Test Equipment

Full range of Test Equipment available at:

www.rapidonline.com

Multimeters

VOLTCRAFT®

R-BOX 01 Decade Resistor Box

The Voltcraft R-Box 01 resistor decade box is made of durable ABS plastic. This allows easy and quick adjustment of any resistance value from 1 to 11.111.110Ω, in 1Ω increments. The box is indispensable for use in a variety of applications: service, schools and educational institutions, maintenance, etc.

- Perfect for servicing, training, education and maintenance
- Accuracy: 1%
- Adjustment range: 1 - 1111110Ω
- Calibration possible to: ISO / DKD
- Max. supply voltage: 35V
- Type: Decade resistor
- Weight: 330g
- Supplied in **R-Box 01** (Resistors)

Type	Order code	1+
Resistor Box	**51-6473**	51.88

525948

VOLTCRAFT®

Digital Multimeter, DMM, 2000 Counts

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, and can handle measurements up to 250V.

- Diode test
- Acoustic: Continuity tester
- Non-contact AC Voltage Detector
- hFE transistor testing (with optional adaptor)
- 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**

Type	Order code	1+
Voltcraft VC-130-1	**55-9059**	17.99

547650

VOLTCRAFT®

Digital Multimeter Class Pack of 16

A classpack of 16 Voltcraft VC130 Digital LCD Multimeters in a deep Gratnell'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	**86-1090**	203.48

526194

≡Rapid

RHMM17 Digital Multimeter

The Rapid RHMM17 digital multimeter has a highly versatile selection of ranges covering AC and DC voltage, AC and DC current, resistance, audible continuity testing, frequency, temperature, capacitance and transistor testing.

Basic accuracy on the DC voltage range is ±(0.5% of the reading ± digit). See Technical Details for a full listing of ranges and accuracies.

- Basic DC voltage accuracy 0.5%
- Large clear LCD display with backlight
- Low battery indicator
- Auto power off
- Display hold button
- Easy access for fuse changing
- Rubberised holster
- Red and black test probes
- K-type thermocouple temperature probe
- **Conforms to IEC61010-1**
- **RoHS, CE, EMC & LVD compliant**
- **Rapid model RHMM17**

Takes a single 9V, PP3 battery, included.

Type	Order code	1+
RHMM17 multimeter	**90-0005**	20.44

566384

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 VCHEK 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.

- VCHEK 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

The full technical specification for this multimeter can be found on this website.

Type	Order code	1+
Fluke 113 multimeter	**85-3560**	110.33

082681

UNI-T

UT58A and UT58C Digital Multimeters

The Uni-T UT58A and UT58C digital multimeters have all the features of a standard digital multimeter. Measurement ranges include AC voltage, DC voltage, AC current, DC current, resistance, capacitance and a continuity check. Model UT-58C also measures temperature and frequency.

- 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 leads, battery, English manual, multi-purpose socket, holster
- Model UT-58C is also supplied with a point-contact temperature probe

Type	Order code	1+	5+	10+
Uni-T Multimeter UT58A	**85-4071**	24.64	22.43	21.34
Uni-T Multimeter UT58C	**85-4072**	24.23	22.05	20.98

400416

VOLTCRAFT®

VC650BT 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 VC650BT	**51-1949**	208.43

524010

FLUKE. | FLIR
KERN | testo | ATP
LogIT | Tektronix
RIGOL | TTi
GW INSTEK | VOLTCRAFT®

See our full range of Test Equipment at **www.rapidonline.com**

METREL EVSE INSTALLATION TESTERS

A range of installation testers designed for Electric Vehicle Supply Equipment (EVSE).

Available testers are:

65-2902 MI 3125BT
Multifunctional 18th Edition Electrical Installation Tester w/Type EV and B RCD Test

65-2903 MI 3100 S EASI
Multifunctional 17th Edition Electrical Installation Tester

65-2904 MI 3100 SE EASI
Multifunctional Installation Tester with Autosequence and Download Software

65-2905 MI 3102BT
Multifunctional 18th Edition Electrical Installation Tester w/Advanced MESM PC/Android S/W

65-2906 MI 3152-S XE
18th Edition Multifunctional Electrical Installation Tester w/Touch-Screen with Autosequence

For details see their individual product pages at **www.rapidonline.com**.

