



## Corporate Backgrounder

Contact: David Scofield  
Bourns, Inc.  
(951) 781-5054  
david.scofield@bourns.com

### History and Vision

Bourns, Inc. has been leading the electronics industry in the design, manufacture and sale of electronic components and integrated solutions since its inception in 1947 by Marlan and Rosemary Bourns. As an industry innovator, Bourns targets product development at high-growth industries such as computers, telecommunications, automotive and portable electronics. Employing 5,300 people throughout the world with corporate headquarters in Riverside, CA, Bourns continues to thrive as a privately held company under the leadership of Gordon Bourns. As Chairman of the Board and CEO, Mr. Bourns' vision for the Company is to be first in providing innovative solutions with superior quality and reliability to customers in a broad range of markets.

### Commitment to Quality and Customer Service

Bourns established a benchmark for the quality, value and innovation of its products and services early in the Company's history with the 1952 introduction of the Trimpot® line. This was the world's first patented trimming potentiometer. Bourns' dedication to excellence ensures the continuous improvement of its products and services to satisfy customers on a global basis. Bourns' philosophy is founded upon product quality, dependable delivery and the best overall value for its worldwide customers. In addition to maintaining global manufacturing and customer support capabilities, Bourns invests heavily in the development of technologies and the expansion of its manufacturing capabilities to meet customers' changing needs. Through this continuous investment, Bourns drives the trend toward component miniaturization. The Company's commitment to quality is demonstrated in its manufacturing operations, which meet QS 9000, ISO 9001/2000 and TS 16949 certifications. In addition, Bourns has received awards from prominent companies such as Rockwell-Collins, Arrow, Mast Distributors, TTI and many others for its excellence as a supplier.

### Products

Bourns sells a broad range of passive components, including trimming potentiometers, overcurrent protection devices, sensors, modular contacts, resistive networks, switches, encoders, panel controls, linear motion potentiometers,

dials, precision potentiometers, inductive components, chip resistors and chip resistor arrays, and more. In addition, our Circuit Protection offering continues to expand to include thyristor surge protectors, resettable and telecom fuses, gas discharge tubes, line protection modules, chip diodes and ESD protection products. Outside Plant products include central office, station and multi-stage protectors as well as Network Interface Devices (NIDS) and Digital Subscriber Line (DSL) products. More recent additions include Specialty Engineering and Manufacturing Services, Specialty Resistors and Transient Blocking Unit Electronic Current Limiters.

### Automotive Applications

Bourns Automotive Division manufactures a range of products from circuit protection devices to steering angle sensors providing innovative position-sensing solutions to the automotive market. Its two strategic business areas are passenger vehicle and commercial vehicle position sensing. The sensor design is customized to the specific environmental considerations for each target market. In the area of non-contacting sensing, Bourns offers solutions based on Hall Effect (HE), 2 Axis HE and Anisotropic Magneto Resistance (AMR) technology. Bourns continues to develop and manufacture new technology sensors, either contacting or non-contacting which are designed to make vehicles safer, more fuel efficient and more comfortable. Some of the non-contacting product highlights include the ability to offer one of the few self-diagnostic, multiturn steering sensors on the market for EPAS that is ready for active steering duty. To complement this product a non-contacting torque sensor, already produced in quantities of several million, is available for torque assisted electronic steering applications. Focus areas include steering, suspension, braking, power train and under hood sensing as well as electronic power steering, torque and position sensors and rotational speed sensors for ABS and electronic transmission applications.

### CPTC Resettable Fuses

Bourns family of Ceramic PTCs gives designers an alternative resettable solution to their overcurrent requirements. Ceramic PTCs are selected for applications that require accurately defined resistance values in particular in telecom applications when the resistance of the tip and ring line must be matched precisely. The high resistance of the ceramic PTC also allows it to act as a coordinator between the primary and secondary overvoltage protectors in telecom systems.

