

# Test & Measurement

## VOLTCRAFT®

### THE DEFINITION OF EXCELLENCE

VOLTCRAFT® is the fusion of electrical purpose and craftsmanship into high calibre, superbly styled equipment, a perfect blend of form and function.

Each instrument and tool has been expertly designed to facilitate the execution of professional and highly skilled work. Established in Germany in 1982, VOLTCRAFT® has established itself as one of the leading performers in European test equipment and industrial measurement.

Rapid is delighted to be bringing VOLTCRAFT® to the UK for the first time. With a wide product range encompassing digital multimeters, thermometers, sound, IR and power supplies, VOLTCRAFT® products are the **definition of excellence**.



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Technical specification

<b>Main Output</b>	
Waveforms	SINE, TRIANGLE, SQUARE, TTL pulse and CMOS output
Amplitude	>20Vpk-pk (open circuit) >10Vpk-pk (into 50Ω load) 50Ω ±10%
Impedance	>20dB ±1.0dB(1kHz)
Attenuator	<-10V to >+10V (<-5V to >+5V into 50Ω load)
DC Offset	1:1 to 10:1 continuously rating
Duty Control	4 digits LED display (GFG-8020H);
Display	0.2Hz to 2MHz 7 ranges
Frequency range	Separate coarse and fine tuning
Frequency control	
<b>Sine Wave</b>	
Distortion	<1%0.2Hz to 20kHz, 2%20kHz to 200kHz(GFG-8020H)
Frequency response	0.2dB 0.2Hz to 100kHz, <1dB100kHz to 2MHz
<b>Triangle Wave</b>	
Linear	
Square Wave	98% 0.2Hz to 100kHz, 95% 100kHz to 2MHz
Symmetry	<2% 0.2Hz to 100kHz
Rise/Fall time	120nS
<b>CMOS Output</b>	
Level	(4Vpk-pk±1Vp-p)(14.5Vpk-pk±0.5Vp-p)adjustable
Rise/Fall Time	<120nS
<b>TTL Output</b>	
Level	>3Vpk-pk
Rise/Fall Time	<30nS
<b>V.C.F.</b>	
Input Voltage	Approx.0V~10V(±1V) input for 10:1 frequency ratio
Input Impedance	10kΩ±10%
<b>Frequency Counter</b>	
Mode	Internal only
Range	0.2Hz~2MHz 0.2Hz(5Hz EXT)
Accuracy	±Time base accuracy:1 Count
Time Base	Oscillation frequency 3.58MHz, Temp.stability±20ppm (23°C±5°C)
Resolution	0.1Hz, 1Hz, 10Hz, 100Hz, 1kHz
Sensitivity	<25mVrms
<b>General</b>	
Power	230V AC
Accessories	Power cord x 1, Instruction manual x 1, General purposes test leads x 1
Dimensions & weight	230(W) x 95(H) x 280(D) mm, Approx. 2.1kg

Type	Order code	1+
2MHz Function generator	<b>85-2064</b>	127.89

061315



### Low-cost 3MHz Function Generator

This low cost function generator has a frequency range up to 3MHz, and offers low distortion sine, square, triangular and ramp waveforms at up to 10V pk-pk output, plus TTL and CMOS outputs.

- The output can go as low as 5mV, which is ideal for small signal amplifier work
- Two step and variable attenuation are included with variable duty cycle, variable DC offset control and external voltage frequency control (VCF)
- Housed in an attractive beige box with carry handle which also serves as an adjustable tilt
- Supplied with a set of general purpose test leads



Technical specification

Frequency range	0.3Hz to 3MHz in 7 ranges	
Amplitude	>10V pk-pk in to 50Ω load	
Attenuator	-20dB ±1dB x 2	
DC offset	<-5V to >+5V in to 50Ω load	
Duty cycle	80%, 20%, 80% to 1MHz continually variable	
Sine wave distortion	<1% 0.3Hz to 200kHz, THD <35dB below fundamental in all ranges	
Flatness	<0.3dB to 300kHz, <0.5dB to 3MHz	
Triangular linearity	>98% to 100kHz, >95% to 3MHz	
Square wave symmetry	±2% 100kHz	
Rise/fall time	100ns at max output in to 50Ω	
CMOS output	4V pk-pk ±0.5V, 1V to 14.5V pk-pk adjustable	
Rise/fall time	<120ns	
TTL output	>3V pk-pk	
Fan out	20 TTL load	
Rise/fall time	<25ns	
External VCF	0V to 10V (100:1) into 10KΩ	
Power requirements	115V/230V AC 50/60Hz	
Dimensions	251 x 91 x 291mm	
Weight	2kg	

Type	Order code	1+
Low cost function generator	<b>85-2144</b>	93.52

035870



### 3MHz Function Generator

This function generator is a stable low distortion instrument and generates signals up to 3MHz.

- Frequency range 0.3Hz to 3MHz
- Sine, triangle, square, ramp, TTL and CMOS output
- External voltage controlled frequency (VCF) function
- Duty cycle controlled with signal inversion capability
- Variable DC offset control
- Two-step (-20dB x2) and variable attenuator
- Built-in 6 digit counter with INT./EXT. function
- INT/EXT AM/FM modulation
- GCV output for synchronisation



Technical specification

Power rating	230V AC ±15%, 50 to 60Hz	
Frequency range	0.3Hz to 3MHz	
Amplitude	>10Vpp (into 50Ω load)	
Impedance	50Ω ±10%	
Display	6 digit LED	
Sine wave (distortion)	<1%, 0.3Hz to 200kHz	
Triangle wave (linear)	>98%, 0.3Hz to 100kHz	
Square wave (symmetry)	±2%, 0.3Hz to 100kHz	
Weight	2.2kg	
Dimensions	251(W) x 91(H) x 291mm(D)	

Type	Order code	1+
Function generator	<b>85-2065</b>	193.66

071555



### DDS Function and Sweep Generator

This series of function generators uses Direct Digital Synthesis (DDS) combined with Field-Programmable Gate Array (FPGA) technology to give a versatile range of high quality yet affordable test equipment.



- DDS uses a single source fixed frequency to digitally create arbitrary waveforms and frequencies
- Sine, square and triangle wave generation
- Frequency range from 0.1Hz up to 4, 7 or 10MHz
- 9 digit LED display
- High frequency accuracy
- High frequency stability
- High frequency resolution
- Low distortion sine wave generation
- Front panel setting save/recall with 10 groups of setting memories
- Built-in 6 digit, 150MHz, high resolution frequency counter (**85-2154/2155/2156** only)
- Lin/log mode sweep generator (**85-2154/2155/2156** only)
- Int/ext AM/FM modulation (**85-2154/2155/2156** only)
- Supplied with instruction manual, power lead and BNC/croc. clip test lead
- **GW Instek SFG** series

Technical specification

Frequency range	Order code		Manufacturers part number
Sine/square wave	0.1Hz to 4MHz	<b>85-2151</b>	<b>SFG-2004</b>
	0.1Hz to 7MHz	<b>85-2154</b>	<b>SFG-2104</b>
	0.1Hz to 10MHz	<b>85-2155</b>	<b>SFG-2107</b>
		<b>85-2156</b>	<b>SFG-2110</b>
Triangle wave	0.1Hz to 1MHz		
<b>Main</b>			
Resolution	0.1Hz		
Stability	±20ppm		
Accuracy	±20ppm		
Aging	±5ppm/year		
Output functions	Sine, square, triangle		
Amplitude	10V p-p (into 50Ω load)		
Flatness	±0.3dB	0.1Hz to 1MHz	
(sinewave relative to 1kHz)	±0.5dB	1MHz to 4MHz	
Impedance	±2dB	4MHz to 10MHz	
Attenuator	50Ω ±10%		
Duty control	-20dB ±1dB x2DC offset	-5V to +5V (into 50Ω load)	
	Range	20% to 80% below 1MHz (square wave only)	
	Resolution	1%	
<b>Sine wave</b>			
Harmonic distortion	-55dBc	0.1Hz to 200kHz	
	-40dBc	0.2MHz to 4MHz	
	-30dBc	4MHz to 10MHz	
<b>Triangle wave</b>			
Linear	≥ 98%	0.1Hz to 100kHz	
	≥ 95%	100kHz to 1MHz	
<b>Square wave</b>			
Symmetry	±1% of period +4ns to 0.1Hz ~ 100kHz; rise or fall time =25ns at maximum output (into 50Ω load)		
<b>CMOS output</b>			
Level	4V p-p ±1V p-p ~ 14.5V p-p ±0.5V p-p adjustable; rise or fall time =120ns		
<b>TTL output</b>			
Level	≥3V p-p; fan out; 20 TTL load; rise or fall time =25ns		
<b>Sweep operation</b>			
Sweep/rate	100:1 ratio max., adjustable		
Sweep/time	0.5s ~ 30s adjustable		
Sweep/mode	Lin/log switch selectable		
<b>Amplitude modulation</b>			
Depth & mod. frequency	0 ~ 100%; 400Hz (INT), DC ~ 1MHz (EXT)		
Carrier bandwidth	100Hz ~ 5MHz (-3dB)		
EXT sensitivity	=10V p-p for 100% modulation		
<b>Frequency modulation</b>			
Deviation & mod. frequency	0 ~ 5%; 400Hz (INT), 1kHz (EXT)		
EXT sensitivity	=10V p-p for 10% modulation		
<b>Frequency counter</b>			
Range	5Hz to 150MHz		
Accuracy	Time base accuracy ±1 count		
Time base	±20ppm (23°C ±5°C) after 30 mins warm-up		
Resolution	10MHz 1Hz, 0.1Hz 100MHz		
Input impedance	1MΩ/150pF		
Sensitivity	~35mV rms (5Hz ~ 100MHz)		
	~45MHz rms (100MHz ~ 150MHz)		
Power source	115/230V ±15%, 50/60Hz		
Dimensions w x h x d (mm)	107 x 266 x 293		
Weight (kg)	3.1 (3.2 for sweep generators)		

Type	Order code	1+
Function generator 4MHz	<b>85-2151</b>	166.86
Function generator 4MHz + sweep	<b>85-2154</b>	183.90
Function generator 7MHz + sweep	<b>85-2155</b>	204.91
Function generator 10MHz + sweep	<b>85-2156</b>	275.26

073557

RVFM

3MHz Function Generator

A multi-purpose and highly reliable 3MHz sweep function generator including many convenient features making an ideal instrument for electronics, education, production, and research and development laboratories. Supplied with manual, mains cable and BNC test leads.

- Six output waveforms
- Pulse generator
- Sweep generator
- Excellent heat dissipation



Technical specification

General specifications

Frequency	0.5Hz ~ 3MHz in 6 steps, controlled by rotary switch.
Output Waveform	Sine, Square, Triangle, Ramp, Positive Pulse and Negative Pulse; 6 waveforms total.
Stability	0.1% - 15minutes after power-on. 0.2% - 24hrs after power-on.
DC Offset	Continuous Adjustment, $\pm 10V$ at no load or $\pm 5V$ at 50 load.
Limits of Operation	0°C to +40°C, 10 to 80%R.H.
Storage Environment	-20°C to +70°C, 0 to 90%R.H.
Power source	AC 115V ( $\pm 10\%$ ) 50/60Hz, FUSE:600mA AC 230V ( $\pm 10\%$ ) 50/60Hz, FUSE:300mA
Power Consumption	25W
Dimensions	27.5 x 9.0 x 30.0 cm
Weight	2.5Kg Net.
<b>Ramp wave</b>	
Frequency	0.5Hz - 2.5MHz
Symmetry	80% (rise wave) to 20% (fall wave), <5%, 1Hz to 100KHz.
Rise Wave Linearity	<2%, 1Hz to 100KHz.
<b>Triangle wave</b>	
Frequency	0.5Hz - 3MHz
Symmetry	50% (rise wave) to 50% (fall wave), <2%, 1Hz to 100KHz
Linearity	<1%, 1Hz to 100KHz
<b>Sine wave</b>	
Frequency	0.5Hz to 3MHz
Distortion	<2%, 1Hz to 100KHz
Harmonic Ratio	<30dB, 100KHz to 3MHz
Frequency Response	<0.1dB up to 100KHz, <1dB 100KHz to 3MHz
<b>Square wave</b>	
Frequency	0.5Hz ~ 3MHz
Symmetry	50% (positive half) to 50% (negative half), <2%, 1Hz to 100KHz
Rise Time	<60ns
<b>Positive pulse</b>	
Frequency	0.5Hz ~ 2.5MHz
Width	0.4sec ~ 100ns continuous adjustment
Symmetry	20% to 80%, <5%, 1Hz to 100KHz
Rise Time	<60ns
<b>Negative pulse</b>	
Frequency	0.5Hz ~ 2.5MHz
Width	0.4sec ~ 100ns
Symmetry	80% to 20%, <5%, 1Hz to 100KHz
Fall Time	<60ns
<b>Main output</b>	
Output Impedance	0 $\Omega$ , <2% Accuracy
Max. output	20 Vp-p (No load), $\pm 1V$ , 10 Vp-p (50 $\Omega$ load), $\pm 0.5V$
Min. output	0.1Vp-p (No load) and 0.05V (50 $\Omega$ load)
Attenuator	one -20dB switch, <2% Accuracy
<b>Synchronous output</b>	
Output Impedance	50 $\Omega$ , <2% Accuracy
Output Level	TTL level, >3Vp-p fixed amplitude
Fanout	> 20
Rise Time	<30ns
<b>VCF input</b>	
Input Impedance	0 to 10V
Input Frequency	DC ~ 1KHz
Input Frequency Variance	1:1 to 1:1000
<b>Sweep synchronous output</b>	
Output Impedance	1KHz, <20%
Output Waveform	Linear or Log Sweep Ramp Wave
Output Amplitude	10Vp-p (No load) or 5Vp-p (1K $\Omega$ load)
Output Frequency	Continuous adjustment, 0.2Hz ~ 100Hz
<b>Sweep generator</b>	
Sweep Form	Linear or Log switchable
Sweep Speed	5sec ~ 10ms, continuous adjustment
Sweep Width	1:1 to 1:100

Type	Order code	1+
3MHz Function generator	85-2008	80.72

072926

RVFM

3MHz Function Generator with Counter

A multi purpose 3 MHz function generator ideally suited for electronics, education, production, and research and development laboratories. Supplied with manual, mains cable and BNC test leads.

- Six output waveforms
- Pulse generator
- Sweep generator
- Digital counter



Technical specification

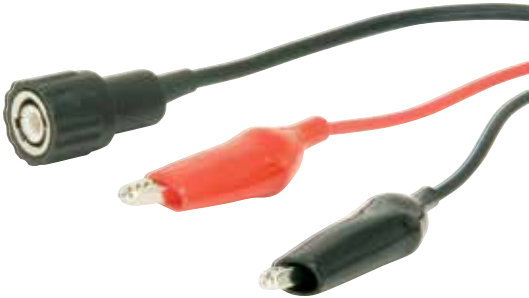
General specifications

Waveform output	Sine, Square, Triangle, Ramp, Positive Pulse and Negative Pulse; 6 waveforms total
Stability	0.1% ~ 15 minutes after power-on, 0.2% ~ 24hrs after power-on
<b>Counter</b>	
Display	5 digits 0.36in red LED
Max. Resolution	0.001Hz
Display unit	Hz / KHz Automatically controlled by CPU
Common specification	
Limits of operation	0°C to 40°C, 10% to 80%R.H
Storage Environment	20°C to 70°C, 0% to 90%R.H
Power consumption	25W
Power source	AC 115V ( $\pm 10\%$ ) 50/60Hz, FUSE:600mA, AC 230V ( $\pm 10\%$ ) 50/60Hz, FUSE:300mA
Ventilation	DC 12V / 100mA Fan
Dimensions	275 x 90 x 300mm
Weight	2.5kg Net
Accessory	Power cord, operating manual
<b>Ramp wave</b>	
Frequency	0.5Hz to 2.5MHz, 5-digit LED display, Max. resolution 0.001Hz, 6 steps selected by rotary switch
Symmetry	80% (Rise wave) to 20% (Fall wave), <5%, 1Hz to 100KHz
Rise Wave Linearity	<2%, 1Hz to 100KHz
Triangle wave	
Frequency	0.5Hz to 3MHz, 5-digit LED display, Max. resolution 0.001Hz
Symmetry	50% (Rise wave) to 50% (Fall wave), <2%, 1Hz to 100KHz
<b>Sine wave</b>	
Frequency	0.5Hz to 3MHz, 5-digit LED display, Max. resolution 0.001Hz
Distortion	<2%, 1Hz to 100KHz
Harmonic Ratio	<30dB, 100KHz ~ 3MHz
Frequency Response	<0.1dB, up to 100KHz, 1dB, 100KHz to 3MHz
Square wave	
Frequency	0.5Hz to 3MHz, 5-digit LED display, Max. resolution 0.001Hz
Symmetry	50% (Positive half) to 50% (Negative half), <2%, 1Hz to 100KHz
Rise Time	<60ns
<b>Positive pulse</b>	
Frequency	0.5Hz to 2.5MHz, 5-digit LED display
Width	0.4sec to 100ns, continuous adjustment
Symmetry	20% to 80%, <5%, 1Hz to 100KHz
Rise Time	<60ns
<b>Negative pulse</b>	
Frequency	0.5Hz to 2.5MHz, 5-digit LED display, Max. resolution 0.001Hz
Width	0.4sec to 100ns
Symmetry	80% to 20%, <5%, 1Hz to 100KHz
Fall Time	<60ns
<b>Main output</b>	
Output Impedance	50W, <2% Accuracy
Max. Output	20Vp-p (No-load), $\pm 1V$ , 10Vp-p (50 $\Omega$ load) $\pm 0.5V$
Min. Output	0.1Vp-p (No-load), or 0.05Vp-p (50 $\Omega$ load)
Attenuator	One -20dB Attenuator, <2% Accuracy
<b>Synchronous output</b>	
Output Impedance	50 $\Omega$ , <2% Accuracy
Output Level	TTL level, >3Vp-p fixed amplitude
Fan Out	>20
Rise Time	<30mS
<b>VCF input</b>	
Input Voltage	0 ~ 10V
Input Frequency	DC to 1KHz
Input Frequency Variance	1:1 to 1:1000
<b>Sweep synchronous output</b>	
Output Impedance	1KHz, <2%
Output Waveform	Linear or Log sweep ramp wave
Output Amplitude	10Vp-p (No load) or 5Vp-p (1K $\Omega$ load)
Output Frequency	0.2Hz to 100Hz continuous adjustment
<b>Sweep generator</b>	
Sweep Form	Linear or Log switchable
Sweep Speed	5sec to 10ms, continuous adjustment
Sweep Width	1:1 ~ 1:100
<b>Counter</b>	
Display	5 digits, 0.36in red LED display
Max. Resolution	0.001Hz
Display unit	Hz / KHz, Auto range
Time base	20MHz
Temperature coefficient	< 10ppm
Accuracy	< 0.002%
Power Supply	+5V, 160mA
<b>Internal counter</b>	
Range	Auto range with 4 resolutions, 0.001Hz / 0.01Hz / 0.001KHz / 0.01KHz, Auto control by CPU
Display	0.500Hz to 3000.0KHz, Auto select by CPU
Gate time	Variable, 0.25sec to 2sec, Auto - setting
Min. display digits	4 digits
<b>External counter</b>	
Max. Input Voltage	< 250Vrms
Input Impedance	1M $\Omega$ , < 2%
Input Frequency	0.2Hz to 60MHz
Attenuator	*20 (-26dB) Attenuator
Coupling	AC (HF) For >100KHz frequency DC (LF) With 100KHz filter, for frequency <100KHz
Range	The same as internal counter.
Min. display digits	4 digits
Gate Time	0.25sec to 10sec, Auto - setting, depends on the input frequency
Sensitivity	< 30mVrms (1MHz)

Type	Order code	1+
3MHz Function generator with counter	85-2009	123.87

072934

BNC to Crocodile Clip Leads





**RVFM**

**5MHz Function Generator**

A rugged, high stability, easy to operate 5MHz function generator. Supplied with manual, mains cable and test leads.

- Linear/Log sweep function
- Duty cycle control
- Invert function
- Auto range auto gatetime counter



Technical specification

<b>Main output</b>	
Frequency Range	0.5Hz to 5MHz in 8 Ranges
Waveforms	4 Waveforms(Sins, Square, Triangle, DC)
Amplitude	20Vp-p / Open, 10Vp-p / 50Ω Load
Attenuator	x20 (-26dB) ±2%, x1 (0dB)
Output Impedance	50Ω (±2%)
DC Offset	±10V With Pull ADJ Switch
Freq Accuracy	±0.02% + 1D
Distortion	1%, 1Hz to 100kHz
Rise/Fall Time	90ns
V.C.F Input	0 to ±10V control frequency to 1000:1
<b>Sweep output</b>	
Rise time	60ns
Level	3Vp-p (open)
Waveform	Square, pulse
<b>Sweep</b>	
Mode	Linear/Log Sweep
Width	>100:1 continuously variable
Rate	From 10ms to 5s continuously variable
Sweep Output	10Vp-p (open)
Output Impedance	1KΩ±2%
<b>Counter</b>	
Display	5 digits 0.36in Red LED display with Autorange
Gate time	Auto Select (0.25s to 10s)
Resolution	0.001Hz
Mode	INT / EXT HF / EXT LF (100kHz Filter)
Accuracy	±Time Base Accuracy ±1count
Time Base	20MHz ±20ppm (23±5°C)
Frequency Range	0.2Hz-60MHz
Sensitivity	25m Vrms at 1MHz
Max Input	150Vrms
Power input	AC 115V/230V ±10%, 50/60Hz, 25watt
Dimensions	275 (w) X 90 (h) X 300 (d) mm
Weight	2.5kg

Type	Order code	1+	3+	6+
5MHz Function generator	<b>85-2010</b>	237.90	214.18	195.42

072935



**TG120 20MHz Function Generator**

The **TG120** is a low-cost instrument that utilises alternative technology to ensure that the high quality of the waveform is retained right up to 20MHz.

- Low-cost with high performance
- 0.2Hz to 20MHz frequency range
- 10mV to 20V peak to peak amplitude
- TTL/CMOS auxiliary output
- DC offset control with zero detent
- Variable symmetry control for pulse and ramp waveform
- External sweep input
- Wide range level control
- Complies with **EN61010-1** and **EN61326**
- **Thurlby Thandar TG120**



Technical specification

Frequency range	0.2Hz to 20MHz in 8 ranges
Vernier range	>10:1 on each range
Vernier accuracy	±5% typ.
Waveform types	Sine, triangle, square, DC, symmetry (variable by external sweep mode)
<b>Output</b>	
Selectable ranges	0dB, -20dB, -40dB
	DC offset
	TTL/CMOS (drives 4 standard TTL loads)
<b>General</b>	
AC Input	115/230V AC 50/60Hz
Dimensions L x W x H (mm)	230 x 220 x 82
Weight (kg)	1.5
Operating temperature	+5°C to +40°C @20-80% RH
Storage temperature	-10°C to +65°C

Type	Order code	1+
20MHz Function generator	<b>85-1297</b>	226.81

074707



**TG300 Series 3MHz Function Generators**



The three models in the **TG300 series** include a basic function generator, a function generator with frequency counter and a function generator with frequency counter and internal sweep generator. These models provide very high waveform quality under all conditions and represent the state-of-the-art in low-cost analogue function generators.

- 0.03Hz to 3MHz frequency range
- Fast and accurate frequency measurement
- Wide range level control with 2mV to 20V peak to peak amplitude
- Simultaneous display of frequency and amplitude
- RMS, peak to peak or DC offset amplitude display
- Very high waveform quality at all frequencies and levels
- Variable symmetry with constant frequency
- Variable DC offset with zero detent
- 1000:1 frequency change by vernier or sweep voltage
- Auxiliary TTL/CMOS output
- External seven digit 120MHz frequency counter (**TG320** and **TG330**)
- Precision internal linear or logarithmic variable sweep generator (**TG330**)
- Internal or external amplitude modulation (**TG330**)
- Complies with **EN61010-1** and **EN61326**
- **Thurlby Thandar TG300 series**

Technical specification

Type	
<b>TG315</b> (Order code <b>85-1294</b> )	Function generator
<b>TG320</b> (Order code <b>85-1295</b> )	Function generator with frequency counter
<b>TG330</b> (Order code <b>85-1296</b> )	Function generator with frequency counter and internal sweep generator

**Function generator**

Frequency	0.03Hz to 3MHz in 7 ranges
Vernier range	1000:1 on each range
Waveform types	Sine, triangle, square, DC, symmetry
Meter functions	
Frequency	Autoranging
Amplitude	Peak to peak or rms value
DC Offset	With clipping indicator
Outputs	
Main	50 or 600Ω
Aux out	0 to 5V TTL/CMOS
Sweep out	TG330 only

**Frequency counter TG320 and TG330**

Frequency ranges	5Hz to 25MHz and 20MHz to 120MHz autoranging
Input sensitivity	50mV
Input impedance	1MΩ/25pF
Measurement time	Selectable 0.5 or 5s
Resolution	6 Digits in 0.5s, 7 digits in 5s
Accuracy	±1 Digit

**Sweep modes**

External	
Input impedance	10kΩ
Input sensitivity	0 to 3V for 1000:1 sweep
Max. input voltage	±10V
Linearity	Better than 1%
Max. slew rate	0.1V/μs

**Internal TG330**

Sweep range	1000:1 within each range
Sweep rate	Adjustable 20ms to 20s typ.
Sweep mode	Linear or logarithmic
Sweep output	3V ramp from 600Ω

**Amplitude modulation TG330**

Depth	Variable 0 to 100% typ.
Frequency	400Hz (internal), DC to 20kHz (external)
External sensitivity	Approx. 2V peak to peak for 50% modulation
Input impedance	40kΩ

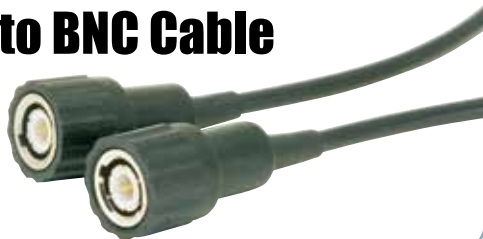
**General**

AC Input	110 to 120V or 220 to 240V 50/60Hz
Dimensions L x W x H (mm)	235 x 260 x 88
Weight (kg)	1.9
Operating temperature	+5°C to +40°C @20-80% RH
Storage temperature	-10°C to +65°C

Type	Order code	1+
TG315	<b>85-1294</b>	215.36
TG320	<b>85-1295</b>	244.49
TG330	<b>85-1296</b>	286.11

074706

**BNC to BNC Cable**



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[www.rapidonline.com/activate](http://www.rapidonline.com/activate)



TG550 5MHz Function Generator with Sweep

Function Generator, 0.005Hz to 5MHz Frequency Range, 0.001% Accuracy, 1mVpp to 10Vpp Amplitude, Sine, Triangle, Square Output Waveforms, 8 Digit LCD Display, 110 to 120V AC/220 to 240V AC Power Source, 5°C to 40°C Temperature Range, Simultaneous Display of Frequency & Amplitude, Crystal Controlled Digital Frequency Locking, Precision Internal Linear or Logarithmic Sweep, Seven Digit External Frequency Counter, Very High Waveform Quality at All Frequencies & Levels, 1000:1 Frequency Change by Vernier or Sweep Voltage, Internal or External Amplitude Modulation up to 100%, 260mm Length, 235mm Width, 88mm Height, 1.9kg Weight



- 0.005Hz to 5MHz frequency range
- Simultaneous display of frequency & amplitude
- Frequency locking for crystal controlled stability
- Precision internal linear or logarithmic sweep
- External frequency counter with 7 digit resolution
- Very high waveform quality at all frequencies & levels
- 20V pk-pk from 50Ω or 600Ω, plus TTL/CMOS output
- 1000:1 frequency change by vernier or sweep voltage
- Internal or external amplitude modulation up to 100%
- Exceptional waveform quality
- Variable symmetry for pulse and ramp waveforms
- Wide range level control
- Fast and accurate frequency measurement
- RMS or peak to peak amplitude display

Technical specification

**Frequency**  
Frequency Range: 0.005Hz to 5MHz in 7 overlapping decade ranges with fine adjustment by verniers  
Vernier Range: 1000:1 on each range  
Frequency Locking  
Operating Range: 0.5Hz to 5MHz with vernier setting within 10% to 100% of range maximum  
Locking Accuracy: Better than 0.01% of displayed value  
Display LCD, 8 digits (11mm high) plus 14 annunciators

**Meter Functions (generator mode)**  
Frequency: Auto-ranging reciprocal measurement giving 4 digit resolution for frequencies down to 1Hz; maximum resolution is 0.001Hz. Accuracy ±1 digit 0.2Hz to 5MHz; accuracy ±1% of range full scale below 0.2Hz

Amplitude: Display shows peak-to-peak amplitude or rms value. Display corrected for attenuator setting. 3-digit resolution, accuracy typically 5% of range 3-digit resolution; accuracy typically ±2% of setting ±1 digit. Display corrected for attenuator setting

DC Offset:  
Main - 50Ω  
Amplitude 2mV to 20V peak-peak open circuit (1mV to 10V peak-peak into 50Ω) in four switch selectable ranges with 20dB vernier control within each range  
Attenuator Ranges: 0dB, -20dB, -40dB, -60dB  
DC Offset Range: ±10V from 50Ω. DC offset plus signal peak limited to ±10V (±5V into 50Ω). DC offset plus waveform attenuated proportionally by the attenuator  
Main - 600Ω  
Ain Out Alternative output socket offering the same facilities as the 50Ω socket  
Aux Out 0 to 5V TTL/CMOS logic levels capable of driving 2 standard TTL loads. Frequency, symmetry and phase as main outputs  
3V ramp from 600Ω

Sweep Out  
**External Counter**  
Frequency Range: 5Hz to 20MHz, fully autoranging  
Input Sensitivity: 50mV rms (sine wave)  
Input Impedance: 1MΩ/25pF  
Measurement Time: Selectable 0.5s or 5s  
Resolution: 6 digits in 0.5s; 7 digits in 5s  
Accuracy: ±1 digit ±timebase accuracy  
Timebase Accuracy: ±10ppm initial error; ±5ppm/year ageing rate; typically less than 0.5ppm/°C. Adjustment point for closed-case recalibration

Operating Modes

Specifications apply for the top decade of each frequency range and maximum output into 50Ω termination.

**Sine**  
Distortion: <0.5% on 500, 5k and 50k ranges; <1% on 5, 50 and 500k ranges; all harmonics >25dB below fundamental on 5M range.  
Amplitude Flatness: ±0.2dB to 200kHz; ±2dB to 5MHz

**Triangle**  
Linearity: Better than 99% to 200kHz

**Square Wave**  
Rise and Fall Times: <45ns  
Mark - Space Ratio: 1:1 ±1% to 100kHz

**DC**  
Range: ±10V untermintated

**Symmetry**  
Symmetry Range: Variable typically 1:9 to 9:1 (on top decade of each range), frequency divided by 10.

**Sweep Modes**  
**Internal**  
Sweep Range: 1000:1 within each range  
Sweep Rate: Adjustable, typically 20ms to 20 secs.  
Sweep Mode: Linear or logarithmic. Sweep start and stop frequencies displayed by button press.

**External**  
Input Impedance: 10kΩ  
Input Sensitivity: 0V to 3V for 1000:1 sweep  
Max. Input Voltage: ±10V  
Sweep Linearity: Better than 1%  
Max. Voltage Rate: 0.1V/μs

**Amplitude Modulation**  
Depth: Variable 0 to 100%  
Frequency: 400Hz (internal), DC to 100kHz (external)  
External Sensitivity: Approx. 2V peak-to-peak for 50% modulation

**General**  
**Power Requirements**  
Input Voltage: 230V or 115V nominal 50/60Hz by internal adjustment; operating range ±14% of nominal.  
Consumption: Installation Category II  
25VA max.

**Environmental & Mechanical**  
Operating Range: +5°C to +40°C, 20% to 80% RH.  
Storage Range: -10°C to +65°C  
Environmental: Indoor use at <2000m, Pollution degree I  
Safety: Complies with EN601010-1  
EMC: Complies with EN50081-1 and EN50082-1  
Size: 260(W) x 88(H) x 235(D)mm  
Weight: 1.9kg

Type	Order code	1+
TG550 Function generator	85-1230	348.53



50MHz Function/Pulse/Arbitrary Generator, USB/LXI/GPIB TG5011G

The Thurlby Thandar TG5011G represents the state-of-the-art in DDS based function generators. The 50MHz Thurlby Thandar TG5011G significantly outperforms other generators in its price range, not just because of its frequency range, but because of its all round performance and features. The Thurlby Thandar TG5011G incorporates a similar feature set at a still lower cost and represents exceptional value for those with lower frequency requirements.



The generator offers very fast edge speeds of better than 8ns on the TG5011, but the edges can be slowed down to simulate slower pulses. Rise and fall times are independently variable in the range 5ns to 40us or can be linked so that both edge speeds are the same. As with all other waveforms, pulses can be triggered from an external trigger input (or manual trigger, the internal trigger generator or a Bus command). Burst mode creates a burst of between one and a million pulses in response to each active edge of the trigger. Gated cause pulses to be generated only when the gate signal is true. The gate source can be external or internal exactly as the trigger signal.

- Advanced Function/Arbitrary/Pulse Generator
- Arbitrary waveforms of up to 128K points at up to 125MS/s
- Up to 50MHz sine and square, 1μHz or 14 digit resolution
- True pulse generator with variable delay and variable rise/fall
- Programmable via USB, GPIB and LXI compliant LAN interfaces
- Manufacturers part no. **Thurlby Thandar TG5011G**

Technical specification

Sine wave  
Harmonics (1V pk-pk) 1μHz to 50MHz, 14 digits or 1μHz resolution  
dc to 20MHz: -65dBc; 20kHz to 100kHz: -60dBc; 100kHz to 1MHz: -45dBc; 1MHz to 50MHz: -40dBc

Square wave  
Rise and fall times 1μHz to 50MHz, 14 digits or 1μHz resolution  
<8ns

Pulse  
Width and delay range 0.5mHz to 12.5MHz, 14 digits or 1μHz resolution  
Width: 20ns to 2000s; Delay: 0ns to 2000s

Rise and fall times Independently adjustable between <8ns and 40μs

Triangle and ramps 1μHz to 500kHz, 12 digits or 1μHz resolution

Symmetry/linearity 0.0 % to 100.0 %, 0.1% resolution; <0.1% to 30kHz

Noise Gaussian white noise 20MHz bandwidth

**Arbitrary waveforms**  
Sample rate/ resolution 125MS/s; 14 bits  
Waveform length Up to 128k points (2 points to 131072 points)  
Maximum frequency 10MHz maximum waveform repetition rate  
Waveform storage Up to 4 waveforms internally, up to 1000 waveforms per memory stick  
Waveforms supplied Sine, exponential rise/fall, logarithmic rise/fall, cardiac, gaussian, haversine, havercosine, lorentz

Waveform editing Built-in point-to-point editor. Full creation and editing on PC using Waveform Manager Plus, transfer by memory stick or digital interfaces

**Modulations: AM, FM, PM, PWM, FSK, noise, sweep, gate, burst**  
AM 0.0% to 120.0%, external or internal using any waveform, DC to 20kHz  
FM DC to Fmax/2; external or internal using any waveform, DC to 20kHz  
PM -360° to +360° external or internal using any waveform, DC to 20kHz  
PWM (pulse only) 0% to 100% of width; external or internal using any waveform, DC to 20kHz  
Noise Noise can be used as a modulator, or can be added to any waveform  
External modulation input AM, FM, PM, PWM: ±5V full scale, DC to 20kHz

Trigger functions Gated or triggered burst, 1 to 1M cycles or infinite, variable start/stop phase  
Source: keyboard, trigger generator, external in socket or bus interface  
2mHz to 1MHz square wave adjustable in 1us steps, 9 digit resolution

**Internal trigger generator**

**Digital interfaces**  
USB Flash drive Front mounted socket for USB flash memory, up to 1000 waveforms and 1,000 setups per device  
Remote control Full control and file transfer via USB and LAN interfaces (LXI class C)  
**General**  
Power requirement 110-240V AC ±10% 50/60Hz; 60VA; installation category II  
Dimensions 250 x 97 x 270mm (or 2U ½-rack without buffers/handle  
Weight 2.55kg

Type	Order code	1+
Arbitrary Generator	85-4538	948.84

517120

velleman®  
2MHz USB PC Function Generator

This PC-based digital function generator is a versatile instrument that can output a variety of waveforms (including sine, square, triangle and rectangle waves) created on a PC. There is a choice of standard, predefined library waveforms or custom-built waveforms using the signal wave editor, with a frequency range of up to 2MHz. The outputs are galvanically isolated from the PC, reducing measurement errors. Additionally, extended Bode plot function is possible when this unit is chained with the PC-scope **85-7417**, creating a complete diagnostic and monitoring system.



- Frequency range 0.01Hz to 2MHz
- DDS (Direct Digital wave Synthesis) functionality
- Crystal based stability
- Low sine wave distortion
- Two parallel output connectors
- TTL-level synchronisation output
- Galvanic isolation
- Storage for up to 8192 waveform points
- Predefined waveform library including noise and sweep types

- Wide sweep frequency range
- Sweep time up to 10hrs.
- Automated wave sequence generation
- Supplied with USB cable, getting started manual, software on CD and 9V power adaptor
- **Velleman type PCGU1000**

Technical specification		
Frequency range	0.01Hz to 2MHz	
Amplitude range	0.1V p-p to 10V p-p @ 1kHz 600Ω 0V offset	
Frequency setting resolution	0.01%	
Amplitude resolution	0.4% of full scale	
Vertical resolution	8 bits (0.4% of full scale)	
Offset	0 to -5V or +5V	
Sweep frequency range	0.0001Hz to 25MHz	
Sweep time	1ms to 10hrs.	
Noise mode bandwidth	25MHz	
Sample rate	50MHz	
Sine wave distortion (THD) typ.	<0.08%	
Output impedance	2x 50Ω	
Power supply	9V DC 600mA (adaptor supplied)	
Dimensions	55 x 190 x 200mm	
System requirements:		
IBM compatible PC		
Windows 98SE/ME/2000/XP/Vista		
SVGA display card (800 x 600 min.)		
Mouse		
USB port		
CD-ROM drive		
Type	Order code	1+
2MHz USB Funct. gen.	<b>85-7421</b>	156.44

060863



ArbStudio AS1104D Waveform Generator 125MHz 4 + 36-channels

The ArbStudio AS1104D arbitrary waveform generator (AWG) is capable of generating signals up to 125 MHz with high sample rate, long memory and high resolution as well as a variety of operating modes, modulation capabilities and a digital pattern generator. The software interface that controls the hardware is designed to simplify waveform creation with an intuitive navigation tree which allows easy access to all channels along with special views for controlling basic function generator outputs as well as pulse width modulation (PWM) capabilities.



