

EngineerIT

Electronics, measurement, instrumentation, automation, control & ICT in engineering

Rates and Data 2018

GENERAL INFORMATION

What is EngineerIT?

EngineerIT is a business-to-business magazine, published by EE Publishers, in print and online, eleven times a year, focused on the business of science, engineering and related technologies. EngineerIT provides a voice for the Institute of Information Technology Professionals South Africa (ITTPSA), Wireless Access Providers Association (WAPA), BCS, The Chartered Institute for IT (Britain), the Information Technology Association (ITA), the IEEE SA Section, the National Laboratory Association (NLA), the National Metrology Institute of South Africa (NMISA), the South African National Accreditation System (SANAS), the South African Council for Automation and Control (SACAC/IFAC), The Society for Automation, Instrumentation, Measurement and Control (SAIMC), the Telkom Society of Engineers (TSE), FTTX Council Africa, Copper Development Association Africa, Association of Representatives for the Electronics Industry (AREI) the South African Electrotechnical Export Council (SAEEC), and the Manufacturing Enterprise Solutions Association (MESA).

Target audience

The target audience of **EngineerIT** includes:

- The engineering sectors in their widest context, including computer, software, information, communications, process, manufacturing, industrial, electronics, electromechanical, mining, construction, civil, chemical, industrial and medical.
- Executives, officials, managers, academics, researchers, designers, developers, engineers, technologists and technicians in the public and private sectors in these fields.
- System integrators, project managers and consultants in the public and private sectors in these fields.
- Manufacturers, marketers and suppliers of products, systems and services to these important sectors.

Fields of interest

EngineerIT covers:

- Information and communication technology (ICT), including telecommunications, networking, broadcasting, computing and software.
- Electronics design, manufacture, test and components.
- Measurement and instrumentation.
- Automation and control.
- Amateur radio, aerospace technology and astronomy.

EngineerIT online

EngineerIT is available online at www.engineerit.co.za. Readers are also invited to subscribe to the monthly email newsletter by visiting our website.

Mission statement

EngineerIT's mission is to be the leading magazine in its field, providing a valued forum of communication for its readers, keeping them abreast of developments, news, views and opinion on the techniques and application of electronic, information and communication technologies in all aspects of engineering for economic, business and social development.

Statement of editorial policy

EngineerIT publishes market-focused, relevant and topical technical and semi-technical articles by leading experts, in an easy-to-read format.

EngineerIT also reports news, events and details of relevance to the target audience, including industry, institute, company, project, product, technology, people and event news, views, comment and opinion. **EngineerIT** aims to publish a sound mix of technical, semi-technical and industry news articles, as well as company and product news articles that are more commercial in nature.

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Circulation

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EngineerIT is published eleven times per annum and has an audited average monthly circulation of 4314 for the period ending June 2017.

As at October 2017, 9210 users have downloaded the **EngineerIT** Android and Apple mobile App to receive the mobile electronic edition of **EngineerIT** monthly.

PRICE PER INSERTION

(Note: Print adverts are also published in the online and mobile editions at no extra cost)

1 – 2 insertions	Full colour	6 – 10 insertions	Full colour
Full page	R25 171 ex VAT	Full Page	R21 398 ex VAT
1/2 page, vert/hor/A5	R17 619 ex VAT	1/2 page, vert/hor/A5	R14 978 ex VAT
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3 – 5 insertions	Full colour	11+ insertions	Full colour
Full Page	R23 283 ex VAT	Full page	R20 138 ex VAT
1/2 page, vert/hor/A5	R16 298 ex VAT	1/2 page, vert/hor/A5	R14 098 ex VAT
1/3 page, vert/hor	R13 970 ex VAT	1/3 page, vert/hor	R12 083 ex VAT
1/4 page	R11 642 ex VAT	1/4 page	R10 069 ex VAT

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Specifications for supplied artwork

- Advertising material can be supplied in JPG, TIF or PDF format, high resolution (300 dpi), with fonts embedded, and in CMYK.
- If an A4 advert is designed to bleed off the page, a 5 mm bleed must be added all round. Keep important information (text, logo's, etc.) in type area.
- For files **bigger than 8 MB**, please contact us.

