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See page 5

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## WELCOME TO SELECT

Design with the best



Home Automation and Smart Metering technologies are used everyday to enhance our lives. New technologies have made automating the home and monitoring our energy usage both affordable and accessible. Touch screens, high performance processing and networking, wireless communications and sensor equipment have given us the ability to control our home environments better than ever before. We are now able to stream movies or music in any room, control temperature settings, programme alarms and operate equipment anywhere in the home. In some cases this is even possible remotely through our phones and PDAs!

The visibility and transparency that Smart Metering brings can be combined with the management of Home Automation to offer unprecedented control over our energy usage. The two can be combined to make systems such as heating and air conditioning operate at optimum times of the day, or could be used to detect motion in a room to help save energy usage and money. Electronics equipment can also be programmed to operate whilst cheaper electricity tariffs are active, again saving money as well as relieving pressure on the national energy grid.

In this issue of Select, we look at a wide range of home automation products including MCUs, DSPs, Zigbee components and modules, peripheral devices and test equipment. On page 4 we feature home automation and smart metering devices including suitable processor and DSP development tools from a range of leading manufacturers - ST, Microchip, Cypress Semiconductor Texas Instruments and Analog Devices.

Also featured inside, see innovative new products from leading manufacturers including Energy Micro, Innovate Software Solutions, Jennic and Bridgelux.

Get involved in the latest Home Automation and Smart Metering debates online at [www.element-14.com](http://www.element-14.com). Your chance to read, review and collaborate on a range of exciting topics. The solutions are out there, you just haven't registered yet...

Yours sincerely

Quintin Komaromy  
Marketing Director - Farnell Europe

**"Home Automation  
and Smart Metering  
technologies are used  
everyday to enhance  
all of our lives"**

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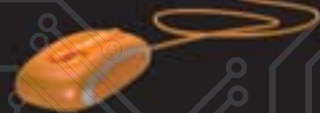
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### 32-bit ARM Cortex-M3 Microcontrollers



The LPC13xx devices are ARM Cortex-M3-based microcontrollers for embedded applications featuring a high level of integration and low power consumption. The ARM Cortex-M3 is a next generation core that offers system enhancements such as enhanced debug features and a higher level of support block integration.

The LPC13xx devices operate at CPU frequencies of up to 70MHz. The ARM Cortex-M3 CPU incorporates a 3-stage pipeline and uses a Harvard architecture with separate local instruction and data buses as well as a third bus for peripherals. The ARM Cortex-M3 CPU also includes an internal prefetch unit that supports speculative branching.

The peripheral complement of the LPC13xx includes up to 32KB of flash memory, up to 8KB of data memory, USB Device (LPC134x only), one Fast-mode plus (Fm+) I2C interface, one UART, four general purpose timers, and up to 42 general purpose I/O pins.

Pins/Pkg	Series	Flash (kB)	RAM (kB)	I/O Lines	Freq (MHz)	Operating Temperature	Mfrs. List No.	Order Code	Price Each			
									1+	10+	100+	250+
33/HVQFN	LPC1300	8	4	28	72	-40°C to +85°C	LPC1311FHN33	<b>176-2575</b>	1.50	1.23	0.90	0.86
33/HVQFN	LPC1300	16	4	28	72	-40°C to +85°C	LPC1342FHN33	<b>176-2579</b>	2.20	1.80	1.32	1.26
48/LQFP	LPC1300	32	8	42	72	-40°C to +85°C	LPC1313FBD48	<b>176-2577</b>	2.60	2.13	1.56	1.49
33/HVQFN	LPC1300	32	8	28	72	-40°C to +85°C	LPC1313FHN33	<b>176-2578</b>	2.20	1.80	1.32	1.26
48/LQFP	LPC1300	32	8	42	72	-40°C to +85°C	LPC1343FBD48	<b>176-2580</b>	3.30	2.70	1.98	1.88
33/HVQFN	LPC1300	32	8	28	72	-40°C to +85°C	LPC1343FHN33	<b>176-2581</b>	2.70	2.21	1.62	1.54

### CC2500/CC2550 Development Kit

The **CC2500/CC2550DK** development platform supports evaluation, development and prototyping. The user can test range and transfer data from one PC to another using the kits, straight out of the box, enabling the user to workout product fit for the intended application.

The **CC2550EM** contains the CC2550 chip and all the necessary external components, a 26MHz crystal with +/-10ppm initial tolerance and +/-10ppm temperature drift in the range 0 to + 50°C. The load capacitors used are 16pF. A 56kΩ 1% resistor is used to set up a biasing current for the CC2550. The components connected to the RF pins of the CC2550 match to 50 Ohms.

**CC2500/CC2550DK Includes:**

- 2x Evaluation Boards
- 2x CC2500 Evaluation Modules

**CC2550EM Includes:**

- 1x CC2550 Evaluation Module
- Cables and Antenna
- 2x Evaluation Modules
- Antenna

Mfrs. List No.	Description	Order Code	Price Each
CC2500-CC2550DK	Development Kit, CC2500-CC2550DK	<b>124-8465</b>	435.66
CC2500EMK	Evaluation Module Kit, CC2500EMK	<b>124-8476</b>	83.91

### MSP430-449STK2 MPS430F449 Starter Kit / Development Board



**Features:**

- MCU: MSP430F449
- JTAG connector
- RS232 connector
- RS232 interface circuit with Tx, Rx signals
- Dallas touch button port
- Frequency input
- LCD custom display
- LED status
- 4x buttons
- Buzzer
- 2x AA 1,5 V Battery holder
- 32 768 Hz oscillator crystal
- 8MHz crystall oscillator
- TEST pin pull-down
- RST/NMI pin pull-up
- Power supply filtering capacitor
- Extension headers for µC pins

Mfrs. List No.	Description	Order Code	Price Each
MSP430-449STK2	Starter Kit / Dev Board	<b>177-6329</b>	59.95

### MCP3901 Eval Board for 16-bit MCU



The MCP3901 ADC Evaluation Board for 16-Bit MCUs system provides the ability to evaluate the performance of the MCP3901 dual channel ADC. It also provides a development platform for 16-bit PIC based applications, using existing 100-pin PIM systems.

**Features:**

- Dual ADC MCP3901 output display using Serial comms to PC Software Interface
- Simultaneous 4ksps @ 90dB SINAD, top speed 55ksps performance on dual MCP3901 channels
- System and ADC performance analysis through graphical PC tools
- Robust hardware design with analog grounding and analog/digital separation
- PICTail Plus connectors for Explorer-16 daughter board compatibility

Mfrs. List No.	Description	Order Code	Price Each
MCP3901EV-MCU16	MCP3901 Eval Board for 16-bit MCU	<b>177-1314</b>	50.00

### STM8L101-EVAL Evaluation Board



The STM8L101-EVAL is composed of two boards:

- An STM8L1/L2 motherboard called MB709 which includes all peripherals which are connected to the MCU on the daughterboard. The motherboard connects to the daughter-board via two 36-pin connectors.
- An STM8L1 daughterboard called MB710 which has an STM8L101 MCU and a STice connector.

The motherboard and daughterboard are a complete development platform for STMicroelectronics' STM8L101 microcontroller with comparator, I2C, SPI, USART and SWIM debugging support.

The full range of hardware features on the motherboard helps users to evaluate all peripherals (MicroSD card™, USART, IrDA®, EEPROM, LCD, for example) and develop your own applications.

Mfrs. List No	Description	Order Code	Price Each
STM8L101-EVAL	Evaluation Board	<b>177-5395</b>	88.89

### Digital Multimeter

**Tektronix DMM4020**



H = 88mm, W = 217mm, D = 297mm

The Tektronix DMM4020 5.5 digit bench multimeter offers a broad range of functions in one easy-to-use instrument. You can also use the DMM4020 to measure frequency, and to perform continuity and diode tests. This allows you to replace your counter, continuity tester, and DMM with one versatile instrument, saving bench space and cost.

**DMM4020 Includes:** Meter, TL710 test leads, spare line fuse, statement of cal practices, Warranty statement, Safety and Installation Guide, Connectivity Installation Manual, CD-ROM with user manual (English, French, Italian, German, Spanish, Simplified Chinese, Traditional Chinese, Korean, Russian, Japanese), RS-232 to USB Adapter Cable, National Instruments LabVIEW SignalExpress™ Tektronix Edition, Limited Edition Software. Euro and UK power cords.

Mfrs. List No.	Description	Order Code	Price Each
DMM4020	Digital Multimeter	<b>177-1901</b>	496.00
<b>Accessories</b>			
TL725	SMD Test Tweezers, 2 X 4 Wire Ohms	<b>177-1904</b>	66.00
196-3520-00	Test Leads, Standard TL710	<b>177-1907</b>	22.00
TL705	Test Leads, Precision, 2X4 Wire	<b>177-1908</b>	50.00
Y8846S	Rackmount Kit, Single	<b>177-1909</b>	96.00
Y8846D	Rackmount Kit, Dual	<b>177-1910</b>	96.00



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### MCP3905 Evaluation Boards



1578434



1578435

Mfrs. List No.	Supported Devices	Description	Order Code	Price Each
MCP3905EV	MCP3905	MCP3905 Energy Meter Evaluation Board	157-8434	57.69
MCP3905RD-PM1	MCP3905	MCP3905 Energy Meter Reference Design	157-8435	34.62

#### MCP3905RD-PM1

A stand-alone low-cost energy meter that can act as either a stand alone energy meter, or as the analog front end design for LCD MCU-based meters. This design is specified with an energy measurement error of 0.1% typical across 1:500 dynamic range for high accurate energy meter designs and is compliant with EMC requirements per energy metering standards IEC62053 and legacy IEC61036, IEC1046 and IEC687.

### F2812 eZdsp Starter Kit



The TMX LF2812 eZdsp™ is a stand alone module that lets evaluators examine certain characteristics of the TMS320F2812 digital signal processor (DSP) to determine if this DSP meets their application requirements. This module has a single chip parallel port to JTAG scan controller. Therefore the module can be operated without additional development tools such as an emulator. Furthermore, the module is an excellent platform to develop, demonstrate, and run software for the TMS320F2812 processor.



Mfrs. List No.	Description	Order Code	Price Each
TMDSEZD2812	F2812 eZdsp Starter Kit	174-8909	275.22

### Hawkboard

OMAP-L138 (ARM 9 C674X Floating Point DSP)



Hawkboard is an open community board mainly designed to provide to the community a feature rich & economical solution based on TI's OMAP L138 processor. With a wide range of peripheral support, this board is an ultimate tool for digital media & storage applications.

The OMAP L138 offers an integrated ARM9 and a TI DSP. Its low power consumption level opens this system to a large range of Embedded & industrial applications.

#### Features:

- OMAPL 138 applications processor ( ARM 926 & C674X floating point DSP)
- 128MB low-power DDR2 RAM
- 128MB NAND flash
- USB 2.0 high-speed on-the-go port
- Ethernet
- SATA
- Composite Video In
- VGA
- SD/MMC
- Stereo audio in/output
- JTAG header
- UART
- I2C, SPI, VPIF, LCDC, Ecap, GPIO, PRU expansion header
- Power via USB or alternate jack

Mfrs. List No.	Description	Order Code	Price Each
ISSPLHAWK	Hawkboard	178-9013	73.69

### CY8CKIT-007 PSoC 3 Precision Analog Voltmeter Demo Kit



The CY8CKIT-007 PSoC® 3 Precision Analog Voltmeter Demo Kit highlights the broad precision analog capabilities of the PSoC 3 architecture. The kit showcases a PSoC 3 device as a single-chip voltmeter, using an onboard 20-bit Delta Sigma Analog-to-Digital Converter (ADC) to measure the voltage from the included test leads and onboard thermocouple while directly driving an LCD. With the kit, designers can use pre-configured op amp, ADC and analog mux components in the PSoC Creator™ Integrated Development Environment (IDE) to quickly and easily design industrial sensors, consumer sensors, glucose meters and other analog applications.



Mfrs. List No.	Description	Order Code	Price Each
CY8CKIT-007	PSoC 3 Precision Analog Voltmeter Demo Kit	178-1126	63.82

### Blackfin® BF518F EZ-Board™ & EZ-KIT Lite®



The Blackfin® ADZS-BF518F-EZBRD evaluation board provides developers with a low-cost platform for initial evaluation of the ADSP-BF512/F, BF514/F, BF516/F, BF518/F Blackfin processors via an external JTAG emulator or standalone debug agent board. The EZ-Board also supports uClinux®.



Note: To debug you must have a Debug Agent Board or Emulator. The EZ-Board has an expansion interface that allows for modularity with different EZ-Extender boards.

The Blackfin® ADZS-BF518F-EZLITE provides developers with a cost-effective method for initial evaluation of the ADSP-BF512/F, BF514/F, BF516/F, BF518/F Blackfin Processors via a USB-based, PC-hosted tool set. With this EZ-KIT Lite, users can learn more about the Analog Devices (AD) ADSP-BF518F hardware and software development, and quickly prototype a wide range of applications.

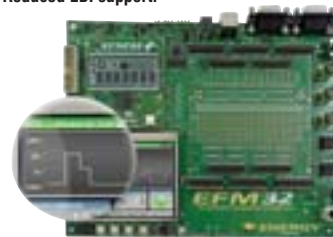
The EZ-KIT Lite includes an ADSP-BF518F Blackfin Processor desktop evaluation board along with an evaluation suite of the VisualDSP++ development and debugging environment, including the C/C++ compiler, assembler, and linker. The evaluation suite of VisualDSP++ is designed to be used with the EZ-KIT Lite only.

The EZ-KIT Lite also comes with a standalone debug agent board that is removable to allow a user to plug-in an external emulator.

Mfrs. List No.	Description	Order Code	Price Each
ADZS-BF518F-EZBRD	EZ-Board Evaluation Board	175-8264	215.61
ADZS-BF518F-EZLITE	EZ-KIT Lite Evaluation Kit	175-8265	328.39

### EFM32 Gecko Development Kit

Includes EFM32G890F128 MCU plug-in board with 160 segment LCD. Reduced EBI support.



The EFM32 Gecko Development Kit is a platform for rapid prototyping of ultra low power microcontroller applications. It consists of a mother board, a replaceable MCU-board and a prototyping-board, along with a comprehensive software development environment.

The development kit contains a unique Advanced Energy Monitoring (AEM) system that allows designers to have full control over their application's energy consumption. Combined with the possibility to isolate the motherboard's components not relevant for the end application, designers can optimize all variables that will make their application as energy efficient as possible.

#### Features:

- Advanced Energy Monitoring
- Real-time, accurate energy and power profiling
- User interface with joystick, switches, and potentiometer
- EXP32 expansion port, 2x RS232, IrDA, Memory Card
- Large EXP32 prototyping module
- 32 KB evaluation compiler versions

Mfrs. List No.	Description	Order Code	Price Each
EFM32-G8XX-DK	EFM32 Gecko Development Kit	179-0957	246.84



### MBED Prototyping Modules



The mbed module is a new community-based embedded development tool featuring the NXP LPC1768 or LPC2368 microcontroller. It allows the user to create, compile, and download embedded software for NXP's LPC series of MCUs using a browser-based GUI. There is no software to install - everything is online, even the compiler.



#### Features:

- 40-pin DIP, 0.1" pitch
- Programmed via USB
- 60MHz ARM, 32KB RAM, 512KB flash
- Ethernet, USB slave
- 2xSPI, 2xI2C, 3xUART, 1xCAN
- GPIO, 6xPWM, 6xADCs, 1xDAC
- C++ libraries and toolchain

Mfrs. List No	Description	Order Code	Price Each
OM11042	MBED Prototyping Module with LPC2368 MCU	176-1178	44.30
OM11043	MBED Prototyping Module with LPC1768 MCU	176-1179	44.30

### ST-LINK

In-Circuit Debugger/Programmer for STM8 and STM32



ST-LINK is a very low-cost, in-circuit debugger/programmer for the STM8L, STM8S and STM32. It connects to application or evaluation boards for programming and debugging via STMicroelectronics' SWIM single-wire connection for the STM8L and STM8S and via a JTAG standard connection for STM32 microcontrollers.

#### Features and Benefits:

- 5 V power supplied by USB connector
- USB 2.0 full speed interface compatible
- USB standard A to Mini-B cable provided



#### STM8 SWIM specific features:

- 1.65 V to 5.5 V application voltage supported
- SWIM low-speed and high-speed modes supported
- SWIM cable provided for connection to an application with an ERNI standard vertical or horizontal connector
- SWIM cable for connection to an application with pin headers or 2.54 mm pitch connector

#### STM32 JTAG specific features:

- 3 V to 3.6 V application voltage supported on JTAG interface and 5 V tolerant inputs
- JTAG cable provided for connection to a standard JTAG 20-pin 2.54 mm pitch connector

Mfrs. List No	Description	Order Code	Price Each
ST-LINK	In-Circuit debugger/programmer	177-9159	17.83

### STM8S-DISCOVERY Evaluation Board



The STM8S-Discovery kit, is the cheapest and quickest way to discover the STM8S, to build and debug the application, and to program and use the device. It is a quick-start evaluation board based on the STM8S105C6T6, and it includes the embedded

debugger ST-LINK and one touch-sensing button which helps users to discover the STM8 features.

Plug the STM8S-Discovery into a PC through a standard USB cable and run the proposed example. Once the debugger is open, users will see the real-time execution of the code. Numerous applications are available in order to learn, re-use and modify codes for a fast time to proof-of-concept or demonstration.

#### Features:

- STM8S105C microcontroller
- Powered by USB cable between PC and STM8S-DISCOVERY
- Selectable power of 5 V or 3.3 V
- Embedded ST-Link for STM8S
- USB interface for programming and debugging
- SWIM debug support
- Touch Sensing button, TS1
- User LED, LD1
- Extension header for all I/Os
- Wrapping area for users own application

Mfrs. List No	Description	Order Code	Price Each
STM8S-DISCOVERY	Discovery Board for STM8S (32K flash) MCUs	177-5251	4.25



### ADSP-BF506F EZ-KIT Lite



The ADSP-BF506F EZ-KIT Lite® provides developers with a cost-effective method for initial evaluation of the ADSP-BF504/F and BF506F Blackfin® Processors via a USB-based, PC-hosted tool set. With this EZ-KIT Lite, users can learn more about the Analog Devices (ADI) ADSP-BF506F hardware and software development, and quickly prototype a wide range of applications.



Mfrs. List No.	Description	Order Code	Price Each
ADZS-BF506F-EZLITE	BF506F EZ-KIT Lite	178-1106	130.16

### nanoWatt XLP 16-bit Development Board



The 16-bit XLP Development Board is designed with extreme low power in mind. Designed as a true platform for low power development, this board utilizes techniques such as MCU controlled component power sources that keep board level current consumption to a minimum. It can be used with all XLP PIC24 Microcontrollers in 20 or 28-pins. The 16-bit XLP Development board supports battery power (AAA, CR2032), energy harvesting, or separate power supplies providing flexibility to the extreme.



#### Features:

- mTouch™ capacitive buttons
- RS-232 communications
- Temperature sensor
- Serial EEPROM
- Watch crystal for RTCC
- Serial to USB link for PC connectivity
- Dual LEDs
- Small prototyping area
- Expansion via a PICtail™ connector

Mfrs. List No.	Description	Order Code	Price Each
DM240311	nanoWatt XLP 16-bit Development Board	176-1254	36.25

### F1 Evaluation Platform



The F1 Evaluation Platform is a demonstration/development tool for Enhanced Mid-range PIC microcontrollers (PIC12F1xxx/PIC16F1xxx). Populated with a PIC16LF1937 featuring XLP technology, this platform consists of a 44-pin development board with prototyping space, 3V LCD glass, support for the Motor Control add-on (DM164130-2), and support for PICKit 3 & PICKit Serial. This kit provides a platform for general purpose development, and includes demonstrations focusing on Low Power, LCD, and Motor Control.



Mfrs. List No.	Description	Order Code	Price Each
DM164130-1	F1 Evaluation Platform	176-1253	24.17

### JN5148 ZigBee PRO Devices



The **JN5148-001** is an ultra low power, high performance wireless MCU targeted at ZigBee PRO networking applications. The device features an enhanced 32-bit RISC processor offering high coding efficiency through variable width instructions, a multi-stage instruction pipeline and low power operation with programmable clock speeds. The **JN5148-EK010** ZigBee PRO evaluation kit provides a complete environment for the development of ZigBee PRO applications based on the JN5148 wireless microcontroller.



The kit contains a complete package of hardware and software, including five wireless sensor nodes, an unrestricted SDK and example code.

The **JN5148-UG010** allows users with existing JN5139-EKxxx evaluation kits to upgrade to ZigBee PRO with the JN5148-UG010 ZigBee Upgrade Kit. It contains 7 modules in total; 5 are standard power and 2 are high power modules.

The **JN5148-001-M0x** family is a range of ultra low power, high performance surface mount modules targeted at ZigBee PRO networking applications, enabling users to realise products with minimum time to market and at the lowest cost. They remove the need for expensive and lengthy development of custom RF board designs and test suites.

Mfrs. List No.	Description	Order Code	Price Each
<b>JN5148 MCU</b>			
JN5148-001	Wireless Microcontroller	173-9339	6.86
<b>JN5148 Kits</b>			
JN5148-EK010	ZigBee PRO Evaluation Kit	173-9333	409.00
JN5148-UG010	ZigBee PRO Upgrade Kit	173-9334	150.00
<b>JN5148 Modules</b>			
JN5148-001-M00	ZigBee PRO Module - Integrated Antenna	173-9336	13.83
JN5148-001-M03	ZigBee PRO Module - UFL Connector	173-9337	15.27
JN5148-001-M04	ZigBee PRO Module - UFL Connector, PA & LNA	173-9338	20.91

## Wireless CPUs & Development Kits Q26 Family



The **Q2686** is equipped with up to 44 GPIOs and is especially suited to applications which require a high number of connections. The Open AT® OS runs on an ARM9 core, providing applications with up to 87 MIPS (using VariSpeed). It features a market-leading range of peripheral interfaces, including companion Bluetooth® and GPS.

The **Q2687** is an automotive-grade Wireless CPU® which is backwards compatible with the Q2686, forwards compatible with 3G evolutions and their cellular software application development environments so that application portability is made easy. It also supports a new parallel data bus for interfacing to displays and external memory and data bearers up to EDGE.

The **Q2686H-DK** and **Q2687H-DK** Development Kits allow Development of Automotive, industrial M2M and Mobile Professional applications. All functions of the kits are provided by the wireless CPU.

	Q2686H	Q2687H
Core Processor	ARM9, 32 bit, 104 MHz running Open AT® RTOS as standard	ARM9 4 6, 32 bit, 104 MHz running Open AT® RTOS as standard
Memory	Internal, supports up to 128Mb Flash, 128 MB PSRAM	Internal, 32 / 8 Mb Flash
Digital Control	Up to 44 GPIO, 2 INT, 2 SPI, 1 I2C, 5 x 5 keyboard	
Digital Comms	2 UART, USB 2.0	2 UART, USB 2.0 , 1 parallel ports , 1 DAC
Analogue Interfaces	2 ADC	
Audio Interfaces	2 analogue channels, 1 PCM	
Cellular Radio	Global operation (auad GSM band: 800/900/1800/1900 MHz)	
Cellular Data	GSM standard SMS, Fax, CSD (circuit), GPRS cl 10 (packet)	GSM standard SMS, Fax, CSD (circuit), GPRS cl 10 (packet), EDGE cl 10
Cellular Voice	Quad codec (FR/HR/EFR/AMR), VDA2A	
RF and IO connectivity	1 UFL connector for GSM FR, 1 RF connection which allows to support board to board solution, 100 I/O Pins connector	
Dimensions	L40 x W32.2 x H 4mm	L40 x W32 x H 6.55mm

Description	Mfrs. List No.	Order Code	Price Each
Wismo Quik GSM/GPRS Quad Band Module	Q2686H	165-6750	60.01
Wismo Quik Q2687H GSM/GPRS/EDGE Quad Band Module	Q2687H	165-6769	53.82
Q2686H Development Kit	Q2686H DK	165-6753	504.56
Q2687H Development Kit	Q2687H DK	165-6751	610.52

## AMBZ300 ZigBee / IEEE802.15.4 Transceiver Module



The AMBZ300 is a compact, powerful 2.4 GHz transceiver module. It combines the latest transceiver technology with a tested antenna configuration and wiring in a single module. With just a few external components, it is possible to set up a ZigBee-compatible network solution. Due to the small size, the outstanding performance with low power consumption, and the easy modular handling, the AMBZ300 is a trendsetter in the domain of ZigBee OEM modules.

### Features:

- RF Transceiver (second generation)
- 2.4 GHz ISM frequency band
- Excellent RX sensitivity up to -98 dBm
- Programmable output power up to 5 dBm
- Compact form factor: 16 x 27 x 3.3 mm
- Large supply voltage range from 1.8 V to 3.8 V
- Hardware support for IEEE802.15.4 conformity
- Easy to interface via SPI
- Configurable IOs and energy saving modes
- Complies with R&TTE directive 1999/5/EC
- Integrated ceramic antenna

Mfrs. List No	Description	Order Code	Price Each
AMBZ300	ZigBee / IEEE802.15.4 Transceiver Module	174-9520	16.34

## Drop-in Networking Professional Development Kits for XBee ZB



The Drop-in Networking Professional Development Kits for XBee® ZB provides the hardware and software tools necessary to rapidly deploy a real-world ZigBee sensor / device network. All hardware components are pre-configured to run ZigBee networking software, which is optimized for low-power, battery-fueled operation.

### Features:

- Easily configure a low-power ZigBee sensor/device network
- Conduct a basic wireless range test
- Provide IP connectivity to the ZigBee network using the ConnectPort X4 gateway
- Monitor light and temperature readings from the XBee ZB wall router

Mfrs List No.	Description	Order Code	Price Each
XK-Z11-EBP-WB	Drop-in Networking Pro Dev Kit for XBee ZB - UK	175-1801	239.11
XK-Z11-EBP-WE	Drop-in Networking Pro Dev Kit for XBee ZB - Europe	175-1802	239.11

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## CC2530 ZigBee Development Kit



The **CC2530ZDK** is designed to deliver the most powerful elements for ZigBee and ZigBee PRO development in the market today. The kit is based on TI's second generation 2.4GHz IEEE 802.15.4 compliant System-on-Chip, the CC2530, and contains all hardware, software, tools, and documentation necessary to build a ZigBee compliant product. The CC2530ZDK includes CC2530-based evaluation modules, SmartRF05EB and SmartRFBB development boards, a USB interface dongle, cables, antennas and documentation to get you up and running with the ZStack on the CC2530.

Mfrs. List No.	Description	Order Code	Price Each
CC2530ZDK	CC2530 ZigBee Development Kit	175-2230	435.98

## Fastrack Supreme Wireless CPU® Development Kit & Terminal



The Fastrack Supreme Wireless CPU® keeps the same versatile form factor as previous FASTRACK products and is designed with expandability in mind. Users can easily add additional IO and features (like GPS, WiFi, Bluetooth, Zigbee and more) thanks to a new open standard internal expansion socket (IES) interface that can be populated with an expansion card from Wavecom or one of your own.

The Fastrack Supreme Development Kit is a ready-to-go hardware and software development platform which provides the user with all the tools and accessories needed to prove concepts, deliver prototypes or develop an end user application.

Mfrs. List No.	Description	Order Code	Price Each
FSU002 8XN500	Fastrack Supreme Terminal	165-6754	143.45
FSUD05-DK	Fastrack Supreme Development Kit	165-6755	320.51

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## ARF32 Class2 Bluetooth® Modules for Data or Audio Transmission



These miniature modules enable full duplex Bluetooth® data or audio transmissions over 20m. They use the international 2.45 GHz frequency band as described by European Directive RTTE / EN300-328 / EN301-489 and US FCC part 15 (USA/CAN). This module is Bluetooth "V2 End Product" certified, meaning users are able to directly use the Bluetooth® logo. Data transmission and configuration are both managed through

UART-type TTL serial interface. The air rate is 723kbps. Miniature antenna is included. With the "Data" version, the embedded SPP profile allows the ARF32 module to establish a wireless serial connection with PDAs, laptops, mobile phones or any other Bluetooth enabled device.

The "Audio" version offers, on top of the data features, an SCO link that supports HFP, HSP and HSAG profiles. By using the HSAG profile, the ARF32 module becomes a gateway to any generic Bluetooth headset. With the HFP and HSP profiles, and with additional basic microphone and speaker, the ARF32 module becomes a hand-free system.

Both Data and Audio versions are extremely easy to use, evaluate and integrate with the tools included in the DemoKits.

### Specifications:

- Class 2 Bluetooth®
- Frequency on the free wavebands 2.4 - 2.5GHz
- Totally complies with the Bluetooth® V2 standard
- Radio rate up to 723 kbps
- Serial link rate: up to 921.6 kbps
- Integrated miniature antenna on the PCB
- On-board SPP profile totally compatible with the PDA, portable PC and Bluetooth® GSM

Mfrs. List No.	Description	Order Code	Price Each
ARF7044A	Class2 Bluetooth® Module - Data Version	175-3619	21.43
ARF7208A	Class2 Bluetooth® Module - Data & Analog Audio Version	175-3621	26.34

## DemoKit Bluetooth - Wireless DemoKits for Class1 & Class2 Bluetooth® Modules



The main functions of the new ADEUNIS RF wireless DemoKits include evaluating ADEUNIS RF products, measuring RF and developing a prototype. These DemoKits are an ideal way to evaluate the Adeunis RF Bluetooth® modules and comprise a demo board, module, power supply cable and documentation. They are available for the following products:

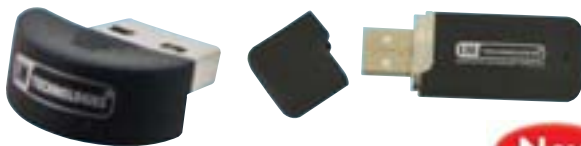
- ARF32 Data - Class2 Bluetooth® Module for Data Transmission
  - ARF32 Data & Audio - Class 2 Bluetooth® Module for Audio Transmission
  - ARF52 - Class1 Bluetooth® Module
- Ease of implementation and configuration by an AT command set limits the risks associated with new technology and optimises time-to-market, especially for those who are not familiar with the detailed design of RF systems.

### Specifications:

- Immediate connection to a PC serial port, permitting in particular, simple and rapid configuration of the radio module with the parameters required by the application
- Implement measurements of sensitivity, power and all RF parameters
- All the DemoKits have chip areas as well as direct access to all the radio module's signals permitting easy addition of additional electronics
- Configuration using AT commands
- Bluetooth® certified "end user" solution
- Fully compliant with the Bluetooth® V2 standard
- Data or Audio versions
- Applications: geo-localization, payment terminals, connection compatible with PDAs, laptops, GSM, etc.

Mfrs. List No.	Description	Order Code	Price Each
ARF7069B	ARF32 - RS232 "Data" DemoKit	175-3620	88.39
ARF7213B	ARF32 - RS232 "Audio" DemoKit	175-3622	88.39
ARF6469B	ARF52 - RS232 Class1 DemoKit	175-3624	133.04

## Bluetooth USB Adapters



These Bluetooth EDR USB adapters allow connection from a desktop or laptop computer to other Bluetooth enabled devices.

The **LM505** Nano Bluetooth EDR USB adapter is the worlds smallest Bluetooth adapter that discreetly fits in to the USB port of a Laptop or desktop computer. The **LM055** is a Class 2 - 40 Metre Bluetooth USB adapter with the latest EDR Chipset and Vista compatibility.

The **LM056** Bluetooth EDR USB adapter allows connect a desktop or laptop computer to other Bluetooth enabled devices within a 250 Metre range.

Mfrs. List No.	Description	Order Code	Price Each
LM505	Nano Bluetooth USB Adapter	169-6625	6.75
LM055	40 Metre Bluetooth USB Adapter	169-6624	6.50

## nDolphin RF Digital Lock Kit



The nDolphin is a new name in RF digital locks, which allows Implementation of 13.56MHz RFID technology.

It is both durable and reliable with dual stainless lock features. Due to minimised power consumption it has a long lasting battery life and is also user friendly for both customers and administrators.

### Features:

- Automatic lock feature
- External emergency power source for battery exhaustion
- Signal alert for battery exchange (Approx. 40x use after first signal alert)
- Signal alert for irregular locked door
- Signal alert for forced breakage
- Easy security restrictions
- Functions as locker handle

Mfrs. List No.	Description	Order Code	Price Each
NDOLPHIN	RF Digital Lock Kit	161-6966	59.12

## USB RFID Reader & RFID Tags (125kHz)



The **MOD-RFID125** is a USB plug in module that works with every USB host which supports HID Keyboard and CDC.

It reads RFID125 kHz tags from 5 - 15 cm in distance and emulates a USB keyboard or Virtual COM port. These RFID tags operate at 125kHz and are suitable for MOD-RFID125 module. They come in different shape and have different reading distances. Generally the bigger the tag, the further the reading distance.



### Features:

- EM4102 64 bit Read only tag
- Operating Temperature -40°C to +85°C
- Relative Humidity 5% to 90% non-condensing
- Operating frequency 125kHz

Mfrs. List No.	Description	Order Code	Price Each
MOD-RFID125	USB RFID Reader	170-1545	39.95
RFID125-CSH	Clamshell Card Tag	170-1548	2.92
RFID125-STI	Sticker Tag	170-1549	3.68
RFID125-KEY	Keyfob Tag	170-1550	3.68

## XPort® Pro™ Embedded Networking Modules & Development Kit



The XPort® Pro™ is Lantronix' most powerful, self-contained embedded networking module. Footprint compatible with the popular XPort® and running either Linux or Evolution OS® operating systems, the XPort Pro eliminates the complexity of designing network connectivity into a product and allows you to deploy advanced applications on the edge device itself.

Mfrs. List No.	Description	Order Code	Price Each
XPP100200S-01R	XPort Pro - Evolution OS	177-4242	52.29
XPP100300S-01R	XPort Pro - Linux OS	177-4243	52.29
XP10010NMK-01	Universal Demo Board	177-4245	77.66

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## ETRX2 Wireless Mesh Networking Ethernet Access Points



The EAP-E -PA Ethernet access point allow access to an ETRX2 or ETRX2-PA wireless mesh networking module via Ethernet using the Lantronix® XPort® Direct™ serial to Ethernet bridge device. The Telegesis AT-Command interface - based on the EmberZNet meshing stack - can be easily accessed by the application software using telnet or by creating a virtual COM port using the supported Lantronix® CPR (COM Port Redirector) software for windows.

### Features Include:

- Complete TCP/IP protocol stack and Windows deployment software
- Interface: Ethernet 10Base-T or 100Base-TX (Auto-Sensing)
- Link and activity indicator (LED)
- Management: Telnet and Microsoft Windows®-based utility for configuration
- Can offer access to the remote AT-Command Interface via a virtual Com port
- SIF interface for Custom application development and real time debugging of custom firmware

Mfrs. List No.	Description	Order Code	Price Each
EAP-E-PA	Power Amplified Wireless Mesh Networking Ethernet Access Point	160-6672	97.29

## Intel® 82574 Family Gigabit Ethernet Controllers

The 82574 family (82574L and 82574IT) are single, compact, low power components that offer a fully-integrated Gigabit Ethernet Media Access Control (MAC) and Physical Layer (PHY) port. The 82574 uses the PCI Express\* (PCIe\*) architecture and provides a single-port implementation in a relatively small area so it can be used for server and client configurations as a LAN on Motherboard (LOM) design. The 82574 family can also be used in embedded applications such as switch add-on cards and network appliances.



Interface	Message Signal Interrupt	NC Sideband Interface	RX Side Scaling	Jumbo Frames Supported	Time Sync Protocol Indicator	Lithography	Max TDP	Temperature Range	Mfrs. List No.	Order Code	Price Each
Single PCIe v1.1 (2.5GT/s)	✓	✓	✓	✓	✓	90 nm	0.727 W	-40°C to 85°C	WG82574L S LB9A	174-0826	5.66
Single PCIe v1.1 (2.5GT/s)	✓	✓	✓	✓	✓	90 nm	0.727 W	-40°C to 85°C	WG82574IT S LBAC	174-0827	6.86

## LAN9xxx Ethernet Products



The **LAN9211** is a full-featured, single chip 10/100 Ethernet controller designed for embedded applications. It has been designed to provide high performance and throughput for 16-bit applications. The LAN9211 is fully IEEE 802.3 10BASE-T and 100BASE-TX compliant and supports HP Auto-MDIX.

The **LAN9500** is a high performance Hi-Speed 2.0 USB to 10/100 Ethernet controller. It contains an integrated 10/100 Ethernet PHY, USB PHY, Hi speed USB 2.0 device controller, 10/100 Ethernet MAC, TAP controller, EEPROM and FIFO controllers with total of 30kb of internal packet buffering.

The **LAN9215** is a full-featured, single chip 10/100 Ethernet controller designed for embedded applications. It has been architected to provide the best price-performance ratio for 16-bit applications with medium performance requirements.

The **LAN9218** is a full-featured, single chip 10/100 Ethernet controller designed for embedded applications. It has been architected to provide the highest performance possible for any given architecture. The LAN9218 is fully IEEE 802.3 10BASE-T and 100BASE-TX compliant and support HP Auto-MDIX.

