AMOS.

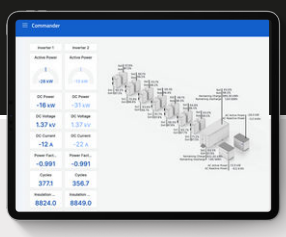
Operating System

Datasheet

Date: 2024-02-07
Revision: 1

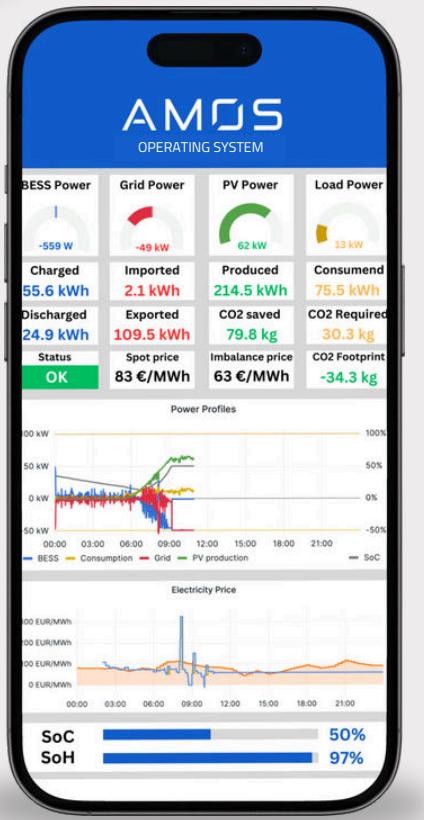
TESLA

AMOS:
OPERATING SYSTEM

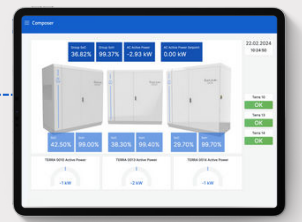


COMMANDER:
ALL-IN-ONE BESS CONTROLLER

NAVIGATOR:
BESS ASSET MANAGER

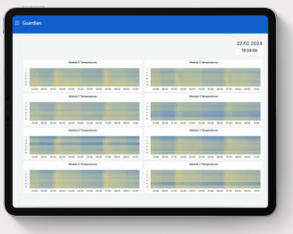


GRIDGENIE:
COGNITIVE BUSINESS INTELLIGENCE



COMPOSER:
VIRTUAL BATTERY BLOCKS

STEADYGRID:
ANCILLARY SERVICES



GUARDIAN:
REVOLUTIONARY BESS OPTIMIZER

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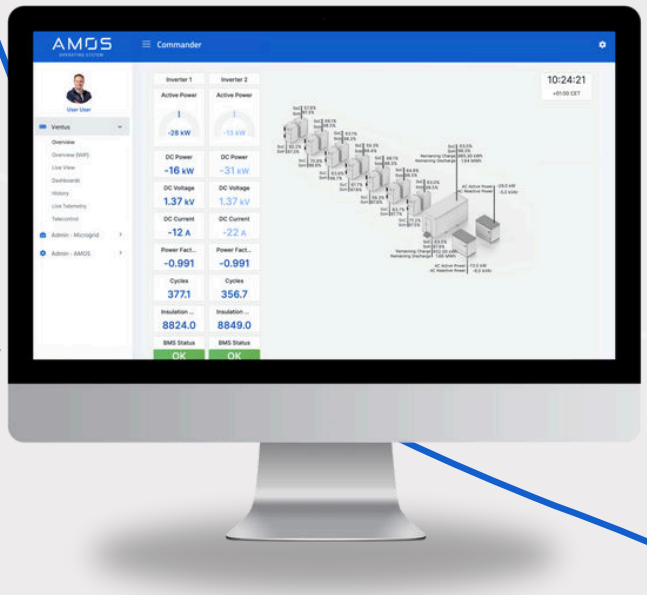
AMOS - OPERATING SYSTEM

COMMANDER
All-in-one BESS controller

AMOS Commander is the ultimate solution for efficiently managing Battery Energy Storage Systems. With a comprehensive suite of features, it optimizes BESS performance, extends longevity, and seamlessly integrates with your power grid infrastructure.



