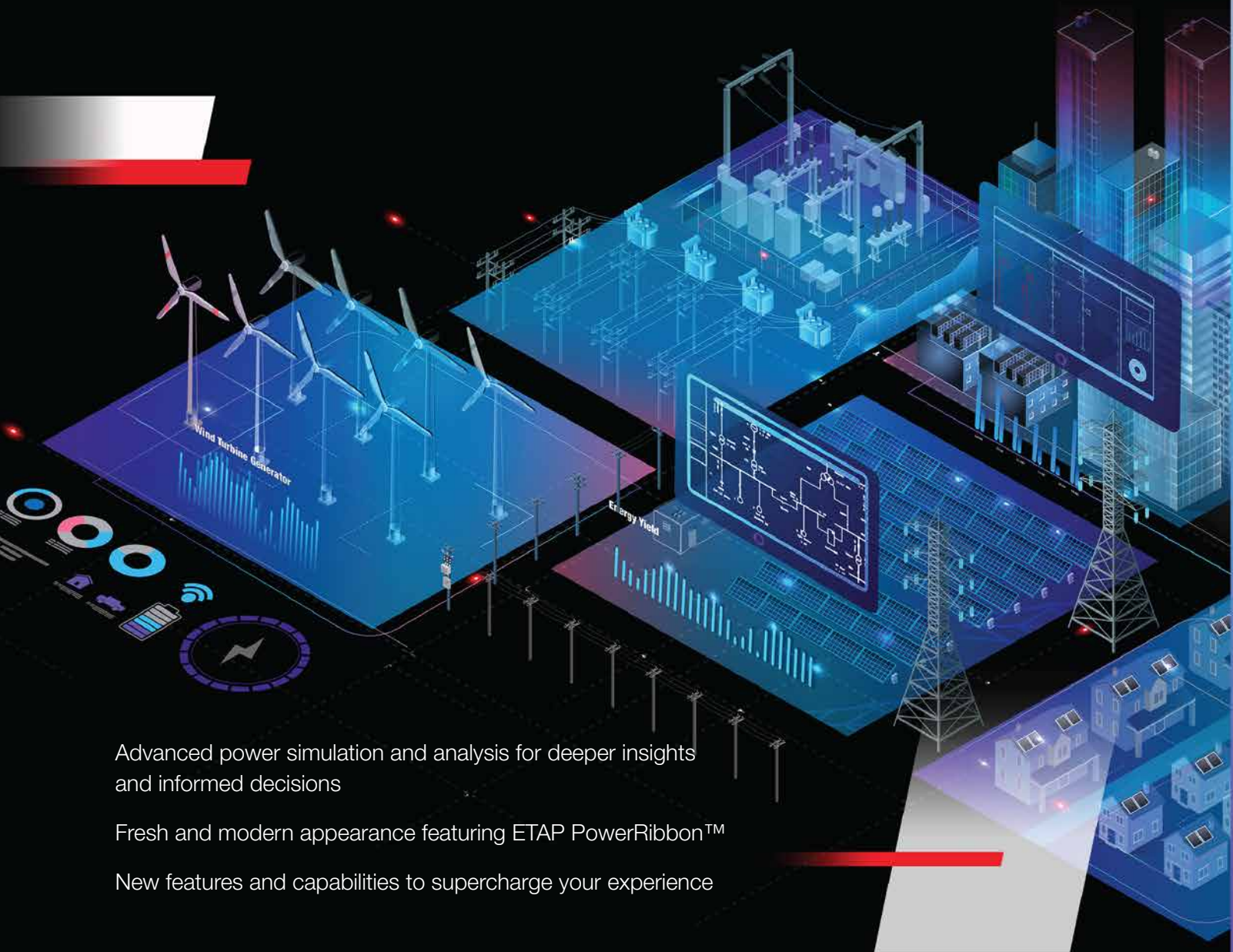


# etap 2024

## Sustainability through Continuous Intelligence

Accelerating Energy Transformation from Design to Operations on a Unified Electrical Digital Twin



Advanced power simulation and analysis for deeper insights and informed decisions

Fresh and modern appearance featuring ETAP PowerRibbon™

New features and capabilities to supercharge your experience

# ETAP 2024, THE NEW BENCHMARK FOR POWER SYSTEM ANALYSIS AND MANAGEMENT



## SAFETY

### Auto-Evaluation

Automated evaluation of cable protection by energy limiting capabilities of MCCB.

### Protective Device Sequence of Operation

Steady state fault current contribution based on IEC 60909.

### Thermal & Shock Protection

Thermal and Shock Protection calculations based on Australian Standards AS/NZS 3000.

### Lightning Risk Assessment

LRA based on IEC 62305-2 including lightning and surge protection risk reduction.

### Cable Sizing

Size main and PE/N conductors based on let-through energy limitation of MCCB.