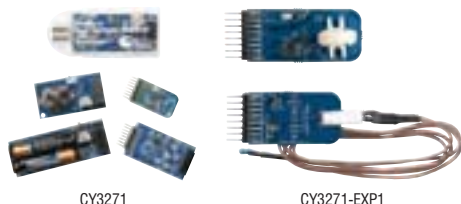
The **LAN9221** is a full-featured, single chip 10/100 Ethernet controller designed for embedded applications. It has been designed to provide high performance and throughput for 16-bit applications. The LAN9221 is fully IEEE 802.3 10BASE-T and 100BASE-TX compliant and supports HP Auto-MDIX. The variable voltage I/O signals accommodate lower voltage I/O signalling without the need for voltage level shifters.

The **LAN9313** is a full featured, 3 port 10/100 managed Ethernet switch designed for embedded application. It combines all functions of a 10/100 switch system including the switch fabric, packet buffers, buffer manager, MAC controllers, PHY transceivers and serial management.



Pins/Pkg	Description	Supply Voltage	Operating Temperature	Mfrs. List No.	Order Code	1+	10+	100+	Price Each
56/QFN	Ethernet Controller with HP Auto-MDIX Support	3 to 3.6V	0°C to +70°C	LAN9211-ABZJ	171-1346	9.95	7.74	5.81	
100/TQFP	Non-PCI 10/100 Ethernet Controller with HP Auto-MDIX Support	3 to 3.6V	0°C to +70°C	LAN9215-MT	171-1347	12.75	9.91	7.44	
100/TQFP	10/100 Ethernet Controller with HP Auto-MDIX Support	3 to 3.6V	0°C to +70°C	LAN9218-MT	171-1348	22.98	17.87	13.41	
56/QFN	Non-PCI 10/100 Ethernet Controller with Variable Voltage I/O	1.62 to 3.6V	0°C to +70°C	LAN9221-ABZJ	171-1351	9.41	8.37	6.28	
128/TQFP	Three Port 10/100 Managed Ethernet Switch with MII	3 to 3.6V	0°C to +70°C	LAN9313-NU	171-1352	11.30	8.79	6.59	
56/QFN	Hi-Speed USB 2.0 to 10/100 Ethernet Controller	3 to 3.6V	-40°C to +85°C	LAN9500I-ABZJ	171-1353	11.95	9.30	6.98	

## PSoC FirstTouch Starter Kit & Environmental Sensing Kit



CY3271

CY3271-EXP1

The **CY3271** Starter Kit allows evaluation of the PSoC programmable system-on-chip and CyFi low-power RF in CapSense™ touch-sensing, proximity-sensing, temperature-sensing, and light-sensing applications. It includes a PC dongle with RF, an RF expansion card with power amplification for long-range applications, a multifunction expansion card, and two battery packs (2xAAA and CR2032). It also features the PSoC Designer IDE and Cypress's Sense and Control Dashboard software.

The **CY3271-EXP1** is an expansion kit for the CY3271 PSoC FirstTouch Starter Kit. Included in the kit are two boards; the Weather Station Expansion Board (atmospheric pressure, humidity, temperature, and ambient light) and the Pigtail Thermistor Expansion Board. The Sense & Control Dashboard (SCD) from the CY3271 Kit lets users quickly setup and monitor a wired or wireless sensor network through an intuitive visual dashboard. Easily demonstrate features such as data logging, data aggregation, alarms, and sensor calibration for nearly any type of sensor.

Mfrs. List No.	Description	Order Code	Price Each
CY3271	PSoC FirstTouch Starter Kit	167-2996	86.24
CY3271-EXP1	Environmental Sensing Kit	167-2997	86.24

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## CY8CKIT-006 and CY8CKIT-029 LCD Segment Drive kits



The **CY8CKIT-006** PSoC® 3 LCD Segment Drive Evaluation Kit and **CY8CKIT-029** PSoC LCD Segment Drive Expansion Board Kit show the ease-of-use, fast development time and flexibility of the PSoC 3 architecture for LCD segment drive applications. The kits demonstrate how a single PSoC 3 device can drive up to 736 LCD segments, more than any microcontroller-based solution. With the kits, designers can leverage the drag-and-drop LCD Drive component in the PSoC Creator™ Integrated Development Environment (IDE) to quickly and easily design products with an LCD screen for the consumer electronics, handheld, medical, industrial, white goods, automotive and other markets

Mfrs. List No.	Description	Order Code	Price Each
CY8CKIT-006	PSoC® 3 LCD Segment Drive Evaluation Kit	178-0584	90.30
CY8CKIT-029	PSoC LCD Segment Drive Expansion Board Kit	178-0585	35.76

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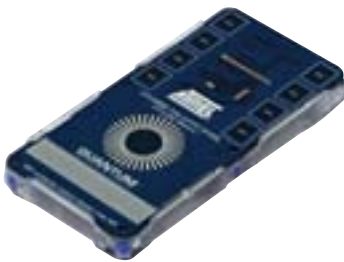
### KITMPL115A: Digital Barometric Sensor Evaluation Boards



KITMPL115A1SPI and KITMPL115A2I2C are evaluation boards consisting of the Freescale MPL115A1 or A2 (SPI or I2C, respectively) digital pressure sensor on a PCB. This aids the customer with a fast prototyping and evaluation tool for our latest pressure sensor. They include all required filters and pull-up resistors for quick connection to a microcontroller. Simply biasing voltage, ground and digital SPI or I2C connections to the microcontroller will start the evaluation process.

Mfrs. List No	Description	Order Code	Price Each
KITMPL115A1SPI	Digital Barometric Sensor Evaluation Board (SPI)	177-8231	11.05
KITMPL115A2I2C	Digital Barometric Sensor Evaluation Board (I2C)	177-8232	11.05

### AVRTS2080A / AVRTS2080B Evaluation Kits



- The **AVRTS2080A** kit is preloaded with software for two buttons, one slider and one rotor.
- The **AVRTS2080B** kit is preloaded with software for four buttons and one rotor.

The AVRTS2080A & AVRTS2080B boards are ideal kits for evaluating the Atmel Touch Library implemented on the ATmega88. By downloading the Atmel Touch Library other configurations can be created and uploaded to the boards. Please note that this requires the use of an external programmer e.g. ATAVRISP mkII or AVR Dragon.

Mfrs. List No.	Description	Order Code	Price Each
ATAVRTS2080A	Evaluation Kit	177-3395	165.31
ATAVRTS2080B	Evaluation Kit	177-3396	165.31

### AccessTouch

Touch Sensitive Keyed Access Controller



AccessTouch is an integrated combination key access controller using capacitive touch sensing technology and featuring tough-sensitive keys for vandal-proof operation. The PCB keyboard shown can be overlaid by a non-metallic covering. It automatically calculates signal averages to compensate for track capacitance, water splashes, etc. A buzzer output provides audio feedback as buttons are pressed.

The unpopulated board includes provision for:

- 20-pin, 28-pin and 40-pin DIL USB devices
- Type B socket, suitable for standard USB cables
- Type A plug, suitable for USB extension cables
- Prototyping area
- RS232 line driver, 9-pin sockets in DTE and DCE configurations
- RS485 line driver
- Coin cell battery
- SPI serial memory
- 28-pin DIL host processor
- 3 active low LEDs
- 3 active high LEDs
- 3 jumpers
- Photodiode
- Thermistor

Mfrs List No.	Description	Order Code	Price Each
ACCESS-TOUCH	Pre-Programmed 20-Pin SSOP	167-0841	6.64
ACCESS-TOUCH-EVAL	Evaluation Board	167-0842	71.43

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### AR1000 Development Kit



The mTouch AR1000 Development Kit provides everything designers need to get started using AR1000 resistive controllers for a turn-key, cost effective solution. The kit includes the AR1000 development board, a 7" four-wire resistive touch screen, a PICKit™ Serial Analyzer and all necessary interface cables, as well as a CD containing technical documentation and all necessary software. The CD also includes an easy-to-use AR1000 configuration utility, which has a Graphical User Interface (GUI) that enables designers to test all user-configurable options with the AR1000 controllers.

Mfrs. List No.	Description	Order Code	Price Each
DV102011	AR1000 Development Kit	174-0243	61.17

### mTouch Cap Touch Evaluation Kit



The mTouch Capacitive Evaluation Kit provides a simple platform for developing a variety of capacitive touch sense applications using PIC16F or PIC24F microcontrollers. The Diagnostic Tool provided allows the user to analyze application-critical information in real-time as it relates to touch sensor behaviour.

• Kit Includes:

- PIC16F727 CSM Motherboard
- PIC24FJ64GB106 Motherboard
- Direct 8 Key Board
- 12-Key Matrix Sensor Board
- 4-Channel Slider Sensor Board
- 2-Channel Slider Sensor Board
- PICKit Serial Analyzer
- USB Cable

Mfrs. List No.	Description	Order Code	Price Each
DM183026	mTouch Cap Touch Evaluation Kit	171-8592	51.97

### 4-Button Inductive Touch Board



The PICDEM Inductive Touch Development Kit is an evaluation and development platform for Microchips Inductive Touch Technology. Factory programmed firmware provides immediate access to all the boards features through the use of the MPLAB mTouch plug-in. Using a PICKit Serial analyzer to communicate with the PC, it allows the user to analyze application critical information in real-time as it relates to sensor behaviour.

Features:

- Populated with a PIC16F1936
- Embossed Aluminum 4 Buttons Front Panel
- Buzzer and LEDs for feedback
- ICSP™ programming header
- PICKit™ Serial Analyzer connectivity

Mfrs. List No.	Description	Order Code	Price Each
DM183027	4-Button Inductive Touch Board	177-8502	43.48

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# Lightning Strikes - Ohmite Protects

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### 3mm / T-1, AlInGaP LED Lamps



- High luminous intensity output
- Low power consumption
- High efficiency
- Versatile mounting on PCB or panel
- I.C. Compatible/low current requirement
- Applications include status indicator, backlighting front panels, light pipe sources and lighted switches

Operating Temperature -40°C to +100°C

Colour	Lens	Viewing Angle	Luminous Intensity		Current If (mA)	Voltage Vf Max (V)	Peak Wavelength (nm)	Mftrs. List No.	Order Code	Price Each			
			Typ (mcd)	Max (mcd)						10+	50+	250+	1K+
Amber	Untinted Non-diffused	45°	400	20	2.2	595	HLMP-Y701-G0000	173-5246	0.160	0.150	0.139	0.128	
Green	Untinted Non-diffused	30°	310	20	2.4	575	HLMP-Y801-JPP00	173-5247	0.160	0.150	0.139	0.128	
Orange	Untinted Non-diffused	45°	680	20	2.4	611	HLMP-Y901-J0000	173-5248	0.160	0.150	0.139	0.128	
Red	Untinted Non-diffused	45°	680	20	2.2	633	HLMP-Y601-J0000	173-5244	0.160	0.150	0.139	0.128	
Red / Orange	Untinted Non-diffused	45°	680	20	2.2	622	HLMP-Y951-K0000	173-5249	0.160	0.150	0.139	0.128	
Deep Red	Untinted Non-diffused	45°	300	20	2.2	652	HLMP-Y651-G0000	173-5245	0.160	0.150	0.139	0.128	

### Moonstone™

#### 1W Power LED Light Source



- Energy efficient
- High current operation
- Long operation life
- Wide viewing angle
- Silicone encapsulation
- Applications include architectural lighting, garden lighting and decorative lighting



Colour	Viewing Angle	Luminous Intensity Typ (lm)	Current If (mA)	Voltage Vf Max (V)	Mftrs. List No.	Order Code	Price Each				
							1+	25+	100+	250+	500+
Warm White	130°	60	350	4	ASMT-AY00-NST00	170-5247	1.92	1.66	1.58	1.51	1.46
Blue	120°	15	350	4	ASMT-MB00-NDFO0	170-5248	2.31	2.00	1.91	1.82	1.76
Blue	120°	15	350	4	ASMT-MBKO-NDFO0	170-5249	3.21	2.77	2.64	2.53	2.44
Green	120°	60	350	4	ASMT-MG00-NJK00	170-5250	2.49	2.16	2.07	1.96	1.89
Green	120°	60	350	4	ASMT-MGKO-NJK00	170-5251	3.47	3.00	2.87	2.73	2.64

### 3W Miniature High-Power LEDs



Power Dissipation Forward Current Operating Temperature

AllInGaP	InGaN
2450mW	3010mW
700mA	700mA
-40°C to +100°C	-40°C to +105°C

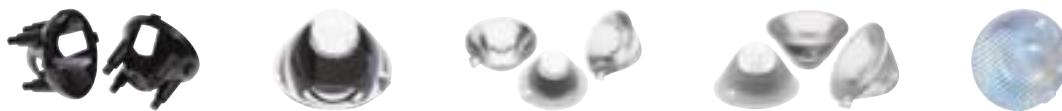
- Energy efficient
- Direct heat transfer from metal slug to mother board
- Compatible with reflow soldering process
- High current operation
- Long operation life
- Silicone encapsulation
- Non-ESD sensitive (threshold > 16Kv)



L=5, W=4, D=1.85  
LED dia.=3.7

Colour	Viewing Angle	Luminous Flux / (Radiometric Power)		Voltage Vf (V)		Wavelength / (Colour Temperature)		Material	Mftrs. List No.	Order Code	Price Each				
		Typ	Max	Min	Max	Dom. / (Min)	Peak / (Max)				1+	25+	100+	250+	500+
Cool White	140°	85lm	113.6lm	4	4.3	(4500K)	(10000K)	InGaN	ASMT-JW31-NTV01	171-8399	2.45	2.17	1.97	1.76	1.69
Cool White	140°	95lm	113.6lm	3.5	4	(4500K)	(10000K)	InGaN	ASMT-JW31-NUV01	176-1161	1.97	1.76	1.57	1.40	1.37
Neutral White	140°	150lm	198lm	4	4.3	(3500K)	(4500K)	InGaN	ASMT-JN31-NTV01	171-8401	1.76	1.55	1.40	1.25	1.21
Warm White	140°	120lm	171lm	4	4.3	(2700K)	(3500K)	InGaN	ASMT-JY31-NSU01	171-8402	2.45	2.17	1.97	1.76	1.69
Amber	165°	80lm	120lm	2.8	3.5	590nm	598nm	AllInGaP	ASMT-JA30-ARS01	171-8394	1.50	1.33	1.20	1.07	1.04
Blue	165°	3333	50lm	4	4.3	470nm	460nm	InGaN	ASMT-JB31-NMP01	171-8397	1.68	1.49	1.34	1.20	1.16
Royal Blue	165°	(650mW)	(515mW)	4	4.3	455nm	450nm	InGaN	ASMT-JL31-NPQ01	171-8398	1.68	1.49	1.34	1.20	1.16
Green	165°	120lm	153lm	4	4.3	525nm	519nm	InGaN	ASMT-JG31-NST01	171-8403	2.02	1.80	1.62	1.45	1.40
Red	165°	80lm	120lm	2.8	3.5	625nm	635nm	AllInGaP	ASMT-JR30-ARS01	171-8395	2.10	1.86	1.68	1.50	1.46
Red / Orange	165°	80lm	120lm	2.8	3.5	615nm	625nm	AllInGaP	ASMT-JH30-ARS01	171-8396	1.50	1.33	1.20	1.07	1.04

### Lenses and LED Holders



177-4870, 177-4871, 177-4877, 177-4878

177-4872, 177-4880

177-4873, 177-4881

177-4874, 177-4879, 177-4882, 177-4883

177-4875, 177-4884

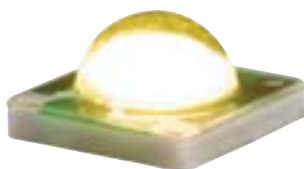


Colour / Type	For Use With	Mftrs. List No.	Order Code	10+	50+	100+
<b>LED Holders</b>						
Black	-	10489	177-4870	0.15	0.14	0.12
Black	-	10499	177-4871	0.15	0.14	0.12
Black	-	10481	177-4877	0.34	0.32	0.30
Black	-	10491	177-4878	0.34	0.32	0.30
<b>Lenses</b>						
Plain Tight	Avago Aveon LEDs	10048	177-4872	1.12	1.07	1.01
Plain Tight	Avago Moonstone LEDs	10391	177-4880	1.12	1.07	1.01
Frost Narrow	Avago Aveon LEDs	10108	177-4874	1.12	1.07	1.01
Frost Narrow	Avago Moonstone LEDs	10392	177-4881	1.12	1.07	1.01
Frost Medium	Avago Aveon LEDs	10124	177-4873	1.12	1.07	1.01
Frost Medium	Avago Moonstone LEDs	10393	177-4882	1.12	1.07	1.01
Soft Frost Wide	Avago Jade LEDs	10260	177-4879	1.12	1.07	1.01
Soft Frost Wide	Avago Moonstone LEDs	10394	177-4883	1.12	1.07	1.01
Elliptical Beam	Avago Aveon LEDs	10049	177-4875	1.12	1.07	1.01
Elliptical Beam	Avago Moonstone LEDs	10395	177-4884	1.12	1.07	1.01





### XPE Series



- Small footprint
- Low thermal resistance 9°C/W
- Electrically isolated base
- New colour versions now available

Colour	Viewing Angle	Luminous Intensity		Current If (mA)	Voltage Vf Max (V)	Mftrs. List No.	Order Code	Price Each				
		Typ (lm)	Max (lm)					1+	25+	50+	100+	250+
Cool White	115°	100	700	3.9	3.9	XPEWHT-L1-R250-00C01	164-9030	4.83	3.98	3.62	3.38	3.11
Cool White	115°	107	700	3.4	3.4	XPEWHT-L1-R250-00D01	168-8707	5.63	5.00	4.59	4.25	3.95
Cool White	115°	114	700	3.4	3.4	XPEWHT-L1-R250-00E01	168-8708	7.23	6.42	5.90	5.46	5.07
Neutral White	115°	87.4	700	3.9	3.9	XPEWHT-L1-R250-00AE5	164-9044	5.26	4.32	3.94	3.67	3.39
Warm White	115°	73.9	700	3.9	3.9	XPEWHT-L1-R250-008E7	164-9045	4.81	3.97	3.61	3.36	3.10
Amber	130°	51.7	500	2.5	2.5	XPEAMB-L1-R250-00401	172-7689	2.03	1.89	1.81	--	--
Blue	130°	30.6	1000	3.9	3.9	XPEBLU-L1-R250-00Y01	172-7687	2.93	2.72	2.61	--	--
Green	130°	100	700	3.9	3.9	XPEGRN-L1-R250-00C01	172-7688	4.06	3.77	3.62	--	--
Red	130°	51.7	700	2.5	2.5	XPERED-L1-R250-00401	172-7691	2.03	1.89	1.81	--	--
Red / Orange	130°	56.8	700	2.5	2.5	XPERDO-L1-R250-00501	172-7690	2.10	1.95	1.87	--	--

### MCE Series



- Industry's first lighting-class multi-chip LED
- Individually addressable LEDs
- Electrically neutral thermal path
- New colour versions now available

Dimensions L=9, W=7, D=4.48

Colour	Viewing Angle	Luminous Intensity		Colour Temperature		Current If (mA)	Voltage Vf Max (V)	Mftrs. List No.	Order Code	Price Each			
		Typ (lm)	Max (lm)	Min (K)	Max (K)					1+	25+	50+	100+
Cool White	110°	370	2600	3700	700	3.9	3.9	MCE4WT-A2-0000-000K01	164-9028	15.84	13.04	11.88	11.09
Cool White	110°	430	10000	5000	700	3.9	3.9	MCE4WT-A2-0000-000M01	168-8706	17.98	15.69	14.38	13.28
Neutral White	110°	320	3700	5000	700	3.9	3.9	MCE4WT-A2-0000-000JE5	164-9027	16.21	13.35	12.16	11.35
Warm White	110°	280	5000	10000	700	3.9	3.9	MCE4WT-A2-0000-000HE7	164-9026	15.05	12.43	11.42	10.53
Red - Green - Blue - White	115°	95	--	--	350	3.9	3.9	MCE4CT-A2-0000-00A5AAAA1	172-7693	9.24	8.59	8.23	--
Red - Green - Blue - White	115°	80	--	--	350	3.9	3.9	MCE4CT-A2-0000-00A4AAAB1	172-7694	9.24	8.59	8.23	--

### Acriche



- Designed for AC source operation and high flux output applications
- 110V or 230V environmentally friendly semiconductor lighting that can be used in AC without additional device
- Thermal management perform exceeds other power LED solutions
- Incorporates state of the art SMD design and thermal emission material
- Applications include architectural lighting, task lighting, decorative / pathway lighting and household appliances

Operating Temperature 25mm x 25mm -30°C to +85°C  
30mm x 30mm -40°C to +85°C

Colour	LED Size	Viewing Angle	Luminous Flux		Current If (mA)	Voltage Vf Max (V)	Mftrs. List No.	Order Code	Price Each				
			Typ (lm)	Max (lm)					1+	5+	20+	100+	250+
Pure White	25mm x 25mm	110°	80	20	110	110	AW2214	173-4730	6.90	6.19	5.69	--	--
Pure White	30mm x 30mm	130°	215	40	110	110	AW3211	173-4731	11.61	10.70	10.48	10.14	10.02
Pure White	30mm x 30mm	130°	215	20	230	230	AW3231	173-4729	11.61	10.70	10.48	10.14	10.02
Warm White	25mm x 25mm	110°	65	20	110	110	AN2214	173-4728	9.59	8.87	8.32	--	--
Warm White	30mm x 30mm	130°	145	40	110	110	AN3211	173-4732	11.61	10.70	10.48	10.14	10.02
Warm White	30mm x 30mm	130°	145	20	230	230	AN3231	173-4733	11.61	10.70	10.48	10.14	10.02

### Acriche Modules



176-8726, 176-8732



176-8729, 176-8733



176-8730, 176-8734



176-8731, 176-8735

Colour	Luminous Flux (lm)	Current If (mA)	Voltage Vf Max (V)	Mftrs. List No.	Order Code	Price Each	
						1+	20+
Warm White	200	40	110	AN4211	176-8726	10.85	
Warm White	200	40	110	AN4212	176-8729	10.43	
Warm White	200	40	110	AN4213	176-8730	11.27	
Warm White	400	80	110	AN4214	176-8731	20.57	
Warm White	200	20	220	AN4221	176-8732	10.85	
Warm White	200	20	220	AN4222	176-8733	10.43	
Warm White	200	20	220	AN4223	176-8734	11.27	
Warm White	400	40	220	AN4224	176-8735	20.57	

**ES Array Series**



178-7306      178-7313, 178-7314      178-7315, 178-7316      178-7307, 178-7308, 178-7309



Operating Temperature -40°C to +105°C

**Features**

- Compact high flux density light source
- Uniform high quality illumination
- Streamlined thermal path
- Energy Star / ANSI compliant binning structure
- More energy efficient than incandescent, halogen and fluorescent lamps
- Low voltage DC operation
- Instant light with unlimited dimming
- Long operating life

**Benefits**

- Enhanced optical control
- Clean white light without pixilation
- Significantly reduced thermal resistance and increased operating temperatures
- Uniform consistent white light
- Lower operating costs
- Increased safety
- Easy to use with daylight and motion detectors to enable increased energy savings
- Reduced maintenance costs
- Environmentally friendly, no disposal issues

Star	Colour	Viewing Angle	Luminous Flux (lm)	Current If (mA)	Voltage Vf Max (V)	CCT (K)	Colour Rendering Index	Mftrs. List No.	Order Code	Price Each	
										1+	100+
Star	Cool White	120°	450	500	9.5	5600	65	BXRA-C0402-00000	178-7306	4.70	4.23
	Warm White	120°	440	700	9.5	3000	82	BXRA-W0401-00000	178-7313	5.91	5.31
	Warm White	120°	460	700	9	3000	82	BXRA-W0402-00000	178-7314	6.93	6.23
Square	Cool White	120°	880	700	12.7	5600	65	BXRA-C0802-00000	178-7307	8.89	8.00
	Cool White	120°	1320	1.05	12.8	5600	65	BXRA-C1202-00000	178-7308	12.02	10.82
	Cool White	120°	2200	1.5	16.2	5600	65	BXRA-C2002-00000	178-7309	18.75	16.88
	Warm White	120°	930	1.05	12.2	3000	82	BXRA-W0802-00000	178-7315	12.48	11.22
	Warm White	120°	1320	1.2	15.1	3000	82	BXRA-W1202-00000	178-7316	18.24	16.42

**LS Array Series**



178-7304      178-7311, 178-7312



Operating Temperature -40°C to +105°C

**Features**

- Compact high flux density light source
- Uniform high quality illumination
- Streamlined thermal path
- Energy Star / ANSI compliant binning structure
- More energy efficient than incandescent, halogen and fluorescent lamps
- Low voltage DC operation
- Instant light with unlimited dimming
- Long operating life

**Benefits**

- Enhanced optical control
- Clean white light without pixilation
- Significantly reduced thermal resistance and increased operating temperatures
- Uniform consistent white light
- Lower operating costs
- Increased safety
- Easy to use with daylight and motion detectors to enable increased energy savings
- Reduced maintenance costs
- Environmentally friendly, no disposal issue

Mini	Colour	Viewing Angle	Luminous Flux (lm)	Current If (mA)	Voltage Vf Max (V)	CCT (K)	Colour Rendering Index	Mftrs. List No.	Order Code	Price Each	
										1+	100+
Mini	Cool White	120°	400	350	13.2	5600	65	BXRA-C0360-00000	178-7304	3.40	3.06
	Warm White	120°	265	350	13.2	3000	82	BXRA-W0240-00000	178-7311	3.62	3.26
	Warm White	120°	295	350	12.6	3000	82	BXRA-W0260-00000	178-7312	4.14	3.74

**RS Array Series**



178-7310      178-7318



Operating Temperature -40°C to +105°C

**Features**

- Compact high flux density light source
- Uniform high quality illumination
- Streamlined thermal path
- Energy Star / ANSI compliant binning structure
- More energy efficient than incandescent, halogen and fluorescent lamps
- Low voltage DC operation
- Instant light with unlimited dimming
- Long operating life

**Benefits**

- Enhanced optical control
- Clean white light without pixilation
- Significantly reduced thermal resistance and increased operating temperatures
- Uniform consistent white light
- Lower operating costs
- Increased safety
- Easy to use with daylight and motion detectors to enable increased energy savings
- Reduced maintenance costs
- Environmentally friendly, no disposal issue

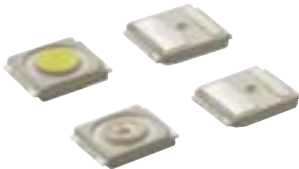
Mega	Colour	Viewing Angle	Luminous Flux (lm)	Current If (mA)	Voltage Vf Max (V)	CCT (K)	Colour Rendering Index	Mftrs. List No.	Order Code	Price Each	
										1+	100+
Mega	Cool White	120°	5000	2.1	25.4	5600	65	BXRA-C4500-00000	178-7310	46.98	42.43
	Warm White	120°	3400	2.1	25.4	3000	82	BXRA-W3000-00000	178-7318	51.73	46.56

601079





### Little Star®



- One of the most robust and light efficient LEDs in the market
- Extremely high level of brightness and the ultra low high profile
- Highly suitable for both conventional lighting and specialized applications
- Applications include automotive signal lights, traffic lights, channel lights, tube lights and garden lights

Operating Temperature -40°C to +100°C

Colour	LED Size	Viewing Angle	Luminous Intensity			Current If (mA)	Voltage Vf Max (V)	Mfrs. List No.	Order Code	Price Each			
			Min (mcd)	Typ (mcd)	Max (mcd)					1+	10+	50+	100+
White	3mm	120°	14000	-	18000	350	4	VLMW711ADAF-GS08	156-1018	4.97	--	--	--
White	3mm	120°	-	25000	-	350	4	VLMW711T3U2US-GS08	176-5223	2.92	2.70	2.59	2.30
White	3mm	120°	-	29700	-	350	4	VLMW711U2U3XV-GS08	176-5222	2.92	2.70	2.59	2.30
Warm White	3mm	120°	18000	-	22400	350	4	VLMW71ACAE-GS08	156-1019	3.83	--	--	--
Warm White	3mm	120°	-	19000	-	350	4	VLMW71S2S3QN-GS08	176-5224	3.10	2.87	2.75	2.43
Amber	3mm	120°	9000	-	11250	400	2.8	VLMK71ABAD-GS08	156-1015	1.59	--	--	--
Red	3mm	120°	7150	-	9000	400	2.8	VLMR71AAAC-GS08	156-1016	1.61	--	--	--
Yellow	3mm	120°	7150	-	9000	400	2.8	VLMY71AAAC-GS08	156-1020	2.38	--	--	--

### M-Tubes

Flexible or Rigid LED-powered Light Tubes for low Energy, Long-life Illumination



M-Tubes from opto-electronic innovators Mentor GmbH deliver many of the properties of fluorescent or cold cathode technologies but have all of the advantages of LEDs. Either standard or hi-brightness LED-sourced light is input at each end of a crystal-clear light guide tube (both rigid and flexible versions are available). A printed reflective strip along the length of the tube delivers even, diffused and targeted light. There are no hot spots of lights as found with LED strips. M-Tubes are suitable for multiple applications including:-

- Architecture - stairs and edges, emergency lighting, ambience / decorative lighting, cove lighting, lift doors etc.
- Industrial electronics - switchgear cabinet illumination, service light, danger signals etc.
- Household - illumination and backlighting of all kinds
- Automotive and marine - light curtains, signal lights, contour illumination, ambience / decorative lighting

The light guide tubes can be up to 700mm in length and either 6mm or 10mm diameter. Brightness level of a 548mm ultra-white hi-brightness M-Tube is 250lx compared with 307lx from a typical 10W 500mm fluorescent tube. Energy-efficient with minimal heat generation - in terms of cost per kWh, the hi-brightness version is 63% cheaper than fluorescent tube and 94% cheaper than tungsten bulbs (approximate). Service life of around 50,000 hours to 50% brightness compares with typical tungsten bulb life of around 1,000 hours. Service life is unaffected by on/off actuations. Immediate full luminosity (no warm-up). Impervious to extremes of temperature - operating range -40°C to +70°C. Available in red, green, blue and up to three Kelvins of white. Dimmability of all LEDs and RGB colour control are possible using alternative power sources (not supplied).

### M-Tubes - Hi-Brightness LED Light System



- The Dragon LEDs used in Hi-Brightness M-Tubes deliver an impressive intensity of illumination whilst still retaining the benefits of low-energy and longevity
- An aluminium profile regulates the thermo-management of these powerful LEDs, whilst at the same time acting as a reflector and an elegant design feature
- As well as fully assembled units with sockets for power-in, unusual design requirements are accommodated for by the availability of modular components

### Complete Hi-Brightness Units

With aluminium profiles, DC/DC converters and female plug sockets (please note, AC / DC adaptor needs to be ordered separately)


Colour	Colour Temperature (K)	Current Consumption Max (mA)	Operating Voltage DC (V)	Mfrs. List No.	Order Code	Price Each
						1+
<b>448.3mm Long Aluminium Profile</b>						
Ultra White	6500	500	11 - 15	1322.1320	177-3103	57.45
Warm White	3500	500	11 - 15	1322.1420	177-3104	57.45
White	5600	500	11 - 15	1322.1520	177-3105	57.45
Red	-	500	11 - 15	1322.1220	177-3106	51.69
Blue	-	500	11 - 15	1322.1620	177-3107	57.45
Green	-	500	11 - 15	1322.1820	177-3108	57.45
<b>548.3mm Long Aluminium Profile</b>						
Ultra White	6500	500	11 - 15	1322.1330	177-3109	59.50
Warm White	3500	500	11 - 15	1322.1430	177-3110	59.50
White	5600	500	11 - 15	1322.1530	177-3111	59.50
Red	-	500	11 - 15	1322.1230	177-3113	53.75
Blue	-	500	11 - 15	1322.1630	177-3114	59.50
Green	-	500	11 - 15	1322.1830	177-3115	59.50
<b>748.3mm Long Aluminium Profile</b>						
Ultra White	6500	500	11 - 15	1322.1340	177-3116	69.60
Warm White	3500	500	11 - 15	1322.1440	177-3117	69.60
White	5600	500	11 - 15	1322.1540	177-3118	69.60
Red	-	500	11 - 15	1322.1240	177-3119	63.84
Blue	-	500	11 - 15	1322.1640	177-3120	69.60
Green	-	500	11 - 15	1322.1840	177-3121	69.60
<b>948.3mm Long Aluminium Profile</b>						
Ultra White	6500	500	11 - 15	1322.1350	177-3122	71.62
Warm White	3500	500	11 - 15	1322.1450	177-3123	71.62
White	5600	500	11 - 15	1322.1550	177-3125	71.62
Red	-	500	11 - 15	1322.1250	177-3126	65.86
Blue	-	500	11 - 15	1322.1650	177-3127	71.62
Green	-	500	11 - 15	1322.1850	177-3128	71.62

Continues on next page




## Modular Hi-Brightness Units

### Light Guides


	Dimensions	Mfrs. List No.	Order Code	Price Each
	Ø10 x 100mm	1320.1010	177-3052	1+
	Ø10 x 300mm	1320.1030	177-3053	2.98
	Ø10 x 500mm	1320.1050	177-3054	6.12
	Ø10 x 700mm	1320.1070	177-3055	9.26
				12.40

### LED Housings

M-Tube hi-brightness LED and housing (32.6mm aluminium) single module with stranded wire and split sleeve for Ø10mm flexible or rigid M-Tube light guides (one required for each unit)

	Colour	Colour Temperature (K)	Forward Current (mA)	Voltage Vf Typ (V)	Mfrs. List No.	Order Code	Price Each
	Ultra White	6500	600	3.6	1322.1300	177-3089	1+
	Warm White	3500	600	3.6	1322.1400	177-3090	14.02
	White	5600	600	3.6	1322.1500	177-3091	14.02
	Blue	-	600	3.6	1322.1600	177-3092	14.02
	Green	-	600	3.6	1322.1800	177-3093	14.02
	Red	-	600	2.1	1322.1200	177-3095	11.14

M-Tube hi-brightness LED and housing (63.1mm aluminium) single module with DC / DC converter, stranded wire and split sleeve for Ø10mm flexible or rigid M-Tube light guides (one required for each unit)

	Colour	Colour Temperature (K)	Current Consumption Max (mA)	Operating Voltage DC (V)	Mfrs. List No.	Order Code	Price Each
	Ultra White	6500	500	11 - 15	1322.1301	177-3096	1+
	Warm White	3500	500	11 - 15	1322.1401	177-3097	28.07
	White	5600	500	11 - 15	1322.1501	177-3098	28.07
	Blue	-	500	11 - 15	1322.1601	177-3099	28.07
	Green	-	500	11 - 15	1322.1801	177-3101	28.07
	Red	-	500	11 - 15	1322.1201	177-3102	28.07

### Power Supplies

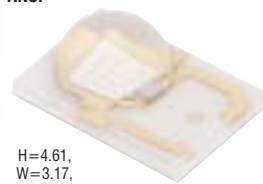
Description	Mfrs. List No.	Order Code	Price Each
 AC / DC adaptor for hi-brightness M-Tubes	1322.1000	177-3133	1+
 Power supply extension 3m	1322.0100	177-3134	11.67
			5.94

### Accessories

Description	Mfrs. List No.	Order Code	Price Each
 Fastening device for Ø6mm M-Tube	1320.0020	177-3062	3+
 Fastening device for Ø10mm M-Tube	1320.0040	177-3063	0.82
 Diffuser cover with end caps 450mm long	1322.0020	177-3129	1+
 Diffuser cover with end caps 550mm long	1322.0030	177-3130	7.59
 Diffuser cover with end caps 750mm long	1322.0040	177-3131	9.42
 Diffuser cover with end caps 950mm long	1322.0050	177-3132	12.52
			13.66

## LUXEON® Rebel Illumination

### ANSI



H=4.61,  
W=3.17,  
D=2.1

- LUXEON® Rebel Illumination emitters deliver optimized combinations of light quality and light output needed for today's lighting applications
- These parts deliver the efficacy, lifetime and reliability that all LUXEON Rebel LEDs are renowned for
- ANSI compliant binning
- Exceed ENERGY STAR® lumen maintenance requirements
- High efficacy for sustainable design
- More light delivered at operating temperature



Colour	Viewing Angle	Luminous Flux		Colour Temperature			Voltage Vf Max (V)	Mfrs. List No.	Order Code	Price Each			
		Min (lm)	Typ (lm)	Min (K)	Typ (K)	Max (K)				1+	10+	50+	100+
White	120°	75	85	3710	3985	4260	3.99	LXM3-PW51	177-4892	4.58	3.33	3.05	2.82
White	120°	67	80	3220	3465	3710	3.99	LXM3-PW61	177-4893	4.58	3.33	3.05	2.82
White	120°	66	77	2870	3045	3220	3.99	LXM3-PW71	177-4894	4.58	3.33	3.05	2.82
White	120°	65	73	2580	2725	2870	3.99	LXM3-PW81	177-4895	4.58	3.33	3.05	2.82
White	120°	90	105	6020	6530	7040	3.99	LXML-PW11	177-4896	4.26	3.10	2.84	2.62
White	120°	90	105	5310	5665	6020	3.99	LXML-PW21	177-4897	4.26	3.10	2.84	2.62
White	120°	90	105	4745	5028	5311	3.99	LXML-PW31	177-4898	4.58	3.33	3.05	2.82
White	120°	90	105	3710	3985	4260	3.99	LXML-PW51	177-4899	4.58	3.33	3.05	2.82
White	120°	50	66	2870	3045	3220	3.99	LXML-PW71	177-4900	4.73	3.33	3.05	2.82