The ArbStudio software runs on an external PC freeing the user from the small displays and readouts found on a typical AWG. A simple function generator window is available for basic waveform creation while a unique, streamlined control panel dedicated for PWM signals is also available. The main software mode provides a start page that provides tutorials on creating a wide range of both simple and complex waveforms, as well as shortcuts to recent projects and an intuitive navigation tree to get started quickly. Once waveform creation has begun, graphical displays show the waveforms that have been created or sequenced and the views can be customized to only show the windows that are of most interest to the user.

The specifications of this model result in a higher performance arbitrary waveform generator that competitive models at this price point cannot match.

- 125 MHz bandwidth
- 1 GS/s maximum sample rate
- Long memory: 2Mpts/Ch
- 16-bit resolution
- 4-channels
- Digital Pattern Generator:36 Channels
- Arbitrary and Direct Digital Synthesis (DDS) modes
- Digital pattern generator
- PWM mode
- Sweep and burst modes
- Modulation: AM, FM, PM, ASK, SK, PSK
- Unmatched Performance
- Up to 8 total 4 channel models can be synchronized with the AS-SYNC cable

Type	Order code	1+
LeCroy ArbStudio AS1104D	<b>86-3115</b>	4723.42
AS-SYNC Synchronisation Cable	<b>86-3119</b>	280.91

400471



10MHz Pulse Generator with Delay

The **TGP1100** is a dedicated instrument used for the generation of pulses for the stimulus and control of electronic systems.

- Frequency range of 0.1Hz to 10MHz
- 50ns minimum pulse width
- Fully variable pulse delay
- Squarewave, double pulse and delayed pulse modes
- Free-run, gated and triggered modes
- TTL and sync outputs
- Complies with **EN50082-1, EN55081-1 EN61010-1**
- **Thurlby Thandar TGP110**



Technical specification		
Output parameters		
Period range	100ns to 10s (10MHz to 0.1Hz)	
Period jitter	<0.1%	
Pulse width range	50ns to 5s	
Pulse width jitter	<0.1%	
Delay range	50ns to 5s	
Operation modes	Run Triggered Gated	Continuous generation 0.1Hz to 10MHz DC to 10MHz triggered pulse train 0.1Hz to 10MHz set pulse train
Pulse modes	Normal	1 pulse/period
	Squarewave	0.1Hz to 10MHz with mark/space ratio 1:1
	Double pulse	2nd pulse generated according to delay control
	Delayed pulse	Pulse generated according to delay control
Outputs		
50Ω output	Amplitude Rise/fall time	0.1-1V or 1-10V switchable 10ns typ.
Aux output		50Ω output at TTL/CMOS level
Sync output	Amplitude Timing Duration	Positive going pulse at TTL/CMOS level Leading edge starts >20ns before output transition 30ns typ. Inverts AUX and 50Ω outputs
Complement switch		
Inputs		
Gate/trig input	Frequency range Signal range Min. pulse width Input impedance	DC - 10MHz TTL threshold: max. input ±10V >30ns 1kΩ typ.
General		
AC Input		115 or 230V AC 50/60Hz
Dimensions L x W x H (mm)		230 x 220 x 140
Weight (kg)		1.6
Operating temperature		+5°C to +40°C @20-80% RH
Storage temperature		-40°C to +70°C
Type	Order code	1+
10MHz Pulse generator	<b>85-1782</b>	239.29

074172



Logic Probe

This logic probe has a memory function which can detect the occurrence of single pulses or logic level. It can detect one shot and low repeat rate narrow pulses, which are nearly impossible to see even with a fast scope. With this probe, they are easily detectable and visible.

The probe has three LEDs, red for high logic level, green for low logic level and yellow for pulse. The intensity of the pulse LED is directly proportional to the duty cycle of the signal observed. All single pulses or pulse trains are recognised from 30ns up to 500ms.

The probe is supplied with approx. 500mm lead terminated in a red and black probe clip. In use, the red clip should be connected to the positive of the circuit under test, and the black to the negative.

- Perfect for testing TTL and CMOS
- Displays pulse presence and logic states
- Able to detect pulse to 30ns or pulse trains to 17MHz
- Input overvoltage protection
- Pulse enlargement capability allows pulse detection down to 25ns
- LED indicators indicates HI or LO logic states
- Supplied complete with power lead and comprehensive instruction manual



Technical specification		
Input impedance:	1MW	
Width of minimum pulse:	30ns	
Input frequency:	17MHz	
Measurable Logic Gate:	TTL and CMOS	
Logic 1 (red LED lights) and then buzz	2.3V ±0.2V 70% VCC	
Logic 0 (green LED lights) and then buzz	0.8V ±0.2V 30% VCC	
Input overvoltage protection:	±220V DC/AC 15 sec	
Pulse (yellow LED) flashing time:	500ms	
Power supply protection:	±20V	
Dimension:	212 x 26.5 x 18mm	
Weight:	65g (without case)	
Type	Order code	1+
Logic probe	<b>85-0695</b>	10.72

031049

4mm Test Probes



**VOLTCRAFT®**

The Voltcraft VC-11 Digital Multimeter is the ideal tool for all the common measuring ranges for home workers. The VC-11 is equipped with a test function for 9V and 1.5V batteries and diode test.



- Measuring and displaying electric parameters in the range of excess voltage Category III
- Measuring direct and alternating voltage up to a maximum of 250V
- Measurement of direct current up to max. 200mA
- Also designed to measure resistance values of up to 2000k $\Omega$
- Diode test
- Battery test for 9V and 1.5V batteries under load condition
- Rectangular signal generator
- Ultra compact
- **What's in the box?** Voltcraft VC-11. 2 batteries and instructions for use

2 batteries, Instructions for use.

### Technical specification

51-5199	
Basic accuracy	1.5%
Calibration possible to	ISO / DKD
Dimensions	52(W) x 103(H) x 27(D)mm
Displays	2000 counts
Interfaces	None
Measurement range - resistance	0.1Ω to 2000kΩ
Measurement range AC	0.1V to 250V
Measurement range DC	200μA to 1mA
Overvoltage category	CAT III 250V
Power supply	2x LR44
Weight	80g

Type	Order code	1+
Voltcraft VC-11	<b>51-5199</b>	4.41

52521

★★★★★ **BESTSELLER** ★★★★★

**VOLTCRAFT®**

The **Voltcraft VC-130-1** is a **Digital Multimeter** that is a robust unit with a manual selection range. The VC-130-1 offers something for every user, from beginners up to the professional user. The VC-130-1 has been designed for all measurement tasks in the household and the leisure sector up to 250V.



- Diode test
- Acoustic: Continuity tester
- Non-contact AC Voltage Detector
- hFE transistor testing (with optional adapter)
- Hold function
- Low battery indication
- Robust housing with soft rubber protection
- Supplied with Test leads, 9V battery and manual
- Manufacturer's part: **Voltcraft VC-130-1**

### Technical specification

Displays	2000 counts
V DC reading range	0.1mV to 250V
Reading range A DC	0.1µA to 10A
Reading category	CAT III 250V
Basic accuracy	±0.5%
Interfaces	None
Power supply	9V battery pack
Weight	200g
Can be calibrated to	DAKMS/separate ISO
Voltage reading range DC (min.)	0.1mV
Dimensions	72(W) x 137(H)mm
Basic accuracy	0.005%
Reading category	CAT III 250V
Measurement type	Average
Amperage reading range DC (min.)	0.1µA
Current reading	DC
Category	Handheld multimeter
V AC reading range (min.)	0.1V
A DC reading range (max.)	10A
Display (counts)	2000
AC resistance	10MΩ
DC resistance	10MΩ
Display	digital
V AC reading range (max.)	250V
Voltage metering	AC/DC
Voltage DC reading range (max.)	250V

Type	Order code	1+
Voltcraft VC-130-1	<b>55-9059</b>	11.07

54765

★★★★★★★★★★★★★★★★

**VOLTCRAFT®**

## VC-12A Analogue Multimeter 250V

This Voltcraft VC-12A is an analogue multimeter 250V, with a Category III approval. Voltcraft are the manufacturer's of high-quality products. It is a name that can be trusted in the field of measuring, charging and power technology, which excel due to professional competence and constant innovation.

With Voltcraft, you will be able to cope even with the most difficult tasks whether you are an ambitious hobby user or a professional user. Therefore, we are absolutely sure your investment in a Voltcraft product will also be the start of a long and good partnership.

- Measuring and displaying electrical values
- Overvoltage category CAT III up to a maximum of 250V
- Alternating and direct voltage measuring up to a maximum of 250V
- Direct current measuring up to 250mA
- Attenuation measurements from -20dB to +50dBm
- Measurement of resistance up to 1MΩ
- Acoustic continuity test
- Battery test for 1.5V and 9V batteries

*battery, Test leads, User manual.*



### Technical specification

51-5173	
AC measurement range	-
AC resistance	2kΩ/V
DC resistance	2kΩ/V
Dimensions	69(W) x 100(H) x 32(D)mm
Error AC/DC (max.)	±5 %
Measurement range AC	0 to 250V
Measurement range DC	0 to 250mA
Overvoltage category	CAT III 250 V
Power supply	1 Mignon batteries
Battery test	1.5V/9V/DC
Resistor	0 to 1 MΩ
Measuring range of damper	-20dB to +50dBm
Weight	132g

Type	Order code	1+
Analogue Multimeter	<b>51-5173</b>	8.50

525194

**VOLTCRAFT®**

## VC-5070 Analogue Multimeter

The Voltcraft VC-5070 Analogue Multimeter has a wide measurement range and mirror scale. The VC-5070 is almost unbreakable by the extremely resilient cable tie-meter movement and the rubber-protected holster together with the overload protection of the inputs. With this Analogue multimeter, more exact measurements are obtained.

With the Voltcraft VC-5070, you will be able to cope even with difficult tasks as an ambitious hobbyist or as a professional user. Voltcraft offers reliable technology with an exceptional cost-performance ratio.

- CAT III 500V
- 10 M $\Omega$  feed impedance for all voltage measurement ranges
- Extremely sturdy cable-tie meter movement
- Supplied with Voltcraft VC-5070, batteries, 1 set of test leads, user manual

Batteries, 1 set of test leads, User manual.



### Technical specification

51-5175	-
AC measurement range	10M $\Omega$
AC resistance	10M $\Omega$
DC resistance	10M $\Omega$
Dimensions	104(W) x 160(H) x 44(D)mm
Error AC/DC (max.)	$\pm 4\%$
Frequency range	0 to 25 kHz
Measurement range AC	0 to 500V
Measurement range DC	0 to 10A
Overvoltage category	CAT III 500V
Power supply	9V block, 2 Mignon batteries
Resistor	0 $\Omega$ to 200M $\Omega$
Weight	380g

Type	Order code	1+
Analogue Multimeter	<b>51-5175</b>	29.17

525196

**New products**  
[www.rapidonline.com](http://www.rapidonline.com)



# VOLTCRAFT®

## VC130 Digital Multimeter Class Pack of 16

A classpack of 16 Voltcraft VC130 Digital LCD Multimeters in a deep Grattnell's Tray with lid.

See order code **55-9059** for full details of the Voltcraft VC130 Digital LCD Multimeter.

- Perfect storage solution for classroom multimeters
- Multimeters are held in place by a slotted foam sheet



Type	Order code	1+
VC130 Classpack 16	<b>86-1090</b>	131.58

526194

# VOLTCRAFT®

## VC250 Green Line Digital Multimeter 2000 counts CAT III 600 V

The large LCD display of this entry-level DMM makes this model ideal for all professional applications up to 600V.

At a keystroke, the input resistance can be temporarily reduced from 10MΩ to 400kΩ in order to avoid measuring errors due to stray voltages. The device is protected with comprehensive safeguards against misuse.

The battery and fuse compartment can only be opened if all measurement leads are removed from the measuring device. It is not possible to insert the measurement cables into the measurement sockets if the battery compartment and fuse compartment are open. This increases the security of the user.

- Standard measurements V/DC, V/AC, A/DC
- Resistance
- Diode test
- Acoustic continuity tester
- Battery test for 1.5V and 9V batteries
- Impedance switching
- Low battery indicator
- Digit height of 23mm
- Robust housing with soft rubber protection
- CAT III 600V
- 2000 counts
- Manual range
- For hobby, household and professionals
- Supplied with battery, test leads and user manual



### Technical specification

Displays:	2000 counts
Measurement range V DC:	0.1mV to 600V
Measurement range - V/AC:	1mV to 600V
Measurement range A DC:	0.1μA to 10A
A/AC measurement range:	0.1μA to 10A
Measurement range - resistance:	0.1Ω to 20MΩ
Overvoltage category:	CAT III 600V
Base accuracy:	±0.5%
Interfaces:	None
Power supply:	9V battery pack
Dimensions:	85(W) x 178(H) x 40(D)mm
Weight:	380g
Can be calibrated to:	ISO / DKD

Type	Order code	1+
Voltcraft VC250	<b>51-1593</b>	25.76

523681

# VOLTCRAFT®

## VC-890 OLED Digital Multimeter

The Voltcraft VC-890 is an OLED digital multimeter that is sturdy, reliable, practical and more importantly, safe for the user with approvals up to 1000V in CAT III or 600V in CAT IV.

The measuring functions are selected using the rotary switch. The measuring range selection is automatic for all measuring functions (except for diode and continuity test). Manual setting is possible at any time.

The VC890 displays true RMS in both the direct and alternating voltage and current range. For negative values, the polarity will automatically be displayed with the sign (-). The two current measuring inputs are secured against overload with ceramic high performance fuses.



The multimeter is powered by a standard 9V alkaline or lithium battery. Although the VC-890 has a power saving power function, this is switched off during data transmission to a PC via optical interface.

The ergonomic shape of the VC-890 makes it comfortable to hold, and the patented casing construction allows you to open the casing for changing the battery and the fuses only when the device has been disconnected from all measuring leads.

- CAT IV 600V
- Comprehensive safety concept
- Warning tone upon incorrect connection
- Standard Measuring area V, A, Ω, Frequency, capacity
- Auto-ranging
- Diode test
- Acoustic continuity tester
- Low-Bat-Function
- Data-hold
- REL
- Duty cycle
- Optical interface
- Impedance change over for stray voltage suppression
- Warning symbol in voltages >30 V
- CAT IV 600V, CAT III 1000V
- TLD Function
- Backlight
- Simpler and safer battery and fuse change without opening the housing completely

### Technical specification

Measurement range:	V/AC 1mV - 750V
A/AC measurement range:	0.1μA to 10A
Overvoltage category:	CAT IV 600V, CAT III 1000V
Base accuracy:	±0.8%
Interfaces:	Optical, 1x USB
Power supply:	9V battery pack
Dimensions:	91(W) x 185(H) x 43(D)mm
Weight:	380g
Can be calibrated to:	ISO / DKD

Type	Order code	1+
Voltcraft VC-890	<b>51-5900</b>	162.18

525431

# VOLTCRAFT®

## VC1008 Graphical Digital Multimeter

The Voltcraft VC1008 Graphical Digital Multimeter combines the functions of a high quality handheld oscilloscope with the functions of a multimeter. With its high sensitivity, adjustable trigger and large LCD display of 160 x 160 pixels, a wide range of different input signals can be clearly displayed.

In SCOPE operation, all important parameters are displayed along with the curve shape. An auto set function facilitates the signal display.

The measuring values in DMM operation are displayed with 4000 counts; you can select between manual and automatic range selection.

A rear positioning foot provides a slightly slanted position, which makes it easier to read the display when measuring. The soft rubber protection applied with a special spray cast method protects the measuring device from knocks and blows.

The individual measuring ranges are selected via a rotary switch, the sub-functions via buttons. The VC1008 is powered by 4x AA batteries (supplied) or an external power supply (optional).

- Additional functions include:
- REL for relative value measuring
- Switchable display illumination
- Optical interface
- A setup menu enables the individual setting of various parameters
- Saving of up to 10 measuring curves in the internal memory
- Adjustable trigger function for clean signal display in SCOPE operation
- HOLD function for freezing measuring values
- Measuring functions for resistance, capacity, continuity and diode tests

Supplied with test leads, 2x alligator clips, BNC adapter, 4x batteries (type AA), Optical USB interface cable, Software and user manual.

### Technical specification

Basic accuracy	0.80%
Calibration possible to	ISO / DKD
Connection	4 mm socket
DSO bandwidth	8MHz
Dimensions	100(W) x 200(H) x 50(D)mm
Display unit (vertical)	20mV to 200V/div
Displays	160 x 160 pixels
Horizontal display unit	100ns
Interfaces	Optical
Overvoltage category	CAT III 600V
Power supply	4x AA batteries
DC/V	0 to 1000V
AC/A, DC/A	0 to 10 A
Sampling rate	40MS/s Realtime, 200 MS/s Equivalent

Type	Order code	1+
Voltcraft VC1008	<b>51-5191</b>	130.17

525202

**No minimum order value**  
UK mainland only

Rapid

212B Digital LCD Multimeter

The **Rapid 212B** is a small hand held 3½ Digital Multimeter which is stable and highly reliable. It is supplied with a clear LCD display 15mm in height. The multimeter measures AC and DC voltage, DC current, resistance, diode test, transistors, temperature and for in-circuit tests, continuity. It has a data hold and the LCD is backlit.

- Large clear LCD display
- Rubberised holster protects the meter
- Built-in stand
- 600V CAT III pollution grade: 2
- Elevation <2000m
- Environment temperature and humidity: 0°C to +40°C
- (<80% RH, <10°C, it is not to be considered). Storage temperature and humidity: 0°C to +60°C
- (<70% RH, remove the battery)
- Temperature coefficient: 0.1 Accuracy / °C(<18°C or >28°C)
- The maximum allowable voltage between measurement end and ground: 600V DC or 600V AC RMS
- Fuse protection: mA grade: Fuse F1 400mA/600V; fuse with A grade F2 10A/600V
- Sampling rate: about 3 times/sec
- Maximum value display: 1999. Automatically display unit symbols in accordance with measurement function grade
- Over-range indication: LCD will show "1"
- Low battery indication: When the battery voltage is lower than the normal operating voltage, will display on the LCD display
- Power supply: DC 9V
- Battery type: NEDA 1604, 6F22 or 006P
- Dimensions: 188(L) x 93(W) x 50(H)mm
- Weight: about 380g (include battery)
- Supplied with 212B multimeter, 1x pair of probes, 9V battery (installed) and instructions



Technical specification		
<b>DC Voltage</b>		
Range	Resolution	Accuracy
200mV	100µA	±0.5% of rdg ± 2 digits
2V	1µA	±0.5% of rdg ± 2 digits
20V	10µA	±0.5% of rdg ± 2 digits
200V	100µA	±0.5% of rdg ± 2 digits
600V	1V	±0.8% of rdg ± 2 digits
<b>AC Voltage</b>		
Range	Resolution	Accuracy
200mV	0.1mV	±(1.2% of reading + 3digits)
2V	1mV	±(0.8% of reading + 3digits)
20V	10mV	±(0.8% of reading + 3digits)
200V	100mV	±(0.8% of reading + 3digits)
600V	1V	±(1.2% of reading + 3digits)
<b>Resistance</b>		
Measuring range	Resolution	Accuracy
200Ω	0.1Ω	±(0.8% of reading + 3digits)
2KΩ	1Ω	±(0.8% of reading + 2digits)
20KΩ	10Ω	
200KΩ	100Ω	
2MΩ	1KΩ	
20MΩ	10KΩ	±(1.0% of reading + 2digits)
200MΩ	100KΩ	±(6.0% of reading + 10digits)
<b>Audible continuity</b>		
Function	Description	Test environment
Sound	When built-in buzzer sounds,	
the resistance to be tested is not more than 50Ω voltage: about 2.8V.	Test current: about 1mA. Open circuit	
<b>Transistor</b>		
Measuring range	Description	Test environment
hFE	hFE approximation on	
the display, (0-1000)	Base current 10µA Vce is about 2.8V	

Type	Order code	1+
Hand held Multimeter	<b>86-3182</b>	6.29
Replacement fuse	<b>86-3185</b>	0.10

544296

Rapid

212B Digital LCD Multimeter Class Pack of 16

A classpack of 16 Rapid 212B Digital LCD Multimeters in a deep Grannell's Tray with lid.

See order code **86-3182** for full details of the Rapid 212B Digital LCD Multimeter.

- Perfect storage solution for classroom multimeters
- Multimeters are held in place by a slotted foam sheet



Type	Order code	1+
212B classpack of 16	<b>86-3186</b>	99.80

549216

Rapid

318C Digital Multimeter

The **Rapid 318C Digital Multimeter** has a highly versatile **range** covering AC and DC voltage, AC and DC current, resistance, diode test, transistor test and audible continuity.

- Basic DC voltage accuracy 0.5%
- Large clear LCD display
- Low battery indicator shows when the battery is nearly exhausted
- Rubberised holster protects the meter and has a 2-height stand and storage for the test probes



Technical specification		
<b>DC Voltage</b>		
Range	Resolution	Accuracy
200mV/ 2V/ 20V/ 200V		±(0.5%+2)
600V		±(0.8%+2)
<b>AC Voltage</b>		
2V/ 20V/ 200V		±(0.8%+3)
200mV/600V		±(1.2%+3)
<b>DC Current</b>		
20µA		±(2.0%+5)
200µA/2mA/20mA		±(0.8%+1)
200mA		±(1.5%+1)
10A		±(2.0%+5)
<b>AC Current</b>		
20µA		±(2%+5)
200µA/2mA/20mA		±(1.5%+5)
200mA		±(1.8%+5)
10A		±(3.0%+7)
<b>Resistance</b>		
200Ω/ 2Ω/ 20Ω/200KΩ/ 2MΩ		±(0.8%+3)
20MΩ		±(1.0%+2)
200MΩ		±(6.0%+10)
<b>Display</b>		
2000 counts		
<b>Transistor hFE</b>		
0 to 1000		
<b>Diode test resolution</b>		
1mV		
<b>Continuity buzzer</b>		
<50Ω		
<b>APO</b>		
Auto power OFF		
<b>LBD</b>		
Low battery display		
<b>Power supply</b>		
1x 9V6F22/ PP3		
<b>Weight</b>		
366g		
<b>Dimensions</b>		
195(L) x 95(W) x 55(D)mm		

Type	Order code	1+
Digital multimeter	<b>86-3181</b>	13.06
Replacement fuse	<b>86-3184</b>	0.95

544286

Rapid

318B Digital LCD Multimeter

This **Rapid 318B Digital Multimeter** can measure AC and DC voltage, AC and DC current, resistance, capacitance and temperature.

- Basic DC voltage accuracy 0.5%
- Large clear LCD display
- Auto power off function
- Rubberised holster protects the meter and has a two height stand as well as storage for the test probes



Technical specification		
<b>DC Voltage</b>		
Range	Resolution	Accuracy
200mV	0.1 mV	±(0.5% of reading 2digits)
2V	1mV	
20V	10mV	
200V	100mV	
600V	1V	±(0.8% of reading + 2digits)
<b>Max input voltage:</b>		
250V DC at 200mV range, 600V DC elsewhere		
<b>Input impedance:</b>		
10M		
<b>AC Voltage</b>		
2V	1mV	±(0.8% of reading + 3digits)
20V	10mV	
200V	100mV	
600V	1V	±(1.2% of reading + 3 digits)
<b>DC Current</b>		
2mA	1µA	±(0.8% of reading + 1 digits)
20mA	10µA	
200mA	0.1µA	±(1.5% of reading 1 digits)
10A	10µA	±(2.0% of reading + 5 digits)
<b>AC Current</b>		
2mA	1µA	±(1.0% of reading + 5digits)
20mA	10µA	
200mA	0.1µA	±(1.8% of reading + 5 digits)
10A	10µA	±(3.0% of reading + 7 digits)
<b>Resistance</b>		
200Ω	0.1Ω	±(0.8% of reading + 3digits)
<b>Frequency</b>		
20kHz	10Hz	±(2.0% of reading + 5digits)
<b>Capacitance</b>		
2µF	1µF	±(4.0% of reading + 3digits)
20µF	10µF	
200µF	0.1µF	
2µF	1µF	
100µF	100µF	±(6.0% of reading + 10digits)
<b>Temperature</b>		
-20°C to 0°C	1°C	±(5.0% of reading + 4digits)
1°C to +400°C	1°C	±(2.0% of reading + 3digits)
401°C to +1000°C	1°C	±(2.0% of reading + 5digits)

Type	Order code	1+
Digital Multimeter	<b>86-3180</b>	13.90

537571

Rapid

## 956A Autoranging Digital Multimeter

The **956A** autoranging digital multimeter is a versatile unit that can, in addition to the standard multimeter functions, also measure temperature and perform diode and transistor hFE tests. The meter comes complete with PP3 battery, test leads, K-type temperature probe, multi-function socket and full instruction manual.

- Secondary injected rubber moulded case
- Autoranging on all functions
- Auto and manual selectable
- 3½ digits bright backlit LCD with a maximum reading of 1999
- Accurate, high resolution LCD
- Measures temperature
- Data hold and maximum data hold
- Automatic shut off fifteen minutes after no use
- Support stand
- Backlight
- Suitable for students, labs, home use and outdoors
- Size: 150 x 70 x 50mm
- Weight: Approx. 240g (including battery)
- Designed to International Safety Standards IEC1010-1, CAT III 600V and Pollution 2



### Technical specification

DC Voltage				
Range	Resolution	Accuracy	Input Impedance	Overload Protection
200mV	0.1mV	±0.5% ±3	10MΩ	
2V	0.001V	±0.5% ±3	10MΩ	200mV range
20V	0.01V	±0.5% ±3	10MΩ	250V DC or AC rms
200V	0.1V	±0.5% ±3	10MΩ	2V to 600V ranges
600V	1V	±0.8% ±2	10MΩ	600V DC or AC rms

### Maximum input 600V DC

AC Voltage				
Range	Resolution	Accuracy	Input Impedance	Overload Protection
2V	0.001V	±0.9% ±3	10MΩ	200mV range
20V	0.01V	±0.9% ±3	10MΩ	250V DC or AC rms
200V	0.1V	±0.9% ±3	10MΩ	2V to 600V ranges
600V	1V	±1.2% ±3	10MΩ	600V DC or AC rms

### Maximum input 600AC rms

DC Current				
Range	Resolution	Accuracy	Voltage Drop	Overload protection
200µA	0.1µA	±1.0% ±3	20mV	
2000µA	1µA	±1.0% ±3	200mV	200mA/250V fuse (quick acting)
20.00mA	0.01mA	±1.0% ±3	20mV	
200.0mA	0.1mA	±1.0% ±3	200mV	
10.00A	0.01A	±3.0% ±5	200mV	

AC Current				
Range	Resolution	Accuracy	Voltage Drop	Overload Protection
200µA	0.1µA	±1.5% ±4	20mV	
2000µA	1µA	±1.5% ±4	200mV	200mA/250V fuse (quick acting)
20.00mA	0.01mA	±1.5% ±4	20mV	
200.0mA	0.1mA	±1.5% ±4	200mV	
2.000A				
10.00A	0.01A	±3.0% ±5	200mV	

Resistance				
Range	Resolution	Accuracy	Open Voltage	Overload Protection
200Ω	0.1Ω	±0.8% ±2	0.25V	
2kΩ	0.001kΩ	±0.8% ±2	0.25V	
20kΩ	0.01kΩ	±0.8% ±2	0.25V	250V DC or AC rms
200kΩ	0.1Ω	±0.8% ±2	0.25V	
2MΩ	0.001MΩ	±0.8% ±2	0.25V	
20MΩ	0.01MΩ	±0.8% ±2	0.25V	

Temperature				
Range	Resolution	Accuracy		
-20°C to 1000°C	1°C	±2.0% ±4		
-4°F to 1832°F	1°F	±2.0% ±4		

Type	Order code	1+
956A Autorange DMM	85-0725	11.79

070935

UNI-T

## UT20B Series: Pocket Size Digital Multimeter

This digital multimeter is a compact, light tool and a bargain if you need something cheap and reliable. The instrument has a large LCD display. This pocket-size digital multimeter, comes complete with test leads, battery.

- Power: 12V Battery A23
- LCD Size: 31 x 13mm
- Product colour: Red and grey
- Product weight: 125g
- Product size: 95 x 52 x 26mm
- Standard accessories: Test lead, battery, English manual



### Technical specification

Function	Range
DC Voltage	200mV/2000mV/20V/200V/300V
AC Voltage	200V/300V
DC Current	2000µA/20mA/200mA
Resistance	200Ω/2000Ω/20kΩ/200kΩ/2000kΩ
Battery Test	1.5V, 9V
Diode	Yes
Square Wave Output	Yes
Low Battery Display	Yes
Input Impedance for DC	Around 1MΩ
Voltage Measurement Max.Display	1999

Type	Order code	1+	5+	10+	25+
Uni-T Pocket Size Digital	85-4082	3.95	3.58	3.42	3.09

40047

UNI-T

## UT10A series: Pocket Size Digital Multimeter

This digital multimeter is a compact, light tool and a bargain if you need something cheap and reliable. The instrument has a large LCD display. This pocket-size auto-ranging digital multimeter, comes complete with test leads, battery and its own vinyl carry case.

- Power: 3V Button Battery (CR2032)
- LCD Size: 43 x 22mm
- Product Colour: Red and Grey
- Product weight: 62g
- Product size: 58 x 108 x 12mm
- Standard accessories: Test lead, battery, English manual, vinyl holder



### Technical specification

Function	Range
DC Voltage	400mV/4V/40V/300V
AC Voltage	4V/40V/300V
Resistance	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ
Capacitance	4nF/40nF/400nF/4µF/40µF/200µF
Frequency	10Hz/100kHz
Auto Ranging	Yes
Duty Cycle	0.1% to 99.9%
Diode	Yes
Continuity Buzzer	Yes
Relative Mode	Yes
Data Hold	Yes
Full Icon Display	Yes
Sleep Mode	Yes
Low Battery Display	Yes
Input Impedance for DC Voltage Measurement Max. Display	Around 10MΩ
	3999

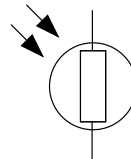
Type	Order code	1+	5+	10+
Uni-T Pocket Size Digital	85-4081	9.57	8.72	8.29

400424

# Hints & Tips

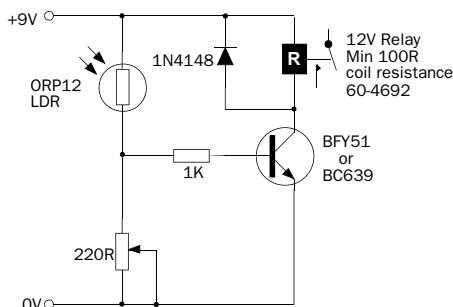
## LDR

The resistance of the LDR decreases as the light level increases.



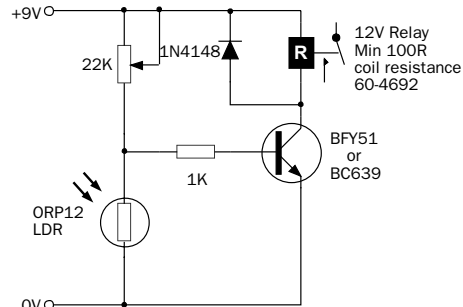
### Relay on when dark

The relay is energised when the light level increases above the level set by 220R variable resistor.



### Relay on when light

The relay is energised when the light level drops below the level set by 22K variable resistor.





UT33A Series: Palm Size Digital Multimeter

Small enough to slip into the palm of one's hand, the UNI-T UT33A series multimeter is powerful enough to test to an acceptable level. A basic but very reliable device, the UT33A helps to check the electronic parts of your electrical equipment, such as DC voltage, AC voltage, DC current, resistance and temperature. The multimeter is small but packed with functionality.

- Supplied complete with battery, test lead and manual
- Power: 1.5V Battery (AAA x 2)
- LCD Size: 48 x 16mm
- Product colour: Red and grey
- Product weight: 156g
- Product size: 130 x 73.5 x 35mm
- Standard accessories: Test lead, battery, English manual, holster



Technical specification				
Function	Range			
DC Voltage	400mV/4V/40V/400V/500V			
AC Voltage	4V/40V/400V/500V			
DC Current	400mA/4000mA/40mA/400mA/4A/10A			
AC Current	400mA/4000mA/40mA/400mA/4A/10A			
Resistance	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ			
Special Functions	Yes			
Auto Ranging	Yes			
Diode	Yes			
Continuity Buzzer	Yes			
Transistor	Yes			
Low Battery Display	Yes			
Input Impedance for DC	Around 10MΩ			
Voltage Measurement Max. Display	3999			

Type	Order code	1+	5+	10+
Uni-T Palm Size Digital	85-4079	12.00	10.92	10.40

400422



UT33D Series: Palm Size Digital Multimeter

One of the basic tools helps to check the electronic parts of your electrical equipment, such as DC voltage, AC voltage, DC current, resistance and temperature. The multimeter is small but packed with functionality. Supplied complete with battery, test lead and manual.

- Power: 9V Battery (6F22)
- LCD Size: 48 x 16mm
- Product colour: Red and grey
- Product weight: 156g
- Product size: 130 x 73.5 x 35mm
- Standard accessories: Test lead, battery, English manual



Technical specification				
Function	Range			
DC Voltage	200mV/2000mV/20V/200V/500V			
AC Voltage	200V/500V			
DC Current	2000mA/20mA/200mA/10A			
Resistance	200Ω/2000Ω/20kΩ/200kΩ/20MΩ/200MΩ			
Diode	Yes			
Continuity Buzzer	Yes			
Square Wave Output	Yes			
Data Hold	Yes			
Display Backlight	Yes			
Low Battery Display	Yes			
Input Impedance for DC	Around 10MΩ			
Voltage Measurement Max. Display	1999			

Type	Order code	1+	5+	10+
Uni-T Palm Size Digital	85-4080	7.32	6.66	6.34

400423

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Basic Tool Kit



Standard Digital Multimeters 39 Series

The UNI-T 39 Series is a feature rich digital multimeter complete with plug-in lead and holster, able to test AC/DC voltage, DC current and resistance.

The Uni-Trend Group Limited is one of the leading testing meters and instruments companies. The group has developed and manufactured the most creative, reliable, high quality and safe to use technology products and provide a wide range of products and related services to global markets.

- Power: 9V Battery (6F22)
- LCD Size: 61 x 32mm
- Product colour: Red and grey
- Product weight: 310g (Including Holster)
- Product size: 172 x 83 x 38mm
- Standard accessories: Test lead, battery, English manual, point contact temperature probe, holster



Technical specification				
Model	UT30B	UT39C		
Order code	85-4076	85-4077		
Function	200mV/2V/20V/200V/1000V	200mV/2V/20V/200V/1000V		
DC Voltage	200mV/2V/20V/200V/1000V	200mV/2V/20V/200V/1000V		
AC Voltage	2V/20V/200V/750V	2V/20V/200V/750V		
DC Current	20μA/200μA/2mA/200mA/20A	20μA/200μA/2mA/200mA/20A		
AC Current	200μA/2mA/200mA/10A/20A	200μA/2mA/200mA/10A/20A		
Resistance	200Ω/2kΩ/200kΩ/2MΩ/20MΩ/200MΩ	200Ω/2kΩ/200kΩ/2MΩ/20MΩ/200MΩ		
Capacitance	2nF/200nF/2μF/20μF	2nF/200nF/2μF/20μF		
Temperature (°C)	-40°C to 1000°C	-40°C to 1000°C		
Frequency	2kHz/20kHz	2kHz/20kHz		
Input impedance for DC voltage measurement	Around 10MW	Around 10MW		

Model	UT39E			
Order code	85-4078			
Function	200mV/2V/20V/200V/1000V			
DC Voltage	200mV/2V/20V/200V/1000V			
AC Voltage	2μA/200μA/2mA/200mA/20A			
DC Current	20μA/200μA/2mA/200mA/20A			
AC Current	200μA/2mA/200mA/10A/20A			
Resistance	200Ω/2kΩ/200kΩ/2MΩ/20MΩ/200MΩ			
Capacitance	2nF/200nF/2μF/20μF			
Temperature (°C)	N/A			
Frequency	2kHz/20kHz			
Input impedance for DC voltage measurement	Around 10MW			

Type	Order code	1+	5+	10+
Multimeter UT39B	85-4076	15.74	14.33	13.63
Multimeter UT39C	85-4077	19.57	17.82	16.95
Multimeter UT39E	85-4078	32.69	29.75	28.31

500138



Digital Multimeter – UT50C Series

The meter is a handled, battery-operated tool for measuring electrical parameters. It has all the features of a digital multimeter and measures AC voltage, DC voltage, AC current, DC current, resistance, capacitance, frequency and continuity check.

- Power: 9V Battery (6F22)
- LCD Size: 60 x 54mm
- Product colour: Grey holster – red
- Product weight: 350g (including holster)
- Product size: 179 x 88 x 39mm
- Standard accessories: Test lead, battery, English manual, point contact temperature probe, test clip, multi-purpose socket, holster



Technical specification				
Function	Range			
DC Voltage	200mV/2V/20V/200V/1000V			
AC Voltage	2V/20V/200V/1000V			
DC Current	2mA/200mA/20A			
AC Current	20mA/200mA/20A			
Resistance	200Ω/2kΩ/20kΩ/2MΩ/200MΩ			
Capacitance	2nF/20nF/2mF/20mF			
Temperature (°C)	-40°C to +1000°C			
Frequency	20kHz			
Special Functions	Yes			
Diode	Yes			
Continuity Buzzer	Yes			
Transistor	Yes			
Data Hold	Yes			
Full Icon Display	Yes			
Sleep Mode	Yes			
Low Battery Display	Yes			
Input Impedance for DC	Around 10MΩ			
Voltage Measurement	Yes			
Max Display	19999			

Type	Order code	1+	5+	10+
Uni-T Modern Multimeter	85-4074	23.58	21.48	20.42

400418

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UNI-T

## UT61A Series: Modern Digital Multimeter

This modern digital multimeter has been designed with a fashionable structure and is a highly reliable hand-held measuring instrument. It is equipped with a comprehensive range of features to satisfy all your needs.

- Power: 9V Battery (6F22)
- LCD Size: 65 x 43mm
- Product colour: Red and grey
- Product weight: 370g
- Product Size: 180 x 87 x 47mm
- Standard accessories: Battery, test lead, English manual, multi-purpose socket



### Technical specification

Function	Range
DC Voltage	400mV/4V/40V/400V/1000V
AC Voltage	400mV/4V/40V/400V/750V
AC Current	400mA/4000mA/40mA/400mA/4A/10A
DC Current	400mA/4000mA/40mA/400mA/4A/10A
Resistance	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ
Capacitance	40nF/400nF/4μF/40mF400mF/4000mF
Frequency	10Hz to 10MHz
Duty Cycle	0.1% to 99.9%
Special Functions	Yes
Auto/Manual Ranging	Yes
Diode	Yes
EF Function	Yes
Audition	Yes
Continuity Buzzer	Yes
Data Hold	Yes
Max/Min Mode	Yes
Display Backlight	Yes
REL	Yes
Analogue Bar Graph	41
Input Impedance for DC Voltage Measurement	Around 10MΩ

Type	Order code	1+	5+	10+
Uni-T Modern Digital	85-4067	40.96	37.29	35.47

400412

UNI-T

## UT71D Series: Intelligent Digital Multimeter

This multimeter is equipped with a comprehensive range of features to satisfy all your needs. It sets a new standard of competitive pricing and high performance, no other DMM in its price range has so much to offer. It has auto range and manual range options. This is also a highly applied digital multimeter of high performance with full input protection and display backlight.