Advertising sizes (For bleed off the page design, request trim and bleed size)

A4 size:	260 mm high x 180 mm wide
1/2 A4 vert size:	260 mm high x 90 mm wide
1/2 A4 hor size:	130 mm high x 180 mm wide
1/2 A4 Island size:	180 mm high x 120 mm wide
1/3 page vert size:	260 mm high x 60 mm wide
1/3 page hor size:	80 mm high x 180 mm wide
1/3 page Island size:	140 mm high x 110 mm wide
1/4 page vert strip size:	260 mm high x 40 mm wide
1/4 page Island size:	120 mm high x 90 mm wide
1/4 page landscape strip size:	60 mm high x 180 mm wide

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1 – 2 sides 80 – 128 gsm A4 paper:	R15 370 ex VAT
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Front covers: Prices on request

Other special positions IFC, OBC, IBC: Standard rate plus 10% premium.

Bellybands: Note that magazines may have bellybands surrounding the front and back covers. Prices on request.

Note: Special positions are irrevocable bookings.

Bookings and deadlines

Space booking deadline: 15th of the month prior to publication.

Material deadline: 20th of the month prior to publication.

Note: No booking, order or copy instruction received by **EE Publishers** for the placing of advertising material in the journals may be transferred to or from any other third party, without the prior written consent of **EE Publishers**.

Cancellations

No cancellations will be accepted after the space-booking deadline, or without the prior written consent and confirmation from **EE Publishers**.

Terms and conditions of sale

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EngineerIT

Features
2018

Electronics, measurement, instrumentation, automation, control & ICT in engineering

In every issue of **EngineerIT** there are five main sections:

- ICT: Computing and software
- ICT: Telecommunications, networking and broadcasting
- Electronics design, manufacture, test and components
- Measurement and instrumentation
- Automation and control

These features are designed to assist you in focusing on a specific service or product range to support clients' advertising with editorial material and technical articles.

In addition we have the following regular monthly features:

- In conversation with... – a monthly interview with a "mover and shaker" in the industry
- AeroSpace and beyond – a monthly feature on space communication and astronomy
- Amateur radio – a monthly feature of technology in action
- Gadgets 4 Geeks – a monthly feature of new and exciting technology gadgets
- Telecoms developments in Africa – a monthly roundup of African telecommunication news
- Q&A – industry experts share their knowledge in a question and answer format
- Virtual panel discussion – a variety of topical issues are discussed by a panel in a virtual format

ICT: Computing & Software

January: High performance computing and computing innovation; big data analytics; impact of IoT on big data; industrial PCs, tablets and smartphones; augmented and virtual reality

High performance computing (HPC); scalable infrastructure to accelerate innovation and boost productivity; purpose-built solutions; adaptive software and solutions; industrial computers for process control and data acquisition in rugged environments; terminal services; big data analytics on and offline; real-time analytics; impact of IoT on big data handling and analytics; augmented and virtual reality applications.

February: Data storage in the cloud; business IT and database applications; integration of plant and enterprise IT; impact of POPI Act on data storage; alternative data storage methods

Services, software applications and storage in the cloud; ERP, MRP, MIS, MES, IRP, CRM, CMS, accounting and other IT applications; integration of automation and process control systems within the overall enterprise IT system; large and distributed database systems; POPI Act impact on cloud storage; encryption for cloud services; alternative ways of storing data.

March: Data security; security as a cloud service; firewalls and security for networks, internet environments; biometrics

Security as a service in the cloud; minimising software and data security risks; protection against viruses and malware; biometrics, passwords and encryption; installation and managing of firewalls; cloud security services; local, remote and internet data backup systems.