- A must have when working with EV charging equipment
- Applications Initial and periodic testing of domestic and industrial installations
- Testing of single and multiphase systems

Order code: 65-2902
MI 3125BT
£710.00

Order code: 65-2903
MI 3100 S EASI
£794.50

Order code: 65-2904
MI 3100 SE EASI
£887.50

Order code: 65-2905
MI 3102BT
£1,070.00

Order code: 65-2906
MI 3152-S XE
£1,454.00

Function Generator

VOLTCRAFT®

FG 250D Function Generator

The **Voltcraft FG 250D function generator** is easy to use and reliable for applications in the NF-range up to 250kHz. The FG 250D is suitable for testing control circuits, analogue and digital circuits, or for measuring the frequency response of LF amplifiers, filters and speakers. The amplitude of sine and triangular signals can be modified in the range from 100mV to 5Vpp. The amplitude of the rectangular signal corresponds to the TTL-level (+5V).
A DC-voltage coupled output (DC) opens up many usage possibilities in digital circuits through the continuous offset setting.

- Frequency range 1Hz to 250kHz in 1Hz steps
- Sine, triangle, rectangle (TTL) settings
- LCD display
- Dimensions 225 x 73 x 212mm
- Weighs 950g

Type	Order code	1+
FG 250D	**55-2319**	121.30

540242

VOLTCRAFT®

8202 Function Generator and Frequency Generator

The professional generator produces sine, rectangle and triangle signals. The square signal is available with CMOS-TTL and variable amplitude. The pulse width can be continuously adjusted.

- Frequency range 0.02 Hz to 2 MHz
- Frequency meter 2 to 10 MHz
- Wobble function

Power cable, BNC cable and operating instructions included.

Type	Order code	1+
Function generator	**51-1602**	250.07

523690

≡RVFM

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

Type	Order code	1+
Logic probe	**85-0695**	15.96

031049

digimess®

SG100 RF Signal Generator HUC 63-00

The digimess SG100 is a very competitively priced microprocessor controlled RF signal generator. The unit covers the frequency 100kHz to 150MHz (450MHz 3rd harmonic) in 6 ranges. A fine adjust control allows precise frequency selection and the set frequency is displayed by a 4 digit LED readout.

The generator also includes both internal and external AM and FM modulation as well as an audio signal output. The SG100 is supplied with operating manual, BNC lead and mains lead.

- Covers the frequencies 100kHz to 150MHz in 6 ranges
- Fine adjustment allows precise frequency selection
- Frequency is displayed by a 4-digit LED readout
- Internal and external AM and FM modulation
- Supplied with full operating manual, BNC lead and mains lead
- CE approved

Type	Order code	1+
Digimess SG100	**85-2229**	258.96

524999

Oscilloscopes

VOLTCRAFT®

DSO-1062D Digital Storage Oscilloscope 60MHz

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).

Type	Order code	1+
Voltcraft DSO-1062D	**51-5195**	280.36

525206

VOLTCRAFT®

DSO-1062D-VGA Digital Oscilloscope, 60MHz with VGA Interface

The **Voltcraft DSO-1062D-VGA** is an **Entry-Level Digital Storage Oscilloscope** with a **VGA Interface** for connection to a large screen or projector if required.

This oscilloscope provides two channels with a bandwidth of 60MHz, a real-time sampling rate of 1GSa/s, and a memory depth of 512kpts per channel, which are available when using only one channel to 1Mpts.

The oscilloscope has a **large 17.7cm** (7 inch) colour display with a resolution of 800 x 480 pixels as well as **WINDOWS-style interfaces** and menus for easy operation.

