

IMPROVED MONITORING FOR LITHIUM-ION BATTERY HEALTH AND SAFETY CASE STUDY

August 2021
Doc. No. 36663_00

Preface

Li-ion Tamer from Xtralis has been used extensively in a wide range of Lithium Ion battery installations. In this document, we provide details on several real-life installations. Early detection of off-gas is vital to help prevent thermal runaway and avoid catastrophic consequences.

Contents

Case Study: 40ft Battery Container.....	1
Case Study: Research & Development 20ft Battery Container.....	2
Case Study: 20ft Battery Container.....	3
Case Study: Solar Power Plant Battery System	4
Case Study: Commercial Facility Battery Room	5

Case Study: 40ft Battery Container

Details:

- 25 battery racks
- LG Chem R800 racks
- 2 MWhr
- Gen 1 Li-ion Tamer product
- Utility installation site
- Front-to-back airflow through racks
- Li-ion Tamer signal used to isolate charge of rack
 - Controller output connected to relays for control of E-stop

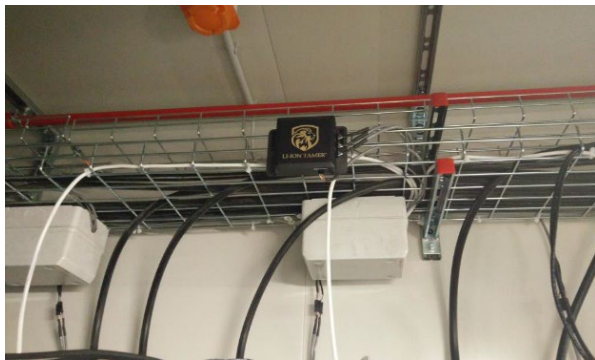
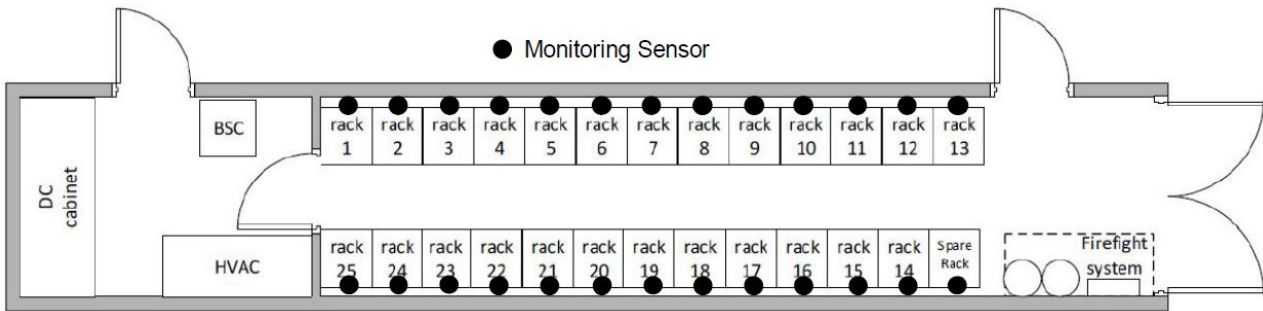


Figure 1: Gen 1 Li-ion Tamer Controller



Figure 2: Monitoring Sensor Placement Above Racks - Mounted to Walls

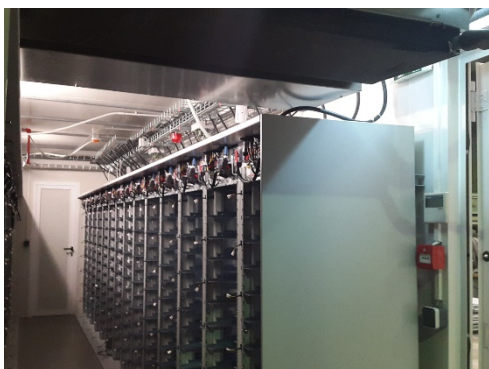


Figure 3: Row of Battery Racks



Case Study: Research & Development 20ft Battery Container

Details:

- 6 battery racks
- 0.65 MW
- Gen 2 Li-ion Tamer product
 - 6 monitoring sensors
 - 3 reference sensors
 - 1 combined controller
- Utility installation site
- Top-to-bottom airflow through racks
- Li-ion Tamer signal used to shut down system
 - Controller digital output connected to system control room for real-time signal observation



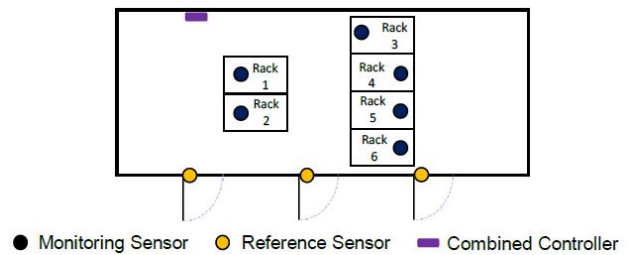
Figure 4: Controllers Tied to System Control Room



Figure 5: System Protected by Li-ion Tamer



Figure 6: Li-ion Tamer Sensor Placement



Case Study: 20ft Battery Container

Details:

- 9 battery racks
- Saft battery racks
- 1+ MWhr
- Front-to-back airflow through racks
- Gen 2 Li-ion Tamer product
 - 9 monitoring sensors
 - 1 combined controller
- Li-ion Tamer signal used for electrical isolation and signal to initiate fire suppression
- Performed large-scale fire testing with customer to understand best sensor placement

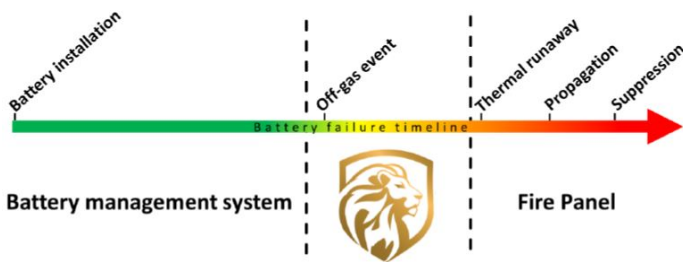
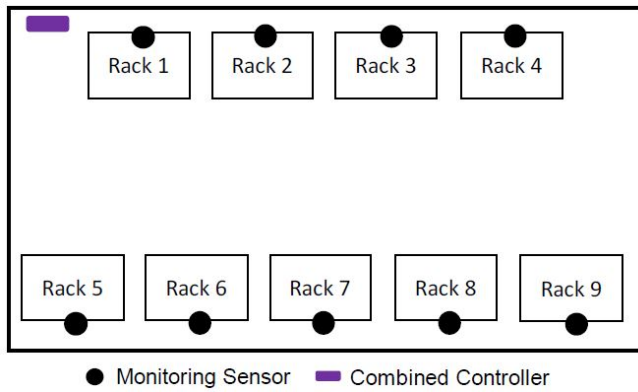


Figure 7: Signal Is Fed to Both BMS and Fire Panel to Maximize Product Value



Figure 8: Large-Scale Fire Testing Enclosure Outfitted with Several Sensors



Case Study: Solar Power Plant Battery System

Details:

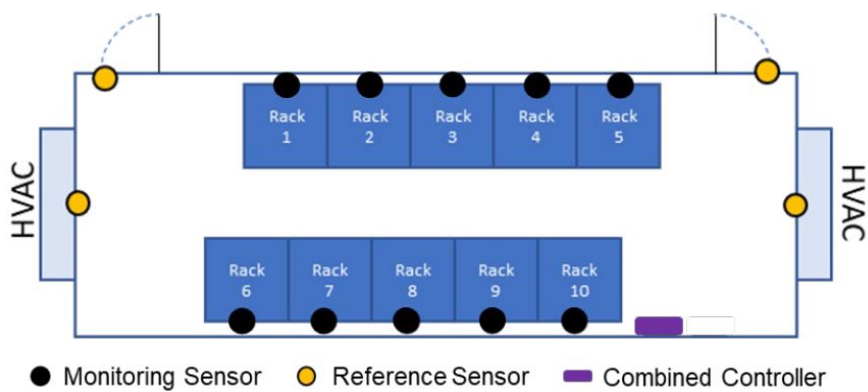
- 2 containers, 10 racks per container
- LG Chem battery racks
- 1 MW, 2 MWhr
- Gen 2 Li-ion Tamer product
 - 10 monitoring sensors per container
 - 5 reference sensors per container
 - 2 combined controllers per container
- Utility installation site
- Front-to-back airflow through racks
- Li-ion Tamer signal over MODBUS communication used for system shutdown



Figure 9: Controllers Mounted Below Fire Control Panel



Figure 10: Battery Container Exterior



Case Study: Commercial Facility Battery Room

Details:

- 12 battery racks
- Destin Power battery racks
- 0.7 MWhr
- Gen 2 Li-ion Tamer product
 - 12 monitoring sensors
 - 3 reference sensors
 - 1 combined controller
- Installed in the basement of high-rise building in Seoul
- No forced air convection
- Li-ion Tamer signal over MODBUS communication used for rack shutdown

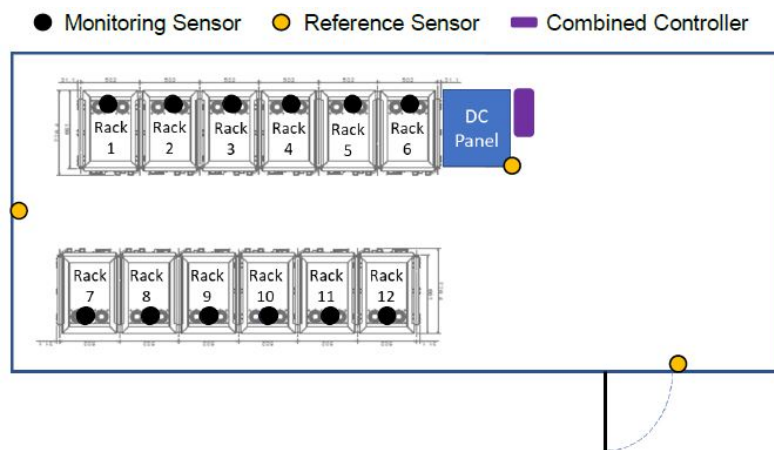


Figure 11: Controller Connected to Monitoring Display



Figure 12: Monitoring Sensors Mounted on Top of Racks