PERFORMANCE SPECIFICATIONS:

BESS THERMAL MANAGEMENT
Optimizes the temperature of BESS components to enhance performance and prolong lifespan

REAL-TIME TELEMETRY
Continuously captures and transmits operational data in real-time via Modbus TCP

DIRECT POWER CONTROL
Allows to set desired power output from the BESS (active power, reactive power, power quality) via Modbus TCP

RAMP MANAGEMENT
Ensures that power changes adhere to prescribed ramp-up or ramp-down limits

CURRENT LIMITATION CONTROL
Prevents overloading and safeguards BESS integrity

POWER SYNCHRONIZATION CONTROL
Aligns BESS output power with the grid's frequency and phase

AUTOMATIC LOAD BALANCING
Intelligently allocates power to individual inverters to maximise efficiency and minimise thermal stress

POWER BACKUP
Grid forming, off-grid mode, black start

AUTOMATIC BESS CALIBRATION
Fine-tunes and adjusts operational parameters to ensure accurate and optimal performance

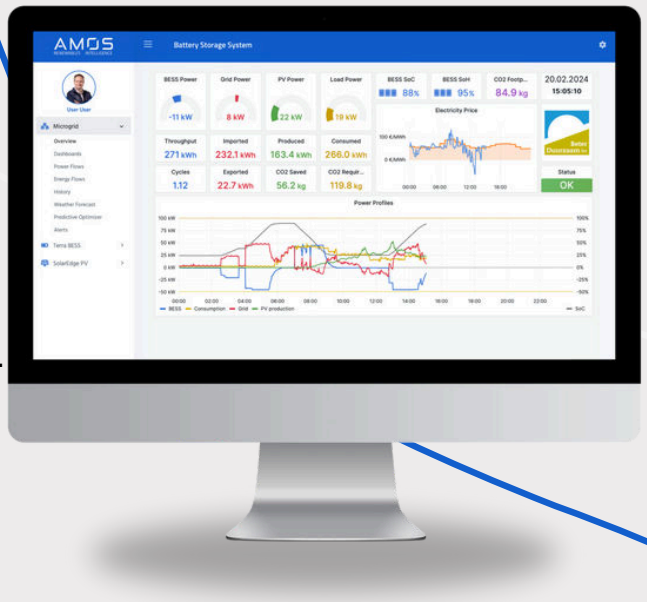
AUTOMATED TESTING
Automates Factory Acceptance Testing (FAT) and Site Acceptance Testing (SAT) procedures

APP HUB
Allows to install and run additional AMOS applications

AMOS

NAVIGATOR:
BESS asset manager

AMOS Navigator revolutionizes Battery Energy Storage System management, offering a suite of features tailored to enhance efficiency and streamline operations. With AMOS Navigator, you can effortlessly oversee your assets, ensuring optimal performance and longevity.



PERFORMANCE SPECIFICATIONS:

COMPONENT INVENTORY MANAGEMENT
Records and visualizes product components in a comprehensive inventory list

ELECTRONIC SERVICE BOOK
Digital repository for service history, diagnostics, and all repairs performed on assets

MAINTENANCE CHECKLISTS
Provides editable checklists for commissioning, inspection, and repair procedures

PLANNED MAINTENANCE SCHEDULES
Establishes and manages scheduled maintenance activities to proactively address asset health

WORK ORDER MANAGEMENT
Tracks and monitors service and maintenance tasks and requests

OPTIMIZATION OF ASSET EXPANSION
Strategically plans and optimizes the expansion of assets for efficient scalability

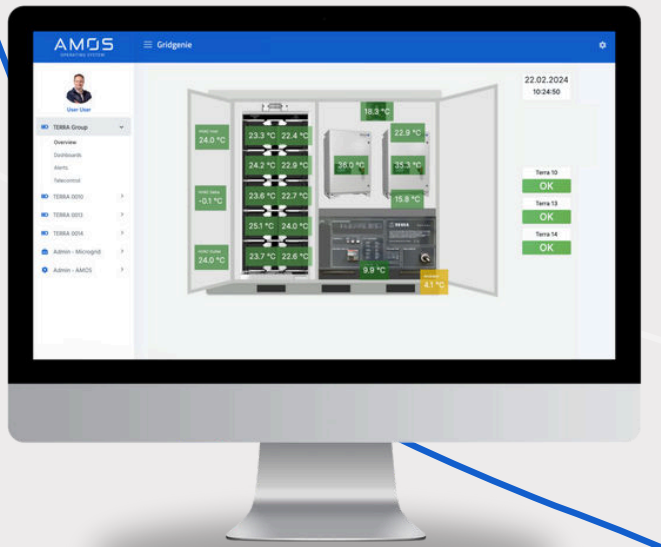
FLEET MANAGEMENT
Manages and oversees the entire fleet of assets, ensuring coordinated and effective operation

USER MANAGEMENT
Administers user accounts and assigns roles to regulate access and permissions

AMOS

GRIDGENIE: Cognitive business intelligence

AMOS GridGenie redefines business intelligence for Battery Energy Storage Systems with its innovative features designed to provide actionable insights and enhance operational efficiency.