The **DSO-1062D-VGA** has a multilingual Help menu, easy-to-operate buttons and multifunctional knobs. The shortcut keys help you save a lot of time in operation; the Autoset function lets you detect sine and square waves automatically; the Probe Check Wizard helps you to adjust the probe compensation and set the Probe option attenuation factor.

The oscilloscope provides context-sensitive, hyperlinks, and an index to enable you to master all operations on the device easily and quickly, improving your efficiency in production and development. It has also a VGA interface for connection to a large screen for classroom demonstration purposes.

What's in the Box?
Voltcraft DSO-1062D-VGA
2 probes (each 1: 1/10: 1)
Power cord
USB cable
Software
Detailed instruction manual (English)
Quick Guide (multilingual

- 60MHz bandwidth
- 1GS/s real-time sampling rate, 25GS/s equivalent
- Discount set with 2 probes
- Manufacturer's part: **Voltcraft DSO-1062D-VGA**

Please Note: *The oscilloscope screen is still valid when connection to a large screen is made.*

Type	Order code	1+
DSO-1062D-VGA	**52-0935**	307.02

552685

OWON®
Meet your best needs

SmartDS 5032E 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 Channels. VGA output is included for external monitors or video projectors, making it ideal for teaching situations.

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 SDS5032E**

Type	Order code	1+
OWON SDS5032E	**85-9990**	251.11

538624

Tektronix®

2 Channel Digital Storage Oscilloscope

The **TBS1000B-EDU Digital Storage Oscilloscope Series** is designed specifically to meet the needs of today's schools and universities. It is the first oscilloscope to use an innovative new Courseware system that enables educators to seamlessly integrate teaching materials onto TBS1000-EDU oscilloscopes. The Courseware information is presented directly on the oscilloscope display and can be used to provide; step by step instructions, background theory, hints and tips or an efficient way for students to document their lab work. The instrument includes a 7-inch WVGA TFT colour display, and a 5 year standard warranty,are just a few of the features that make the TBS1000B-EDU the industry's best value entry level oscilloscope for educational activities.

Usually, entry-level instruments are as light in features as they are in price. But **Tektronix TBS1000** and **EDU Series** are not usual instruments. Ideal for students, hobbyists or any person or organization on a tight budget, TBS1000 Series 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.

What's in the box?
Your chosen Oscilloscope model, Power cord, Traceable certificate of calibration, Printed documentation (Installation and safety manual), CD with customer documentation (including detailed user manuals), and 5-year warranty

- 2-channel models
- Up to 2GS/s sample rate on all channels
- 2.5k point record length on all channels
- 7 inch WVGA (800X480) Active TFT Colour Display
- 34 automated measurements
- Dual window FFT, simultaneously monitors both the time and frequency domains
- Integrated Courseware feature (EDU Models only)
- Dual channel frequency counter
- Multiple-language user interface
- Small footprint and lightweight - Only 4.9 in. (12 mm) deep and 4.4lb. (2kg)
- Advanced triggers including pulse and line-selectable video triggers
- Built-in waveform limit and trend plot testing
- Zoom Function
- Automated, extended data logging feature
- Autoset and auto-ranging functions
- Built-in context-sensitive help
- Available in **200MHz, 150MHz, 100MHz, 70MHz** and **50MHz bandwidth models**

Type	Order code	1+
TBS1052B-EDU, 50Mhz	**52-1230**	404.38
TBS1072B-EDU, 70Mhz	**55-8782**	350.00
TBS1102B-EDU, 100Mhz	**55-8783**	500.00
TBS1152B-EDU, 150Mhz	**55-8784**	1118.14
TBS1202B-EDU, 200Mhz	**55-8785**	1387.17

544285

≡Rapid
e d u c a t i o n

We bring STEM to life

RIGOL

4 Channel Digital Storage Oscilloscope, DS1100Z Series

A range of **Rigol High Quality 4-Channel Digital Storage Oscilloscopes** (**DSO**) with a real-time sample rate of up to 1GSa/s.