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## Light Bars



Adaptor

Colour	Viewing Angle	No. of LEDs	Luminous Flux (lm)	Colour Temperature (°K)	Operating Voltage (V)	Mfrs. List No.	Order Code	1+	10+	50+	100+		
<b>300mm</b>													
Cool White	100°	60	220	5500	24	LB3002006CW	<b>178-3813</b>	36.36	32.73	30.91	29.09		
White	100°	60	200	3500	24	LB3002006NW	<b>178-3812</b>	36.36	32.73	30.91	29.09		
<b>600mm</b>													
Cool White	100°	120	440	5500	24	LB6002012CW	<b>178-3815</b>	70.45	63.41	59.89	56.36		
White	100°	120	400	3500	24	LB6002012NW	<b>178-3814</b>	70.45	63.41	59.89	56.36		
Operating Voltage (V)		Power Consumption (W)		Operating Temperature Range		Mfrs. List No.	Order Code	1+	10+	50+	100+		
Adaptor		24		12		0°C to +40C		PSLB01	<b>178-3817</b>	15.68	14.11	13.33	12.55

## Panel Circuit Indicators

3.2mm x 2.9mm x 1.9mm



- Surface-mount devices
- Flat-top type
- High luminous intensity
- Low drive current, high-intensity light emission
- Colours: red, orange, yellow, blue, white(warm), green
- Applications include automotive use, message signboards and backlighting

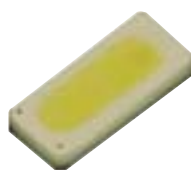
Operating Temperature -40°C to +100°C

**TOSHIBA**



Colour	Luminous Intensity Typ (mcd)	Current If (mA)	Voltage Vf Max (V)	Mfrs. List No.	Order Code	1+	25+	100+	250+	500+
White	1500	20	3.8	TLWK1100B(T11)	<b>168-4616</b>	2.670	1.810	1.350	1.050	0.880
White	1700	30	3.2	TLWK1100C(T11)	<b>176-1574</b>	0.630	0.600	0.580	0.570	--
Warm White	1500	30	3.8	TLWVK1100B(T11)	<b>176-1576</b>	0.630	0.600	0.580	0.570	--
Warm White	1500	30	3.8	TLWLK1100B(T11)	<b>176-1577</b>	0.630	0.600	0.580	0.570	--
Blue	100	20	4.3	TLRPA1100(T11)	<b>176-1591</b>	0.950	0.930	0.870	0.810	--
Fresh Green	45	20	2.4	TLFGE1100B(T11)	<b>176-1585</b>	0.187	0.185	0.174	0.164	--
Pure Green	35	20	2.5	TLPGH1100B(T11.TEE)	<b>176-1588</b>	0.280	0.270	0.260	0.240	--
Orange	500	20	2.5	TLOK1100C(T11)	<b>168-4612</b>	1.680	1.130	0.850	0.650	0.560
Orange	270	20	2.3	TLOH1100B(T11)	<b>176-1587</b>	0.240	0.220	0.210	0.185	--
Red	300	20	2.5	TLRK1100C(T11)	<b>168-4613</b>	1.670	1.120	0.840	0.650	0.550
Red	400	20	2.5	TLRMK1100C(T11)	<b>168-4614</b>	1.560	1.050	0.790	0.610	0.510
Red	500	20	2.5	TLSK1100C(T11)	<b>168-4615</b>	1.810	1.220	0.920	0.710	0.600
Red	150	20	2.3	TLRH1100B(T11)	<b>176-1589</b>	0.240	0.220	0.210	0.185	--
Red	150	20	2.3	TLRMH1100B(T11)	<b>176-1590</b>	0.240	0.220	0.210	0.185	--
Red	260	20	2.3	TLSH1100B(T11)	<b>176-1592</b>	0.240	0.220	0.210	0.185	--
Green	150	20	2.5	TLGH1100B(T11.TEE)	<b>176-1586</b>	0.280	0.270	0.260	0.240	--
Yellow	400	20	2.5	TLYK1100C(T11)	<b>168-4617</b>	1.830	1.240	0.930	0.720	0.610
Yellow	220	20	2.3	TLYH1100B(T11)	<b>176-1593</b>	0.240	0.220	0.210	0.185	--

## Power LEDs



Slim



- High luminous flux
- Colors: White, Neutral White and Warm White
- Operating / storage temperature: -40°C to 100°C
- Reflow-solderable
- Applications include LCD backlighting

Operating Temperature -40°C to +100°C

**TOSHIBA**



Colour	LED Size (L x W x H)	Viewing Angle	Luminous Flux Typ @ If (lm)	Current If (mA)	Voltage Vf Max (V)	Mfrs. List No.	Order Code	1+	25+	100+	500+
<b>0.5W</b>											
White	4.5mm x 2mm x 0.8 mm	120°	19	180	3.8	TL30W01-D(T36)	<b>176-1578</b>	2.20	2.14	2.03	1.86
<b>0.8W</b>											
White	10.5mm x 5mm x 2.1mm	120°	40	300	3.4	TL12W01-D(T30)	<b>176-1579</b>	2.31	2.25	2.13	1.95
Warm White	10.5mm x 5mm x 2.1mm	120°	30	300	3.4	TL12W01-L(T30)	<b>176-1580</b>	2.31	2.25	2.13	1.95
<b>1.7W</b>											
White	10.5mm x 5mm x 2.1mm	120°	90	300	6.8	TL12W02-D(T30)	<b>176-1581</b>	3.59	3.47	3.29	3.02
Neutral White	10.5mm x 5mm x 2.1mm	120°	90	300	7.9	TL12W02-N(T30)	<b>176-1582</b>	3.59	3.47	3.29	3.02
Warm White	10.5mm x 5mm x 2.1mm	120°	60	300	7.9	TL12W02-L(T30)	<b>176-1583</b>	3.59	3.47	3.29	3.02

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**High Power**



Style A



Style B



Style C



Style D



Style E



Style F

- High luminous flux
- Excellent heat transfer

Operating Temperature -40°C to +75°C



537570

Colour	Luminous Flux		Current If (mA)	Voltage Vf (V)		Wavelength (nm)		Style	Mfrs. List No.	Order Code	Price Each				
	Min (lm)	Max (lm)		Min	Max	Min	Max				1+	25+	50+	100+	225+
White	67	147.6	700	4.25	-	-	-	A	OSW-1301	171-6738	8.65	7.86	7.08	6.29	5.50
White	147	323	1500	4.25	-	-	-	A	OSW-1501	171-6735	8.65	7.86	7.08	6.29	5.50
White	67	147.6	700	4.25	-	-	-	B	OSW-4301	171-6757	7.97	7.25	6.52	5.80	5.07
White	67	147.6	700	4.25	-	-	-	D	OSW-6301	171-6751	7.97	7.25	6.52	5.80	5.07
White	67	147.6	700	4.25	-	-	-	C	OSW-8301	171-6742	10.14	9.22	8.30	7.38	6.45
Warm White	51	113	700	4.25	-	-	-	A	OSW-1302	171-6739	8.70	7.91	7.12	6.33	5.54
Warm White	113	248	1500	4.25	-	-	-	A	OSW-1502	171-6737	8.70	7.91	7.12	6.33	5.54
Warm White	67	147.6	700	4.25	-	-	-	B	OSW-4302	171-6758	8.00	7.27	6.55	5.82	5.09
Warm White	67	147.6	700	4.25	-	-	-	D	OSW-6302	171-6752	8.00	7.27	6.55	5.82	5.09
Warm White	67	147.6	700	4.25	-	-	-	C	OSW-8302	171-6743	10.19	9.26	8.33	7.41	6.48
Blue	7	23.5	700	4.25	460	475	-	B	OSW-4303	171-6759	5.28	4.80	4.32	3.84	3.36
Blue	7	23.5	700	4.25	460	475	-	D	OSW-6303	171-6753	5.28	4.80	4.32	3.84	3.36
Blue	7	23.5	700	4.25	460	475	-	C	OSW-8303	171-6745	6.87	6.24	5.62	5.00	4.37
Green	30.5	67	700	4.25	520	535	-	B	OSW-4334	171-6760	5.28	4.80	4.32	3.84	3.36
Green	30.5	67	700	4.25	520	535	-	D	OSW-6334	171-6754	5.28	4.80	4.32	3.84	3.36
Green	30.5	67	700	4.25	520	535	-	C	OSW-8334	171-6746	6.87	6.24	5.62	5.00	4.37
Red	23.5	51.6	700	2.8	620	630	-	B	OSW-4338	171-6763	4.82	4.38	3.94	3.51	3.07
Red	23.5	51.6	700	2.8	620	630	-	D	OSW-6338	171-6756	4.82	4.38	3.94	3.51	3.07
Red	23.5	51.6	700	2.8	620	630	-	C	OSW-8338	171-6749	6.43	5.84	5.26	4.67	4.09
Red - Green - Blue	18 / 30.5 / 10.7	30.5 / 50 / 13.9	350	2.8 / 4 / 4	620 / 520 / 460	630 / 535 / 475	-	F	OSW-8339	171-6740	8.40	7.64	6.87	6.11	5.34
Red - Green - Blue	18 / 30.5 / 10.7	30.5 / 50 / 13.9	350	2.8 / 4 / 4	620 / 520 / 460	630 / 535 / 475	-	E	OSW-8349	171-6741	4.52	4.11	3.70	3.29	2.87
Yellow	23.5	51.6	700	2.8	585	595	-	B	OSW-4336	171-6762	5.30	4.82	4.34	3.86	3.37
Yellow	23.5	51.6	700	2.8	585	595	-	D	OSW-6336	171-6755	5.30	4.82	4.34	3.86	3.37
Yellow	23.5	51.6	700	2.8	585	595	-	C	OSW-8336	171-6747	6.90	6.27	5.64	5.02	4.39

**DMX LED Controller**

iDrive™ UL



H=60, W=210, D=95

The powerful new iDrive™ UL LED driver is designed to optimize the performance of high power lighting fixtures using high power LEDs. The integrated technology enables excellent colour matching and 100% smooth dimming with precise DC current control combined with advanced automatic heat management system to enhance the long life of both fixtures and LED boards. iDrive™ UL can be controlled by DMX512A, or use the hundreds of pre-programmed settings to provide independent scenes, colour combinations and effects.



- 16.8W per channel
- 3 fully addressable constant current outputs
- Digital dimming level from 0 - 100 % (350mA max)
- On board DMX512A compliant control interface
- LED temperature compensation feedback
- Energy efficient switch mode power electronics
- Short and open circuit protected
- Long life (+ 50,000 hours)
- High quality rugged construction
- Meets lighting approbation requirements (CE)
- Compliant with Luxeon™ power light sources
- Can be remote mounted from LEDs ~ 30 meters
- No binning of LEDs needed

Mfrs. List No.	Order Code	Price Each	
ISTL058	173-8713	1+	10+
		98.00	92.00

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**Cool-LED Switchable LED Drivers**

350 / 700mA and 500 / 1000mA



- Power factor corrected (0.98)
- Constant current output
- Switch-able between 350 / 700mA or 500 / 1000mA
- Screwless cable clamps for fast assembly
- Surge protection up to 4kV
- Made in UK

Power (W)	Frequency (Hz)	Input Voltage (V)	Output Voltage (V)	Output Current (mA)	Dimensions (L x W x H) (mm)	Mfrs. List No.	Order Code
33	48	198 - 265	55	350 and 700	179 x 31 x 31.5	CL700S-240-C	176-1445
33	48	198 - 265	55	500 and 1000	179 x 31 x 31.5	CL1000S-240-C	176-1446

Mfrs List No.	Order Code	Price Each		
CL700S-240-C	176-1445	1+	10+	50+
CL1000S-240-C	176-1446	21.50	19.30	17.41
		21.50	19.30	17.41

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### Voltage Output DACs

These devices are serial input, voltage output, digital-to-analog converters (DACs). They can operate from single or dual supply voltages. Nominal full-scale output range is software selectable. Integrated output amplifiers, reference buffers, and proprietary power-up/power-down control circuitry are also provided. The parts offer guaranteed monotonicity, integral nonlinearity (INL), low noise, and short typical settling time with on-chip voltage reference.

Pins/Pkg	Resolution		Settling Time (µs)	Power Dissipation (mW)	No. of Outputs	Type	Mfrs. List No.	Order Code	Price Each					
	(Bits)	Update Rate							1+	10+	100+	250+		
<b>Unipolar/Bipolar</b>														
24/ETSSOP	12	1.1 MSPS	10	310	4	Voltage Output	AD5724RBREZ	178-6047	14.66	12.49	10.71	10.06		
24/ETSSOP	14	1.1 MSPS	10	310	4	Voltage Output	AD5734RBREZ	178-6048	17.61	14.21	12.45	12.09		
24/ETSSOP	16	1.07 MSPS	7.5	190	2	Voltage Output	AD5752RBREZ	178-6049	14.40	12.26	10.51	9.88		
24/ETSSOP	16	1.1 MSPS	10	310	4	Voltage Output	AD5754RBREZ	178-6050	20.84	16.81	14.74	14.31		
<b>Bipolar</b>														
32/TQFP	16	84.6 KSPS	8	250.5	2	Voltage Output	AD5762RCSUZ	178-6051	27.21	21.97	19.26	18.69		

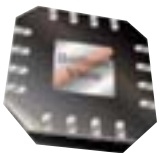
### Low Noise, 1 GHz FastFET Op Amps



These single and dual FastFET amplifiers are unity-gain stable, ultrahigh speed voltage feedback amplifiers with FET inputs. They are developed with the eXtra Fast Complementary Bipolar (XFCB) process, which allows the amplifiers to achieve ultralow noise (4 nV/Hz; 2.5 fA/Hz) as well as very high input impedances. With a wide supply voltage range from 5 V to 10 V, a 1.5 pF of input capacitance, low offset voltage and 1050 MHz -3 dB bandwidth, they are ideal for data acquisition front ends as well as wideband transimpedance applications, such as photodiode preamps.

Pins/Pkg	Bandwidth (MHz)	Slew Rate (V/µs)	Voltage - Offset (mV)	Input Current		Noise (nV/Hz)	Mfrs. List No.	Order Code	Price Each					
				Bias (µA)	Quiescent (mA)				1+	10+	100+	250+		
<b>Single</b>														
8/LFCSP	1050	870	0.4	2	21	4	ADA4817-1ACPZ-R2	178-6053	5.74	4.40	3.92	3.68		
8/SOIC	1050	870	0.4	2	21	4	ADA4817-1ARDZ	178-6054	4.99	3.83	3.40	3.21		
<b>Dual</b>														
16/LFCSP	1050	870	2	2	21	4	ADA4817-2ACPZ-R2	178-6055	9.75	7.50	6.66	6.27		

### Step-Down DC-to-DC Regulators



These low quiescent current, synchronous, step-down, dc-to-dc regulators use a current mode, and a constant frequency pulse-width modulation (PWM) control scheme for excellent stability and transient response. Under light loads, they can be configured to operate in pulse frequency modulation (PFM) mode that reduces switching frequency to save power.

16-LFCSP

Pins/Pkg	Input Voltage (V)	Output Voltage (V)	Switching Frequency (MHz)	Output Current (MAX) (A)	Mfrs. List No.	Order Code	Price Each			
							1+	10+	100+	250+
16/LFCSP	2.3 - 5.5	1.0	0.6/1.22	3	ADP2118ACPZ-1.0-R7	178-6056	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	1.2	0.6/1.22	3	ADP2118ACPZ-1.2-R7	178-6057	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	1.5	0.6/1.22	3	ADP2118ACPZ-1.5-R7	178-6058	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	1.8	0.6/1.22	3	ADP2118ACPZ-1.8-R7	178-6059	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	2.5	0.6/1.22	3	ADP2118ACPZ-2.5-R7	178-6060	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	3.3	0.6/1.22	3	ADP2118ACPZ-3.3-R7	178-6061	4.01	2.88	2.24	2.04
16/LFCSP	2.3 - 5.5	0.6 to 5.5	0.6/1.22	3	ADP2118ACPZ-R7	178-6062	4.01	2.88	2.24	2.04

### Low Power, 3-Axis Accelerometers



The **ADXL32X** family is a small, low power, complete 3-axis accelerometer with signal conditioned voltage outputs. They measure acceleration with a minimum full-scale range of  $\pm 2g$  to  $\pm 16g$ . These products can measure the static acceleration of gravity in tilt-sensing applications, as well as dynamic acceleration, resulting from motion, shock, or vibration. The user can select the bandwidth of the accelerometer to suit the application with a range of frequencies using the CX, CY, and CZ capacitors for the X, Y and Z axes respectively.

16-LFCSP

Pins/Pkg	Measurement Range (g)	Input Voltage Range (V)	Frequency Response Range			Operating Temperature	Mfrs. List No.	Order Code	Price Each			
			X (Hz)	Y (Hz)	Z (Hz)				1+	10+	100+	250+
16/LFCSP	$\pm 2g$	1.8V to 3.6V	0.5 to 1600	0.5 to 1600	0.5 to 550	-40°C to +85°C	ADXL327BCPZ	178-6066	4.20	3.36	2.79	2.59
16/LFCSP	$\pm 5g$	1.8V to 3.6V	0.5 to 1600	0.5 to 1600	0.5 to 550	-40°C to +85°C	ADXL325BCPZ	178-6063	4.20	3.36	2.79	2.59
16/LFCSP	$\pm 16g$	1.8V to 3.6V	0.5 to 1600	0.5 to 1600	0.5 to 550	-40°C to +85°C	ADXL326BCPZ	178-6065	4.20	3.36	2.79	2.59

### Mono/Stereo Low Power CODECs



The **WM8940** is a low power, high quality mono CODEC designed for portable applications such as digital still cameras or camcorders. The device integrates support for a differential or single ended mic, and includes drivers for speakers or headphone, and mono line output.

The **WM8974** integrates support for a differential or single ended mic, and includes drivers for speakers or headphone, and mono line output with no separate microphone or headphone amplifiers required.

The **WM8731x** can be controlled via a 2 or 3 wire serial interface. It has a stereo line and mono microphone level audio inputs along with a mute function, programmable line level volume control and a bias voltage output suitable for an electret type microphone.

The **WM8988** is a low power, high quality stereo CODEC designed for portable digital audio applications. The device integrates complete interfaces to 2 stereo headphone or line out ports.

The **WM8750xx** integrates complete interfaces to stereo or mono microphones and a stereo headphone. Advanced on-chip digital signal processing performs graphic equaliser, 3-D sound enhancement and automatic level control for the microphone or line input.

The **WM8976** is a low power, high quality codec designed for portable applications such as digital still camera or digital camcorder. The device integrates a preamp for a differential mic, and includes drivers for speakers, headphone and differential or stereo line output.

The **WM8960** is a stereo class D speaker driver that provides 1W per channel into 8W loads. The device integrates a complete microphone interface and a stereo headphone driver with advanced on-chip digital signal processing performs automatic level control for the microphone or line input.

Continues on next page



The **WM9711L** is a highly integrated input / output device designed for mobile computing and communications. The device can connect directly to mono or stereo microphones, stereo headphones and a mono speaker, reducing total component count in the system.  
The **WM8991** is a highly integrated ultra-low power hi-fi CODEC designed for handsets rich in multimedia features such as GPS, mobile TV, digital audio playback and gaming that can operate in class D or AB modes.

Pins/Pkg	DACs / ADCs	Headphone Driver	BTL Speaker Output	DAC SNR/THD (dB)	ADC SNR/THD (dB)	Clocking	Analogue Supply (V)	Digital Supply (V)	Mfrs. List No.	Order Code	1+	Price Each 10+	100+
<b>Mono Low Power CODECs</b>													
24/QFN	1 / 1	✓	400mW	98 / -84	94 / -80	Ext. MCLK, PLL	2.5 to 3.6	1.7 to 3.6	WM8940GEFL/RV	177-6284	1.96	1.47	1.15
24/QFN	1 / 1	—	900mW	98 / -84	94 / -83	Ext. MCLK, PLL	2.5 to 3.6	1.7 to 3.6	WM8974GEFL/RV	177-6291	2.16	1.62	1.27
<b>Stereo Low Power CODECs</b>													
28/SSOP	2 / 2	✓	—	100 / -86	90 / -84	Ext. MCLK, OSC	1.8 to 3.6	1.4 to 3.6	WM8731SEDS/RV	177-6264	2.46	1.85	1.45
28/QFN	2 / 2	✓	—	100 / -90	93 / -81	Ext. MCLK	1.8 to 3.6	1.42 to 3.6	WM8988LGECON/RV	177-6294	2.91	2.26	1.77
32/QFN	2 / 2	✓	400mW	98 / -84	95 / -82	Ext. MCLK	1.8 to 3.6	1.4 to 3.6	WM8750BLGEFL/RV	177-6270	3.23	2.42	1.90
32/QFN	2 / 2	✓	400mW	98 / -84	95 / -82	Ext. MCLK	1.8 to 3.6	1.4 to 3.6	WM8750LSEFL/R	177-6271	2.93	2.20	1.72
32/QFN	2 / 1	✓	900mW	98 / -84	95 / -84	Ext. MCLK, PLL	2.5 to 5.5	1.7 to 3.6	WM8976GEFL/RV	177-6292	2.77	2.08	1.63
32/QFN	2 / 2	✓	Up to 1.4W	98 / -84	95 / -82	Ext. MCLK, PLL	2.5 to 3.6	1.7 to 3.6	WM8960GEFL/RV	177-6288	3.37	2.53	1.98
48/QFN	2 / 2	✓	400mW	98 / -84	95 / -82	Ext. MCLK	1.8 to 3.6	1.4 to 3.6	WM9711LGEFL/V	177-6301	4.22	3.17	2.48
65/BGA	2 / 2	✓	Up to 1.4W	99 / -84	94 / -82	Ext. MCLK, PLL	2.7 to 5.5	1.5 to 3.6	WM8991GEB/RV	177-6295	3.98	2.98	2.34

### Stereo Low Power CODECs with Touchscreen Controller

The **WM9705** is a high-quality stereo audio codec with an integrated touch screen controller. It performs full-duplex 18-bit codec functions and supports variable sample rates from 8 to 48k samples/s with high SNR.

The **WM9712L** is a highly integrated input / output device designed for mobile computing and communications. The device can connect directly to a 4-wire or 5-wire touchpanel, mono or stereo microphones, stereo headphones and a mono speaker. Additionally, phone input and output pins are provided for seamless integration with wireless communication devices.

The **WM9713L** is architected for dual CODEC operation, supporting Hi-Fi stereo Codec functions via the AC link interface, and additionally supporting voice Codec functions via a PCM type Synchronous Serial Port (SSP).

Pins/Pkg	DACs / ADCs	Headphone Driver	BTL Speaker Output	Control & Data Interface	Touch Panel Digitiser	Clocking	Analogue Supply (V)	Digital Supply (V)	Mfrs. List No.	Order Code	1+	Price Each 10+	100+
<b>Stereo Low Power CODECs</b>													
48/QFN	4 / 3	✓	400 mW	AC'97 PCM, I2S	4 / 5-wire control	Ext. MCLK, PLL	1.8 to 3.6	1.8 to 3.6	WM9713LGEFL/V	135-4191	5.64	4.51	3.72
48/QFN	2 / 2	✓	—	AC'97	4 / 5-wire control	Ext. MCLK, PLL	3.0 to 5.0	3.0 to 5.0	WM9705SEFL/V	177-6298	4.22	3.17	2.48
48/QFN	3 / 3	✓	400 mW	AC'97	4 / 5-wire control	Ext. MCLK, OSC	1.8 to 3.6	1.5 to 3.6	WM9712LGEFL/V	177-6302	4.53	3.39	2.66

### Power Management with Audio

The **WM8351/WM8352** are integrated audio CODECs that allows for the direct connection of headphones and microphones. A programmable low-noise bias voltage is available to feed one or more electret microphones. They includes four/six programmable DC-DC converters respectively, four low-dropout (LDO) regulators and a current limit switch to generate suitable supply voltages for each part of the system, as well as off-chip components such as a digital core and I/O supplies, and LED lighting. An additional on-chip regulator maintains the backup power for always-on functions. These CODECs can be powered by a lithium battery, by a wall adaptor or USB.

Pins/Pkg	DACs / ADCs	Headphone Driver	BTL Speaker Output	Control & Data Interface	Touch Panel Digitiser	Clocking	Analogue Supply (V)	Digital Supply (V)	Mfrs. List No.	Order Code	1+	Price Each 10+	100+
129/BGA	2 / 2	✓	—	1 x 1A, 2 x 500mA	1 x 20V @ 40mA	4 x 150mA	3	3	WM8351GEB/V	177-6251	7.60	5.70	4.47
129/BGA	2 / 2	✓	—	2 x 1A, 2 x 500mA	1 x 20V @ 40mA	4 x 150mA	3	3	WM8352GEB/V	177-6252	8.42	6.32	4.96

### Stereo Low Power Dual CODECs (voice & audio)

The **WM8753L** is a low power, high quality stereo Codec with integrated PCM CODEC designed for portable digital telephony applications such as mobile phone, or headset with Hi-Fi playback capability. The device integrates dual interfaces for two differentially connected microphones, and includes drivers for speakers, headphone and earpiece. Advanced on-chip digital signal processing performs tone control, bass boost and automatic level control for the microphone or line input through the ADC. The two ADCs may be used to support voice noise cancellation in a partnering DSP, or for stereo recording.

Pins/Pkg	DACs / ADCs	Headphone Driver	BTL Speaker Output	DAC SNR/THD (dB)	ADC SNR/THD (dB)	Control & Data Interface	Clocking	Analogue Supply (V)	Digital Supply (V)	Mfrs. List No.	Order Code	1+	Price Each 10+	100+
52/BGA	3 / 2	✓	500mW	98 / -84	95 / -82	PCM, I2S	External MCLK, PLLs	1.8 to 3.6	1.4 to 3.6	WM8753LGEFL/RV	177-6273	5.47	4.11	3.22

### LED Drivers

Pins/Pkg	Description	Input Voltage (V)	Output Current (mA)	Operating Temperature	Mfrs. List No.	Order Code	1+	Price Each 10+	100+	250+	500+
4/SOT343	LED Driver for Low Power LED's	18	10	-65°C to +150°C	BCR401W	179-1058	0.28	0.22	0.17	0.15	0.13
4/SOT343	LED Driver for Low Power LED's	18	20	-65°C to +150°C	BCR402W	179-1061	0.28	0.22	0.17	0.15	0.13
6/SC74	LED Driver for 0.5W Power LED's	24	250	-65°C to +150°C	BCR320U	179-1065	0.54	0.42	0.34	0.30	0.25
6/SC74	LED Driver for 0.5W Power LED's	24	250	-65°C to +150°C	BCR321U	179-1066	0.54	0.42	0.34	0.30	0.25
6/SC74	LED Driver IC for driving LED's above 100mA	27	90	-65°C to +150°C	BCR450	179-1069	0.71	0.63	0.50	0.45	0.38
6/SC74	LED Driver for Low Power LED's	40	10	-65°C to +150°C	BCR401U	179-1062	0.38	0.30	0.24	0.21	0.17
6/SC74	LED Driver for Low Power LED's	40	20	-65°C to +150°C	BCR402U	179-1063	0.38	0.30	0.24	0.21	0.17
6/SC74	LED Driver for Low Power LED's	40	50	-65°C to +150°C	BCR405U	179-1064	0.38	0.30	0.24	0.21	0.17
6/SC74	LED Driver for 0.25W Power LED's	40	150	-65°C to +150°C	BCR420U	179-1067	0.54	0.42	0.34	0.30	0.25
6/SC74	LED Driver for 0.25W Power LED's	40	150	-65°C to +150°C	BCR421U	179-1068	0.54	0.42	0.34	0.30	0.25

### USB Host Audio Decoder ICs

The **BU9457KV/BU9458KV** integrate USB 2.0 memory/SD card host audio and system controllers on a single chip. This configuration combines a controller and an audio decoder that utilizes commands from a CPU simplifying the design and reducing the number of external components. Both components are designed with an ESD resistance ±6000V at the USB terminal, 15kV against proximity (air) discharge (when used in conjunction with an external Zener diode), and 8kV against direct (contact) discharge, providing superior strength against surge noise, resulting in unsurpassed reliability. The BU9457KV/BU9458KV are compatible with MMC SD, miniSD, microSD, SDHC and support MPEG1,2,2.5 and Layer1,2,3.

Pins/Pkg	Operating Voltage	Serial Interface	WMA	AAC	Audio Output Analog	Audio Output Digital	Mfrs. List No.	Order Code	1+	Price Each 10+	250+	500+
64/VQFP	3V to 3.6V	I <sup>2</sup> S BUS	—	—	Line	I <sup>2</sup> S SPDIF	BU9457KV-E2	177-0569	31.71	25.72	20.85	17.80
64/VQFP	3V to 3.6V	I <sup>2</sup> S BUS	WMA9Standard	MPEG4AAC-LC	Line	I <sup>2</sup> S SPDIF	BU9458KV-E2	177-0570	31.71	25.72	20.85	17.80

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### SEMICONDUCTORS

- Number 1 worldwide in discrete power semiconductors
- Number 1 worldwide in diodes
- Number 1 worldwide in power rectifiers
- Number 1 worldwide in low-voltage power MOSFETs
- Number 1 worldwide in infrared components



### PASSIVE COMPONENTS

- Number 1 worldwide in wirewound and other power resistors
- Number 1 worldwide in leaded film resistors
- Number 1 worldwide in thin film SMD resistors
- Number 1 worldwide in wet and conformal-coated tantalum capacitors
- Number 1 worldwide in capacitors for power electronics

Build **Vishay**  
into your **Design**



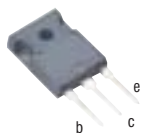




Mfrs. List No.	Order Code	1+	25+	100+	250+
<b>NPN</b>					
2STR1230	174-9422	0.11	0.09	0.08	0.07
2STR1160	174-9421	0.11	0.09	0.08	0.07
2SD882	174-9417	0.26	0.23	0.20	0.17
2STX1360	174-9423	0.11	0.09	0.08	0.07
MJD44H11T4	174-9426	0.28	0.24	0.22	0.18
BU208A	174-9424	2.96	2.59	2.30	1.88
<b>PNP</b>					
2STF2360	174-9418	0.17	0.15	0.14	0.11
MJD295T4	174-9425	0.49	0.43	0.38	0.31
MJE172	174-9427	0.46	0.40	0.36	0.29
2N5195	174-9416	0.52	0.46	0.41	0.33

### T0247 Audio Power Transistors

ON Semiconductor



- Excellent gain linearity
- Pin/package 3/ T0247
- High SOA: 2.25A, 80V, 1 second
- Total harmonic distortion characterized
- High DC current gain, hfe=20 min @ Ic=8Adc



The MJW21195/6 utilize Perforated Emitter technology and are specifically designed for high power audio output, disk head positioners and linear applications.

Mfrs. List No.	Transistor Type	Order Code	1+	25+
MJW21195G	NPN	170-0965	4.85	3.50
MJW21196G	PNP	170-0966	4.85	3.50

### 893D Series



- Solid Tantalum Chip Capacitors

Operating Temperature -55°C to +125°C  
Capacitance Tolerance ± 20% Reel Qty. 500

Dimensions μF H W D	Max. DC Leakage Current (μA)	Max. ESR @ 25°C, 100 kHz (Ω)	Mfrs. List No.	Order Code
<b>16 Volt d.c.</b>				
10 2.5 6 3.2	1.6	1.8	893D106X0016C2TE3	175-4032
<b>20 Volt d.c.</b>				
22 2.8 7.3 4.3	4.4	0.7	893D226X0020D2TE3	175-4033
<b>25 Volt d.c.</b>				
4.7 2.5 6 3.2	1.2	1.9	893D475X0025C2TE3	175-4034
<b>35 Volt d.c.</b>				
2.2 2.5 6 3.2	0.8	2.9	893D225X0035C2TE3	175-4035
10 2.8 7.3 4.3	3.5	0.8	893D106X0035D2TE3	175-4036
<b>50 Volt d.c.</b>				
1 2.5 6 3.2	0.5	4.4	893D105X0050C2TE3	175-4037
3.3 2.8 7.3 4.3	1.7	1.6	893D335X0050D2TE3	175-4039

μF	Order Code	1+	10+	100+	250+	500+
<b>16 Volt d.c.</b>						
10	175-4032	1.89	1.72	1.55	1.32	0.97
<b>20 Volt d.c.</b>						
22	175-4033	2.75	2.50	2.25	1.92	1.42
<b>25 Volt d.c.</b>						
4.7	175-4034	1.72	1.57	1.41	1.20	0.89
<b>35 Volt d.c.</b>						
2.2	175-4035	1.72	1.57	1.41	1.20	0.89
10	175-4036	2.75	2.50	2.25	1.92	1.42
<b>50 Volt d.c.</b>						
1	175-4037	0.67	0.61	0.55	0.46	0.34
3.3	175-4039	3.54	3.21	2.89	2.46	1.82

### T83 Series



- Weibull Grading and Surge Current Test options
- Standard and Low ESR options

Operating Temperature -55°C to +125°C  
Capacitance Tolerance ± 10%

Dimensions μF H W D	Max. DC Leakage Current (μA)	Max. ESR @ 25°C, 100 kHz (Ω)	Reel Qty.	Mfrs. List No.	Order Code
<b>6.3 Volt d.c.</b>					
47 1.9 3.5 2.8	2.8	2	2000	T83B476K6R3EBZL	175-4243
<b>16 Volt d.c.</b>					
10 2.5 6 3.2	16	1.8	500	T83C106K016EBZS	175-4244
<b>25 Volt d.c.</b>					
47 2.8 7.3 4.3	11.8	0.6	500	T83D476K025EBZL	175-4246
<b>35 Volt d.c.</b>					
22 4 7.3 4.3	7.7	0.6	400	T83E226K035EBZL	175-4247

Order Multiple=5 μF	Order Code	5+	50+	100+	250+	2K+
<b>6.3 Volt d.c.</b>						
47	175-4243	6.45	5.86	5.28	4.49	3.32
<b>16 Volt d.c.</b>						
10	175-4244	5.72	5.20	4.68	3.98	2.94
<b>25 Volt d.c.</b>						
47	175-4246	8.67	7.88	7.10	6.04	4.47
<b>35 Volt d.c.</b>						
22	175-4247	8.03	7.30	6.57	5.59	4.13

### 298D Series - MicroTan™



- Solid tantalum chip capacitors
- MICROTAN™ lead frame-less molded



Operating Temperature -55°C to +85°C

μF	Dimensions L W H	Tolerance	Case Size	Mfrs. List No.	Order Code
<b>4 Volt d.c.</b>					
220	2.4 1.45 1.1	± 20%	P	298D227X0004P2T	156-5124
<b>6.3 Volt d.c.</b>					
10	1.6 0.85 0.8	± 10%	M	298D106X96R3M2T	156-5120
22	1.6 0.85 0.8	± 20%	M	298D226X06R3M2T	156-5123
<b>10 Volt d.c.</b>					
10	1.6 0.85 0.8	± 20%	M	298D106X0010M2T	156-5121
15	1.6 0.85 0.8	± 20%	M	298D156X0010M2T	156-5122
<b>16 Volt d.c.</b>					
1	1.6 0.85 0.8	± 10%	M	298D105X9016M2T	156-5119

μF	Order Code	1+	50+	100+	500+	1K+
<b>4 Volt d.c.</b>						
220	156-5124	1.95	1.38	1.06	0.82	0.65
<b>6.3 Volt d.c.</b>						
10	156-5120	0.84	0.68	0.55	0.47	0.42
22	156-5123	0.74	0.59	0.49	0.43	0.42
<b>10 Volt d.c.</b>						
10	156-5121	1.11	0.88	0.72	0.63	0.54
15	156-5122	1.11	0.88	0.72	0.63	0.54
<b>16 Volt d.c.</b>						
1	156-5119	0.74	0.59	0.47	0.43	0.38

### T95 Series



- High reliability; Weibull grading available
- Standard and Low ESR options

Operating Temperature -55°C to +85°C  
Capacitance Tolerance ± 10%  
Reel Qty 600

μF	Dimensions H W D	Max. DC Leakage Current (μA)	Max. ESR @ 25°C, 100 kHz (Ω)	Mfrs. List No.	Order Code
<b>10 Volt d.c.</b>					
330	1.3 1.83 7.2	33	0.13	T95R337K010ESAL	175-4248
<b>50 Volt d.c.</b>					
15	1.3 1.83 7.2	7.5	0.4	T95R156K050ESAL	175-4249
22	1.3 1.83 7.2	11	0.39	T95R226K050EABL	175-4250