April: Data centres and power supply; green computing and energy storage; UPSs, batteries and back-up generators; renewable energy systems

Developments in data centre power management and utilisation; power and energy efficient hardware and software applications; recycling, clean power and other "green" computing and IT issues; UPSs, standby power and back-up generators; renewable energy and solar power systems.

May: Big data; IoT data handling; software project management tools; software quality; open source software; software development for gaming

Role and handling of big data; IoT data handling; impact of CMMI; software engineering and design tools; emulators and simulators for rapid software development; low and high-level languages and instruction sets; CAD/CAM and 3D engineering design; GUI software development tools and platforms; software development for gaming.

June: Biometric technology and applications; CCTV, access control and security; cabling, interconnections and surge protection

Biometric technology and applications; computer-based security systems; CCTV and access control; developments in fingerprint, face recognition, DNA, palm-print, hand geometry, iris recognition, odour/scent and voice recognition; cabling, interconnections and surge protection systems.

July: Virtualisation and its impact; security issues with virtualisation; software as a service (SaaS); platform as a service (PaaS); security in a virtualised environment

Hardware virtualisation; execution of software separated from the underlying hardware resources; hardware-assisted virtualisation; full, partial and para-virtualisation accommodating guest operating systems for higher efficiency; cloud and web-service applications in computing; security measures, tools and applications for virtual environments.

August: Security in the network environment; encryption and compression techniques

Privacy, network security, firewalls, encryption and compression techniques for Ethernet, TCP/IP, WiFi, Diginet and other LANs, WANs, intranets and the internet; virtual private networks (VPN); cloud and value-added network services (VANS); communications hardware, software and middleware.

September: Real-time and embedded software and computing; digital signal processing and applications; training and education; operating systems

Real-time and embedded software and hardware design and integration; high-level coding and compilers; simulators, emulators, testing and debugging; DSP software design, simulation and modelling; DSPs in image, pattern and speech recognition and synthesis; communication, audio, video, smart card and other applications.

October: Data centres; local vs overseas storage, archiving and back-up; memory and data storage technologies; storage in the cloud

Vendor-neutral data centres; local vs overseas data storage; databases and associated software; data storage, database archiving and back-up technologies and practices; archiving and back-up on magnetic, optical, flash memory and other data storage technologies and techniques.

Nov/Dec: Cloud computing and PC trends: desktop, notebook, netbook, tablets, smartphones, peripherals; gamification for training, education and safety

Cloud computing and developments in desktop, notebook, netbook and tablet PCs; trends in smartphone and unified communication systems; technology developments in screen, printer, scanner, keyboard and other peripherals; special-purpose application cards and technologies; computer simulation, virtual reality and gamification for training, education and safety.

ICT: Telecoms & Broadcasting

January: Fibre technology; Gpon, wireless routers, FTTH, dark fibre, Gfast

Fibre rings and long-haul fibre networks; optical networks; gated community fibre networks; wireless routers; fibre to the home (FTTH) and small office networks; IoT networks.

February: Mobile broadband; LTE, LTE Advanced, 5G, WiFi and WiMAX; mobile networks for IoT

Mobile broadband, LTE, LTE advanced, 5G and WiFi developments; automatic hand-over between systems and billing issues; mobile offload to WiFi; WiMAX; signal extenders, and antennas for mobile applications; IoT applications served by short-range radio technologies such as WiFi and Bluetooth; wide area networks (WANs) facilitated by cellular networks; alternative methods of transferring data.

March: Fixed-line broadband; ADSL, VDSL, CDMA and PLT; satellites

Fixed-line broadband; ADSL and VDSL; satellites for rural fixed-lines; VSAT for backhauling; overcoming latency in satellite internet and internet networks; satellite antennas, dishes, patch antennas, receivers and terminal equipment.

April: Virtual PBX, VoIP and VoIP CPE; virtual contact centres; BYOD and SYOD

New opportunities in IP networks for customer premises equipment; virtual contact centres; virtual PBX and other IP-driven devices; voice services over data connections; mobile money; location services and mapping; securing the network to implement BYOD (bring your own device) and SYOD (select your own device).