These high-performance and economical digital oscilloscopes are ideal for the designing, debugging and educational requirements of the mainstream digital oscilloscope market. The oscilloscopes are compact, easy-to-use and packed with useful features and functions for all measuring tasks. This high performance standard not only ensures capturing real-time instantaneous signals, but also observes details of repeated signals.

The particularly large TFT colour displays are very easy to read with the largest possible area always available for displaying signals. The signal curves, the FFT display, and other functions can be shown simultaneously on the display.

The oscilloscopes are available in two models, with or without a built-in 2 channel function/arbitrary waveform generator.

The **Rigol DS1104Z-S-Plus** (order code **64-6950**) is supplied with a built-in 25MHz bandwidth 2-channel arbitrary waveform generator.

What's in the Box?
4-Channel Digital Storage Oscilloscope
4x passive probes (150MHz)
USB cable
UK and European mains leads
Quick guide
CD (user guide and application software)

- MSO Ready
- Built-in 2 channel function/ arbitrary waveform generator (**DS1104Z-S Plus only**)
- Maximum sample rate 1GSa/s
- Vertical scale 1mV/div to 10V/div
- Innovative 'UltraVision' technology
- Up to 30,000wfms/s waveform capture rate
- 7 inch WVGA (800x480) TFT LCD display, 64 intensity grading levels
- Up to 15 off trigger functions, including various protocol triggers
- Auto measurement of 33 waveform parameters, with statistics
- Built-in FFT with a choice of window functions
- Pass/fail test function
- Built-in help facility
- Compact size, light weight, easy to use
- Available with a **bandwidth of 50, 70** and **100MHz**
- Available **with** or **without a built-in 2 channel function/ arbitrary waveform generator**

Type	Order code	1+
DS1104Z-S Plus	**64-6950**	772.72
DS1104Z Plus	**64-7977**	604.24
DS1074Z Plus	**64-6951**	479.44
DS1074Z-S Plus	**64-7976**	648.96
DS1054Z	**64-7999**	405.00
Software bundle	**64-7432**	201.77

561770

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

Type	Order code	1+
Voltcraft 610/1	**51-5193**	156.46

525204

≡Rapid

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

Type	Order code	1+
7020A Oscilloscope	**85-2200**	409.99

036638

GW INSTEK

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

The **GDS-1052-U** is 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
- Manufacturer's part no. **GDS-1052-U**

Type	Order code	1+
50MHz, GDS-1052-U	**90-6017**	254.95

502688

pico Technology

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

Type	Order code	1+
PicoScope 2204A	**85-7492**	99.00

534017

pico Technology

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

Type	Order code	1+
Picoscope 2205A	**85-7493**	159.00

534018

Environmental Meters

VOLTCRAFT®

MS-1300 Digital 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 ±5%
- 0.1 to 50 000 lux
- Supplied with carry bag, 1x battery and operating instructions

Type	Order code	1+
Light meter	**51-5154**	30.46

525165

Free Delivery*

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

* See Terms & Conditions for full details - **www.rapidonline.com/terms**

Education

8

Test Equipment

VOLTCRAFT®

SL-50 Digital Sound Level Meter

The Voltcraft SL-50 noise level meter is a digital measurement device which can measure noise levels of sources in the intensity range 40dB to 130 dB. It is ideal for checking noise sources or for simple measurements of environment noise.

The measurements 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).

Type	Order code	1+
Sound Level Mete	**51-5135**	24.68

525146

VOLTCRAFT®

PHT-01 ATC pH Meter

The Voltcraft PHT-01 ATC pH Meter Stick 0 to 14 pH is a handy device for quickly and easily measuring the pH in aquariums, swimming pools, nurseries, etc. Despite the low price, this device has 1-point calibration and includes automatic temperature compensation for precise measurements at different temperatures.

The pH meter stick PHT-01 ATC is a state-of-the-art product and therefore meets the requirements of the current European and national guidelines. All the relevant documents have been deposited at the manufacturer. The PHT-01ATC is powered by 1x 9V battery (PP3 type).

