Texas Instruments

TI POWER

# TI *Live!* BATTERY MANAGEMENT SYSTEMS SEMINAR

JINRONG QIAN

## OPENING KEYNOTE

# The evolution of the battery management systems seminar

- **In 2004:** 1-day training for 6 engineers on gauges for Inventus (formerly Palladium)
- **In 2008:** 2 parallel tracks: charger and gauge with lab session, 50-60 engineers from BMS customers, distributors and TI FAEs
- **In 2011:**
  - An educational conference for professionals all over the world
  - **~ 150** battery-management experts in attendance
  - 2-3 parallel sessions (chargers, gauges, monitors and protectors)
  - 1:1's between customer and TIers for specific project collaboration
- **2020:** Virtual format and 574 customers attended

**Our commitment is to support battery-management engineers and exchange ideas for solving your BMS design challenges**

# TI's BMS product portfolio

## Battery gauge and monitor products

### Products

- Gauges
- Monitors and balancers
- Protectors
- Authenticator

### Applications

- Industrial: Power tools, garden tools, vacuum cleaner, E-Bike, E-Scooter, medical, ePOS, motor drives, battery packs. energy storage system (ESS)
- Automotive: EV, HEV, eBus
- Personal Electronics: Smartphones, tablets, wearables, portable audio

## Battery charger products

### Products

- Linear chargers
- Switching chargers
  - Buck with integrated FET
  - Boost/buck-boost with integrated FET
  - Charger controller
  - Inductor-less charger

### Applications

- Industrial: Building automation, medical, vacuum cleaners, robots, ePOS, power delivery, power tools, Industrial transport
- Automotive: E-call, smart key fob, backup battery
- Personal electronics: Smartphones, tablets, notebooks, BT speakers & headsets, wearables, accessories.

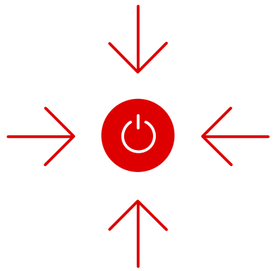
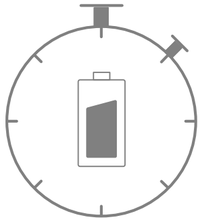
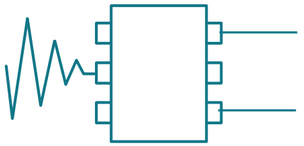
## Industrial

## Automotive

## Personal electronics

# Key battery management technology trends

- Fast charging - power density.
- Longer battery run-time and cycle life - accuracy and low $I_{Q.}$
- Use every “drop of juice” from the battery pack - accuracy and low power consumption.

| Power density | Low $I_Q$ | Low noise & accuracy |
|---|---|---|
|  |  |  |
| **Achieve fast charging with highest power conversion efficiency to safely and reliably charge the battery with smallest solution size.** | **Lowering quiescent current to extend battery and shelf life without compromising system performance.** | **Maximize the battery capacity and cycle life for extending the battery run-time and improving safety.** |

# 2021 battery management systems seminar agenda

| | | Day 1: November 9 | | | | | | Day 2: November 10 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Time (Dallas time) | Length | Keynotes & opening sessions | | | | Time (Dallas time) | Length | Keynotes & opening sessions | | |
| 9:00am-9:15am | 15 min | Opening keynote & welcome<br>Presenter: Jinrong Qian | | | | 9:00am-9:45am | 45 min | Achieving high power density and ultra-fast USB battery charging with new charger topologies<br>Presenter: Jing Ye | | |
| 9:25am-10:10am | 45 min | Why innovation in medicine relies on advanced battery technologies<br>Guest speaker: Gaurav Jain | | | | 9:55am-10:40am | 45 min | System-level considerations for multi-cell industrial battery packs<br>Presenter: Sid Sundar | | |
| 10:20 am-11:05am | 45 min | Battery technology development trends<br>Presenter: Yevgen Barsukov | | | | 10:50am-11:35am | 45 min | More miles, less wires: Revolutionizing automotive battery management with TI wireless BMS<br>Presenters: Mark Ng, Jon Nafziger | | |
| | | **Chargers** | **Gauges** | **Monitors** | **Automotive monitors** | | | **Chargers** | **Gauges** | **Automotive monitors** |
| 11:15am-12:00pm | 45 min | Implementing USB Type-C® and power delivery (PD) for battery charging and sourcing<br>Presenter: Pengzhao Zhu | Gauging techniques for rarely discharged batteries<br>Presenter: Dominik Hartl | Battery gauging for high-cell-count industrial systems<br>Presenter: Xiaodong Cai | 48-V battery monitors in xEV BMS<br>Presenter: Dan Torres | 11:45am-12:30pm | 45 min | Design considerations for battery chargers to achieve the best user experience<br>Presenter: Nick Brylski | Deep dive into TI's Impedance Track™ technology<br>Presenter: Dominik Hartl | Intelligent battery junction box for voltage and current synchronization<br>Presenters: Sudhir Nagaraj, Milos Acanski |
| 12:10pm-12:55pm | 45 min | Autonomous solar panel maximum power point tracking with fully integrated buck-boost chargers<br>Presenter: Mike Emanuel | Battery gauging fundamentals<br>Presenter: Eric Vos | Implementing functional safety systems with TI's industrial battery monitors and protectors<br>Presenter: Terry Sculley | xEV battery pack autonomous management in park mode<br>Presenter: Spencer Hu | 12:40pm-1:25pm | 45 min | A guide to building a low-power charge system of common battery chemistries<br>Presenter: Bill Johns | TI gauges: A step-by-step guide to production<br>Presenter: Damian Lewis | Ask the experts on automotive monitors (Nov 10 session) |
| 1:05pm-1:35pm | 30 min | Ask the experts on battery chargers | Ask the experts on battery gauges | Ask the experts on battery monitors | Ask the experts on automotive monitors | 1:35pm-2:05pm | 30 min | Ask the experts on battery chargers | Ask the experts on battery gauges | None. this track will end at 1:25pm |

# Additional resources

- For information on our BMS portfolio, go to ti.com/battery.
- The material used during this event will be available on demand under design resources.
- A survey will appear at the end of each session. Please provide feedback on the sessions you attend.
- If you have questions, please post them at e2e.ti.com and our experts will get back to you.

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