- Power: 9V Battery (6F22)
- LCD Size: 73 x 50 mm
- Product colour: Red and grey
- Product weight: 384g
- Product size: 200 x 93 x 40mm
- Standard accessories: Test lead, English manual, battery, USB interface cable, software, point contact temperature, probe, carrying bag and test clip



### Technical specification

Function	Range
DC Voltage	400mV/4V/40V/400V/1000V
AC Voltage	4V/40V/400V/1000V
AC Bandwidth	100KHz
DC Current	400μA/4000μA/40A/400mA/10A
AC Current	400μA/4000μA/40A/400mA/10A
Resistance	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ
Capacitance	40nF/400nF/4μF/40μF/400μF/4mF/40mF
Temperature (°C)	-40°C to 1000°C
Temperature (°F)	-40°F to 1832°F
Frequency	40Hz/400Hz/4kHz/40kHz/400kHz/4MHz/40MHz/400MHz
Duty Cycle	10% to 90%
4 to 20mA Loop	0 to 100%
Power Measurement	
Special Functions	Yes
Fused 10A Range	Yes
Auto Ranging	Yes
Current Measurement Alarm	Yes
Function Set Up	Yes
Auto Ranging	Yes
Voltage & Current :	Yes
AC + DC Measurement	Yes
Data Logging	9999
Data Recall	Yes
Diode	Yes
Continuity Buzzer	Yes
True RMS	Yes
Peak Hold	Yes
Max/Min Mode	Yes
Relative Mode	Yes
Data Hold	Yes
USB	Yes
Double Display Backlight	Yes
Full Icon Display	Yes
Sleep Mode	Yes
Low Battery Display	Yes
Input Impedance for	Yes
DC Voltage Measurement	Yes
Max. Display	40000
Analogue Bar Graph	Yes

Type	Order code	1+	5+	10+
Uni-T Intelligent Digital	85-4066	138.61	126.24	120.05

400411

UNI-T

## UT81B Series: Scope Digital Multimeter

This scope multimeter is the rugged solution for industrial troubleshooting and installation applications. Find fast answers to problems in machinery, instrumentation, control and power systems.

- Power: 1.5V Battery (R6) x6
- LCD Size: 60 x 60mm
- Product Colour: Red and grey
- Product weight: 498g
- Product size: 200 x100 x 48mm
- Standard accessories: Test lead, battery, English manual, alligator clip, USB interface cable and software



### Technical specification

Function	Range
DC Voltage	400mV/4V/40V/400V/1000V
AC Voltage	4V/40V/400V/750V
DC Current	400mA/4000mA/40mA/400mA/4A/10A
AC Current	400mA/4000mA/40mA/400mA/4A/10A
Resistance	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ
Capacitance	40nF/400nF/4μF/40mF/100mF
Frequency	10Hz to 10MHz
Input Sensitivity	20mV/div-500V/div (1-2-5)
Timebase Range	100ns/div-5s/div (1-2-5)
Display Resolution	160X160
Duty Cycle	0.1% to 99.9%
Display	160x160 Monochrome
Trigger types	Free Run / Normal / Single Shot
Memory	10 screens and setups

Type	Order code	1+	5+	10+
Uni-T Scope Digital Multimeter	85-4064	250.48	228.13	216.93

400409

AMPROBE

## PM55A Pocket Multimeter

The ultimate shirt-pocket sized meter and less than 3oz in weight with full functionality offering AC and DC voltage to 600V, AC and DC current, resistance, capacitance, frequency, diode test and continuity w/beeper.

Another key feature is AutoTec which automatically selects between AC voltage, DC voltage or resistance measurement based on the test point to which the leads are connected. Fully autoranging, this meter offers nine different measurement functions plus features that are usually found in much more expensive and larger meters. The digital display is oversized with large digits and unit icons in the display.

- AutoTect feature
- AutoTect feature has lower input impedance
- Large oversize digital display
- Protective silicon holster included, attached test leads, battery, deluxe carry case and manual



### Technical specification

Display LCD	3 1/2 6000 digits
Voltage AC	0.001V to 600V
Overvoltage category	CAT III/300V, CAT II/600V
Safety	DIN VDE 0411, EN 61010, IEC 61010
Power supply	1x battery 3V
Dimensions	113 x 53 x 10mm
Weight	78g

Type	Order code	1+
Amprobe PM55A Pocket Meter	90-4030	31.06

400749

Page 987

## Electronics Tool Kit



FLUKE.

113 Digital Multimeter

This True-rms utility multimeter has been designed for basic electrical tests. It will give users the means to quickly and easily do basic meter set and reconnect testing. This meter is simple-to-use and has all the features needed to repair most electrical problems. Using the Fluke VCHECK LoZ low impedance measurement function, users can simultaneously test for voltage or continuity.

It is able to perform diode tests, and also provides both auto and manual ranging capabilities. With features such as backlight, a much larger display for easier viewing and conforming to all the latest safety standards, makes this meter is a must have for the utility users toolbox.

- VCHECK LoZ low impedance measurement function to simultaneously test for voltage or continuity
- True-rms for accurate AC measurements on non-linear loads
- A large backlit display allows for easy visibility in low-lit areas
- Record signal fluctuations using the min/max function
- Diode test for testing general-purpose germanium, silicon, and power diodes
- Integral holster with probe holders for easy storage
- Auto and manual ranging for added user functionality
- Meets Measurement Category CAT III 600V and Category IV 300V standards for a higher level of safety
- The optional TPAK magnetic hanger allows the user hands-free flexibility

Technical specification			
VCHECK	Range	6.000V	
		60.00V	
		600.0V	
	Resolution	0.001V	
Accuracy		0.01V	
		0.1V	
		DC, 45 to 500Hz:2.0 % + 3	
		500Hz to 1kHz: 4.0 % + 3	
Diode test	Range	2.000V	
	Resolution	0.001V	
	Accuracy	2.0% + 3	
	Range	600.0Ω	
Ω		6.000kΩ	
		60.00kΩ	
	Resolution	0.1Ω	
		0.001kΩ	
Accuracy		0.01kΩ	
		0.9% +2	
		0.9% +1	
		0.9% +1	
Capacitance; Range		1000 nF	
		10.00μF	
		100.0μF	
		9999μF	
Resolution		1nF	
		0.01μF	
		0.1μF	
		1μF	
Accuracy		1.9% +2	
		1.9 % +2	
		1.9 % +2	
		100μF - 1000μF: 1.9% +2	
		>1000μF: 5% +20	
Maximum voltage between any terminal and earth ground 600V			
Display	3 1/2 digits, 6000 counts, updates 4/sec		
Temperature coefficient	0.1 x (specified accuracy)/°C (<18°C or >28°C)		
Operating altitude	2,000m		
Storage altitude	10,000m		
Relative humidity	95% to 30°C		
	75% to 40°C		
	45% to 50°C		
Battery type	9V Alkaline, ANSI 1604A / IEC 6F22		
Battery life	Alkaline: 300 hours typical, without backlight		
Shock	1 Meter drop per IEC 61010-1-2001		
Size	167.1(H) x 85.1(W) x 46.0(L)mm		
Weight	404g		
Safety	Complies with ANSI/ISA 82.02.01 (61010-1) 2004, CAN/CSA-C22.2 No 61010-1-04, UL 61010-1 (2004) and IEC/EN 61010-1 2nd Edition for measurement Category III, 600 V, Pollution Degree 2, EMC EN61326-1		
EMI regulations	Complies with FCC Part 15, Class B		
VCHECK	Input impedance (nominal)	-3kΩ <300pF	
VCHECK	Common mode rejection ratio (1kΩ Unbalanced)	>60dB at DC, 50 or 60Hz	
Ω	Open circuit test voltage	<2.7V DC	
	Full scale voltage	<0.7V DC	
Diode test	Open circuit test voltage	<2.7V DC	
	Full scale voltage	2.000V DC	
Ω	Short circuit current	<350μA	
Diode test	Short circuit current	<1.0 A	

Type	Order code	1+
Fluke 113 multimeter	85-3560	109.00

082681



- Measures 20 A (30 seconds momentary; 10 A continuous)
- Large white LED backlight to work in poorly lit areas
- Compact ergonomic design for one-handed operation
- Compatible with optional magnetic hanger (ToolPak)
- True-rms for accurate measurements on non-linear loads
- Min/Max/Average with elapsed time to record signal fluctuations
- CAT III 600 V safety rated
- Supplied with TL75 Test leads, holster, user's manual, 9 V battery (installed)

Technical specification	
Maximum voltage between any terminal and earth ground	600V
Surge protection	6 kV peak per IEC 61010-1 600 VCAT III, pollution degree 2
Display	Digital: 6,000 counts, updates 4 per second Bar graph: 33 segments, updates 32 per second
DC Millivolts	Range: 600.0mV Resolution: 0.1mV Accuracy: ± [(% of reading) + [counts]]: 0.5% +2
DC Volts	Range/resolution: 6.000 V / 0.001V Range/resolution: 60.00 V / 0.01V Range/resolution: 600.00 V / 0.1V Accuracy: ± [(% of reading) + [counts]]: 0.5% +2
AC millivolts true-rms	Range: 600.0mV Resolution: 0.1mV Accuracy: 1.0% +3 (DC, 45Hz to 500Hz)2.0% + 3 (500Hz to 1kHz)
AC Volts true-rms	Range/resolution: 6.000V / 0.001V Range/resolution: 60.00V / 0.01V Range/resolution: 600.0V / 0.1V Accuracy: 1.0% + 3 (DC, 45Hz to 500Hz)2.0% +3 (500Hz to 1kHz)
Continuity	Range: 600Ω Resolution: 1Ω Accuracy: Beeper on 250Ω; detects opens or shorts of 500Ωs or longer.
Ohms	Range/resolution: 600.0Ω / 0.1Ω Range/resolution: 6.000kΩ / 0.001 kΩ Range/resolution: 60.00kΩ / 0.01 kΩ Range/resolution: 600.0kΩ / 0.1 kΩ Range/resolution: 6.000MΩ / 0.001 MΩ Accuracy: 0.9% +1 Range/resolution: 40.00MΩ / 0.01 MΩ
Diode Test	Accuracy: 5% +2 Range/resolution: 2.00V / 0.001V
Capacitance	Accuracy: 0.9% +2 Range/resolution: 1000nF / 1nF Range/resolution: 10.00μF / 0.01μF Range/resolution: 100.0μF / 0.1μF Range/resolution: 9999μF / 1μF Range/resolution: 100μF to 1000μF Accuracy: 1.9% +2 Range/resolution: <1>> 1000μF
Lo-Z Capacitance	Accuracy: 5% + 20% Range: 1nF to 500μF
AC Amps true-rms (45 Hz to 500Hz)	Accuracy: 10% + 2 typical Range/resolution: 6.000A / 0.001A Range/resolution: 10.00A / 0.01A Accuracy: 1.5% +3 20 A overload for 30-seconds max
DC Amps	Range/resolution: 6.000A / 0.001A Range/resolution: 10.00A / 0.01A Accuracy: 1.0% +3 20A overload for 30-seconds max
Hz (V or A input)2	Range/resolution: 99.99Hz / 0.01Hz Range/resolution: 999.9Hz / 0.01Hz Range/resolution: 9.999kHz / 0.001kHz Range/resolution: 50kHz / 0.01kHz Accuracy: 0.1% +2
Size	167 x 84 x 46 mm
Weight	550g
Warranty	3 years
Operating temperature	-10°C to +50°C
Storage temperature	-40°C to +60°C
Battery type	9V Alkaline, NEDA 1604A/ IEC 6LR61
Battery life	400 hours typical, without backlight

Type	Order code	1+
Fluke 115 multimeter	85-3562	151.00

082683

FLUKE.

117 Digital Multimeter

A True RMS AC measurement, a 6000 - count display and min-max-average recording are standard with nearly all multimeter models. But the added capability to measure frequency and capacitance makes the Fluke 117 really powerful. The compact case has a removable protective holster and a battery door to allow easy replacement of the batteries. It conforms and is protected with all the required safety features EN610101-1 CAT11 600V. UL, CSA, TUV listed and VDE pending.

The 117 is the ideal meter for demanding settings like commercial buildings, hospitals and schools. It includes integrated non-contact voltage detection to help get the job done faster and safer.

With additional features of 5% accuracy 28% larger digits Bargraph backlit and recording display hold makes this the ideal choice for your tool box.

- Clear display bargraph updated 4 times per second
- Min-Max-Average recording mode with Mix/Max alert
- Autoranging frequency measurement
- True RMS measurements
- Basic Accuracy 0.07%
- Digital Display Counts 6000
- Voltage AC/DC (V) 600
- Current AC/DC (A) 10
- Frequency (kHz) 50
- Capacitance (uf) 10000
- Volt Alert - non contact voltage detector built-in
- Resistance (Mohms) 40
- Auto ranging



FLUKE.

115 Digital Multimeter

This Fluke 115 is one of the family of new digital multimeters. It has been designed by electricians to meet the specific needs of various users. This multimeter is an electrician's multimeter having the extra functions for field service testing and industrial applications. It is straightforward to use and an excellent choice for all your electrical troubleshooting and the ideal tool for residential and commercial applications. The 115 is a compact true-rms meter and comes complete with a function set that includes measurement of AC/DC current and simplifies working.

- Resistance, continuity, frequency, capacitance, and diode test



- Display hold
- Audible diode and continuity test
- Unsafe voltage alert
- Backlit display
- Low battery indication
- Protective holster
- Easy battery exchange
- Sleep mode preserves battery life
- Warranty 3 years
- Input protection to EN 61010-1 CAT 111 600V

Technical specification	
Maximum voltage between any terminal and earth ground	600V
Surge protection	6kV peak per IEC 61010-1 600V CAT III, Pollution Degree 2
Fuse for A input	11A, 1000V FAST Fuse (Fluke PN 803293)
Display	6,000 counts, updates 4 per second
Bar graph	33 segments, updates 32 per second
Operating Temperature	-10°C to + 50°C
Storage Temperature	-40°C to + 60°C
Battery type	9V Alkaline, NEDA 1604A/ IEC 6LR61
Battery life	400 hours typical, without backlight
DC millivolts	Range: 600.0mV Resolution: 0.1mV Accuracy: ± ([% of reading] + [counts]): 0.5% +2
DC volts	Range/resolution: 6.000V / 0.001V Range/resolution: 60.00V / 0.01V Range/resolution: 600.00V / 0.1V Accuracy: ± ([% of reading] + [counts]): 0.5% +2
Auto volts	Range: 600.0V
AC millivolts true-rms	Resolution: 0.1V Accuracy: 2.0% +3 (DC, 45Hz to 500Hz) 4.0% +3 (500Hz to 1kHz)
AC volts true-rms	Range: 600.0mV Resolution: 0.1mV Accuracy: 2.0% +3 (DC, 45Hz to 500Hz) 4.0% +3 (500Hz to 1kHz)
Continuity	Range/resolution: 6.000V / 0.001V Range/resolution: 60.00V / 0.01V Range/resolution: 600.0V / 0.1V Accuracy: 1.0 % +3 (DC, 45Hz to 500Hz) 2.0% + 3 (500Hz to 1kHz)
Ohms	Range: 600Ω Resolution: 1Ω Accuracy: Beeper on <20Ω, off >250Ω; detects opens or shorts of 500Ωs or longer.
Diode Test	Range/resolution: 600.0Ω / 0.01kΩ Range/resolution: 60.00kΩ / 0.01kΩ Range/resolution: 600.0kΩ / 0.1kΩ Range/resolution: 6.000MΩ / 0.001MΩ Accuracy: 0.9 % +1
Capacitance	Range/resolution: 40.00MΩ / 0.01MΩ Accuracy: 5% +2
LoZ capacitance	Range/resolution: 2.000V / 0.001V Accuracy: 0.9% +2
AC amps true-rms (45 Hz to 500 Hz)	Range/resolution: 1000nF / 1nF Range/resolution: 10.00nF / 0.01nF Range/resolution: 100.0nF / 0.1nF Range/resolution: 9999nF / 1nF Range/resolution: 100nF to 1000nF Accuracy: 1.9% +2
DC amps	Range: 1nF to 500nF Accuracy: 10% + 2 typical
HZ (V or A input)2	Range/resolution: 6.000A / 0.001A Range/resolution: 10.00A / 0.01A Accuracy: 1.5% +3 20A continuous overload for 30 seconds max
Size	Range/resolution: 6.000A / 0.001A Range/resolution: 10.00A / 0.01A Accuracy: 1.0% +3 20A continuous overload for 30 seconds max
Weight	99.99Hz / 0.01Hz Range/resolution: 999.99Hz / 0.1Hz Range/resolution: 9.999Hz / 0.001Hz Range/resolution: 50.00Hz / 0.01Hz Accuracy: 0.1% +2
Warranty	167 x 84 x 46mm 550g 3 years

Type	Order code	1+
Fluke 117 multimeter	85-3564	180.00

062685

FLUKE.

170 Series Digital Multimeters

The Fluke 170 series sets the benchmark for general purpose multimeters. They set the standard with a combination of precision, features, ease-of-use, safety and reliability. It offers true rms AC voltage and current readings, 6000-count resolution, min-max-average recording, as well as frequency and capacitance ranges. Despite all these and many other useful features, the 170 series remains easy to use.

The ergonomic case with integrated holster protects the meter in rough and tough environments. The case does not have to be opened to change the battery, as access to the battery is via an easy to open battery door. Similarly, calibration is carried out through the front panel. Smoothing mode allows filtering of rapidly changing inputs, and manual and auto ranging make this an extremely versatile multimeter. Other features include.

- Digital display with bargraph
- Display backlight (not 175)
- Auto and manual ranging
- Temperature measurement (179 only)
- 0.09% Basic accuracy



- Test lead alert
- Unsafe voltage alert warns of voltages over 30V
- Audible continuity and diode test
- Supplied with TL75 test leads, installed 9V battery, user manuals and 80BK temperature probe (only with the 179).
- Manufacturers lifetime warranty
- Inputs protected to **EN61010-1 CAT IV 600V/CAT III 1000V**
- **UL, CSA, TUV** listed and **VDE** pending

Technical specification			Fluke 175 (accuracy)	Fluke 177 (accuracy)	Fluke 179 (accuracy)
Functions	Maximum	Max. resolution			
Voltage DC	1000V	0.1mV	±(0.15% +2)	±(0.09% +2)	±(0.09% +2)
Voltage AC	1000V	0.1mV	±(1.0% +3)	±(1.0% +3)	±(1.0% +3)
Current DC	10A	0.01mA	±(1.0% +3)	±(1.0% +3)	±(1.0% +3)
Current AC	10A	0.01mA	±(1.5% +3)	±(1.5% +3)	±(1.5% +3)
Resistance	50Ω	0.1Ω	±(0.09% +2)	±(0.9% +1)	±(0.09% +2)
Capacitance	1000μF	1nF	±(1.2% +2)	±(1.2% +2)	±(1.2% +2)
Frequency	100kHz	0.01Hz	±(0.1% +1)	±(0.1% +1)	±(0.1% +1)
Temperature	-40°C +400°C	0.1°C	N/A	N/A	±(1.0% +10)
Digital display	6000 counts, updates 4 times per second				
Analogue display	33-segments, updates 40 times per second				
Battery life	200hrs, typical with alkaline battery				
Size	185 x 90 x 43mm				
Weight	420g				

Type	Order code	1+
Fluke 175	85-0130	193.00
Fluke 177	85-2032	215.00
Fluke 179	85-0126	238.00

061470

FLUKE.

83V Multimeter

This multimeter is fast with a high basic accuracy, and a clear high contrast display with backlighting. It is capable of automatic ranging, automatic measurement memory and Touch Hold for all functions. It is accurate and features diagnostic functions for maximum industrial productivity.

Solve more problems on motor drives, in-plant automation, power distribution and electro-mechanical equipment with improved measurement functions, troubleshooting features, resolution and accuracy. The multimeter will withstand hazardous 8,000V spikes caused by load switching and faults on industrial circuits and complies with second edition IEC and ANSI electrical safety standards. 4½ digit mode for precise measurements μF capacitance range for components and motor caps. It is able to measure up to 1000V AC and DC. Measures 10A, 20A for up to 30 seconds .

- Large digit display with bright, two-level backlight
- Series V significantly easier to read than older models
- 10,000μF capacitance range for components and motor caps
- Measure up to 1000V AC and DC
- Measure up to 10A, 20A for up to 30 seconds
- Auto and manual ranging for maximum flexibility
- Analog bargraph
- Resistance, continuity and diode test
- Frequency to 200kHz and % duty cycle
- Min/ max and average recording to capture variations automatically
- Relative mode to remove test lead resistance from low Ohms measurements
- Improved sleep mode for long battery life
- Access door for fast battery changes without breaking the calibration seal
- Removable holster with built in test lead and probe storage
- **Cat IV 600V and Cat III 1000V** electrical safety ratings

Technical specification			
Maximum voltage	1000V		
Accuracy	±(0.1%+1)		
Maximum amps	10A		
Amps accuracy	±(0.4%+2)		
Maximum resolution	0.01mA		
Maximum amps	10A		
Amps accuracy	±(1.2%+2)		
Maximum conductance	60.00nS		
Accuracy	±(1.0%+10)		
Maximum resolution	0.01nS		
Operating temperature	-20°C - 55°C		
Storage temperature	-40°C - 60°C		
Dimensions	5.2(H) x 9.8(W) x 20.1(D)cm		
Weight	624g		

Type	Order code	1+
Multimeter 83V	85-3502	335.00

062486

Order online

Save time, and place your order at:

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Bench Multimeters

VOLTCRAFT®

Desktop Multimeter

The VC650BT multimeter shows actual effective measured values (True RMS) in the direct and alternating voltage and current measuring area.



The measurement functions are selected using the rotary control. The measuring range is selected automatically for all measuring functions (except for diode and continuity tests). Manual setting is possible at any time.

Polarity is automatically indicated with the prefix (-) in case of negative measured values.

The multimeter is operated with six 1.5V batteries type C or 230V/AC, 50Hz. Automatic switching off saves power if the device is not used for approx. 15 minutes. (The function is activated only when the multimeter is powered by batteries).

- Measurement of direct and alternating voltage up to 600V
- Measurement of direct and alternating current up to 10A
- Measuring impedance values of up to 40MΩ
- Diode test
- Please see individual specs for each of these multimeters

Type	Order code	1+
Voltcraft VC610BT	51-1948	131.13
Voltcraft VC650BT	51-1949	168.02

524010

- Product colour: Red and Grey
- Product weight: 2.4kg
- Product size: 310 x 240 x 105mm
- Standard accessories: Test lead, ac220v power cord, English manual, point contact, RS232C interface cable, USB interface cable and software

Technical specification	Range
Function	600mV/6V/60V/600V/1000V
DC Voltage	600mV/6V/60V/600V/1000V
AC Voltage	600μA/6000μA/60mA/600mA/10A
DC Current	600μA/6000μA/60mA/600mA/10A
AC Current	600Ω/6kΩ/60kΩ/600kΩ/6MΩ/60MΩ
Resistance	6nF/60nF/600nF/6μF/60μF/600μF/6mF
Capacitance	-40°C to 1000°C
Temperature (°C)	-40°F to 1832°F
Temperature (°F)	6kHz/60kHz/600kHz/6MHz/60MHz
Frequency	Yes
Fused 10A Range	Yes
Auto Ranging	Yes
Voltage & Current :	Yes
AC+DC Measurement	Yes
AC Voltage Frequency	100kHz True RMS
Diode	Yes
Continuity Buzzer	Yes
Transistor	Yes
Max/Min Mode	Yes
Data Hold	Yes
RS232C	Yes
USB	Yes
Display Backlight	Yes
Full Icon Display	Yes
Sleep Mode	Yes
Low Battery Display	Yes
Input Impedance for DC Voltage Measurement	600mV Range Around 3GΩ All Other Ranges: 10MΩ
Max. Display	5999

Type	Order code	1+	5+	10+
Uni-T Bench Type Digital	85-4084	102.39	93.24	88.67

400426

UNI-T

UT804 Series: Bench Type Digital Multimeter

These versatile and dependable bench multimeters are suitable for applications in education, R & D, service and repair, and manufacturing requiring reliable measurements. Additionally, these meters will enhance your productivity with features not found in other bench meters in this price category.



- Power: AC220V/50Hz or 1.5V Battery (R14) x 6
- LCD Size: 128 x 28mm
- Product colour: Red and Grey
- Product weight 2.2kg
- Product size: 310 x 240 x 105mm
- Standard accessories: Test lead, batteries, ac220v power cord, English manual, point contact temperature probe, test clip, RS232C interface cable, USB, interface cable, software

Technical specification	Range
Function	400mV/4V/40V/400V/1000V
DC Voltage	4V/40V/400V/1000V
AC Voltage	100kHz
AC Bandwidth	400μA/4000μA/40mA/400mA/10A
DC Current	400μA/4000μA/40mA/400mA/10A
AC Current	400Ω/4kΩ/40kΩ/400kΩ/4MΩ/40MΩ
Resistance	40nF/400nF/4μF/40μF/400μF/4mF/40mF
Capacitance	-40°C to +1000°C
Temperature (°C)	-40°F to +1832°C
Temperature (°F)	4MHz/40MHz/400MHz
Frequency	1
Duty Cycle	0 to 100%
4~20mA Loop	Yes
Special Functions	Yes
Fused 10A Range	Yes
Auto / Manual Ranging	Yes
Function Set Up	Yes
Voltage & Current :	Yes
AC+DC Measurement	Yes
AC Voltage Frequency	100kHz True RMS
Data Logging	Yes
Data Recall	Yes
Diode	Yes
Continuity Buzzer	Yes
True RMS	Yes
Peak Hold	Yes
Max/Min Mode	Yes
Relative Mode	Yes
Data Hold	Yes
RS232C	Yes
USB	Yes
Display Backlight	Double
Full Icon Display	Yes
Sleep Mode	Yes
Low Battery Display	Yes
Input Impedance for DC Voltage Measurement	400mV Range: Around 4GΩ All other Ranges: 10MΩ
Max. Display	39999
Analogue Bar Graph	Yes

Type	Order code	1+	5+	10+
Uni-T Bench Type Digital	85-4085	155.94	142.02	135.06

400438

UNI-T

UT801 Series: Bench Type Digital Multimeter

The UT801 is a versatile and dependable bench multimeter suitable for applications in education, service and repair, and manufacturing requiring basic and reliable measurements. Additionally, this meter enhances your productivity with features not found in other bench meters in this price category.



- Power: AC220V/50Hz or 1.5V Battery x 6 (R14)
- LCD Size: 108 x 35mm
- Product colour: Red and Grey
- Product weight: 1500g
- Product size: 300 x 245 x 105mm
- Standard accessories: Test Lead, AC220V Power cord, English manual, point contact, temperature probe, multi-purpose socket

Technical specification	Range
Function	200mV/2V/20V/200V/1000V
DC Voltage	2V/20V/200V/1000V
AC Voltage	200μA/2mA/20mA/200mA/10A
DC Current	2mA/20mA/200mA/10A
AC Current	200Ω/2kΩ/20kΩ/200kΩ/2MΩ/20MΩ
Resistance	20nF/2μF/200μF
Capacitance	2kHz/200kHz
Frequency	-40°C to +1000°C
Temperature (°C)	Yes
Transistor	Yes
Sleep Mode	Yes
Diode	Yes
Continuity Buzzer	Yes
Display Backlight	Yes
REL	Yes
Max/Min Mode	Yes
Low Battery Display	Yes
Input Impedance for DC Voltage Measurement	>10MΩ
Data Hold	Yes
Max. Display	1999

Type	Order code	1+	5+	10+
Uni-T Bench Type Digital	85-4083	58.13	52.94	50.35

400425

UNI-T

UT803 series: Bench Type Digital Multimeter

These versatile and dependable bench multimeters are suitable for applications in education, R & D, service and repair, and manufacturing requiring reliable measurements. Additionally, these meters will enhance your productivity with features not found in other bench meters in this price category.



- Power: AC220V/50Hz or 1.5V Battery (R14) x 6
- LCD Size: 128 x 28mm

6 days per week phone orders

Monday to Friday 8am to 7pm, Saturday 9am to 5pm





### Digital Bench Multimeter

This very accurate, high resolution true rms digital bench multimeter from GW Instek is designed for a wide range of applications including laboratory, schools, colleges, workshops etc. This affordable multimeter is housed in an attractive grey case with carry handle, which acts as a tilt when used on the bench. Supplied with mains power cord, instruction manual and one set of general purpose test leads.



- 6 Functions AC/DC voltage, AC/DC current resistance and diode test
- Large 12.5mm red LED display
- AC or AC+DC true RMS
- 1200V High voltage range
- 20A High current range
- Auto zero circuit
- 0.03% DC V accuracy
- All ranges with protection circuit
- High resolution - 10µV, 10nA, 10mΩ

#### Technical specification

<b>DC Voltage</b>		
Range	200mV, 2V, 20V, 200V, 1200V 5 Ranges	
Accuracy	±(0.03%rdg + 4 digits)	
Input Impedance	10MΩ	
<b>AC Voltage (AC or AC+DC true RMS)</b>		
Range	200mV, 2V, 20V, 200V, 1000V 5 Ranges	
Accuracy	45Hz to 2kHz ±(0.5%rdg + 15 digits) below 200V 45Hz to 1kHz ±(0.5%rdg + 15 digits) over 200V	
Input Impedance	10MΩ	
<b>DC Current</b>		
Range	200µA, 2mA, 20mA, 200mA, 2000mA, 20A 6 ranges	
Accuracy	±(0.2%rdg+2 digits) to 200mA ±(0.3%rdg+2 digits) 2000mA to 20A	
<b>AC Current</b>		
Range	200µA, 2mA, 20mA, 200mA, 2000mA, 20A 6 ranges	
Accuracy	45Hz to 2kHz ±(0.5%rdg+15 digits)	
<b>Resistance</b>		
Range	200Ω 2kΩ 20kΩ 200kΩ 2000kΩ 20MΩ 6 ranges	
Accuracy	200Ω range ±(0.1%rdg + 4 digits) 2kΩ to 2000kΩ ranges ±(0.1% rdg + 2 digits) 20MΩ range ±(0.25%rdg + 2 digits)	
Display	12.5mm LED display	
Diode Test	The three ranges have enough voltage to turn on silicon junctions to check forward resistance, but 2kΩ range is preferred.	
Power Source	AC 100V/120V/220V/230V, 50/60Hz	
Dimensions & Weights	230(W) x 95(H) x 280(D)mm, Approx. 1.3kg	

Type	Order code	1+
Digital bench meter	85-2066	86.70

061316



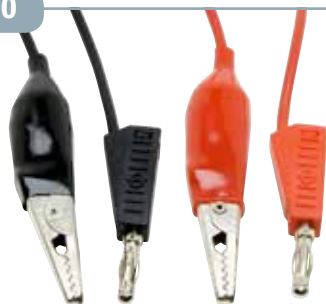
### 1604 Autoranging Bench Multimeter

The Thurlby Thandar 1604 is a low-cost autoranging bench-top digital multimeter offering a large, bright LED display. With a multi-position tilt stand, the 1604's display can always be in an easy-to-read position - it stays where it is put even with heavy leads connected.



- Robust construction
- 400mV to 750V AC voltage measuring range
- 1mA to 10A current measurement range
- 400R to 40MR resistance measurement range
- 4 to 40kHz, LED display
- Isolated RS-232 interface
- Wide AC bandwidth
- Audible Continuity, Diode Test, Relative, T-Hold and Min-Max Functions included
- 115/230V AC supply voltage
- Dimensions (L x W x H) 260 x 235 x 88mm

#### Page 770



## 4mm Stackable Plugs to Crocodile Clip Leads

#### Technical specification

<b>DC VOLTAGE</b>		
Range	Accuracy	Resolution
400mV	0.08% ±4 dig	10µV
4V	0.08% ±4 dig	100µV
40V	0.08% ±4 dig	1mV
400V	0.08% ±4 dig	10mV
1000V	0.09% 4 dig	100mV

<b>RESISTANCE</b>		
Range	Accuracy	Resolution
400Ω	0.15% 6 dig	10mΩ
4kΩ	0.1% 4 dig	100mΩ
40kΩ	0.1% 4 dig	1Ω
400kΩ	0.15% 4 dig	10Ω
4MΩ	0.3% 6 dig	100Ω
40MΩ	1.0% 10 dig	1KΩ

<b>DC CURRENT</b>		
Range	Accuracy	Resolution
4mA	0.1% 4 dig	0.1µA
400mA	0.1% 4 dig	10µA
10A (up to 1A)	0.3% 4 dig	1mA
10A (up to 5A)	1.0% 4 dig	1mA
10A (up to 10A)	3.0% 10 dig	1mA

<b>AC CURRENT</b>		
Range	Accuracy	Resolution
1mA	0.5% 4 dig	1µA
100mA	0.5% 4 dig	100µA
10A (up to 1A)	0.8% 4 dig	10mA
10A (up to 5A)	1.5% 4 dig	10mA
10A (up to 10A)	3.0% 4 dig	10mA

Type	Order code	1+
1604 Multimeter	85-1220	208.08

031516

### FLUKE.

### 8808A 5.5 Digit Bench Multimeter

The Fluke 8808A multimeter has a broad range of functions, measuring Volts, Ohms and Amps with a basic V DC accuracy of 0.015%. It is remarkably easy to use, even by unskilled operators, because it makes the measurements you perform most often extremely easy and fast to do. Six setup buttons on the 8808A front panel operate like a car radio's station presets. Simply set up the meter for a common measurement, then press shift followed by a setup button (S1 to S6) to save the setup. Now each time you perform that measurement, you simply press the appropriate setup key. It's that easy.



The setup buttons eliminate the need to follow complex work instruction sheets. Operators no longer need to press multiple buttons to set up a measurement function and range, test limits, or enter other parameters to make a measurement.

- 5.5 digit resolution
- Basic V DC accuracy of 0.015%
- Dual display
- Dedicated dc leakage current measurement
- 2x 4Ω 4-wire measurement technique
- Six dedicated buttons for fast access to instrument setups
- Hi/Lo limit compare for Pass/fail testing

#### Technical specification

Display	VFD multi segment display, dual readings	
Resolution	5.5 digits	
V DC	Ranges:	200mV to 1000V
	Max. resolution:	1µV
	Accuracy:	0.015 + 0.003
V AC	Ranges:	200mV to 750V
	Max resolution:	1µV
	Accuracy:	0.2 + 0.05
Resistance	Frequency:	20Hz to 100kHz
	2x 4 Wire:	Yes
	Ranges:	200Ω to 100 M
A DC	Max resolution:	1mΩ
	Accuracy:	0.02 + 0.003
	Ranges:	200 µA to 10 A
A AC	Max resolution:	1nA
	Accuracy:	0.02 + 0.005
	Ranges:	20mA to 10A
Frequency	Max resolution:	100µA
	Accuracy:	0.3 + 0.06
	Frequency:	20Hz to 2kHz
Math functions	Ranges:	20Hz to 1MHz
	Max resolution:	0.1mHz
	Accuracy:	0.01%
Advanced functions	dB/dBm:	Yes
Interfaces	Limit compare test, with pass and fail indicators	
Programming languages/modes	RS-232, USB with optional adapter	
Weight	Simplified ASCII, Fluke 45 remote command emulation	
Size	2.1g	
	88(H) x 217(W) x 297(D)mm	

Type	Order code	1+
Digit bench multimeter	85-3503	520.00

062487

**New products**  
[www.rapidonline.com](http://www.rapidonline.com)

Clamp Meters

VOLTCRAFT

AC Mini Clip-on Clamp

A range of extremely compact clip-on ammeters used for taking a measurement of alternating current up to 400A/AC (AVG). The ergonomic housing has been sprayed with a soft rubber protection.

- Data-Hold
- Auto-power Off function
- Voltage, frequency, temperature, capacity and resistance measurement functions
- Diode test and acoustic continuity tester
- AC current measurement (AVG) up to 400A
- Contact less voltage tester
- Supplied with 2x AAA batteries, bag, safety measurement leads, Thermo-sensor, K-type, measurement adapter and instructions for use



Technical specification			
Mfrs Part No:	VC520	VC530	VC531
Order code	51-6843	51-6844	51-6845
Display LCD:	4,000 counts	6,000 counts	6,000 counts
AC Measurement range:	0.01Hz - 400A	1 - 1000V A	1 - 1000V A
Frequency range:	50 to 60Hz	50 to 60Hz	50 to 400Hz
DC Measurement range:	0 - 600V	0 - 600V	0 - 600V
Frequency:	10Hz - 10kHz	10Hz - 10kHz	10Hz - 10kHz
Resistance:	0 - 40MΩ	0 - 60MΩ	0 - 60MΩ
Temperature:	-20°C to +760°C	-20°C to +760°C	-20°C to +760°C
Capacity:	1nF - 100µF	0.01nF - 4000µF	0.01nF - 4000µF
Base accuracy:	3%	3.5%	3.5%
Opening clamps:	30mm	40mm	40mm
Category:	CAT III 600V	CAT III 600V	CAT III 600V
Power supply:	2x AAA	9V (PP3)	9V (PP3)
Can be calibrated to:	ISO / DKD	ISO / DKD	ISO / DKD
Weight:	180g	250g	250g

Type	Order code	1+
VC-520	51-6843	23.83
VC-530	51-6844	35.80
VC-531	51-6845	43.74

FLUKE.

373 True-rms AC Clamp Meter

The new Fluke 373 clamp meter offers improved performance perfect for any ac only current measurement situations. Featuring true-rms ac voltage and current measurements, and resistance measurement up to 6000Ω with continuity detection, the Fluke 373 is everything you need, plus a little more.

This work horse clamp meter offers improved performance that is perfect for many AC only current measurement situations. With true-rms AC voltage and current measurements, the Fluke 373 reads up to 600 A AC and 600V AC or DC.