### ESD Protection Products

Bourns provides Schottky Diodes, Transient Voltage Suppressor (TVS) Diodes and ChipGuard® ESD Suppressors

as ESD protection solutions. The products in various discrete (0402, 0603, SOD323) or array (SC70-6, SOT23-6, SOT143A, NSOIC) package formats are designed to provide ESD protection to industry specification IEC 61000-4-2 (minimum 8 kV contact and 15 kV air discharge ESD withstand). Providing general purpose ESD protection, the devices can also protect fast communication ports such as USB1.1, 10/100b Ethernet ports while protecting high-speed communication ports such as USB 2.0, IEEE1394 and Gb Ethernet ports. Advantages of using Bourns® ESD protection products include meeting technical requirements, maximizing space saving and part count reduction, as well as significant cost reduction.

### **Encoders**

Bourns® Encoders provide outstanding value and performance in industrial, medical, professional audio and other applications where extreme reliability, resolution and long life are required. Encoder types available include optical and contacting technologies available in various package sizes with incremental and absolute (ACE™) outputs.

### **Gas Discharge Tubes (GDTs)**

Bourns® Gas Discharge Tubes provide primary protection against harmful electric surges caused by lightning, power line crosses, induced overvoltages due to load bank switching and ground potential rises. Bourns® GDTs offer unmatched performance and reliability in surge handling capability. They are the industry's most efficient gas discharge tubes providing long life, low capacitance and insertion loss for use in high-speed broadband circuits. The optional Switch-Grade Fail-Short mechanism gives maximum fire prevention. Standards agencies' recognition includes UL, Telcordia, REA, IEEE, ITU-T and IEC. Bourns offers three electrode balanced TRIGARD®, Mini-TRIGARD™, and 2-electrode GDTs in multiple lead configurations, surface mount and tape and reel packaging. Multi-Stage Protection (MSP®) devices feature GDT robustness with solid-state responsiveness.

### **Inductive Components**

Serving a wide variety of applications ranging from telecom, such as line-matching, DSL, RF Transformers and Networking, Automotive CAN Bus Line Filters, Common Mode Chokes, Power Inductors for switching power supplies and DC/DC converters, to wirewound and multi-layer chip inductors for the communications and industrial markets, Bourns® inductive components are available in a variety of standard products, or as special units for specific applications.

### **Specialty Engineering & Manufacturing Services**

Bourns assembly capabilities include chip on board, gold and aluminum wire bonding, high speed, automated, ball/wedge, wedge/wedge, ribbon, gold wire and aluminum wedge bonding for high current/power applications. Die attachment epoxy or eutectic with glob top, dam and fill, flip chip mounts, thermo-sonic bonding (Gold-to-Gold Interconnect) and solder mounting are also available. Bourns manufacturing processes utilize the latest in SMT equipment to allow us to place small chip size (0201), odd form and very tight pitch components. We can place and repair BGAs and create custom BGAs and MicroBGAs. In addition, Bourns manufactures ceramic substrates and packages that provide extreme flexibility and cost advantages. We also support Aluminum Nitride, LTCC, HTCC and organic substrates, FR4, Polyimide and Flex circuits. Bourns has expertise in the optoelectronic modules and telecom industry, industrial sensors, automotive, medical, military and consumer industries. The Bourns business model is conducive for product development through high volume production with global price advantages.

### **Modular Contacts**

Bourns® rugged male and female Modular Contacts provide off-the-shelf solutions for portable electronics. Available in surface mount and through-hole models, these devices function in rechargeable battery packs, portable electronics and other contact applications such as cellphones, PDAs, laptop computers and board-to-board interface applications.

### **Networks**

Bourns® Thick-Film-on-Ceramic Resistor/Capacitor Networks minimize space, reduce costs and improve reliability by decreasing the number of components and solder connections, and are frequently used in computer and peripheral equipment, telecommunications and automotive electronics applications. Available in a wide range of dual in-line, single in-line and SOIC packages, these resistive and capacitive networks are ideally suited for EMI/RFI filtering, RC termination, emitter coupled logic, R2R ladders, SCSI termination and pull up/pull down resistor applications.

### **Panel Controls**

As long life devices, Bourns® Panel Controls are used in applications requiring frequent adjustment, such as front panel applications. Bourns® single-turn and multiturn panel controls are available in 9 mm to 22 mm package sizes in a wide assortment of tapers and terminal styles. A full line of commercial grade panel controls and slide potentiometers is also available.