May: Telepresence, teleconferencing, video and audio conferencing; video streaming; video security and remote monitoring (CCTV) broadcasting

Interoperability between systems, PC-based high-definition teleconferencing systems; conference bridges and public services; mobile conferencing applications; emerging technologies for business video streaming; telepresence service centres; video security and remote monitoring (CCTV); digital radio mondiale for AM and shortwave; DAB digital radio; studio and sound equipment; digital terrestrial TV (DTT).

June: Two-way radio, underground mine communications; towers, antennas and masts

Developments in the two-way radio market; TETRA, IDAS, D-Star, DMR and other digital systems; push-to-talk cell phone applications; ancillary equipment including base stations, vehicle antennas and hands-free systems; towers and masts; wayleaves and other environmental issues; rapid deployment policies.

July: Cable technologies; fibre optic and sub-marine cables; FTTH; dark fibre; cable testing and maintenance

Fibre optic cables and accessories; dense wavelength division multiplexing (DWDM); fibre to the home (FTTH); dark fibre; passive optical networks; international sub-marine cables; sub-marine cable technology and repeaters; optic cable laying, commissioning, testing and maintenance; preview of SATNAC 2018 to be held in September 2018.

August: Data centres; connectivity and cloud operations; hosting and outsourcing data storage and management

Vendor-neutral data centres; data hosting options – complete or partial outsourcing; service benefits and economic issues of outsourcing; application of software protocol; data farms, data centre cooling, racking, cabling, connectors; UPSs, DC power supplies, battery technology, renewable and other power supply systems, and back-up generator technology; the POPI Act's impact on data storage; equipment compatibility and standards; installation, testing, commissioning and maintenance procedures.

September: Microwave systems for point-to-point private networks; cellular back-haul; new communication systems; rural communications, millimetre wave communications

Point-to-point microwave systems; microwave in back-haul applications; deployment of E and V band equipment for 4G and 5G base station interconnectivity; antennas and new technologies on a low budget; antennas, transmitters and receivers; power and bandwidth issues; frequency allocation issues; regulation, competition and licensing; rural telecommunications.

October: Lightning and surge protection for telecommunications; network test equipment and configuration; broadcasting

A comprehensive approach to total protection – protection against lightning, under-voltages, over-voltages, spikes, dips and other variable line conditions; networks: configuring networks; automated network testing; network test systems and equipment; a review of SATNAC 2018; broadcasting: internet radio technologies, set top boxes, digital television and radio.

Nov/Dec: Moving into the cloud; selecting a cloud service provider; encryption

Moving into the cloud and selecting the right mixture of public cloud, private or hybrid cloud, selecting a cloud provider, encryption methods and security issues; regulatory challenges and regulations, including the POPI Act; innovative new apps for business.

Automation & Control

January: Control rooms; situation awareness monitoring systems; integration of automation and process control in the enterprise; dashboard applications – factory, boardroom, mobile; minimising environmental impact

Integration of automation and process control within the enterprise IT system; dashboard applications; networking and data communications in PC, PLC and DCS-based control systems and SCADA applications; open control systems; IT architecture/network hierarchies and interfacing between layers; ERP, MRP, MIS, MES and IRP and other business IT systems; situation awareness systems.

February: Terminal services vs industrial computers; data acquisition and IoT; digital and embedded automation and control; managing big data

Application of terminal services (thin clients) vs. industrial computers; digital control system design, techniques and analytical methods; digital controllers and control systems; DSP-based controllers and systems; self-tuning and adaptive controllers; discrete time applications in automation and process control; industrial, military and other applications; embedded automation and control; big data management for reducing cost and increasing output; IoT for condition monitoring and preventative maintenance.