- 600A AC current measurement with fixed jaw
- 600V AC and DC voltage measurement
- State of the art signal processing
- True-rms AC voltage and current for accurate measurements on non-linear signals
- Large, easy to read backlight display
- Automatically sets the correct measurement range
- Soft carrying case
- Safety conformance EN/IEC 61010-1:2001; 600V CAT III, 300V CAT IV



Technical specification			
Diameter of measurable conductor	0.126 inches or 32mm max		
Operating temperature	-14°F to +122°F (-10°C to +50°C)		
Storage temperature	-40°C to +140°F (-40°C to +60°C)		
Operating humidity	< 90% @ -10°C to +30°C, < 75% @ -30°C to +40°C		
Operating altitude	0 to 3000m		
Size	232 x 85 x 45mm		
Weight	370g, (13oz.)		
Temperature coefficient	0.01% /°C (-18°C to +28°C)		

Fluke 373	Range	Max Resolution	Accuracy
AC current	600A	0.1A	2% ± 5 digits
AC voltage	600V	0.1V	1% ± 5 digits
DC voltage	600V	0.1V	1% ± 5 digits
Resistance	6000Ω	0.1Ω	1% ± 5 digits
Capacitance	10µF to 1000µF	1µF	1.9% ± 2 digits
Wire capacity	750MCM	750MCM	750MCM
Safety rating	CAT III 600V, CATIV 300V	CAT III 600V, CATIV 300V	CAT III 600V, CATIV 300V

Type	Order code	1+
Fluke 373	85-3576	180.00

AMPROBE

ACDC-100 Clamp Multimeter 1000A

This multimeter is where accuracy, quality, and the newest technology meet. The ACDC-100 offers superior AC/DC measurement capabilities, highest product quality and enhanced ergonomic design.

- 1000A AC and DC current
- Capacitance test
- AC/DC voltage to 600V
- Resistance
- Continuity beeper
- Relative zero mode
- Auto power off
- Data hold
- Large, easy to read digital display
- Rubber over-moulded case with built-in probes storage



Technical specification			
Display LCD	3 1/2 digit, 4000 count		
Current AC	0.1A to 800A		
Frequency range	50Hz to 500Hz		
Jaw opening	50mm		
Overvoltage category	CAT III/600V		
Safety	DIN VDE 0411, EN 61010, IEC 61010		
Power supply	2x battery 1.5V		
Dimensions	227 x 78 x 40mm		
Weight	290g		

Type	Order code	1+
Amprobe ACDC-100 Multimeter	90-4012	72.78

Anemometers

VOLTCRAFT

BL-30 AN Anemometer

The Voltcraft BL-30 AN Anemometer is a handy impeller meter with a low loss magnetic collector for measuring the speed of wind and gas flow rate. The speed can be displayed in five different units (m/s, ft/min, km/h, mile/h and knots). Moreover, the average speed or maximum speed of each measuring process can be determined and shown on an illuminated display. The BL-30 is powered by a 9V battery.

- Magnetic impeller
- MAX/AVG display
- Measurement rate 1s
- Automatic power off
- Automatic background lighting
- Supplied with battery and user manual
- Supplied with Voltcraft BL-30, battery and user manual



The product is not suitable for medical or commercial uses.

Technical specification			
Accuracy	±(3% + 0.2m/s)		
Calibration possible to	ISO / DKD		
Dimensions	165(L) x 54(W) x 34(H)mm		
Measurement range - wind speed	6 to 8m/s		
Power supply	9V battery pack		
Weight	125g		
Wind speed resolution	0.01m/s		

Type	Order code	1+
Voltcraft BL-30 AN	51-5206	28.76

Page 785

9V PP3 Alkaline Batteries



**UNI-T**

**UT362 Series: Anemoscope**

The anemoscope is a mechanical instrument for determining the course and velocity of the wind. The UT362 meter includes a small electronic rotating vane and will measure the wind speed, wind count and temperature. It uses high precision bearings and a light weight impeller to provide accurate air flow measurements even at low speeds.

- Power: 9V Alkaline Battery
- LCD Size: 57 x 37mm
- Product colour: Red and Grey
- Product weight: 375g
- Product size: 162 x 78 x 30mm
- Standard accessories: English manual, carrying bag, USB interface cable, software



**Technical specification**

Function	Range
Wind Speed Measurement	2-10m/s 10-30m/s
Wind Count Measurement (CMM)	0.001 to 9999x10
Wind Count Measurement (CFM)	0.001 to 9999x10
Temperature Measurement	0 to +40°C (32°F to 104°F)
Temperature Measurement	0 to 40°C (-32°F to +104°F)
Data Hold	VEL/ FLOW
Wind Speed/Wind Count Display	Yes
Max / Min	Yes
Sleep Mode	Around 10 Minutes
Units Switch	Yes
Auto Record Time Setup	Yes
Low Battery Display	Yes
Display Backlight	Yes
USB	Yes

Type	Order code	1+	5+	10+
Uni-T Anemoscope UT362	<b>85-4089</b>	76.40	69.58	66.17

400430

**AMPROBE**

**TMA10A Anemometer with Flexible Precision Vane**

The TMA10A is ideal for HVAC/R technicians measuring heat/ventilation/ air conditioning/ refrigeration wind flow and temperature in residential, commercial and industrial air conditioning systems. It offers numerous functions. It can be used to check air velocity FPM (Feet per minute), air volume (flow) CFM (Cubic feet per minute) plus the remote vane allows greater measurement location flexibility. Measure an air flow source for a continuous moving average for up to two hours.

Determine minimum, maximum and average readings from a single point air source. Large dual display to view both the air flow or velocity measurement plus temperature. Long extended flexible cord for remote vane access capabilities.

All the TMA10A measurements can be output to a computer for charting or analysis by **TM-SWA software and RS232 cable** (order code 90-4105).

- Air velocity measurement (m/s)
- Temperature measurement
- Integrated measurement memory (data hold)
- Min/max and AVG value measurement
- Auto power-off (can be deactivated)
- Flexible precision vane



**Technical specification**

Display	Dual 4-digit (9999 count) LCD
Power supply	1x 9V battery
Dimensions	181 x 71 x 38mm
Weight	363g

Type	Order code	1+
Amprobe TMA10A Anemometer	<b>90-4075</b>	130.05

400795

**Page 606**

**Mini USB Data Loggers**



**FLUKE.**

**975V AirMeter with Velocity**

The Fluke 975V AirMeter test tool raises indoor air monitoring to the next level by combining five powerful tools in one, rugged and easy-to-use handheld device. Use the 975V to optimize HVAC ventilation settings for ASHRAE 62 recommendations, actively monitor conditions that promote a productive environment, and quickly and accurately address occupant comfort complaints the first time.



The 975V will measure: temperature, velocity, humidity, CO2 and CO. Use the 975V to: Respond to comfort-related calls from occupants; Verify the operation of building HVAC control systems; Determine whether adequate ventilation exists; Monitor air flow and velocity; Test for dangerous carbon monoxide leaks; Perform duct traversals; Optimize HVAC systems to manage energy costs.

- One-touch air flow and velocity with available probe
- Simultaneously measures, logs, and displays temperature, humidity, CO2, and CO on a bright, backlit LCD display
- Wet bulb and dew point temperature
- % of outside air calculation
- CO2 and CO field calibration feature Self-test function at start-up
- Auto-backlight
- Automatically compensates for barometric pressure changes
- Min/max/average on all measured and calculated readings
- Multi-language user interface
- Metric or standard units
- Audible and visual threshold alarms
- Extensive discrete or continuous data logging capacity, downloadable to PC via USB interface
- Keypad lock for security
- Included FlukeView Forms software

Type	Order code	1+
Fluke 975V with velocity	<b>85-3638</b>	1677.00

083242

**Sound Meters**

**VOLTCRAFT**

**SL-50 Sound Level Meter, Measuring Meter, Noise Measuring Apparatus**

The Voltcraft SL-50 noise level meter is a digital measurement device for measuring the noise level in units of decibel (dB). The noise level meter is for measuring noise levels of sources in the intensity range 40dB to 130 dB. It is an appliance for checking noise sources or for simple measurements of environment noise.

The measurements and the instantaneous units/functions are shown digitally on the large four-digit LCD display (Liquid Crystal Display). In unfavourable light conditions the display is illuminated automatically.

The measurement signal is sampled linearly (C-characteristic) with a fast measurement speed of 125ms which enables measurements in the frequency range of 30Hz (Hertz) to 4KHz (kilo Hertz).

In order to suppress disturbing wind noise, an attachable wind deflector is enclosed, which does not affect the noise level measurement. A 9V block battery (type PP3) is required for operation.

- LCD read out
- Ideal for audio and general purpose applications in warehouses, manufacturing units, offices, schools, pubs, clubs etc
- High and low measurement ranges
- Auto power off function
- Supplied with attachable wind deflector

**Please note:** Requires 1x 9V battery (not supplied).

**Technical specification**

Power Supply:	9V DC (type PP3)
Power input:	40mA max (with display light)
Measuring range:	40dB to 130dB (30Hz to 4kHz)
Evaluation time:	125ms
Display definition:	0.1dB
Accuracy:	±3.5dB (for 1kHz and 94dB)
Microphone:	½ inch electret condenser microphone
Operating instructions:	0°C to 40°C (not condensing)
Operating altitude:	2.000m max
Weight:	135g
Dimensions:	130(L) x 52(W) x 32(H)mm

Type	Order code	1+
Sound Level Mete	<b>51-5135</b>	20.42

525146

VOLTCRAFT®

SL-100 Digital Sound Level Meter 31.5Hz – 8kHz

This sound level detector is a digital meter for measuring the sound level in decibels (dB). It has two ranges from 30 to 130 dB. Once the values have been detected, the momentary units/functions are displayed digitally on a large LCD (Liquid Crystal Display). The maximum value and the details shown on the display can both be stored.

The professional, extensive features of this meter are virtually unbeatable for this price range.

- A/C evaluation curves
- Time evaluation modes (fast/slow)
- Maximum value memory function
- Measuring range 30dB to 130dB A/C
- Accuracy ±2dB (1kHz)
- Fulfils the standard EN 60651 Class 3
- Supplied with wind deflector, 1x battery (9V pack) and operating instructions



2 years warranty

Technical specification

Accuracy	± 2 dB (94 dB/1kHz)
Calibration possible to	ISO
Dimensions	55(W) x 210(H) x 32(D)mm
Frequency range	31.5Hz to 8kHz
Measurement range - sound level	30dB to 130dB
Pick-up time	125/1000ms
Power supply	9V battery pack
Sound level resolution	0.1dB
Weight	230g

Type	Order code	1+
SL-100 Sound meter	51-1600	24.31

523688

VOLTCRAFT®

SL-200 Sound Level-measuring Apparatus, Noise-measuring Apparatus

This sound level detector is a digital meter for measuring the sound level in decibels (dB). The sound level detectors meet the requirements of EN 60 651 (IEC651). This model, the SL-200 has the accuracy class 2 for general field examinations (e.g. operations tests).

The values detected and the momentary units/functions are displayed digitally on a large LCD (Liquid Crystal Display). Two frequency evaluation filters (A/C) and the two time evaluations can be preselected and allow the device to be used universally.

The measurement has a range of 31.5Hz to 8KHz as well as a sound level of 30dB to 130 dB. The maximum value and the details shown on the display can both be stored.

To suppress troublesome wind noise, the device is delivered with an attachable windscreen. This does not impair correct measurement of the sound level. A 9-V block battery (type 1604A) is required for operation (included).

- A/C-switch evaluation characteristics
- Switchable time evaluation (slow / quick)
- Memory function for max. values
- Measures 30dB to 130dB
- Curves A or C
- EN 60651 class 2 and EN 61672 compliant
- Supplied with digital sound meter SL-200, case, wind screen, 1x battery (9V block (PP3 type))

Digital Sound Meter SL-200;Case;Wind screen;1 battery (9V block).

Technical specification

51-5136	
Accuracy	± 1.5dB (94dB/1kHz)
Calibration possible to	ISO
Dimensions	55(W) x 210(H) x 32(D)mm
Frequency range	31.5Hz to 8000Hz
Measurement range - sound level	30dB to 130 dB
Pick-up time	125/1000ms
Power supply	9V Block
Sound level resolution	0.1dB
Weight	230g

Type	Order code	1+
Voltcraft SL-200	51-5136	56.18

525147



UNI-T

UT352 series: Sound Level Meter

The UT352 sound level meter has a wide dynamic range from 30-130dB. Due to its simple push-button operation, this noise meter is extremely easy to use. Just switch it on and it is measuring with the most common settings. It is suitable for audio and general purpose applications in warehouses, manufacturing units, offices, schools, pubs, clubs etc.

- Power: 1.5V Battery (AA) x 4
- LCD Size: 53 x 41mm
- Product Colour: Red and grey
- Product weight: 330g
- Product size: 273 x 70 x 39mm
- Standard accessories: Batteries, English manual



Technical specification

Function	Range
Total Range	30 to 130dB
Maximum Level	130dB
Accuracy	±1.5dB
Range Selections	30 to 80dB, 50 to 100dB, 60 to 110dB, 80 to 130dB
Frequency Range	31.5Hz to 8000Hz
Frequency Weighting	A and C
Time Weighting	FAST (125ms) SLOW (1 second)
Analogue Bar Graph	30 to 130dB
Warning	Over-Range 'OVER', Under-Range 'UNDER'
Analogue Outputs	AC: 0.707Vrms full scale; Output impedance: around 600Ω DC: 2Vrms full scale; 10mV/dB; Output impedance around 100Ω
Max/Min Mode	Yes
Data Hold	Yes
Display Backlight	Yes
Sleep Mode	Yes
Low Battery Display	4.8V
Data Logging	63 data sets

Type	Order code	1+	5+	10+
Uni-T Sound Level Meter UT352	85-4088	60.65	55.23	52.52

400429

VOLTCRAFT®

SL-50 Sound Level Meter, Measuring Meter, Noise Measuring Apparatus

The Voltcraft SL-50 noise level meter is a digital measurement device for measuring the noise level in units of decibel (dB). The noise level meter is for measuring noise levels of sources in the intensity range 40dB to 130 dB. It is an appliance for checking noise sources or for simple measurements of environment noise.

The measurements and the instantaneous units/functions are shown digitally on the large four-digit LCD display (Liquid Crystal Display). In unfavourable light conditions the display is illuminated automatically.

The measurement signal is sampled linearly (C-characteristic) with a fast measurement speed of 125ms which enables measurements in the frequency range of 30Hz (Hertz) to 4KHz (kilo Hertz).

In order to suppress disturbing wind noise, an attachable wind deflector is enclosed, which does not affect the noise level measurement. A 9V block battery (type PP3) is required for operation.

- LCD read out
- Ideal for audio and general purpose applications in warehouses, manufacturing units, offices, schools, pubs, clubs etc
- High and low measurement ranges
- Auto power off function
- Supplied with attachable wind deflector

Please note: Requires 1x 9V battery (not supplied).

Technical specification

Power Supply:	9V DC (type PP3)
Power input:	40mA max (with display light)
Measuring range:	40dB to 130dB (30Hz to 4kHz)
Evaluation time:	125ms
Display definition:	0.1dB
Accuracy:	±3.5dB (for 1kHz and 94dB)
Microphone:	½ inch electret condenser microphone
Operating instructions:	0°C to 40°C (not condensing)
Operating altitude:	2.000m max
Weight:	135g
Dimensions:	130(L) x 52(W) x 32(H)mm

Type	Order code	1+
Sound Level Meter	51-5135	20.42

525146





## Light Meters

### VOLTCRAFT

#### MS-1300 Digital Luxmeter 0.1 – 50 000 Lux, Light Meter

This device is used to register the exact level of illumination required in the home, workplace or hobby room, or to check individual lights. This handy device has an external light sensor and is easy to use. Also perfect for hobby-photography or terrarium owners for measuring optimum brightness.

- Accuracy  $\pm 5\%$
- 0.1 to 50 000 lux
- Supplied with carry bag, 1x battery and operating instructions



##### Technical specification

Accuracy	$\pm 5\%$
Dimensions	65(W) x 188(H) x 25(D)mm
Light intensity resolution	0.1 lux
Measurement range - light strength	0.1 to 50 000 lux
Power supply	12 V Alkaline
Product Specifications	Measurement interval 1.5s.
Weight	160g

Type	Order code	1+
Light meter	<b>51-5154</b>	21.28

525165

### VOLTCRAFT

#### BL-10L Lux-Meter, Illumination Measuring Device

The Voltcraft BL-10L lux-meter has been designed to measure the intensity of illumination and the incidence of light on a certain surface area. The measurement is carried out via a silicon photo diode.

The readings can be displayed in lux (lx) or foot-candle (fc), as required. Moreover, the maximum readings for a particular measurement process can be shown. With the help of the integrated IR-filter only the visible range of the light spectrum is included in the measurement. The BL-10 is powered by a 9V battery.

- Compact light intensity meter
- MAX-hold
- Measurement rate 2.5/s
- Measured value display in lux (lm/m<sup>2</sup>) or foot candle (lm/ft<sup>2</sup>)
- Illuminated display
- Light sensor with IR-spectral filter
- Supplied with Voltcraft BL-10, 9V battery and user manual



The product is not suitable for commercial uses.

##### Technical specification

51-5208	
Accuracy	$\pm 2\%$
Calibration possible to	ISO / DKD
Dimensions	(L x W x H) 157(L) x 54(W) x 34(H)mm
Light intensity resolution	0.1 lx
Measurement range - light strength	0 - 40000 lx
Power supply	9V battery pack
Weight	125g

Type	Order code	1+
Lux-Meter	<b>51-5208</b>	34.04

525219

### AMPROBE

#### LM-100 Light Meter Manual Ranging

The Amprobe LM-100 light meter measures the visible light from fluorescent, metal halide, high-pressure sodium or incandescent sources. It is a portable, easy to use digital light meter designed for simple one-hand operation reading in Lumen (lux) or foot candle (fc) units. The LM-100 measures a wide range of light up to 20,000fc or lux with an accurate, high resolution of 0.01fc/lux.

Use the LM-100 light meter to measure the illumination level in the interior and to switch off or reduce or increase the output level of lighting fixtures. Reduce the energy burden of the building by significantly increasing the efficiency of its lighting system.

- Measure in Lux or foot candles, front panel switchable
- Measuring range to 200000 Lux or 20000 foot candles
- Silicon photodiode sensor and filter
- Data hold to freeze reading on the digital display
- Max ability to show high readings
- Includes protective sensor cap



##### Technical specification

Display LCD	3 1/2 digit
Power supply	1x 9V battery
Weight	220g

Type	Order code	1+
Amprobe LM-100 Light Meter	<b>90-4080</b>	62.11

400800

### DI-LOG

#### Digital Light Meter 400k Lux DL7040

The Di-Log DL7040 is a Digital Light Meter that will measure up to 400k Lux. The light and very portable meter will give you precise measurements of light level each and every time it is used. The photo detector is attached to a coiled extension cord for best positioning, so making it ideal to see the results on the receiver. The DL7040 is perfect for photography, movie or scene setting applications or for lab, schools or industrial places.

The Di-Log DL7040 has a 3 1/2 digit LCD display with low-battery indication, is easy to use with single function switch, and all output is displayed in Lux.

- Wide measuring range up to 400,000 Lux
- Long life silicon photo diode sensor
- Measurement rate 1.5 times per second
- Manufacturers part no. **DI-Log DL7040**



##### Technical specification

Display	3 1/2 Digit
Lux range/resolution	0 to 50,000 Lux 0 to 400,000 Lux
Accuracy	$\pm 5\%$ +10 digits $\pm 10\%$ +digits
Max resolution	0.1 Lux
Measuring rate	1.5 times per second
Power supply	1x 9V battery
Dimensions	165 x 76 x 43mm
Weight	403g

Type	Order code	1+
Digital Light Meter	<b>90-6404</b>	93.52

503026

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# Oscilloscopes

★★★★★ **BESTSELLER** ★★★★★

**VOLTCRAFT®**

## DSO-1062D 2-Channel Digital Storage Oscilloscope

The Voltcraft DSO-1062D 2-Channel Oscilloscope is an entry-level model in the field of digital storage oscilloscopes. The device has two channels with a bandwidth of 60MHz and a real-time sampling rate of max. 1GSa/s and a memory depth of 512kpts.



Up to 1Mpts are available if only one channel is used. The DSO-1062C is almost unbeatable value for money with its large 17.7cm 800 x 480 pixel colour display and USB host for storing data on an optional stick.

The DSO-1062D is completed by a USB interface, multilingual Help menu, extensive trigger possibilities, automatic measuring functions including FFT and standard software included in the delivery.

- 60MHz bandwidth
- 1 GS/s real time sampling rate, equivalent to 25GS/s
- Supplied with Voltcraft DSO-1062D, 2 probes (each 1:1 / 10:1), Power cord USB cable, software, detailed instruction manual (English), Quick Start Guide (Multilingual)

2 probes (each 1:1/10:1), Power cable, USB cable, Software, Detailed user manual (English), Quick instructions (Multilingual).

Technical specification	
51-5195	
Accuracy	±3%
Bandwidth	60MHz
Calibration possible to	ISO / DKD
Channel type	2
Dimensions	313(W) x 142(H) x 108(D)mm
Display type/resolution	800 x 400 pix
Displays	LCD
Input coupling	DC/AC/GND
Input impedance	1M $\Omega$
Input voltage range	2mV to 100V (DC/ACpp)
Interfaces	1x USB
Mathematics functions	Pk-pk, max, min, effective value, cys, RMS, Hz, period, rise/fall time, pos/neg half-wave
Max. power consumption	30W
Memory depth	1 MPts (single), 512 kPts (dual)
Operation type	CH1, CH2, dual, XY
Power supply	100V AC to 240V AC
Resolution	8-bit
Sampling rate	1GS/s (single mode), 500 MS/s (dual mode)
Screen size	17,7cm
Timebase range	4ns to 40s/div
Triggering	DC, AC, HF, LF, noise, EXT, EXT/5
Type (manufacturer type)	DSO-1062D
Vertical deflection	2mV to 5V/div
Weight	2kg

Type	Order code	1+
Voltcraft DSO-1062D	<b>51-5195</b>	248.95

525204

★★★★★★★★★★★★★★★★



## SmartDS 5032E 30MHz Oscilloscope

## The OWON SDS5032E

is a **30MHz Slim Design Oscilloscope** that

provides a combination of comprehensive features, speed of use and comprehensive analysis capabilities. The impressive **full colour 8 inch LCD display** has a high resolution 800 x 600 that makes the wave easy to read. The SDS5032E offers a 30MHz bandwidth, a sample rate of 125MSa/s in dual Channel projectors, making it ideal for



The OWON digital storage oscilloscope SDS5032E offers reliable measurement technology for a really good price.

- 8 inch LCD TFT colour display 800 x 600
- Bandwidth: 30MHz
- Sample rate: up to 250ms/s
- Autoscale and built-in FFT
- Record length: 10K points per channel
- Store up to 15 waveforms
- 20 Automatic measurements
- USB interface, LAN
- VGA output for use of projection
- Rechargeable battery (optional)
- Light weight: 1.5kg

- Compact design
- Dimensions: 350 x 157 x 80mm
- What's in the box? Power probe, power cord, USB data cable, CD-Rom and user's manual
- Manufacturer's part: **OWON SD5032E**

Technical specification	
Bandwidth	30MHz
Sample rate (Real time)	250MS/s using one channel
Horizontal Scale(S/div)	4ns/div to 100s/div, step by 1-2-4
Rise time (at input, typical)	$\leq 8\text{ns}$
Channels	Two, external trigger
Display	8 inch colour TFT LCD display , 800 x 600
Input impedance	1M $\Omega$ $\pm$ 2% in parallel with 20pF $\pm$ 5pF
Channels isolation	50Hz: 100 : 1, 1.0MHz: 40 : 1
Max. input voltage	400V (PK-PK) $\leq$ 4C PK-PK
DC gain accuracy	$\pm$ 3%
DC accuracy (Average)	Average $\geq$ 16 : $\pm$ (3% reading+0.05div)
Probe attenuation factor	1X, 10X, 100X, 1000X
Record length	Max.10K points for each channel
Interpolation	(sin x)/x
Vertical resolution	(A/D) 8 bits resolution (2 Channels simultaneously)
Vertical sensitivity	5mV/div to 10V/div(at input)
Trigger type	Edge, Pulse, Video, Slope
Trigger level range	$\pm$ 6 divisions from screen centre
Waveform Math	+ , - , x , / , FFT
Waveform storage	15 waveforms
Interface	USB 2.0, LAN, VGA output for projection use
Power consumption	<18W
Dimension	350(W) x 157(L) x 80(D)mm
Weight	1.8Kg

Type	Order code	1+
OWON SDS5032E	<b>85-9990</b>	216.24

53862



## SDS6062 Digital Oscilloscope with Logic Analyser 60MHz 2-channel

The Owon SDS6062 Digital Oscilloscope with Logic Analyser 60MHz with 2-Channels is a two-channel bench top scope with a huge 10MSa record length for each channel, allowing zooming capability for investigating fast, intermittent pulses.

This low-cost versatile scope samples at 500MSa/s and is packed with useful features normally only seen on higher-end DSOs, including deep memory, external, video-capable trigger, auto-measurements, auto-scaling, large 8 inch full colour LCD display, XY mode, auto-set, averaging, math functions, USB output, waveform storage, pass/fail output and a 3-year warranty.



This lightweight scope is perfect for any engineers or students desk. The USB master and slave connections make printing or storing results easy too. The sensitivity range is 2mV/div to 10V/div with maximum display of  $\pm 50V$ . Another really useful feature is the ability to store up to 15 waveforms for comparison with live inputs. The SDS6062 offers on-board storage, and USB output, making it an unbeatable value for use in design, maintenance and lab applications. Also included are a USB cable, power adaptor, user manual, and the software CD.

This highly portable unit weighs less than 4lbs. and measures 340 x 155 x 70mm.

- Bandwidth: 60MHz
- Channels: Dual
- Display: 8 inch colour LCD, TFT screen, 800 x 600 pixels
- VGA output for projector, large screen, whiteboard etc, which supports standard VGA
- USB (host) direct output for saving images and data straight to USB flash drive
- USB-for communicating with computer, working with PC suite software
- LAN- for connecting to network
- Ability to store 15 waveforms
- Multiple waveform calculation function
- USB communication port
- 120/240V AC 50/60Hz, CAT II, CE
- Manufacturer's part no. **OWON SDS6062**

Technical specification	
Model Name	SDS6062
Bandwidth	60MHz
Sample Rate(Real time)	500MS/s
Horizontal Scale	5ns/div to 100s/div step by 1, 2, 5
Rise Time (at input, typical)	<5.8ns
Display	8 Inch colour display with TFT panel (800 x 600 pixels)
Channels	Dual
Input Impedance	1M $\Omega$ $\pm$ 2%, in parallel with 15pF $\pm$ 5pF
Record length	Max 10M points on each channel
Interpolation	(sin x)/x
Probe attenuation factor	1X, 10X, 100X, 1000X
Input coupling	DC, AC, GND
DC accuracy (average)	Average $>16$ : $\pm$ (5% reading + 0.05 div)
Vertical sensitivity	2mV/div to 10V/div (at input)
Vertical resolution (A/D)	8-bit (2-channels simultaneously)
Max. input voltage	400V (PK-PK) (DC +AC PK-PK)
Trigger type	Edge, Pulse, Slope, Video, Alternate
Trigger mode	Auto, Normal, Single
Trigger level	$\pm$ 6 divisions from screen centre
Acquisition modes	Sample, Peak Detect and Average
DC gain accuracy	$\pm$ 3%
Automatic measurement	Vpp, Vavg, RMS, Frequency, Period, Vmax, Vmin, Vtop, Vbase, Width, Overshoot, Preshoot, RiseTime, Falltime, +Width, -Width, +Duty, -Duty, Delay A-B, Delay A-B
Waveform storage	15 waveforms
Bandwidth	60MHz
Difference	$\pm$ 3°
Communication Interface	USB, and USB flash disk storage
Power supply	100V to 240V AC, 50/60Hz

Type	Order code	1+
Digital Oscilloscope	<b>85-2770</b>	332.52
Battery	<b>85-2771</b>	60.78

517620



### MSO Series 2-channel Mixed Signal Oscilloscope



The **MSO5022S** mixed-signal oscilloscope from **Owon Technology** is a 2-channel colour unit that provides a combination of comprehensive features, speed of use and extensive analysis capabilities, functioning as a 2-channel oscilloscope or as a logic analyser. With its 25MHz bandwidth this instrument is perfect for design, testing and maintenance in the laboratory or workshop. Features a large 7.8in, colour STN display that makes analysis of waveforms easy and accurate. Additionally, features such as dual channel storage facilities and USB connectivity further enhance their useability. Contents of the kit include 1x pair of 1:1 (10:1) passive probe, USB cable, power cable, instruction manual, driver CD, adjustment probe compensation pen.

- 25MHz bandwidth
- High resolution 7.8in colour display
- Manual cursor measurement
- Five automatic measurements
- High-speed screen refresh
- Store up to four waveform and setup parameters
- USB interface
- Powered by 100v to 240V AC, 50Hz
- Optionally powered by rechargeable battery (see price panel for details)
- **Owon Technology MSO5022S**

#### Technical specification

Model No.	<b>MS07102</b>
Order code	<b>85-2780</b>
Bandwidth	100MHz
Channels	2
Mode	Normal, peak detect, averaging
Sample rate (real time)	500MS/s
<b>Input</b>	
Input coupling	DC, AC
Input impedance	1MS $\Omega$
Probe attenuation	x1, x10, x100, x1000
Input voltage max.	300V pk to pk Cat II
<b>Horizontal system</b>	
Sampling range	10S/s to 1000MS/s
Time base	5ns/div to 5s/div
<b>Vertical system</b>	
Vertical resolution	5mV/div to 5V/div
Vertical sensitivity	$\pm 10$ div (5mV/div to 5V/div)
Position range	$\leq 5.8$ ns
Rise time	$\leq 5.8$ ns
<b>Trigger</b>	
Trigger mode	Edge, video
Line/field frequency (video)	Supports NTSC, PAL and SECAM
<b>Measurement system</b>	
Measurement modes	Cursor (vertical, time), pk-pk, averaging, rms, frequency, circle
Waveform maths	+, -, inverted
Waveform storage	4 waveforms, 4 settings
<b>Logic analyser</b>	
Sampling rate max.	100MHz
Input channel	16
Storage max.	4M/channel
Measurement bandwidth	33MHz
Input impedance	1MS $\Omega$ $\pm 2\%$
Voltage	0 to 4V
Input signal range	0 to 5V
Trigger position setting	Pre-, mid-, re-trigger
Trigger mode	Bus, state, data alignment, data width trigger
Data system	Binary, decimal, hex

Type	Order code	1+	3+	10+
100MHz MSO Scope	<b>85-2780</b>	654.84		
Rech. batt. for scope	<b>85-2798</b>	60.78	56.66	52.54

081344

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## 60MHz Oscilloscope Probes



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HDS1021M, Handheld 1-channel 20MHz Oscilloscope Plus DMM

The Owon HDS1021M is a 20MHz bandwidth 1 channel digital storage oscilloscope and multimeter with a 100MSa/s sample rate and a 3.5 inch colour TFT-LCD screen with 320x240 resolution.

The unit contains 1 passive probe that is switchable between 1:1 and 10:1 input ratio, and 1 pair of multimeter leads. Also included are a USB cable, power adapter, user manual, software CD-ROM, and a soft carrying case.

- **Oscilloscope**
- Record length of 6,000 points
- Cursor read-out
- 18 automatic measurement functions
- Auto scale function
- 3.5 inch Colour (TFT) LCD with high contrast
- Ability to store and recall waveforms
- Automatic setting function
- Multiple waveform calculation function
- Can detect the average and peak values of a waveform
- Edge and video trigger function
- USB communication port
- Multiple language user interface
- Lithium battery (6 hours of operation time)
- **Multimeter**
- 3 3/4 digits
- Volts, amps, ohms, diode, capacitance, continuity measurements
- 20A maximum amplitude
- Isolated inputs between oscilloscope and multimeter



Technical specification	
Model Name	HDS1021M
Bandwidth	20MHz
Sample Rate (Real time)	100MS/s
Horizontal Scale(S/div)	5ns/div to 100s/div, step by 1 to 2.5 to 5
Rise time (at input, typical)	17.5ns
Display	3.5 inch colour TFT display (320 x 240 pixels)
Channels	Single
Input impedance	1MΩ ±2% in parallel with 20pF ±3pF
Record length	6000 points on each channel max
Probe attenuation factor	1X,10X,100X,1000X
Input coupling	DC, AC, GND
DC accuracy (Average)	Average>16 ±(3% reading
Vertical Sensitivity	5mV/div to 5V/div (at input)
Vertical resolution (A/D)	8-bit
Max. Input Voltage	400V (PK-PK) (DC + AC PK-PK, 1MΩ input impedance, probe attenuation 10:1)
Trigger type	Edge,Video
Trigger Mode	Auto, normal, single
Trigger level	6 divisions from screen centre
Acquisition modes	Sample, peak detect and average
DC gain accuracy	0.03
Communication interface	USB
Power supply	100V to 240V AC, 50/60Hz
Li-ion battery	7.4V, 6 hours operation
Dimension	180mm x 115mm x 40mm
Weight	455g

Type	Order code	1+
HDS1021M 20mhz Oscilloscope	85-2750	303.91

40044

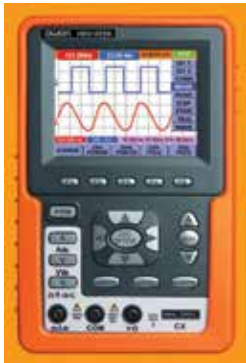


HDS1022M-N Handheld 2-channel 20MHz Oscilloscope Plus DMM

The HDS1022M-N can be used as TrueRMS multimeter and as a professional oscilloscope. Only with the HDS1022M-N, are you able to measure and inspect waves simultaneously.

The digital multimeter and storage oscilloscope HDS1022M-N offers reliability and high quality measurement technology for a really good price. The colourful LCD panel with the resolution of 640 x 480 makes the wave easy to read. Wherever and whenever, you will always view the best display by its crystal clear LCD panel. The HDS1022M-N offers 20 MHz bandwidth and a sample rate of 100 MS/s in dual Channel.

- True RMS multimeter volts, amps, ohms, continuity, diode
- Dual independent floating isolated channels (for multimeter and between oscilloscope and multimeter)
- Trigger modes free run, single shot, edge and video
- 20MHz Bandwidth
- 100MS/s Real time sampling rate
- Up to 250MS/s real time sample rate
- 2 in 1 (multimeter function support)
- Replaceable Li-ion battery back-up



- LCD back-light adjustment support
- Rising time 17.5ns
- USB Interface
- PC Download and analysis software
- 6 Hour Capacity Li-ion rechargeable batteries
- 3.8 inches, 320 x 240 colour LCD

Technical specification	
Model Name	HDS1022M
Bandwidth	20MHz
Sample Rate (Real time)	100MS/s
Horizontal Scale(S/div)	5ns/div - 100s/div, step by 1 to 2.5 to 5
Rise time(at input, typical)	<17.5ns
Display	3.8 inch colour TFT display (320 x 240 pixels)
Channels	Dual
Input impedance	1MΩ ±2% in parallel with 20pF ±3pF
Record length	6000 points on each channel max
Interpolation	(sin x)/x
Probe attenuation factor	1X,10X,100X,1000X
Vertical Sensitivity	5mV/div to 5V/div (at input)
Vertical resolution (A/D)	8-bit
Trigger type	Edge, video
Trigger Mode	Auto, normal, single
Trigger level	6 divisions from screen centre
Acquisition modes	Sample, peak detect and average
Waveform storage	4 waveforms
Communication interface	USB
Power supply	100V-240V AC, 50/60Hz
Li-ion battery	7.4V, 6 hours operation

Type	Order code	1+
HDS1022M-N 20mhz Oscilloscope	85-2751	370.87

400441



UTD2000 Series 2-channel 25 and 40 MHz Digital Storage Oscilloscopes

These Uni-T 25 and 40MHz Digital Storage Oscilloscopes from the UTD2000 Series have all of the features you would expect in a standalone scope - and some you could only have wished for. They will give you greater control, portability, large colour displays and easy signal analysis.



- Power: 100 to 240VACRMS, 45Hz - 440Hz, CAT II
- LCD Size: Diagonal 145mm (5.7 inches)
- Product colour: Red and grey
- Product weight: 2.5kg (Excluding packaging)
- Product size: 320mm x 150mm x 130mm
- Standard accessories: Probe x2 (1x, 10x switchable), power cord and English manual
- Available in 25 and 40MHz options

Technical specification	
Model	UTD2025C
Order code	85-4007
Bandwidth	25 MHz
Sample range	250MS/s
Vertical sensitivity	2mV to 10V/div
Record length (max)	2x 512k
Sample rate	Real time 250MS/s
Trigger type	Edge, Pulse, Video and Alternate
Auto waveform	28
Ports	Standard: USB Device, USB Host, RS232. Optional: LAN
Mathematics	Add, Subtract, Multiply, Divide, FFT
Applications	College Education, R&D, Electronic product assemble line, Industrial Control etc.
Display	64k, Full colour LCD, 320 x 240

Model	UTD2042C
Order code	85-4008
Bandwidth	40 MHz
Sample range	500MS/s
Vertical sensitivity	2mV to 5V/div
Record length (max)	2x 512k
Sample rate	Real time 500MS/s, Equivalent: 25GS/s
Trigger type	Edge, Pulse, Video and Alternate
Auto waveform	29
Ports	Standard: USB Device, USB Host, RS232. Optional: LAN
Mathematics	Add, Subtract, Multiply, Divide, FFT
Applications	College Education, R&D, Electronic product assemble line, Industrial Control etc.
Display	64k, Full colour LCD, 320 x 241

Type	Order code	1+
Uni-T 25MHz 2 Channel	85-4007	187.05
Uni-T 40MHz 2 Channel	85-4008	188.70

518754



UTD2000L Series: 2-channel Digital Storage Oscilloscope

Engineers around the world trust Uni-T to help them speed debug and test tomorrow's designs. With the broadest portfolio of digital oscilloscopes available, the richest set of product features, the most extensive analysis capability and their award-winning service and support, Uni-T has the right oscilloscope to meet your need.



- Power: 100 - 240VACRMS, 45Hz -440Hz, CAT II
- LCD Size: Diagonal 178mm (7 inches)
- Product colour: Red and Grey
- Product weight: 2.2kg
- Product size: 306mm x 147mm x 122mm
- Accessories probe: x2 (1x, 10x switchable), power cord and English manual, UT-DO5 USB cable, PC communication software



Technical specification

Model	<b>UDT2052CL</b>	<b>UDT2102CEL</b>
Order code	<b>85-4020</b>	<b>85-4021</b>
Bandwidth	50 MHz	100 MHz
Sample range	500MS/s	1GS/s
Vertical sensitivity	50GS/s	50GS/s
Record length (max)	1mV to 20V/div	1mV ~ 20V/div
Sample rate	2x 600k	2 x 600k
Scan time base	5ns to 50s/div	2ns ~ 50s/div
Trigger type	Edge, Pulse, Alternate	Edge, Pulse, Alternate
Auto waveform	28	28
Ports	6 digits frequency counter	6 digits frequency counter
Mathematics	USB OTG	USB OTG
Applications	Add, Subtract, Multiply, Divide, FFT	Add, Subtract, Multiply, Divide, FFT
Display	Special Print Screen Feature	Special Print Screen Feature

Model	<b>UDT2202CEL</b>
Order code	<b>85-4021</b>
Bandwidth	50 MHz
Sample range	1GS/s
Vertical sensitivity	50GS/s
Record length (max)	1mV to 20V/div
Sample rate	2x 600k
Scan time base	5ns to 50s/div
Trigger type	Edge, Pulse, Alternate
Auto waveform	29
Ports	7 digits frequency counter
Mathematics	USB OTG
Applications	Add, Subtract, Multiply, Divide, FFT
Display	Special Print Screen Feature

Type	Order code	1+	5+	10+
Uni-T 50MHz 2 Channel	<b>85-4020</b>	307.15	279.72	266.01
Uni-T 100MHz 2 Channel	<b>85-4021</b>	259.06		
Uni-T 50MHz 2 Channel	<b>85-4022</b>	182.58		

400401



GDS-1052-U 50MHz, 2-channel Digital Storage Oscilloscope

The GDS-1052-U offers a 50MHz digital storage oscilloscopes with 5.7 inch colour TFT LCD display. With dual sampling modes, a 4,000 point record length, a real-time sampling rate of 250MSa/s and an ET sampling rate of 25GSa/s, the GDS-1052-U provides an excellent balance of performance between memory length and sampling speed. Other major features include user-friendly menu tree operations, compact size, ergonomic design, USB host for PC connectivity and USB device port support. The GDS-1052-U is designed to meet today's most demanding engineering requirements and budgets.