### ***PPTC Resettable Fuses***

Bourns® Multifuse® PPTC Resettable Fuses utilize the Company's innovative circuit protection technology called Polymer Positive Temperature Coefficiency (PPTC). In an overcurrent or fault condition, this unique conductive polymer increases its resistance, protecting circuit components from high current. It then returns to its original conductive state or resets once the fault is removed and the power cycled. Multifuse® PPTC Resettable Fuses provide overcurrent protection for computers, portable electronics, battery-operated devices, automotive electronics or any equipment that has a power source and load.

### ***Precision Controls***

Bourns offers a wide variety of Precision Controls in both wirewound and thick film technologies. For long life applications, Bourns offers the Hybritron® element that combines the two technologies for low noise output. Precision Controls are available in multiturn and single-turn, and various package sizes. These products are suitable for applications ranging from aerospace to industrial applications. Value-added options are available including cable/connector assemblies and custom shaft and bushing sizes.

### ***Sensors and Controls***

Bourns® Sensors and Controls can be utilized in many applications and markets including agricultural, industrial, computer, professional audio and lighting, and medical industries. Bourns offers contacting and non-contacting sensors in thick film, wirewound, optical and magnetic technologies. Various custom features are available including wire harness, connector/cable assemblies, tapers, electrical and mechanical travel, and custom shaft and bushing lengths.

### ***Switches***

Bourns philosophy for switch design prescribes that devices be small, sealed and surface mounted with the ability to withstand virtually all-standard attachment and cleaning processes. These devices can be used for selection, operation or programming of various circuit functions in equipment types that virtually span the world of electronics. These unique products are complemented by an array of standard off-the-shelf, through-hole switches, which are available in a variety of mounting configurations, terminal styles, sizes and packages to meet the broad range of customer requirements existing today. Bourns diverse switch offerings are ideally suited for a broad range of applications, including instrumentation, industrial controls, communications equipment, computers, security systems, appliances, automotive, audio/visual and pagers.

### ***Telecom Protectors and POTS Splitters***

Bourns offers a broad line of signal, data, coax, 5-pin, and station protection products designed to meet current and future demands of high-speed broadband circuitry. Bourns complements this offering with a full line of Network Interface Devices (NIDs) and Building Entrance Terminals designed for use within the outside plant environment. Bourns also offers a complete line of NID based DSL POTS splitters and equalization modules. These products meet all DSL requirements, including ADSL2+ and VDSL2 systems.

### ***Thick-Film Chip Resistors and Resistor Arrays***

To provide Thick-Film Chip Resistors of exceptional quality and stability, a three-layer contacting process with nickel barrier is used to prevent leaching and provide excellent solderability. Bourns® Thick-Film Chip Resistor Arrays offer a similar level of quality and stability with resistance tolerances from 5 percent to 1 percent and resistance ranges from 10 ohms to 1 megohm.

### ***Thyristor Surge Protectors***

The Bourns range of TISP® thyristor-based surge protection devices provides overvoltage protection for telecommunications systems and enables designers and manufacturers to meet the rigorous protection requirements of international standards. These devices provide protection against lightning strikes; power contact and induction hazards and are available with fixed voltage, programmable voltage or customized options. The fixed voltage options are offered in single, dual or triple configurations with voltage options from 15 V to 520 V and 10/1000 µs surge ratings to 200 A. Programmable voltage devices are available in both polarities, with 10/1000 µs surge ratings as high as 100 A.

### ***Transient Blocking Unit – Electronic Current Limiter***

The TBU® device provides blocking protection for both power cross and lightning. Benefits of the TBU® device include overvoltage and overcurrent protection in one package, extremely high-speed performance, high blocking voltages and currents, precise output current and voltage limiting, very high bandwidth, and a small size. These advantages result in a protection device which exceeds Telcordia GR-1089 and ITU K.20/K.21 requirements, provides automatic protection coordination, and is GHz data rate compatible all within a minimal printed circuit board area. The TBU® protector provides the circuit protection design community with a simple, superior protection device.

