



Micro Systems Technologies  
engineering for life

## Battery Technology

- High-performance batteries for medical implants
- Based on Lithium-Iodine or Lithium-Manganese Dioxide
- High volumetric energy densities
- Low self-discharge



# Battery Technology

For more than 20 years LITRONIK Batterietechnologie GmbH, an MST company located in Pirna, Germany, has been active in the development and manufacture of highly reliable power sources. LITRONIK delivers innovative solutions to manufacturers of implantable pulse generators and implantable cardiac defibrillators in Europe and beyond. The high-performance / high-reliability batteries are based on the electrochemical systems Lithium-Iodine and Lithium Manganese Dioxide.

## CAPABILITIES AND SERVICES

In addition to a standard line of battery products, LITRONIK offers solutions tailored to particular needs of an application.

LITRONIK's R&D and manufacturing capabilities include:

- Electrochemistry
- Material science
- Chemical and physical analysis like ICP-OES, IR-spectroscopy, gas chromatography, laser diffraction spectroscopy, Carl-Fischer analysis, BET-surface determination, micro calorimetry
- Powder processing including milling, separation, drying, heat treatment
- Production under dry conditions (glove boxes, dry room technology)
- Metal and plastics engineering
- Laser and plasma welding
- Chemical synthesis of cathode material
- Electrical characterization

## STANDARD PRODUCT LINES

Three base technologies are offered to cover three ranges of performance for different medical devices:

### Li-Iodine High Energy Batteries

- For implantable pulse generators or other medical devices with highest reliability demands
- Highest volumetric energy densities
- Lowest self-discharge rates
- Solid-state battery
- Long operational safety

### Li-Manganese Dioxide Medium Rate Batteries

- For implantable devices with medium pulse power demand
- Very high power densities
- Direct power supply of telemetric units
- Low self-discharge rates
- No voltage delays

### Li-Manganese Dioxide High Power Batteries

- For implantable defibrillators and other devices with high pulse power demand
- Very high power densities
- Fastest capacitor charging
- Low self-discharge rates
- No voltage delays

## QUALITY

LITRONIK's quality system derives from the stringent requirements of life sustaining implants and assures 100% traceability of processes and materials.

## MICRO SYSTEMS TECHNOLOGIES

Micro Systems Technologies Group (MST) comprises five technology companies providing innovative products and services for medical devices, especially implants, and other high-reliability/high-performance industries. The offering includes HDI/microvia PCBs, ceramic substrates, electronic module design and manufacturing, batteries and hermetic feedthroughs for medical implants, as well as catheter technology.

The MST Companies:

DYCONEX AG  
LITRONIK Batterietechnologie GmbH  
Micro Systems Engineering GmbH  
Micro Systems Engineering, Inc.  
VascoMed GmbH



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Micro Systems Technologies  
Neuhofstrasse 4  
CH-6341 Baar, Switzerland  
Phone +41 (43) 266 11 28  
Fax +41 (43) 266 11 11

Micro Systems Technologies, Inc.  
1839 S. Alma School Road, Suite 205  
Mesa, AZ 85210-3024, USA  
Phone +1 (480) 775 6878  
Fax +1 (480) 775 6880

info@mst.com  
www.mst.com