PERFORMANCE SPECIFICATIONS:

HEY AMOS
AI assistant that allows to interact with the system by asking questions in any language

LIVE TELEMETRY
Visualizes the current state of monitored BESS and all its components

THERMAL PROFILER
Employs advanced data processing techniques to visualize the distribution of heat within individual battery cells in a BESS

HEALTH MONITORING
Constantly assesses and reports the condition of assets to ensure optimal performance

EFFICIENCY MONITORING
Tracks and analyses the efficiency of BESS operations

REMOTE MONITORING AND CONTROL
Integrates the BESS into the customer's existing IT infrastructure via REST API, Websockets, and MQTT protocols

SMART ALERTS WITH NOTIFICATIONS
Issues automated alerts to promptly notify asset owners of critical events and conditions

TRENDS AND DASHBOARDS
Shows graphical representations of the time profiles of measured signals with complete signals' history

CUSTOM DASHBOARDS
Empowers customers to design and configure personalized dashboards according to their specific needs and preferences

DYNAMIC STATE LOG
Tracks the occurrence and duration of alerts and the operational state changes of system components

KPI's
Generates Key Performance Indicators to assess and measure the efficiency and performance of monitored assets

REPORTS
Generates concise and informative summary reports, providing a comprehensive overview

COMPLIANCE MONITORING
Constantly monitors compliance with regulatory requirements and industry standards

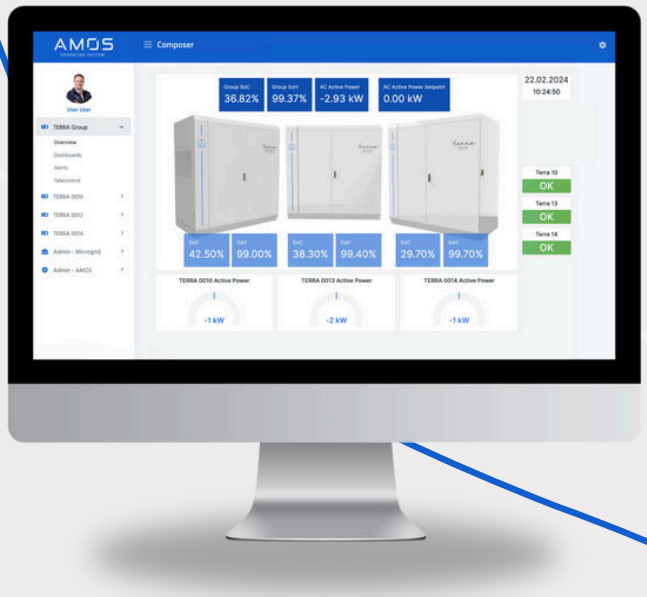
HISTORICAL DATA ANALYSIS
Analyzes historical performance data to identify trends, patterns, and opportunities

FULL TELEMETRY HISTORY WITH DATA EXPORT
Archives complete telemetry history and allows users to export data in common formats (Excel, CSV, JSON, ...)

API ACCESS
Provides programmatic access for integration with other applications or custom analysis

COMPOSER: Virtual battery blocks

AMOS Supervisor introduces a groundbreaking concept with its Virtual Battery Blocks feature, providing unparalleled control and optimization capabilities for Battery Energy Storage Systems.