### ***Trimming Potentiometers***

As one of the first products designed by Bourns, the Trimpot® Trimming Potentiometer ushered in a new era in the passive electronic components industry with its launch

in 1952. The product line has continued to evolve, enabling engineers to perform a variety of fine adjustments in all types of electronic circuits. To meet the increasing demand for smaller, more reliable electronic components, Bourns® trimmers are now available in packages as small as 2 mm, with rugged designs tailored to withstand increasingly harsh operating environments. Bourns® trimming potentiometers are available in a broad range of models and options, including surface and through-hole mounting, cermet, wirewound and carbon elements, single and multiturn units, sealed and open-frame styles and top, side, front and rear adjustment.

## **Significant Dates in Bourns History**

### *Highlights Span Seven Decades*

- 1947 – Bourns Laboratories founded by Marlan and Rosemary Bourns in Altadena, CA
- 1950 – Company relocated to Riverside, CA
- 1952 – Trimspot® Trimming Potentiometer introduced
- 1959 – Bourns Laboratories, Inc. became Bourns, Inc.
- 1960 – Worldwide corporate headquarters opened
- 1961 – Bourns named “Growth Company of the Year”
- 1962 – Bourns AG European headquarters established in Switzerland
- 1963 – Riverside facility named one of “Top 10 New Plants”
- 1965 – Acquired Chicago Aerial Industries (later renamed Recon/Optical, Inc. which included Pacific Optical)
- 1967 – Bourns de Mexico plant opened
- 1969 – Bourns® products supported Apollo II moon landing
- 1970 – Panel controls product line introduced; Marlan Bourns cofounded World Presidents Organization
- 1974 – Bourns purchased Precision Monolithic, Inc. Semiconductor Company
- 1976 – Resistor network products introduced
- 1980 – Cork, Ireland plant opened
- 1981 – Trimmer Primer Handbook published
- 1982 – La Mesa, Mexico plant opened
- 1985 – Surface mount trimmers and surface mount networks introduced
- 1986 – Taipei, Taiwan manufacturing facility began operations
- 1987 – Bourns, Inc. named “Riverside Business of the Year”
- 1989 – Sensors/Controls introduced steering sensor products
- 1991 – Recon Optical, Inc. cameras shot over 4,000,000 U.S. reconnaissance photos during Desert Storm
- 1994 – Xiamen, China manufacturing facility began operations, Bourns acquired Mecopal’s trimmer assets
- 1995 – Bourns acquired VRN’s Trimmer assets and introduced the first 4 mm surface mount sealed tact Switch, Model 7914
- 1996 – Multifuse® Polymer Positive Temperature Coefficient (PPTC) product line introduced
- 1997 – Bourns celebrated its 50th anniversary, introduced the Multi-Axis Force Sensor and received ISO 9000 Certification
- 1998 – Bourns offered standard and custom Surge Protection solutions
- 2000 – Bourns acquired Power Innovations, Ltd., a leading manufacturer of thyristor-based overvoltage protectors
- 2001 – Bourns acquired the Communication Protection Product lines from Joslyn and received QS 9000 Certification
- 2003 – Bourns acquired Telecom Protection Assets from Texas Instruments Sensors and Controls Division. Bourns acquired assets of Microelectronics Modules Corporation
- 2004 – Bourns acquired assets of Ruf Automotive, a company of W.E.T. Automotive Systems AG and received ISO/TS16949 Certification
- 2005 – Bourns acquired Tyco/Meggitt’s Fuel Card product assets
- 2006 – Bourns acquired assets of J.W. Miller Division of Bell Industries, the Automotive Controls Division of SSI Technologies, Inc. and the Polymer PTC business of Therm-O-Disc, Inc.
- 2007 – Bourns celebrated its 60th anniversary
- 2008 – Bourns Acquires Assets from Emerson Network Power Energy Systems, North America
- 2009 – Bourns acquired central office surge protection products assets from Corning Cable Systems LLC
- 2012 – Bourns acquired Assets from Jensen Devices AB, Stockholm, Sweden
- 2014 – Bourns acquired Komatsulite Mfg. Co., Ltd
- 2015 – Bourns acquired Murata Manufacturing Co., Ltd. trimming potentiometer business