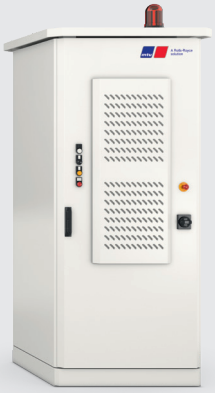
System overview

mtu ENERGETIQ BESS CONTROLLER

Control solution for safe and efficient operation of battery energy storage systems (BESS)





Smart control, data handling and analytics for EnergyPack QG

The ***mtu*** EnergetIQ platform is the brain of your power plant. It optimizes plant performance through seamless control and integration of all equipment. The platform consists of different levels covering all control stages. The ***mtu*** EnergetIQ BESS Controller ensures safe, efficient operation of the ***mtu*** EnergyPack QG while providing primary control functions. It also manages battery data in accordance with warranty requirements and supports data analytics.

Control Functions

- Control of subcomponents (Engine, AVR, Inverters, BMS, MV Switchgear, etc.)
- Internal control loops to increase asset performance

Protective Functions

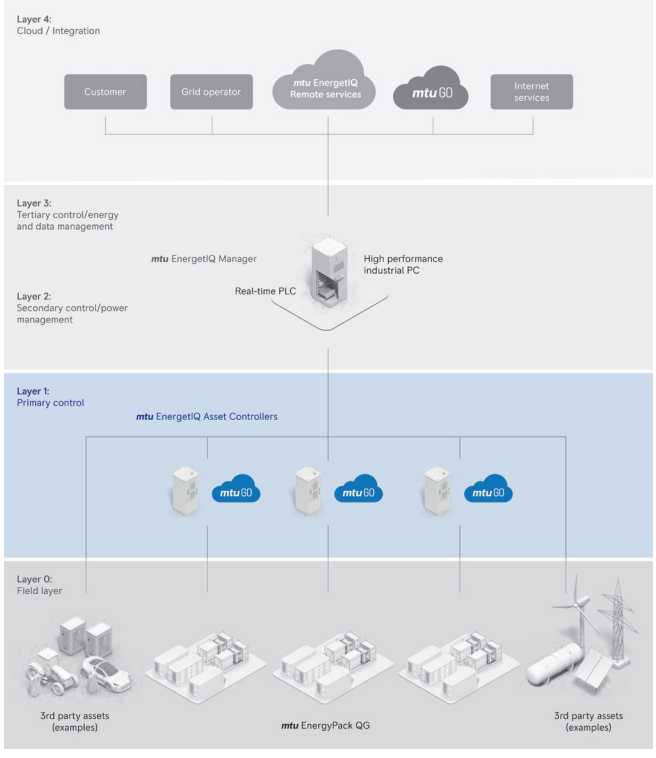
- Asset protection
- Grid protection (for single assets)

Asset Data Management

- Warranty data, Performance data, On-premise Battery Analytics
- Local storage, Cloud connectivity

Visualization

- Operator HMI
- Engineering, Service HMI



A Rolls-Royce solution

Full-Stack Solution

- Seamless field-to-cloud data flow from field equipment to cloud for data consistency
- Integrated automation solution reduces system complexity and software management effort

Availability

- Built on industry standards
- Redundancy options including controller, network and I/O redundancy meet highest availability requirements
- C-HIL[1] test environment ensures smooth integration and operational reliability

Battery Analytics

- On-premise analytics for battery performance insights and KPI tracking
- Early warning algorithms enable predictive maintenance for improved availability (only in combination with ***mtu*** EnergetIQ Manager)

Connectivity

- Connects to ***mtu*** Go for fleet management, service, and cloud storage.
- Secure VPN for remote troubleshooting and updates by Rolls-Royce service
- Customer remote access option to the ***mtu*** EnergetIQ HMI for monitoring and (restricted) control