The USB Host port on the front significantly enhances the data storage capability of the product. The large amount of data, including screenshot, waveform and panel setup, could be easily stored into a popular flash drive. A USB device port on the rear of the product transfers the screen image and waveform raw data to PC, and also allows your PC to remotely control the GDS-1052-U DSO.

A total of 15 waveforms can be saved into memory to be displayed at a later time. Two saved reference waveforms and two live waveforms can be compared on the screen at the same time. All signal time and voltage related measurements can be shown on the screen simultaneously in real-time via the Measure key press.

The GDS-1052-U has an enhanced 1kHz calibration signal. Its output frequency is adjustable from 1kHz to 100 kHz and has an adjustable duty cycle of 5% to 95%. Due to the flexible output, the calibration output can also be used as a basic signal generator for other applications.



- 50MHz Bandwidth with 2 input channels
- 250MSa/s real-time and 25GSa/s equivalent-time sampling
- 4k Memory length per channel
- Peak detect as fast as 10ns
- Save/recall of 15 front panel settings and waveforms
- 5.7 inch TFT colour display
- 19 Auto measurements
- Arithmetic operators - add, Subtract, FFT
- USB Port for PC connection
- Data logger
- Limited lifetime warranty
- Manufacturers part no. **GDS-1052-U**

Type	Order code	1+
50MHz, GDS-1052-U	<b>90-6017</b>	215.58

502688



GDS-1102-U 100MHz, 2CH Digital Storage Oscilloscope

The GDS-1102-U offers a 100MHz digital storage oscilloscopes with 5.7 inch colour TFT LCD display. With dual sampling modes, a 4,000 point record length, a real-time sampling rate of 250MSa/s and an ET sampling rate of 25GSa/s, the GDS-1102-U provides an excellent balance of performance between memory length and sampling speed. Other major features include user-friendly menu tree operations, compact size, ergonomic design, USB host for PC connectivity and USB device port support. The GDS-1102-U is designed to meet today's most demanding engineering requirements and budgets.

The USB Host port on the front significantly enhance the data storage capability of the product. The large amount of data, including screenshot, waveform and panel setup, could be easily stored into a popular flash disk. A USB device port on the rear of the product transfers the screen image and waveform raw data to PC, and also allows your PC to remotely control the GDS-1102-U DSO.

A total of 15 waveforms can be saved into memory to be displayed at a later time. Two saved reference waveforms and two live waveforms can be compared on the screen at the same time. All signal time and voltage related measurements can be shown on the screen simultaneously in real-time via the Measure key press.

The GDS-1072-U has an enhanced 1kHz calibration signal. Its output frequency is adjustable from 1kHz to 100kHz and has an adjustable duty cycle of 5% to 95%. Due to the flexible output, the calibration output can also be used as a basic signal generator for other applications.

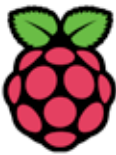


- 100 MHz Bandwidth with 2 input channels
- 250MSa/s Real-time and 25GSa/s equivalent-time sampling
- 4k Memory length per channel
- Peak detect as fast as 10ns
- Save/recall of 15 front panel settings and waveforms
- 5.7 inch TFT colour display
- 19 Auto measurements
- Arithmetic operators - add, subtract, FFT
- USB Port for PC connection
- Data logger
- Limited lifetime warranty
- Manufacturers part no. **GDS-1102-U**

Type	Order code	1+
100MHz, GDS-1102-U	<b>90-6019</b>	300.83

502690

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TBS1000 Series 2-channel Oscilloscopes

Usually, entry level instruments are as light in features as they are in price. But the Tektronix TBS1000 Series are not usual instruments.

With up to 100MHz bandwidth and 500MS/s sample rate, no other digital storage oscilloscope offers as much bandwidth and sample rate for the price. Tektronix proprietary sampling technology provides real-time sampling with the stated sampling rate on all channels, all the time to accurately capture your signals. Sampling performance is not reduced when using multiple channels.

The TBS1000 Digital Oscilloscope Series is especially well suited to meet the needs of today's schools and universities. Packed with features and built-in tools, the TBS1000 is easy to learn and simple to operate and ideal for first-time oscilloscope users and students. Featuring the same user interface as the Tektronix TDS Oscilloscope Family, students will learn to operate the world's most popular oscilloscope platform, with over 500,000 oscilloscopes in operation worldwide.

To simplify integration with your existing curriculum, the TBS1000 also includes an Education Resource CD filled with tools to help your students master the use of an oscilloscope. The TBS1000 offers the tools and performance you need at a price you can afford.

The TBS1000 series is ideal for students, hobbyists or any person or organization on a tight budget. These oscilloscopes deliver outstanding performance, including best in class, digital real time sampling, pass/fail testing, and familiar, easy to use controls.

All at a price that's equally impressive

- Available in 100MHz and 25MHz bandwidth models
- 2-channel Models
- Up to 1GS/s sample rate on all channels
- Up to 500MS/s sample rate on all channels
- 2.5k point record length on all channels
- Advanced triggers including pulse width trigger and line-selectable
- Video trigger
- 16 Automated measurements and FFT analysis for simplified waveform analysis
- Built-in Waveform Limit Testing
- Automated, Extended Data Logging Feature
- Autoset and Signal Auto ranging
- Built-in Context-sensitive Help
- Probe Check Wizard
- Multiple-language User Interface
- 5-year Warranty

Technical specification	
Model	<b>TBS1022</b>
Display (QVGA LCD)	TFT
Bandwidth*1	25 MHz
Channels	2
External Trigger Input	Included on all models
Sample Rate on Each Channel	500MS/s
Record Length	2.5k points at all time bases on all models
Vertical Resolution	8 bits
Vertical Sensitivity	2mV to 5V/div on all models with calibrated fine adjustment
DC Vertical Accuracy	±3% on all models
Vertical Zoom	Vertically expand or compress a live or stopped waveform
Maximum Input Voltage	300 VRMS CAT II; derated at 20 dB/decade above 100 kHz to 13Vp-p AC at 3MHz
Position Range	2mV to 200mV/div +2V >200mV to 5V/div +50V
Bandwidth Limit	20MHz for all models
Input Coupling	AC, DC, GND on all models
Input Impedance	1MΩ in parallel with 20pF
Time Base Accuracy	50ppm
Horizontal Zoom	Horizontally expand or compress a live or stopped waveform
I/O Interfaces	
USB Ports	USB host port on front panel supports USB flash drives USB device port on back of instrument supports connection to PC and all PictBridge-compatible printers

Type	Order code	1+
TBS1022	51-5419	343.00
TBS1102	51-5420	726.00

525278



2-Channel Digital Storage Oscilloscope, TBS1042

The Tektronix TBS1042 40MHz Bandwidth, 500MS/s Sample Rate, 2-Channel Digital Storage Oscilloscope provides you with affordable performance in a compact design. Packed with standard features including USB connectivity, 16 automated measurements, limit testing, data-logging, and context-sensitive help; the Tektronix TBS1042 40MHz Bandwidth, 2-Channel Digital Storage Oscilloscope helps you get more done, in less time.

Tektronix proprietary sampling technology provides real-time sampling with the stated sampling rate on all channels, all the time to accurately capture your signals. Sampling performance is not reduced when using multiple channels.

The Tektronix TBS1042 Digital Oscilloscope is especially well suited to meet the needs of today's schools and universities. Packed with built-in tools, the Tektronix TBS1042 is easy to learn and simple to operate. Ideal for first time oscilloscope users and students. Featuring the same user interface as the Tektronix TDS Oscilloscope Family, students will learn to operate the world's most popular oscilloscope platform. The Tektronix TBS1042 offers the tools and performance you need at a price you can afford.

- 40MHz Bandwidth models
- 2-channel
- Up to 500MS/s Sample rate on all channels
- 2.5k point Record length on all channels
- Advanced triggers including pulse width trigger and line-selectable video trigger
- 16 Automated measurements, and FFT analysis for simplified waveform analysis
- Built-in waveform limit testing
- Automated, extended data logging feature
- Autoset and signal auto-ranging
- Built-in context-sensitive help
- Probe check wizard
- Multiple language user interface
- 5.7 inch (144mm) active TFT colour display
- Small footprint and lightweight
- Connectivity includes USB 2.0 host port on the front panel and one USB 2.0 device port on rear panel for easy connection to a PC or direct printing to a PictBridge compatible printer

Technical specification	
Display (QVGA LCD):	TFT
Bandwidth:	40MHz
Channels:	2
External Trigger Input:	Included on all models
Sample Rate on Each Channel:	500 MS/s
Record Length:	2.5k points at all time bases
Vertical Resolution:	8-bits
Vertical Sensitivity:	2mV to 5V/div on all models with calibrated fine adjustment
DC Vertical Accuracy:	±3%
Vertical Zoom:	300 VRMS CAT II; derated at 20dB/decade above 100kHz to 13Vp-pA Cat 3MHz
Maximum Input Voltage:	300 VRMS CAT II; derated at 20 dB/decade above 100kHz to 13Vp-pA Cat3MHz
Position Range:	2mV to 200mV/div +2V >200mV to 5V/div +50V
Bandwidth Limit:	20MHz for all models
Input Coupling:	AC, DC, GND on all models
Input Impedance:	1MΩ in parallel with 20pF
Time Base Range:	5ns to 50s/div
Time Base Accuracy:	50ppm
Horizontal Zoom:	Horizontally expand or compress a live or stopped waveform
USB Ports:	USB host port on front panel supports USB flash drives USB device port on back of instrument supports connection to PC and all PictBridge compatible printers
Reference Waveform Display:	(2) 2.5k point reference waveforms
Waveform Storage without USB Flash Drive:	(2) 2.5k point
Maximum USB Flash Drive Size:	64 Gbyte
Waveform Storage with USB Flash Drive:	96 or more reference waveforms per 8 Mbyte
Setups without USB Flash Drive:	10 front-panel setups
Screen Images with USB Flash Drive:	128 or more screen images per 8 Mbyte (the number of images depends on file format selected)
Save All with USB Flash Drive:	12 or more Save All operations per 8 Mbyte

Type	Order code	1+
Oscilloscope TB1042	52-1980	449.00

539650



TBS1062 2-channel Oscilloscope Bandwidth 60MHz

The Tektronix TBS1062 60 MHz Bandwidth, 1GS/s Sample Rate, 2-Channel Digital Storage Oscilloscope provides you with affordable performance in a compact design. Packed with standard features, including USB connectivity, 16 automated measurements, limit testing, data-logging, and context sensitive help; the Tektronix TBS 1062 60MHz Bandwidth, 2-channel digital storage oscilloscope helps you get more done, in less time.



WSD81i  
Soldering  
Station



No other digital storage oscilloscope offers as much bandwidth and sample rate for the price. Tektronix proprietary sampling technology provides real-time sampling with the stated sampling rate on all channels, all the time to accurately capture your signals. Sampling performance is not reduced when using multiple channels.

The Tektronix TBS1062 Digital Oscilloscope is especially well suited to meet the needs of today's schools and universities. Packed with features and built-in tools, the Tektronix TBS1062 is easy to learn and simple to operate, ideal for first time oscilloscope users and students. Featuring the same user interface as the Tektronix TDS Oscilloscope Family, your students will learn to operate the world's most popular oscilloscope platform, with over 500,000 oscilloscopes in operation worldwide.

To simplify integration with your existing curriculum, the Tektronix TBS/1062 also includes an Education Resource CD filled with tools to help your students master the use of an oscilloscope. The Tektronix TBS 1062 offers the tools and performance you need at a price you can afford.

- 60MHz, two-channel, portable digital oscilloscope
- Ideal for electronics applications such as electrical engineering education and hobbyist projects
- Maximum real-time sample rate of 1GS/s per channel
- Record length of 2.5kpts per channel for acquiring detailed waveforms
- Advanced triggers - rising and falling edge, pulse width, and video
- Allows isolation of specific signals
- 5.7 inch colour TFT-LCD with anti-glare surface for viewing waveforms
- Meets EN and IEC 61010-1:2001 safety standard
- Rated for CAT II installations to 300V

**Technical specification**

Display	5.7 inch colour TFT-LCD
Bandwidth	60MHz
Channels	Two
Maximum real-time sample rate	1GS/s per channel
Record length	2.5kpts
Installation rating	CAT II, 300V
Standards meet	EN and IEC 61010-1:2001, UL 61010-1:2004, and CSA C22.2 61010-1:2004 safety standards; CE marking
Power source	125V AC, 10A power cord
Dimensions	158(H) x 326.3(W) x 124.2(D)mm
Weight	2 kg

Type	Order code	1+
Tektronix TBS1062	<b>86-3049</b>	547.00

52832

## VOLTCRAFT® 610/2 1-channel Oscilloscope

The Voltcraft 610/1 is a portable 1-channel oscilloscope with a frequency bandwidth of 0 to 10MHz and sensitivity of 5mV/DIV to 5V/DIV. The oscilloscope is very easy to operate, highly reliable and its light weight design makes it very easy to carry.

This 10MHz oscilloscope has an excellent price/quality ratio and can also be used for research, education, DIY and development in the electronics and circuitry industries.

- Calibrated switch settings for vertical deviation and time base
- Adjustable focus, intensity and elongation
- 4.8 x 6cm CRT with internal raster
- Integrated trigger function (with external trigger input)
- X-Y operation and probe calibrator
- Supplied with power cable and operating instructions



**Technical specification**

Accuracy	±5 %
Bandwidth	0 (DC) to 10MHz
Calibration possible to	ISO / DKD
Channel type	1
Dimensions	130(W) x 190(H) x 270(D)mm
Input impedance	1 MO/30pF
Input voltage range	400V (DC + peak AC).
Power supply	230V AC
Product Specifications	Signal delay pos. or neg.
Flank direction	K I, mains, external;
Trigger coupling	AC
Int. trigger threshold	1.5 div
Ext. trigger threshold	0.5Vss
Horizontal bandwidth (-3dB)	DC to 1MHz
Var. Hold-Off time	
<b>Expansion</b>	
Accuracy	30%
X-Y phase difference	30kHz to 10kHz
Calibrator	1kHz: 0.5Vss
Max. supply fluctuation	10%
Power supply frequency range	50Hz
Screen size	6 x 4,8cm
Timebase range	0.1s/cm - 0.1µs/cm
Triggering	norm, auto, TV-H, EXT
Vertical deflection	0.05 - 5V/cm
Weight	3 kg

Type	Order code	1+
Voltcraft 610/1	<b>51-5193</b>	111.59

525204

**digimess®**

## 10MHz Single Channel Oscilloscope

This single channel 10MHz analogue oscilloscope is a modern design, offering excellent features at an affordable price.

- Ideal for educational and field use
- Compact design includes a carry/tilt stand and X1/X10 probes
- The high brightness display is easy to use and includes auto, normal and TV triggering modes



**Technical specification**

<b>Vertical System</b>	
Sensitivity	5mV/DIV to 5V/DIV
Bandwidth	0 to 10MHz
Accuracy	3%
I/P impedance	1MΩ/30pF
Max I/p	<400V DC
<b>Triggering System</b>	
Trigger source	Int, Ext, Line
Trigger mode	NORM, AUTO, EXT, TV
<b>Horizontal System</b>	
Sweep rate	100ms to 0.1µs
Accuracy	±3%
<b>Calibration Signal</b>	
Waveform	symmetric square wave
Range	0.5V pk-pk
Frequency	1kHz
<b>CRT</b>	
Display area	75mm round screen 8 x 10 DIV, 1div = 6mm
Accelerating voltage	1200V
<b>General</b>	
Voltage	230V/50Hz
Dimensions	220 x 270 x 90mm
Weight	3kg

Type	Order code	1+	5+	10+
10MHz Oscilloscope	<b>85-1920</b>	136.63	131.12	122.80

062131

**GW INSTEK**

## 20MHz Analogue Oscilloscope/ 1MHz Function Generator

A unit that is both a 20MHz bandwidth oscilloscope and a 1MHz function generator in one compact body. Its comprehensive specification and versatility ensures that the user has a high quality product for an economic price that will be at home in the laboratory, classroom and workshop.

- Dual channel
- High sensitivity
- ALT triggering function
- TV synchronisation
- CH1 output
- Z Axis input
- Rectangular 6in. CRT display with internal graticule, 8 x 10 div and auto focus
- Input power 115/230V 50/60Hz
- Dimensions 310 x 150 x 455mm
- Weight 8.5kg
- Supplied with Power cord, 1x test lead, 2x probes, instruction manual



**Technical specification**

<b>Vertical system</b>	
Sensitivity	5mV/div to 5V/div (1mV/div to 1V/div with x5 mag.)
Bandwidth	DC to 20MHz
Rise time	17.5ns approx.
Maximum input	300V AC/DC at 1kHz
Input coupling	AC, DC, GND
Input impedance	1MΩ/25pF approx.
Vertical mode	CH1, CH2, DUAL (ALT, CHOP), ADD, CH2 INV
<b>Horizontal system</b>	
Sweep time	0.2µs/div to 0.5s/div
Sweep rate max.	100ns/div
<b>Trigger</b>	
Mode	AUTO, NORM, TV-V, TV-H
Source	CH1, CH2, ALT, UNE, EXT
Slope	+ve or -ve
<b>Function generator</b>	
Frequency range	0.1Hz to 1MHz in 7 ranges
Waveform	Sine, square, triangle
Frequency variable range	10:01:00
Output impedance	50Ω
Voltage	14V peak to peak

Type	Order code	1+
Scope/funct. gen.	<b>85-2061</b>	257.45

077000

**Design & Technology – Programming**

**See pages 127-130**





7020A 20MHz Dual Channel Oscilloscope

The 7020A 20MHz dual channel oscilloscope offers exceptional value in terms of price and performance.

- 20MHz bandwidth
- High sensitivity
- Full 8 x 10cm rectangular screen with scale illumination
- Excellent triggering facilities
- Ideally suited for general service and education applications
- A well presented front panel ensures quick and easy operation
- Variable hold-off function
- Convenient X-Y operation mode allows phase difference between measurements between two waveforms
- Carrying handle, which may be locked into any position, also doubles as a tilt stand
- Supplied complete with mains lead and comprehensive instruction manual
- Probes not included, see this section for suitable items



Technical specification

Vertical system		
Sensitivity	X1 mode	5mV/div. to 5V/div.
	X5 mode	1mV/div. to 1V/div.
	1-2-5 seq	10 step attenuation. Vernier control provides fully adjustable attenuation between steps
Accuracy	X1 mode	±3%
	X5 mode	±5%
Bandwidth	5mV to 5V/div	DC to 20MHz (-3dB)
	1mV/div (CAL)	DC to 10MHz (-3dB)
Rise time		17.5ns
Maximum input		400V DC + AC peak
Input impedance		1MΩ/25pF
Operating modes	CH1	CH1, single trace
	CH2	CH2, single trace
	ALT	dual trace, alternative
	CHOP	dual trace, chopped
	ADD	algebraic sum of CH1 and CH2
Horizontal system		
X-Y mode		switch selectable using X-Y switch
CH1		X-axis
CH2		Y-axis
Sensitivity		as vertical channel
Accuracy	X-axis	±6%
	Y-axis	±3%
Input impedance		same as vertical channel
X-Y phase difference		3° at 50kHz
Frequency response		DC to 1MHz typical (-3dB)
Sweep system		
Sweep speed		0.1µs/div. to 0.2s/div. in 1-2-5 sequence, 20 steps. Vernier control provides fully adjustable sweep time between steps
Magnifier		X10 (increases sweep to 100ns/div.)
Accuracy		±3%
Hold-off		Variable control from NORM to 5 times normal
Triggering		
Modes		Auto, Normal
Source		CH1, CH2, ALT EXT, LINE
Sensitivity	Internal	0.5 div.
	External	500mV
X-Y operation		Selected by switch
X-Y mode		DC-2MHz (3dB)
Bandwidth		Ch1-X axis, Ch2-Y axis
Display		
CRT		150mm diagonal flat screen illuminated scale
Graticule		8x 10 1cm divisions. Internal
EHT		2.1kV acceleration voltage
Trace rotation		electrical via front panel adjust
Calibrator		1kHz, square wave 2.0V ±3%
Power requirements		110/120/220/240V AC 50/60Hz 35W
Weight		7.5kg
Type	Order code	1+
7020A Oscilloscope	85-2200	249.88

036638



7025 25MHz Dual Channel Oscilloscope

The 7025 is a 25MHz dual channel oscilloscope at an affordable price.

- 25MHz ALT trigger
- 1mV sensitivity
- 10ns resolution
- Component test
- Beam finder
- Please note: No test probes are supplied with this unit



Technical specification

Vertical system	
Sensitivity	5mV/div to 5V/div(X1 mode), 1mV/div to 1V/div(X5 mode) 1-2-5 sequence, 10 step attenuator. Vernier control provides full adjustable attenuation between steps. ±3% (X1 mode), ±5% (X5 mode)
Accuracy	±3%
Input resistance	1MΩ±2%
Input capacitance	25pF±10pF
Frequency response	5mV to 5V/div (CAL): DC to 25MHz (-3dB) 1mV/div (CAL): DC to 10MHz (-3dB)
Rise time	Approx. 14.0ns
Operating modes	CH1: CH1, single trace. CH2: CH2, single trace. ALT: dual trace, alternating CHOP: dual trace, chopped. ADD: algebraic sum of CH1+CH2 CH2 only
Polarity reversal (invert)	400VDC+AC peak
Max. input voltage	DC to 25MHz: 4 divisions, DC to 15MHz: 8 divisions
Max. undistorted amplitude	
Horizontal system (input through channel 1 input)	
OX-Y mode	switch selectable using X-Y switch. CH1: x axis, CH2: y axis
Sensitivity	1mV/div to 5V/div
Accuracy	y axis: ±3%, x axis: ±6%
Input impedance	1MΩ/25pF
Frequency response	DC to 1MHz typical (-3dB)
X-Y phase difference	Approx. 3° at 50kHz
Max. input voltage	400VDC+AC peak
Sweep system	
Sweep speed	0.1µs/div to 2s/div in 1-2-5 sequence, 23 steps. Vernier control provides fully adjustable sweep time between steps. ±3%
Accuracy	±3%
Sweep magnification	10X, ±6% (0.1µs and 0.2µs ranges uncalibrated when X10 is engaged). Continuously adjustable from NORM to 5 times normal
Hold off	
Triggering	
Trigger source	CH1, CH2, ALT, EXT, LINE
Max. external trigger voltage	300VDC+AC peak
Trigger coupling	AC: 30Hz to 30MHz, TV-H: used for triggering from horizontal sync pulses. TV-V: used for triggering from vertical sync pulses. Internal: 0.5 division (1 division with TV coupling), External: 500mV.
Trigger sensitivity	
Component test	
Test voltage	Max. 6Vrms (open circuit)
Test current	Max. 11mA (shorted)
Test frequency	Line frequency
Components	Capacitor, Inductor, Diode, Transistor, Zener etc.
Beam finder	Trace can be returned to CRT centre area when beam finder button is pressed
Power requirements	115/230VAC ±10%, 50/60Hz
Dimensions	324 x 132 x 398mm
Weight	Approx. 7.6kg

Type	Order code	1+	3+	6+
7025 Oscilloscope	85-2203	387.18	349.99	319.68

072927

Free Delivery\*

on all orders over £30 (excl. VAT)  
(UK mainland only)

\* See Terms & Conditions for full details

NAO Humanoid Robots

Bring STEM to life with a NAO in your classroom.

- Programming
- Mechatronics
- Compete in the NAO Challenge



See **D&T Robotics** section page 152





## 7040A 40MHz Dual Channel Oscilloscope

The 7040A 40MHz 2-channel oscilloscope is ideal for industrial production, research and development and educational environments.

- Outstanding value for money
- 40MHz bandwidth
- High sensitivity
- Full 8 x 10cm rectangular screen with scale illumination
- Delayed sweep time base
- Component test facility
- Excellent triggering facilities
- A well presented front panel ensures quick and easy operation
- The advanced CRT ensures a distinct bright trace even at high frequencies
- An X-Y mode allows Lissajous figures to be produced and phase shift to be measured
- Very fast 10ns/div sweep rate make high speed risetime signals easily observable
- Variable hold-off function
- Output is available from channel 2 providing 50mV/div to drive external instruments
- The carrying handle, which may be locked into any position, also doubles as a tilt stand
- Supplied complete with mains lead and comprehensive instruction manual
- Probes not included, for suitable probes see this section



### Technical specification

#### Vertical system

Sensitivity	5mV/div. to 5V/div. plus variable control
Accuracy	1mV/div. to 1V/div. when x 5 magnification used
Bandwidth	±3% (±5% with x5 mag)
Rise time	DC to 40MHz (-3dB)
Maximum input	<8.8ns
Input impedance	400V (DC + AC peak)
Operating modes	1MΩ/25pF
Output signal	CH1 or CH2, Dual trace, chop or alternate
Horizontal system	Channel 2 only 50mV/div. with 50Ω; load
Sweep speed	0.1μs/div. to 0.2s/div. plus variable control

#### Sweep speed

Magnifier	x10 (extends sweep speed to 10ns/div.)
Accuracy	±3%
Hold-off	Variable control increases hold-off time by 5:1
Delayed sweep	0.1μs/div. to 0.2s/div. in calibrated steps

#### Trigger system

Modes	AUTO, NORM, TV-V and TV-H
Source	CH1, CH2, ALT, LINE, EXT
Polarity	+ or -

#### Trigger sensitivity

Coupling	Bandwidth	Internal	External
TV-V	DC-1kHz	1/div.	0.1V p-p
TV-H	1kHz to 100kHz	1/div.	0.1V p-p
Auto	100Hz to 40MHz	1.5/div.	0.1V p-p
Norm	100Hz to 40MHz	1.5/div.	0.1V p-p

#### X-Y operation

X-Y mode	Selected by switch
Bandwidth	DC-1MHz (-3dB)
	Ch1-X axis, Ch2-Y axis

Accuracy	Y axis ±3%
	X axis ±6%
	Less than 3°; at DC-100kHz

#### Phase shift

#### Z-axis (intensity modulation)

Sensitivity	3V p-p TTL signal compatible
Bandwidth	DC to 5MHz (-3dB)
Impedance	5KΩ

#### Component test

Test voltage	6V rms max. (open circuit)
Test current	11mA max. (shorted)
Test frequency	Line frequency
Components	Capacitor, inductor, diode, transistor, etc

#### Display

CRT	rectangular with integral graticule
Display area	8 x 10 div (1div = 1cm)
Accelerating voltage	2.1kV
Phosphor	P31

#### General

Calibration voltage	1kHz (nominal) positive square wave, 2.0V pk-pk
Power requirements	115, 230V AC 50/60Hz, 40W approx
Dimensions	324 x 132 x 398mm
Weight	7.8kg

Type	Order code	1+	3+	6+
7040A Oscilloscope	85-2202	423.00	409.22	388.56

036639

## 7041 40MHz 2-channel Oscilloscope with Counter

The 7041 is a 40MHz 2-channel oscilloscope with the added advantage of a 60MHz counter.

- Outstanding value for money
- 40MHz bandwidth
- High sensitivity
- 8 x 10cm rectangular screen with scale illumination
- Delayed sweep time base
- Component test facility
- Excellent triggering facilities
- Well presented front panel ensures quick and easy operation
- Advanced CRT ensures a distinct bright trace even at high frequencies
- X-Y mode allows Lissajous figures to be produced and phase shift to be measured
- Very fast 10ns/div sweep rate make high speed risetime signals easily observable
- Variable hold-off function
- Output is available from channel 2 providing 50mV/div to drive external instruments



- Features a 5-digit 9mm red LED display and measures from 0.1Hz to 60MHz with excellent resolution and accuracy
- The carrying handle, which may be locked into any position, also doubles as a tilt stand
- Supplied complete with mains lead and comprehensive instruction manual.
- Probes not included, for suitable items see this section

The 7041 oscilloscope is available on a 14-day evaluation period. For further details contact sales.

### Technical specification

#### Vertical system

Sensitivity	5mV/div. to 5V/div. plus variable control
Accuracy	1mV/div. to 1V/div. when x 5 magnification used
Bandwidth	±3% (±5% with x5 mag)
Rise time	DC to 40MHz (-3dB)
Maximum input	<8.8ns
Input impedance	400V (DC + AC peak)
Operating modes	1MΩ/25pF
Output signal	CH1 or CH2, Dual trace, chop or alternate
	50mV/div. with 50Ω; load Channel 2 only

#### Horizontal system

Sweep speed	0.1μs/div. to 0.2s/div. plus variable control
Magnifier	x10 (extends sweep speed to 10ns/div.)
Accuracy	±3%
Hold-off	Variable control increases hold-off time by 5:1
Delayed sweep	0.1μs/div. to 0.2s/div. in calibrated steps

#### Trigger system

Modes	AUTO, NORM, TV-V and TV-H
Source	CH1, CH2, ALT, LINE, EXT
Polarity	+ or -

#### Trigger sensitivity

Coupling	Bandwidth	Internal	External
TV-V	DC-1kHz	1/div.	0.1V p-p
TV-H	1kHz-100kHz	1/div.	0.1V p-p
Auto	100Hz-40MHz	1.5/div.	0.1V p-p
Norm	100Hz-40MHz	1.5/div.	0.1V p-p

#### X-Y operation

X-Y mode	Selected by switch
Bandwidth	DC-1MHz (-3dB)
	Ch1-X axis, Ch2-Y axis

Accuracy	Y axis ±3%
	X axis ±6%
	Less than 3° at DC-100kHz

#### Phase shift

#### Z-axis (intensity modulation)

Sensitivity	3V p-p TTL signal compatible
Bandwidth	DC to 5MHz (-3dB)
Impedance	5KΩ

#### Component test

Test voltage	6Vrms max. (open circuit)
Test current	11mA max. (shorted)
Test frequency	Line frequency
Components	Capacitor, inductor, diode, transistor, etc

#### Counter

Display	5-digit 0.36in red LED
Gate time	auto select, auto detect, auto reset
Resolution	0.001Hz to 1kHz according to the frequency of the input signal, auto select
Counter range	0.1Hz to 60MHz max
Accuracy	±0.01% +1 digit or 1/99999 +1 digit
	18.432MHz ±10ppm (23°C ±5°C)

#### Time base

#### Sensitivity

Mode	Range	Sensitivity
INT	2Hz to 40MHz	>=1 DIV
	1Hz to 45MHz	>=2 DIV
	0.2Hz to 50MHz	>=3 DIV
	10Hz to 50MHz	>=200mV rms
	1Hz to 60MHz	>=400mV rms

#### EXT

#### Display

CRT	rectangular with integral graticule
Display area	8x 10 div (1div = 1cm)
Accelerating voltage	2.1kV
Phosphor	P31

#### General

Calibration voltage	1kHz (nominal) positive square wave, 2.0V pk-pk
Power requirements	115, 230V AC 50/60Hz, 40W approx
Dimensions	324 x 132 x 398mm
Weight	7.8kg

Type	Order code	1+	3+	6+
7041 Oscilloscope + counter	85-2204	446.40	429.87	411.96

036661

## velleman®

### Oscilloscope Tutor Board

The Velleman EDU06 Oscilloscope Tutor Board will show you how to get the most out of your digital oscilloscope. The board generates a number of signals, which you can use to become familiar with AC, DC and frequency measurements, sine and square waves, power supply ripple, full and half wave rectifiers and oscillators. The kit will also help you learn the meaning of terms such as V/div, Time/div, trigger level and auto-setup. Most of the experiments involved can be done using any digital storage scope. Some experiments can be performed with an analogue scope.



- Assembled and tested
- No soldering required
- Dimensions: 116 x 74 x 24mm
- Power supply 9-12V AC/100mA min

Type	Order code	1+
Tutor board	70-4210	14.79

518052

## New products

...added daily, check our website  
[www.rapidonline.com](http://www.rapidonline.com)



Picoscope 2204A 2-channel PC Oscilloscope with Probes 10MHz

The **PicoScope 2204A oscilloscope** offers a small, light, modern alternative to the bulky bench top device. You can slip this 10MHz instrument easily in your laptop bag, making it perfect for engineers on the move; and ideal for a wide range of applications including design, test, education, service, monitoring, fault finding and repair.



The supplied PicoScope 6 software has an array of high-end features, such as serial decoding and mask limit testing now included as standard. New functionality is regularly delivered through free upgrades, optimised with the help of customer feedback.

The PicoScope 2204A has a built-in arbitrary waveform generator (AWG). Waveforms can be imported from the oscilloscope as well as external data files. New files can be created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, triangle, DC level and many more standard waveforms. As well as level, offset and frequency controls, the advanced options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses.

Being able to print, copy, saving, and emailing your data from the field is quick and easy with the USB connection.

- Light but sturdy build
- Easy to use software with powerful features such as serial decoding
- 10MHz, 2 channels, 100MS/s sampling rate
- SDK makes it possible to use it as very capable data capture device
- Powerful signal generator in the same package
- Advanced digital triggers
- Arbitrary waveform generator
- Serial decoding
- USB powered
- Ultra compact design
- **What's in the box?**
- PicoScope 2204A Series oscilloscope
- USB cable
- Quick Start Guide
- Software and reference CD
- Two x1/x10 passive probes are included, chosen to match the bandwidth of your scope

Technical specification	
Model	<b>PicoScope 2204A</b>
Bandwidth	10MHz
Sampling rate (Maximum)	100MS/s
Rise time (calculated)	35ns
Input channels	2
Vertical resolution	8-bits
Enhanced vertical resolution	Up to 12-bits
Input ranges	±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V, ±20V
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input coupling	Software selectable AC/DC
Input characteristics	BNC, 1 MΩ ; 14pF BNC, 1MΩ ; 13pF
DC accuracy	±3% of full scale
Overvoltage protection	±100V (DC+AC peak)
<b>Function Generator</b>	
Standard output signals	Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Pseudorandom output signals	None
Standard signal frequency	DC to 100kHz
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments
Output frequency accuracy	±100ppm
Output frequency resolution	<0.01Hz
Output voltage range	±2V
Output adjustments	Any amplitude and offset within ±2V range
Amplitude flatness (typical)	< 1dB to 100 kHz
DC accuracy	±1% of full scale
SFDR	>55dB @ 1 kHz full-scale sine wave
Connector type	Front panel BNC with 600Ω output impedance
Overvoltage protection	±10V

Type	Order code	1+
PicoScope 2204A	<b>85-7492</b>	119.00

534017



Picoscope 2205A 2-channel PC Oscilloscope with Probes 25MHz

The **PicoScope 2205A oscilloscope** offers a small, light, modern alternative to the bulky bench top device. You can slip this 25MHz instrument easily in your laptop bag making it is perfect for engineers on the move; and ideal for a wide range of applications including design, test, education, service, monitoring, fault finding, and repair.



The supplied PicoScope 6 software has an array of high-end features, such as serial decoding and mask limit testing now included as standard. New functionality is regularly delivered through free upgrades, optimised with the help of customer feedback.

The PicoScope 2205A has a built-in arbitrary waveform generator (AWG). Waveforms can be imported from the oscilloscope as well as external data files. New files can be created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, triangle, DC level and many more standard waveforms. As well as level, offset and frequency controls, the advanced

options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses. Being able to print, copy, saving, and emailing your data from the field is quick and easy with the USB connection.

- Light but sturdy build
- Easy to use software with powerful features such as serial decoding
- 25MHz, 2 channels, 200MS/s sampling rate
- SDK makes it possible to use it as very capable data capture device
- Powerful signal generator in the same package
- Advanced digital triggers
- Arbitrary waveform generator
- Serial decoding
- USB powered
- Ultra compact design
- **What's in the box?**
- PicoScope 2205A Series oscilloscope
- USB cable
- Quick Start Guide
- Software and reference CD
- Two x1/x10 passive probes are included, chosen to match the bandwidth of your scope

Technical specification	
Model	PicoScope 2205A
Bandwidth	25MHz
Sampling rate (Maximum)	200MS/s
Rise time (calculated)	14ns
Input channels	2
Vertical resolution	8-bits
Enhanced vertical resolution	Up to 12-bits
Input ranges	±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V, ±20V
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input coupling	Software selectable AC/DC
Input characteristics	BNC, 1MΩ ; 14pF BNC, 1 MΩ ; 13pF
DC accuracy	±3% of full scale
Overvoltage protection	±100V (DC+AC peak)
<b>Function Generator</b>	
Standard output signals	Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Pseudorandom output signals	None
Standard signal frequency	DC to 100kHz
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments
Output frequency accuracy	±100ppm
Output frequency resolution	<0.01Hz
Output voltage range	±2V
Output adjustments	Any amplitude and offset within ±2V range
Amplitude flatness (typical)	< 1dB to 100 kHz
DC accuracy	±1% of full scale
SFDR	>55dB @ 1 kHz full-scale sine wave
Connector type	Front panel BNC with 600 Ω output impedance
Overvoltage protection	±10 V

Type	Order code	1+
Picoscope 2205A	<b>85-7493</b>	199.00

534018



Picoscope 2206A 2-channel PC Oscilloscope with Probes 50MHz

The **PicoScope 2206A oscilloscope** offers a small, light, modern alternative to the bulky bench top device. You can slip this 50MHz instrument easily in your laptop bag making it is perfect for engineers on the move; and ideal for a wide range of applications including design, test, education, service, monitoring, fault finding, and repair.



The supplied PicoScope 6 software has an array of high-end features, such as serial decoding and mask limit testing now included as standard. New functionality is regularly delivered through free upgrades, optimised with the help of customer feedback.

The PicoScope 2206A has a built-in arbitrary waveform generator (AWG). Waveforms can be imported from the oscilloscope as well as external data files. New files can be created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, triangle, DC level and many more standard waveforms. As well as level, offset and frequency controls, the advanced options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses.

Being able to print, copy, saving, and emailing your data from the field is quick and easy with the USB connection.