Order Multiple=5 μF	Order Code	5+	50+	100+	250+	600+
<b>10 Volt d.c.</b>						
330	175-4248	8.14	7.40	6.66	5.67	4.19
<b>50 Volt d.c.</b>						
15	175-4249	8.53	7.76	6.98	5.95	4.40
22	175-4250	14.02	12.75	11.47	9.77	7.22

### Accelerate your designs with DesignLink



Download Farnell parts data directly into your schematic.  
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## RF Cable Assemblies

### U.FL-LP-088 Terminal to SMA / N Type Bulkhead Jack



- Standard, Reverse Polarity and IP67 cable assemblies available
- Cable lengths from 100 - 300mm
- Cable diameter = 1.37mm

**Specifications:-**  
 Impedance 50Ω  
 Max. Working Voltage 60V rms.  
 Min. Dielectric Withstanding Voltage 200V rms.  
 Min. Insulation Resistance 500MΩ  
 Frequency Range DC to 3GHz. (SMA) / DC to 6GHz. (N Type)



Cable Length	Order Code	Price Each				
		1+	10+	25+	50+	100+
<b>Standard U.FI - SMA</b>						
100mm	169-9231	6.57	5.58	4.60	4.09	3.68
150mm	169-9242	6.75	5.73	4.73	4.20	3.78
200mm	169-9243	6.70	5.71	4.85	4.31	3.88
300mm	169-9244	7.29	6.19	5.10	4.53	4.08
<b>Reverse Polarity U.FI - SMA</b>						
100mm	169-9245	6.70	5.71	4.85	4.31	3.88
150mm	169-9247	7.11	6.04	4.98	4.42	3.98
200mm	169-9248	7.29	6.19	5.10	4.53	4.08
300mm	169-9249	7.64	6.49	5.35	4.76	4.28
<b>IP67 U.FI - SMA</b>						
100mm	169-9254	10.66	8.44	6.75	5.78	5.06
150mm	169-9255	10.67	8.49	6.93	5.94	5.20
200mm	169-9256	10.40	8.23	6.58	5.64	4.94
300mm	169-9257	11.82	9.36	7.48	6.41	5.61
<b>IP67, Reverse Polarity U.FI - SMA</b>						
100mm	169-9259	11.24	8.90	7.11	6.10	5.34
150mm	169-9261	11.24	8.94	7.30	6.25	5.47
200mm	169-9262	11.82	9.36	7.48	6.41	5.61
300mm	169-9263	11.46	9.08	7.26	6.23	5.45
<b>IP67 U.FL - N Type</b>						
100mm	171-4789	18.25	14.60	12.17	10.43	9.13
150mm	171-4791	18.50	14.80	12.33	10.57	9.25
200mm	171-4792	18.75	15.00	12.50	10.71	9.38

## SMA Plugs, Jacks and Adaptors

50Ω

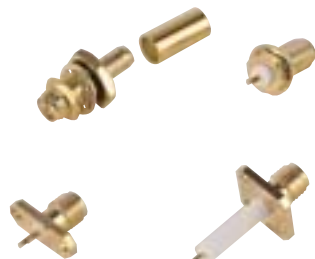
- Semi precision, sub miniature connectors
- Broadband performance with low reflection

Impedance 50Ω  
 Frequency Range 0 to 18.0GHz Semi Rigid  
 0 to 12.4GHz Flexible Cable  
 Contact Res - Centre 3mΩ  
 Contact Res - Outer Ins Resistance 2mΩ  
 Temp Range 5000MΩ min  
 -65°C 165°C to +



SMA Plugs

Cable	Order Code	Price Each				
		1+	10+	50+	100+	
<b>Straight Plugs</b>						
Crimp	RG58	116-9616	2.45	2.11	1.69	1.53
Clamp	RG58	116-9617	3.47	2.93	2.35	2.15
Clamp	RG174	116-9618	3.44	2.92	2.34	2.14
Direct Solder	RG402	116-9619	2.52	2.14	1.73	1.56
Direct Solder	RG405	116-9620	2.12	1.79	1.39	1.24
<b>RA Plugs</b>						
Crimp	RG58	116-9627	2.07	1.74	1.38	1.24
Direct Solder	RG402	116-9624	4.29	3.64	2.96	2.68
Direct Solder	RG405	116-9625	4.29	3.64	2.96	2.68



SMA Jacks

Cable	Order Code	Price Each				
		1+	10+	50+	100+	
<b>Straight Bulkhead Jack</b>						
Direct Solder	RG402	116-9621	2.14	1.80	1.42	1.29
Direct Solder	RG405	116-9623	2.56	2.14	1.68	1.52
Crimp	RG58	116-9628	3.87	3.29	2.67	2.41
<b>Straight Bulkhead Jack - Rear Mount</b>						
Solder		116-9630	3.15	2.67	2.17	2.15
<b>4 Hole Square Flange Jack - Epoxy Captivated</b>						
		116-9626	4.70	3.98	3.23	2.93
<b>2 Hole Flange Jack Receptacle - Solder Pot Contact</b>						
		116-9629	3.55	3.01	2.46	2.20



SMA PCB Mount Jacks

PCB Mount Jacks	Order Code	Price Each			100+
		1+	10+	50+	
<b>Through Hole PCB Mount</b>					
Straight	116-9631	3.56	3.03	2.45	2.19
RA	116-9632	4.79	4.03	3.30	2.97
<b>SMT PCB Mount</b>					
Straight	116-9633	3.72	3.15	2.56	2.33
RA	116-9635	3.75	3.13	2.46	2.22



SMA Adaptors

Adaptors	Order Code	Price Each			
		1+	10+	50+	100+
SMA Plug - SMA Plug	116-9638	3.81	3.24	2.63	2.36
SMA Jack - SMA Jack	116-9639	3.52	3.01	2.45	2.19
RA SMA Plug - SMA Jack	116-9636	5.18	4.42	3.56	3.21
SMA BH Jack - SMA Jack	116-9637	5.01	4.24	3.45	3.10

## SMA Jack End Launchers 50Ω



Gold plated centre contact & body with PTFE insulation

Impedance 50Ω  
 Frequency Range 0 - 18GHz  
 Contact Resistance 3mohm  
 Insulation Resistance 5000Mohm  
 Body Brass - Gold plated

Type	PCB Thickness (mm)	Order Code	Price Each		
			1+	10+	50+
<b>SMA Jacks</b>					
Bulkhead	1.73	134-2651	2.66	2.23	1.87
PCB	1.73	134-2652	2.32	1.97	1.63
PCB	1.22	134-2653	2.32	1.97	1.63

## RF Cable Assemblies



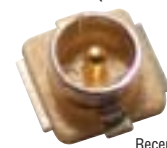
**Specification:-**  
 Attenuation 1.5dB  
 VSWR 1.5 max  
 Frequency Range 45MHz - 6GHz  
 Impedance 50Ω

- U.FI to SMA cable assemblies
- Cable length from 75mm to 150mm

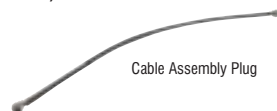
Cable Length	Mftrs. List No.	Order Code	Price Each			
			1+	10+	50+	100+
150mm	CASS-0419-RC	168-8079	11.88	9.42	8.33	7.80
100mm	CASS-0442-RC	168-8081	10.27	8.14	7.20	6.74
75mm	CASS-0627-RC	168-8082	10.67	8.55	7.40	6.91

## Ultra Small SMT Coaxial Connectors

U.FL Series (Commodity Version)



Receptacle



Cable Assembly Plug



- 2.5mm mated height
- 7.7mm<sup>2</sup> footprint
- High frequency performance DC to 6 Ghz
- Plug diameter - 0.81mm / 1.37mm
- Nominal attenuation at 6Ghz - 9.42dB/m (0.81mm Ø) / 4.3dB/m (1.37mm Ø)
- Ultra-fine PTFE Cable
- Extraction tool for easy removal

Continues on next page





## CONAN® High Density, Low Profile 1.00mm Receptacles



- 'Snap' engagement contacts assure secure mating with an audible 'click'
- The receptacles have a stacking height of 3.28mm supporting a range of PCB stack heights: 4.15mm to 7mm
- 9 part sizes: 9 to 69 contacts
- Conan® receptacles mate with Conan® headers (91910-21XXLF)
- Lead-free RoHS compatible products satisfy environmental regulations

Housing Material	Contact Material	Contact Plating	No. of Mating Cycles	Operating Temperature
LCP	Copper Alloy	0.38 µm (15 µin.) GXT	30	-55°C to 130°C

Mfrs. List No.	Stacking Height	No. of Ways	Order Code	1+	10+	50+	100+
91930-21109LF	3.28mm	9	163-0766	2.01	1.86	1.77	1.65
91930-21111LF	3.28mm	11	163-0767	2.40	2.28	2.17	1.99
91930-21115LF	3.28mm	15	163-0768	2.79	2.66	2.51	2.34
91930-21121LF	3.28mm	21	163-0769	2.60	2.45	2.30	2.15
91930-21125LF	3.28mm	25	163-0770	3.48	3.30	3.12	2.89
91930-21131LF	3.28mm	31	163-0771	3.46	3.27	3.10	2.87
91930-21141LF	3.28mm	41	163-0772	4.08	3.87	3.65	3.40
91930-21151LF	3.28mm	51	163-0773	4.42	4.17	3.96	3.66
91930-21169LF	3.28mm	69	163-0774	6.62	6.28	5.94	5.53

## 0.8mm Board-to-Board Headers 2011 Series



- Double row
- Profile Height - 4.15mm / 5.15mm / 5.65mm
- Pitch - 0.8mm
- Pitch Row - 0.8mm
- Flammability Rating - UL94V-0
- Operating Temperature - -40°C to 105°C
- Mates with 2010 series

Current Rating	Voltage Rating	Contact Material	Contact Plating	Insulator Material
0.5A	50V AC/DC	Phosphor Bronze	Gold	High Temp. Plastic (Nylon 46)

Mated Heights with 2010 series				
2010 Profile Height	2011 Profile Height			
	4.15mm	5.15mm	5.65mm	
3.55mm	5.0mm	6.0mm	6.5mm	
4.05mm	5.5mm	6.5mm	7.0mm	

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No. of Ways	Order Code	5+	25+	50+	100+	250+
<b>Profile Height - 4.15mm</b>						
40	166-1185	1.08	0.99	0.83	0.77	0.72
60	166-1186	1.48	1.36	1.16	1.08	1.01
80	166-1187	2.42	2.25	1.87	1.77	1.68
100	166-1189	2.82	2.62	2.21	2.11	2.01
<b>Profile Height - 5.15mm</b>						
40	166-1191	1.08	0.99	0.83	0.77	0.72
60	166-1192	1.48	1.36	1.16	1.08	1.01
80	166-1193	2.42	2.25	1.87	1.77	1.68
100	166-1194	2.82	2.62	2.21	2.11	2.01
<b>Profile Height - 4.2mm</b>						
40	166-1195	1.08	0.99	0.83	0.77	0.72
60	166-1196	1.48	1.36	1.16	1.08	1.01
80	166-1197	2.42	2.25	1.87	1.77	1.68
100	166-1198	2.82	2.62	2.21	2.11	2.01

## 0.8mm Board-to-Board Sockets 2010 Series



- Double row
- Profile Height - 3.55mm / 4.05mm
- Pitch - 0.8mm
- Pitch Row - 0.8mm
- Flammability Rating - UL94V-0
- Operating Temperature - -40°C to 105°C
- Mates with 2011 series

Current Rating	Voltage Rating	Contact Material	Contact Plating	Insulator Material
0.5A	50V AC/DC	Phosphor Bronze	Gold	High Temp. Plastic (Nylon 46)

Mated Heights with 2011 series			
2010 Profile Height	2011 Profile Height		
	4.15mm	5.15mm	5.65mm
3.55mm	5.0mm	6.0mm	6.5mm
4.05mm	5.5mm	6.5mm	7.0mm

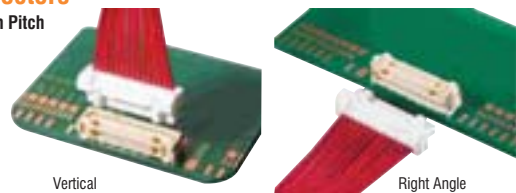
527891

No. of Ways	Order Code	5+	25+	50+	100+	250+
<b>Profile Height - 3.55mm</b>						
40	166-1199	1.08	0.99	0.83	0.77	0.72
60	166-1200	1.48	1.36	1.16	1.08	1.01
80	166-1201	2.42	2.25	1.87	1.77	1.68
100	166-1202	2.82	2.62	2.21	2.11	2.01
<b>Profile Height - 4.05mm</b>						
40	166-1203	1.08	0.99	0.83	0.77	0.72
60	166-1204	1.48	1.36	1.16	1.08	1.01
80	166-1205	2.42	2.25	1.87	1.77	1.68
100	166-1207	2.82	2.62	2.21	2.11	2.01

## CLIK-Mate™ SMT Wire-to-Board Connectors



1.25mm Pitch



Molex' new 1.25mm pitch SMT CLIK-Mate series has a superior lock design that offers easier use and better mating retention compared to competitive versions. This series also provides about 60% space savings compared to similar dual-lock 2.00mm pitch versions. The CLIK-Mate 1.25mm series was designed for applications such as LCD TVs that require higher pin count connectors to carry more signal lines in less space. The connectors in this series have a unique tuning fork terminal concept that provides low insertion force and secure mating contact.

Benefits of the 1.25 pitch SMT CLIK-Mate series:

- Audible click, low insertion force and secure mating
- Secure contact and avoids terminal stubbing
- Easy and quick mating operators
- Housing wall support and secure PCB retention
- Reinforced metal solder tabs
- No costly capton tape needed

Housing Material	Contact Material	Contact Plating	Voltage	Current Rating	Operating Temperature
Polybutylene Terephthalate	Copper Alloy	Tin	50V	1A	-25°C to 85°C

Mfrs. List No.	No. of Ways	Order Code	10+	100+	250+	500+	1K+
<b>Crimp Housings</b>							
502380-0200	2	162-0773	0.069	0.056	0.047	0.042	0.037
502380-0300	3	162-0774	0.071	0.058	0.049	0.043	0.038
502380-0400	4	162-0775	0.072	0.059	0.049	0.044	0.039
502380-0500	5	162-0776	0.077	0.063	0.053	0.047	0.042
502380-0600	6	162-0777	0.079	0.065	0.054	0.048	0.042
502380-0800	8	162-0778	0.083	0.068	0.057	0.051	0.045
502380-1000	10	162-0779	0.122	0.100	0.084	0.074	0.065
502380-1200	12	162-0780	0.123	0.101	0.084	0.075	0.066
502380-1400	14	162-0781	0.124	0.102	0.085	0.075	0.067
<b>Vertical Receptacles</b>							
502382-0270	2	162-0783	0.290	0.240	0.200	0.178	0.157
502382-0370	3	162-0785	0.310	0.250	0.210	0.186	0.165
502382-0470	4	162-0786	0.330	0.270	0.230	0.200	0.178
502382-0570	5	162-0787	0.340	0.280	0.240	0.210	0.185
502382-0670	6	162-0788	0.360	0.290	0.250	0.220	0.192
502382-0870	8	162-0789	0.380	0.320	0.260	0.230	0.210
502382-1070	10	162-0790	0.370	0.300	0.260	0.230	0.199
502382-1270	12	162-0791	0.440	0.360	0.300	0.270	0.240
502382-1470	14	162-0792	0.440	0.360	0.300	0.270	0.230
<b>R/A Receptacles</b>							
502386-0270	2	162-0793	0.300	0.240	0.200	0.180	0.159
502386-0370	3	162-0795	0.300	0.250	0.210	0.185	0.163
502386-0470	4	162-0796	0.340	0.280	0.230	0.210	0.183
502386-0570	5	162-0797	0.340	0.280	0.230	0.210	0.183
502386-0670	6	162-0798	0.350	0.290	0.240	0.220	0.190
502386-0870	8	162-0799	0.340	0.280	0.230	0.210	0.182
502386-1070	10	162-0801	0.380	0.310	0.260	0.230	0.210
502386-1270	12	162-0802	0.410	0.330	0.280	0.250	0.220
502386-1470	14	162-0803	0.420	0.340	0.290	0.260	0.230
<b>Pre-Crimped Leads</b>							
85409-0051	300mm, 1.25mm	162-0804	0.700	0.600	0.550	0.500	0.450
85409-0052	150mm, 1.25mm	162-0805	0.380	0.320	0.300	0.270	0.240

Over half a million products available online





### Mini-Clamp Sockets

372 series



Socket

Dust Cover

- 2 mm boardmount, straight solder tails
- Provides even quality
- Ensures easy operation for system building

- Saves board space
- Reduces waste
- Dust cover accessory available
- Flammability rating - UL 94V-0

Housing Material	Contact Material	Contact Plating	Current Rating	Voltage Rating	Operating Temperature
Nylon	Copper Alloy	Gold	3A	32V	-20 - 85°C

521953

Mfrs. List No.	No. of Ways	Order Code	1+	50+	100+
37203-62A3-003PL	3	163-7130	1.060	0.980	0.950
37203-62B3-003PL	3	163-7131	1.060	0.980	0.950
37204-62A3-004	4	163-7132	1.190	1.120	1.090
37204-62B3-004	4	163-7133	1.100	1.040	1.010
37206-62A3-003PL	3 x 2	163-7134	1.820	1.700	1.650
37208-62A3-004PL	4 x 2	163-7135	2.230	2.080	2.030
37212-62M3-003PL	3 x 4	163-7136	2.080	1.950	1.900
37216-62M3-004PL	4 x 4	163-7138	1.990	1.860	1.810
<b>Dust Covers</b>					
37803-1000-00	3	163-7139	0.038	0.035	0.033
37804-1000-00	4	163-7140	0.041	0.038	0.036

### Mini USB Interfaces

MUSB Series



- B and AB types available
- Surface Mount

#### Specifications:-

Contact Material	Phosphor Bronze	Contact Plating	Gold
Insulator Material	High Temp. Thermoplastic	Contact Resistance	50mohm
Current Rating	1A per contact	Voltage Rating	30Vrms
No. of Mating Cycles	1500	No. of Ways	5
Operating Temp.	-50°C to 85°C		

No. of Ways	Type	Mfrs. List No.	Order Code	1+	10+	50+	100+	500+
5	B	MUSB-05-S-B-SM-A	175-3806	0.76	0.59	0.54	0.49	0.45
5	AB	MUSB-05-S-AB-SM-A	175-3807	0.83	0.64	0.58	0.53	0.48

### USB Interfaces

USBR Series



175-3808

175-3809

- A and B types available
- Higher retention than standard USBs
- Through Hole

#### Specifications:-

Contact Material	Phosphor Bronze	Contact Plating	Gold
Insulator Material	High Temp. Thermoplastic	Contact Resistance	30mohm
Current Rating	1A per contact	Voltage Rating	30Vrms
No. of Mating Cycles	1500	No. of Ways	4
Operating Temp.	-50°C to 85°C		

No. of Ways	Type	Mfrs. List No.	Order Code	1+	10+	50+	100+	500+
4	A	USBR-A-S-S-O-TH	175-3808	1.10	0.86	0.77	0.70	0.64
4	B	USBR-B-S-S-O-TH	175-3809	0.98	0.76	0.68	0.62	0.57



### Mini HDMI Connectors

Type C



170-8473 170-8474 170-8475 170-8476 170-8477 170-8479

- 0.4mm pitch, 19 position, mini HDMI Connectors
- Type C connectors, HDMI 1.3 specification
- Solderable nickel plated shell
- Dimensions - 10.5 x 2.5mm (sockets), 10.42 x 2.42mm (plugs)



#### Specifications:-

Current Rating	0.5A	Dielectric Withstanding Voltage	500VAC r.m.s.
Insulation Resistance	100Mohm	Operating Temp.	-20°C to 85°C
Contact Material	Brass (Socket) / Phosphor Bronze (Plugs)	Contact Plating	Gold Flash

Description	Order Code	Price Each				
		1+	10+	100+	500+	1K+
Socket, SMT Type Solder Tail	170-8473	1.12	0.90	0.75	0.64	0.56
Socket, Through Hole Solder Tail	170-8474	1.12	0.90	0.75	0.64	0.56
Socket, Kinked Through Hole Solder Tail	170-8475	1.12	0.90	0.75	0.64	0.56
Plug, without PCB	170-8476	1.05	0.84	0.70	0.60	0.53
Plug, with PCB	170-8477	1.12	0.90	0.75	0.64	0.56
Plug, C/M to A/F PCB	170-8479	1.19	0.95	0.79	0.68	0.60

### SIM Card

5 Direction SIM



- Suitable for reading SIM and UIM cards
- Tape mounted for pick and place manufacturing

Housing	Thermoplastic, UL94V-0, Black
Contacts	Gold
Durability	Up to 5000 mating cycles

Height	Mfrs. List No.	Order Code	Price Each		
			1+	10+	50+
2.1mm	2-1705300-1	128-4399	0.38	0.36	0.32

### Security Access Modules (SAM)



- SIM/SAM
- Metal Locking Disk
- Includes Switch

Housing	High Temperature Thermoplastic, Black
Contact Plating	Gold
Durability	Up to 10000 mating cycles

No. of Contacts	Mfrs. List No.	Order Code	Price Each			
			1+	10+	50+	100+
6	5145299-1	128-4401	1.90	1.77	1.69	1.60
8	5145299-2	128-4402	2.29	2.04	--	--

### Multifunction Graphics Meter



Panel Pilot Series



The Panel Pilot Series is a range of color TFT graphics meters that users can program to display a variety of meter styles previously provided by a traditional panel meter. Initially available in 2.4" screen size, the meters are programmable via USB interface with free Windows-based configuration software provided with the unit. Users can select the type of meter style they want (choices include 3½ digit, bar graph and analog style options) and personalise the display by selecting preferences in color, text and voltage input scaling. Once programming is complete, the user can

save all selections to the meter and computer, detach the unit and mount in their panel as they would any standard display. The unit is supplied with 6 programmable meter styles. Users can select more by visiting Lascar's website at [www.panelpilot.com](http://www.panelpilot.com)

- Large 2.4" Color TFT Screen options
- Programmable via USB Interface
- User selectable meter style selection
- Simple panel mounting
- Free Windows-based Configuration Software supplied with meter
- Operating Voltage of 4V - 30Vd.c.
- Adjustable 0 to 40 Vd.c. input
- Screw terminal connections

Mfrs. List No.	Order Code	Price Each				
		1+	5+	10+	25+	50+
SGD 24-M	178-1995	59.95	58.00	56.85	55.75	54.00



**Digital Metering System**



The Integra Ci3 digital metering system (dms) represents the first model of a new generation of digital metering systems designed to complement the current Crompton Instruments Integra series. Its easy programming, mounting and user-friendly navigation make the Integra Ci3 dms an ideal choice for customers who require reliable energy measurement. The product features a DIN 96 panel mounted enclosure, backlit LCD display and user programmable CT ratios, all accessible via an intuitive user interface. Integra Ci3 dms measures 17 electrical parameters including total harmonic distortion (THD) measurement up to the 31st harmonic.



- DIN 96 enclosure
- Backlit LCD screen
- Bezel depth 6.1mm
- Plug-in output modules
- Programmable CT ratio
- True rms measurement
- User programmable system configuration

Nominal input voltage 100 to 289V ac  
 Nominal input voltage burden <0.2VA per phase  
 Nominal input current 5A AC rms  
 Dimensions 96 x 96 x 64.1mm (depth behind panel without module 58mm, with module 82.5mm)  
 Panel cut-out 92 x 92mm  
 Panel thickness 1mm to 5mm  
 Front protection rating IP52  
 Case protection rating IP30  
 Terminals Shrouded screw-clamp 0.05-4mm wire  
 Operating temperature -10°C to +55°C  
 Parameters measured Voltage, Frequency, Current, Power, Power factor and Energy.

Mftrs. List No.	Description	Order Code	1+	5+
CI3-01	Intgra Ci3 Base Unit	<b>177-5885</b>	99.00	80.00
<b>Modules</b>				
CI-PUL-01	Pulsed Output	<b>177-5886</b>	18.00	16.70
CI-MOD-01	Modbus™ RS485	<b>177-5887</b>	35.00	33.30

**Digital Metering System**



Tegra 710 and 810 Series



The Tegra 710 and 810 multi-function digital metering systems display and communicate major electrical parameters. The digital meters are available in 4 module DIN-rail or DIN 72 panel mounted enclosure and display up to 57 electrical parameters including the true rms values, selectable CT and VT ratios and monitor current, voltage, power factor, phase angle, active/reactive energy, and frequency values. The simple menu-driven interface offers three reading modes (phase parameters, system parameters and maximum parameter values).

- LCD, backlight control
- Fully programmable VT and CT ratios
- Current demand per phase
- Resettable active energy meter
- Resettable reactive energy meter
- Programmable relay outputs
- Modbus RTU

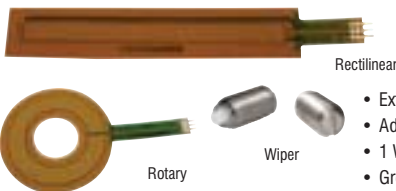
Supply Voltage 195.5V - 253V ac 50/60Hz  
 Supply burden <4 VA  
 Sealing IP 40 (54 front side installed)  
 Operating temperature 0°C to +50°C  
 Parameters measured System volts, System current, System active power, System apparent power, System reactive power, Phase - neutral voltages (VL-N), Phase - phase voltages (VL-L), Phase - phase current, Frequency (of voltage V1), Active power per phase, Apparent power per phase, Reactive power per phase, Power factor (PF), Total active energy Wh, Total reactive energy VArh, Phase angle, Mean and peak values, Time and date, Hours run

Mftrs. List No.	Type	Output	Order Code	1+	5+
TEGRA-810-200	DIN Rail	Pulsed	<b>177-5888</b>	140.00	120.00
TEGRA-810-010	DIN Rail	Modbus™ RS485	<b>177-5889</b>	160.00	135.00
TEGRA-710-200	72mm Panel Mount	Pulsed	<b>177-5890</b>	140.00	120.00
TEGRA-710-010	72mm Panel Mount	Modbus™ RS485	<b>177-5891</b>	160.00	135.00

**Position Sensors**



Membrane - Self Adhesive



- Extremely flat - 0.5mm
- Adhesive film
- 1 Watt max. @ 25°C
- Greater than 1 million cycles life

Length (mm)	Width (mm)	Mftrs. List No.	Order Code	1+	10+	25+	50+
<b>Rectilinear</b>							
65.86	20.32	SP-L-0050-ST	<b>173-4690</b>	16.25	15.12	14.13	13.00
115.86	20.32	SP-L-0100-ST	<b>173-4691</b>	17.75	16.51	15.43	14.20
215.86	20.32	SP-L-0200-ST	<b>173-4692</b>	21.00	19.53	18.26	16.80
515.86	20.32	SP-L-0500-ST	<b>173-4693</b>	27.00	25.12	23.48	21.60
<b>Rotary</b>							
56mm OD of Track SP-R-0046/353-103-ST			<b>173-4694</b>	21.00	19.53	18.26	16.80
<b>Accessories</b>							
Wiper, M6 x 0.75 WIPER 1-3N			<b>173-4695</b>	7.00	6.51	6.09	5.60

**Pressure Sensor - Silicon**



TruStability™ Range



HSC Series H = 5.9, W = 9.91, D = 6.99mm  
 SSC Series H = 13.85, W = 9.91, D = 9.91mm

The sensing element consists of 4 piezoresistors galvanized with a thin, chemically etched silicon diaphragm. A pressure change will flex the mechanism, causing a strain in the diaphragm and buried resistors. The resistor values will change in proportion to the stress applied, which produces an electrical output. These devices have potential applications in dialysis equipment, blood analysis, centrifusion and oxygen and nitrogen gas distribution, HVAC devices, data storage, process controls, industrial machinery, pumps and robotics.



- Fully calibrated
- On-board Application Specific Integrated Circuit (ASIC)
- Long term stability
- High accuracy
- Miniature package size
- Low operating voltage
- Extremely power consumption
- Insensitive mounting orientation

Order Code	Mftrs. List No.	Pressure Range	Supply Voltage	Output Type
<b>HSC Series - High Accuracy</b>				
177-8672	HSCMRN001BGAA5	0bar to 1bar	5V	Analog voltage
177-8673	HSCMRN001BG2A5	0bar to 1bar	5V	Analog voltage
177-8674	HSCMRN001PG2A3	0psi to 1psi	3.3V	Digital
<b>SSC Series - Standard Accuracy</b>				
177-8676	SSCSANN001BGAA5	0bar to 1bar	5V	Analog voltage
177-8677	SSCSANN001PGAA5	0psi to 1psi	5V	Analog voltage

Pressure Range	Mftrs. List No.	Order Code	1+	10+	25+	50+
<b>HSC Series - High Accuracy</b>						
0bar to 1bar	HSCMRN001BGAA5	<b>177-8672</b>	30.90	23.33	21.63	20.55
0bar to 1bar	HSCMRN001BG2A5	<b>177-8673</b>	30.90	23.33	21.63	20.55
0psi to 1psi	HSCMRN001PG2A3	<b>177-8674</b>	30.90	23.33	21.63	20.55
<b>SSC Series - Standard Accuracy</b>						
0bar to 1bar	SSCSANN001BGAA5	<b>177-8676</b>	25.49	18.54	17.10	16.38
0psi to 1psi	SSCSANN001PGAA5	<b>177-8677</b>	25.49	18.54	17.10	16.38

**Digital Soft Starters**



Single Phase AC Motors



- Fit and Forget - No maintenance
- Quick fit and simple wiring
- Simple and easy Retrofit
- LED Indication showing power and energy saving
- Energy Optimising
- Torque Reduction



HFE5, 10 & 17 - H = 180, W = 65, D = 69mm  
 HFE30 - H = 195, W = 150, D = 97.5mm

HFE energy saving soft starters are designed to control single phase AC motors. Operation is fully automatic, a low starting voltage is applied to the motor as soon as the supply is switched on. The internal automatic ramp control immediately takes over and raises the voltage progressively, causing the motor to accelerate smoothly. At the end of the ramp period, the motor is operated in Energy Saving mode and the HFE continuously regulates the voltage to match mechanical load. Energy consumption at light loads is considerably reduced, motor winding and case temperatures are lowered, motor life is extended, noise levels are reduced and Power Factor is improved.

Operational Current (A)	Motor kW (kW)	HP (460) V	Mftrs. List No.	Order Code	Price Each 1+
5	0.56	0.56	HFE 5A	<b>176-0621</b>	105.00
10	1.1	1.1	HFE 10A	<b>176-0623</b>	108.35
17	2.2	2.2	HFE 17A	<b>176-0624</b>	115.00
30	4	4	HFE 30A	<b>176-0625</b>	233.35

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## Electronic Soft Starters

### 3 - Phase AC Induction Motors



This range of soft starters display the latest developments in design and technology from a company that has over 25 years experience of innovative design and manufacture of motor starters. With the addition of the optional fan, these units can be upgraded from 10 starts or 5 starts + 5 stops per hour to 60 starts or 30 starts + 30 stops per hour.

Case Size 1 - H = 140, W = 45, D = 120mm  
Case Size 2 - H = 165, W = 55, D = 120mm



- Voltage - 230V rms to 460V rms
- Current - 5A to 41A (460V)
- Control voltage - 24V dc
- Start time - 1s to 30s
- Stop time - 0 to 30s
- Start pedestal voltage - 30% to 100%
- Standard Duty - IE AC53B, 3-5, 355
- DIN rail mounting
- Two phase control
- Internally bypassed
- Over current protected

Case Size	Operational Current (A)	Motor kW (kW)	Motor HP (460) V	Mfrs. List No.	Order Code	Price Each 1+
1	5	2.2	2.2	PFE-02	176-0605	82.00
1	7	3	3	PFE-04	176-0606	88.00
1	9	4	4	PFE-06	176-0607	98.00
1	12	5.5	5.5	PFE-08	176-0608	106.00
1	16	7.5	7.5	PFE-10	176-0611	115.00
2	22	11	11	PFE-12	176-0612	132.00
2	30	15	15	PFE-14	176-0613	160.00
2	36	18.5	18.5	PFE-16	176-0614	188.00
2	41	22	22	PFE-18	176-0615	210.00
Fan for Case Size 1 Softstarters					PFEFAN01	28.55
Fan for Case Size 2 Softstarters					PFEFAN02	210.00

## efergy E<sup>2</sup> Energy Monitoring Meter

### Wireless



Display - H = 185, W = 185, D = 24mm



- Simple and quick to install and use
- PC connectivity, sensor, transmitter/sender and Elink energy monitoring software CD included
- Program up to 4 tariffs - set start/end times and p/kWhr to match your supply
- Instant, Average and Historical data shown on portable wireless display

The Efergy 2 + Elink wireless electricity display device is a wireless energy monitor that displays at a glance how much electricity your equipment is using. Elink technology allows data to be transferred to your computer to help you spot money saving opportunities and to assist with the reduction of carbon footprints.

You can view instant, average and historical information (daily, weekly and monthly totals are stored in the memory) on the portable display unit. Download stored data to your PC for more detailed analysis and see your energy use clearly displayed in bar charts and line graphs. Radiated frequency 433.52MHz with a range of 40 to 70m depending on the environment. The Portable Display Unit and the Transmitter/Sender Unit require 3 X AAA batteries each (6 in total). Lithium or rechargeable cells are recommended.

Mfrs. List No.	Order Code	Price Each 1+
EFERGY E2-METER	177-4541 ●	52.45

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## Lighting Controllers

### Energy Saving - Fluorescent and HID circuits



- Fit and Forget - No maintenance
- Quick fit and simple wiring
- Simple and easy Retrofit
- LED Indication showing power and energy saving
- Electrical connections via terminal block at base of unit

H = 305, W = 170, D = 100mm



After fluorescent / HID lights have been switched on and go through a warm up period they can operate effectively on a reduced power supply. These units function by allowing lights to be activated at the standard utility voltage and then reducing the voltage by switching into economy mode. This intelligent and safe control of power reduces energy consumed with little or no impact on light output.

A Liquid Crystal Display panel on the front on the device shows savings being made in real time.

The units can sense a change in energy demand and automatically switch back to mains voltage where necessary. System failure is eliminated as internal circuits automatically change over to mains power if overload or low voltage is detected. A bypass switch to allow manual bypass of economy mode during lighting maintenance is fitted as standard with automatic return to economy mode after a set period of time.

The units can be retrofitted to existing fluorescent / HID lighting circuits and can be easily installed by a qualified electrician in less than 30 minutes keeping interruption and lighting downtime is a matter of minutes. Once installed there are no maintenance costs - only ongoing savings.

Load Current (A)	Load (VA)	Mfrs. List No.	Order Code	Price Each 1+
<b>Fluorescent Light Controllers</b>				
9	2400	LIGHT ECO 2.4	176-0618	526.00
14	3800	LIGHT ECO 3.8	176-0619	760.00
<b>High Intensity Discharge (HID) Light Controller</b>				
16		LIGHT ECO PLUS HID	176-0620	820.00

## Override & Status Indicating Modules

### 19 Series



These modules are used as an interface between Building Management Systems (BMS), Direct Digital Controllers (DDC) or in combination with Programmable Logic Controllers (PLC's) and connected equipment.

**Override Control Modules** can override the BMS, DDC or PLC and permit the equipment to be forced into the desired operational status. In the "Automatic" position, signals from the BMS, DDC or PLC will be transferred, unchanged, to the equipment. In the "Hand" position it is possible to force the equipment to the desired status, which is indicated by an LED (or LED's for type 19.50) on the module's fascia.

**Status Indicating Modules** are LED indicating modules which show the status of the input signal, but where the LED colour has been preset to match the degree of importance or urgency of the signal. Presetting the colour to Red, Green or Blue is by a DIP-switch on the rear face of the module, before mounting. An output CO or NC contact, following the input, is provided for control or status feedback.

- Clear indication of signal or equipment status
- Easy operation of selector switches and potentiometers
- Feedback contact - Signals when switch is not in the "Auto" position
- Compact housing with two widths, 17.5 or 35mm
- Uniform unit depth of 60.8mm overall
- Only 88.8mm in height
- 35mm DIN Rail mounting



Nominal Supply Voltage	Mfrs. List No.	Order Code	Price Each 1+
<b>Status Indicating Modules</b>			
1 Channel Input Module	19.31.0.024.0000	171-8985 ●	42.53
2 Channel Input Module	19.32.0.024.0000	171-8986 ●	45.36
<b>Digital Override Control Modules</b>			
On / Off Module	19.41.0.024.0000	171-8987 ●	49.14
Low / High Output Module	19.42.0.024.0000	171-8989 ●	56.70
<b>Analogue Override Control Module</b>			
Analogue Output Module 0-10V	19.50.0.024.0000	171-8991 ●	51.98

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## WSM Soldering Station



Ideal for all soldering applications that need a professional but handy and uncomplicated station. ESD safe and designed for use in laboratories, repair, service and industrial engineering.

