Battery System Requirements for Park Controller Integration

Communication and performance questionnaire for BESS integration

This document defines the minimum communication and performance requirements for integrating a Battery Energy Storage System (BESS) into the EcoData Park Controller.

The purpose of this questionnaire is to determine whether the battery system can be controlled fast and accurately enough for active power management, reactive power control and grid support applications according to VDE-AR-N 4105 and VDE-AR-N 4110.

General Information

Manufacturer / System	
Model / Type	
Technical Contact	
Phone	
E-Mail	

Required Data Points and Control Functions

The following measured values and control values must be available via Modbus TCP, Modbus RTU or another documented communication interface.

Measured Values

Data Point	Supported	Register Address	Comment / Scaling / Unit
Actual charge/discharge power (AC side)	○ Yes ○ No		kW
Actual reactive power (AC side)	○ Yes ○ No		kVar

Measured Values (continued)

Data Point	Supported	Register Address	Comment / Scaling / Unit
State of Charge (SOC)	○ Yes ○ No		%
State of Health (SOH)	○ Yes ○ No		%
Available charging power (actual available charging capability)	○ Yes ○ No		kW
Available discharging power (actual available discharging capability)	○ Yes ○ No		kW
Nominal charging power	○ Yes ○ No		kW
Nominal discharging power	○ Yes ○ No		kW
Nominal reactive power	○ Yes ○ No		kVar

Available Power Requirements

The available charging and discharging power registers shall represent the actual currently available power. These values must reflect limitations caused by:

- Battery temperature
- State of Charge limitations
- BMS restrictions
- PCS restrictions
- Protection functions
- Any other temporary limitation of charging or discharging capability

Example: A 1 MW battery system may only be able to charge with 200 kW because the battery is almost full. In this case the available charging power register shall report 200 kW and not the nominal 1 MW.

Control Values

Control Function	Supported	Register Address	Comment / Scaling / Unit
Charge/discharge power setpoint (AC side)	○ Yes ○ No		kW
Reactive power setpoint (underexcited / overexcited)	○ Yes ○ No		% Qnom / var / kVar

Reactive Power Setpoint Format

The reactive power setpoint must support one of the following input formats:

- ☐ % of nominal reactive power
- ☐ var
- ☐ kVar

Not acceptable: cos phi setpoint or power factor setpoint only. Reactive power control via cos phi or power factor setpoint only is not sufficient and cannot be used for integration.

If the reactive power setpoint is specified as a percentage, an additional register providing the nominal reactive power is required.

Dynamic Performance Requirements

The battery system shall follow externally provided active power and reactive power setpoints directly.

The battery inverter, PCS, EMS and BMS shall not apply additional ramp limits, smoothing functions, filtering functions, averaging functions or delayed execution mechanisms that modify the requested setpoint.

The EcoData Park Controller generates all required ramps and gradients. The battery system shall therefore execute the received setpoints as requested.

Dynamic Performance

Requirement	Supported	Specification / Register	Comment / Unit
Active power setpoints can be implemented without internal ramp limitation	○ Yes ○ No		
Reactive power setpoints can be implemented without internal ramp limitation	○ Yes ○ No		
Setpoint shall affect AC power output/input directly	○ **Yes** ○ **No**		
Active power response time			ms
Maximum charging ramp rate			%Pn/s
Maximum discharging ramp rate			%Pn/s
Maximum read cycle time			ms
Maximum write cycle time			ms

Internal Ramp Limitation

Does the system apply any internal ramp limitation, power smoothing, slew-rate limitation, filtering or averaging function to active or reactive power setpoints?

○ No ○ Yes

If yes, please specify:

Response Time Requirement

The EcoData Park Controller typically updates setpoints every 500 ms.

The response time is defined as the time between receipt of a new active power setpoint and achievement of the requested active power level.

Maximum acceptable response time VDE4105	Maximum acceptable response time VDE4110
<= 500 ms	**<= 200 ms**

Manufacturer specified response time: ms

Communication Performance

Parameter	Supported	Value	Comment / Unit
Maximum read cycle time			ms
Maximum write cycle time			ms
Recommended polling interval			ms
Supported communication protocols			

Notes

Integration can only be performed if a real test system is available.

A technical contact person from the battery system manufacturer must be available during the integration process and must be familiar with the communication interface, register map and controller configuration of the battery system.

The manufacturer is responsible for providing complete and correct documentation of all registers, scaling factors, units and communication parameters required for integration.

Confirmation

The undersigned confirms that the information provided in this questionnaire is complete and technically correct to the best of their knowledge.

Place / Date	Name	Position	Signature / Company stamp