modes:	AM modulation waveform, FM modulation waveform, Carrier waveform (against time-base), Carrier level (horizontal line), Waterfall (demodulated waveform over time)	
Time-base:	5us/div to 200ms/div (1:2:5 sequence)	
Trigger:	Rising Edge / Falling Edge, Auto or Free Run	
Markers:	Twin markers with delta readout	
Marker Readout:	AM:	Absolute depth and difference depth
	FM:	Absolute deviation and difference deviation
	Carrier:	Absolute time and difference time
Marker Resolution:	0.01% AM, 10Hz FM	
AM Measurement:	Modulation rate:	35 Hz to 100kHz
	Modulation depth:	5 % to 100 %
	Scale:	5 % to 100 % full scale, 1:2:5 sequence
FM Measurement:	Modulation rate:	35 Hz to 100kHz
	Deviation:	1kHz to 1MHz
	Scale:	1kHz to 1MHz full scale, 1:2:5 sequence

REAL TIME SPECTRUM ANALYSIS *

Span Range:	1.35kHz to 10.8MHz
Span Divider Value:	Integer value between 1 (for 10.8MHz span) and 8000 (for 1.35kHz span)
Number of Sweep Points:	271
Marker Step Size:	Span / 270
Sweep Time:	Sweep time is a function of Span, FFT length and FFT count (number of FFTs combined in a single trace) Minimum: 100us, Maximum: 1s

DATA ACQUISITION

ADC Sampling rate:	40.96Msa/s
Maximum FFT Processing Rate:	81.92Msa/s
ADC Resolution:	14 bits
FFT Length:	Selectable between 64, 128, 256, 512 and 1024 (sweep time restrictions apply)
FFT Window:	Selectable between Blackman Harris, Flattop, Gaussian, Rectangular, Hanning, and Kaiser
FFT Overlap Factor:	Selectable between 50%, 66.66% and 75%
FFT Count:	Number of FFTs combined in one trace, 1 to 80000. The combining is determined by FFT detector selection.
FFT Detector:	Positive Peak, Negative Peak, Sample, or Linear Average
Spectrum Processing Rate:	80000 /s (10.8MHz span)

MEASUREMENT

Minimum signal duration necessary for specified level measurement uncertainty (100% POI):	37.5us ([2]Typical) (10.8MHz span, 1024-point FFT, 50% overlap factor, positive peak detector)
Minimum detectable signal duration:	62.5ns ([2]Typical)
FFT bin resolution:	10 Hz to 40kHz (span / 270)
Amplitude flatness:	±1.0dB ([2]Typical)

DISPLAY

Displayed Modes:	Full screen, split 1, split 2	
	Conventional sweep, FFT sweep and Real time sweep:	Sweep, sweep plus waterfall, and sweep plus heatmap display
	Demodulation (Zero span):	Amplitude vs time, amplitude depth vs time, frequency deviation vs time, amplitude vs time plus waterfall, amplitude depth vs time plus waterfall, frequency deviation vs time plus waterfall.

SWEEP TRACE

Trace Area:	232 x 271 pixels (full screen mode)
Graticule:	8.5 x 10 divisions, light grey graticule (full screen mode)
Displayed Points:	271 points per sweep.
Live Trace:	Dot-joined, point-sample, and persistence traces
Trace Modes:	Normal (overwrite), Peak Hold, or Average (2 to 48 sweeps).
View Trace:	Buffered “instance” of the live trace.
Reference Trace:	Stored trace recalled from a trace file.
Dual Trace Mode:	For Peak Hold and Average modes, processed and un-processed traces can be displayed simultaneously.

WATERFALL TRACE

Result:	Colour graded amplitude values
Colour Depth:	256
Trace Area:	232 x 271 points (full screen mode)
History Depth:	2048 (maximum)

HEATMAP TRACE

Result:	Colour graded number of hits
Colour Depth:	256
Trace Area:	232 x 271 points (full screen mode)
Accumulation Duration:	100us to > 24 hours

SIGNAL INPUT

Input Connector:	N Type, 50 Ω
VSWR:	1.4:1 [2]Typical
Maximum Level:	+ 23dBm, (130dBµV) >50MHz; +/-50V DC

DISPLAY

Display Type:	4.3 inch (10.9 cm) backlit TFT LCD, 480 x 272 pixels total, 65536 colors (5-6-5 RGB), resistive touch screen.