Temperature range 100°C - 400°C  
Heat up time 4 sec.  
Power 40W / 12V  
Switching power supply 100 - 230V

### WSM 1:

- ESD safe, for industrial applications
- Built in Stop+Go function for energy efficient switch off
- Touch sense technology
- Temperature-locking function
- 2 adjustable temperatures
- Integrated micro soldering iron WMRP 40 W in chrome design
- Changeable, highly efficient RT 3 Micro soldering tip and integrated heating element
- Safety rest with WDC dry cleaner

### WSM 1C:

Like WSM 1, plus rechargeable battery for mobile, cordless service. The perfect alternative to gas powered irons.

- Latest LiFePo4-rechargeable technology
- Up to one hour soldering capacity
- Recharged in 20 minutes

Mfrs. List No.	Order Code	Price Each
		1+
WSM 1 (UK + EU)	172-9965	230.43
WSM 1C (UK + EU)	172-9966	285.52

## WS81 Soldering Station



An 80 watt electronically controlled soldering station. The station has an analogue temperature scale and is suitable for through hole and surface mount printed circuit board assembly and rework operations

- Rating 80W
- Supply 230V input, 24V output
- Temperature range: 150°C to 450°C
- Temperature accurate to ±2% of Max. temp
- Temperature set by rotary potentiometer
- LED temperature condition indicator
- ESD safe
- Can drive all Weller electronically controlled tools up-to 80W rating compatible with the station
- Uses LT series tips
- Lead free manufacture compatible

Station comprises:

PU81 power unit, Mfr's List No. 0053252399  
WSP80 soldering iron, Mfr's List No. 0052918099  
WPH80 bench support, Mfr's List No. 0051514099

Description	Order Code	Price Each
		1+
WS 81 (UK Plug)	972-009	191.88
WS 81 (EU Plug)	380-4379	174.99

## WFE2ES Fume Extraction System



Comprises:  
WFE 2ES volume fume extraction unit with filter system  
One extraction arm kit consisting of:  
60mm Extraction Arm  
Funnel Nozzle  
Stop Valve  
2 bench mounting clamps  
3 metre length of extraction hose

- Supply voltage 230V / 50Hz
- Dimensions 320 x 320 x 395 mm (L x W x H)
- Power input 115 VA
- Noise level 52db(A) at 1 m
- Extraction rate 220 Cu/M per hour
- Max vac 1800Pa
- Filter fine dust filter grade F5
- Combined HEPA filter grade H12 and wide band gas filter
- Will remove 99.5 % of particles down to 0.3 micron
- Can be upgraded to a 2 point extraction unit by the addition of an extra arm kit

The WFE 2ES is a powerful and economic volume extraction system which will support up to 2 workstations. Ideally suited to applications involving solder baths, hot air soldering, hand soldering and gluing work, this system will safely and efficiently remove from the workplace, the increased levels of air-borne pollutants produced when using lead free solder.

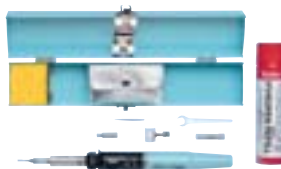
Filter: F5 fine dust filter  
H12 HEPA filter plus wide band gas filter

Max. Vacuum: 1800 Pa  
Max. Airflow: 220m³/h

Description	Mfrs. List No.	Order Code	Price Each
Fume Extraction Kit	0053651689	168-8999	603.56
Fume Extraction Unit	WFE 2ES	137-8428	489.46
60mm Funnel Arm Kit	0053657199	167-6548	122.76
Filter Set (1 x H12, 10 x F5 Pre-Filters)	0058762701	137-8432	73.18
F5 Fine filter for WFE 2ES (Pack of 10)	0058762703	137-8433	24.39

## Gas Soldering Iron

### Pyropen Peizo Kit - Self Igniting



Kit contents:

Self igniting butane powered soldering iron, 3mm chisel soldering tip (Mfr's No. 0051612199), hot blow nozzle (Mfr's No. 0051614299) and an accessory pouch, containing heat shrink kit, wrench and butane refill canister.

- Supplied in a robust, hinged metal case, complete with a soldering iron support and a cleaning sponge
- Temperature range 300°C - 500°C
- Functions as a soldering iron, or hot air blower
- Self igniting piezo ignition
- Gas level indicator
- Approx. 3 hours operation from each fill
- Uses WPT series tips
- Uses WHC series hot blow nozzles

Mfrs. List No.	Order Code	1+	5+	10+
Pyropen Kit	0051605999	434-3554	118.43	114.88

## Soldering and Rework Station

### ZD-917



The digital repair system includes a soldering iron and desoldering gun. It offers a controlled supply of heat, suitable for desoldering all type of components and allows easy removal of the residual solder. The soldering iron and desoldering iron can be used independently or at the same time. The temperature sensor on the top of the tips can check the tip temperature quickly and decrease the possibility of the tip temperature falling off during the operation. Suitable for lead free soldering applications.

**Contents of Station:** Power unit, soldering iron (with a conical tip), desoldering gun (with 3 conical tips), ZD-10K stand with sponge and

user instructions.

#### Technology Specification

Supply Voltage 230V (220-240V)  
Power 60W Soldering  
80W Desoldering

#### Technology Specification

Temperature range 160°C - 480°C

Description	Order Code	1+	3+	10+
Soldering & Rework Station (UK & EU Plug)	149-8363	137.33	127.03	120.17
Replacement Filter	151-6020	0.22	0.21	0.19

## MRS-1000A Modular Rework System



A convection rework system for the removal and placement of QFP/BGA/CSP and SMT components. The MRS provides rework solutions to customers who have a need to repair PCB's in a simple and professional manner.

- Digital display for repeatable temperature settings and profile control
- Automatic control of the preheater for simple operation
- Easy profile creation for operator repeatability
- Integrated vacuum pickup for easy component removal
- Hand held or tool holder mounted for operator comfort
- Manual mode for quick setup

Continues on next page

- External thermocouple for process setup and verification
- Digital controlled airflow for repeatable results
- X, Y, Z and Theta controls for component alignment
- Adjustable PCB holder for easy change outs
- Automatic vacuum lift off at the end of the cycle

**MRS-1000A Contents:** PCT-1000 Programmable Preheater, HCT-1000 Programmable Hand Held Convection Tool, ATH-1000 Adjustable Tool Holder and LM-1000 Light Magnifier.

Description	Mfrs. List No.	Order Code	Price Each
Modular Rework System	MRS-1000A	177-3269	3,264.00
Hot Air Rework Station	HCT-1000	177-3270	1,348.00
Preheater	PCT-1000	177-3271	710.00

### MX-5000 Soldering, Desoldering and Rework System



MX-5010 - Soldering / Rework System

MX-5020 - UltraFine™ Soldering

MX-5041 - Precision Tweezer, Soldering / Rework    MX-5051 - Soldering, De-soldering / Rework

- Powered by Metcal SmartHeat™ technology
- Unique display indicating thermal demand, power output, per solder joint
- Tip saver stand with sponge & brass pad for extended tip life
- Automatic power down when not in use for prolonged periods
- 100 - 240VAC Input voltage

#### MX-5010 Soldering and Rework System

The MX-5010 configured with the Metcal Advanced™ Hand-piece is highly effective for all soldering applications including: lead-free, high mass components or boards, thermally sensitive components requiring low operating temperature, high volume production soldering and touch-up soldering operations, using the STTC Series soldering cartridges. In addition, the MX-5010 can be used for conduction rework of SMDs when using SMTC Series soldering.

#### MX-5020 UltraFine™ Soldering System

The MX-5020 includes the Metcal UltraFine™ Soldering Hand-piece. Using the all-new UFTC cartridges, the hand-piece is a speciality tool for soldering and touch-up of very small components, restricted access or high density component packaging on a PCB.

#### MX-5041 Precision Tweezers, Soldering and Rework System

The MX-5041 combines both the Metcal Advanced™ Hand-piece and the Precision Tweezers Hand-piece. Users get maximum application flexibility for soldering and reworking the wide range of surface mount components. When switching hand-pieces, tips reach operating temperature in seconds by simply pressing the Output Selector/Command Button.

#### MX-5051 Soldering, De-soldering and Rework System

The MX-5051 addresses through-hole de-soldering, general soldering, and SMD rework applications. The system includes two hand-pieces. The Metcal Advanced™ Hand-piece with a selection of soldering and SMD rework cartridges and the Metcal MX-DS1 De-soldering hand-piece for through-hole de-soldering. This configuration is ideal for mixed technology boards and provides the greatest versatility for addressing soldering and rework tasks.

Content of each single Soldering System					
Mfrs List No.	Description	MX-5010	MX-5020	MX-5041	MX-5051
MX-PS5000	Power Supply 100 - 240V AC	●	●	●	●
MX-H1-AV	Advanced Handpiece	●	●	●	●
AC-CP2	Cartridge Removal Pad	●	●	●	●
AC-YS3	Sponge	●	●	●	●
AC-BP	Brass Pad (Pack of 10)	●	●	●	●
MX-W1AV	Solder Handpiece Stand	●	●	●	●
MX-H2-UF	Ultra Fine Handpiece		●		
MX-PTZ	Precision Tweezer Handpiece			●	
MX-W4PT	Precision Tweezer Stand			●	
MX-DS1	Desoldering Handpiece				●
MX-W5DS	Desolder Stand				●
MX-RM8E	Desoldering Cord				●
MX-DAH4	Desolder Air Line				●
AC-TC	Desoldering Tip Cleaner				●
MX-DCF1	Desolder Filter & Liner Set				●

Mfrs List No.	Description	Order Code	Price Each
MX-5010	Soldering / Rework System	169-7226	420.00
MX-5020	UltraFine™ Soldering System	170-5191	430.00
MX-5041	Precision Tweezers, Soldering / Rework System	170-5190	640.00
MX-5051	Soldering, De-soldering / Rework System	170-5188	650.00

**Power Supply and Accessories**

MX-H1-AV	Advanced Handpiece	170-5193	61.00
MX-PTZ	Precision Tweezer Handpiece	170-5194	164.00
MX-H2-UF	Ultra Fine Handpiece	170-5195	77.00
MX-DAH4	Desolder Air Line	170-5196	22.50
MX-W1AV	Solder Handpiece Stand	170-5197	44.00
MX-W4PT	Precision Tweezer Stand	170-5198	44.00
MX-W5DS	Desolder Stand	170-5199	44.00

### ST 65 Soldering System



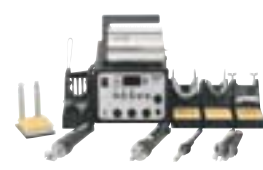
The ST 65 is a single channel, dial control system features the SX-90 Sodr-X-Tractor. Compatible with all IntelliHeat™ hand-pieces. Featuring a powerful multi-stage venturi powered by your compressed air source, the ST 65 is ideal for applications requiring continuous pressure. It is compatible with all IntelliHeat handpieces. Tips supplied separately.

- IntelliHeat Control Technology
- °C/°F Temperature Scales
- Temperature Adjustment Lockout
- Patented Snap-Vac Technology
- ESD grounding jack
- ESD Safe metal housing
- Stackable
- Tips not included

Power requirements	197-253 VAC, 50/60Hz, 90 Watts Max
Dimensions	104 x 130 x 152mm
Weight	2.3Kg
Temp. stability	±1.1°C (±2°F) @ Idle tip temp
Temp. range	176°C - 482°C (350°F - 900°F)

Description	Mfrs. List No.	Order Code	Price Each
ST 65 with SX-90 Handpiece	8007-0516	177-5252	385.78
ST 65 Power Unit	8007-0517	177-5253	251.59

### MBT 250 Digital High Performance Rework System



The MBT 250-SDPT provides you with an advanced, microprocessor-based Thermal SMT and repair management centre which powers and controls three SensaTemp handpieces simultaneously for safe, rapid installation and removal of surface mount and thru-hole components.

- Setback automatically reduces tip temperature to 350°F/177°C after 10-90 minutes
- Manual mode allows you to put all channels into setback; Auto Off
- High power, 3 channel system - 185 watts total power
- Independently powered
- °F/°C selector key
- Tip and temperature selection system charts make choosing the right tip and temperature easy
- Tips not included

Power requirements	230VAC, 50/60Hz, 207 Watts maximum
Dimensions	135 x 165 x 260mm
Weight	5Kg
Temp. stability	±1.1°C (±2°F) @ idle from set tip temp
Temp. range	38°C to 482°C (100°F to 900°F) nominal

Description	Mfrs. List No.	Order Code	Price Each
MBT 250 with PS-90, SX-90, TT-65 & TP-65 Handpieces	8007-0207	177-5255	1,408.24
MBT 250 Power Unit	8007-0353	177-5256	738.00

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**Digital Microscope, USB**



- Digital microscope with image capture facility
- Manual focus range from 10mm
- 10x - 200x magnification
- 4x White LEDs provide illumination in any conditions
- Software (supplied) shows live feed on your monitor/notebook
- Capture still images and video up to 1280x960 resolution (640x480 pixel sensor)
- TWAIN compatible
- USB interface with 1.4m cable

- Supports Win 98SE/ME/2000/XP or later
- Dimensions (HxWxD): 33x33x112mm
- Contents: Microscope, software and user guide.

Mfrs. List No.	Order Code	Price Each
MICROSCOPE, DIGITAL, USB	D00997	59.90

**Electronic Professional Side Cutters**



The Best Cutters You'll Ever Use



- High quality ball bearing steel
- 63 - 65 Rockwell Hardness (HRC)
- 2-Component ESD Ergonomic handles, soft comfortable gripping surface, hard plastic core
- Dual leaf springs in blue steel
- Matched bearing rings to minimize metal-metal contact and friction

- Lap joint with screw to achieve a high level of strength and precision
- Static dissipative (10<sup>6</sup> - 10<sup>8</sup> Ω/sq.), oil, grease and wear-resistant
- All cutters available with three types of cutting blades:
  - Semi-flush: for soft and hard wire
  - Flush: for very precise cutting of soft wire
  - Full-flush: for a perfect cutting of soft wire

Head Size	Cut Type	Cutting Capacity	Overall length inch	Overall length mm	Mfrs. List No.	Order Code
<b>Oval Head</b>						
S	Semi-flush	0.2 - 1.2 mm	4.8"	123	D00998	169-6510
S	Flush	0.1 - 1.2 mm	4.8"	123	D00999	169-6511
S	Full-flush	0.1 - 1.0 mm	4.8"	123	D01000	169-6512
L	Semi-flush	0.3 - 1.6 mm	4.9"	125	D01001	169-6513
L	Flush	0.2 - 1.6 mm	4.9"	125	D01002	169-6514
L	Full-flush	0.2 - 1.2 mm	4.9"	125	D01003	169-6515
<b>Tapered Head</b>						
S	Semi-flush	0.2 - 1.2 mm	4.8"	123	D01004	169-6516
S	Flush	0.1 - 1.2 mm	4.8"	123	D01005	169-6517
S	Full-flush	0.1 - 1.0 mm	4.8"	123	D01006	169-6519
L	Semi-flush	0.3 - 1.6 mm	4.9"	125	D01007	169-6521
L	Flush	0.2 - 1.6 mm	4.9"	125	D01008	169-6522
L	Full-flush	0.2 - 1.2 mm	4.9"	125	D01009	169-6523
<b>Tapered &amp; Relieved Head</b>						
S	Semi-flush	0.2 - 1.0 mm	4.8"	123	D01010	169-6524
S	Flush	0.1 - 1.0 mm	4.8"	123	D01011	169-6525
S	Full-flush	0.1 - 0.8 mm	4.8"	123	D01012	169-6526

Mfrs. List No.	Head Size	Cut Type	Order Code	1+	5+	10+	Price Each
<b>Oval Head</b>							
D00998	S	Semi-flush	169-6510	23.72	21.83	21.37	
D00999	S	Flush	169-6511	24.23	22.29	21.83	
D01000	S	Full-flush	169-6512	24.74	22.75	22.29	
D01001	L	Semi-flush	169-6513	24.74	22.75	22.29	
D01002	L	Flush	169-6514	25.25	23.21	22.75	
D01003	L	Full-flush	169-6515	25.76	23.72	23.21	
<b>Tapered Head</b>							
D01004	S	Semi-flush	169-6516	23.72	21.83	21.37	
D01005	S	Flush	169-6517	24.23	22.29	21.83	
D01006	S	Full-flush	169-6519	24.74	22.75	22.29	
D01007	L	Semi-flush	169-6521	24.74	22.75	22.29	
D01008	L	Flush	169-6522	25.25	23.21	22.75	
D01009	L	Full-flush	169-6523	25.45	23.41	22.90	
<b>Tapered &amp; Relieved Head</b>							
D01010	S	Semi-flush	169-6524	25.45	23.41	22.90	
D01011	S	Flush	169-6525	25.45	23.41	22.90	
D01012	S	Full-flush	169-6526	25.45	23.41	22.90	

**Electronic Professional Pliers**



The Best Pliers You'll Ever Use



- High quality ball bearing steel
- 63 - 65 Rockwell Hardness (HRC)
- 2-Component ESD Ergonomic handles, soft comfortable gripping surface, hard plastic core
- Dual leaf springs in blue steel
- Matched bearing rings to minimize metal-metal contact and friction

- Lap joint with screw to achieve a high level of strength and precision
- Static dissipative (10<sup>6</sup> - 10<sup>8</sup> Ω/sq.), oil, grease and wear-resistant

Mfrs. List No.	Jaw	Overall length inch	Overall length mm	Order Code	1+	5+	10+	Price Each
<b>Long Snipe Nose</b>								
D01013	Smooth	5.6"	143	169-6527	21.42	19.69	19.28	
D01014	Serrated	5.6"	143	169-6528	22.44	20.66	20.20	
<b>Snipe Nose</b>								
D01015	Smooth	5.2"	133	169-6529	20.91	19.23	18.82	
D01016	Serrated	5.2"	133	169-6530	21.93	20.20	19.74	
<b>Flat Nose</b>								
D01017	Smooth	5.2"	133	169-6532	20.20	18.56	18.16	
<b>Round Nose</b>								
D01018	Smooth	5.2"	133	169-6533	20.99	19.30	18.92	

**Vacuum Pick-up Set**



Hand held vacuum pick-up tool, suitable for the handling and placement of surface mount and small components. Supplied with: 3 Straight heads with rubber suction pads 3 Angled heads with rubber suction pads Suction pad diameters: 3, 6 & 10mm Supplied complete in a fitted plastic case

Mfrs. List No.	Order Code	1+	5+	10+	Price Each
VACUUM PICK UP TOOL SET	79-050-100	171-6016	15.25	14.18	13.52

**Electronic Cutters and Pliers Kit**



6 Pieces



- High quality ball bearing steel
- 63 - 65 Rockwell Hardness (HRC): Pyrometer controlled inductive hardening
- All cutters available with three types of cutting blades:

- SEMI-FLUSH, for soft and hard wire
- FLUSH, for very precise cutting of soft wire
- FULL-FLUSH, for a perfect cutting of soft wire
- 2-Component ESD Ergonomic handles, soft comfortable gripping surface, hard plastic core
- Dual leaf springs in blue steel
- Matched bearing rings in order to minimize metal-metal contact and friction
- Lap joint with screw in order to achieve a high level of strength and precision. The nut is made of hardened alloy steel in order to resist high cutting load. The screw is fine-pitched for perfect joint adjustment
- Kit Content:
  - Oval Small Semi-Flush cutters
  - Oval Big Semi-Flush cutters
  - Tapered Small Flush cutters
  - Tapered and relieved Full-Flush cutters
  - Snipe Long Nose pliers
  - Round Nose pliers

Description	Mfrs. List No.	Order Code	1+	3+	5+	Price Each
ELECTRONIC PLIERS + CUTTERS SET, 6PC	D01628	177-2127	99.90	95.90	89.90	

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### Electronics Tool Kit

**DURATOOL**



Ideal for technicians, a comprehensive electronics toolkit supplied within a handy zipped tool bag - external dimensions: 340 x 210 x 50mm

**New**

**Kit Contents:**

- 20W/130W Soldering iron
- Desoldering pump
- Multimeter
- 5" Long nose pliers
- 5" Side cutters
- slotted precision screwdriver: 2.5 x 75mm
- Phillips precision screwdriver: PH00 x 75mm
- Slotted screwdriver: 4 x 75, 5 x 75, 6 x 125mm
- Phillips Screwdriver: PH0 x 75, PH1 x 75, PH2 x 125mm
- Maintester screwdriver
- Wire stripper/cutter
- 8pc Hex key set: 1.5, 2, 2.5, 3, 4, 5, 5.5, 6mm
- IC Extractor
- Tweezers

Mfrs. List No.	Order Code	1+	3+	10+	Price Each
D00029	171-2132	20.35	17.29	15.25	

### 15 Piece Precision Screwdriver Set

**DURATOOL**



- Cushion handle provides super soft comfortable grip allowing use over prolonged periods
- Supplied in a convenient plastic carry case

**Set contents:**

Slotted - 2 x 65mm, 2.5 x 65mm, 3 x 65mm, 4 x 65mm  
 Phillips - PH000 x 65mm, PH00 x 65mm, PH0 x 65mm, PH1 x 65mm  
 Torx - T6 x 50mm, T7 x 50mm, T8 x 50mm, T9 x 50mm, T10 x 50mm, T15 x 50mm, T20 x 50mm

Order Code	1+	5+	10+	20+	50+	Price/Set
144-7570	9.60	8.53	7.59	7.02	6.71	

### 4 in 1 Ceramic Trimmers

**CK**



**New**

- Same characteristics as individual trimmer series T4845
- 4 ceramic trimmer blades in 1 tool
- Each 2 reversible inserts with each 2 ceramic blades
- Delivered with transparent protection caps
- Antistatic handle
- With protection cap fitted, the blade inserts can be used as Mini-Alignment-Tools
- Blade sizes
  - Slotted 0,9 mm and 1,8 mm
  - Phillips size 0 and Phillips size 0 special



Mfrs. List No.	Order Code	1+	5+	10+	Price Each
T4856	172-5368	36.82	34.99	33.15	

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### Ergo Quickset Calibrated Screwdriver TLS 0022 GOLD

**Proskit**



**New**

- The TLS 0022 incorporates slipping technology, eliminating over tightening
- Tamperproof adjustment makes this tool ideal for production, where the same torque must be accurately and repeatably applied
- Smooth reset action reduces operator fatigue
- Manufactured to exceed the requirements of ISO 6789:2003
- Torque range: 0.5 - 22cNm
- Accuracy +/- 6% of Setting

Mfrs. List No.	Order Code	Price Each
TLS 0022 F/HEX GOLD	171-4397	71.35

### Precision Tweezer Sets

**DURATOOL**

ESD-conductive



161-7215  
 (includes: 3.SA; 7A.SA; 12.SA.SMD; 13.SA.SMD)



161-7216  
 (includes: 3.SA; 5.SA; 7A.SA; 12.SA.SMD; 13.SA.SMD)



161-7218  
 (includes: 3.SA; 3C.SA; 5.SA; 7A.SA; 12.SA.SMD; 13.SA.SMD)

- The Set contains the most used precision tweezers
- Made of Anti-Magnetic Anti-Acid stainless Steel with ESD polyester epoxy coating (10<sup>5</sup> - 10<sup>6</sup> ohm)
- Comfortable handling and insertion of SMD components

Mfrs. List No.	Type	Description	length
D00831	3.SA ESD	Sharp Tweezers	120
D00832	3C.SA ESD	Sharp Tweezers	110
D00833	5.SA ESD	Fine Tips Tweezers	110
D00834	7A.SA ESD	Fine Curved Tweezers	115
D00836	12.SA.SMD	SMD Tweezers for handling and positioning 2 and 3 lead SOT 45° bent	120
D00837	13.SA.SMD	SMD Tweezers for handling and positioning 1mm components	120

Mfrs. List No.	Order Code	1+	5+	10+	Price Each
D00838	161-7215	31.62	30.04	28.46	
D00839	161-7216	39.00	37.05	35.10	
D00840	161-7218	46.92	44.57	42.23	

### Magnifier With 2 Arms

**Proskit**



- Rimless Optical Lens Magnifier with Detail Inset
- Sturdy Alloy Clamp with Protective Coated Clip holds Magnifier firmly
- Stands on Desk or Tabletop with Legs Pulled Out
- Flexible Goose Neck adjusts to any position
- 2 LED Lights can also be used as a Reading Light

Description	Mfrs. List No.	Order Code	1+	5+	10+	Price Each
Two-Arms Clip/Stand Magnifier	MA-018	166-6224	20.81	19.76	18.72	

## Low profile AC/DC Power Modules

### TMP Series with extended power from 7 to 30 Watt

- 40 Models offer single, dual, and triple output voltages
- UL 508 (15 to 30 Watt models) and UL 60950-1 safety approvals
- Fully encapsulated plastic casing
- Available for PCB mount or chassis mount with screw terminals
- Optional DIN-rail mount adaptor
- Universal Input 85-264 VAC, 47-440 Hz
- Output voltages from 5 VDC up 48 VDC
- Protection Class II, double insulation
- Short circuit protection and overload protection
- EMC compliance for commercial, residential and industrial applications
- **3 years warranty**





**DC/DC Converter - Adjustable O/P**

Okami Series



The OKY-T/3 and -T/5 series are miniature nonisolated Point-of-Load (POL) switch mode DC/DC power converters for embedded applications. The module is fully compatible with Distributed-power Open Standards Alliance (DOSA) industry-standard specifications. Applications include powering CPU's, datacom/telecom systems, distributed bus architectures (DBA), programmable logic and mixed voltage systems.

- Non-isolated SMT POL DC/DC power module
- 8.3-14Vdc input voltage range
- Programmable output voltage from 0.75-5.5Vdc
- Drives 1000 µF capacitive loads
- Over temperature and over current protection
- On/Off control
- Industry-standard (DOSA) surface-mount package

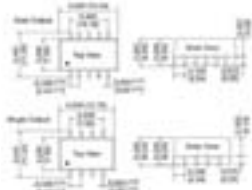
Mfrs. List No.	Output Voltage (V)	Output Current (A)	Input Voltage (V)	On/Off Control Polarity *	Dimensions(mm) (WxHxD)
OKY-T/3-D12N-C	0.75 - 5.5	3	12	N	20.8x11.9x7.1
OKY-T/3-D12P-C	0.75 - 5.5	3	12	P	20.8x11.9x7.1
OKY-T/5-D12N-C	0.75 - 5.5	5	12	N	20.8x11.9x7.1

\* N = Negative polarity, P = Positive polarity.

Mfrs. List No.	Order Code	Price Each			
		1+	10+	25+	50+
OKY-T/3-D12N-C	170-5270	6.20	6.10	6.01	5.83
OKY-T/3-D12P-C	170-5272	6.20	6.10	6.01	5.83
OKY-T/5-D12N-C	170-5273	7.50	7.38	7.27	7.05

**1 Watt Single and Dual Output DC/DC Converters**

Industry Standard SMD Package



PIN CONNECTIONS		
Pin	Single Output	Dual Output
1	-Vin	-Vin
2	+Vin	+Vin
3	N/C	N/C
4	0V	0V
5	+Vout	-Vout
6	N/C	N/C
7	N/C	+Vout
8	N/C	N/C
9	N/A	N/C
10	N/A	N/C

- Single & Dual Output
- SMD Package
- Industry Standard Pinout
- 1000 VDC Isolation
- Short Circuit Protection
- MTBF >3.5 Mhrs
- 3 Year Warranty



Input Voltage Range: Nominal ±10%  
 Line Regulation: 1.2%/1% Δ Vin  
 Load Regulation: 7.5% 10-100% load change  
 Ripple & Noise: Single output: 100 mV pk-pk, 20 MHz bandwidth  
 Dual output: 75mV pk-pk, 20MHz bandwidth  
 Isolation: 1000 VDC  
 Operating Temperature: -40°C to +85°C, full load  
 MTBF: >3.5 Mhrs to MIL-HDBK-217F at 25°C, GB

Mfrs. List No.	Input Voltage (V)	Output Voltage (V)	Output Current (mA)	Efficiency (%)	Order Code
ISF0303A	3.3	3.3	300	73	177-6109
ISF0305A	3.3	5	200	74	177-6110
ISF0503A	5	3.3	300	72	177-6111
ISF0505A	5	5	200	77	177-6112
ISF0509A	5	9	110	76	177-6114
ISF0512A	5	12	84	79	177-6115
ISF0515A	5	15	67	78	177-6116
ISF0505	5	±5	±100	77	177-6117
ISF0509	5	±9	±55	76	177-6118
ISF0512	5	±12	±42	79	177-6119
ISF0515	5	±15	±33.5	78	177-6120
ISF1205A	12	5	200	69	177-6121
ISF1209A	12	9	110	73	177-6122
ISF1212A	12	12	84	73	177-6123
ISF1215A	12	15	67	74	177-6124
ISF1205	12	±5	±100	69	177-6126
ISF1209	12	±9	±55	73	177-6127
ISF1212	12	±12	±42	73	177-6128
ISF1215	12	±15	±33.5	74	177-6129
ISF2403A	24	3.3	300	69	177-6130
ISF2405A	24	5	200	70	177-6131
ISF2409A	24	9	110	72	177-6132
ISF2412A	24	12	84	75	177-6133
ISF2415A	24	15	67	76	177-6134

Mfrs.	Input	Output	Efficiency		
ISF2424A	24	24	42	77	177-6135
ISF2405	24	±5	±100	70	177-6136
ISF2409	24	±9	±55	72	177-6138
ISF2412	24	±12	±42	75	177-6139
ISF2415	24	±15	±33.5	76	177-6140

	Order Code	Price Each			
		1+	5+	10+	25+
Single Output	All Order Codes	4.00	3.88	3.76	3.60
Dual Output	All Order Codes	4.50	4.37	4.23	4.05

**150 - 500 Watt Single Output Industrial PSU's**



- Single Output Industrial Supplies
- High Efficiency
- Low Cost
- Output Voltage Trim
- 150 W Convection Cooled
- 300 W & 500 W with Internal Fans
- Outputs from 12 V to 48 V
- 3 Year Warranty

Mfrs. List No.	Power	Output Voltage	Current	Dimensions (WxDxH)	Order Code
LCL150PS12	150W	12V	12.5A	192 x 95 x 50	173-8311
LCL150PS15	150W	15V	10A	192 x 95 x 50	173-8312
LCL150PS24	150W	24V	6.3A	192 x 95 x 50	173-8313
LCL150PS48	150W	48V	3.1A	192 x 95 x 50	173-8314
LCL300PS12	300W	12V	25A	205 x 110 x 50	173-8315
LCL300PS15	300W	15V	20A	205 x 110 x 50	173-8316
LCL300PS24	310W	24V	13A	205 x 110 x 50	173-8317
LCL300PS48	320W	48V	6.7A	205 x 110 x 50	173-8319
LCL500PS12	500W	12V	42A	250 x 127 x 53	173-8321
LCL500PS15	500W	15V	34A	250 x 127 x 53	173-8322
LCL500PS24	500W	24V	21A	250 x 127 x 53	173-8323
LCL500PS48	500W	48V	10.5A	250 x 127 x 53	173-8324

	Order Code	Price Each			
		1+	5+	10+	25+
LCL150	All Order Codes	53.00	51.41	49.82	47.70
LCL300	All Order Codes	95.00	92.15	89.30	85.50
LCL500	All Order Codes	150.00	145.50	141.00	135.00

**100 Watt Single Output**

Ultra Compact Design



- IT & Medical Safety Approvals
- Green Mode, <0.5 W Standby Power
- 80W - Convection-cooled
- 100W - Forced Cooled
- Class I & Class II Construction
- Industry Standard 2" x 4" Package
- Low Leakage Current
- 3 Year Warranty

Dimensions(mm): H=30.5, W=101.6, D=50.8

Mfrs. List No.	Output Power (Convection Cooled)	Output Power (Forced Cooled 10 CFM)	Output Voltage	Output Current	Order Code
ECS100US12	100W	100W	12V	8.3A	173-8297
ECS100US15	100W	100W	15V	6.7A	173-8298
ECS100US24	100W	100W	24V	4.2A	173-8299
ECS100US28	100W	100W	28V	3.6A	173-8300
ECS100US48	100W	100W	48V	2.1A	173-8301

ECS100 Series	Order Code	Price Each			
		1+	5+	10+	25+
	All Order Codes	41.00	39.77	38.54	36.90

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## U1210 Series Handheld Clamp Meters

Agilent Technologies



U1213A

Measurements of electrical distribution cables can be challenging and risky. The Agilent U1210 Series handheld clamp meters enable high-current measurements without breaking the circuit. Unlike most clamp meters, they also include DMM capabilities - resistance, capacitance, frequency and temperature - to simplify troubleshooting during installation and maintenance. Best of all, they provide an extra layer of protection with CAT IV 600V and CAT III 1000 V safety ratings.



- Large clamp opening of 52mm or 2 inch
- High measurement capability of up to 1000 A for AC, DC or AC + DC
- CAT III 1000 V/ CAT IV 600 V safety rating
- Includes full-featured DMM with resistance, capacitance, frequency and temperature functions
- High resolution measurements - measure current as low as 0.01 mA
- Peak hold

- Dual ranging mode - manual and auto
- Min / max recording capability
- Large dual display
- For more information, please visit [farnell.com](http://farnell.com)

Dimensions	U1211A
	106mm(W) X 273mm(L) X 43mm(H)
Net Weight	U1212A & U1213A
	106mm(W) X 260mm(L) X 43mm(H)
Display	U1211A
	625 grams with batteries included
Battery	U1212A & U1213A
	525 grams with batteries included
Battery Life	4 digits with maximum reading 4,100 counts. The 12 Segments analog bar graph and full annunciator. Automatic polarity indication.
Operating temperature	Standard 9 V Battery - Alkaline
Storage temperature	60 hours (typical)
	-10°C to 50°C, 0-80% R.H.
	-20°C to 60°C, 0-80% R.H.

	Mfrs. List No.	Order Code	Price Each
AC Clamp Meter - 1000A	U1211A	178-0334	189.00
AC/DC Clamp Meter - 1000A	U1212A	178-0336	249.00
AC/DC Clamp Meter Pro - 1000A	U1213A	178-0337	264.00

## U1583B Current Clamp

Agilent Technologies



The U1583B current clamp is designed for Agilent handheld digital multimeter (DMM) and Agilent handheld digital oscilloscope. The BNC-to-banana plug is required to connect the current clamp with DMM. While for handheld oscilloscope, it needs to use with BNC connector.



- Dual range 40 A and 400 A clamp-on AC current clamp.
- Designed for Agilent handheld digital multimeter (DMM) and Agilent handheld oscilloscope.
- For more information, please visit [farnell.com](http://farnell.com)

Specifications	Current Clamp
Specified Current Range	1 A to 400 A ac
Usable Current Range	0.5 A to 400 A
AC crest factor	< 3
Bandwidth	10 kHz
Operating Temperature	-10 °C to 55 °C (14 °F to 131 °F)
Storage Temperature	-20 °C to 70 °C (-4 °F to 158 °F)
Relative Humidity	Max 80% RH for temperature up to 35 °C decreasing linearly to 50% RH at 55 °C
Maximum Jaw Opening	32 mm
Maximum conductor size	30 mm or 16 mm x 2
Load impedance	> 1 M ohm, < 100 pF
Cable length	1500 +/- 20 mm
Altitude	Up to 2000 meters
Safety Compliance	Certified by UL ( Canada & USA) for IEC/EN/UL 61010-1 2nd Edition & EN/IEC 61010-2-032
Measurement Category	CAT III 600 V; Pollution degree II
EMC Compliance	Certified to IEC/EN 61326:2002, CISPR 11, and equivalents for Group 1, Class A
Dimensions (HxWxD)	44 mm (H) x 92 mm (W) x 188 mm (L)
Weight	294 grams
Warm-up time	Immediately upon power on

Mfrs. List No.	Order Code	Price Each
U1583B	178-0332	106.00

## Handheld Digital Oscilloscopes

Agilent Technologies

U1600B Series



W=138, H=241, D=66mm. Weight 1.5kg



A three-in-one solution: Dual channel oscilloscope, True RMS DMM and Real-Time Data Logger. A high performance troubleshooting and quality assurance tool for technical professionals in the installation, maintenance, service and automotive industries.