- One-point calibration
- Automatic temperature compensation
- Supplied with Voltcraft PHT-01 ATC pH meter stick, preservation solution, calibration solution pH 7, battery (9V block), calibration screwdriver, preservation box, instructions for use

Type	Order code	1+
Meter Stick	**51-5151**	50.78

525162

eti

813-513 pH Pal Plus pH Tester

This **pH Tester** from ETI is a robust meter that can be used both indoors and outdoors, courtesy of the water resistant case, making it ideal for measuring the pH in food processing and water testing applications. It is also an invaluable tool when mixing concentrates with water.

The meter is user-friendly and incorporates an automatic recalibration feature. At the touch of a button, the instrument will automatically recalibrate itself when used in conjunction with a 7.00 pH buffer solution. It also features an easy to read 8mm LCD display, indicating pH over the range of 0 to 14 pH, with a resolution of 0.1 pH, plus an accuracy of ±0.2 pH.

The pH Pal Plus tester will power off automatically after 10 minutes, maximising battery life, and is powered by four LR44 button cell batteries (supplied). Also included is a protective cap.

- Pocket-sized meter, ideal for everyday use
- Easy to read 8mm LCD display
- Display hold function
- 15 x 32 x 170mm
- 70g
- UK manufacturer
- 2-year manufacturer's guarantee
- Manufacturer's part **813-513**

Type	Order code	1+
pH tester	**85-3173**	43.68

561935

VOLTCRAFT®

PH-100 ATC pH Meter

The **Voltcraft PH-100 ATC is a handy pH measuring device** with a resolution of 0.01pH. Whether you want to know the pH of water in a swimming pool or in an aquarium, this clever device is for you.

Poor water quality is often the cause of fish death, poor plant growth or for failed experiments in the school and laboratory. And when the consequences of poor water quality become apparent, it's usually too late. With the Voltcraft PH 100 ATC you can check the pH in a variety of fluids quickly and reliably.

The Voltcraft Digital pH meter PH-100 ATC is a reliable and accurate pH meter for applications in swimming pools and other water storage areas for quality checking. With this measuring device, you can easily detect how acidic or alkaline a liquid is.

The device has a fast response time and low power consumption making it highly effective. With the HOLD function, you can keep the reading on the large LCD if measuring in an awkward situation. The automatic temperature compensation (ATC) ensures correct measurements over the meter's whole operating temperature range.

- Data hold
- Two-point calibration
- Automatic temperature compensation
- Supplied with pH electrode with storage solution and operating instructions
- Spare electrodes are also available **55-2341**

PH-100ATC, pH-electrode with storage solution, operating instructions

Type	Order code	1+
Voltcraft pH Meter	**51-5153**	56.89
Spare electrode	**55-2341**	24.27

525164

Balances

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

Type	Order code	1+
EMB 200-2 Scales	**85-2356**	109.38
EMB 2200-0 Scales	**85-2358**	49.88
EMB 5.2K5 Scales	**85-2359**	48.13
EMB 500-1 Scales	**85-3436**	48.13
EMB 5.2K1 Scales	**85-3437**	52.50

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 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.

- 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

Type	Order code	1+
PCB 100-3	**85-3441**	231.88
PCB 6000-1	**85-3448**	210.00
PCB 10000-1	**85-3450**	214.38

082373

ATP

600g X 0.01G Precision Weighing Balance FGL-600

This ATP FGL-600 600g X 0.01G Precision Weighing Balance is housed in an impact-resistant ABS case with a 115mm stainless steel weighing pan, splash-proof membrane keypad, levelling bubble and adjustable feet. The balance can be either battery or mains powered via an AC/DC Adaptor.

