BLOOMY®

Automated test solutions for the entire product lifecycle

ESS Performance Test System

Standardizing energy storage testing

The Energy Storage System (ESS) Performance Test System is used to evaluate, test, and certify the performance of energy storage systems up to 2MW. The system is a configurable platform with over 200 channels of simultaneously measured AC and DC voltages and currents, environmental temperatures, airflow, and communications. Intuitive software provides real-time monitoring and analysis (power, energy, efficiency) to adhere with industry standards. The test system interfaces hardware and controls the ESS to simulate utility applications such as peak shaving and frequency regulation.

APPLICATIONS

- Functional, performance, and life-cycle testing
- Utility application simulations
- Factory and Site Acceptance Testing

FEATURES

- Power quality and energy efficiencies measured to IEC, EN, and IEEE standards
- Simulate utility applications such as peak shaving and frequency regulation
- Portable system for field testing
- Assists with IEEE 1547.1 testing for interconnecting distributed grid resources
- Helps verify response and accuracy of frequency regulation per FERC Order 755
- DNP3 and IEC 61850 communication protocols
- Generate standardized system performance reports

"With Bloomys' data acquisition and controls experience combined with DNV's expertise in power systems, we were able to create a state-of-the-art energy storage system performance test facility."

— Paul Leufkens, DNV

COMMON MEASUREMENTS AND TESTS

Measurements

3-Phase AC Line
- Voltage and current
- AC Power (real, reactive, power factor)
- Total harmonic distortion (THD)

Energy Storage (HV Battery)
- DC voltage and current
- DC power

Bi-Directional Inverter
- AC voltage and currents
- DC voltage and currents
- Switching frequency

System
- Demand power kW
- Energy kWh
- Efficiency (DC/AC)

Temperature

Ancillary Load Power

Tests

Interconnect Tests
- Startup / shutdown / e-stop
- Equipment failure
- Abnormal grid events

Performance Testing
- Power rating
- Energy rating
- Round trip efficiency
- Short / long term test

Application testing
- Frequency Regulation
- Peak Shaving
- Wind Farm Smoothing

HARDWARE SPECIFICATIONS

The following are typical configurations, higher voltage and current ranges, or customized channels are available.

AC VOLTAGE	
3-Phase Connection	Delta or Wye
Channel Sets	4
Voltage Range	400 Vrms L-N, 800 Vrms L-L
Overvoltage Withstand	1000 Vrms for 1 sec
Surge Withstand	5 kV for 100µS
Accuracy	0.05% reading + 0.012% range
AC CURRENT	
3-Phase Connection	Delta or Wye
Channel Sets	4
CT Type	Rogowski Coils
Current Range	250 - 5000 Arms
Linear Accuracy	±1%
Phase Angle	<0.5°
Bandwidth	14.5 kHz
Isolation	5 kV

DC VOLTAGE	
Channels	4 differential
Voltage Range	0 - 1000V
Accuracy	±0.05%
Bandwidth	DC to 25 kHz
Surge Withstand	5 kV
DC CURRENT	
Channels	4 differential
CT Type	Open loop hall effect
Current Range	200 - 2000 Arms
Accuracy	±1%
Bandwidth	DC to 6 kHz
Isolation	5 kV

TEMPERATURE	
Channels	16
Thermocouple Types	J, K, T types
Accuracy	±0.5°C
COMMUNICATIONS	
Supported Protocols	Modbus, DNP 3.0, IEC 61850