- Large 4.5" 320x240 pixel colour LCD display
- Full remote control and data transfer via PC Link application software
- USB 1.1 full speed interface connectivity
- Multi-language Quick Help support
- 125 kilobytes/channel of waveform memory depth
- Up to 10 waveforms and configuration setups can be stored and recalled at anytime
- For extra storage, versions with USB flash drive support are available
- Real-time data logging functionality

### Oscilloscope features:

- Available in 20MHz and 40MHz bandwidth versions
- Autoscaling
- Dual Waveform Math (DWM) and Fast Fourier Transform (FFT)
- 22 automatic measurements and cursor measurements

### Multimeter features:

- 6000 count auto-ranging TRMS Digital Multimeter
- Voltage, Resistance and Capacitance measurements
- Diode and Continuity tests

### Oscilloscope Specifications

	U1602B	U1604B
Bandwidth	20MHz	40MHz
Max. Sample Rate	200 MSamples/sec (interleaved)	
Rise Time	17ns	8ns
Memory Depth	125 kB / channel	
<b>Vertical System</b>		
Vertical Range	5mV/div to 100V/div	
Vertical Resolution	8 bits	8 bits
DC Vertical Gain Accuracy	3%	3%
<b>Horizontal System</b>		
Horizontal Range	50ns/div to 50s/div	10ns/div to 50s/div
Horizontal Resolution	2ns	400ps
Horizontal Accuracy	3%	3%
<b>Triggering</b>		
Trigger Source	Channel 1 and Channel 2	
Trigger Modes	Auto, Normal, Single, Roll	
Selections	Edge, Pattern, Pulse Width, Video	
<b>Automatic Measurements</b>		
Voltage	pk-to-pk, max, min, amplitude, top, base, overshoot, preshoot, RMS and mean	
Time	frequency, period, width, duty cycle, rise time, fall time, delay and phase shift	
Waveform Maths	CH1 + CH2, CH1-CH2, CH2-CH1	
FFT (U1604A only)	Rectangular, Hanning, Hamming and Blackman-Harris windows	

### Multimeter Specifications

	Ranges	Best Accuracy
AC Voltage	600mV to 600V	±(0.75% rdg + 0.2% range)
DC Voltage	600mV to 600V	±(0.3% rdg + 0.08% range)
Resistance	600Ω to 600MΩ	±(0.5% rdg + 0.2% range)
Capacitance	60nF to 300μF	±(2% rdg + 0.2% range)

**Accessories included:** Probe (1:1) CAT III 300 V, Probe (10:1) CAT III 600 V, Ground alligator clip, DMM test lead, Hook Clip, Medium jaw alligator clip, USB cable, Power lead and AC adapter, Ni-MH battery pack, Quick Start Guide, CD-ROM containing Users Guide, Quick Start Guide and PC Link Application Software.

Description	Mfrs. List No.	Order Code	Price Each
20MHz Scope	U1602B	178-0320	1,025.00
20MHz Scope with USB	U1602B-001	178-0321	1,139.00
40 MHz Scope	U1604B	178-0322	1,280.00
40MHz Scope with USB	U1604B-001	178-0324	1,394.00



**U1401B Multi-function Calibrator/Meter** 



The U1401B Handheld Multi-function Calibrator/Meter from Agilent Technologies sets new levels of versatility and convenience in process control calibration with its ability to simultaneously source and measure. Such versatility, complete with high performance DMM capability, in an attractive price-value point, sets the U1401B strides ahead of other instruments in its class.

- Key Features:**
- Simultaneous source and measure
  - Process calibration tool incorporated with complete DMM features
  - Trusted reliability and value
  - 3-year warranty standard with every unit

(HxWxD) 192 x 90 x 54mm

Order Code 178-0331	Price Each 553.00
------------------------	----------------------

**Digital Multimeters U1241B & U1242B** 



- 10,000 count display
- 0.09% basic DC voltage accuracy and true RMS measurement
- Basic functions: DCV, DCI, ACV, ACI, resistance, frequency, continuity, diode test
- Advanced functions (U2141B): capacitance, temperature, switch counter
- Advanced functions (U2142B): capacitance, temperature, switch counter, harmonic ratio, dual temperature (T1, T2, T1-T2)
- Manual and autoranging
- Continuity beeper and diode test
- Adjustable backlighting
- Min/Max recording
- Built-in probe holder
- Overmould body casing
- CAT III 1000V OV protection
- Certified to CE, CSA, and UL standards
- Powered by 4 x AAA batteries

Description	Mfrs. List No.	Order Code	Price Each
Handheld Multimeter U1241A	U1241B	178-0325	152.00
Handheld Multimeter U1242A	U1242B	178-0326	167.00

**Handheld Digital Multimeters** 

**U1251B and U1252B**



- 50000 counts resolution on both displays
  - 100 manual data storage points
  - dBm measurements
  - Diode test
  - Duty cycle measurements
  - Pulse width measurement
  - Peak Hold
  - IR to USB connectivity (optional U1173A connectivity cable sold separately)
  - -20°C to +55°C operating temperature
  - IEC61010-1 Cat III 1000V safety compliance
  - Robust over-moulded design with multi-function tilt stand
- U1252B Additional Features:**
- 20 MHz frequency counter
  - Programmable square wave generator
  - Built-in battery charger capability
  - Support for J type thermocouple

**Accessories Included:**

Soft carrying case, Battery, U1160A Standard Test Lead Kit, Quick Start Guide, User Guide, PC Software, Instrument Drivers, AC adaptor (U1252B only).

DMM	Mfrs. List No.	Order Code	Price Each
DMM	U1251B	178-0318	303.00
DMM	U1252B	178-0319	333.75

**Agilent OLED DMM U1253B** 



When you're carrying the world's first OLED handheld DMM, you won't have to squint to be sure that you're reading it right. On the go or on the bench, you'll get crystal-clear viewing indoors, even in dark, off-angle situations. Even though the U1253B is loaded with high-performance features and easy-to-use functions, it's priced to be easy on your pocket, too. You might even say it's revolutionary.

Mfrs.	Order Code	Price Each
U1253B	178-0327	339.00

**PicoLog 1000 Series**  
Multichannel Voltage Data Loggers



Designed to meet the needs of a wide range of general-purpose voltage, sensor and transducer logging applications, the PicoLog 1216 and 1012 feature independent software-configurable channels, ranges, scaling and control outputs, an external terminal board for custom front-end circuitry and a choice of 10 or 12-bit input resolution.

The PicoLog 1000 Series multichannel voltage data loggers include everything needed for immediate use and are complemented by a full suite of software including the PicoLog data logging package, the PicoScope oscilloscope package and an SDK for writing user programs. Both loggers feature 3 sampling modes to meet most data logging needs: real-time continuous, streaming and block mode. Streaming allows channel voltage readings to be logged continuously at 1 kS/s on any number of channels, while real-time continuous provides averaged, time-accurate readings with automatic measurements available in PicoLog. Block mode captures at the full 1 MS/s sample rate of the logger for the duration of the 8k sample buffer.

**PicoLog 1000 Series:**

- 12 or 16 unipolar analog input channels
- 10 or 12-bit resolution for up to 0.5% accuracy
- up to 4 software configurable digital output lines
- 1 PWM control output (PicoScope 1216 only)
- Up to 1 MS/s sample rate
- USB connected and powered
- Software and pin-compatible with Pico USB ADC-11
- Works with Windows XP and Vista (32 and 64-bit) and Windows 7.
- Includes API and examples for C/C++/C#, VB, LabVIEW VIs
- Complete with terminal board and ready-to-go data logging software

Mfrs. List No.	Order Code	Price Each
PICOLOG 1216	171-5266	159.00
PICOLOG 1012	171-5267	105.00
SMALL TERMINAL BOARD	171-5269	15.00

**Digital Storage Oscilloscopes**  
GDS1000A Series



GDS-1000A Series is a general purpose 2-channel oscilloscope and originally designed to meet educational and industrial requirements without specializing in DSO features. This series provides three selective bandwidths of upto 150MHz together with innovative human machine interface design plus an TFT color LCD display, users will enjoy better measurement experience!

GDS-1000A series offers dual sampling mode, giving users two options for 1GSa/s Real-Time sampling or 25GSa/s high-speed Equivalent sampling rate. What's more, with high-speed wave handling capability, more advanced triggering functions, and 2.5 kg light-weight design, it is a powerful functional oscilloscope.

Easy to use Several acquisition mode and 27 auto measurement functions help user to measure the accurate property of waveforms. The advanced auto-set function makes GDS-1000A Series catch waveform automatically and display waveform quickly. With arithmetic functions, FFT function keeps user aware of the results by updating value immediately. Without almost extra-calculation GDS-1000A series can provide sufficient information of testing.

- 150/100/60 MHz Bandwidths
- Sample Rates up to 1 GSa/s Real-Time Maximum, 25GSa/s Equivalent-Time
- 2M Points Record Length Maximum
- 2mV-10V Vertical Scale
- 1ns-50s Horizontal Range
- TFT LCD Display Panel
- Up to 27 Automatic Measurements
- Up to 10ns Peak Detection for Glitch Capture
- Advanced Video, Pulse Width Trigger
- Cursor Tracking
- SD Card Supported
- On-Line Help and Multi-Language Operating Supported

	GDS1062A	GDS1102A	GDS1152A
Bandwidth	60MHz	100MHz	150MHz
Channels	2	2	2
Real-Time Sample Rate	1GSa/s maximum		
Vertical Sensitivity	2mV/div ~ 10V/div (1-2-5 increments)		
Vertical Resolution	± (3% x 'Readout' + 0.1 div + 1mV)		
Display	5.6 inch		
Display resolution	234 (Vertically) x 320 (Horizontally) Dots		
Dimensions	310(W) x 142 (H) x 140(D)mm		
Weight	Approx. 2.5kg		

Continues on next page

Bandwidth MHz	Order Code	Price Each
60	173-9527	514.00
100	173-9528	634.00
150	173-9531	699.00

### Digital Storage Oscilloscopes



**New**

- Dual channel
- HD colour LCD display system at 320 x 240 resolution
- Supports plug-and-play USB storage devices and capable of communicating with a computer through the USB storage device
- Automatic waveform and status configuration
- Storage of waveforms, setups and bit map and waveforms, setups recurrence
- Sophisticated window expansion function to analyse waveform details and overview precisely
- Automatic measurement of 19 waveform parameters
- Automatic cursor tracing measurement
- Unique wave recording and replay function
- Built-in FFT
- Multiple waveform mathematics functions (including add, subtract, multiply and divide)
- Edge, video, pulse width and alternate trigger functions
- Multilingual menu displays

Sample Rate	500MS/s
Sample Rate (72-8395)	250MS/s
Trigger Type	Edge, Pulse, Video and Alternate
Auto Waveform Measurements	28
Dimensions (WxHxD)	320x150x130mm
Weight	4kg

	72-8395	72-8225	72-8230
Bandwidth	25 MHz	40 MHz	60 MHz
Rise Time	<14ns	<8.7ns	<5.8ns
	72-8240	72-8245	72-8250
Bandwidth	100 MHz	150 MHz	200 MHz
Rise Time	<3.5ns	<2.3ns	<1.8ns

Mfrs. List No.	Bandwidth	Order Code	Price Each
72-8395	25MHz	173-9448	269.00
72-8225	40MHz	173-9443	305.00
72-8230	60MHz	173-9444	349.00
72-8240	100MHz	173-9445	495.00
72-8245	150MHz	173-9446	660.00
72-8250	200MHz	173-9447	795.00

### DMM/Component Tester with Tweezers



**New**

Compact pocket size component tester with tweezers measures AC/DC volts, resistance, capacitance and provides diode test. Convenient 'pen-style' allows the unit to be carried easily in a shirt pocket or toolbox. Included SMD probe allows quick one hand measurements of resistors, capacitors and diodes, even when mounted to a PC board. Simply unplug the probe and insert the included test leads and the unit is ready to measure AC/DC volts.

- 6,000 Count LCD display
- Selectable auto/manual range
- Data Hold/Max/Min recording mode
- Auto power off
- Wide capacitance range
- Diode check & continuity test
- Simple two button operation
- Slim compact size
- Dimensions (WxHxD): 37 x 184 x 23mm
- Weight: 110g
- Supplied with SMD probe & cover, test leads, 2x LR44 batteries & user guide.

Technical Data		
DC Voltage	600mV, 6V, 50V	±0.5%, ±2
AC Voltage		±1.0%, ±3
Resistance	600Ω, 6KΩ, 60KΩ, 600KΩ, 6MΩ, 60MΩ	±0.8%, ±2
Capacitance		±5%, ±7
Diode Continuity	Buzzer sounds at less than 30Ω	

Description	Order Code	Price Each
SMD-100	174-9431	35.00

### LAN Tester & Multimeter

**TEMMA**  
**New**



Compact 2-in-1 unit provides standard digital multimeter functions, as well as pin configurations on network and voice cables. Dual pinout indicator provides sequential verification of each pin on a network cable, and the included remote terminator allows testing of cables which are already installed. Digital multimeter measures AC/DC volts and amps, resistance and diodes, and provides audible continuity test.

- Rugged overmoulded housing
- Supplied with 1x 9V & 2x AA batteries, test leads, BNC network cable adaptors, zipper carry case and owners manual.

#### Technical Data

	Basic Accuracy
DC Voltage	200mV, 2V, 20V, 200V, 600V
AC Voltage	2V, 20V, 200V, 600V
DC Current	200μA, 2000μA, 20mA, 200mA
AC Current	200μA, 2000μA, 20mA, 200mA
Resistance	200Ω, 2KΩ, 200KΩ, 2MΩ, 20MΩ
Continuity	Buzzer sounds at less than 150Ω
Input Impedance	7.5MΩ

Description	Order Code	Price Each
	174-9433	29.95

### Tone & Probe Set

**TEMMA**  
**New**



This tone & probe set is a basic necessity for anyone running data, voice or any other low voltage cable. It is also suitable for tracing alarm, coax or speaker cables which are already installed.

- Headphone jack
- Transmitter has attached RJ-11 plug and clip leads

- Quickly trace and identify cables
- Provides live telephone line status check
- Selectable steady and warble tone
- Volume control

Supplied with 2x 9V batteries, belt loop carry case & user guide.

Order Code	Price Each
174-9434	32.50

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Phone: 08447 11 11 11



**NEW**

**FLUKE**

**The world's first Digital Multimeter with detachable display**

The Fluke 233 Remote Display Multimeter will change the way you use a True-RMS Digital Multimeter (DMM). Its removable magnetic display has a wireless link, so you can take measurements in one place and view readings at another. Ideal for hard to reach places or hazardous areas, it lets you work more productively and more safely. That's Fluke's Five-Star performance.

- ★ Rugged
- ★ Safe
- ★ Easy to use
- ★ Accurate
- ★ Reliable, with long life

Looking for true flexibility in unusual test situations? The Fluke 233 is the world's first DMM that lets you be in two places at once.

**Fluke.** Keeping your world up and running.®

**Be here, work there!**



**Fluke 233 Remote Display Digital Multimeter**

**FLUKE**



True-rms New

The first Fluke digital multimeter with a detachable display is here. The 233 wireless remote DMM allows maintenance professionals to address an age-old problem - display positioning. The new Fluke 233 can be used for even the most common meter measurements and is especially suited for those situations where display viewing is challenging

- True-rms ac voltage and current for accurate measurements on non-linear signals
- Measure up to 1000 V ac and dc
- Measure up to 10 A (20 A for 30 seconds)
- 10,000 µF capacitance range
- Frequency to 50 kHz
- Built in thermometer conveniently allows you to take temperature readings without having to carry a separate instrument
- Resistance, continuity and diode test

Wireless Range	30 Ft	Size (H x W x L) cm	5.3 x 9.3 x 19.3
Safety Rating	CAT III 1000 V CAT IV 600 V	Weight	604 g

**Fluke 233 Remote Display Multimeter Includes:** Getting Started Manual (Printed), AA Batteries installed, Test leads, AC72 Alligator clips, 80BK-A Temperature Probe, CD-ROM (user manual & technical notes and application images)

Mfrs. List No.	Order Code	Price Each
FLUKE 233	177-2092	1+ 269.00

**Fluke 27 II & 28 II Multimeters**

**FLUKE**



New

The NEW Fluke 27 II and 28 II digital multimeters define a new standard for operating in harsh conditions with the features and accuracy to troubleshoot most electrical problems. Both meters have IP 67 (waterproof and dustproof) rating, extended operating temperature range of -15 °C to +55 °C (5 °F to 131 °F, -40 °C for up to 20 minutes) and 95 % humidity, and have been designed and tested to withstand a 3 m (10 ft) drop. The new Fluke 20 Series Multimeters are built to work in the toughest environments.

- Measure up to 1000 V ac and dc
- Measure up to 10 A (20 A for 30 seconds)
- 10,000 µF capacitance range
- Frequency to 200 kHz
- Extended ac voltage bandwidth-15 Hz to 20 kHz (28 II), 40 Hz to 30 kHz (27 II)
- Built in thermometer conveniently allows you to take temperature readings without having to carry a separate instrument (28 II)
- Resistance, continuity and diode test
- Min/Max and average recording to capture variations automatically
- Peak min-max (28 II)
- Unique function for accurate voltage and frequency measurements on adjustable speed motor drives and other electrically noisy equipment (28 II)

**Product Specifications:**

	Fluke 27 II	Fluke 28 II
Agency Approvals: CSA, C-US, C-Tick, TUV Counts	Average Responding 6000	True-rms 6000 / 19,999
Voltage: 1000 V AC/DC	●	●
Current: 10 A AC/DC	●	●
Resistance: 50 MΩ	●	●
Continuity / Diode	●	●
Capacitance: 10,000 µF	●	●
Frequency 200kHz	●	●
Min/Max/Average, Hold, Auto and Manual Range	●	●
Peak Min/Max	●	●
Temperature: -40 °C to +1090 °C (Display °C or °F)	●	●
Low Pass Filter for working on variable speed drives	●	●
Safety Rating	●	●
Battery life	●	●
	CAT III 1000 V CAT IV 600 V	800 Hrs.

**Fluke 27 II & 28 II Multimeters Include:** Getting Started Manual (Printed), AA Batteries installed, Test leads, AC72 Alligator clips, 80BK-A Temperature Probe (Fluke 28-II), CD-ROM (16 language user manual & technical notes and application images)

Mfrs. List No.	Order Code	Price Each
FLUKE-27-II	177-2093	1+ 329.00
FLUKE-28-II	177-2094	329.00 359.00

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### EdgeGuard



EdgeGuard beading strip is used to protect cables routed around sharp edged cut-out sections. It can also be used to provide an attractive finish to panel edges and protect cables from chafing on cut edges of panels. Manufactured from a flexible PVC compound that ensures ease of use.

HellermannTyton



Material Polyvinyl-chloride (PVC) Operating Temperature -65°C to +105°C continuous  
 Colour Black (BK) Flammability UL94 HB

Mfrs. List No.	Length	Dimensions			Order Code	Price Per Coil		
		Width	Height			1+	5+	10+
SM1	75m	5mm	6.3mm		177-4269	25.36	24.60	23.86
RA1	75m	6.4mm	7.1mm		177-4271	20.89	20.26	19.65
PS1	75m	5mm	5mm		177-4272	15.16	14.71	14.27

### Thermal Transfer Desktop Printer System



Panduit TDP43MY Thermal Transfer Printer produces a comprehensive range of labels and markers to meet manufacturing, maintenance and site installation applications. Supports Panduit's complete range of thermal transfer labels, including self-laminating, heat shrink, vinyl and polyolefin wire/cable markers, polyester and polyimide component labels, engraved plate replacement labels, and safety and facility markers. 300 dpi print resolution ensures durable, crisp, clear printing. Using Easy-Mark™ Labeling Software (included) ensures a fast, efficient and comprehensive solution to on-demand labelling needs.

- Hybrid - Recommended for use with self-laminating, heat shrink, component and non-laminated labels
- Wax - Recommended for use with self-laminating and non-laminated labels
- Resin - Recommended for use with component labels, marker plates, and continuous tape

**TDP43MY Contents:** Printer, Easy-Mark™ Labeling Software, RMH4BL hybrid black ribbon, USB cable, AC power adapter with UK and Europlug power cords, manual and quick start card.

Mfrs. List No.		Order Code	Price Each
TDP43MY/E	Thermal Transfer Desktop Printer System	177-3903	791.00
<b>Ribbons</b>	<b>Colour</b>	<b>Type</b>	
RMW4BL	Black	Wax	177-3905 17.52
RMH4BL	Black	Hybrid	177-3906 17.52
RMR4BL	Black	Resin	177-3907 17.52
RMR4BU	Blue	Resin	177-3908 24.50
RMR4GR	Green	Resin	177-3909 24.50
RMR4RD	Red	Resin	177-3910 24.50
RMR4WH	White	Resin	177-3911 43.26
<b>Accessories</b>			
TDP43M-RS	3" Label Stand	177-3904	61.40
PROG-EMCD3	Easy-Mark Labelling Software (for PC)	177-3912	189.76

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### Thermal Transfer Self-Laminating Labels



- Panduit thermal transfer self-laminating labels provide a white print-on area and clear overlamine to help protect the legend from abrasion, solvents, oils and chemicals for clear and durable identification
- Vinyl with acrylic adhesive
- For indoor/outdoor use, thin and conformable material suitable for general wire/cable labelling

- Supplied on rolls for use with TDP43MY Printer
- Recommend use with Panduit RMH4BL hybrid thermal transfer ribbon
- Use Panduit TDP43M-RS roll stand for part numbers ending TY

Mfrs. List No.	Width (mm)	Length (mm)	Cable Diameter		Print On Area (mm)
			Min. (mm)	Max. (mm)	
S050X075VA1Y	12.7	19.05	3.07	4.04	12.7 x 6.35
S050X125VA1Y	12.7	31.75	3.07	7.03	12.7 x 9.65
S050X150VA1Y	12.7	38.1	4.04	8.09	12.7 x 12.7
S075X075VA1Y	19.05	19.05	3.07	4.04	19.05 x 6.35
S075X125VA1Y	19.05	31.75	3.07	7.03	19.05 x 9.65
S075X150VA1Y	19.05	38.1	4.04	8.09	19.05 x 12.7
S100X075VA1Y	25.4	19.05	2.02	4.04	25.4 x 6.35
S100X125VA1Y	25.4	31.75	3.07	7.03	25.4 x 9.65
S100X150VA1Y	25.4	38.1	4.04	8.09	25.4 x 12.7
S100X225VA1Y	25.4	57.15	6.06	12.13	25.4 x 19.05
S100X400VA1Y	25.4	101.6	8.09	24.26	25.4 x 25.4
S100X650VA1Y	25.4	165.1	12.13	40.43	25.4 x 38.1
S150X150VA1Y	38.1	38.1	4.04	8.09	38.1 x 12.7
S150X225VA1Y	38.1	57.15	6.06	12.13	38.1 x 19.05
S150X400VA1Y	38.1	101.6	8.09	24.26	38.1 x 25.4
S200X225VA1Y	50.8	57.15	6.06	12.13	50.8 x 19.05
S200X400VA1Y	50.8	101.6	8.09	24.26	50.8 x 25.4
S200X650VA1Y	50.8	165.1	12.13	40.43	50.8 x 38.1

Mfrs. List No.	Pack Qty	Order Code	Price Per Pack		
			1+	5+	10+
S050X075VA1Y	5000	177-3913	53.70	52.09	50.53
S050X125VA1Y	5000	177-3915	64.80	62.86	60.97
S050X150VA1Y	5000	177-3916	68.20	66.15	64.17
S075X075VA1Y	5000	177-3917	66.80	64.80	62.86
S075X125VA1Y	5000	177-3918	96.20	93.31	90.51
S075X150VA1Y	5000	177-3919	115.40	111.94	108.58
S100X075VA1Y	2500	177-3920	40.90	39.67	38.48
S100X125VA1Y	2500	177-3921	59.45	57.67	55.94
S100X150VA1Y	2500	177-3922	64.20	62.27	60.40
S100X225VA1Y	1500	177-3923	65.10	63.15	61.26
S100X400VA1Y	1000	177-3924	74.12	71.90	69.74
S100X650VA1Y	250	177-3925	31.25	30.31	29.40
S150X150VA1Y	5000	177-3927	217.00	210.49	204.18
S150X225VA1Y	5000	177-3928	356.30	345.61	335.24
S150X400VA1Y	2500	177-3929	295.05	286.20	277.61
S200X225VA1Y	500	177-3930	51.31	49.77	48.28
S200X400VA1Y	500	177-3931	77.18	74.86	72.61
S200X650VA1Y	250	177-3932	60.53	58.71	56.95

### Thermal Transfer Polyester Component Labels



Panduit thermal transfer Component Labels are suitable for a wide variety of flat surface applications including electronics, equipment, panels, bins, etc.

- Operating temperature range: -40°C to 150°C
- For use with harsh solvents, oils, and chemicals without over-lamination
- White polyester material with permanent acrylic adhesive
- Halogen free meeting UL 969 requirements
- For indoor/outdoor use with high temperature resistance, dimensional stability, does not stretch or easily tear
- Supplied on rolls for use with TDP43MY Printer
- Use with Panduit RMR4 resin range of thermal transfer ribbons
- Use Panduit TDP43M-RS roll stand

Mfrs. List No.	Width (mm)	Length (mm)	Mfrs. List No.	Width (mm)	Length (mm)
C025X025YJT	6.3	6.3	C150X075YJT	38.1	19
C038X038YJT	9.6	9.6	C160X020YJT	40.6	5.1
C050X044YJT	12.7	11.1	C200X050YJT	50.8	12.7
C060X020YJT	15.2	5.1	C200X100YJT	50.8	25.4
C075X025YJT	19	6.3	C400X100YJT	101.6	25.4
C080X020YJT	20.3	5.1	C400X200YJT	101.6	50.8
C100X025YJT	25.4	6.3	C400X400YJT	101.6	101.6
C100X050YJT	25.4	12.7	C400X600YJT	101.6	152.4

Continues on next page



Mftrs. List No.	Pack Qty	Order Code	1+	5+	10+
C025X025YJT	10000	177-3933	16.80	16.30	15.81
C038X038YJT	10000	177-3934	33.60	32.59	31.61
C050X044YJT	10000	177-3935	47.20	45.78	44.41
C060X020YJT	10000	177-3936	32.00	31.04	30.11
C075X025YJT	10000	177-3937	46.00	44.62	43.28
C080X020YJT	10000	177-3939	35.40	34.34	33.31
C100X025YJT	10000	177-3941	48.20	46.75	45.35
C100X050YJT	10000	177-3942	73.20	71.00	68.87
C150X075YJT	5000	177-3943	70.70	68.58	66.52
C160X020YJT	10000	177-3944	59.00	57.23	55.51
C200X050YJT	5000	177-3945	72.60	70.42	68.31
C200X100YJT	2500	177-3946	62.20	60.33	58.52
C400X100YJT	2500	177-3947	124.00	120.28	116.67
C400X200YJT	1000	177-3948	97.00	94.09	91.27
C400X400YJT	1000	177-3949	163.76	158.85	154.08
C400X600YJT	1000	177-3950	276.96	268.65	260.59

**PT-90 Label Printer**



- Portable and Lightweight Design
- QWERTY Keyboard
- Built in cutter enables accurate tape length
- Utilises 2 Tape widths (M tapes) 9 & 12mm
- 12 character x 1 Line LCD display screen
- Prints 1 to 2 lines of text
- Prints up to 203 dpi
- Prints up to 7.5mm per second
- 7 Frame Styles
- 8 Font Styles
- Requires 4 x AAA batteries (not supplied)
- Dimensions (WxDxH): 156x111x57mm
- Weight: 0.25kg

Description	Order Code	Price Each
Label Printer	178-1128	28.55
<b>9mm Tapes</b>		
Black on White	379-9580	9.10
<b>12mm Tapes</b>		
Black on White	379-9645	9.88

**PT-1290DT Label Printer**



The Brother P-touch 1290DT has been specifically designed to accommodate all of your labelling needs. This simple, easy-to-use desktop labelling machine will help you to create clear, professional labels with the minimum of fuss, leaving you free to use your time more efficiently. It sits neatly in the desk organiser provided and is easily accessible whenever you need to label as well as keeping your desk are tidy and clutter free.

- QWERTY Keyboard
- 15 character x 1 line LCD display
- Built-in tape cutter
- Maximum print height: 9mm
- 15 print sizes
- 8 print styles
- 7 framing and fill patterns
- 80 symbols
- 3 x 'favourite label' storage locations
- Double line printing
- Helsinki and Bohemia fonts
- Print image (preview)
- Print speed of 10mm/sec
- 180dpi print resolution
- Vertical and mirror printing
- Memory - 720 characters
- Multiple copies (1-9)
- Auto power off
- Utilises 4 Tape widths (TZ tape) - 3.5, 6, 9 & 12mm

Mftrs. List No.	Order Code	Price Each
PT-1290DT	178-1132	61.19

**Self-Adhesive Write-On Labels**

**Metallised Polyester**



- For industrial, warehouse, QA and safety marking needs
- Easily applied to any clean, dry, oil free surface
- Each label is smudge-free and permanently debossed once marked
- Each pack contains 350 labels measuring 16x38mm
- Labels supplied on a backing card to provide a firm writing surface
- To select the correct label for your requirements, refer to the Farnell Order Code under the desired legend
- The Manufacturers List No. is shown in brackets after the relevant Farnell Order Code.

<b>APPLIANCE TESTED</b> BY DATE NEXT TEST DUE	<b>FAILED</b>	<b>TESTED FOR ELECTRICAL SAFETY</b> BY DATE NEXT TEST DUE	<b>FIXED ASSET NO.</b>
171-7336 (7827328)	171-7348 (7827338)	171-7361 (7827350)	171-7350 (7827340)
<b>BLANK (Not printed)</b>	<b>PASSED</b>	<b>DATE INSTALLED</b> BY	<b>NOT CALIBRATED</b>
171-7337 (7827329)	171-7353 (7827342)	171-7344 (7827334)	171-7351 (7827341)
<b>CALIBRATED</b> BY DATE DUE	<b>SERIAL NO.</b>	<b>DO NOT USE</b> AFTER	<b>PROPERTY TAG</b> ASSET NO.
171-7338 (7827330)	171-7355 (7827344)	171-7345 (7827335)	171-7354 (7827343)
<b>NOT CALIBRATED INDICATOR ONLY</b>	<b>SERVICE RECORD</b> SERV. CASE NO. BY DATE NEXT SERVICE	<b>ELECTRICAL APPLIANCE</b>	<b>SERVED BY:</b> DATE
171-7341 (7827331)	171-7356 (7827345)	171-7346 (7827336)	171-7357 (7827346)
<b>CALIBRATION</b> BY DATE DUE	<b>TESTED</b> BY DATE DETAILS	<b>EQUIPMENT NO.</b>	<b>SHELF LIFE</b> EXP. DATE
171-7342 (7827332)	171-7359 (7827348)	171-7347 (7827337)	171-7358 (7827347)
<b>CHECKED</b> BY DATE	<b>TESTED FOR ELECTRICAL SAFETY</b> BY DATE NEXT TEST DUE	<b>FAULTY</b>	
171-7343 (7827333)	171-7360 (7827349)	171-7349 (7827339)	

Pack Size	Order Code	1+	5+	20+	50+
350 Labels	All Order Codes	16.07	15.26	14.49	13.76

**General**



<b>TESTED</b> BY DATE NEXT TEST DUE	<b>BLANK (Not printed)</b>	<b>PART NO.</b>	<b>REJECTED</b>
<b>TESTED FOR ELECTRICAL SAFETY</b> BY DATE NEXT TEST DUE	<b>CALIBRATION</b> BY DATE DUE	<b>BATCH NO.</b>	<b>SERVED BY:</b> DATE
<b>CALIBRATION NOT REQUIRED</b>	<b>INSPECTED BY:</b> DATE	<b>DO NOT USE</b>	<b>ACCEPTED</b> BY DATE
<b>TESTED FOR ELECTRICAL SAFETY</b> BY DATE	<b>TESTED FOR ELECTRICAL SAFETY</b> DATE NEXT TEST DUE		<b>New</b>

- Self-adhesive, cloth backed, white vinyl labels
- Pre-printed legends
- Supplied on dispenser cards
- Easily marked with a ball pen, typewriter or spirit based ink

Mftrs List No.	Legend	Label Size	Labels Per Card	Label Colour
7827265	Tested	15x38mm	14	Green
7827266	Plain Label	15x38mm	14	Plain
7827267	Accepted	15x38mm	14	Green
7827268	Rejected	15x38mm	14	Red
7827269	Serial No.	15x38mm	14	Black
7827270	Calibration	15x38mm	14	Green
7827271	Batch No	15x38mm	14	Blue
7827272	Serviced By	15x38mm	14	Blue
7827273	Calibration Not Required	15x38mm	14	Red
7827274	Inspected by	15x38mm	14	Black
7827276	Tested for Electrical Safety (A)	15x38mm	14	Green
7827277	Do Not Use	15x38mm	14	Red
7827278	Part No	15x38mm	18	Blue
7827351	Test for Electrical Safety (B)	15x38mm	14	Green

Mftrs. List No.	Legend	Order Code	10+	100+	500+	1K+
7827265	Tested	171-7266	0.78	0.70	0.65	0.56
7827266	Plain Label	171-7267	0.78	0.70	0.65	0.56
7827267	Accepted	171-7268	0.78	0.70	0.65	0.56
7827268	Rejected	171-7269	0.78	0.70	0.65	0.56
7827269	Serial No.	171-7270	0.78	0.70	0.65	0.56
7827270	Calibration	171-7271	0.78	0.70	0.65	0.56
7827271	Batch No	171-7272	0.78	0.70	0.65	0.56
7827272	Serviced By	171-7274	0.78	0.70	0.65	0.56
7827273	Calibration Not Required	171-7275	0.78	0.70	0.65	0.56
7827274	Inspected by	171-7276	0.78	0.70	0.65	0.56
7827276	Tested for Electrical Safety (A)	171-7277	0.78	0.70	0.65	0.56
7827277	Do Not Use	171-7278	0.78	0.70	0.65	0.56
7827278	Part No	171-7279	0.78	0.70	0.65	0.56
7827351	Test for Electrical Safety (B)	171-7280	0.78	0.70	0.65	0.56

Over half a million products available online



### Self-Adhesive Numbers & Letters

BEAVERSWOOD®



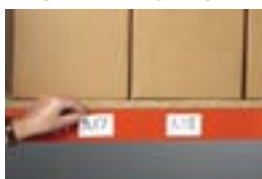
These self-adhesive numbers and letters are printed black on yellow, ensuring high visibility. Simple to apply, they can be quickly removed and leave no adhesive residue. They are suitable for a variety of uses throughout the warehouse including labelling of shelves, racking, bins and other areas.

- Clean peel - leaves no residue
- Bin numbering
- 1 card for each character
- Easy warehouse identification
- High Visibility

Legend	Size (HxW)	Characters Per Card	Order Code	Price Per Pack		
				1+	5+	10+
0-9	19 x 14mm	36	163-8346	9.53	9.24	8.97
A-Z	19 x 14mm	36	163-8347	22.92	22.24	21.56
0-9	38 x 21mm	12	163-8349	9.53	9.24	8.97
A-Z	38 x 21mm	12	163-8351	21.20	20.57	19.94
0-9	56 x 21mm	12	163-8352	13.50	13.09	12.70
A-Z	56 x 21mm	12	163-8353	35.09	34.04	33.01
0-9	90 x 38mm	6	163-8354	18.73	18.17	17.62
A-Z	90 x 38mm	6	163-8355	48.69	47.22	45.81

### Magnetic Easy Wipe Location Markers

BEAVERSWOOD®



White faced magnetic location markers supplied in packs of single sized markers. Use a wet-wipe marker pen, write on, update and move when required.

- Locates on steel surfaces
- Quick and easy re-location
- Write on - Wipe off

#### Wet Wipe Marker Pens

The black marker pens allow for easy updates and text can be wiped clean with a damp cloth.

Size (HxW)	Pack Qty	Order Code	Price Per Pack		
			1+	5+	10+
20 x 80mm	100	163-8404	21.17	20.53	19.91
25 x 80mm	100	163-8405	23.92	23.21	22.50
30 x 80mm	100	163-8406	27.29	26.47	25.67
40 x 80mm	100	163-8407	29.19	28.33	27.48
50 x 80mm	100	163-8408	34.35	33.32	32.32
30 x 100mm	100	163-8409	25.17	24.41	23.68
50 x 100mm	100	163-8410	45.69	44.31	42.98
50 x 150mm	100	163-8411	47.20	45.78	44.41
56 x 105mm	100	163-8412	60.70	58.87	57.11
90 x 210mm	10	163-8413	15.03	14.58	14.15
Accessories Marker Pen	5	163-8343	9.14	8.87	8.68

### Wireless Energy Monitor



Simply attach the sensor around the live power supply cable coming from the electricity meter to the consumer unit, and the product will measure the total electricity being used in the premises.

- Wireless monitor
- Measures energy usage in units or actual cost
- Saves money by reducing energy bills through simple and efficient energy saving practices

- Developed to meet community/government demands for energy efficiency
  - Assist in energy conservation
  - Separate displays for temperature and humidity
  - Identify whether appliances have inadvertently been left on
  - Easy to read, easy to use & easy to install
  - No additional wiring necessary
- Contents; Remote monitor, sender box, sensor, 6 x AAA batteries, user manual

Order Code	Price Each	
	1+	5+
173-4572	34.67	32.13

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Live technical chat at  
www.farnell.co.uk

### Wireless Micro Electricity Monitor



- Owl Micro is a portable wireless electricity monitor which shows you how

much electricity you are using at any time

- It can help you to save money off your electricity bill by providing up to the second information on the amount of electricity you are using in pounds and pence
- Whether it's turning off at the plug rather than

just using standby or simply turning off a light

- The OWL shows you the how changing your behavior can save you money and so help the environment

- No additional wiring required

Contents: Remote monitor, sender box, sensor, 6 x AAA batteries, user manual

Order Code	Price Each	
	1+	5+
173-4573	25.49	23.45

### Conduit Contractor Packs



- Adaptalok conduit with one-piece, fast fit, push & twist fittings

- Protection class IP66
- Polyamide (Nylon) 6

- Kit includes:  
10m Conduit  
10 x Straight Fitting  
10 x Locknuts

- Available in 20mm and 25mm conduit sizes

Mfrs. List No.	Conduit Size	Order Code	Price Per Pack	
			1+	10+
CP-AF20A	20mm	173-4610	36.35	34.33
CP-AF25A	25mm	173-4612	48.47	45.44

### Protective Split Corrugated Polyamide Conduit



The split conduit is ideal for protecting assembled cables after installation.