March: SCADA applications in industrial automation and process control; wireless applications; IoT for automation

PC, PLC, DCS and SCADA systems; on/off, continuous and discrete time control; batch control applications; measurement and control of temperature, pressure, flow, level, pH, speed and other process variables; linear and non-linear closed-loop controllers; MMIs, displays and data entry terminals; IoT and automation.

April: Intelligent building automation; energy monitoring and management; case studies; dashboards and public information systems

Automated HVAC, lighting and comfort control; automation in power and energy management; building automation, sensors and SCADA systems; building fieldbuses, networks and data communications; emergency management, security and access control; asset and people tracking; time and attendance systems.

May: Artificial intelligence in process automation; robotics in automation and control; mining, automotive and food processing; specialised precision automation and control; predictive maintenance and augmented reality; M2M communications

Application of robotics across the automation and control industry; precision motion, position and speed control for critical applications; DSP control applications; servo-motor and stepper-motor applications; machine tool applications; aircraft, military vehicle, satellite, missile and other critical control applications; M2M in automation.

June: Automation and control project management; Industry 4.0 and open standards; system modelling and simulation; projects using various GUI software platforms

Methods and techniques for automation and control project management; modelling and simulation of automation and control systems; CAD and GUI design tools and software platforms for automation and control applications in electrical, electronic, mechanical, chemical, economic and other disciplines and systems; Industry 4.0 and open standards.

July: Asset management and enterprise integration; motor and servo-motor control, automation and applications; RFID technologies and applications

Integration with the corporate enterprise; motor control and automation technologies; MMIs; micro-machine, servo-motor and stepper-motor control; fixed and variable speed AC and DC drives and multi-motor drives; mine automation and communication applications; RFID technologies for ID, real-time monitoring and control of products, personnel, vehicles and containers; security and electronic payment applications; asset tracking.

August: Sensors, valves and actuators in automation and feedback control systems

Pressure, temperature, level, flow, pH, position, linear and angular displacement; velocity, acceleration, mass, force, torque and other measurement and feedback control systems; conventional and wireless sensors; motorised, pneumatic and hydraulic actuators and valves; electrical to pneumatic/hydraulic converters; sensors to enhance condition monitoring and preventative maintenance.

September: Practical implementation and maintenance of automation and control systems; preventative maintenance; automation applications in mining and other industries

Installation, testing, calibration, tuning and commissioning of automation and control systems; performance and condition monitoring; maintenance and asset management; predictive maintenance; project planning and management; life cycle and compatibility issues, upgrades and system integration; benefits of automation and control systems.

October: Wired and wireless data communications, telemetry and networking; interfacing and systems integration; M2M communication; Ethernet for automation applications

Wired and wireless I/O devices and intelligent field devices; PLCs, PCs and RTUs for local automation and control; process computers, SCADA and MIS systems; wired and wireless data networks, fieldbuses, PLC networks and Ethernet; integration with business IT systems, intranets and internet; communication protocols, standards and compatibility; high-speed and long-distance wireless applications for smart cities, smart grids, oil and gas; Ethernet in automation.

Nov/Dec: Multi-disciplinary automation and control systems; robotics and applications in the motor and other industries

Multi-disciplinary automation and control systems and projects, including electrical, electronic, mechanical, chemical, industrial, civil, mining, military, business and economics sectors; robotic applications and projects in automotive and other manufacturing industries; access control and security systems.

Measurement & Instrumentation

January: Portable and analytical field instruments and data loggers

Hand-held test devices including multi-meters, waveform generators, scopes, logic and spectrum analysers; thermal imaging devices; field and laboratory analytical equipment; solid, liquid and gas analysers; specific gravity analysers, mass spectrometers, X-ray spectrometers and other chemical analysis instruments; data loggers.

February: Software-defined measurement systems; instrumentation and enclosures for hazardous and arduous environments; smoke and fire detection

Software-defined measurement systems; flameproof, explosion-proof and intrinsically safe electronic and instrumentation equipment and enclosures for the petro-chemical and coal mining industries; instrumentation for aggressive chemical, high electro-magnetic, temperature, pressure, humidity, pollution, shock, vibration and other arduous environmental conditions; smoke and fire sensors; protective clothing.