PERFORMANCE SPECIFICATIONS:

VIRTUAL BATTERY BLOCK CONTROLLER
Aggregates multiple physical BESS units into a single virtual battery block

VIRTUAL BATTERY BLOCK OPTIMIZER
Adjusts power setpoints for units in a virtual battery block to maximize performance and minimize degradation

DYNAMIC RECONFIGURATION
Allows to change the composition of a virtual battery block on-the-fly

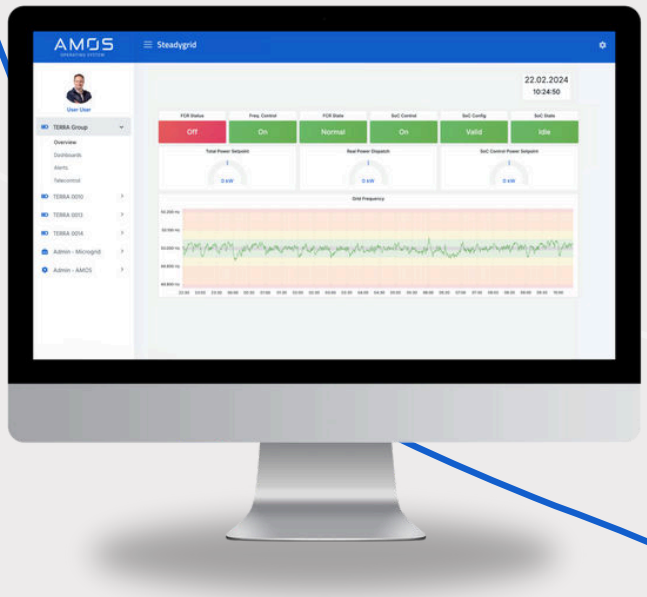
AUTOMATIC SOC BALANCING
Autonomously balances State of Charge across all BESS units in a virtual battery block

THERMAL STRESS MINIMISATION
Distributes workload in a virtual battery block to minimize the thermal stress of individual BESS units

AMOS

STEADYGRID: Ancillary services

AMOS SteadyGrid introduces a cutting-edge solution for grid stability, offering ancillary services designed to meet the highest industry standards.



PERFORMANCE SPECIFICATIONS:

FREQUENCY CONTAINMENT RESERVE (FCR)

Executes FCR algorithms according to entso-e standards

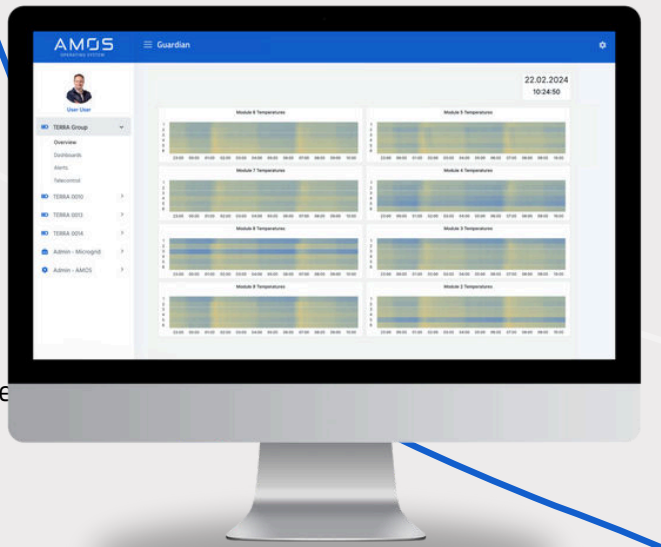
FAST FREQUENCY RESERVE (FFR)

Executes FFR services according to entso-e standards with ramp-up time below 700 milliseconds

AMOS

GUARDIAN: Revolutionary BESS optimizer

AMOS Guardian sets a new standard in Battery Energy Storage System optimization, offering a range of advance functionalities to ensure performance, reliability, and longevity.



PERFORMANCE SPECIFICATIONS:

VALUE PROTECTION
Modulates power setpoints to reduce degradation, thermal stress, increase performance, and extend technical life

WARRANTY PROTECTION
Constantly assesses the impact of operational actions on warranty and maintenance agreements for assets

RELIABILITY MONITORING
Monitors the reliability of BESS units, providing insights into performance and stability

DEGRADATION TRACKING
Tracks and alerts on potential degradation in the performance of monitored units

DETERIORATION MODELING
Utilizes models to predict and understand the deterioration patterns of BESS over time

DETECTION OF ANOMALIES
Automatically identifies irregularities or deviations from expected behavior

PREDICTIVE ALARMS
Anticipates potential issues and trigger alarms before they occur

PREDICTIVE MAINTENANCE
Forecasts maintenance needs based on asset health data, minimizing downtime

ROOT CAUSE ANALYSIS
Conducts in-depth analysis to identify the underlying causes of system issues or failures

TESLA Group a.s.
Na Strži 1702/65,
140 00 Prague 4
Czech Republic

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