- Weighs in g, oz, ct and tola
- Impact-resistant ABS case with adjustable feet
- Splash-proof membrane keypad incorporating 3 function keys
- 115mm diameter stainless steel weighing pan
- 26mm hi-contrast LCD display with backlight
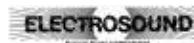- Automatic backlight when weight is placed on the pan

- Zero tracking ensures stable and repeatable readings
- Tare facility over the full range
- Overload protection to 100% over capacity
- Low battery indication
- Auto power Off after 1.5 minutes of no activity (battery powered only)
- Supplied with user guide and battery
- 2 year warranty

Type	Order code	1+
Precision Balance	**90-6579**	104.48
Power Adaptor	**90-6592**	12.09

518029

PAT Testers & Accessories

ELECTROSOUND

Patch Portable Appliance Tester

Portable patch **appliance tester** from **Electrosound**, 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

Type	Order code	1+
Patch appliance tester	**85-1905**	298.30

031070

SEAWARD

Apollo 600 PAT Tester in Kits/ Bundles with Software

The **Seaward Apollo 600 PAT Tester** is available to buy on its own or in a kit with a selection of optional accessories to help you get the most out of your Apollo 600 tester. The available kits are as follows:

Apollo 600 Elite Kit (order code **90-4359**) contains:
Apollo 600 PAT tester plus standard accessories
Test 'n' Tag Elite 2 portable printer
4x Test 'n' Tag printer 25 x 52mm label rolls
Bluetooth barcode scanner
Apollo kit carry case
110V adapter

Apollo 600 Elite Kit + Software
(order code **90-4360**) contains:
Apollo 600 PAT tester plus standard accessories
PATGuard 3 software 1year licence
Test 'n' Tag Elite 2 portable printer
4x Test 'n' Tag printer 25 x 52mm label rolls
Bluetooth barcode scanner
Apollo kit carry case
110V adapter

Apollo 600 Pro Kit (order code **90-4361**) contains:
Apollo 600 PAT tester plus standard accessories
Test 'n' Tag Pro lightweight portable printer
4x Test 'n' Tag printer 25 x 52mm label rolls
Bluetooth barcode scanner
Apollo kit carry case
110V adapter

Apollo 600 Pro Kit + Software (order code **90-4362**) contains:
Apollo 600 PAT tester plus standard accessories
PATGuard 3 software 1year licence
Test 'n' Tag Pro lightweight portable printer
4x Test 'n' Tag printer 25 x 52mm label rolls
Bluetooth barcode scanner
Apollo kit carry case
110V adapter

Only the **Apollo 600** integrates PAT testing with risk assessment so you can comply with the latest **IET Code of Practice**. The **Apollo 600** offers an all-in-one solution to managing a risk-based approach to health and safety in any workplace, reducing the burden and ensuring compliance.

Keep comprehensive client records including test and inspection reports, risk assessments and visual evidence with the help of Seaward's **PATGuard 3 Health and Safety Edition software**.

The **Apollo 600** is not only portable and lightweight; it is also a professional grade PAT tester with a fully downloadable memory, a detailed asset management system and integrated **QWERTY keyboard**. This makes it significantly easier to manage all aspects of daily PAT testing, from customer data to specific problems with equipment all being logged directly on the tester. For complete traceability of results, including proof of visual inspection, the Apollo 600 features an on-board camera, allowing photographs to be stored alongside risk assessments and other test and inspection data.

The **Apollo 600** can perform every PAT testing procedure and includes functions for earth continuity, insulation resistance, IEC lead, protective conductor current/load, touch current, load power/current, alternative leakage current, RCD and power sockets. It is fully suitable for use on IT and 110V equipment (provided the adapters are used) and can be used to check any appliance for electrical safety.

When the **Apollo 600** is purchased on its own or in a kit, it is supplied with the following **standard accessories**:

Apollo checkbox

30 day free trial of PATGuard 3
Carry case
2x test leads and probes with crocodile clips
0.5m IEC lead
Mains power lead
USB download cable
Quick start guide
UKAS calibration certificate

- Fully downloadable PAT tester
- 50,000 on-board record memory
- Storage for 2000 images
- Built-in full colour camera with flash - take visual evidence of appliance defects
- Bluetooth and USB connectivity for quick, easy download to PC
- Low current earth continuity test guarantees accurate measurements
- Insulation resistance testing
- IEC lead test
- Protective conductor current test
- Touch current test
- Load power/current testing
- Alternative leakage current testing
- Point-to-point testing function for use on fixed appliances
- RCD testing
- Power socket test
- Integrated QWERTY keyboard plus quick-access function keys
- Full colour LCD screen
- Comprehensive risk-based assessment tool
- Manufacturer: **Seaward**