INTERNAL STORAGE

Internal Disk:	1.8 GB of internal memory.
External Storage:	USB host interface for removable USB Flash drives (maximum 32GB).
Store Trace:	Up to 999 traces can be stored under either default file names or user entered file names. Traces are stored as tables of amplitude versus frequency and can be imported into other programs, as well as being recalled to the screen.
Recall Trace:	Recalls any stored trace to the reference trace of the display.
Store Set-up:	Up to 999 instrument set-ups can be stored under either default file names or user entered file names. All settings of the instrument are saved.
Recall Set-up:	Recalls any stored set-up, overwriting the existing settings of the instrument.
Store Screen:	This function copies the whole screen area to memory as a bitmap. Up to 999 screens can be stored under either default file names or user entered file names.
Recall Screen:	Recalls any stored screen as an image.

CONNECTORS

RF Input:	Standard N Type connector.
DC Power:	1.3 mm power socket for external power supply/ charger 5V-2A-Centre Positive
USB Host:	Standard USB type A connector for connection of USB Flash drives.
USB Device:	Mini USB connector for connection to a PC. Limited digital remote-control facilities are available through this USB interface. Content of Spectrogram / Histogram RAM can be accessed via remote control. Also enables the screen of the spectrum analyser to be sent to a PC and displayed at a user-defined size.
Audio Out:	3.5 mm jack socket for demodulated audio out (accepts mono or stereo plugs).
Trigger In/Out (for use with option U03 only):	3.5 mm jack socket; Input for external trigger event, status output.

POWER SOURCES

BATTERY

Battery Type:	Li-ion 3.7V 3000mA-hour
Battery Life:	Up to 4.5 hours continuous (in conventional sweep mode)
Recharge Time:	< 3 hours from fully discharged
Auto Off Mode:	To conserve battery life, the system can be set to automatically switch off after a defined time from the last key press. This can be set between 5 mins and 60 mins (or never).
Battery Status:	Multi-segment battery status indicator.

AC LINE OPERATION/ CHARGING

The instruments can be operated continuously from mains power using the AC line adaptor provided. This powers and recharges the instrument simultaneously.

Voltage Range:	100V to 240V nominal 50Hz / 60Hz

MECHANICAL

Size:	192mm x 92mm x 49mm (HxWxD) (height excludes RF input connector)
Weight:	580 grams.
Tilt Stand:	Built-in tilt stand, for bench use which angles the unit at 40 degrees to the horizontal.
Stylus:	Casing incorporates plug-in stylus.

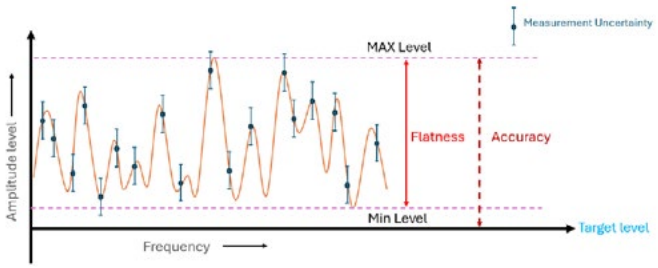
ENVIRONMENTAL AND SAFETY

Operating Range:	+5°C to + 40°C, 20% to 80% relative humidity and non-condensing
Storage Range:	-10°C to +50°C
Environmental:	Use at altitudes to 2000m, Pollution Degree 2.
Electrical Safety:	Complies with EN61010-1.
EMC:	Complies with EN61326.

Thurlby Thanadar instruments Ltd, operated a policy if continuous development and reserves the right to alter specifications without prior notice.

***Available with PSA2704RT**

****Available with option U03**



[1] **Reference level:** *calibrated range is between +10dBm to -40dBm.*

[2]**Typical (Typ):** *Refers to the performance values that represent the expected behaviour of a unit under standard operating conditions. These values are not guaranteed but are indicative of what most units will achieve during normal use. Typically, they are derived from testing and are meant to reflect the performance that can be expected from approx-imately 80% of the units produced with a 95 percent confidence level, Typical measurement does not factor in measurement uncertainty.*

NOTE: Specifications apply after storage at 20°C to 25°C for a minimum of 2 hours prior to use.

EXCELLENCE THROUGH EXPERIENCE

Aim-TTi is the trading name of Thurlby Thandar Instruments Ltd. (TTi), 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.

The company is based in the United Kingdom, and all products are built at the main 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.

ISO9001:2015

Certificate number FM 20695

WHERE TO BUY AIM-TTI PRODUCTS

Aim-TTi products are widely available from a network of distributors and agents in more than sixty countries across the world.

To find your local distributor, please visit our website which provides full contact details.

www.aimtti.com

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