March: Sensors for IoT implementation; wirelessly connected instrumentation; machine-to-machine (M2M) communication; connectivity between instruments and sensors; security issues

Wireless industrial instrumentation and wireless connections to instrumentation; wireless measurement techniques; wireless networks and sensors; wireless automation, monitoring and control; wireless data communication; wireless applications in mining and process industries; sensors for IoT implementation and applications; Bluetooth and other connectivity systems and security issues.

April: Thermal imaging in electrical, maintenance and other applications; optical, laser and acoustic instrumentation and test equipment; management of steam loss

Thermal imaging technologies, systems and applications; camera and video technologies; barcode readers and scanners; video scanning and inspection; pattern recognition and identification systems; laser distance measurement; scanner and printing technologies; photometers and audio test equipment; measuring and mitigating steam loss.

May: Industrial process measurement, instrumentation and applications, including wireless applications; man-to-machine (M2M) communications; virtual inspection systems (video and scanning devices)

Temperature, pressure, humidity, level, flow, pH, conductivity, linear and angular displacement, velocity, acceleration, vibration, mass, force, torque and strain measurement and instrumentation systems; sensors, transducers, transmitters, converters and other instruments; M2M interfaces, displays and data entry terminals; LCD and other displays, chart recorders and data loggers.

June: Calibration, test and measurement equipment and systems; software-defined instruments, test equipment and applications; standards and accreditation

Standards; traceability and accreditation of calibration facilities and equipment; calibration of physical quantities, electrical quantities and process quantities; calibration, test and measurement equipment and systems; software-based virtual instrumentation, test equipment and applications.

July: Thermal imaging devices for industry, utility and the built environment; electrical measurements, meters, test equipment and data loggers; radar measurement equipment for volume measurement

Thermal imaging devices and applications in preventative maintenance; AC and DC voltage and current, active, reactive and apparent power and energy, power factor and frequency measurement equipment, instruments and transducers; resistance, impedance, capacitance and inductance measurements; multi-meters for application in the field, factory and laboratory.

August: Programming software-defined instrumentation; testing and commissioning of instrumentation; automated routine testing; sensors for condition monitoring and breakdown prevention and related security issues

Special purpose and standard test and measurement equipment and systems; type and routine testing procedures and equipment; installation and commissioning tests, procedures and equipment; non-destructive testing and condition monitoring systems and equipment; accelerated life testing.

September: EMC/EMI test and measurement equipment; surge protection for instrumentation systems; EMC compliance and HF noise levels

EMC/EMI test and measurement equipment; oscilloscopes, disturbance recorders, spectrum analysers and quality of supply instruments; AC, DC, impulse, resistance, tan-delta and partial discharge insulation and dielectric test equipment; RFI, fast transient burst and other EMC test equipment; surge protection for instrumentation.

October: Sensors for measurement, instrumentation and control in all industrial applications; sensors in the IoT environment

Temperature, pressure, level and flow sensors; proximity, limit and photoelectric sensors; mark, colour and texture sensors; mass and force sensors, strain gauges and load cells; displacement, velocity and acceleration sensors and encoders; vibration and motion sensors; sensors for environmental monitoring and hazardous gas detection; wireless sensors in environmental control, manufacturing processes, building automation; security applications; IoT and the need for internet enabled sensors.

Nov/Dec: Navigation, surveying, security and military measurement and instrumentation systems; thermal imaging technologies

Digital terrain mapping; air, sea and land navigation equipment; radar and sonar measurements and systems; thermal imaging; optical electronic measurement systems and instruments; land surveying and laser distance measurement instruments; GPS and satellite tracking systems; security and anti-hijacking equipment.

Electronics – design, manufacture, test & components

January: Nanotechnologies; nanocrystalline LEDs, application of graphene in electronics; enclosures for electronic equipment, racks and hazardous areas

Application of nanotechnology in electronics; enclosures for electronics equipment, racks and hazardous areas; enclosure standards; the use of graphene in the development of new generation electronic components.