- Light but sturdy build
- Easy to use software with powerful features such as serial decoding
- 50MHz, 2 channels, 500MS/s sampling rate
- SDK makes it possible to use it as very capable data capture device
- Powerful signal generator in the same package
- Advanced digital triggers
- Arbitrary waveform generator
- Serial decoding
- USB powered
- Ultra compact design
- **What's in the box?**
- PicoScope 2206A Series oscilloscope
- USB cable
- Quick Start Guide
- Software and reference CD
- Two x1/x10 passive probes are included, chosen to match the bandwidth of your scope

Technical specification

Model	<b>PicoScope 2206A</b>
Sampling rate (maximum)	500MS/s
Bandwidth	100MHz
Rise time (calculated)	7ns
Input channels	2
Vertical resolution	8-bits
Enhanced vertical resolution	Up to 12-bits
Input ranges	±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V, ±20V
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input coupling	Software selectable AC/DC
Input characteristics	BNC, 1MΩ; 14pF BNC, 1 MΩ; 13pF
DC accuracy	±3% of full scale
Overvoltage protection	±100V (DC+AC peak)
<b>Function Generator</b>	
Standard output signals	Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Pseudorandom output signals	None
Standard signal frequency	DC to 1MHz
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments
Output frequency accuracy	±50ppm
Output frequency resolution	<0.01Hz
Output voltage range	±2V
Output adjustments	Any amplitude and offset within ±2V range
Amplitude flatness (typical)	< 0.5dB to 1MHz
DC accuracy	±1% of full scale
SFDR	> 60dB @ 10kHz full-scale sine wave
Connector type	Front panel BNC with 600 Ω output impedance
Overvoltage protection	±10 V

Type	Order code	1+
PicoScope 2206A	<b>85-7494</b>	299.00

534019



### PicoScope 2207A 2-channel PC Oscilloscope with Probes 100MHz

The **PicoScope 2207A oscilloscope** offers a small, light, modern alternative to the bulky bench top device. You can slip this 100MHz instrument easily in your laptop bag making it is perfect for engineers on the move; and ideal for a wide range of applications including design, test, education, service, monitoring, fault finding, and repair.



The supplied PicoScope 6 software has an array of high-end features, such as serial decoding and mask limit testing now included as standard. New functionality is regularly delivered through free upgrades, optimised with the help of customer feedback.

The PicoScope 2207A has a built-in arbitrary waveform generator (AWG). Waveforms can be imported from the oscilloscope as well as external data files. New files can be created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, triangle, DC level and many more standard waveforms. As well as level, offset and frequency controls, the advanced options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses.

Being able to print, copy, saving, and emailing your data from the field is quick and easy with the USB connection.

- Light but sturdy build
- Easy to use software with powerful features such as serial decoding
- 100MHz, 2 channels, 1GS/s sampling rate
- SDK makes it possible to use it as very capable data capture device
- Powerful signal generator in the same package
- Advanced digital triggers
- Arbitrary waveform generator
- Serial decoding
- USB powered
- Ultra compact design
- **What's in the box?**
- PicoScope 2207A Series oscilloscope
- USB cable
- Quick Start Guide
- Software and reference CD
- Two x1/x10 passive probes are included, chosen to match the bandwidth of your scope

Technical specification

Model	<b>PicoScope 2207A</b>
Sampling rate (maximum)	1GS/s
Bandwidth	100MHz
Rise time (calculated)	3.5ns
Input channels	2
Vertical resolution	8-bits
Enhanced vertical resolution	Up to 12-bits
Input ranges	±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V, ±20V
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input coupling	Software selectable AC/DC
Input characteristics	BNC, 1MΩ; 14pF BNC, 1 MΩ; 13pF
DC accuracy	±3% of full scale
Overvoltage protection	±100V (DC+AC peak)
<b>Function Generator</b>	
Standard output signals	Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Pseudorandom output signals	None
Standard signal frequency	DC to 1MHz
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments
Output frequency accuracy	±50ppm
Output frequency resolution	<0.01Hz
Output voltage range	±2V
Output adjustments	Any amplitude and offset within ±2V range
Amplitude flatness (typical)	< 0.5dB to 1MHz
DC accuracy	±1% of full scale
SFDR	> 60dB @ 10 kHz full-scale sine wave
Connector type	Front panel BNC with 600 Ω output impedance
Overvoltage protection	±10 V

Type	Order code	1+
PicoScope 2207A	<b>85-7495</b>	399.00

534020



### PicoScope 2208A 2-channel PC Oscilloscope with Probes 200MHz

The **PicoScope 2208A oscilloscope** offers a small, light, modern alternative to the bulky bench top device. You can slip this 200MHz instrument easily in your laptop bag making it is perfect for engineers on the move; and ideal for a wide range of applications including design, test, education, service, monitoring, fault finding, and repair.



The supplied PicoScope 6 software has an array of high-end features, such as serial decoding and mask limit testing now included as standard. New functionality is regularly delivered through free upgrades, optimised with the help of customer feedback.

The PicoScope 2208A has a built-in arbitrary waveform generator (AWG). Waveforms can be imported from the oscilloscope as well as external data files. New files can be created and modified using the built-in graphical AWG editor.

A function generator is also included, with sine, square, triangle, DC level and many more standard waveforms. As well as level, offset and frequency controls, the advanced options allow you to sweep over a range of frequencies. Combined with the spectrum peak hold option, this creates a powerful tool for testing amplifier and filter responses.

Being able to print, copy, saving, and emailing your data from the field is quick and easy with the USB connection.

- Light but sturdy build
- Easy to use software with powerful features such as serial decoding
- 200MHz, 2 channels, 1GS/s sampling rate
- SDK makes it possible to use it as very capable data capture device
- Powerful signal generator in the same package
- Advanced digital triggers
- Arbitrary waveform generator
- Serial decoding
- USB powered
- Ultra compact design
- **What's in the box?**
- PicoScope 2208A Series oscilloscope
- USB cable
- Quick Start Guide
- Software and reference CD
- Two x1/x10 passive probes are included, chosen to match the bandwidth of your scope

Technical specification

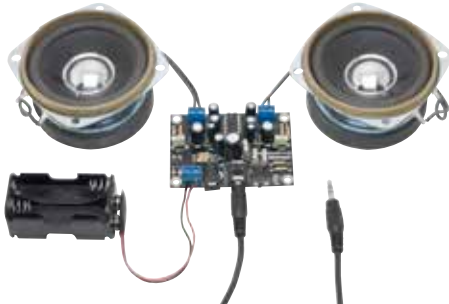
Model	<b>PicoScope 2208A</b>
Sampling rate (maximum)	1GS/s
Bandwidth	200MHz
Rise time (calculated)	1.75ns
Input channels	2
Vertical resolution	8-bits
Enhanced vertical resolution	Up to 12-bits
Input ranges	±50mV, ±100mV, ±200mV, ±500mV, ±1V, ±2V, ±5V, ±10V, ±20V
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input coupling	Software selectable AC/DC
Input characteristics	BNC, 1MΩ; 14pF BNC, 1 MΩ; 13pF
DC accuracy	±3% of full scale
Overvoltage protection	±100V (DC+AC peak)
<b>Function Generator</b>	
Standard output signals	Sine, square, triangle, DC voltage, ramp, sinc, Gaussian, half-sine
Pseudorandom output signals	None
Standard signal frequency	DC to 1MHz
Sweep modes	Up, down, dual with selectable start/stop frequencies and increments
Output frequency accuracy	±50ppm
Output frequency resolution	<0.01Hz
Output voltage range	±2V
Output adjustments	Any amplitude and offset within ±2V range
Amplitude flatness (typical)	< 0.5dB to 1MHz
DC accuracy	±1% of full scale
SFDR	>60dB @ 1 kHz full-scale sine wave
Connector type	Front panel BNC with 600 Ω output impedance
Overvoltage protection	±10 V

Type	Order code	1+
PicoScope 2208A	<b>85-7496</b>	499.00

534021

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## 2.5W+2.5W Stereo Audio Amplifier Project

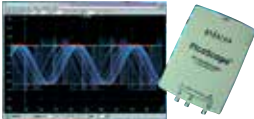






Picoscope 3000 Series Oscilloscopes

The PicoScope 3000 series oscilloscopes are the latest offerings from the market leaders in PC oscilloscopes, combining high bandwidths with large recording memories. Using the latest advances in low power electronics, the oscilloscopes are powered by the USB port, eliminating the need for separate mains power.



- High performance – 2004S/s and 200MHz bandwidth
- 1MB buffer memory allows complex signals to be captured at high speed
- Advanced display and trigger modes
- Automated measurement (frequency, rise-time, distortion etc.)
- Built-in signal generator (PicoScope 3205 and 3206 only)
- Connects to USB2.0 port for fast data transfer
- Compact and portable, works with desktops or laptops – no external PSU required
- Supplied with PicoScope (oscilloscope/spectrum analyser) and PicoLog (data acquisition) software for Windows 98SE/ME/2000/XP

Technical specification			
Model	3204	3205	3206
Bandwidth	50MHz	100MHz	200MHz
Sampling rate (rep) (ETS)	2.5GS/s	5GS/s	10GS/s
Sampling rate (single)	50MS/s	100MS/s	200MS/s
Channels	2+ext trigger	2+ext trigger/sig gen	2+ext trigger/sig gen
Oscilloscope timebases	5ns/div to 50s/div	2ns/div to 50s/div	1ns/div to 50s/div
Spectrum ranges	0Hz to 25MHz	0Hz to 50MHz	0Hz to 100MHz
Record length	256k	512k	1 Mbyte
Resolution/accuracy	8-bits/3%	8-bits/3%	8-bits/3%
PC connection	USB2.0 (USB1.1 compatible)		

Type	Order code	1+	3+
PicoScope 3204	85-7420	421.07	361.37
PicoScope 3206	85-7424	841.07	734.47

068138



PicoScope 3204A, 3204B and 3204 MSO 60MHz 2-channel Oscilloscopes with Probes

Pico Technology continues to push the limits of USB oscilloscopes. Their PicoScope 3204A/B and MSO oscilloscopes offer high performance and feature a high-speed USB 2.0 interface, together with impressive sampling rates, high bandwidths and a very large buffer memory.



The PicoScope 3204A/B and MSO computer oscilloscopes simply connect to the USB port on any standard Windows based computer, making full use of your PCs processing capabilities, large screens and familiar graphical user interfaces. Whether you are used to traditional bench top oscilloscopes or modern PC Oscilloscopes the Pico Technology PicoScope 3204A/B and MSO oscilloscopes offer outstanding performance and ease of use.

Each captured waveform is stored in a segmented buffer so you can rewind and review up to 10,000 previous waveforms. No longer will you see a glitch on the screen only for it to vanish before you stop the scope. Combined with mask limit testing, the buffer navigator can be instructed to show only waveforms that are out of specification.

As well as the standard range of triggers found on all oscilloscopes, the PicoScope 3204A/B and MSO offers an industry leading set of advanced triggers including pulse width, windowed and dropout triggers to help you capture the data you need. All advanced trigger types have adjustable thresholds and hysteresis.

The PicoScope 3204 MSO has 16 channels and a further set of digital triggers that can detect any data pattern with optional edge sensitivity. The logic trigger applies the selected Boolean operation to any number of analogue, EXT or MSO digital inputs.

- 2 Channels and external trigger (MSO 16-channels)
- 60MHz bandwidth
- 500MS/s real-time sampling
- 2.5GS/s repetitive sampling
- Built-in function generator/AWG (3204B and MSO only)
- USB-connected and powered

Technical specification	
Vertical (analog)	PicoScope 3204A, 3204B, 3204 MSO
Bandwidth (-3 dB)	60MHz
Rise time	5.8ns
Input connectors	BNC
Resolution	8-bits
Input characteristics	2 channels, 1MΩ ±1%
Input coupling	AC/DC
Input sensitivity	10mV/div to 4V/div (10 vertical divisions)
Input ranges	±50mV to ±20V
AWG	3204B and MSO only
DC accuracy	±3% of full scale
Analog offset acc	<±1%
Overvoltage protection	±100V (DC + AC peak)
Vertical (digital)	PicoScope 3204 MSO
Number of channels	16

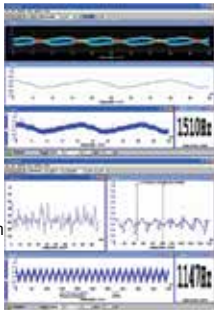
Type	Order code	1+
PicoScope 3204A	85-7330	399.00
PicoScope 3204B	85-7331	499.00
PicoScope 3204 MSO	85-7332	649.00

525084



Picoscope Hand-Held PC Oscilloscopes

These hand-held single-channel oscilloscopes give powerful performance with portable convenience and low-cost. In conjunction with a PC these instruments can be used as an oscilloscope, spectrum analyser,



data logger and meter, without the need for additional probes or power supplies. Their ergonomic design and small size means that they fit any size hand making them ideal for use by technicians, students, hobbyists in a wide range of applications on both analogue and digital circuits.

- Simple, lightweight and comfortable to use
- Ideal for portable use
- Includes the powerful features normally found in larger oscilloscopes
- High sampling rate can be increased for repetitive signals
- Connected and powered by USB 1.1 or 2.0
- Overload protection
- Supplied with CD containing all required functional software and drivers

Technical specification			
Order code	85-7425	85-7426	
Mfrs.p.t.no.	PicoScope 2104	PicoScope 2105	
Bandwidth	10MHz	25MHz	
Sampling rate (single shot)	50MS/s	100MS/s	
Sampling rate (repetitive signals)	1GS/s	2GS/s	
Buffer size	8k samples	24k samples	
Timebases	20ns/div to 50s/div	10ns/div to 50s/div	

Voltage ranges	±100mV to ±20V in 8 ranges
Dynamic range	48dB
Resolution	8 bits
Input resistance	1MΩ
Input capacitance	20pF
Input coupling	AC/DC
Operating temperature	0°C to +45°C
Dimensions	Probe and cable Diameter
PC requirements	Pentium class processor or equivalent 32 Mbyte minimum memory 10 Mbyte minimum disk space MS Win 98SE, ME, 2000 or XP USB 1.1 or 2.0 port

Type	Sampling Rate	Order code	1+	3+	10+
2104	50MS/s	85-7425	125.00	120.00	110.00
2105	100MS/s	85-7426	201.47	190.81	169.49

017295



PicoScope 3404A, 3404B 60MHz 4-channel Oscilloscopes with Probes

These four channel oscilloscopes simply connect to the USB port on any standard Windows based computer, making full use of your PC's processing capabilities, large screens and familiar graphical user interfaces. Whether you are used to traditional bench top oscilloscopes or modern PC oscilloscopes, these scopes offer outstanding performance and ease of use.



As the front runner in PC oscilloscope design, Pico know that everyone wants a high bandwidth and a high sampling rate, but not a high price tag. That is why these high performance four channel oscilloscopes with their 60MHz bandwidths give you the bandwidth you need at a price you can afford.

Your new PicoScope 3404A/B oscilloscope has the power to perform in many applications previously the domain of traditional bench top oscilloscopes; from design and research, to education, service and repair. But, unlike bench top oscilloscopes, your new PicoScope need not be confined to your bench.

The small size and lightweight design of your PicoScope 3404A/B means that you can take it with you. Put it in your laptop bag and wherever you go you will have your own test and measurement laboratory. Not only that, thanks to the Pico FlexiPower system, you have the choice of powering your PicoScope either from the mains supply or from USB ports, so if you need to use your PicoScope in the field you can.

- 60MHz bandwidth
- 1GS/s real-time sampling
- Advanced digital triggering: Edge, window, pulse width, window pulse width, dropout, window dropout, interval,
- logic, runt pulse
- 60MHz spectrum analyzer
- Function generator and AWG (PicoScope 3404B only)
- USB 2.0 Hi-Speed
- Flexible power
- Available with 4ms or 8ms deep memory



- **What's in the box?**
- PicoScope 3404A USB Oscilloscope
- 4x oscilloscope probes
- Single headed USB cable
- Double headed USB cable
- Universal mains (AC) power supply
- User manuals
- PicoScope oscilloscope software
- Free software updates
- 5 year warranty

Technical specification			
		PicoScope 3404A	PicoScope 3404B
Vertical (analog)		<b>85-7341</b>	<b>85-7342</b>
Order code			
Bandwidth (-3 dB)		60MHz	60MHz
Rise time		4ms	8ms
Input channels		4	4
Resolution		8-bits	8-bits
Input characteristics		1 MΩ ±1%	1 MΩ ±1%
Input coupling		AC/DC	AC/DC
Input sensitivity		10mV/div to 4V/div	10mV/div to 4V/div
Input ranges		±50mV to ±20V	±50mV to ±20V
AWG		3404B	3404B
DC accuracy		±3% of full scale	±3% of full scale
Analog offset acc		<±3%	<±3%
Overvoltage protection		±100V (DC + AC peak)	±100V (DC + AC peak)
Type	Order code	1+	
PicoScope 3404A	<b>85-7341</b>	599.00	
PicoScope 3404B	<b>85-7342</b>	749.00	



## PicoScope 4224 and Pico 4424 Precision Oscilloscopes

The PicoScope 4000 Series has been designed to meet the requirements of today's professional engineers. Whether you require an oscilloscope for general use, field servicing, research and development or scientific use, a high resolution PicoScope 4000 Series oscilloscope is the scope you need.



The 2-channel PicoScope 4224 and the 4-channel PicoScope 4424 are high-resolution oscilloscopes that are suitable for general, scientific and field service use. With 12-bit resolution (adjustable up to 16-bits in enhanced resolution mode) and 1% accuracy, they also make an excellent choice for noise, vibration and mechanical analysis.

These two oscilloscope bundles have been designed to give you all you need in a tough carry case. Each oscilloscope kit contains a PicoScope PC Oscilloscope (PCO) together with one x1/x10 passive oscilloscope probe for each oscilloscope channel. Also included in the case is a USB 2.0 cable to connect your PC to the oscilloscope, a quick start guide and a CD-ROM containing the latest oscilloscope and data logging software.

The Pico oscilloscope kit is lightweight and compact, making it the ideal tool for use in the field. When you're not using the PicoScope, the scope, cable and probes can all be stored in the carry case, thus protecting your test equipment and making sure you don't have to hunt around for that elusive cable or probe.

The PicoScope 4224 and 4424 are supplied with PicoScope oscilloscope software. PicoScope is your complete test and measurement lab in one easy to use application. As well as a fully-functioning oscilloscope with advanced features such as digital persistence, math functions and automated measurements, PicoScope software allows you to use your PicoScope 4224 or 4424 as a spectrum analyser. PicoScope is free to use on as many PCs as you like, it's regularly updated with new features and enhancements, and you can always download the latest version from the Pico website.

Pico know that you may want to write your own software or use a third party application to control your PicoScope oscilloscope. No problem. That is why they also provide a free software development kit that contains various software drivers and example code.

- Up to 80MS/s real-time sample rate
- Up to 20MHz bandwidth
- 32M sample buffer memory
- Free software updates
- Oscilloscope kit contents:
- PicoScope PC Oscilloscope (PCO)
- Oscilloscope probes (1 per oscilloscope channel)
- Available with **2 and 4-channels**

Technical specification			
		PicoScope 4224	PicoScope 4424
Model		<b>85-7440</b>	<b>85-7441</b>
Order code			
Input channels		2	4
Bandwidth:		20MHz (10MHz on ±50mV range)	20MHz (10MHz on ±50mV range)
Rise time (calculated):		17.5ns on all ranges except 50 mV; 3ns on 50mV range	17.5ns on all ranges except 50 mV; 3ns on 50mV range
Vertical resolution:		12-bits	12-bits
Enhanced vertical resolution:		16-bits	16-bits
Input sensitivity:		10mV/div to 20V/div	10mV/div to 20V/div
Input characteristics:		1MΩ in parallel with 22pF	1MΩ in parallel with 22pF
Input type:		Single ended, BNC connector	Single ended, BNC connector
Input coupling:		Software selectable AC/DC	Software selectable AC/DC
Input ranges (full scale):		±50mV to ±100V in 11 ranges	±50mV to ±100V in 11 ranges
Overload protection:		±200V (DC+AC peak)	±200V (DC+AC peak)
Type	Order code	1+	
4224 Oscilloscope kit	<b>85-7440</b>	519.00	
4424 Oscilloscope kit	<b>85-7441</b>	825.00	



## PicoScope 4223 2-channel automotive oscilloscope

The PicoScope 4223 2-channel automotive oscilloscope has been designed to save you time and money by making it easier and quicker to diagnose faults on today's modern vehicles. It is one of the most advanced scopes available and can be purchased separately or as part of an automotive kit.



The 4223 can capture signals four times faster than any other PicoScope automotive scope making it compatible with the new FlexRay standard and ensures your PicoScope oscilloscope will continue to be useful for a long time to come. As well as capturing faster signals, it can also outperform other scopes thanks to the 32 Mbytes of always on memory. With 64 times the memory of the previous generation of scopes will ensure that you can effortlessly capture every detail of the signal. Never again will you miss those hard-to-find intermittent faults.

The high ±100V input range of the PicoScope 4223 eliminates the need for external attenuators for most vehicle tests. Thanks to the familiar graphical user interface, help files and reference library, using your oscilloscope is as easy as ever. If you are an existing PicoScope user you can just connect your scope and benefit immediately from the power and performance of your new PicoScope. If you have never used a PicoScope oscilloscope before you can get started without needing to spend hours reading manuals.

The fast sampling speeds, large memory and bandwidth of the PicoScope 4000 Series means that not only is it suitable for use on all current vehicles, but it will continue to be of use in diagnosing faults with the complex electrical and electronic systems that will be found on new and future generations of vehicles.

- 2-channels
- Up to 80MS/s real-time sample rate
- Up to 20MHz bandwidth
- 32,000,000 sample memory
- 100V maximum input
- No power supply required
- USB 2.0 (USB 1.1 compatible) connection for fast screen updates
- Protected against overloads and short circuits
- CAN bus and FlexRay compatible
- Use with any vehicle
- Easy to use
- Includes PicoScope Automotive software
- Free software updates
- 24 month warranty
- Free technical support

Technical specification			
		Oscilloscope	
Bandwidth		20MHz (10MHz on ±50mV range)	
Channels		2	
Vertical resolution		12-bits	
Enhanced vertical resolution		16-bits	
Accuracy		±1%	
Sensitivity		10mV/div to 20V/div	
Input ranges (full scale)		±50mV to ±100V in 11 ranges	
Input characteristics		1MΩ in parallel with 22pF	
Input type		Single-ended, BNC connector	
Input coupling		Software selectable AC/DC	
Overload protection		±200V on single input	
Maximum sampling rate (single shot)		80MS/s	
Buffer memory		32M samples shared between active channels	
Waveform buffer		Up to 1000 waveforms	
Timebase ranges		100ns/div to 200s/div	
		Triggers	
Source		Any input channel	
Basic triggers		Auto, repeat, single, none	
Advanced triggers		Rising edge, falling edge, edge with hysteresis, pulse width, runt pulse, dropout, windowed	
Maximum pre trigger delay		10 x per division timebase setting	
Maximum post trigger delay		50s	
		Spectrum Analyser	
Bandwidth		20MHz	
Frequency range		DC to 20MHz	
Display modes		Magnitude, peak hold, average	
		PC Requirements	
Minimum		Processor: Pentium II processor, or equivalent Memory: 64 MB (XP) / 512 MB (Vista) minimum Operating system: Microsoft Windows XP SP2 or Vista (32-bit only) Ports: USB 1.1 compliant port Processor: 2GHz Pentium IV processor, or equivalent Memory: 256 Mbyte (XP) / 1 Gbyte (Vista) Operating system: Microsoft Windows XP SP2 or Vista (32-bit only)	
Recommended			
		Environmental	
Operating environment		0°C to +45°C (+15°C to +40°C for quoted accuracy)	
Temperature range		-20°C to +60°C	
Humidity		5 to 95% RH, non-condensing	
Dimensions		200 x 140 x 35mm	
Weight		<500 g (approx 1.1lb)	
		General	
Additional hardware (supplied)		USB 2.0 cable, user manuals, software CD-ROM	
PC interface		USB 2.0 (USB 1.1 compatible) - cable supplied	
Power requirements		From USB port	
Compliance		FCC (EMC), CE (EMC and LVD), RoHS compliant	
Warranty		2 years	
Type	Order code	1+	
PicoScope 4223 2-channel	<b>85-7469</b>	456.25	

**6 days per week phone orders**

Monday to Friday 8am to 7pm, Saturday 9am to 5pm



Current Clamp 600A AC/DC with BNC and 3m screened lead PP266

The PP266 current clamp is ideal for use with a PicoScope automotive oscilloscope to display starter current waveforms, charging currents and for performing quick compression tests.



The current clamp can measure up to 600A (AC or DC). In use there is no need to break into the circuit or disturb the isolation as the opening jaws simply clamp around the current carrying conductor. No electrical contact is required. This high amp probe is an improved version and features superior noise rejection. The PP266 is terminated in a BNC connector and so can be connected directly to a Pico automotive oscilloscope.

The current clamp is calibrated to provide 1 mV of output for every 1A of measured current.

- Range: 600A AC/DC
- AC Frequency range: 50Hz to 400Hz
- Maximum conductor: Size 30mm
- Operation temperature: 0°C to +50°C, 70% RH

Technical specification

Accuracy:	DC	0 to 600A ±(2% reading +2A)
	AC	0 to 300A ±(2% reading +2A)
AC/DC	300A to 500 A	±(3% reading +2A)
	500A to 600 A	±(6% reading +2A)
AC frequency range		50Hz to 400Hz
Voltage output		1mV per 1A (0 to 600mV AC and DC)
Max conductor size		30mm
Operating temp		0°C to +50°C, 70% RH

Type	Order code	1+
Current Clamp 600A	17-2913	90.56

180611



BNC to 4mm Test Leads

The TA000 and TA020 test leads have been custom made for automotive use with PicoScope automotive oscilloscopes. Their length (3m and 5m) allows the oscilloscope to be placed on the work bench away from the car being tested or repaired. A wide range of probes, clips and gators can be plugged into the 4 mm connectors at the end of the cable.



The cables have been fully screened to reduce noise pickup.

- 3 or 5m (10 or 16 feet) long
- Fully screened to reduce noise pickup
- Suitable for interfacing 4mm current clamps

Type	Order code	1+
Test lead 3m	17-2926	18.30
Test lead 5m	17-2927	27.45

180619



CAN Test Box PP619

The CAN test box gives you easy access to the 16-pins of the diagnostic connector that is fitted to all modern vehicles. Depending on the configuration of the vehicle, this may allow you to check power, ground and CAN Bus signal quality. The CAN test box uses numbered backlit LEDs which illuminate when signal data is present on the corresponding pin of the DLC. Pulsing LEDs indicate signals being pulled high/low.



With the test leads supplied you can connect your PicoScope automotive scope, or any other suitable scope, to the CAN test box to monitor any signals present, such as the CAN high and low signals.

The CAN Test Box allows you to connect your PicoScope oscilloscope, or any other compatible scope, enabling you to monitor any signals present, such as the CAN high and low signals. The CAN test box terminal pin ports are accessible with standard 4mm jacks.

The CAN Test Box includes a 2.5 metre (8.2 feet) cable so that you can work in a convenient location away from the diagnostic connector, and an additional pass-through connector so that you can hook up your scan tool at the same time as your scope. The box is powered by the diagnostic connector, so no batteries or mains adaptor are needed.

- Instantly check power and ground circuits
- Identify communication link protocols
- Connect an oscilloscope for signal capture and collection of signal waveform data

Technical specification

The LEDs indicate the following signals:

LED 1/9	485A/485B (Manufacturer's proprietary information)
LED 2/10	Bus+ Line J1850/ Bus-Line J1850
LED 3/8/12/13	Future upgrade
LED 4	Chassis GND (GROUND)
LED 5	Signal GND (SIGNAL)
LED 6/14	CAN High of SAE J2284/CAN Low of SAE J2284
LED 7/15	K Line of ISO9141-2 and keyword 2000485A/L line of ISO9141-2 and keyword 2000
LED 11	Clock
LED 16	Battery + (voltage supply)

Type	Order code	1+
Pico CAN test box PP619	17-2934	149.00

180622



BNC plug to BNC Plug MI030

Designed for repeated insertion and extraction the Pico range of test leads are available with a variety of connectors to suit almost any test and measurement need.



- Lead length 1.8m/ 5.9 ft

Type	Order code	1+
BNC plug to BNC Plug MI031	17-2932	8.00

400947



BNC Plug to Crocodile Clips MI031

Designed for repeated insertion and extraction the Pico range of test leads are available with a variety of connectors to suit almost any test and measurement need.



- Lead length 1.8m/ 5.9 ft

Type	Order code	1+
Pico BNC plug to crocodile	17-2933	4.57

400948



150MHz Oscilloscope Probe

A high quality x1/x10 switchable probe which complies with the requirements of IEC 1010.

- Fully shrouded BNC connector
- 1.2m of high flexibility cable
- Integral x1/x10 slide switch
- Colour: black/yellow
- Please note: Not supplied with tips (see order code 85-1560)



Technical specification

Input impedance	10MΩ
Capacitance	47pF to 15.5pF
Bandwidth	20MHz to 150MHz
Rise time	18ns to 2.3ns
Max. voltage	600V peak
Compensation range	10pF to 60pF

Supplied complete with spring loaded test clip, 22cm ground lead, BNC adaptor, insulating tip, IC insulating tip, spare probe tip, instructions sheet and trimmer adjusting tool.

Type	Order code	1+	10+	25+
Switched x1/x10 probe	85-1550	24.87	23.07	21.90
Pack of 2 Test hooks	85-1555	3.83	3.53	3.23
Pack of 5 screw tips	85-1560	5.40	4.99	4.46
Grounding lead	85-1551	2.12		

063657



250MHz Oscilloscope Probe

A professional quality modular oscilloscope probe delivered with the following:

- Trimming tool
- IC insulating tip
- Insulating tip
- Test clip
- 22cm ground lead
- Additional probe tip



Technical specification

Input impedance	10MΩ
Capacitance	47 to 15pF
Bandwidth	25 to 250 MHz
Rise time	14 to 1.4ns
Max voltage	600V peak
Compensation range	10 to 60pF

Type	Order code	1+	10+	25+
Switched x1/x10 probe	85-1552	36.01	33.80	33.07
Pack of 2 Test hooks	85-1555	3.83	3.53	3.23
Pack of 5 screw tips	85-1560	5.40	4.99	4.46

067864

Rapid

60MHz Oscilloscope Probe

A very high quality 60MHz oscilloscope probe with switchable x1 and x10 input division ratios.

- Maximum input voltage is 600V peak or 200V rms
- Supplied with 1.4m of lead with BNC connector



Technical specification

Bandwidth	60MHz
Division ratio	x1, x10
Rise time	x1 58ns
	x10 5.8ns
I/p resistance	x1 1MΩ
	x10 10MΩ
I/p capacitance	x1 55pF
	x10 16pF
Compensation range	10 to 50pF
DC accuracy	<1%

Type	Order code	1+	4+	8+
60MHz Scope probe	85-2212	12.38	10.74	9.80

036667

RVFM

100MHz Oscilloscope Probe

A very high quality 100MHz oscilloscope probe with a x10 input division ratio.

- Maximum input voltage is 1000V peak or 300V rms
- Supplied with 1.4m of lead with BNC connector



Technical specification

Bandwidth	100MHz
Division ratio	x10
Rise time	3.5ns
I/p resistance	10MΩ
I/p capacitance	16pF
Compensation range	10 to 35pF
DC accuracy	<1%

Type	Order code	1+	4+	8+
100MHz Scope probe	85-2214	20.66	19.01	17.72

036670

HAMEG Instruments

A Rohde & Schwarz Company

HZ20 Adapter BNC to 4mm Banana

A quality BNC plug with 2x 4mm sockets. HAMEG Instruments are well known for oscilloscopes and test equipment for more than 50 years.

- Sockets are colour coded red and black for easy identification
- Shrouded sockets supplied 4mm



Type	Order code	1+
Adapter BNC/4mm	85-4454	15.51

501780

HAMEG Instruments

A Rohde & Schwarz Company

HZ22 Feed-Through Termination 500

The feed through terminator HAMEG HZ22 is used to terminate 50Ω sources. Then the signal can be applied to instruments with high impedance inputs. Max input 2W. Designed to provide high impedance devices such as an oscilloscope with characteristic 500hm impedance.



HAMEG Instruments are well known for oscilloscopes and test equipment for more than 50 years.

- BNC plug BNC socket
- 50Ω feed-through termination
- 1GHz
- 2W

Type	Order code	1+
Termination 500	85-4456	24.12

501782

HAMEG Instruments

A Rohde & Schwarz Company

HZ26 BNC-T-Adapter UG274; 500

This adapter is ideal for connecting 1 female BNC connectors to 2 male BNC connectors. All of the connectors made of nickel-plated brass and of industrial quality. HAMEG Instruments are well known for oscilloscopes and test equipment for more than 50 years.



- 1 BNC plug to 2 BNC sockets

Type	Order code	1+
BNC-T-Adapter 500	85-4458	15.51

501784

Scales

KERN Instruments

Hanging Scales



These practical, cost effective hanging scales are always at hand and, due to their versatility, are the ideal solution for a variety of situations. Available with accessories which give many different working combinations.

- Weighing range from 15kg to 50kg
- Simple, hand-held or suspended operation (with accessories - see below)
- LCD display with 12mm high digits
- Tare function resets display to '0' during weighing process enabling, e.g. the addition or removal of material from a container
- Data hold function freezes display reading for 5 seconds
- 100cm extractable tape measure
- Robust, stainless steel hook
- Auto power off
- Calibration facility (requires test weight - not included)
- Also available are a Pan Beam and Tare Pan as well as a Angle Bracket and a Strap enabling scales to be suspended
- 2 year warranty
- Kern CH series

Requires 1x PP3 battery (not included).

Technical specification

	CH 15K20	CH 50K50	CH 50K100
Kern part number	15	50	50
Range (kg) max.	15	50	100
Resolution (g)	20	50	100
Stabilisation time (s)	2	2	2
Reproducibility (g)	20	50	100
Linearity (g)	0.5%	0.5%	0.5%
Operating temperature	+10°C to +30°C 80% RH (non-condensating)		
Dimensions	90(W) x 30(D) x 175(H)mm (270 with hook)		
Weight approx.	0.25kg	0.25kg	0.25kg
Order code	85-3380	85-3381	85-3382

Type	Order code	1+	3+
Hanging scales 15kg	85-3380	60.11	55.77
Hng scales 50kg/50g res.	85-3381	64.45	60.11
Hng scales 50kg/100g res.	85-3382	50.69	47.08

073245

RVFM

Portable Digital Scales

A low-cost portable electronic scale with a weighing capacity of 2kg/4lb. 8oz. It comes with the following features:

- Low-cost and portable
- Constructed of hi-grade ABS plastic with non-slip rubber feet
- High contrast 17mm LCD display
- Function indicators with positive action buttons
- Slide selection switch selects the grams or ounce range
- Overload protection is incorporated to twice the scales capacity
- Featured tare facility allowing the scales to be zeroed
- Easy to set up check weighing program
- Emits an hi-frequency audio alarm in stages as weight is applied
- A low battery indicator shows when battery is to be replaced
- Supplied with comprehensive instructions for use
- An optional 150mm diameter bowl is available which features a base recess that locates securely over the scale pan, please see below

Requires 1x 9V PP3 battery (not included), or alternatively a 9V 300mA power supply with 3.5mm jack connection (not included).

Type	Order code	1+	3+
CB-2K 2kg Scale	85-2350	36.76	34.99
Weighing Bowl	85-2360	1.64	1.52

07090



Kern School Scales

These scales are ideal for general purpose weighing in laboratory environments through to quality control applications.

- Only two function keys
- Very easy to use
- Large 16mm LCD display
- Adjustment program CAL
- Battery powered (supplied) or by optional AC/DC power adaptor
- Impact resistant ABS case with non-slip rubber feet
- Splash-proof membrane keypad

Technical specification

Kern No.	EMB 200-2	EMB 2200-0	EMB 5.2K5
Readout	0.01g	1g	5g
Weigh range	200g	2,200g	5,200g
Stabilisation	2 to 3 secs	2 to 3 secs	2 to 3 secs
Auto-off (batt)	After 3 mins	After 3 mins	After 3 mins
Operating temp	0°C to +40°C	0°C to +40°C	0°C to +40°C
Battery supply	1x 9V	2x AA	2x AA
Mains adaptor	85-1681	85-1681	85-1681
Dimensions (mm)	170(W) x 240(D) x 39(H)	170(W) x 240(D) x 39(H)	170(W) x 240(D) x 39(H)
Weight approx.	600g	600g	600g
Order code	85-2356	85-2358	85-2359

Kern No.	EMB 500-1	EMB 5.2K1
Readout	0.1	1
Weigh range	500g	5200
Stabilisation	2 to 3 secs	2 to 3 secs
Auto-off (batt)	After 3 mins	After 3 mins
Operating temp	+5°C to +35°C	+5°C to +35°C
Battery supply	1x 9V	1x 9V
Mains adaptor	85-1681	85-1681
Dimensions (mm)	170(W) x 240(D) x 38(H)	170(W) x 240(D) x 38(H)
Weight approx.	0.5kg	0.5kg
Order code	85-3436	85-3437

Type	Order code	1+
EMB 200-2 Scales	85-2356	91.37
EMB 2200-0 Scales	85-2358	36.21
EMB 5.2K5 Scales	85-2359	37.25
EMB 500-1 Scales	85-3436	39.64
EMB 5.2K1 Scales	85-3437	39.64

071952



Kern Precision Balances



The Kern PCB series is an economical alternative to premium priced balances. PCB precision scales are affordable, accurate and easy to use for all of your basic weighing needs. They are great in academic, educational and school environments.

This wide range of Laboratory scales and balances covers both spectrums of the requirements of the modern laboratory, whether you are in a pharmaceutical company, quality control laboratory, a university, college or school; you will find the right scale here.

- Pre-tare function for manual subtraction of a known container weight
- Backlit LCD display with digit height 15mm
- Data transfer, for example to a printer or PC
- Battery operation possible; block battery (9V).
- Auto-Off function after 3 min without a change of load to preserve the batteries
- Protective working cover
- Simple adding function
- Accurate and reliable weighing
- Large LCD display
- Crafted by the oldest and most respected German precision scales company
- Easy to use, fast response
- All the features your laboratory needs
- Durable precision electronic scales for laboratory and industrial use

Technical specification

Kern part No.	PCB 100-3	PCB 1000-2
Readout	0.001g	0.01g
Weighing range	100g	1000g
Battery supply	9V; Block	9V; Block
Auto-Off	After 3 mins	After 3 mins
Operating temp.	+5°C to +35°C	+5°C to +35°C
Dimensions WxDxH	163 x 245 x 79mm	340 x 200 x 140mm
Weight approx.	1.8kg	1.8kg
Order code	85-3441	85-3446

Kern part No.	PCB 6000-1	PCB 400-3
Readout	0.1g	0.1g
Weighing range	6kg	10kg
Battery supply	9V; Block	9V; Block
Auto-Off	After 3 mins	After 3 mins
Operating temp.	+5°C to +35°C	+5°C to +35°C
Dimensions WxDxH	340 x 200 x 140mm	163 x 245 x 79mm
Weight approx.	1.8kg	1.8kg
Order code	85-3448	85-3450

Type	Order code	1+
PCB 100-3	85-3441	182.59
PCB 1000-2	85-3446	194.45
PCB 6000-1	85-3448	154.82
PCB 10000-1	85-3450	150.76

082373



Kern Precision Balance

These are the ideal entry-level models for all laboratory technicians.