Type	Order code	1+
Elite Bundle	**90-4359**	1817.00
Elite Bundle+Software	**90-4360**	1912.00
Pro Bundle	**90-4361**	1492.00
Pro Bundle+Software	**90-4362**	1587.00

563302

Thermometers & Thermal Imaging

Brannan

Green Fill Laboratory Thermometers

These green fill laboratory thermometers are a safe alternative to traditional mercury filling.

- Moulded glass triangular top to prevent rolling
- Available in 150mm, 200mm and 300mm lengths
- 150mm thermometer is available in total immersion and the 200mm and 300mm thermometers are available in partial immersion
- Temperature range –10 to +110°C
- Clear permanent markings

Type	Order code	1+
150mm	**85-2652**	1.45
200mm	**85-2653**	1.50
300mm	**85-2654**	1.55

072999

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 (supplied)
- Not suitable for transparent surfaces such as glass or plastic
- Includes user's guide

Type	Order code	1+
Voltcraft IR 260-8S	**51-1589**	22.72

523677

VOLTCRAFT®

IR 110-1S Infrared Thermometer

The Voltcraft IR-110-1S mini infrared thermometer is intended for non-contact measuring of temperatures of -33°C to +110°C. The IR-110-1S can also be used as a clock or a stopwatch. It is not suitable for industrial or medical use. The product is powered by a CR2032 battery.

- Small, convenient and accurate
- The ideal companion with a wide variety of optional features
- Min/ Max function
- Automatic power off after 15 seconds
- Duration measuring activated
- Integrated clock
- Stopwatch
- Display of the room temperature
- Switchable between C and F
- Optics 1:1
- Measuring range -30°C to +110°C
- Integrated stopwatch

Lithium battery (CR2032), Manual.

Please Note: *Use only in a dry indoor environment.*
Please Note: *It is not suitable for industrial or medical use.*

Type	Order code	1+
Voltcraft IR 110-1S	**51-5190**	15.60

525201

Education

8

Test Equipment

◆ FLIR

FLIR thermal cameras give students the opportunity to learn about heat and temperature in an interactive and engaging way. Instead of reading about friction, they're able to see how it works in real life. Rather than explain insulation, they can see firsthand the rate and speed of heat loss.

MAKING DIFFICULT CONCEPTS EASIER TO UNDERSTAND

Many concepts that involve heat and heat transfer are very theoretical and not always easy for students to understand. Using the FLIR infrared camera, difficult theory and equations come to life as colourful thermal images, making them easy for teachers to explain. A few concepts that can be easily visualised with a thermal imaging camera include:

· Thermal properties of material and objects
· Heat conduction, convection & radiation · Heat insulation
· Friction · Energy transformation · Phase change

Order code 85-3798
£370.00

C2 Educational R&D Thermal Camera Kit

Included in the kit are:

– FLIR C2 Thermal Camera
– Copy of FLIR ResearchIR Software
– Camera tripod mount
– Carrying lanyard
– Power supply and charger (with EU, UK, US, CN and AUS Plugs)
– Printed getting started guide
– USB Memory stick with documentation
– USB Cable

This marvellous **FLIR C2** kit has been specifically designed for use in education and R & D. The kit will help students understand temperature and the effects of power in a hands-on, real-time, dynamic way, studying local phenomena that is familiar and understandable. Using a thermal imaging camera makes it easy to study the effects of temperature on objects due to friction, heating and cooling. The kit is based around the FLIR C2, the world's first full-featured, pocket sized thermal camera.