- Highly flexible
- Split remains closed under torsion
- UV resistant for photovoltaic applications
- Easy installation
- Operating temperature -40°C to 140°C
- Supplied in 25m Coils

Mfrs. List No.	Diameter		Order Code	Price Per Coil	
	Internal (mm)	External (mm)		1+	5+
61806560	9.9	13	164-2142	46.21	44.81
61806565	12.2	15.7	164-2143	55.80	54.13
61806570	16.6	21.2	164-2144	85.95	83.39
61806580	23.2	28.3	164-2146	125.75	121.97

### Self-Adhesive Mico One Piece Trunking



Semi-circular Mico 16 x 8mm trunking is a perfect solution for hiding low voltage and single cables. The patented hinged and click-lock lid in a unique single piece design makes the product easy to handle and easy to later add or remove cables. The pack includes a range of flush-fit accessories (couplers, bends, tees, end caps etc.) for the perfect finish.

Applications:

- Cabinets and Display
- Hiding low voltage and singles cables
- Speaker Systems

Kit Contents: 2m lengths of 16x8mm (Pk 10), Assorted flush fit accessories (Pk 24)

Order Code	Price Per Kit		
	1+	5+	10+
170-2083	21.48	20.84	20.21



## IEE Wiring Regulations

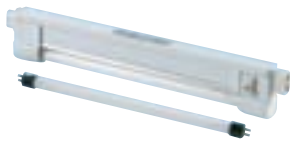
17th Edition



The IEE Wiring Regulations (BS 7671) are the national standard to which all domestic and industrial wiring must conform. The 17th Edition reflects significant changes to both the technical content and structure of the book. Key changes in the volume include: a change allowing a socket outlet in bathrooms extension of the Regulations to cover new special locations: exhibition shows, photovoltaic (pv) power supply systems, floor and heating systems, marinas and fairgrounds and amusement parks; and, re-numbering and restructuring of chapters to align with international standards.

Order Code	Price Each
154-2083	1+ 68.64

## Ultraslim Link Triphosphor Fittings



- Ultraslim fluorescent fittings for all manner of display lighting, particularly kitchen cabinets
- White plastic or aluminium construction with on/off rocker switch
- Universal mounting brackets
- IP20 rated
- Each fitting supplied with 1 x T4 fluorescent tube (3400K)
- Up to 6 fittings can be linked to a 6-way connector block
- 6-way connector block comes complete with 2m mains cable and 3 amp fused plug
- Various lengths of link lead available to run between fittings and connector blocks
- Fitting dimensions (H x D): 43 x 19mm

Watts	Length	Order Code	Price Each		
			1+	5+	10+
<b>White Plastic Fittings</b>					
6W	270mm	177-4181	7.09	6.81	6.45
10W	390mm	177-4178	8.63	8.29	7.85
16W	520mm	177-4179	9.60	9.24	8.73
20W	620mm	177-4180	11.15	10.72	10.13
<b>Spare Tubes</b>					
6W	220mm	177-4184	2.74	2.64	2.49
10W	341mm	177-4185	3.07	2.94	2.79
16W	468mm	177-4186	3.57	3.43	3.25
20W	567mm	177-4187	3.80	3.65	3.45
<b>Accessories</b>					
Link Lead	250mm	177-4183	1.46	1.40	1.33
Link Lead	1m	177-4182	2.01	1.93	1.83

## Halogen Twin Spot Emergency Light



Supply Voltage 230V  
Lamp 12V 20W BA 15S  
IP Rating IP20  
Battery 1 x 12V 7Ah  
Dimensions (WxHxD) 310 x 310 x 70mm



- Non-maintained emergency light with twin halogen spots
- 3 hours continuous illumination
- Steel box construction
- Individual LED health lamp indicators
- Conforms to BS EN 60598-2-22
- Supplied with 2 x 20W lamps and battery

Order Code	Price Each		
	1+	5+	10+
177-4174	59.28	56.99	53.89

## 2220 Versabrite™ III LED Zone 1



- Ex Code: ATEX Ex II 2 G EEx ib IIC T6
- 2 X 5mm White Nichia LEDs
- Head flips up to activate LEDs and rotates 180 for aiming light where you need it
- Body made of virtually indestructible Xylex®
- Multiple use built in clip
- Attaches to surface up to 10mm thick
- Tested Lumen Value: 6
- Power: 0.6 Watts
- 2 x CR2032 3v Lithium coin-cell Batteries (included)
- 100 hours of battery burn time
- Length: 89mm

Order Code	Price Each	
175-3233	1+ 22.84	5+ 21.99

## Industrial ATEX LED Torch



- Uses 2 x AA batteries
- 3 x Nichia LEDs
- 18 Lumens. 19 metres beam distance
- Designed to produce a "flood" type beam, ideal for close up inspection work
- Completely Water Proof and Dustproof (IEC standard IP67) IP6X (dust and solid bodies) and IPX7 (waterproof)
- Robust: survives 2.5m drop
- ATEX approval for Intrinsically Safe
- MSHA certified (US Mine Safety and Health Administration)
- UL approved as Intrinsically Safe for Class 1 Div 1 (highest rating possible)
- Ex I M2 / II 1 G, EEx ia I/IIC T4, DEMKO 07, ATEX 0618226

Mfrs. List No.	Order Code	Price Each	
628908	177-5673	1+ 11.03	5+ 10.45

## ATEX LED Headlight



- 80 lumens
- 2 red LEDs (night vision)
- 1 green LED (pipe inspection)
- Adjustable light (from spot to diffuser)
- Weatherproof IPX4
- 2m drop test
- 60m beam distance
- Shatterproof Lens
- ATEX certified
- 3 x AA batteries needed not included
- Ex I M2 / II 1 G, EEx ia I/IIC T4, DEMKO 08, ATEX 0803999

Mfrs. List No.	Order Code	Price Each	
632026	177-5676	1+ 34.78	5+ 32.99

## LED Head Torch



- Compact LED head-torch
- 12 x high intensity LEDs (100,000 hours average life)
- 4 mode operation - 4 LED, 8 LED, 12 LED, 12 LED Flashing
- Adjustable head strap with padded front section for comfort
- Adjustable position head for work area focus
- Torch head dimensions (WxHxD): 70 x 55 x 60mm
- Requires 3 x AAA batteries (not supplied- part number 1712514)

Order Code	Price Each	
	1+	5+
173-6638	5.17	4.55

## Premium service without a premium price



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### Solid Brass Padlocks

55 Series



- Solid brass body
- Hardened steel shackle
- Option of 3, 4, or 5 pin tumbler mechanism manufactured from all rust-free components
- Automatic locking
- Paracentric keyway (55 series)
- Precision, mushroom pins & paracentric keyway for anti-pick protection (65 series)
- Keyed alike padlocks available
- Supplied with 2 keys
- Internal standard security applications

Order Code	Tumbler Mechanism	Dimensions			Shackle Dia.	Shackle Height	Shackle Width
		H	W	D			
177-7119	3 Pin	44mm	29mm	12mm	4.5mm	13.5mm	14.5mm
177-7120	3 Pin	44mm	29mm	12mm	4.5mm	13.5mm	14.5mm
177-7123	5 Pin	60mm	38mm	13mm	6.5mm	21.5mm	20.5mm
177-7132	5 Pin	102mm	38mm	13mm	6.5mm	63mm	20.5mm
177-7124	4 Pin	60mm	38mm	13mm	6.5mm	21.5mm	20.5mm
177-7133	5 Pin	102mm	38mm	13mm	6.5mm	63mm	20.5mm
177-7127	5 Pin	68mm	48mm	14mm	7mm	24mm	25mm
177-7128	5 Pin	68mm	48mm	14mm	7mm	24mm	25mm

Description	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
<b>30mm Padlocks</b>						
Standard	55/30	177-7119	3.96	3.82	3.67	3.55
Keyed Alike	55/30 KA 5303	177-7120	4.35	4.19	4.05	3.91
<b>40mm Padlocks</b>						
Standard	55/40	177-7123	4.74	4.57	4.41	4.25
Standard, Long Shackle	55/40HB63	177-7132	5.71	5.51	5.31	5.13
Keyed Alike	55/40 KA 5403	177-7124	5.23	5.03	4.85	4.69
Keyed Alike, Long Shackle	55/40HB63 KA 5402	177-7133	6.29	6.07	5.85	5.64
<b>50mm Padlocks</b>						
Standard	55/50	177-7127	7.33	7.05	6.80	6.57
Keyed Alike	55/50 KA 5503	177-7128	8.06	7.76	7.48	7.22

### Solid Brass Padlocks

65 Series



- Solid brass body
- Hardened Steel / Brass / Stainless Steel shackle
- Option of 3, 4, or 5 pin tumbler mechanism manufactured from all rustfree components
- Automatic locking
- Precision, mushroom pins & paracentric keyway for anti-pick protection
- Standard, Keyed Alike, Anti-Spark & Marine Quality padlocks available
- Supplied with 2 keys

Order Code	Tumbler Mechanism	H	Dimensions			Shackle Dia.	Shackle Height	Shackle Width
			W	D				
177-7114	3 Pin	34mm	20mm	10mm	3.5mm	11.5mm	9.5mm	
177-7115	4 Pin	42mm	25mm	12mm	4mm	13.5mm	13.5mm	
177-7116	4 Pin	50mm	30mm	12mm	5mm	17.5mm	16mm	
177-7121	5 Pin	62mm	40mm	15mm	6.5mm	22.5mm	22mm	
177-7118	4 Pin	50mm	30mm	14mm	5mm	17.5mm	16mm	
177-7122	5 Pin	62mm	40mm	15mm	6.5mm	22.5mm	22mm	
177-7131	4 Pin	93mm	30mm	14mm	5mm	70mm	16mm	
177-7134	5 Pin	103mm	40mm	15mm	6mm	63mm	22mm	
177-7126	5 Pin	74mm	50mm	14.5mm	8.5mm	20.5mm	18.5mm	
177-7125	5 Pin	62mm	40mm	15mm	6.5mm	22.5mm	22mm	

Size	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
<b>Standard, Hardened Steel Shackle</b>						
20mm	65/20	177-7114	3.43	3.31	3.19	3.08
25mm	65/25	177-7115	3.82	3.67	3.55	3.43
30mm	65/30	177-7116	4.31	4.17	4.02	3.89
40mm	65/40	177-7121	5.40	5.21	5.02	4.86
<b>Keyed Alike, Hardened Steel Shackle</b>						
30mm	65/30 KA 6301	177-7118	4.93	4.75	4.59	4.43
40mm	65/40 KA 6401	177-7122	6.17	5.94	5.73	5.53
<b>Anti-Spark, Long Brass Shackle</b>						
30mm	65MB/30HB70 C	177-7131	5.40	5.21	5.02	4.86
40mm	65/MB/40HB63 C	177-7134	7.51	7.24	6.97	6.73
<b>Closed, Hardened Steel Shackle</b>						
50mm	65CS/50	177-7126	11.52	11.01	10.40	10.10
<b>Marine Quality, Stainless Steel Shackle</b>						
40mm	65IB/40	177-7125	8.22	7.61	7.31	7.05

### Heavy Duty Service Padlocks

83 Series



- Through hardened steel body
- 11mm through hardened steel shackle
- Ball bearing locking resists pulling attacks
- Raised shoulders on p/n 177-6517 protects shackle from cutting & torsion attacks
- 5 pin tumbler mechanism manufactured from all rustfree components
- Hardened steel base plate to protect against drill attack
- Supplied automatic locking & non-key retaining
- Features a patented 'Z' bar which allows the lock to be changed to dead locking & key retaining
- Supplied with 2 keys
- For medium to high security applications

Order Code	Material	Dimensions			Shackle Dia.	Shackle Height	Shackle Width
		H	W	D			
177-6517	Hardened Steel Alloy	91.5mm	55mm	25mm	11mm	26.5mm	25mm
177-7110	Hardened Steel Alloy	103.5mm	55mm	25mm	11mm	26.5mm	25.5mm

Shackle	Mfrs. List No.	Order Code	Price Each			
			1+	5+	10+	25+
Closed	83CS/55	177-6517	44.15	41.82	41.31	39.08
Standard	83/55	177-7110	40.40	37.76	37.35	35.02

### Aluminium Combination Padlocks

145 Series



- Precision extruded, cut & drilled pure aluminium body - Light & strong
- Mechanism & shackle coated to prevent chemical corrosion
- Corrosion resistant anodised coating
- 6mm hardened steel shackle
- 3 or 4 wheel resettable combination - Set your own pin
- Security with the convenience of an easy to set combination
- For internal & external standard security applications

Size	Combination	H	Dimensions		Shackle Dia.	Shackle Height	Shackle Width
			W	D			
20mm	3 Wheel	52mm	20mm	14mm	3mm	22mm	9mm
30mm	3 Wheel	65mm	30mm	13mm	5mm	26mm	14mm
40mm	4 Wheel	81mm	40mm	18mm	6mm	27.5mm	21.5mm

Size	Colour	Mfrs. List No.	Order Code	Price Each			
				1+	5+	10+	25+
20mm	Blue	145/20 BLUE C	177-7137	5.31	5.11	4.92	4.76
20mm	Brown	145/20 BROWN C	177-7138	5.31	5.11	4.92	4.76
20mm	Green	145/20 GREEN C	177-7139	5.31	5.11	4.92	4.76
20mm	Red	145/20 RED C	177-7140	5.31	5.11	4.92	4.76
20mm	Silver	145/20 SILVER C	177-7141	5.31	5.11	4.92	4.76
20mm	Yellow	145/20 YELLOW C	177-7143	5.31	5.11	4.92	4.76
30mm	Blue	145/30 BLUE C	177-7144	6.07	5.85	5.63	5.44
30mm	Brown	145/30 BROWN C	177-7145	6.07	5.85	5.63	5.44
30mm	Green	145/30 GREEN C	177-7146	6.07	5.85	5.63	5.44
30mm	Red	145/30 RED C	177-7147	6.07	5.85	5.63	5.44
30mm	Silver	145/30 SILVER C	177-7148	6.07	5.85	5.63	5.44
30mm	Yellow	145/30 YELLOW C	177-7149	6.07	5.85	5.63	5.44
40mm	Blue	145/40 BLUE C	177-7150	8.76	8.44	8.14	7.86
40mm	Brown	145/40 BROWN C	177-7151	8.76	8.44	8.14	7.86
40mm	Green	145/40 GREEN C	177-7152	8.76	8.44	8.14	7.86
40mm	Red	145/40 RED C	177-7153	8.76	8.44	8.14	7.86
40mm	Silver	145/40 SILVER C	177-7155	8.76	8.44	8.14	7.86
40mm	Yellow	145/40 YELLOW C	177-7156	8.76	8.44	8.14	7.86

### Hasp & Staples



- Steel construction
- Hardened steel hinge pin & staple
- Concealed hinge pin
- Hidden screws deters opportunist thieves
- Including all fixings

Continues on next page



Order Code	Material	Height	Width	Dia.
177-7183	Steel	76mm	29mm	9.5mm
177-7184	Steel	97mm	39mm	13.5mm
177-7185	Steel	116mm	47mm	13.5mm
177-7186	Steel	155mm	45mm	12.5mm
177-7187	Steel	120mm	56mm	12.5mm

Mfrs. List No.	Order Code	1+	5+	10+	25+
200/75 C	<b>177-7183</b>	2.91	2.81	2.71	2.62
200/95 C	<b>177-7184</b>	4.29	4.14	3.99	3.85
200/115 C	<b>177-7185</b>	5.50	5.30	5.11	4.93
110/155 C	<b>177-7186</b>	11.17	10.45	10.15	10.10
140/120 C	<b>177-7187</b>	11.17	10.00	9.95	8.63

### 3 Way Mains Connector Quick Connect



A high temperature and corrosive resistant connector, suitable for rigorous Mains applications.

- Same size contact in each position
- Designed to BS EN 60320-2-2
- Positive Location
- Withstands heat, dust and moisture

Contact Rating	13A @ 240V ac	Temperature Rating	-55°C to 150°C
Housing	Ultem®	IP Rating	IP68
Contacts	Copper Alloy / Gold Plated		

535817

Description	Mfrs. List No.	Order Code	1+	10+	50+
Receptacle	QC24-1603X	<b>171-1298</b>	3.20	3.04	2.89
Plug	QC26-1603X	<b>171-1299</b>	1.74	1.65	1.57
Wire Seal	QC220-03	<b>171-1300</b>	0.98	0.93	0.88
Crimp Contact - Pin	429913-31	<b>171-1302</b>	0.98	0.93	0.88
Crimp Contact - Socket	429915	<b>171-1303</b>	1.40	1.33	1.26

### Helios H4 Photovoltaic Connectors



- Meets all new NEC 2008 requirements
- Quick and easy snap lock mating
- Long term UV and Ozone resistance
- Low contact resistance means low power loss
- Self Cleaning contact grid
- IP68 - water and weather proof
- TUV 'Touch-Proof' Design
- RoHS Compliant

Rated Current	40 A	Rated Voltage	1000 V
Contact Material	Copper, Nickel Plated	Insulation Material	PBT
Contact Type	4mm High Efficiency Grid	IP Rating	IP67
Operating Temp.	-40°C to +105°C		

Description	Order Code	1+	10+	25+	50+
Socket	<b>175-6342</b>	1.74	1.68	1.62	1.56
Pin	<b>175-6343</b>	1.19	1.15	1.11	1.07
<b>Tooling</b>					
Wrench	<b>175-6344</b>	1.83	1.77	1.71	1.64
Crimp Tool	<b>175-6346</b>	34.73	33.57	32.41	31.26

### Panel Mount Photovoltaic Power Systems LC3 Series



- Panel mount connectors for system components such as inverters, generator isolation housings or accumulation boxes
- Quick and easy assembly
- Manual crimping tool allows for cost effective assembly
- Rugged and durable for permanently reliable system operation
- Optional locking according to NEC 2008 NFPA 70
- With contact-voltage protection
- UV and ozone-resistant
- Halogen-free



Current Rating	35A (12 AWG) / 40A (10 AWG)	Voltage Rating	1000VDC
Contact Resistance	5mohm	Housing Material	TPU
IP Rating	IP68	Wire Size	10 / 12 AWG
Operating Temp.	-40°C to 85°C		

Mfrs. List No.	Wire Size	Polarity	Order Code	1+	10+	25+
<b>Plugs</b>						
LC3-CP 10-1 4.0	12AWG	Positive	<b>174-0193</b>	2.20	1.77	1.61
LC3-CP 10-1 6.0	10AWG	Positive	<b>174-0194</b>	2.39	1.92	1.75
LC3-CP 10-2 4.0	12AWG	Negative	<b>174-0195</b>	2.20	1.77	1.61
LC3-CP 10-2 6.0	10AWG	Negative	<b>174-0196</b>	2.39	1.92	1.75
<b>Sockets</b>						
LC3-CP 11-1 4.0	12AWG	Positive	<b>174-0197</b>	2.76	2.20	2.00
LC3-CP 11-1 6.0	10AWG	Positive	<b>174-0198</b>	2.76	2.21	2.01
LC3-CP 11-2 4.0	12AWG	Negative	<b>174-0199</b>	2.76	2.20	2.00
LC3-CP 11-2 6.0	10AWG	Negative	<b>174-0200</b>	2.76	2.21	2.01
<b>Dust Caps</b>						
LC3-CX 91	For Sockets		<b>174-0211</b>	0.49	0.39	0.35
LC3-CX 92	For Plugs		<b>174-0212</b>	0.47	0.37	0.34
<b>Crimp Tools</b>						
LC3-CX CZ47-4	12AWG		<b>174-0221</b>	284.73	--	--
LC3-CX CZ47-6	10AWG		<b>174-0223</b>	281.65	--	--

### Field Attachable Photovoltaic Power Systems LC3 Series



- Can be assembled anywhere on-site
- Convenient for smaller installations
- Complements the wiring concept with pre-assembled, overmolded connectors
- Quick and easy assembly
- Only one tool necessary for stripping and crimping
- Rugged and durable for permanently reliable system operation
- With contact-voltage protection
- Optional locking according to NEC 2008 NFPA 70
- UV and ozone-resistant, halogen-free

Current Rating	35A (12 AWG) / 40A (10 AWG)	Voltage Rating	1000VDC
Contact Resistance	5mohm	Housing Material	TPU
IP Rating	IP67	Wire Size	10 / 12 AWG
Operating Temp.	-40°C to 85°C		

Mfrs. List No.	Wire Size	Polarity	Order Code	1+	10+	25+
<b>Plugs</b>						
LC3-CP 30-1 4.0	12AWG	Positive	<b>174-0201</b>	2.74	2.19	1.99
LC3-CP 30-1 6.0	10AWG	Positive	<b>174-0202</b>	2.90	2.32	2.11
LC3-CP 30-2 4.0	12AWG	Negative	<b>174-0203</b>	2.74	2.19	1.99
LC3-CP 30-2 6.0	10AWG	Negative	<b>174-0204</b>	2.90	2.32	2.11
<b>Sockets</b>						
LC3-CP 31-1 4.0	12AWG	Positive	<b>174-0205</b>	2.95	2.36	2.14
LC3-CP 31-1 6.0	10AWG	Positive	<b>174-0206</b>	2.96	2.36	2.15
LC3-CP 31-2 4.0	12AWG	Negative	<b>174-0207</b>	2.95	2.36	2.14
LC3-CP 31-2 6.0	10AWG	Negative	<b>174-0208</b>	2.96	2.36	2.15
<b>Dust Caps</b>						
LC3-CX 91	For Sockets		<b>174-0211</b>	0.49	0.39	0.35
LC3-CX 92	For Plugs		<b>174-0212</b>	0.47	0.37	0.34
<b>Crimp Tools</b>						
LC3-CX CZ47-4	12AWG		<b>174-0221</b>	284.73	--	--
LC3-CX CZ47-6	10AWG		<b>174-0223</b>	281.65	--	--

### Panel Mount Photovoltaic Power Systems LC4 Series



- Panel mount connectors for system components such as inverters, generator isolation housings or accumulation boxes
- Quick and easy assembly
- Manual crimping tool allows for cost effective assembly
- Rugged and durable for permanently reliable system operation
- With contact-voltage protection
- UV and ozone-resistant
- Halogen-free

Current Rating	35A (12 AWG) / 40A (10 AWG)	Voltage Rating	1000VDC
Contact Resistance	5mohm	Housing Material	PPE
IP Rating	IP68	Wire Size	10-12 AWG
Operating Temp.	-40°C to 90°C	No. of Mating Cycles	50

Continues on next page

Mfrs. List No.	Wire Size	Polarity	Order Code	Price Each		
				1+	10+	25+
<b>Plugs</b>						
LC4-CP 10-1 4.0/6.0	10-12 AWG	Positive	174-0213	1.87	1.50	1.35
LC4-CP 10-2 4.0/6.0	10-12 AWG	Negative	174-0214	1.87	1.50	1.35
<b>Sockets</b>						
LC4-CP 11-1 4.0/6.0	10-12 AWG	Positive	174-0215	1.90	1.53	1.38
LC4-CP 11-2 4.0/6.0	10-12 AWG	Negative	174-0216	1.90	1.53	1.38
<b>Crimp Tool</b>						
LC4-CX CZK48	10-12 AWG		174-0224	293.35	--	--

### Field Attachable Photovoltaic Power Systems LC4 Series



Plug

Socket



- Can be assembled anywhere on-site
- Convenient for smaller installations
- Complements the wiring concept with pre-assembled, overmolded connectors
- Quick and easy assembly
- Rugged and durable for permanently reliable system operation
- With contact-voltage protection
- UV and ozone-resistant
- Halogen-free

**Specifications:-**

Current Rating	35A (12 AWG) / 40A (10 AWG)	Voltage Rating	1000VDC
Contact Resistance	5mohm	Housing Material	TPU
IP Rating	IP67	Wire Size	10-12 AWG
Operating Temp.	-40°C to 90°C	No. of Mating Cycles	50

Mfrs. List No.	Wire Size	Polarity	Order Code	Price Each		
				1+	10+	25+
<b>Plugs</b>						
LC4-CP 30-1 4.0/6.0	10-12 AWG	Positive	174-0217	1.82	1.45	1.32
LC4-CP 30-2 4.0/6.0	10-12 AWG	Negative	174-0218	1.82	1.51	1.47
<b>Sockets</b>						
LC4-CP 31-1 4.0/6.0	10-12 AWG	Positive	174-0219	2.24	1.80	1.63
LC4-CP 31-2 4.0/6.0	10-12 AWG	Negative	174-0220	2.24	1.80	1.63
<b>Crimp Tool</b>						
LC4-CX CZK48	10-12 AWG		174-0224	293.35	--	--

### Multifunction Meter



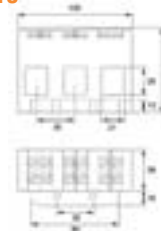
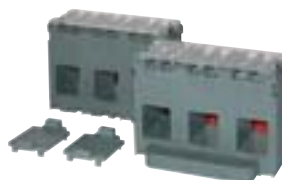
- Single or 3 phase system
- Fully programmable CT & VT ratios
- Security code access for programming
- Blue LED display
- Input voltage range 28-570V
- Replacement for M802 and M812 Series meters

Bezel = 96 x 96 x 19, Panel cut-out = 92 x 92mm

Parameters measured Phase Voltage (V), Phase to Neutral Voltage (V), Phase Current (I), Frequency (Hz), Active Power (W), Active Energy (kWh), Reactive Power (VAR), Apparent Power (VA), Reactive Energy (VARh), Power Factor (PF), Instantaneous Amp Demand, Instantaneous Watt Demand, Instantaneous VA Demand, Maximum Amp Demand, Maximum Watt Demand, Maximum VA Demand, Neutral Current Measurement

Type	Mfrs. List No.	Order Code	Price Each	
			1+	5+
Standard	M850-MP1	175-8713	99.00	80.00
<b>Plug-In Options</b>				
RS485	RS485-M850	175-8714	35.00	28.00
Pulse	PULSE-M850	175-8715	18.00	13.50

### 3 Phase Current Transformers



- Moulded case current transformers
- Input ranges from 100A to 250A
- Secondary outputs 5A
- For conductors up to 25mm
- Foot mounted
- Rated system voltage 0.72/3kV
- Continuous current 1.2 x rated current
- Ambient temperature range -30°C to +80°C
- Conforms to IEC185, BS 7626, BSEN 60044-1 and IEC 60044-1.
- CE Marked

Order Code	Mfrs. List No.	Primary Current	VA	Class
175-8716	CT105F-100/5-2.5/1	100A	2.5	1
175-8717	CT105F-125/5-2.5/1	125A	2.5	1
175-8719	CT105F-150/5-2.5/1	150A	2.5	1
175-8721	CT105F-200/5-2.5/1	200A	2.5	1
175-8722	CT105F-250/5-2.5/1	250A	2.5	1

Ratio Input/Output	Order Code	Price Each		
		1+	5+	10+
100A/5A	175-8716	25.00	23.81	22.05
125A/5A	175-8717	25.50	24.29	22.50
150A/5A	175-8719	26.00	24.76	22.94
200A/5A	175-8721	26.50	25.24	23.38
250A/5A	175-8722	27.00	25.71	23.80

### 3 1/2 Digit - LED Voltmeter



- Daylight-readable LED display with automatic brightness adjustment
- Operates from universal 85-264Vac or 110-300Vdc
- Input circuit fully isolated from operating ac power source
- Red LED backlighting



Supply Voltage	85 to 264Vac	Rated Voltage	300Vac
Supply Current:		Sampling Rate	2.5 readings per second
Total Darkness	4mA	Accuracy	±0.4%FS ± 2 counts
Full Sunlight	40mA	Operating Temperature	-25°C to 60°C

Input Range	Order Code	Price Each				
		1+	5+	10+	25+	50+
<b>DMU-30ACV Series</b>						
0 to 19.33	169-2063	89.98	85.50	77.50	76.00	74.99
0 to 199.9	169-2064	89.98	85.50	77.50	76.00	74.99
0 to 300	169-2065	89.98	85.50	77.50	76.00	74.99
<b>DMU-30DCV Series</b>						
0 to ±1.999	169-2066	84.68	79.50	72.50	71.75	70.45
0 to ±19.99	169-2067	84.68	79.50	72.50	71.75	70.45
0 to ±199.9	169-2068	84.68	79.50	72.50	71.75	70.45

### 10A to 82.5A DIN Rail & Surface Mount



**HS Series**



- Combined AC output ratings from 5 to 80 amps rms @ 40°C
- 24 to 280 & 48 to 660 VAC 50/60 Hz AC line rated SSRs available
- Single, dual and 3 channel output models available
- AC or DC control models available
- Ready to use, no assembly required



Continues on next page

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Pressure Type	Pressure Range	Mfrs. List No.	Order Code	1+	10+	25+	Price Each
<b>0 to 1V dc Linear Output</b>							
Differential	0 to 10" H <sub>2</sub> O	NPA-100-B-010W-D	177-6493	23.95	22.15	20.60	
<b>0.5 to 4.5V dc Ratiometric Output (5V dc nominal)</b>							
Absolute	0 to 15 PSI	NPA-500-B-015-A	177-6503	28.89	26.70	24.85	
<b>Digital Output</b>							
Differential	0 to 15 PSI	NPA-600-B-010W-D	177-6504	36.00	33.30	31.00	
Differential	0 to 15 PSI	NPA-600-B-015-D	177-6505	30.00	27.75	25.80	
Absolute	0 to 15 PSI	NPA-600-B-015-A	177-6506	30.00	27.75	25.80	

### Fast Acting PTC Resettable Fuse

SMD - Case Style 0603



- Compact space saving 0603 footprint
- Very fast reaction time to fault events
- low profile
- V<sub>Max</sub> 9V
- I<sub>Max</sub> 40A

Operating temperature	-40°C to +85°C	Max Operating Current	40A
Surface temperature (Tripped)	125°C	Power Dissipation (Tripped)	0.5W

(A) *	(A) **	R <sub>Min</sub>	R <sub>Max</sub>	Time to Trip	Tripped Power Dissip.	Mfrs. List No.
I Hold @ 23°C	I Trip @ 23°C	(R) @ 23°C	(R) @ 23°C	(s) @ 23°C	(W) @ 23°C	
0.2	0.5	0.55	3.5	0.6	0.5	MF-FSMF020X-2
0.35	0.75	0.2	1.4	0.1	0.5	MF-FSMF035X-2
0.5	1	0.1	0.8	0.1	0.5	MF-FSMF050X-2

\* I Hold - Current at which Fuse will not trip  
\*\* I Trip - Current at which Fuse will trip

Order Multiple	Mfrs. List No.	Order Code	5+	50+	100+	250+	500+	Price Each
Hold Current								
0.2A	MF-FSMF020X-2	171-7225	0.44	0.34	0.29	0.24	0.21	
0.35A	MF-FSMF035X-2	171-7226	0.44	0.34	0.29	0.24	0.21	
0.5A	MF-FSMF050X-2	171-7227	0.44	0.34	0.29	0.24	0.21	

### Biometric Switch - 22mm

Harmony XB5 - Plastic



- 24V dc supply
- Dark gray plastic body
- Available with 2m cable or M12 connector output
- PNP output, available with either Bistable or Monostable circuit
- IP65
- CE, CSA Approved, UL Recognised

Body - H = 42.3, W = 69.3, D = 38.8mm Depth behind pannel = 39.7, Panel cut-out = 22mm

The XB5 Biometric control and signalling unit is designed for use in industry to protect access to systems or machines. No interface is required for programming and operating the switch: it is an independent stand alone unit.

The biometric switch is aimed at two types of user:

The administrator who manages the registration and deletion of users.

The operator who, once registered, uses the device as a control unit.

The product is of monolithic design and is mounted by means of a hand tightened nut (no need for tools) in a standard 22mm diameter hole. Installation can be on either a horizontal or vertical surface.

534902

Output	Connection	Mfrs. List No.	Order Code	1+	Price Each
PNP - Bistable	2m cable	XB5S1B2L2	170-6643	342.95	
PNP - Bistable	M12 Connector	XB5S1B2M12	170-6644	317.23	
PNP - Monostable	2m cable	XB5S2B2L2	170-6645	317.23	
PNP - Monostable	M12 Connector	XB5S2B2M12	170-6646	317.23	

### Micro PLC - CP11 Series

Starter Kit



The CP11 Starter Kit is complete with programming software, USB connecting cable and a CPU unit. Two CPU versions are available, AC and DC. The CP11 CPU Series offers the compactness of a micro-PLC with the capability of a modular PLC.

CPU Unit - H = 90, W = 86, D = 85mm

The CPU has the following features:

- 4 high speed encoder inputs
- Instruction set compatible with CP1H, CJ1 and CS1 series PLC
- USB programming port
- Scalable with a wide range of I/O ports
- Motion functionality
- The same software as other Omron controllers

**KIT Contents:**

- CPU AC Version - CP1L-J14DR-A
- CPU DC Version - CPL1-J14DT1-D
- RS-232 Option Port
- CX-one lite software
- USB Cable
- Promo CD
- Input Switchboard

Operating Voltage Range	Mfrs. List No.	Order Code	1+	Price Each
85 to 264V ac	CP1LSTARTERKITAC	168-7710	509.85	
20.4 to 26.4V dc	CP1LSTARTERKITDC	168-7711	509.85	

### Temperature and Process Controller

1/16 DIN - PID



H = 48, W = 48, D = 70mm

This controller has a reduced behind panel depth of 70mm and capability expected from higher end products. This includes a universal input for all sensor types allowing flexible utilisation, 2 or 3 outputs (including relay, SSR driver, linear DC), full PID control and a simple user interface with easy to read LED display consisting of 4 digits upper and lower, 4 button membrane keypad including function button that can be configured for auto/manual, tuning or profiler control and 3 output status LED's.

A programmer function has the capability of 2 profiles of up to 16 segments incorporating delay timer, auto holdback for guaranteed dwell and easy control via the controller's function button providing easy implementation of temperature profile control. Furthermore, alarms and diagnostics help to prevent problems before they happen: relay life, high ambient warning and absolute or deviation limit alarms allow preventative maintenance actions to be taken instead of needing emergency replacements should a controller fail.

- Universal Input - Thermocouple, RTD and linear DC
- Full PID with auto/manual pre-tune
- Heat or Heat/Cool operation
- Up to 3 outputs - Relay, SSR Driver and linear DC
- Programmer function
- Alarms and Diagnostics
- Only 70mm depth behind panel
- CE Approvals

**Programmer Functions**

- 2 programs of up to 16 segments
- Delay timer
- Auto holdback function - guaranteed soak
- Ramp, dwell, step, events, loop
- Function button for profiler control (run, hold, stop, reset)

Supply Voltage	Mfrs. List No.	Order Code	1+	Price Each
<b>Relay - Outputs 1 &amp; 2</b>				
100 to 240V ac	E6CORR002	179-1025	95.00	
20 to 48V ac	E6CORR022	179-1026	95.00	
<b>SSR &amp; Relay - Outputs 1 &amp; 2</b>				
100 to 240V ac	E6COSR002	179-1027	95.00	
20 to 48V ac	E6COSR022	179-1028	95.00	
<b>Relay - Outputs 1, 2 &amp; 3</b>				
100 to 240V ac	E6CORRR02	179-1029	105.00	
20 to 48V ac	E6CORRR22	179-1030	105.00	
<b>SSR, Relay &amp; Relay - Outputs 1, 2 &amp; 3</b>				
100 to 240V ac	E6COSRR02	179-1031	105.00	
20 to 48V ac	E6COSRR22	179-1032	105.00	
<b>Relay, Relay &amp; Linear DC - Outputs 1, 2 &amp; 3</b>				
100 to 240V ac	E6COSRR02	179-1033	105.00	
<b>Relay - Outputs 1, 2 &amp; 3</b>				
100 to 240V ac	E6CORRL02	179-1034	130.00	

### Solid State Contactor Relay

3 Phase - 53TP Series IP20



Panel mounted three phase AC output Solid State Contactor Relays feature IP20 touch safe covers with load current ratings of either 25 or 50 amps per channel at 530 V ac.

