etap

etap GridCode™

Integrated, Unified Digital Twin Solution for Renewable Energy Systems

Optimize Design & Performance

etap GridCode™

Conform to Grid Codes & Maintain Compliance from Design, Operations to Performance

ETAP GridCode utilizes a progressive electrical digital twin with automated analysis, predictive calculations, network optimization, validation processes, and intelligent power plant control hardware to ensure local grid code compliance throughout the power system design and operations lifecycle.

Design & Build

ETAP reduces projects' time to market and cost with optimized & best-in-class electrical engineering that complies to grid codes and standards.

Model

- Field data collection & intelligent modeling
- Cloud-based collaboration
- Verified & Validated brand-agnostic libraries

Simulate & Analyze

- For LV, MV, and HV systems
- Unified AC & DC calculations
- Design tool & optimization
- Grid code compliance
- Co-engineering & simulation

Operate & Maintain

ETAP maximizes revenue and optimizes operations with a focus on the safety of people and assets, system reliability and operational efficiency.

Monitor

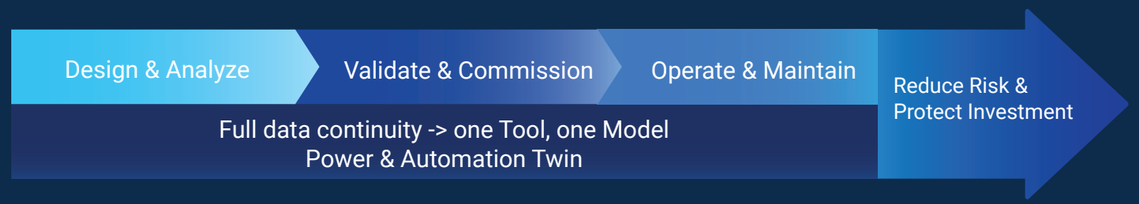
- Grid code compliance – dynamic system monitoring

Control

- Power Plant Controller

Operate

- Predictive Simulation
- Operator Training Simulator
- Protection & Asset Management



Design, Validate, Control, & Audit

End-to-end power solution to reduce the Levelized Cost of Electricity

Intelligent Design & Engineering

Perform automated steady-state and transient studies to design and simulate power plant controller logic for optimal grid performance under all feasible scenarios.

Performance Testing & Validation

Test and validate power plant controller logic with ETAP SIL technology to ensure smooth commissioning and approval procedure when connecting to the grid. Reduce downtime via direct deployment or hot swap of logic to Power Plant Controller.

Value Proposition

- Single Source of Truth - from design to operation
- Full farm: from Point of Connection to Balance of Plant
- Accurate forecast of yield & transfer capability
- Conform to grid requirements
- Reduce risk throughout planning and operations

Design & Compliance

Efficiently design, analyze, and optimize renewable energy power plants.

Grid Code Compliance	
Grid Code Analysis	Voltage Ride-Through
Time-Domain Load Flow	Frequency Ride-Through
Quasi-Dynamic Load Flow	User-Defined Dynamic Models
DC Load Flow	Power Plant Controller
PQ Capability	Electromagnetic Transients
Harmonic Analysis	EMTCoSim
Transient Stability	

Key Features

Rulebooks

- Automatically evaluate grid code compliance regulations based on country specific standards and guidelines