February: Automotive electronics; fast-charging systems for electrical cars, the connected car, computerised vehicle controls; in-car entertainment and communication systems; in-vehicle IP networks

Industrial automotive electronics; GPS and on-board computers; LEDs in the automotive sector; vehicle alarm and security monitoring systems; embedded comfort control systems; in-car audio and video entertainment systems; internet and cell phone connectivity and hands-free communication systems; electric vehicles and associated battery charging systems; electronics for the connected car; IoT for vehicles; in-vehicle IP networks.

March: Circuit and PCB design; automatic component selection, placement and soldering; 3D design, prototyping and small production runs

Electronics prototyping and testing services; PCB design, simulation and debugging tools; electronics and PCB manufacturing; in-circuit emulators and other electronic design, simulation and test equipment; proto-type testing, routine testing and quality assurance of electronic systems; 3D design, prototyping and small production runs.

April: Power electronic components and systems

Power electronic devices and systems; diodes, thyristors, TRIACs, FETs, MOSFETs, IGBTs and other power electronic devices; rectifiers, solid state relays and switches; power supplies, chargers, converters, inverters, and regulators.

May: EMC/EMI standards and mitigation techniques; RF and HF electronics; embedded systems

RF and HF electronics and EMC/EMI; microwave electronics; ferrites, inductors, capacitors, filters and other HF and RF components; specialised design tools and techniques; shielding, layout and EMC/EMI issues; EMC/EMI standards, mitigation techniques and testing.

June: Programmable electronics; FPGAs and microprocessors; ASIC design and manufacture; solar systems and controllers

Programmable micro and sub-micro electronic devices and applications; programmable gain amplifiers (PGAs), microprocessors and micro-controllers; FPGA applications with embedded microprocessors; ASIC design and manufacture; miniature magnetic resonance machines.

July: Electronics manufacture; component placement and soldering systems; components for electronic manufacturing; enclosures; 3D design

Surface-mount, pick-and-place and other electronic manufacturing techniques; tooling and design for manufacturability; flow-soldering techniques and equipment; multi-layer PCBs; mass production, outsourcing and quality assurance; emerging manufacturing technologies and techniques; enclosures for electronic equipment; 3D design and simulation.

August: Battery technology and energy storage, electronic power supplies; renewable power sources including solar and wind power; battery technologies

Electronic power supplies and DC-to-DC converters; batteries and super-capacitor power sources; battery-charging control systems; battery testing equipment and software; batteries for UPS applications; solar and wind power charging systems; inverters, converters, UPS and other standby power systems; batteries and charging systems including zinc-air and lithium-ion.

September: Active electronic devices; optoelectronics and photonic devices and applications; LEDs in lighting and displays

Active electronic devices; transistors and op-amps; A/D and D/A converters, multiplexers and filters; RAM, ROM, EPROM and EEPROM and other memory devices; magnetic, optical and flash memory data storage devices; scanners and displays; optoelectronic and photonic devices and applications; LEDs for lighting, backlighting, monitors, screens and displays; memistors, spintronics and molecular electronics.

October: Lightning and surge protection components for embedded applications; enclosure systems; cables and terminals

Surge protection components for in-circuit embedded protection; wiring accessories and enclosures; pushbuttons, manual input switches, DIP switches and keypads; indicator lamps, LED and LCD displays; power, control, signal and isolation relays and optocouplers; edge connectors, plugs, sockets, wire, ribbon and other cables; wire terminations and terminals.

Nov/Dec: Embedded systems; specialised chip and FPGA design and customised applications

Embedded systems including specialised analogue, digital and mixed technology chip, device, ASIC and PCB design techniques and applications; FPGA applications; low-power components and devices; high-speed, high-bandwidth analogue and digital technologies; DSPs and high-speed A/D and D/A converters.