H = 35.4, W = 101.3, D = 79.7mm

- Three-phase solid-state relay
- 48 to 530V<sub>rms</sub> Operating Voltage
- Ratings 25A and 50A per phase
- IP20 Package style
- SCR output for heavy industrial loads
- AC or DC control
- Zero-crossing (resistive loads) or random-fire (inductive loads) output
- LED input status indicator
- Transient protection built in
- EMC Compliant for reliable operation in harsh environments
- 100k-cycle UL508 endurance rating for enhanced reliability
- CSA and TUV Approved, UL Recognised

Continues on next page

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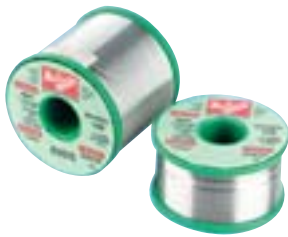
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### Lead Free 97SC (SAC305), 309 Rosin Cored Solder wire



- Pale coloured residues do not require cleaning
- Mild odour
- Halide content < 1.0%
- Contains five cores of non-corrosive 309 Rosin based flux
- Complies with all lead-free legislative requirements

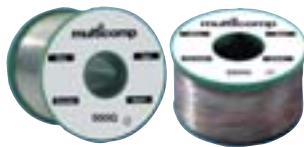
Lead Free (97SC) SAC305, 309 Rosin Cored Solder wire was developed in response to customer requests for a cored solder wire that will

solder difficult surfaces (good spread on nickel, stainless steel, chromel, monel, constantin etc.) whilst leaving pale post soldering residues. Heat stable - low fuming with a mild odour.

Alloy	Lead Free, 96.5% Tin, 0.5% Copper, 3% Silver
Flux Type	309, Rosin based
Melting Temperature	217°C
Tip Temperature (Approx.)	340°C - 420°C

Wire Diameter	Order Code	Price Per Reel	
		1+	10+
0.5mm	125-7142	35.98	32.39
0.7mm	125-7143	27.23	24.50
1.0mm	125-7144	28.16	25.35
1.2mm	125-7145	27.69	24.93
1.6mm	125-7148	27.44	24.69

### Lead Free Alloy, Rosin Flux



- Lead free
- Contains multiple cores of rosin based flux
- Amber coloured (rosin) residues do not require cleaning
- For all general purpose lead-free electronic assembly and re-work applications

Alloy	Lead Free 99.3% Tin, 0.7% Copper Alloy	Tip Temperature (Approx.)	350°C
Melting Temperature	227°C		

Weight	Wire Diameter	Order Code	Price Per Reel	
			1+	10+
250g Reels	0.5mm	507-1290	14.16	13.14
	0.7mm	507-1306	11.64	10.79
	0.9mm	507-1318	8.31	7.71
500g Reels	1.2mm	507-1320	10.40	9.65
	0.7mm	507-1343	19.73	18.31
	0.9mm	507-1355	17.83	16.55
	1.2mm	507-1367	17.36	16.12

### WS200 Water Washable Solder Paste



- General purpose for stencil printing applications
- Wide printing and reflow process windows (air and nitrogen)
- Good tack performance, excellent slump resistance
- Easy to remove water soluble residues
- 88.5% metal content

Alloy 62% Tin, 36% Lead, 2% Silver Alloy

Size	Mftrs. List No.	Order Code	Price Each	
			1+	10+
500g	1303125	169-7892	132.22	123.88

### LF318 Lead Free No-Clean Solder Paste



- Lead free, Halide free solder paste
- No clean residues
- 88.5% metal content
- Suitable for reflow in air or nitrogen
- 96SC (SAC 387) 95.5% Tin, 3.8% Silver, 0.7% Copper
- Melting point 217 °C

Size	Order Code	Price Each	
		1+	10+
500g Jar	125-7149	52.00	49.40

### Electrical kit CM.ELEC1PB



- Indispensable kit for electrical maintenance
- Supplied with 10 tools for stripping, cutting, tightening etc.
- Supplied in a compact and practical vinyl case
- Quick and easy access to tools
- Elastic band for securing tools

**Kit containing:**  
Protwist 1000V screwdrivers (x4; 2slotted and 2 PZ)

Stripping pliers  
28mm sheath stripper  
3x16 tape measure  
Hard wire insulated cutting pliers  
A-D3E 90-480V tester screwdriver  
Electrician stripping knife  
Case

Mftr Part No.  
A3,5x100VE;  
A5,5x125VE;  
AD1x100VE;

AD2x125VE)  
793936  
985956  
893.316  
192.16VE  
AV.HT1B  
840.1  
N.38-16

Mftr Part No.	Order Code	Price Each		
		1+	5+	10+
CM.ELEC1PB	169-8914	120.94	116.10	111.46

### Micro-tech® kit MT.J4PB



- Indispensable kit for IT and office equipment maintenance
- Supplied with 15 precision tools
- Supplied in a compact and practical vinyl case
- Quick and easy access to tools
- Elastic band for securing tools

**Kit containing:**  
Precision screwdrivers (x5)  
Torch  
Hinged and flexible mirror  
Pliers (x2)  
Tweezers (x2)  
Reversible blade holder  
Reversible blades (x2)  
Adjustable wrench 6  
Case

Mftr Part No.  
AEF.2,5x35; AEF.1,8x35; AEF.1,5x35; AEF.2x35; AEPF.00x35  
836  
834.R1  
405.10MT; 422.MT  
140.AA; 152.Y  
AM.D  
Slotted (AMZ.S5,5-7); Phillips (AMZ.P1-2)  
113A.6C  
N.38-16

Mftr Part No.	Order Code	Price Each		
		1+	5+	10+
MT.J4PB	169-8913	107.30	103.01	98.90

### Ultra compact 1/4" "RADIO" Square Drive Socket Set R2 Nano



- Ultra-compact, fits pockets or portable toolboxes
- Immediate tool selection with pictograms of screw head patterns
- For a variety of applications
- Full range of 1/4" socketry
- Sockets can easily removed with a tilting action
- Bit storage bar automatically straightens when the case is opened
- Easy to clean

- Tough, metal hinge rod, self closing, metal clasp
  - Plastic case resistant to workshop chemicals
- Set Contents:-** Sockets R 5.5 - 6 - 7 - 8 - 9 -10-11-12-13-14 mm  
- Selection of screwdriver bits  
- With pictogrammes for fast identification  
- Security Torx 10 - 15 -20 - 25 - 27 - 30 - 40  
- Hex 3 - 4 - 5 - 6 - 7 mm  
- PH No. 1 -2 - 3  
- PZ No. 1 -2 - 3  
- Slotted 4.5 - 6.5 - 8 mm  
- 1/4" spinner handle

Continues on next page



- Bit holder for screwdriver bits
- Ratchet
- 2 x Extensions
- Universal Joint

Mfrs List No.	Order Code	1+	5+	10+
R2NANO	178-1007	184.80	175.35	166.95

### Electronic Tool Kit



- A well equipped tool kit for the electronics engineer
- Supplied in a sturdy zipper case
- Exclusive to Farnell

#### Content

Micro-Cutting Plier  
Clean Cut Micro Nipper  
Heavy Duty Long Nose Plier  
Desoldering Pump  
Solder Aid Tool Kit  
Slot Screwdrivers 2.0mm, 2.5mm, 3.0mm  
Phillips Screwdrivers PH0, PH00  
Tamperfree Torx Screwdrivers T5, T6, T7, T8, T10, T15  
Extremely Fine And Sharp Tip Tweezer  
Super Fine Tip Straight Tweezer  
2 SMD Tweezers

4 PCS Plastic Tweezer Set  
Precision Knife  
40W Soldering Iron  
Soldering Tip Cleaner  
Helping Hand with Soldering Stand  
3 PCS Anti-Static Alignment Tool Kit  
Quick-Fasten ESD Wrist Band  
Vacuum pick-up Tool  
PLCC Extractor  
  
IC Extractor  
Inspection Mirror  
Flux Bottle

Description	Mfrs. List No.	Order Code	1+	5+	10+
Tool Kit (sold. iron with UK plug)	PK-4025C-40	166-6225	73.08	69.42	65.81
Tool Kit (sold. iron with EU plug)	PK-4025B-40	166-6226	73.08	69.42	65.81

### Maintenance Tool Kit



- A well equipped tool kit for the maintenance engineer
- Supplied in a durable, soft nylon zipper case
- Exclusive to Farnell

#### Content

Digital Multimeter  
Mains Tester  
40W Soldering Iron  
Soldering Tip Cleaner  
Desoldering Pump  
VDE Combination Pliers  
VDE Side Cutter  
VDE Long Nose Pliers

VDE Cable Stripper  
Electrician Scissors  
Utility Knife  
2 VDE Slot Screwdrivers: 3.0, 5.5  
2 VDE Phillips Screwdrivers: PH1, PH2  
Ball-Point Hex Key Set: 2.5, 3, 4, 5, 6, 8, 10  
2 PCS Tweezer Set  
Utility Component Storage Box  
Adjustable Wrench

Description	Mfrs. List No.	Order Code	1+	5+	10+
Tool Kit (sold. iron with UK plug)	PK-2807C-40	166-6227	62.63	59.49	56.36
Tool Kit (sold. iron with EU plug)	PK-2807B-40	166-6229	62.63	59.49	56.36

### Vacuum Swivel Vice



Versatile swivel vice with powerful section base which fixes to any smooth surface. Swivelling head allows many varied positions. V grooved jaws for holding cylindrical and irregular shapes. Supplied with removable soft rubber safety jaw covers.

Mfrs. List No.	Order Code	1+	5+	10+
VAC10/L	170-6192	30.55	29.02	27.49

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### 1/4" Square Drive Socket Set



13 Piece 1/4" Square Drive Metric Socket Set

Kit Contents:

13 1/4" SD Cold forged metric hexagon sockets 4, 4.5, 5, 5.5, 6, 7, 8, 9, 10, 11, 12, 13, 14mm

Driver Size	Mfrs. List No.	Order Code	1+	3+	5+
SOCKET SET, 1/4", 13PC	1/4"	708010	177-1860	16.27	15.61 14.94

### Fatmax Snap Off Knife



- Stainless steel barrel
- Up to 20kg/50lbs push back force
- Push button cartridge release stores spare blades
- Push button blade clamp reduces blade wobble
- Bi-material slider
- Blade wiper removes excess debris
- Removable blade snapper for faster and safer removal of a worn segment
- Cartridge holds up to 6 blades
- Instant blade replacement

	Mfrs. List No.	Order Code	1+	6+	12+
9.5mm	10-475	169-6665	7.03	6.70	6.32
18mm	10-481	169-6666	8.22	7.79	7.42
25mm	10-486	169-6667	9.47	8.98	8.54

### Wire Stripper Super No 5



- Automatic wire stripper for all common stranded and solid conductors of 0,2 to 6,0 mm<sup>2</sup> (24-10 AWG).
- Adjustable length stop of 5 to 12 mm (removable of required).
- Easily accessible built-in side cutter for max 2mm

Mfrs. List No.	Order Code	1+	5+	10+
D01022	169-6726	19.07	18.11	17.19

### Adjustable Wrench Set, 3-PC



Set of 3 80-Series Phosphated Adjustable Wrenches. Precision-hardened and anti-corrosion treated.

Mfrs. List No.	Order Code	1+	5+	10+
ADJUSTABLE WRENCH SET, 3-PC	ADJUST 3	171-8741	40.75	38.71 36.67

£ € **40,000 PRICES REDUCED**

**Ratchet Screwdriver Set**



- 40 piece set in robust moulded compact case
- Containing one of each
  - Sockets: metric 6, 7, 8, 9, 10, 11, 12 and inch 3/16; 1/4; 5/16; 11/32; 3/8; 7/16; 1/2"
  - Screwdriver bits: Slotted 3/16; 1/4; 8/32 - PH 1; 2; 3 - Hex 1,5; 2; 2,5; 3; 4,0; 5; 5,5; 6 - PZD/SDV 1, 2, 3; - Torx T10; T15; T20; T27; T30; T40 - Square drive 1 and 2
  - Comfort Grip Ratchet Driver, 1/4" Drive Adaptor, Magnetic Extension



	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
Ratchet Screwdriver Set	T4819	<b>172-5402</b>	17.60	16.73	15.81

**Tape Measure, Micropowerlock 5M/16" STANLEY**



- Versatile wide blades
- Mylar™ polyester film extends life of entire blade
- High-impact, ABS case with rubber over mold withstand rugged conditions
- Stronger spring ensures extra-long life and smooth blade recoil



- Riveted, corrosion-resistant hook moves to allow for accurate inside/outside measurements
- easy-to-read, high-contrast blade for all light conditions
- Top-forward blade lock designed for easy locking and unlocking

Mfrs. List No.	Order Code	Price Each		
		1+	3+	6+
33-553	<b>169-6684</b>	10.71	10.20	9.64

**Wireless Inspection Camera with LCD Monitor ITALECO**



The water-proof Mini Camera with lighting LEDs allows easy visual inspection in hard-to-reach areas. Lightweight, handheld design. Enabling the person to locate diagnose and solve problems with the flexible extended tube and useful attachments.



**Application:**

- Checking for internal leaks
- Reading the model number of the back of hard to reach appliances
- Retrieving lost objects in hard to reach areas
- Internal inspection of pipes and wall cavities

Technical Specifications	
Display	4" TFT-LCD
Resolution	480 x 240 Pixel
Videosystem	PAL
Transmission frequency	2468MHZ
Power Supply	Monitor: built-in Li-Ion battery Hand grip: 4xAA batteries
External Power supply	8V-36V/450mA
Video output level	0,9-1,3Vpp an 750hm
Dimensions (HxWxD)	Monitor: 100x70x30mm Hand grip: 186x145x41mm (without flexible tube) Camera Diameter: 16mm
Content:	Detachable LCD Monitor, Handheld Grip, Flexible 1m Endoscope incorporating 4 LEDs, Mirror, Magnet, Hook, Adaptor for Monitor, Power Adaptor Cable

Description	Type	Order Code	Price Each	
			1+	3+
Wireless Inspection Camera	WIC	<b>173-6046</b>	250.95	225.75

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**Wall Organiser Cabinet**

41 Compartments



- 40 clear compartment pull out trays
- 1 large transparent tray
- Robust impact resistant plastic
- Suitable for wall or desk mounting
- Dimensions: (LxWxH) 310 x 138 x 490mm

Order Code	Price Each			
	1+	5+	10+	20+
<b>144-7384</b>	12.05	10.98	10.07	9.61

**FatMax™ Lock & Stock Storage Solution**



- Unique, storage solution for all equipment
- 6 individual, removable storage compartments for huge variety of items
- Large adjustable organiser featuring saw groove
- Large lower pull out bin for bulky items
- Strong structural foam construction for long life
- Large lower bin ideal for bulky materials and equipment such as paint cans, large components and power tools.

	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
LOCK & STOCK STORAGE SOLUTION	94-747	<b>171-8761</b>	89.91	85.41	80.91
STOCK & CARRY BINS (TRIPLE PACK)	94-746	<b>171-8765</b>	10.76	10.22	9.68

**FatMax™ Waterproof Toolbox**



- NEW waterproof storage solution
- All round water seal ensures safe and dry storage
- Constructed of structural foam for extra strength
- Extra large storage capacity
- Portable Tote tray designed to carry tools and small parts, yet enables large tool storage inside the tool box as it is 3/4 length
- Integrated V-Groove on top lid for sawing work needed, suitable for working with pipes and lumber
- Tough Ergonomic soft grip handle allows heavy loads to be carried with ease
- Large metal rust proof latches with padlock for locking possibilities

Mfrs. List No.	Order Code	Price Each		
		1+	5+	10+
93-935	<b>171-8763</b>	28.80	27.36	25.92
94-749	<b>171-8764</b>	21.60	20.52	19.44

### Technicians Tool Case PLUS



- A further development of the award winning case offering protection for tools, manuals, and sensitive electronic equipment
- 50 Internal and external pockets
- Padded central compartment with divider
- Separate side compartments for tools
- Two internal zipped document pockets
- New rubber waterproof base
- Heavy weight zips
- Soft and comfortable carrying handle
- More capacity

525110

	Mfrs. List No.	Order Code	1+	5+	10+
TECHNICIAN TOOL CASE PLUS	T1632	166-0782	41.32	39.16	36.96

### Explorer Cases



Virtually indestructible, durable waterproof, dustproof cases providing a solution for any equipment requiring a high level of protection. Applications range from valuable industrial equipment to military, aerospace or computer. All cases feature manual pressure release valve, corrosion proof metal reinforced hinges and lid stay feature, sealing O-Ring, load tested handle, high resistance latches and precubed foam interior. Temperature rating -33/+90°C, or -27/+194°F. Colour black.

Order code 137-1606 includes a computer bag with shoulder strap.  
Conforms to IP67 dustproof/waterproof, Defence Standard 81-41

Level J pt4 and STANAG 4280 edition 2.  
Conformity with the directive 2002/95/EC.

Model	Removable Lid	Wheel Base	Internal Dimension		External Dimensions		Weight (kg)	Volume (litres)
			L x H x W (mm)	L x H x W (mm)	L x H x W (mm)	L x H x W (mm)		
1908B	No	No	190 x 125 x 85	216 x 180 x 102	0.8	2		
1913B	No	No	190 x 125 x 135	216 x 180 x 152	0.92	3.2		
2209B	No	No	220 x 160 x 95	246 x 215 x 112	0.99	3.3		
2214B	No	No	220 x 160 x 145	246 x 215 x 162	1.29	5.1		
2712B	Yes	No	276 x 200 x 120	305 x 270 x 144	1.83	6.6		
2717B	Yes	No	276 x 200 x 170	305 x 270 x 194	2.12	9.3		
3317B	Yes	No	330 x 234 x 170	360 x 304 x 194	2.51	13.1		
3818B	No	No	380 x 270 x 180	410 x 340 x 205	3.58	18.4		
4412B	Yes	No	445 x 345 x 125	474 x 415 x 149	3.9	19.2		
4419B	Yes	No	445 x 345 x 190	474 x 415 x 214	4.7	29.2		
4820B	No	No	480 x 370 x 205	520 x 435 x 230	5.4	35.5		
5117B	Yes	No	517 x 277 x 173	546 x 347 x 197	4.5	24.7		
5122B	Yes	Yes	517 x 277 x 217	546 x 347 x 247	7	31		
5822B	No	No	580 x 440 x 220	650 x 510 x 242	8.19	56.1		
5833B	No	Yes	580 x 440 x 330	682 x 510 x 355	11.66	84.2		
7630B	No	Yes	765 x 485 x 305	860 x 560 x 330	14.03	113.1		
7641B	No	Yes	765 x 485 x 415	860 x 560 x 435	15.92	153.9		
13515B	No	Yes	1350 x 350 x 135	1410 x 415 x 159	9.95	63.7		
4412BC	Yes	No	445 x 345 x 125	474 x 415 x 149	4.2	19.2		

		1+	5+	10+
Model	Order Code	29.65	28.15	26.66
1908.B	137-1594	31.64	30.09	28.45
1913.B	137-1595	32.20	30.57	28.96
2209.B	137-1596	35.98	34.18	32.35
2214.B	137-1597	42.33	--	--
2712.B	753-6550			

Model	Order Code	Price Each		
		1+	5+	10+
2717.B	753-6569	47.43	--	--
3317.B	137-1598	77.44	73.70	69.75
3818.B	753-6577	77.47	--	--
4412.B	137-1600	110.30	104.89	99.33
4419.B	137-1601	123.85	117.78	111.60
4820.B	753-6585	111.18	--	--
5117.B	137-1602	130.31	123.76	117.25
5122.B	137-1603	189.05	179.32	169.96
5822.B	753-6593	164.35	--	--
5833.B	753-6607	229.90	--	--
7630.B	753-6615	255.55	--	--
7641.B	753-6623	295.45	--	--
13513.B	137-1604	208.47	202.98	197.78
4412.BC	137-1606	165.02	156.76	148.55
5823.B	164-1786	179.00	169.00	161.10
11413.B	164-1787	185.00	175.00	166.50
13527.B	164-1788	299.00	284.00	269.10

### Loctite® 3430

**LOCTITE**



- Medium viscosity
- Ultra clear
- Toughened
- Water resistant
- Working time: 5 - 10 min.
- Fixture time: 15 min.
- Service temperature range: -55°C - +100°C
- Colour mix: ultra clear

Loctite® 3430 structural bonding - 2K Epoxy, multiple purpose bonder, fast, ultra clearA&B is a five-minute, 2K-Epoxy adhesive, suitable for applications requiring an optically clear bond line. Ideal for bonding glass, decorative panels and displays and general DIY applications.

	Mfrs. List No.	Order Code	1+	5+
LOCTITE 3430, 24ML	142517	176-9530	6.53	6.26

### Glue Remover Gel

**LOCTITE**



Loctite Glue remover is suitable for the removal of super glue and many other glues from badly bonded objects, stained surfaces, fabrics and accidentally bonded fingers. It can also remove traces of sticky labels, inks and permanent marker stains. Non-drip gel formula quick and easy to use. The non drip formula is suitable for application to vertical surfaces

	Mfrs. List No.	Order Code	1+	5+	12+
ADHESIVE, GLUE REMOVING GEL 5GM PACK	853360.1	177-4199	2.92	2.62	2.53

### Adhesive Glass Bond

**LOCTITE**



- Applications:
- Glassware - bowls, jars, bottles, vases, drinking glasses
  - Glass furniture - tables, display cabinets, TV stands, sideboards, worktops
  - Art glass - figurines, beads, jewellery
  - Optical industry - lenses, mirrors
  - Medical industry - syringes, catheters
  - General industry - electric lighting, displays
- Designed specifically for glass to glass or glass to metal applications  
Clear bond line  
Water and detergent resistant  
Triggered by UV rays in normal daylight

	Mfrs. List No.	Order Code	1+	5+	12+
ADHESIVE, GLASS BOND 3GM PACK	853358.1	177-4200	3.36	3.20	3.04

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**Adhesive, Thermal Conductive, 2 part**



- Boron nitride filled, two-part, thermally conductive epoxy adhesive
- Low Outgassing
- Low Chloride Ion content compared to standard epoxies.



3M™ Thermally Conductive Epoxy Adhesive TC 2810 is a boron nitride filled, two-part, thermally conductive epoxy adhesive.

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	
ADHESIVE, THERMAL CONDUCTIVE, 2 PART	TC2810	173-6089	39.43	37.47	37.34

**Adhesive, Epoxy, 2 part**



- Aluminium metal filled, two-part, thermally conductive epoxy adhesive
- Low Outgassing
- Low Chloride Ion content compared to standard epoxies.



3M™ Thermally Conductive Epoxy Adhesive TC-2707 is an aluminum metal filled, two-part, thermally conductive epoxy adhesive.

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	
ADHESIVE, EPOXY, 2 PART	TC2707	173-6090	31.24	29.67	29.61

**3M™ Polyimide Film Electrical Kapton Tape 92**



Tape is amber with a 1 mil polyimide film backing with a silicone adhesive system for exceptional heat resistance, and may be applied at very low temperatures. Can be imprinted. On a 3 inch plastic core and sold in minicase.



Mfrs. List No.	Order Code	Price Each			
		1+	10+	36+	
92 TAPE, KAPTON, 12MMX33M, AMBER	92 TAPE 12MM X 33M	330-9691	22.26	21.08	19.97
92 TAPE, KAPTON, 19MMX33M, AMBER	92 TAPE 19MM X 33M	330-9708	31.14	28.85	27.72
92 TAPE, KAPTON, 25MMX33M, AMBER	92 TAPE 25MM X 33M	330-9710	43.79	42.07	40.48

**Tape, Foam Sealer, Black**



Medium density PVC foam air, dust and weather seal, coated on the face side with an acrylic pressure sensitive adhesive for easy positioning. A removable support liner on the other side prevents stretch during application. For general sealing and cushioning applications, can be cleanly drilled through for mechanical fixing.



- Cushioning
- Sound insulation
- Water seals
- Air seals
- Dust seals
- Light seals
- Abrasive protection
- Electrolytic insulation
- Draught seals
- Anti-vibration insulation
- Security bonding

Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	
TAPE FOAM SEALER 3MMX6MM ROLL, BLACK	PPC116	176-0686	3.31	2.98	2.68
TAPE FOAM SEALER 4.5MMX12MM ROLL, BLACK	PPC117	176-0687	4.30	3.86	3.47
TAPE FOAM SEALER 4.5MMX19MM ROLL, BLACK	PPC118	176-0688	6.88	6.19	5.57
TAPE FOAM SEALER 6MMX19MM ROLL, BLACK	PPC119	176-0689	6.78	6.10	5.49

**Switch and Contact Cleaner**



- Removes dirt, grease, oil and other contaminants
- Leaves a residual oil film, which increases with the contact area and reduces resistance
- Compatible with most plastics and rubber compounds
- Supplied with a plastic applicator to reach inaccessible components



Description	Order Code	Price Each	
		1+	12+
Contact Cleaner, 200ml	120-6544	2.00	1.81

**IPA Cleaning Solvent**



- Powerful electronic cleaning solvent
- Removes moisture from components by forming an azeotrope
- Leaves no visible residue
- Ideal for cleaning PCB's, optical equipment, precision instruments, photocopier drums and most delicate components
- Available in a 400ml aerosol and a 1 litre tin

Description	Order Code	Price Each	
		1+	12+
IPA, 400ml	120-6535	2.65	2.35
IPA, 1 Litre	120-6536	6.47	6.14

**Freezer Spray**



- Aids rapid fault detection in electronic components
- Provides heat sink protection during soldering and calibration
- Tests trace continuity in PCB's
- Cools components to -50°C

Description	Order Code	Price Each	
		1+	12+
Freezer Spray, 400 ml	120-6534	7.95	7.29

**Flux Remover 400ml**

An acrylic resin based coating used to protect PCB's and electrical components from the effects of humidity and moisture



- Insulates and seals PCB's and electrical components from the effects of humidity
- Transparent film
- Provides protection from environmental attack
- Can be soldered through without the need to remove
- Effective from -40°C to +60°C



Mfrs. List No.	Order Code	Price Each			
		1+	5+	10+	
PROPOWER FLUX REMOVER 400ML AEROSOL	PPC120	173-6213	3.99	3.59	3.30

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### Conformal Coating 400ml

A Blend of Solvents designed to remove flux residues from PCB's



- Removal of flux residues from PCB's and components
- Evaporates quickly leaving no residue
- Fast and effective in use
- Also removes uncured surface mount adhesive



Description	Mfrs. List No.	Order Code	Price Each		
			1+	5+	10+
PRO-POWER CONFORMAL COATING, 400ML	PPC121	176-5265	4.63	4.16	3.75

### CRC Minus 50-Non Flammable Freezer



Coolant for electrical and electronic use. CRC Minus 50 is a non-flammable, inert dry coolant-spray for maintenance, trouble shooting and repair. Used to cool down parts and components to temperatures below 0°C to a minimum of -50°C; the tracking of intermittent faults, the detection of hairline cracks, and the locating of defective components becomes easier.



- Protects heat sensitive components from high temperatures during soldering and desoldering.
- Facilitates precision fitting of metal parts : a short spray will shrink one part so a slip fit becomes possible.
- Saves maintenance cost and downtime.
- Non-flammable and inert.
- No chemical attack of components.
- Evaporates completely, leaving no residue.
- Invaluable for testing thermostats and all systems responding to temperature changes

Description	Mfrs. List No.	Order Code	Price Each	
			1+	12+
MINUS 50-NON FLAMMABLE FREEZER-500ML	108393161231	177-2078	15.84	15.05

### Thermal Management



#### HTCP – Non Silicone Heat Transfer Paste PLUS

- Silicone free
- High thermal conductivity – 2.5W/mK
- Wide operating temperature range -50°C to +130°C
- Non-melting and non-hardening

#### HTSP – Silicone Heat Transfer Paste PLUS

- High thermal conductivity – 3.0W/mK
- Wide operating temperature range -50°C to +200°C
- Non-melting and non-hardening

#### HTC – Non-Silicone Heat Transfer Paste

- Silicone free
- 35ml Luer Lock syringe and 10ml syringe dispensers
- Excellent non-creep properties
- High thermal conductivity - 0.9W/mK

#### HTS – Silicone Heat Transfer Paste

- High thermal conductivity – 0.9W/mK
- Luer Lock syringe for hand or automatic application
- Wide operating temperature range -50°C to +200°C
- Non-melting and non-hardening

Description	Mfrs. List No.	Order Code	Price Each			
			1+	12+	36+	144+
10 ML Syringe	HTC10S	317-950	2.41	2.15	1.90	1.76
35 ML Syringe	HTC35S	317-962	4.90	4.39	3.97	3.78
35 ML Syringe	HTS35SL	891-344	5.14	4.69	4.52	4.27
20 ML	HTCP20S	634-920	10.40	9.53	9.19	8.59
50 ML Tube	HTSP50T	725-572	1+	5+	10+	20+
			21.90	20.43	18.86	16.58

### ULS - Ultrasolve Cleaning Solvent



- Fast drying solvent blend
- Removes flux, dirt and grease
- Suitable for PCB and electronic assembly cleaning
- Safe on most plastics
- 100% Ozone Friendly

725-651 - Aero Brush

Size	Mfrs. List No.	Order Code	Price Each			
			1+	12+	36+	144+
200ml Aerosol	ULS200D	298-335	4.29	4.07	3.99	3.75
400ml Aerosol	ULS400D	298-207	7.13	6.78	6.60	6.10
400ml Aero-Brush	ULS400DB	725-651	7.33	7.01	6.57	6.15
1 Litre Tin	ULS01L	298-219	12.68	12.17	11.72	10.91

### CRC Contact Cleaner



CRC Contact Cleaner is a high purity, effective precision cleaning solvent designed to meet today's environmental challenges. Based on fast drying naphthenic solvents without chlorinated, alcohol or glycol ether components. CRC Contact Cleaner improves the performance and reliability of electrical/electronic equipment by cleaning contacts and components quickly and effectively. Prevents contact failures or malfunctions by dissolving and/or rinsing away contaminants, which holds moisture and causes corrosion or arcing.



- Fast cleaning action for removal of flux traces, light oils, finger prints and other contaminants.
- No ozone-depleting action (ODP = 0,00).
- Periodic planned application prolongs the life expectancy of components.
- Non-conductive and non-corrosive.
- Evaporates completely, leaving no residue.
- Safe for all metal surfaces, most rubbers, plastics and coatings. Test on sensitive plastics,
- adhesive-mounted or stressed parts.
- Convenient 360° (upside-down) spray valve for aerosols.
- High purity CO2 propellant, giving an active product content of 97%.

Description	Mfrs. List No.	Order Code	Price Each		
			1+	12+	24+
CONTACT CLEANER-HIGH PURITY-500ML	101513161231	177-2066	14.99	14.24	13.53

### CRC Silicone-Synthetic Lubricant



- Forms a colorless, non-staining film.
- Highly water-resistant; repels water from glass, ceramics, fabrics and leather.
- Eliminates squeaking, binding and sticking.
- Protects metals, plastics, rubbers and other surfaces.
- Low surface tension gives better coverage and deeper penetration.
- Effective over a wide temperature range (-40°C to +200°C).
- Excellent release properties.
- NSF H1 registered N°126501.



Lubricates, protects, waterproofs and restores. A blend of high quality stable silicone oils. The highly versatile, non-corrosive formula lubricates, protects, waterproofs and restores a wide range of parts and equipment. Ensures superior lubrication of plastics and provides excellent separation and release properties.

Description	Mfrs. List No.	Order Code	Price Each		
			1+	12+	24+
FPS SILICONE-SYNTHETIC LUB-500 ML	190755161231	177-2069	10.27	9.76	9.27

### CRC Professional Degreaser



- Cleans and degreases all metal parts.
- Fast evaporation to minimize downtime.
- Does not leave a residue.
- Safe on all metal surfaces, does not stain.
- Safe on most rubbers, plastics and coatings. Test on sensitive or stressed materials before use.
- Convenient 360° (including inverted position) spray valve for aerosols.
- High purity CO2 propellant, giving an active product content of 95%.

Fast and powerful cleaner. Removesoil, brake fluid, grease, dirt and stains. Without chlorinated solvents.

Mfrs. List No.	Order Code	1+	12+	24+
PROFESSIONAL DEGREASER-UNIV USE500ML1012631612311	177-2072	3.42	3.25	3.09
PROFESSIONAL DEGREASER-UNIV USE-2.5L 1012636901311	177-2071	13.70	13.02	12.37

### WD40 Smart Straw 420ml



The WD-40 Smart Straw's contemporary sleek design delivers product quickly and efficiently and ensures you will never lose the straw again! WD-40 Smart Straw sprays two ways: simply flip the straw up for a precision stream for hard to reach jobs and fold it down for a regular wide spray action to cover a larger surface area. A revolutionary packaging design, the new WD-40 Smart Straw comes in a 420ml can and is available in most leading retailers

- **CLEANS:** WD-40 gets under dirt, marks and grease making it easy to wipe away. It also dissolves adhesives, allowing easy removal of labels, tape, and stickers
- **PROTECTS:** WD-40 protects metal surfaces with corrosion-resistant ingredients to shield against moisture and other corrosive elements
- **LUBRICATES:** WD-40's lubricating ingredients are widely dispersed and hold firmly to all moving parts
- **PENETRATES:** WD-40 loosens rust-to-metal bonds and frees stuck, frozen or rusted metal parts
- **DISPLACES MOISTURE:** Because WD-40 displaces moisture, it quickly dries out electrical systems to eliminate moisture-induced short circuits.

Mfrs. List No.	Order Code	1+	5+	10+
WD40 SMART STRAW 44736.	174-2153	4.52	4.07	3.86

### Safety Helmet A-59



4 point plastic suspension and sweatband. HDPE shell



Safety helmet with 4 point plastic suspension with forehead comfort band, 4 - point chin-strap anchorage and 3 - level height adjustment. The 30mm accessory slots fits most available accessories.



Mfrs. List No.	Order Code	1+
HELMET, SAFETY, A-59, RED 933152	169-6171	2.67
HELMET, SAFETY, A-59, SKY BLUE 933154.2	169-6172	2.88
HELMET, SAFETY, A-59, ORANGE 933155	169-6173	2.88
HELMET, SAFETY, A-59, GREY 933156	169-6174	2.88

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### Cold Grip Glove, Knitted, Pair



Seamless knitted and brushed winter liner with black PVC knuckle coating. High flexibility also in temperatures below -25C. High comfort, fit and good dexterity compared to other winter gloves.



- Cold Grip
- Seamless knitted and brushed winter liner
- Special PVC foam knuckle coating

Mfrs. List No.	Order Code	Price Each
GLOVE, COLD GRIP, KNITTED, L, PAIR NF11HD/9L	169-6156	3.39
GLOVE, COLD GRIP, KNITTED, XL, PAIR NF11HD/10XL	169-6157	3.39
GLOVE, COLD GRIP, KNITTED, XL, PAIR NF11HD, 11XXL	169-7032	3.34

### Nitrile Glove, Blue, Powder Free, Pk 100.



Nitrile examination glove 24cm long with rolled cuff. Packed per 100 pieces. High chemical resistance. Available in AQL1,5 for medical application powder free version. 100 gloves per box.



- Nitrile powder free textured examination gloves
- AQL 1.5
- Roll Cuff

Mfrs. List No.	Order Code	Price Each
GLOVE, NITRILE POWDER FREE S PK100 LA049PF/S	169-6147	8.18
GLOVE, NITRILE POWDER FREE, M, PK100 LA049PF/M	169-6148	8.18
GLOVE, NITRILE POWDER FREE, L PK100 LA049PF/L	169-6149	8.18
GLOVE, NITRILE POWDER FREE, XL PK100 LA049PF/XL	169-6150	8.18

### Statutory First Aid Kit



1-10 persons



**Contains:** 1 first aid guidance leaflet, 20 sterile washproof plasters, 2 sterile eye pads with bandage, 4 triangular bandages, 6 safety pins, 8 sterile dressings with pad (assorted), 10 moist wipes, 1 pair latex gloves.

Description	Order Code	Price Each
1-10 Persons Kit	137-6441	30.44
1-10 Refill	137-6487	6.04

### Deb InstantFoam™ Alcohol Hand Wash



Revolutionary alcohol skin sanitiser delivered as a foam



Deb InstantFOAM™ has been tested and found to be effective against H1N1.

1. 12 x 47ml personal issue pack 1712674
2. 12 x 250ml desk top pack 1712675
3. 6 x 1 Litre cartridge 1712677
4. 1 litre Deb InstantFOAM Manual Dispenser 1712678
5. 1 Litre InstantFOAM TouchFREE Dispenser 1712679

- Instant Action - Spreads rapidly to cover hands quickly, killing 99.999% of many common germs in just 15 seconds.
- Convenient - Available in a range of sizes for use in different working environments. No water required, so can be used anywhere.
- Dermatologically Tested - 48hr single patch test, with results validated by a dermatologist, shows the product to be 'non-irritant'. Meets the requirements of European Cosmetic regulation.
- Unique Foam Format - Quickly and easily rubs across the hands with no drips or splashes.

Mfrs. List No.	Order Code	1+	5+	10+
SANITISER, HAND, A/BACTERIAL, 47ML DIS47ML	171-2674	2.00	1.86	1.77
SANITISER, HAND, A/BACTERIAL, 250ML DIS250ML	171-2675	6.98	6.52	6.18
SANITISER, HAND, A/BACTERIAL, 1L DIS1000ML	171-2677	9.96	9.33	8.83
DISPENSER, FOAM, MANUAL, 1L INF01CON	171-2678	4.62	4.32	4.09
DISPENSER, FOAM, AUTOMATIC, 1L AUTOINFCON	171-2679	35.82	33.42	31.69

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- 2. More capabilities** – Feel like you're using a much higher-priced scope as a result of 23 automatic measurements, sequence mode, advanced triggering, mask testing and more.
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