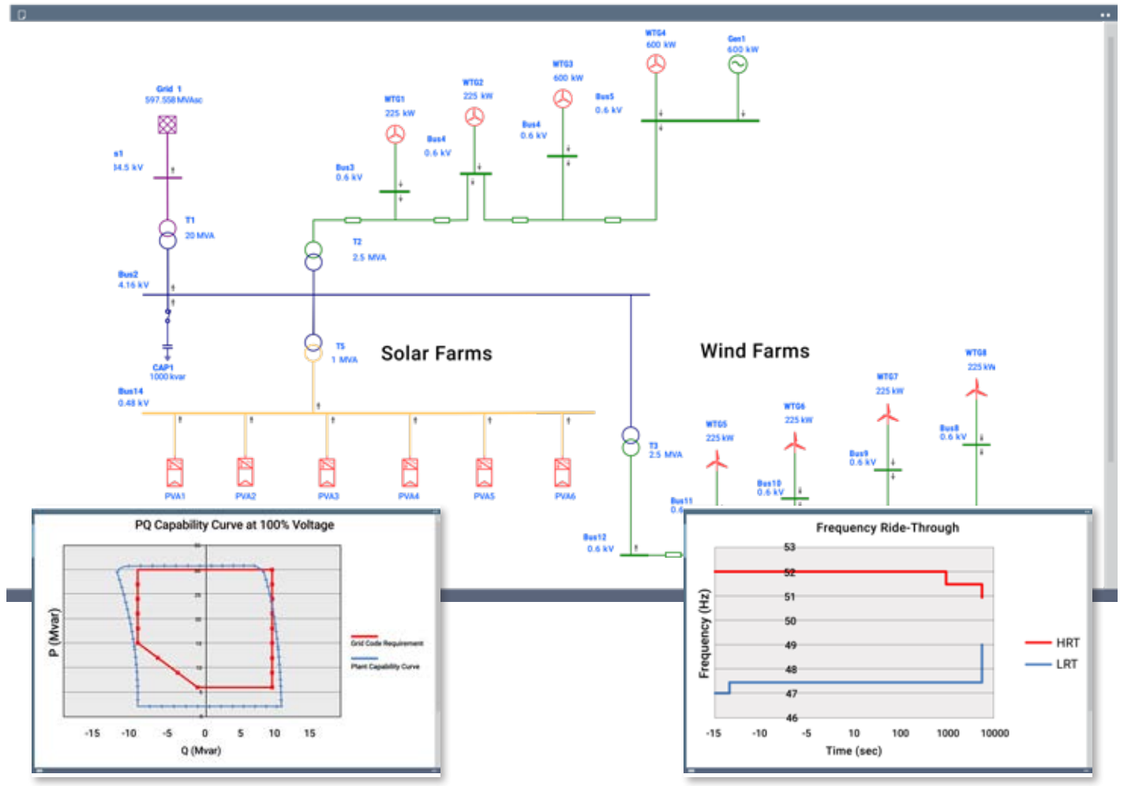
Included Country Codes

- ENA EREC G99 2021 (United Kingdom)
- ENA EREC G5/5 2020 (United Kingdom)
- IEEE 1547 2018
- PRC-024-2 (North America)
- Enedis-PRO-RES_64 2020 (France)
- RTE_DTR 2020 (France)
- Guida Tecnica - Allegato A.68 - Rev.03 12/2019 (Italy)
- Guida Tecnica - Allegato A.17 - Rev.02 12/2019 (Italy)

Analysis & Maintenance

Maximize safety and reliability from Point of Connection to Balance of Plant.

Safety & Security	Resiliency & Reliability
Arc Flash, ArcFault	Optimal Power Flow
Short Circuit	Reliability Assessment
Protection & Coordination	Contingency Analysis
Ground Grid	Feeder Hosting
Cable Derating	Short & Long Term Forecasting
Asset Management	Demand Response