- Excellent value for money in this performance class
- Many multiple functions are at users disposal
- Can be used for parts counting and also for weighing different mixtures
- Data transfer to printer or PC function
- Four function keys
- Protective working cover as standard
- Includes test weight, DKD approved
- Supplied with an AC/DC mains power adaptor

Technical specification

Kern part No.	440-35N
Readout	0.01g
Weighing range	400g
Stabilisation time	3 seconds
Auto-off function (batt. mode)	After 3 minutes
Operating temperature	+10°C to +40°C
Dimensions	165(W) x 230(D) x 80(H) mm
Weight approx.	1kg
Order code	85-2361

Type	Order code	1+
440 35N Scales	85-2361	261.98

071956



CHEMICALS

for Science





## Kern EMB Series Precision Balances with Density Measurement

The electronic KERN EMB range is the perfect entry into the world of laboratory balances. The ease of use and lots of useful features, these scales will make the perfect companion, for example in the chemistry class. Due to its compact, lightweight design and battery operation, makes it portable.

The EMB is an affordable basic bench top balance offering excellent value for money. Thanks to the self-explanatory, graphic-assisted control panel, the density of solids and liquids can be determined in seconds, making them ideal for use in schools and universities.

- Ideal for the laboratory in schools and universities
- Particularly flat design
- Plastic weighing tray, removable
- For easy and hygienic cleaning
- Tare function facilitates formulation work
- Simple and convenient 2-key operation
- Available in **200** and **2000g** options



Technical specification

	KERN EMB 200-3V 85-2364	KERN EMB 2000-2V 85-2367
Order code	85-2364	85-2367
Capacity:	200g	2000g
Minimum:	Capacity 0.001g	Capacity 0.001g
Readability:	0.001g	0.001g
Resolution:	0.001g	0.001g
Repeatability (std. deviation):	0.001g	0.001g
Linearity:	±0.003g	±0.003g
Pan Size:	82mm diameter	105mm diameter
Average Stabilization Time:	2.5 seconds	2.5 seconds
External Calibration (Min):	200g F1 Class	200g F1 Class

Type	Order code	1+
EMB 200-3V	85-2364	196.64
EMB 2000-2V	85-2367	196.64
Density set YDB-01	85-2368	176.46
Density set YDB-02	85-2370	264.18

525053

## SALTER Electronic Disc Kitchen Scale

The Salter Disc Scale's Add & Weigh function allows you to measure multiple ingredients in the same bowl - saving you washing up!

- Weigh ingredients directly onto the scale or use your own bowl
- Switch between g / kg and oz. / lb
- Easy to read LCD display
- Compact slim design for easy storage
- Contemporary design
- Capacity: 5kg / 11lb
- Resolution 1g / 0.1oz.
- Powered by a single Lithium CR2032 battery (included)
- Manufacturer's 15-year guarantee
- **Salter model 1036 BKSSDR**



Type	Order code	1+
Salter disc scale	52-7245	12.45

300580

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## Brass Slotted Weights



## Analysers & Testers



### LED Tester

A handy and versatile LED tester from TruOpto that is suitable for mono colour LEDs as well as bi-colour and tri-colour LEDs of both anode-cathode-anode and cathode-anode-cathode types.

- Push button switch to test
- Test indicator LED
- Multiple testing holes for comparing colours, brightness, etc.
- Current testing at 2, 5, 10, 20 and 30mA (mono colour)
- ACA and CAC testing for bi-, tri-colours LEDs at 20, 50, 70 and 150mA



**Note:** Current indications are for guidance only.

Type	Order code	1+
LED Tester	55-0000	4.11

123551

## VOLTCRAFT

### LCR-9063 LCR-Multimeter

The Voltcraft LCR-9063 enables you to make detailed measurements of no-load components, such as resistances in the range 0 to 20MΩ, capacitors in the range from a few pF up to 200μF, and inductors in the range from a few μH up to 20H.

Relatively low current consumption allows achievement of high efficiency. The 13mm high 3½ liquid crystal display (LCD) makes the device very easy to read. The internally generated measurement frequency is approx. 250Hz.

The measuring device can be used universally in the hobby and industrial sectors, or in schools, etc.

- ½ digit LCD display, max. display value: 1999
- On/Off switch 0 - 1
- Measurement range switch
- Slide switch 'R' - 'L/C' for switching between resistance measurement 'R', inductance measurement 'L' and capacitance measurement 'C'
- Input sockets ± for connecting measuring leads



Technical specification

Basic accuracy	2 %
Calibration possible to	ISO / DKD
Dimensions	(W) x 120(H) x 37(D)mm
Displays	2000 counts
Interfaces	none
Measurement frequency	250Hz
Measurement range - capacity	1pF to 200μF
Measurement range - inductivity	1μH to 20H
Measurement range - resistance	0.1Ω - 20
Power supply	9V battery pack
Weight	180g

Type	Order code	1+
Multimeter	51-5943	32.33

525587

## VOLTCRAFT

### SMD-200 RVC-Multimeter

The Voltcraft SMD-200 is the ideal solution for measurement of SMD components. The forceps adapter allows the simultaneous measurement of adherence and small SMD capacitors, resistors and diodes. The gauge is located perfectly in the hand and always allows a view of the display.

- For resistors, capacitors and diodes
- AC/DC voltage measurement with tweezers and test lead adapter
- Supplied with SMD-200, Tweezers, adapter test lead adapter, Protective cap, 2x LR44 batteries, operational instructions



Technical specification

Basic accuracy	±0.8%
Dimensions	184(L) x 37(W) x 23(H)mm
Displays	LCD, 6000 counts
Interfaces	none
Measurement range - capacity	1pF - 60 mF
Measurement range - resistance	0.1Ω - 60MΩ
Measurement range AC	0.1mV - 600V
Overvoltage category	CAT III 600V
Power supply	2x LR44
Product Specifications	Diode Test
Tweezers adapter	Diode Test
Weight	110g

Type	Order code	1+
Multimeter	51-5946	20.13

525590



**LCR Passive Component Analyser**



An innovative compact device for the automatic identification of most passive components (inductors, capacitors and resistors). Results are displayed on the clear green-mode LCD, showing the component type, measured value and test frequency. For inductors, the DC resistance is also automatically measured.

- Automatic identification and measurement of Inductors, Capacitors and Resistors
- Automatic test frequency selection
- Uses high purity sine waves (-60dB 3rd harmonic)
- Incorporates probe compensation memory
- Supplied with micro-hook probes, battery and user guide
- Includes alkaline battery GP23A, MN21 (12V remote control/lighter type)
- Designed and built in the UK
- **ROHS, WEEE and CE** compliant

Technical specification	
Automatic test frequency selection	DC, 1kHz, 15kHz and 200kHz
Nominal Accuracy, inductance	±1% ±1.6µH
Nominal Accuracy, capacitance	±1% ±0.3pF
Nominal Accuracy, resistance	±1% ±0.6W
Inductance measuring range	1µH to 10H
Capacitance measuring range	0.4pF to 10,000µF
Resistance measuring range	1Ω to 2MΩ
Height, external: 72mm	72mm
Width, external: 103mm	103mm
Depth, external: 20mm	20mm
Temp, op. max: 40°C	+40°C
Temp, op. min: 10°C	+10°C

Type	Order code	1+	2+	5+
Atlas LCR analyser	<b>85-2070</b>	76.45	66.87	62.41

061157



**SCR Triac and Thyristor Analyser**



The Peak Atlas SCR is specifically designed for the rapid identification and analysis of a very wide range of thyristors and triacs. Just connect the test probes any way round and press test. The Atlas SCR will instantly identify the type of part, identify the pinout, categorise it's gate sensitivity and measure the gate voltage drop. Gate current is autoranging from 100µA to 100mA while the load test condition is maintained at 12V 100mA regardless of battery condition.

- Automatic type identification
- Automatic pinout identification, just connect any way round

- Gate sensitivity display from 100µA to 100mA
- Consistent load test conditions of 12V at 100mA, even for a dying battery
- Measures gate voltage drop
- Supplied with universal premium probes that can connect to T0-220, T0-3, T0-92 and even bolt styles
- Supplied with premium grade probes, battery and user guide
- Includes alkaline battery GP23A, MN21 (12V remote control/lighter type)
- Designed and built in the UK
- **ROHS, WEEE and CE** compliant

Technical specification				
Height, external: 72mm				
Width, external: 103mm				
Depth, external: 20mm				
Temp, op. max: -40°C to +40°C				
Temp, op. min: -10°C to +10°C				

Type	Order code	1+	2+	5+
Atlas SCR analyser	<b>85-2102</b>	78.32	67.86	64.33

068061



**ESR Capacitance and Equivalent Series Resistance Meter**



Measuring a capacitor's ESR (Equivalent Series Resistance) is a great way to assess the condition of a capacitor, particularly electrolytics. The **Atlas ESR** measures both ESR and capacitance, giving you all the information you need in one test.

Just connect the gold plated Kelvin probes to the capacitor, even in-circuit, and press test. ESR is measured to a resolution as fine as 0.01W. Capacitance can range from 1µF to 22,000µF.

The **Atlas ESR** is even protected against highly charged capacitors and will automatically perform a controlled discharge function before continuing with the analysis.

- Supports capacitors from 1µF to 22,000µF
- Can measure both ESR and capacitance
- Enhanced dynamic range
- High resolution
- Analyses at the industry standard of 100kHz
- Can test both in- and out-of-circuit
- Polarity free testing
- Protected against highly charged capacitors
- Compact size 100 x 70 x 20mm
- Fitted with a long life alkaline battery
- Measures capacitance and ESR
- ESR resolution as fine as 0.01W
- Capacitance measurement from 1µµF to 22,000µF
- Analyses at the industry standard frequency of 100kHz
- Software automatically eliminates any errors due to capacitor reactance
- Protected against charged capacitors
- Automatic controlled discharge function
- Polarity free, connect any way round
- ESR measurement works in-circuit
- Can be used to short-circuit tracing
- Gold plated Kelvin-wired crocodile clips
- Test leads are 18" long
- Supplied with premium grade probes, battery and user guide
- Includes alkaline battery GP23A, MN21 (12V remote control/lighter type)
- Designed

Technical specification				
Height, external	72mm			
Width, external	103mm			
Depth, external	20mm			
Temp, op. max	+40°C			
Temp, op. min	+10°C			

Type	Order code	1+	2+	5+
Atlas ESR analyser	<b>85-2104</b>	66.25	63.75	60.28

068038

[www.rapidonline.com](http://www.rapidonline.com)

**For our full range of Electronic Components visit [www.rapidonline.com](http://www.rapidonline.com)**



## DCA Semiconductor Component Analyser



A smart and really clever instrument that will automatically analyse almost any semiconductor. Just connect it any way round and press test. It will automatically identify the type of part you have, identify the pinout and measure important parameters.

It supports most bipolar transistors, Darlingtons, MOSFETs, diodes, LEDs and more. For 2-leaded components, just use any pair of test clips, any way round. It will even identify special component features such as fly-wheel diodes and resistor shunts on transistors.

The Atlas DCA will measure current gain for transistors, gate threshold for MOSFETs and voltage drops for semiconductor junctions (such as transistor base-emitter junctions, diodes, LEDs etc).

- Automatic identification of most discrete semiconductor components
- Supports Bipolar Transistors, MOSFETs, JFETs, Diodes, LEDs, Diode Networks (such as SOT23 networks) and more
- Connect any way round, the **Atlas DCA** will tell you which lead is which
- Measures transistor HFE from 4 to 65,000
- Measures transistor leakage current
- Tests at a safe 5mA (into short circuit)
- Silicon/Germanium identification
- BiColour LED identification (2 and 3 lead types)
- Fully automatic
- Supplied with new premium quality universal hook probes
- Supplied with premium grade probes, battery and user guide
- Includes alkaline battery GP23A, MN21 (12V remote control/lighter type)
- Designed and built in the UK
- **ROHS, WEEE and CE** compliant

### Technical specification

Height, external	72mm
Width, external	103mm
Depth, external	20mm
Temp, op. max.	+40°C
Temp, op. min.	+10°C

Type	Order code	1+	2+	5+
Atlas component analyser	<b>85-2514</b>	42.45	38.56	35.09

036637

## ABI

### ABI Linear IC Tester

The ABI LinearMaster Compact Professional is a low-cost, hand-held out-of-circuit IC tester. The LinearMaster is designed for testing analogue ICs with up to 16 pins through a ZIF socket. A range of adaptors is also available for SOIC and PLCC devices.

The LinearMaster includes a search facility for unknown ICs, loop modes for intermittent failure detection, diagnostic information for individual pins and self diagnosis for product integrity.

The unit is battery operated (4x AA/LR6) but an optional battery eliminator is available for extended use.

The ABI Compact Range is fitted with an RS-232 interface to allow connection with a computer and use with the optional software CompactLink.

CompactLink is a PC based software package that allows users to add new devices to the library and create functional tests to suit special applications.

- Simple operation
- Extensive built-in library
- Comprehensive tests
- Unknown device identification
- Diagnostic information for individual pins
- Conditional loop testing mode



Type	Order code	1+	2+	4+
Linearmaster compact	<b>85-2285</b>	442.05	436.31	430.56

031078

## ABI

### ABI Chipmaster Compact Digital IC Tester

Digital IC Tester, Digital IC Testing, 2x16 Dot Matrix Alphanumeric LCD Indication, Hand Held, Include TTL, CMOS, Memory, LSI, Interface, 4 x AA Battery Power Source, Comprehensive Device Library Covers Almost All TTL, CMOS, Memory and Interface Devices, 40pin capability (NAND Gates Toppus), Identifies Unmarked and House-Coded devices, Detects Intermittent and Temperature Related Faults, Displays Diagnostic Information for Individual Pins, Battery Operated (4 x AA) with Low Power Design, Autopower-down Function, Mains Adapter Available

- Powered by 4x AA batteries (supplied) (for replacements see **Batteries** section) or may alternatively be powered by a suitable adaptor (for suitable item see **Power supplies** section)
- Ideal for service centres or educational establishments wishing to perform fast, accurate fault finding on digital circuits



Type	Order code	1+	3+	5+
Chipmaster compact	<b>85-2280</b>	390.37	378.89	373.15

031077



### LCR400 Precision LCR Bridge with Limits Comparator



The **LCR400** is an LCR bridge that uses innovative design techniques to give a low-cost, precision instrument that is suitable for a wide range of uses, from laboratory to quality control to goods-inwards inspection. Optional accessories include four-terminal SMD tweezers for measuring surface mount components, an adaptor for converting the test fixture into a set of four BNC sockets and Kelvin clip test leads set (requires the BNC Adaptor).

- Measurement accuracy of 0.1%
- Test frequencies up to 10kHz
- Automatic component recognition
- Range hold function prevents autoranging when changing components
- Limits comparator
- Eight 'pass bins' and two 'fail bins' for component sorting by measured value
- High quality built-in four terminal component test fixture
- Suitable for axial and radial components
- Unobstructed test fixture for ease of use with bandoliers
- Dual five digit high brightness displays
- Non-volatile memory for up to nine set-ups
- RS-232 interface
- Available with accessories which extend the instruments range of use, please see below
- Complies with **EN61010-1** and **EN61326**
- **Thurby Thandar LCR400**

### Technical specification

#### Measuring ranges

Resistance	0.1mΩ to 990MΩ
Inductance	0.001H to 9900H
Capacitance	0.001pF to 99000μF
D	0.001 to 999
Q	0.001 to 999

#### Measurement functions

Parameters	R, L, C, D, Q
Selection	Manual or automatic selection of R, L or C
Modes	Series or parallel equivalent circuit
Zero function	Nulls out up to 100pF at test fixture
Measurement frequency	100/120Hz, 1kHz, 10kHz selectable

#### General

AC Input	115V or 230V AC 50/60Hz
Dimensions (mm)	360 x 240 x 95
Weight (kg)	2.9
Operating temperature	+5°C to +40°C @20-80% RH
Storage temperature	-40°C to +70°C

Type	Order code	1+
Precision LCR bridge	<b>85-1781</b>	676.26
SMD Tweezers	<b>85-1796</b>	171.67
BNC Adaptor	<b>85-1797</b>	74.91
Kelvin clip leads	<b>85-1798</b>	84.27
Serial Cable	<b>85-4662</b>	20.81

074711



Electrical Testers



Network Cable Analyser



The **Peak Atlas IT** is a fast, comprehensive tool for testing RJ45 based network cabling (such as Cat5, Cat6 etc). Plug one end of your cabling into the **Atlas IT** and the other end into one of the supplied miniature terminators and let the **Atlas IT** analyse the cable run.

It will identify the connection configuration (straight through, crossover, token ring and many other types). It will also tell you if there are any faults such as open, short or miswired connections. When not testing cables, the **Atlas IT** will even list the full connection details (including wire colours) of the most common cable types.

The **Atlas IT** is supplied in its own padded carry case together with 2 terminators, 2 patch cables (to allow for socket testing), user guide, laminated Ethernet chart (detailing 8 most common wiring patterns) and a spare battery.

- Automatic pattern identification for many wiring configurations (such as 4 & 8 wire straight through, 4 & 8 wire crossover, 6 wire voice/data, Linn Audio, Token Ring, Twisted Cisco)
- Cable wiring configuration can be identified even if there are wiring faults
- Displays full connection pattern of the cable under test
- Compatible with optional identified terminators allowing for the extra feature of multiple cable run numbering
- Compatible with RJ45 based Cat5/6 connections
- Supplied with 2 patch cables for socket and patch panel testing
- Displays cable-making instructions when not testing cables
- Terminators are very small, ideal for use in cramped conditions
- Auto power-on and power-off
- Complete with laminated full colour ether connection chart for 8 common wiring configurations
- Supplied in carry case
- Supports cable lengths of up to 150m (500ft)
- Supplied with fitted battery, spare battery and user guide
- Uses alkaline battery GP23A, MN21 (12V remote control/lighter type)
- Designed and built

Technical specification				
Instrument height, external	72mm			
Instrument width, external	103mm			
Instrument depth, external	20mm			
Operating temperature, max	+40°C			
Operating temperature, min	+10°C			
Type	Order code	1+	2+	5+
Atlas IT cable analyser	85-2516	66.26	62.42	59.87
Terminator no.s 1 to 8	85-2515	50.15	47.12	45.80
Terminator no.s 9 to 16	85-2517	50.15	47.12	45.80
Terminator no.s 17 to 24	85-2519	50.15	47.12	45.80

FLUKE.

2042 Cable Locator Transmitter and Receiver

Tracing cables in walls, identifying which safety devices are connected to certain circuits, or locating an interrupted wire in a cable or pipe. These can often be tiresome and time-consuming practices, but not so if you have the **Fluke 2042** in your tool kit.

This is a professional general purpose cable locator. It is ideal for tracing cables in walls and underground. It can be used for locating fuses and breakers on final circuits and locating interruptions and short-circuits in cables and electrical floor heating systems. It can also be used for tracing metallic water and heating pipes.

The **Fluke 2042** comprises a transmitter that supplies a modulated alternating voltage to the cable to generate an electrical field around it, and a receiver with a coil that is placed close to cable. A voltage is induced in the coil, which is shown on the display. To prevent incorrect readings caused by interfering fields from things like electronic fluorescent lamp ballasts or frequency converters, and uses a digitally coded transmitter signal. The unit is supplied as a complete kit comprising of a transmitter and receiver in a purpose-made carry case.



- For all applications (live or dead cables)
- Ideal for tracing cables in walls and underground
- Includes a transmitter and a receiver
- Proven digitally coded sender signal
- Torch function for dark areas
- Locates fuses/breakers on final circuits and locating interruptions
- Can also be used for tracing metallic water and heating pipes
- Automatic or manual adjustment of receiving signal sensitivity
- Acoustical receiving signal switchable
- Auto-power - Off
- Additional transmitters are available for extension of to distinguish between several signals
- Supplied with transmitter, receiver, test lead, soft carrying case, hard case, batteries and user manual

Technical specification			
Voltage measurement range	Transmitter:	12V, 50V, 120V, 230V, 400V	
Frequency range	Transmitter:	0...60Hz	
Output signal	Transmitter:	125kHz	
Voltage	Transmitter:	Up to 400V AC/DC	
Tracing depth cable location	Receiver:	0...2.5m wall/underground cables	
Main voltage detection	Receiver:	0...0.4m	
Operating temperature	Transmitter:	0°C to 40°C	
	Receiver:	0°C to 40°C	
Storage temperature	Transmitter:	-20°C to +60°C	
	Receiver:	-20°C to +60°C	
Humidity (without condensation)	Transmitter:	Max. 80% relative	
	Receiver:	Max. 80% relative	
Operating altitude	Transmitter:	Up to 2000m	
	Receiver:	Up to 2000m	
Electrical safety	EN 61010-1		
Overvoltage category	Cat. III 300V		
Size	Transmitter:	190 mm x 85 mm x 50 mm	
	Receiver:	250 mm x 65 mm x 45mm	
Weight	Transmitter:	0.45kg	
	Receiver:	0.36kg	
Batteries	Transmitter:	6x batteries 1.5V	
	Receiver:	1x battery 9V	
Warranty	2 years		

Type	Order code	1+
Fluke 2042 Cable locator	85-3585	538.00

AMPROBE

LAN-1 LAN Cable Tester

The **Amprobe LAN-1** cable tester is designed for testing opens, shorts and wrongly cable installations. It is designed to work with various data cables and connectors. This cable tester provides a quick go / no-go LED display of the wiring and connection of item under test. You can either step through the test cable wiring one at a time or have the unit automatically pulse through the pin-outs and display the results.



Technical specification			
Display	18 LEDs: 9x red and 9x green, 9x LEDs on remote module		
Battery	1x 9V battery		
Battery life	20 hours		
Low Battery Indicator	LED indicator will not turn ON when BATT button is pushed		
Operating environment	0°C to +40°C		
Storage temperature	-10°C to +60°C		
Altitude	2000m, indoor operation		
Dimensions	130 x 56 x 38mm		
Weight	1.26kg		

Type	Order code	1+
Amprobe LAN-1 LAN	90-4063	49.79

Volt Stick

230V AC Voltage Detector

The **Volt Stick AC Voltage Detector** has a 220 to 230V testing range and can be used to locate breaks in cables, detects blown fuses inside plugs or fuse holders. It can also distinguish between live and neutral wires in both single and three-phase supplies, identify voltage-carrying cables in junction boxes and locate defective in-series light bulbs.

- Extremely compact, styled in the format of a large pen
- The nylon tip of the unit glows red when a voltage is detected
- Due to the unique design of the detector there is no need for current to be flowing or contact to be made with the circuit to activate the unit

Type	Order code	1+	10+
AC Voltage detector	85-0692	12.05	11.15

13A Mains Plugs





## Volt Stick

### PRO12 AC Voltage Detector

This **Volt Stick** device is a handy tester that is easy to use. It will detect the presence of an AC voltage, without the need for the disconnection of cables, fuses, circuit breakers, etc.



The red indicator in the tip illuminates, on detection of AC, when the tip is close to any live point or is moved along any insulated cable.

The detector features a unique shielded fork tip which enables selective and accurate testing of AC in specific cables, making this device especially suitable for professional testing and installation work.

- Voltage range 12V to 600V AC
- Unique forked tip for high selectivity
- Design reduces spurious indications
- Easily detects live cables
- Supplied field strength amplifier
- Powerful red light in tip to indicate voltage
- Fully insulated for safe use
- No current flow needed for operation
- Approved to **IEC61010-1, CAT III 1000V AC**
- Powered by 2x AAA cells (supplied) (for replacement batteries see **Batteries** section)

Type	Order code	1+	10+
AC Detector PRO12	<b>85-0674</b>	22.26	20.69

082159

## FLUKE.

### T5 Voltage, Continuity and Current Tester

This 1000V Fluke T5 electrical tester lets you check voltage, continuity and current with one compact tool. With the T5, all you have to do is select Volts, Ohms, or current and the tester does the rest. Open jaw current lets you check current up to 100A without breaking the circuit.



Its tough test leads stow neatly in the back of the tester, making it easy to carry around in your tool pouch. Detachable SlimReach test probes are customised for national electrical standards. The test leads accept optional accessories such as clips and specialty probes.

- Automatically measures volts ac and Volts DC with precise digital resolution
- Displays resistance to 1000Ω
- Easy and accurate OpenJaw current measurement
- Continuity beeper
- Compact design with neat probe storage
- Rugged enough to withstand a 3m drop
- Detachable SlimReach probe tips are customized for national electrical standards
- Test leads accept Fluke accessory test clips
- Supplied in 1000V model
- Can stay connected much longer than solenoid type tester
- Auto off mode to conserve battery life
- Includes: 4mm detachable probes and instructions
- All inputs of the T5-600 are protected to **EN61010-1 CAT III 600V** and the **T5-1000 to EN61010-1 1000V CAT III** rating. **UL, CSA and VDE** listed

#### Technical specification

Continuity beeper: Threshold: On at <25Ω, off at >400Ω  
Volts indicator LED: Threshold: Guaranteed on by 30V AC

#### Environmental Specifications

Operating temperature: -10°C to +50°C  
Storage temperature: -30°C to +60°C  
Humidity (Without Condensation): +5°C to +30°C  
+30°C to +40°C  
+40°C to +50°C

Dust/water resistance: Yes

Operating Altitude: 2000m max

Temperature Coefficient: <18°C or >28°C

#### Safety Specifications

Overvoltage category: 600V AC/DC, CAT III  
Agency Approvals: UL, CSA, and VDE  
Maximum voltage: Between any terminal and earth ground

#### Mechanical and General Specifications

Size: 30.5 x 51 x 203mm  
Weight: 300g  
Warranty: 2 years  
Battery life: 200 hrs zinc chloride, 400 hrs alkaline  
Battery type: Two AA zinc chloride  
Low battery indicator: Yes  
Current sensor opening: 12.9mm  
Calibration cycle: 1 year  
Test leads: Type: Heavy duty, flexible leawwwds rated for 1000V use. Field replaceable leads terminate in male shrouded banana plugs  
Probes: One red, one black, of two tip. Detachable Slim-ReachT probe tips in one  
Styles: TP4 4mm round

Type	Order code	1+
Volts/continuity /current	<b>85-3534</b>	139.00

082615

## FLUKE.

### T90, T110, T130 and T150 Two Pole Voltage and Continuity Testers

All electricians need a two pole tester. **Experienced professionals** know that they can, and should trust their job, their reputation, and even their personal safety to Fluke electrical test tools. This family of two pole voltage and continuity testers is no exception. Built with state of the art measurement and safety technology, these testers offer everything you expect from Fluke, and a little bit more.

The **Fluke T90/T110/T130** and **T150** are **two pole voltage and continuity testers**. They are now more rugged and easier to use than ever before. They produce fast test results the way you need them, with large, easy to use buttons, bright backlights, and clear audible and physical indicators designed for any work situation.

Being rugged, they have been built to last. The high-quality construction includes a heavy duty moulded case, a thicker cord with wear indicator, sturdy battery case, and well-fitting and durable probe protector. The enhanced ergonomic design feels good in your hand, is easy to use (even with gloves) and quick, secure probe docking.

The **Fluke T90/T110/T130** and **T150** are a complete family of testers with the features, functions, and price/performance to fit your applications and preferences.

- CAT II 690V, CAT III 690V and CAT IV 600V, safety rating
- 4-ways to detect AC/DC voltage
- Backlit graduated scale and backlit indicators
- Vibration provides tactile feedback (**T110, T130, T150**)
- Audio On/Off for testing in quiet areas
- Never guess whether your batteries are in good working order
- Detects voltage even with discharged batteries
- Improved probe docking for secure storage
- Phase rotation indicator for 3-phase systems
- RCD functionality
- Display hold (**T130, T150**)
- Built in electric torch (**T110, T130, T150**)
- Single phase voltage offers fast identification of live conductors
- Probe tip protection adapts to your changing environment
- Probe tip protector and storage accessory
- Resistance testing (**T150**)
- WearGuard insulation shows damage to test leads



#### Technical specification

Model	T90	T110	T130	T150
Order code	<b>85-3592</b>	<b>85-3593</b>	<b>85-3594</b>	<b>85-3595</b>
Voltage AC/DC	12V to 690V	12V to 690V	6V to 690V	6V to 690V
Continuity	0 to 400kΩ	0 to 400kΩ	0 to 400kΩ	0 to 400kΩ
Frequency	0/40 to 400Hz	0/40 to 400Hz	0/40 to 400Hz	0/40 to 400Hz
Phase rotation	-	100V to 690V	100V to 690V	100V to 690V
Resistance measurement	-	-	-	Up to 1999Ω
Response time (LED)	< 0.5s	< 0.5s	< 0.5s	< 0.5s
200kΩ input impedance	3.5mA @ 690V 1.15mA @ 230V	3.5mA @ 690V 1.15mA @ 230V	3.5mA @ 690V 1.15mA @ 230V	3.5mA @ 690V 1.15mA @ 230V
7kΩ input impedance	-	30mA @ 230V	30mA @ 230V	30mA @ 230V
Safety rating	CAT II 690V CAT III 690V CAT IV 600V	CAT II 690V CAT III 690V CAT IV 600V	CAT II 690V CAT III 690V CAT IV 600V	CAT II 690V CAT III 690V CAT IV 600V
IP rating	IP54	IP64	IP64	IP64

Type	Order code	1+
Fluke T90	<b>85-3592</b>	37.00
Fluke T110	<b>85-3593</b>	56.00
Fluke T130	<b>85-3594</b>	89.00
Fluke T150	<b>85-3595</b>	109.00

537501

## Rapid

### 13A Socket Tester with Audible Indication

A simple to use tester, for 13A sockets, that will give visual and audible indication of the state of electrical circuits. Clear LED readout and varying tone pulses indicate a range of wiring conditions including: correct, missing earth, live/earth reverse, live/neutral reverse, and missing neutral.

- Simply and easily tests 13A 230V sockets in one step
- Reliable indication
- Designed to **IEC1010-1 CAT II 600V**



Type	Order code	1+
13A Socket tester	<b>85-1948</b>	3.57

080053

**6 days per week phone orders**

Monday to Friday 8am to 7pm, Saturday 9am to 5pm

MARTINDALE  
ELECTRIC

13A Socket Tester

A plug-in tester for 13A sockets. Fault indications are instantly identified by a bank of three neon lamps on the face of the plug.

- Ergonomically designed case moulded in high density, flame retardant ABS
- Easily gripped for ease of insertion and removal
- Ideal for electricians and safety checks



Type	Order code	1+	5+
13A Socket tester	85-1947	11.20	10.62

032034

MARTINDALE  
ELECTRIC

13A Socket Tester with Audible Warning



Safe and simple to use, the 'BUZZ-IT' is a real improvement for awkward sockets. It has an audible signal to tell you instantly whether or not the wiring is correct, and can also be used as a fuse finder, as the correct fuse is located when the buzzer stops. If there is a problem the pattern of neon lights indicates the fault. Any results other than three indicators lit and a continuous buzzing tone shows a fault condition.

- Housed in a sculptured, flame retardant ABS case for easy insertion and removal

Type	Order code	1+	5+	10+
Audible check plug	85-2520	15.85	14.67	13.08

036398

Socket & See

Socket & See 110V Industrial Socket Tester

An industrial socket tester which provides a fast and easy way of checking and fault finding 110V systems up to 16A.

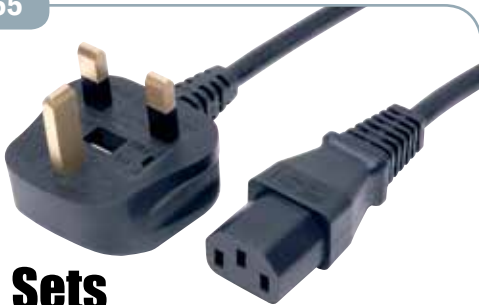
- Specifically designed for UK 55-0-55 (110V) construction sites
- Three pin (two pin + E)
- Tough rubber holster for heavy duty use
- Straight forward and easy to understand correct/incorrect conditions
- Continuous audible tone indicates correct sequence
- Strong warbling tone indicates faulty condition
- Clearly Indicates position of L1, L2 and centre tap
- Manufacturers two year guarantee
- CE marked
- BS 4343 approved
- Socket & See SOK 50/16HD



Type	Order code	1+	5+	10+
110V Socket tester	85-1986	32.31	30.65	29.54

074140

Page 755



Cord Sets

MARTINDALE  
ELECTRIC

IN2101/2102 16th Edition Insulation Testers

New, high quality BS 7671 16th Edition electrical testers that give accurate test performance at low-costs. These units feature automatically displayed output test voltage during testing to ensure that a minimum test voltage of 500V is being applied.

- Durable construction with tough ABS casing
- Large, easy to read backlit digital display with analogue bargraph
- Automatic zero adjustment removes test lead resistance
- Test button can be ?press to test? or latched for constant output
- Auto hold
- Battery condition test
- Auto power off
- Auto power off disable (85-2688 only)
- Includes batteries, manual, carry case and test leads
- IP44 protection
- Complies with all UK and international standards



Technical specification

Insulation tests		
250V	200kΩ to 1000MΩ (4 ranges)	85-2688 only
500V	200kΩ to 4,000MΩ (4 ranges)	
1000V	200kΩ to 5000MΩ (4 ranges)	85-2688 only
Continuity test		
Range	0.1 to 40Ω	
Resolution	0.01Ω	
Short circuit current	>200mA	
Resistance test		
Range	0.1Ω to 1999kΩ	
Voltage test		
Range	600V AC/DC	
Voltage warning indicator	>30V	
Overvoltage	600V CAT III	
Dimensions	90 x 210 x 54mm	

Type	Order code	1+
IN2101	85-2687	188.71
IN2102	85-2688	209.10

077274

MARTINDALE  
ELECTRIC

Continuity Tester with Audible Indication

The Martindale continuity tester is a low-cost, easy-to-use instrument with audible indication.

- Loud buzzer makes it easy to use in noisy environments with an output of over 85dB
- Probe voltage is 9V with a test current of 5mA
- Audible frequency is 2.8kHz
- Housed in a robust plastic case with convenient belt clip, and supplied with a set of test leads
- Dimensions 150 x 65 x 35mm



Requires 1x 9V PP3 battery (not included).

Type	Order code	1+	3+
Continuity tester	85-2038	28.43	26.83

061358

MARTINDALE  
ELECTRIC

RCD Tester

This RCD is fast and easy to use and is suitable for testing all common RCDs (IDN) up to 500mA.

- The RCD rating is set using the conveniently centrally located rotary switch
- Three different current (full, half and fast test) are available at a touch of one selector, and 0° or 180° (positive/negative half cycle) can be set on the second selector
- Supplied with quality soft protective carry case, mains test lead and user manual



Technical specification

RCD ratings (IDN)	6mA, 10mA, 30mA, 100mA, 300mA and 500mA
Half trip settings	3mA, 5mA, 15mA, 50mA, 150mA and 250mA
Fast trip settings	150mA (for IDN = 6, 10 and 30mA only)
Test polarity	0° and 180°
Timing range	0 to 1999ms (1ms resolution)
Timing accuracy	±2% of reading ±1 digit
Dimensions	190 x 90 x 54mm

Type	Order code	1+	3+
RCD Tester RC2000	85-2540	239.38	217.53

068068

**MARTINDALE**  
ELECTRIC

**Microwave Leakage Detector**

A microwave leakage detector that is a low cost and easy to use device suitable for commercial and domestic microwave ovens. It is designed to comply with national standards on permitted exposure levels.

- Test for potentially dangerous leaks
- Simple pass/fail indication
- Self test facility
- Can be used to assess power levels using supplied accessories
- Tests to **BS 5175**
- Includes thermometer, water beaker, carry case and manual

Receiver requires 1x PP3 battery (not included).

Technical specification

Detection frequency range	2450MHz ±25MHz
Sensor distance	Gentle contact to give 50mm separation
Dimensions	150 x 64 x 30mm
Weight	170g

Type	Order code	1+	3+
Microwave detector	<b>85-2698</b>	142.10	131.88

01782



**PAT Testers & Accessories**

**RVFM**

**Patch Portable Appliance Tester**

PATCH Portable Appliance Tester, Earth Bond, Insulation, Lead, Continuity/Fuse Testing, LED Indication, 240V Power Source, 250mm Length, 155mm Width, 135mm Height, 3.5kg Weight, Specifically Designed for Ease of use, Test for Mains Continuity Through the Switch, Fuse and Internal Components of the Tested Item, Provides LED Indication of Pass or Fail of Electrical Tests Applied, Patch is Housed in a Sturdy 18SWG Steel Enclosure, Supplied Complete with 2 Metres of Mains Cable, Test Leads, Test Result Labels, Copyright Free Sample Test Certificate and Full Instructions

- Specifically designed for ease of use
- Test for mains continuity through the switch, fuse and internal components of the tested item
- Provides LED indication of pass or fail of electrical tests applied
- PATCH is housed in a sturdy 18swg steel enclosure
- Supplied complete with 2 metres of mains cable, test leads, test result labels, copyright free sample test certificate and full instructions

Technical specification

Mains input	240V 50Hz
Test period	5 seconds. Automatic earth bond and insulation test
Earth bond test	Test voltage: 6V AC nominal Short circuit current 36A Two shrouded 4mm sockets: 25A - pass limit <=0.1Ω 10A - pass limit <=0.45Ω
Insulation test	Test voltage 500-600V DC load dependent Short circuit output current <0.5mA Class 1 pass limit >=2MΩ Class 2 pass limit >=7mΩ
IEC and kettle lead tests	25A Earth bond and 2/7MΩ insulation tests
Extension lead test	10/25A Earth bond and 2/7MΩ insulation tests
Continuity/fuse test	Pass indicated by blue LED
Dimensions	250 x 155 x 135mm
Weight	3.5kg

Type	Order code	1+
Patch appliance tester	<b>85-1905</b>	215.29

031070

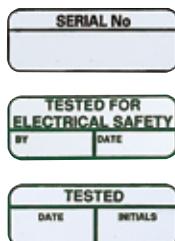


**Customark**

**Partially Laminated Labels**

A range of pre-printed, self-adhesive vinyl labels which are partially laminated with clear polyester allowing text to be written or typed onto the label.