The kit is suitable for use in both secondary and higher education, being capable of forming the basis of basic and advanced lessons. As a modern way of demonstrating temperature effects the thermal imaging camera is much better than rubbing hands together to study friction - just rub the desk with an eraser and observe the effects with FLIR C2. Teachers now can fully explain friction, backing up the theory with empirical evidence that students can see in real-time.

With the included FLIR **ResearchIR** software students and teachers can prepare professional reports based on the images captured on the camera, using the reports to study and discuss specific measurements from a controlled area, helping to understand temperature in greater detail.

Features of the ResearchIR software include:
– Image Display - completely resizable images with selectable colour and grey scale palettes
– Comprehensive Image Analysis Tools - real-time image analysis with spots, lines and areas
– Charting and Plotting - create profiles, histograms and temporal plots based on all measurement tools
● Based around the FLIR C2 thermal camera
● Fully featured kit
● Ideal for secondary and further education
● Documentation gets you up and running quickly

TG130 Spot Thermal Camera

The **FLIR TG130 Spot Thermal Camera** provides an economical way to bring infrared into the everyday world. With one button simplicity and a quick start up time, the TG130 is ready at hand to find simple energy leaks, check temperatures on electrical or heating appliances, or even just to see the family dog in a whole new light. A centre crosshair will pinpoint the measurement area, while the screen will display the temperature of the object in real time.

The TG130 is built around the FLIR Lepton Core, providing an imaging resolution of 80 x 60, for a total of 4800 pixels. The thermal detector can view and measure temperatures from -10°C to +150°C (+14°F to +302°F) a surprisingly wide span for such an economically priced thermal camera.

It can sense temperature differences as small as 0.1°C, creating an image that has the variation necessary to detect patterns of overheating, water leakage, or hidden pipes and studs in walls. The image on screen can be frozen temporarily by squeezing the trigger. Because simplicity and economy are the goals of the TG130 thermal camera, the unit is unable to record or store images and video as other cameras can. The TG130 is wonderfully small, light, and rugged and has an excellent build quality.

What's in the Box?
FLIR TG130 Spot thermal camera
Lanyard
3x AAA batteries
User manual

Order code 85-3598
£165.00

C3 Compact Thermal Imaging Camera with Wi-Fi

The FLIR C3 is a pocket-sized thermal imaging system that features an infrared camera and Wi-Fi data transfer. The unit is designed to be the perfect choice for application such as building inspections, facilities maintenance, HVAC, or electrical repair. The camera fits easily into a pocket so it can be taken anywhere and be ready for instant use, ideal for use in the field. The integrated 3in capacitive touch screen has auto orientation and is a snap to learn, getting you up and running quickly and easily, allowing you to start finding hidden problems, documenting repairs, and sharing images over the embedded Wi-Fi.

Along with the thermal imager, there is a fixed focus camera so that there are several image modes to choose from: thermal, visual, MSX, and picture-in-picture. The MSX mode adds visual details to full resolution thermal images, and the picture-in-picture mode allow the superimposition of an IR view over a visual view. Fully radiometric images gives the ability to measure any point in the image in post-analysis when the temperature is between -10°C and +150°C. Max/min box measurement finds the hottest or coldest temperature within a defined area.

Order code 85-3707
£657.00

The Wi-Fi connection allows the C3 to instantly connect to a mobile device or remote PC, so that critical issued can be reported immediately. The imager includes the FLIR Tools professional reporting software, for PC or Mac, that allows the streaming of live video. The Thermal imaging camera is supplied with lanyard, pouch, power supply/charger, tripod mount, USB cable, and printed documentation.

Uses for the C3 include:

Building - Let the FLIR C3 help you uncover missing insulation, drafts, and other hidden energy waste culprits. Find signs of invisible moisture, locate pipes in walls, and much more.

Electrical - Scan equipment for hot spots signalling loose connections and overloaded circuits to keep homes, businesses, and manufacturing safely up and running.

HVAC-R - FLIR C3 makes it easy to spot ductwork gaps and refrigerant issues, see overheating mechanical equipment, and inspect radiant floor heating systems.

For full details and to see our full range of Flir products visit **www.rapidonline.com**