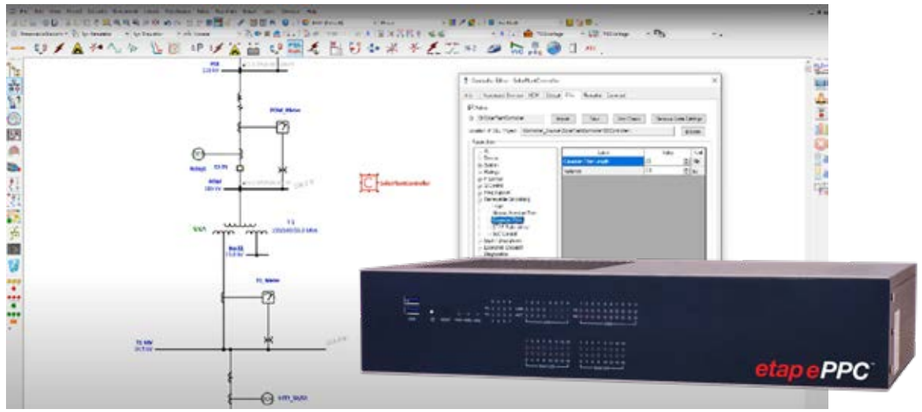


Operations & Control

Maximize yields and meet TSO stability & power quality requirements at POI with ETAP Grid Compliance solution, including model-driven eSCADA platform, ePPC™ Power Plant Controller, and eTESLA™ Dynamic System Monitoring Recorder.

ePPC™ Power Plant Controller

Intelligent and secure controller hardware ensures compliance with local grid code and standards. ePPC leverages a model-driven electrical digital twin for visualization, predictive calculations, optimization, and management of renewable power plants.



Integrated Plant Controller & SCADA

Monitor and gain insight into asset health and perform preventive maintenance based on present and anticipated conditions. This can be achieved by combining PPC and SCADA information in dedicated HMIs and predictive analysis applications.

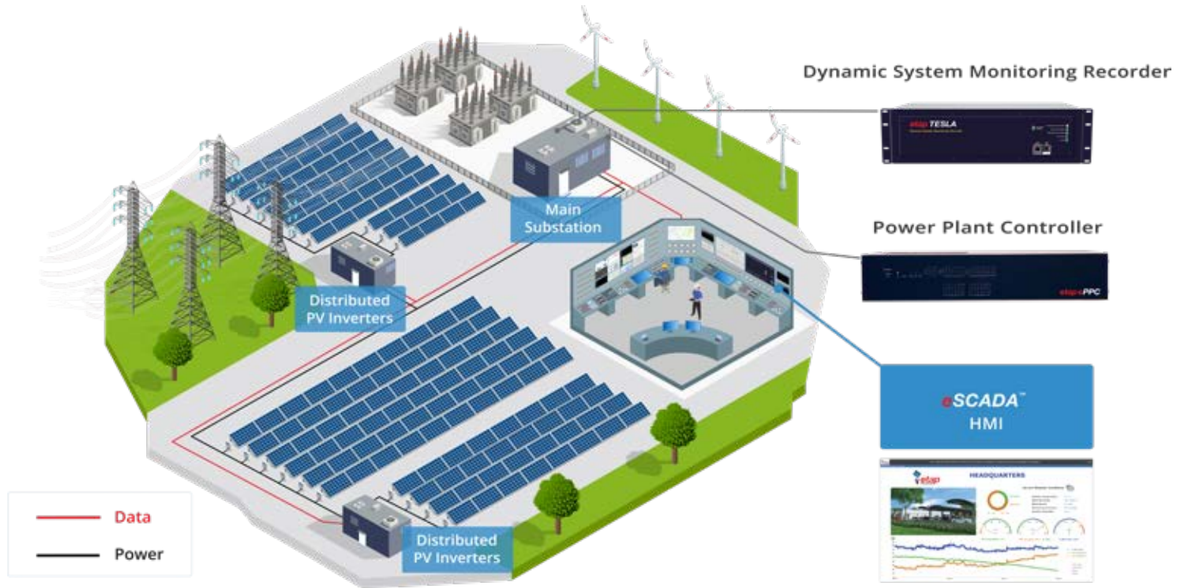
Monitor & Audit

Continuous monitoring of steady-state and dynamic plant response to tune the electrical model, identify generator AVR, govern and control parameters, and confirm Power Plant Controller (PPC) response under operating conditions.

eTESLA™ Dynamic System Monitoring Recorder

Grid Compliance Monitoring & Reporting

TESLA hardware and software solution performs assessment and continuous audit of actual operation versus expected response. System operating condition is compared with established grid code rules for compliance reporting and evaluation.



etap GridCode™

Design & Analyze

Verify & Validate

Automate & Control

Visualize & Manage

+1.800.477.ETAP | +1.949.900.1000 | info@etap.com

etap.com

B8-GRID-JAN2023