- Can then be fully laminated ensuring information cannot be removed, smudged or affected by acids, alkalis, oils or grease
- Label size 40 x 15mm
- Supplied in **packs of 100 labels**



Price per pack of 100

Type	Order code	1+	10+	50+	100+
Tested	<b>32-0960</b>	7.10	6.42	5.85	5.18
Serial No.	<b>32-0965</b>	7.10	6.42	5.85	5.18
Tested for safety	<b>32-0970</b>	7.10	6.42	5.85	5.18

064789

**RVFM**

**Equipment Labels**

A self adhesive, white vinyl label for fixing to equipment.

- Labels can easily be marked using a spirit based or ball pen
- Printed in green on white background
- Label size 16 x 43mm
- Available in **packs of 100 or 1000**



Type	Order code	1+	5+	10+
Pack of 100	<b>32-0662</b>	4.28	3.72	3.54
Pack of 1000	<b>32-0661</b>	33.07	23.12	

064790

**MARTINDALE**  
ELECTRIC

**Safety Test/PAT Labels**

A selection of pass, fail and appliance labels in various sizes.

- See Technical Specification for full details



Technical specification

Type	Size (mm)	Quantity on roll	Features
Pass	30 x 20	500	Small paper label
Pass	50 x 25	500	High quality polyester label
Pass	60 x 30	500	Paper label
Fail	60 x 30	100	Paper label
Passed	60 x 30	500	Mark and seal - sealable for protection
Appliance	60 x 30	500	High quality polyester with barcode

Type	Order code	1+	3+
Pass label - small	<b>85-2554</b>	19.52	18.17
Pass labels	<b>85-2556</b>	30.11	28.00
Paper pass labels	<b>85-2558</b>	13.94	12.96
Fail labels	<b>85-2560</b>	5.58	5.18
Passed - Mark & seal	<b>85-2562</b>	55.75	51.86
Appliance labels	<b>85-2564</b>	39.02	36.29

068117

**SEAWARD**

**PrimeTest 100**

The PrimeTest 100 is a functional and diverse manual PAT tester. Featuring three operational modes, it is an ideal choice for those looking for an easy to use, electrical safety tester. Simply pushing a button will give you the option of PAT Test mode: Class I and II, IEC Lead test mode or Power Socket mode.

A large LCD display shows the test results values as well as a PASS or FAIL indication. It is battery powered and lightweight to enable quick and efficient portable appliance testing.

- Simple to use PAT tester with actual test readings
- Battery powered
- Easy to use
- Class I, Class II, IEC lead and mains socket modes
- Please note: PrimeTest 100 does not have a backlight



Technical specification

<b>PAT Test</b>	
<b>Earth continuity</b>	
Test current	± 200mA DC
Display range	0.00Ω to 19.99Ω
Pass Value	0.20Ω
<b>Insulation resistance</b>	
Test voltages	500V DC
Display range	0.20MΩ to 19.99MΩ
Pass value	2MΩ Class II
<b>IEC Lead test</b>	
Tests performed	Earth continuity Insulation resistance Live/neutral checks for o/c, s/c and crossed

**Equivalent leakage class I**

Test voltages	40V AC Nominal
Display range	0.10mA to 19.99mA
Pass Value	0.75mA

**Equivalent leakage class II**

Test voltages	40V AC Nominal
Display range	0.10mA to 19.99mA
Pass Value	0.25mA

**Power socket test**

Input voltage range	230V +10%, -15% AC
Indicators	Phase to Earth voltage Phase to neutral voltage Neutral to Earth

**Weight and dimensions**

Weight	11(W) x 5.5(D) 27(L)cm
Dimensions	800g

**Power source**

Power source	6x AA type disposable batteries
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Type	Order code	1+
Primetest 100	<b>90-4200</b>	306.97
Carry case	<b>90-4203</b>	26.94
Earth lead	<b>90-4204</b>	16.16
230V/115V Adaptor	<b>90-4205</b>	17.23

50000





PrimeTest 250 PAT Tester

The handheld PrimeTest 250 PAT tester features all of the electrical safety tests required to meet the IEE Code of Practice including RCD trip time, protective conductor current and touch current. The unit also includes a 250V DC insulation test suitable for testing sensitive electrical appliances and surge protected leads, and can test 3 phase industrial plant and equipment.

Connecting this battery-powered tester to a mains supply allows protective conductor current or touch current measurements to be made automatically. All electrical safety tests are carried out against pre-set limits with measured test result values and clear PASS/FAIL indication on a large display.

- Comprehensive handheld Manual PAT tester
- Intuitive and easy to use
- Automatic mains detection & leakage test selection
- 3 phase leakage testing (Adaptor required for 3 phase testing)



Technical specification

Earth continuity

Output current 200mA  
Test voltage (o/c) 9V DC nominal  
Test duration (Class I Test) 2s nominal  
Display range 0.01Ω to 19.99Ω  
Pass value (Class I Test) 0.2Ω

Insulation resistance

Test voltage 250/500VDC @1mA nominal, <2mA (s/c)  
Test duration (Class I or II) 2s  
Display range 0.01MΩ to 19.99MΩ  
Pass value 1.0MΩ Class I  
2.0MΩ Class II

Equivalent leakage

Test voltage 40V Nominal AC 50Hz Open circuit  
Test duration 2s nominal  
Display range 0.1mA to 19.99mA  
Pass value 0.75mA CL I / 0.25mA CL II

IEC lead test

Test voltage 5V DC nominal  
Test duration Time for test (2s max)  
Test Live/neutral checks for o/c, s/c and crossed

Protective conductor current

Test voltage Supply voltage, max current 13A  
Test duration 30s maximum  
Display range 0.15mA to 9.99mA  
Pass value 0.75mA/3.5mA (user selectable with 0.75mA as default)

Touch current

Test voltage Supply voltage, max current 13A  
Test duration 30s maximum  
Display range 0.10mA to 5.00mA  
Pass value 0.25mA

3 phase differential leakage current

Test voltage 3 phase supply voltage  
Test duration continuous measurement  
Display range 0.10mA to 9.99mA  
Pass value 3.5mA

RCD trip time

Test voltage Mains supply voltage  
Test current 10mA / 30mA rms sinusoidal  
Test current phase 0° 180° auto switched on alternate tests  
Measuring range 0ms to 500ms  
Pass value 200ms

Power socket check

Input voltage range 225 to 254V AC max current 13A UK  
Measurement range 50V to 250V

Type	Order code	1+
PrimeTest 250	90-4206	457.77
RCD Adaptor	90-4208	70.02
Adaptor 5 Star 16A	90-4209	145.41
Adaptor 5 star 32A	90-4210	140.02
Extension adaptor	90-4211	10.50
Earth lead	90-4212	11.96
Mains lead	90-4213	16.16

500002



PrimeTest 350

The PrimeTest 350 PAT tester enables fast and efficient portable appliance testing. This handheld battery powered tester stores results and connects wirelessly to results printers and barcode scanners. Its data logging feature means results, asset IDs, location and other data can be stored and transferred to PAT testing software such as the Seaward PATGuard Elite package for record keeping and traceability.

Its vast range of tests include alternative leakage, 250V insulation and load is measured during the protective conductor and touch current tests.

- Advanced handheld PAT tester with memory
- Rechargeable battery-power and handheld
- Memory for around 8000 records
- USB and Bluetooth download



Technical specification

Earth continuity

Test current ±200mA  
Display range 0.00Ω to 19.99Ω  
Pass value User defined

Insulation resistance

Test voltage 500V/ 250V DC @ 1mA nominal  
Display range 0.01MΩ - 199MΩ  
Pass value User defined

IEC Lead test

Tests performed

Earth, insulation resistance, live and neutral continuity

Protective conductor current/load

Test voltage 195V - 230V, 45Hz to 60Hz  
Display ranges 0.15mA to 19.99mA  
0.00kVA to 4.00kVA  
0.00A - 16.00A  
User defined

Touch current/load

Test voltage 195V - 230V, 45Hz-60Hz  
Display ranges 0.07mA - 3.5mA  
0.00kVA - 4.00kVA  
0.00A - 16.00A  
User defined

Pass value

Alternative leakage current

Test voltage 40V, 50Hz  
Display range 0.10mA - 19.99mA  
Pass value User Defined

RCD Trip time

Test current 30mA rms, 0°/180°auto switched  
Display range 0ms - 200ms

Loop Impedance

Test Current Non-tripping for >30mA RCD  
Display range 0.0Ω- 199Ω

Power socket test

Voltage Range 195V - 253V  
Voltage indicators phase-earth and phase-neutral

General

Memory size 8000 records  
Weight 0.9kg  
Dimensions 260mm x 100mm x 80mm  
Power source 6x AA Batteries

Type	Order code	1+
Seaward PrimeTest 350	90-4214	968.29
Elite printer	90-4217	630.09
Bluetooth scanner	90-4218	290.81
Elite printer labels	90-4219	18.01
USB/ Serial Adaptor	90-4220	32.31
RS232 Lead	90-4221	15.08
Batteries +charger	90-4222	51.69
Carrying case	90-4223	26.94

500012



Test n Tag Printer Kit (including K3100 printer)

Seawards new small, portable printer and a Seaward PAT tester. Combined with new software, Seaward are bringing you the complete automated PAT testing process. The printer produces synthetic, durable labels that not only give you all the test information you could require but also the opportunity to promote your company with you own logo and contact details.

The new Test 'n' Tag system is a fully integrated process.

- Test the appliance with the Supernova or Europa range of testers (not Europa PAC Plus)
- A durable, waterproof label is printed automatically after test, no user intervention required
- Tag the appliance or wrap around cable
- The labels are waterproof, don't tear and don't fade



Type	Order code	1+
Test n Tag kit	90-4236	479.30
Printer K3100	90-4237	263.88
Carrying case	90-4238	25.86
Label cartridge	90-4235	31.24
Bluetooth adaptor	90-4234	204.64
USB Bluetooth Adaptor	90-4295	34.47

500018

velleman®  
Electronic Kits





**SEAWARD**

**PATGuard Elite**

A top of the range premier PAT software package that is ideal for companies that PAT test on a regular basis and PAT test service companies. This PAT software program provides you with quick and easy, complete management of the PAT testing process.

PATGuard enables the downloading of results directly from a PAT tester with memory, creation of certificates, planning of re-tests and uploading information back into the tester. It's simple to use with extensive features including clear re-test identification, optional email alerts for re-testing, and an extensive range of reports that help to increase the speed of your business. PATGuard Elite uses Windows-based management of information so it is easy to learn how to use it.

- Advanced Upload & Download PAT Software
- Database compatibility across the range
- Full test history
- Automatic re-test scheduler

Type	Order code	1+
PATGuard Elite	<b>90-4248</b>	560.08
Elite update	<b>90-4254</b>	161.57
Elite upgrade	<b>90-4259</b>	220.80

500023



**SEAWARD**

**PATGuard Lite**

This is an entry level PAT software package facilitating the quick and effective downloading of PAT test information and certificate printing. It's ideal for those requiring quick, basic testing.

PATGuard Lite PAT software provides records and documentation to support PAT testing and enables the user to quickly and effectively download PAT test results, even with just limited training. This low cost PAT software package uses Windows-based management of information so it's easy to learn and you can hook your tester to your PC to download directly into PATGuard. IMPORTANT: This program does not allow manual entry - this feature is only available in the higher level PATGuard PC programs. PATGuard Lite will only accept tester download data.

- Entry Level Download PAT Software
- Automatic record generation
- Database compatibility across the range
- Password protected

Type	Order code	1+
PATGuard Lite	<b>90-4250</b>	161.57
Lite update	<b>90-4256</b>	45.24
Lite to Pro upgrade	<b>90-4262</b>	296.20
Lite to Elite upgrade	<b>90-4263</b>	457.77

500025



**SEAWARD**

**PAT Testing Labels (Pass)**

Paper labels for visual identification of tested appliances.

- Test date and retest date recorded
- Appliance number field
- Strong adhesive
- Supplied on **rolls of 1000 labels**

Type	Order code	1+
PAT pass labels	<b>90-4283</b>	26.94

500040



**SEAWARD**

**NIMH Batteries and Battery Charger**

Recharge anywhere between 2 and 8 NiMH or NiCd batteries at a time in this automatic battery charger. Included are 2 high quality NiMH batteries for use with high quality Seaward battery powered test instruments.

- Rechargeable AA batteries and automatic charger
- Automatic charger

Type	Order code	1+
Charger/batts	<b>90-4296</b>	34.47

500054



**Thermometers**

**VOLTCRAFT®**

**IR 260-8S Infrared Thermometer**

The IR-260-8S is a high performance device for non-contact temperature measurement, which uses emitted infrared energy to determine the surface temperature of hot, hard-to-reach or moving objects.

The thermometer has a temperature range of -30°C to +260°C. Power is supplied by a 9V battery.

- 8:1 optics
- Connectable target laser
- Illuminated display
- Data-hold
- Max/min value display
- 1x 9V battery
- Not suitable for transparent surfaces such as glass or plastic
- Includes user's guide

**Technical specification**

Accuracy:	±2% ±2°C
Optics:	8:1
Emissivity:	0.95 fix
Power supply:	9V battery pack
Temperature resolution:	0.1°C
Response time:	<1 second
Spectral response:	6µm to 14µm
Laser emission rating:	<1mW
Laser class:	II
Operating temperature:	0°C to +50°C (32°F to +122°F)
Storage temperature:	-20°C to +60°C (-4°F to +140°F)
Relative air humidity:	10% to 90% (Operation) <80% (Storage)
Temperature:	-30°C to +260°C
Pick-up time:	<1 seconds
Weight:	180g
Dimensions:	33(W) x 133(H) x 80(D)mm

Type	Order code	1+
Voltcraft IR 260-8S	<b>51-1589</b>	21.01

523677



**VOLTCRAFT®**

**IR-SCAN-350RH Infrared Thermometer**

The Voltcraft IR-SCAN-350RH Infrared Thermometer is an easy-to-use product which enables you to detect hot or cold spots in the home or workplace.

With an in-built integrated moisture meter, the IR-SCAN-350RH detects dampness at the touch of a button. The illuminated display can show the ambient temperature, ambient humidity, dew point temperature and the temperature of the surface being measured.

Just point it at walls, floors and ceilings and the meter will identify for you areas vulnerable to mould - before the fungus is visible.

This product also features a dual target laser, bargraph display and an alarm function (acoustic and visual). Power is supplied by a 9V block battery.

- Class 2 laser
- Contactless mildew warning
- Representation of potential mould hazard zones
- Display temperature, humidity and dew point temperature
- Automatic shutdown
- Supplied with Dew point scanner, 9V block battery, storage pouch and operating instructions

**Technical specification**

Accuracy of:	±3.5°C
Optics:	12:1
Emissivity:	0.95
Temperature:	-50°C to +350°C
Weight:	163g
Temperature resolution:	0.1
Dimensions:	168(L) x 82(W) x 58(H)mm
Power supply:	9V battery

Type	Order code	1+
IR-SCAN-350RH	<b>51-1591</b>	41.51

523679



**Free Delivery\***

on all orders over £30 (excl. VAT)  
(UK mainland only)

\* See Terms & Conditions for full details

VOLTCRAFT®

12D/20D Infrared Thermometers

The Voltcraft 12D/20D Infrared Thermometers are high quality devices that have been designed with a number of outstanding and innovative features.

Precision while aiming and high measurement accuracy take the centre stage through the double fixing laser and the adjustable degree of emission, while spot measurements can be done very quickly through the very short response time.

Along with the standard measurement function, this device possesses adjustable alarm values with an optical display, along with background lighting that changes to red when the set alarm value is exceeded. In this way, quality control can be done quickly and easily.

- Optical and acoustic alarm display
- Max-value display
- Continuous measurement function
- Attachable double laser with sharp-point optics for target localisation
- Adjustable alarm values with red display in case of exceeding or falling short of limiting values
- Adjustable degree of emission
- Storage case, one battery (9V pack) and operating instructions all included



Technical specification

51-5691	
Accuracy	±1%
Calibration possible to	ISO/DKD
Dimensions	43 x 156 x 94mm (W x H x D)
Emissivity	adjustable from 0.1 to 1.0
Measurement range - temperature	-50 to +650°C
Optics	12/1
Pick-up time	< 150ms
Power supply	9V battery pack
Temperature resolution	0.1°C
Weight	180g
51-5692	
Accuracy	±1%
Calibration possible to	ISO/DKD
Dimensions	43 x 156 x 94 mm (W x H x D)
Emissivity	0.1-1.0
Measurement range - temperature	-50 to +800°C
Optics	20/1
Pick-up time	< 150ms
Power supply	9V battery pack
Temperature resolution	0.1°C
Weight	180g

Optics	Order code	1+
12:01	51-5691	31.76
20:01	51-5692	55.34

525288

VOLTCRAFT®

IR-230 Infrared Thermometer Optics

The Voltcraft IR-230 mini infrared thermometer is intended for non-contact measuring of temperatures of -35°C to +250°C. This product is especially small and handy, and in spite of the affordable price the IR-230 is precise and robust.

- Min/max-value storage
- Auto-hold function
- Lock mode for long-term measurements
- °C/°F switch
- 1:1 optics
- Measuring range: -35°C - to +250°C
- Min. / maximum function
- Supplied with Infrared thermometer IR-230, 1 battery (coin cell CR2032), wrist strap, pouch, holding magnet and user manual



PLEASE NOTE:

The instrument is not suitable for industrial use. Operate the device in dry environment only. It must be powered by CR2032 button cells or similar type.

Technical specification

Accuracy	±2°C or 2%
Calibration possible to	ISO / DKD
Dimensions	40(W) x 75(H) x 20(D)mm
Emissivity	0.95 fix
Measurement range - temperature	-35°C to +250°C
Optics	1/1
Pick-up time	< 1 secs
Power supply	CR2032 button cell
Temperature resolution	0.1°C
Weight	25g

Type	Order code	1+
Infrared Thermometer	51-5144	22.97

525155

Downloadable datasheets  
www.rapidonline.com



ETI 810-268 Digital T-shaped Pocket Thermometer

A low-cost digital T-shaped thermometer with a 125mm long (4mm diameter) pointed stainless steel probe.

- Able to measure temperature over the range -49.9°C to +149.9°C
- A display hold feature is included
- Supplied with probe cover with pocket clip, and a battery (for replacement see Batteries section)



Technical specification

Range	-49.9°C to +149.9°C
Resolution	0.1°C
Accuracy	±1°C
Battery	1x 1.5V button/cell
Sensor	thermistor
Display	8mm LCD
Dimensions	22 x 55 x 150mm
Weight	24g

Type	Order code	1+	5+	10+
T-Shaped Pocket therm	85-2464	13.39	12.43	11.56

036272



ETI 810-930 Digital Thermometer

This easy-to-use, economical digital thermometer features a large, clear display with a 0.1°C or 0.1°F read-out of temperature over the range of -50°C to +150°C.

- The instrument is supplied with a detachable, stainless steel penetration probe (3.3mm dia x 120mm) and one metre connecting lead
- Features both a display hold and max/min memory function
- Includes 1x AAA battery, suitable replacement is 18-1902



Technical specification

Range	-50°C to +150°C
Resolution	0.1°C/°F
Accuracy	±1°C ±1 digit
Battery	1x AAA
Sensor	thermistor
Display	12.7mm LCD
Dimensions	20 x 65 x 97mm
Weight	100g

Type	Order code	1+	5+	10+
Digital thermometer	85-2460	16.58	15.32	14.24

036269



ETI 810-155 Digital Thermo-hygrometer

A low-cost digital thermo-hygrometer.

- Easy to read dual display, simultaneously indicating both temperature and humidity
- Compact and attractively designed unit
- Indicates and records maximum and minimum readings of both temperature and humidity
- Max./min. memory
- High/low alarm
- Powered by single AAA alkaline battery, for suitable replacement see Batteries section



Technical specification

Range	temperature humidity	-20°C to +70°C 20% to 99% RH
Resolution		0.1°C/°F & 1% RH
Accuracy		±1°C or ±5% RH
Battery		1x AAA
Sensor		thermistor
Display		dual custom LCD
Dimensions		20 x 65 x 97mm
Weight		100g

Type	Order code	1+	5+	10+
Digital thermo-hygrometer	85-2472	18.35	17.12	15.84

036270

**FLUKE.**

**62 Max Infra Red Thermometer**

The Fluke 62 Max digital thermometer is the perfect introduction to infrared (IR) thermometers for the professional. The thermometer offers quick and reliable surface temperature readings. This compact and portable IR thermometer enables technicians to diagnose heating and ventilation problems and monitor the temperature of electrical motors and electrical panels without contact. Rugged enough for industrial environments with its protective rubber "boot", it is also supplied with a handy nylon belt holster to keep quick temperature checks at the ready.

- Single point laser sighting
- Best accuracy in its class:  $\pm 1\%$  of reading
- Holds temperature readings for 7 seconds
- Dual display shows current and MAX measurements simultaneously
- Backlit display for poorly lit areas
- Comfortable, ergonomic handle with protective rubber boot, adds durability
- Fitted carrying case attaches to belt
- Robust, award winning design
- Wide temperature range from  $-30^{\circ}\text{C}$  to  $500^{\circ}\text{C}$  ( $-20^{\circ}\text{C}$  to  $932^{\circ}\text{F}$ )



Technical specification

Measurement range	$-30^{\circ}\text{C}$ to $500^{\circ}\text{C}$ ( $-20^{\circ}\text{F}$ to $932^{\circ}\text{F}$ )
Accuracy	$0^{\circ}\text{C}$ to $30^{\circ}\text{C}$ ( $50^{\circ}\text{F}$ to $86^{\circ}\text{F}$ ): $\pm 1^{\circ}\text{C}$ ( $2^{\circ}\text{F}$ ) Outside $10^{\circ}\text{C}$ to $30^{\circ}\text{C}$ ( $50^{\circ}\text{F}$ to $86^{\circ}\text{F}$ ): $\pm 1.5^{\circ}\text{C}$ ( $3^{\circ}\text{F}$ ) or $\pm 1.5\%$ of reading, whichever is greater

Repeatability

Emissivity

Response time

Distance to spot size	10:1 calculated @ 80% energy
Spectral range	6.518 microns thermopile detector
Display resolution	$0.2^{\circ}\text{C}$ ( $0.5^{\circ}\text{F}$ )
Temperature display	$^{\circ}\text{C}$ or $^{\circ}\text{F}$ selectable
Ambient operating range	$0^{\circ}\text{C}$ to $50^{\circ}\text{C}$ ( $32^{\circ}\text{C}$ to $120^{\circ}\text{F}$ )
Relative humidity	10-90% RH non-condensing, @ up to $30^{\circ}\text{C}$ ( $86^{\circ}\text{F}$ )
Typical distance to target (spot)	Up to 2m (6ft)
Laser class II	Single offset laser
Weight/dimensions	200g; 152(L) x 101(W) x 38(D)mm
Power	9V Alkaline battery (included)
Battery life (alkaline)	12 hours
Storage temperature	$-20^{\circ}\text{C}$ to $65^{\circ}\text{C}$ ( $-4^{\circ}\text{F}$ to $150^{\circ}\text{F}$ ) without battery
Options/accessories	Includes protective boot and storage holster

Type	Order code	1+
Mini IR thermometer	<b>85-3520</b>	84.00

082497

**FLUKE.**

**80TK Thermocouple Module (Type K)**

The Fluke 80TK is a thermocouple converter for use with any K-type thermocouple and a digital multimeter. The 80TK accepts the output of any K-type thermocouple and converts it to 1 millivolt per degree (Celsius or Fahrenheit). A three-position switch acts as a power switch as well as selecting Fahrenheit or Celsius scaling for the output.



In addition, the OFF position of the power switch allows you to read the battery condition via the external multimeter. The thermocouple input accepts wire leads or standard minithermocouple connectors. Temperature is measured by exposing or attaching the thermocouple to the surface to be measured. The multimeter displays the temperature directly in degrees Fahrenheit or Celsius.

- Converts a DMM to a thermometer
- For use with type-K thermocouples in low voltage applications (below 24V AC, 60V DC)
- Measurement range  $-50^{\circ}\text{C}$  to  $1000^{\circ}\text{C}$  (probe dependent)
- One year warranty

Technical specification

Measurement range:	$-50^{\circ}\text{C}$ to $+1000^{\circ}\text{C}$
<b>Resolution</b>	
2000 count display:	$>0.1^{\circ}\text{C}/^{\circ}\text{F}$ in 200mV range $1.0^{\circ}\text{C}/^{\circ}\text{F}$ in 2V range
3200 count display:	$>0.1^{\circ}\text{C}/^{\circ}\text{F}$ in 300mV range $1.0^{\circ}\text{C}/^{\circ}\text{F}$ in 3V range
4000 count display:	$>0.1^{\circ}\text{C}/^{\circ}\text{F}$ in 400mV range
Weight:	4.5 ounces, 126 grams
Overall length:	11.75mm
Battery:	Standard 9V battery
Battery life:	1600+ hours, 6.5V minimum
Output:	$\frac{1}{8}$ inch spaced banana plugs, 10M $\Omega$ minimum load resistance

Type	Order code	1+
Fluke 80TK Probe	<b>85-3673</b>	104.00

083268

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**AMPROBE®**

**TPP1-C1 Pocket Thermometer Probe; Immersion**

Small and portable for those measurements out in the field. Digital displays with 0.1 inches resolution. Fahrenheit and Celsius versions available.



- Temperature measurement with integrated NTC sensor
- Immersion probe
- Measurement memory (data hold)
- Compact design
- With protective sleeve/holder (TPP1-C1 only)

Technical specification

Display LCD	3 1/2 digit
Power supply	3V CR 2032
Dimensions	40 x 30 x 160mm
Weight	16g

Type	Order code	1+
Amprobe TPP1-C1 Thermometer	<b>90-4088</b>	8.32

400808

**AMPROBE®**

**TPP2-C1 Pocket Thermometer Surface Probe**

Small and portable, this pocket thermometer surface probe is perfect for those measurements out in the field. Digital displays with 0.1 resolution.



- Temperature measurement with integrated NTC sensor
- Immersion probe
- Measurement memory (data hold)
- Compact design
- Surface probe and no protective sleeve/holder

Technical specification

Display LCD	3 1/2 digit
Measurement ranges	$-50^{\circ}\text{C}$ to $+250^{\circ}\text{C}$
Power supply	1x 3V, CR 2032
Dimensions	40 x 30 x 160mm
Weight	16g

Type	Order code	1+
Amprobe TPP2-C1 Thermometer	<b>90-4089</b>	10.48

400809

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Thermal Image Cameras



i3 Compact Infrared Thermal Imaging Camera

The FLIR i3 combines all the important parameters that are required for reliable, ergonomic and affordable measurement operation. Working with the FLIR i3 saves you time; simply target, trigger and evaluate.

The FLIR i3 thermal imaging camera is the ideal temperature-measuring tool for fast and accurate spot measurements in electrical and building inspection. Three different colour palettes are available for precise analysis: Iron, Rainbow, and Black / White. The jpg-infrared images can be stored with all radiometric data on a miniSD card or directly through the mini-USB port on your PC. Every inspection image can be integrated with the performance evaluation and analysis software tool.

- Total pixels: 3600
- Thermal image quality: 60 x 60 pix
- Thermal sensitivity: <0.15°C
- Temperature range: -20°C to +250°C
- Data stored on miniSD card
- Includes FLIR evaluation and analysis software tools
- Excellent 7.1cm screen size and quality
- Easy-to-use, rugged design
- Fully Radiometric Images
- Store up to 5,000 JPEG image files with all your temperature measurements
- Image refresh rate 9Hz
- Adjustable emissivity
- Automatic reflectance correction
- Mini-USB port
- Built-in Li-Ion Battery
- Auto power-off
- What's in the box:-
- FLIR i-Series infrared camera
- Carrying case
- FLIR software tools
- Wrist strap
- Battery
- AC adapter / charger with mains plug for EU, GB, USA and Australia
- USB cable
- 512 Mbytes miniSD card
- Quick reference guide
- CD-ROM with user documentation
- Certificate of calibration

Technical specification	
Optics	12.5° x 12.5°
Emissivity	0.1 to 1.0
Colour schemes	3
Thermal sensitivity	150
Weight	365g (with battery)
Dimensions	223(L) x 79(W) x 83(H)mm
Geometric resolution (IFOV)	3.7 mrad
Temperature	-20°C to +250°C
Protection type	IP43
Frame rate	9Hz
Type	i3
Focussing	>40cm
Memories	5000
Bolometer matrix	60 x 60 pix
Temperature resolution	0.15°C

Type	Order code	1+
i3 Infrared Thermal camera	85-3549	657.00

400999



i5 Infrared Thermal Image Camera

The FLIR i5 combines all the important parameters that are required for reliable, ergonomic and affordable measurement operation. Working with the FLIR i5 you save time, just target - trigger - evaluate.

The FLIR i5 thermal imaging camera is the ideal temperature measuring tool for fast and accurate spot measurements in the electrical and building inspection. Three different colour palettes are available for precise analysis: Iron, Rainbow, and Black/ White. The jpg-infrared images can be stored with all radiometric data on a miniSD card or directly through the mini-USB port on your PC. Every inspection image can be integrated with the performance evaluation and analysis software tool.

- Total pixels: 10,00
- Thermal image quality: 100 x 100 pix
- Thermal sensitivity: <0.15°C
- Temperature range: -20°C to +250°C
- Data stored on miniSD card
- 7.1cm colour LCD display
- Excellent screen size and quality
- Easy to use, rugged design
- Fully radiometric images
- Store up to 5,000 JPEG image files with all your temperature measurements
- 9Hz refresh rate
- Adjustable emission and reflectance
- Mini-USB interface
- Built-in Li-Ion battery
- Battery power management
- Auto power Off
- Integrated lens cover
- Includes FLIR evaluation and analysis software tools
- What's in the box:-
- FLIR Tools software
- Hand Strap
- Accumulator
- AC adapter / charger with power cord for EU, UK, USA and Australia
- USB cable
- 512 Mbytes miniSD card
- Quick Guide
- CD-ROM with user documentation
- Certificate of Calibration

Technical specification	
Accuracy	±2C or ±2%
Optics	21 x 21
Emissivity	0.1 - 1.0
Focussing	>60cm
Frame rate	9Hz
Memories	5000
Colour schemes	3
Protection type	IP43
Thermal sensitivity	100
Dimensions	223(L) x 79(W) x 83(H)mm
Type	i5
Bolometer matrix	100 x 100 pix
Temperature	-20C to +250°C
Temperature resolution	0.10°C
Weight	365g
Geometric resolution (IFOV)	3.7 mrad

Type	Order code	1+
FLIR i5 Camera	85-3540	1236.00

082653

TG165 Imaging  
IR-thermometer  
-25 to +380°C



Order code 85-3553  
£399.00

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## Other Test Equipment



### Wideband Amplifier WA301

The WA301 is a DC to 1MHz amplifier with a maximum output (e.m.f.) of 30V peak to peak from a 50W source impedance. A 600W output is also provided.

The unit can provide up to 15V peak to peak into a 50W load and can drive up to 300mA peak into a low impedance or short circuit.

Fully variable gain between x1 and x10 is provided by a rotary vernier with calibrated end stops. A -20dB output attenuator is also incorporated.

An output clip LED is provided to warn if the output amplitude exceeds  $\pm 15V$ .

- 30V peak-peak maximum output
- DC to 1MHz bandwidth
- Variable gain 0dB to +20dB
- 50W and 600W outputs
- -20dB output attenuator
- Fully protected output with high current drive

#### Technical specification

Bandwidth:	-3dB at 1MHz
Flatness:	-1dB at 400kHz
Rise/fall time:	<0.5µs
Distortion:	<0.1% at 1kHz
Gain:	Vernier adjustment between x1 and x10
Input impedance:	10kΩ
Output impedance:	50W and 600W (separate sockets)
Output 0dB:	30V peak to peak max. from 50W (15V into 50Ω) 30V peak to peak max. from 600W (15V into 600Ω)
Output -20dB:	3V peak to peak max. from 50W (1.5V into 50Ω) 3V peak to peak max. from 600W (1.5V into 600Ω)
DC offset:	<5mV
Power:	230V or 115V AC nominal 50/60Hz
Dimensions:	210(W) x 75(H) x 230(D)mm including feet
Weight:	1.1kg
Operating Range:	+5°C to +40°C, 20-80% RH
Storage Range:	-40°C to +70°C
Safety:	Complies with EN61010-1
EMC:	Complies with EN61326

Type	Order code	1+
TTI Wideband Amplifier WA301	<b>85-2067</b>	158.14

400522



### TH-3 Relative Humidity and Temp Meter

The TH-3 uses a precision capacitance sensor to deliver accurate performance with long term stability. This high accuracy instrument measures the full range of relative humidity from 0% to 100% and features an exceptionally wide ambient temperature measurement range. The sensor is mounted on a long shaft extending from the top surface of the unit, making probing into ductwork and hard to reach areas more easy.

The large LCD displays two measurements simultaneously with a full range of display options including hold, min, max, and relative.

- Humidity measurement
- Temperature measurement
- Probe integrated in device
- Integrated measurement memory (data hold)
- Min and max data hold
- Auto power-off

#### Technical specification

Display LCD	3½ digit dual
Power supply	1x 9V battery
Dimensions	240 x 54 x 34mm
Weight	180g

Type	Order code	1+
Amprobe TH-3 Temp Meter	<b>90-4078</b>	68.29

400798



### Digital Stroboscope and Tachometer

A digital Stroboscope and Tachometer which can measure between 100 and 10000rpm at a 1rpm resolution. The rpm reading is displayed on an LED display on top of the unit.

- Microprocessor-based
- Ideal for industrial maintenance, laboratories and educational demonstration of stroboscopic action
- Suitable for inspection and measurement of gear speeds, centrifuges, pumps and motor shafts



- Flash rate is adjustable and the corresponding rotational speed is displayed on the digital display
- Mains powered from IEC mains inlet
- 210mm Length, 120mm Width, 120mm Height

#### Technical specification

Range	100 to 10,000 flashes/min. (r.p.m)
Accuracy	$\pm 1$ digit
Resolution	1 r.p.m (10 r.p.m above 10,000)
Dimensions	210 x 120 x 120mm
Power supply	220V to 240V AC 50Hz to 60Hz

Type	Order code	1+	3+
Digital stroboscope	<b>85-1900</b>	217.01	205.52

028709



### TOOLCRAFT

### Ultrasonic Distance Meter with Laser Pointer

This Toolcraft microprocessor-controlled ultrasound rangefinder measures lengths with amazing ease and precision. It can also add up the measurements at the touch of a button, then calculate surface area ( $m^2$ ) and volume ( $m^3$ ) automatically. Use the built-in laser pointer to accurately locate the surface to be measured from.

- Rangefinder up to 15m
- Laser-pointer
- Measures distances, calculates surface areas and volumes
- Calculation range: Area  $324m^2$ , volume  $5832m^3$ , length 999.99m



Takes 1x 9V PP3 battery, not included.

#### Technical specification

Measurement range	0.6 to 15m
Accuracy	0.5%
Display resolution	0.01
Laser class	II
Laser wavelength	650nm
Power supply	1x PP3 9V battery
Dimensions	58 x 125 x 38mm (W x H x D)
Weight	130g

Type	Order code	1+
Distance meter	<b>51-2467</b>	16.98

524378



### Pocket pH Meter

This durable Pocket pH meter is easy to use and provides fast, accurate and repeatable measurement of pH values.

- Unique feature of a retractable electrode
- Protective cap houses a moisture sponge, which keeps the electrode wet and prolongs the products life



Type	Order code	1+	5+	13+
pH Meter	<b>52-0042</b>	45.78	41.86	36.16

066615



### Digital Tachometer

The Ut372 is a hand-held digital tachometer non-contact measurement of rotational and linear motions. With an accuracy of  $\pm 0.04\%$  of indicated reading. The Ut372 is ideal for uses in production, engineering, inspection, quality control, and maintenance. The compact size and light weight of the device makes for easy, one-hand operation while the rugged, high impact housing provides for years of dependable service.

- Power: 1.5V Battery (AA) x 4
- LCD Size: 53 x 41mm
- Product colour: Red and grey
- Product weight: 100g
- Product size: 184 x 56 x 34mm
- Standard accessories: Batteries, English Manual, Reflecting Tape, USB Interface Cable



Type	Order code	1+	5+	10+
Uni-T Tachometer UT372	<b>85-4090</b>	31.49	28.67	27.26

400431

**NEW**

## Introducing FlowPaw!

FlowPaw is an electronics board that plugs into a PC via USB. It has all the things you need to build your own gadgets and gizmos: buttons, LEDs, sensors and electronic inputs. You can also plug remote controlled (RC) servo motors directly onto the board to create robots or other mechanical devices.

FlowPaw is expandable using extensions called Click Boards.

There are 4 claws on the Paw and each can take a different Click Board. In total, there are 20 different Click Boards available.

### How is FlowPaw programmed?

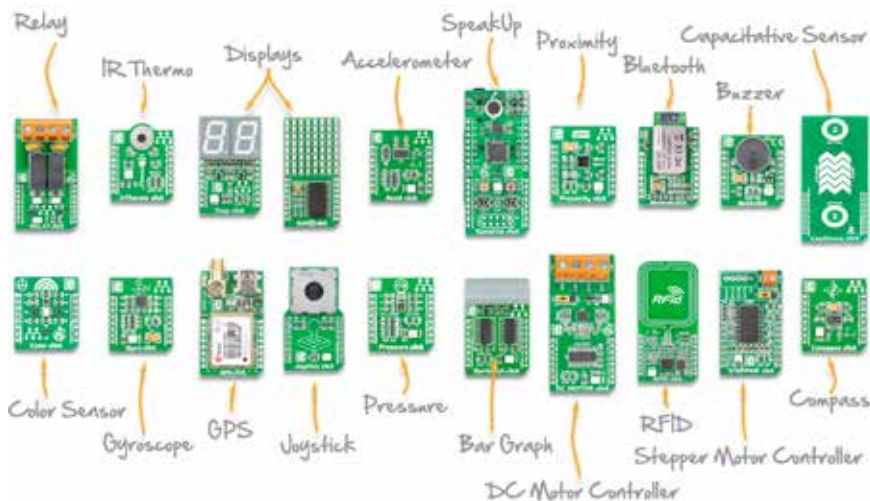
FlowPaw is programmed with FlowStone STEM - a new version of DSP Robotics' award winning graphical programming software, FlowStone. It's super intuitive; by simply connecting building blocks together you literally draw out a program. Best of all, everything works in real time so you can modify your creation as it's running!

With FlowStone you can create easy to manage, modular programs as quickly as you can think them up. By mixing graphical and text based programming children can learn how to code at their own pace without being dropped in at the deep end.

### What is included with a FlowPaw starter kit?

In the Starter Kit you'll find the FlowPaw board itself, a neat retractable USB cable, four awesome click boards comprising an 8x8 LED display, accelerometer (think Wii controller), proximity sensor and a buzzer (mono synthesizer). Also included is a CD with the Flowstone software, quick start guide and a host of examples to get you started.

### What additional Click Boards are available?



To learn more and see pricing for the full range of accessories, visit

[www.rapidonline.com/FlowPaw](http://www.rapidonline.com/FlowPaw)

FlowPaw Starter Kit

Only  
**£95.00**  
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73-5005