1 Controller-hardware-in-the-loop simulation



Category

Product information	Product family	***mtu*** EnergetIQ
	Product name	***mtu*** EnergetIQ BESS Controller
	BESS Controller software version	V 2.0.X
	Product scope	Control and management of a battery energy storage system (BESS), comprising multiple battery and power conversion system (PCS) units
Main components	Outdoor cabinet	Housing and climatization
	Programmable logic device	Control and safety of the BESS and its subcomponents
	Industrial PC	Data handling and analytics
	Connectivity device	Connection to ***mtu*** Go for remote monitoring and analysis and VPN for Rolls-Royce Service
	UPS	> 0.5 h
BESS functions	Plant manager interface	Bi-directional communication of setpoints, signals and alarms with higher level plant management (***mtu*** EnergetIQ Manager or 3rd party). Aggregation of all components within the BESS into one technical unit towards higher level plant management (e.g. one setpoint per BESS)
	Power setpoint limitation	Calculation of the active and reactive power setpoints taking system limits and component capabilities into account, in order to avoid damaging the batteries and PCS units
	Power dispatch	Dispatch of the BESS power setpoint between battery and PCS units, taking individual limitations of the units into account
	Partial and limited operation	Maintaining operation at the maximum available power and capacity if the BESS cannot operate at full power and capacity due to physical faults or safeguard functions
Battery functions	State of charge management	Automatic modes for low charge balancing including SOC calibration, full charge balancing and SOC calibration and internal passive rack balancing. Modes can be selected via HMI or OPC UA
	Guarantee data handling	Collection of data required for claim management, local storage for 30 days and efficient transfer to cold storage within ***mtu*** Go
PCS functions	Supported control modes	Active power control, reactive power control, AC voltage control, DC voltage control, blackstart, frequency response, fast frequency response, synthetic inertia
Predictive functions	Battery Analytics (optional)	Locally hosted algorithms for battery health analytics, anomaly detection and predictive maintenance (in combination with ***mtu*** EnergetIQ Manager only)
Safety functions	Double layer protection	Continuous monitoring of the operating parameters and detection of imminent critical states. Instead of rigorous component responses (e.g. disconnection by tripping a circuit breaker), power is reduced in a controlled manner to reduce component load and increase availability
	Shut down	Safety related shutdown according SIL1

Category - continued

Admin functions	Parameter management	All the parameters of the ***mtu*** EnergetIQ BESS Controller can be defined with the parameter management feature
	User management	System-wide user administration facilitates the creation of personalized profiles for accessing additional functions. Analysis and recording of all operator activities related to the installation
HMI	Access	Locally via Web (HTML) Interface. Remotely via ***mtu*** EnergetIQ Manager HMI
	Views	Multiple views and functions such as single line, asset dashboard, component details, manual control, status, configuration and parametrization, event list, etc.
Plant interface	Topologies	Ring type / star type
	Communication medium	Optical fiber multimode / Ethernet
	Communication protocol	OPC UA
	Time synchronization	NTP
Sub-components interface	Topologies	Star type
	Communication medium	Optical fiber single mode
	Communication protocol	Modbus TCP
	Max. supported amount of PCS	2
	Max. supported amount of battery containers	3
Internet	Topologies	Ring type / star type
	Communication medium	Optical fiber multimode / LAN (Ethernet) / LTE (optional)
	Requirements	Broadband connection with 70-100 Mbps, capable of handling 1.5 TB per year per ***mtu*** EnergetIQ BESS Controller
Electrical	Type of electrical system	TN-S
	AC input voltage	100 to 240 V, -15%/+10%
	AC input frequency	50 to 60 Hz, ±6%
	AC input current	28 A at 120 V, 12 A at 230 V
Mechanical	Dimensions (H/W/D)	2045 mm (incl. plinth 200 mm) / 894 mm / 984 mm
	Weigth	300 kg
	IP rating	IP 55
Ambient conditions	Operating temperature	- 30 to + 50° C
	Altitude	<= 2000 m
	Snow load	850 kg/m²
	Wind load	56 m/s
Main standards	Cybersecurity	IEC 62443-4-1 ML 2
	Other	Low Voltage Directive 2014/35, EN ISO 12100:2010, EN 60204-1:2018, EN 61439-1:2021, EN 61439-2:2021

All information is for general guidance only and may change without notice.

Subject to change. | Edition 01/26 | BMC 2026-09.