### Transient DC Arc Flash for BESS

Simulation of transient DC AF using IEC 61660 bolted fault currents.



## RELIABILITY

### AC Control Circuit Diagram

Simulation of AC single-phase circuits in control panels.

### Unbalanced Network Frequency Scan

Identify and analyze harmonic resonance for an unbalanced distribution system.

### Asset & Configuration Management

Updated relay settings exchange tool.



## EFFICIENCY

### Modern Ribbon User Experience

New look and feel that matches the power and precision of ETAP.

### Electric Copilot™

AI - Natural language search with GPT or other AI engines.

### Document Tagging

Single source of information for all electrical assets.

### DC Arc Flash C-area

Evaluate DC AF Incident Energy during Protection and Coordination.

### Passive Filter Sizing

Size High-Pass Damped, Third-Order C-Type and Damped Filters.

### Autotransformers 2W and 3W

Digital twin modeling and simulation.

### Unified Dynamics and Protection

Simulate all protective devices in transient stability, such as overload, overcurrent, differential, and distance functions.

### Network Project Management

Improved performance and optimization for distribution systems.

### Digital Twin Live Updates

Incrementally update digital twin from design to operations.



## COMPLIANCE

### STAR™

Display and verify energy and current limiting capabilities of MCCB and power cables.

### Engineering Library

Modeling of MCCB energy and current limiting characteristics, 17000+ Protective Device, 3000+ Cable, PV Array, and Harmonic Distortion.

### Arc Flash

Updated based on the latest safety requirements.

### Ground Grid EN 50522

Substation grounding design based on European Standard EN-50522.

### Harmonic Analysis

Compliance with IEEE 1547 and IEEE 2800.

### Harmonic Distortion Limits

Transformer K-Factor evaluation, IEEE 519-2022 interharmonics and distortion compliance limits.

### ETAP License Manager

Compliance with cybersecurity standards.



## SUSTAINABILITY

### Sustainability Analysis

Improve electrical designs with a new dimension.

### Feeder Hosting Capacity

Simulation and analysis of renewable energy hosting.

### Techno-Economic Analysis

Assess the investment, operations, and financing of electrical power systems.

### Grid Code Interconnection

Automated grid code analysis with expanded capabilities.

### DC Capacitor

Digital twin modeling and simulation.

### Grid Interactive Smart Inverters

Additional control modes for power factor correction.

### Transient Stability

Calculate and report symmetrical components for grid code analysis, enhanced result annotation, plot generator prime mover action, and consider line mutual coupling.

### Alkaline Electrolyzer

Simulate and analyze the transient effect on hydrogen production and storage.



# DESIGN SOLUTIONS FOR SIMULATION & ANALYSIS

## SUSTAINABILITY ANALYSIS

New

Improve electrical designs with a new dimension

- Carbon emission footprint analysis (scope 2)
- Inspect the CO2 emissions of electrical network operations
- Compare emissions between scenarios
- Specify emissions baselines
- Specify utilities across different world regions
- Select custom regions for islanded power systems
- Use real-time emission factors from ETAP's cloud
- Combine historical data (time series) emission factors (marginal and average) with time-domain load flows
- Use static emission factors to simplify calculations
- Show rich dashboards for presentations
- Export results to CSV

## AC ARC FLASH

Reduce risk, improve safety & enforce compliance

- ArcFault™ with Incident Energy Subtraction method
- Updated arc-flash boundaries based on NFPA 70E – 2024 and CSA Z462 - 2024
- New NEC® label templates
- Enhanced AC and DC arc-flash calculators

## DC ARC FLASH

Reduce risk, improve safety & enforce compliance

- Battery Energy Storage DC Arc Flash Method ArcFault™ with Incident Energy Subtraction method
- Conductor erosion and DC arc elongation effects
- Transient DC AF for Stokes and Oppenlander and DGUV-I 203-077 methods
- Arc energy, incident energy, arc current, and voltage transient plots
- DC arc-flash calculator transient plots (IEC-61660)
- Auto-update worst-case and minimum DC bolted fault currents
- Enclosure reflectivity MF for Maximum Power method

## UNBALANCED NETWORK FREQUENCY SCAN

New

Comprehensive per-phase unbalanced network harmonic analysis

- Phase and sequence harmonic frequency impedance plots
- 1-Phase unbalanced harmonic analysis
- Unbalanced harmonic waveform and vector visualizer for “what-if” scenarios
- Short and long line modeling, skin effect, harmonic distortion limits evaluation per phase, plots per phase
- Includes harmonic mitigation and unbalanced correction using active and passive harmonic filters

## LIGHTNING RISK ASSESSMENT

Graphical Lightning Risk Assessment

- Lightning risk assessment per IEC 62305-2 2010
- Graphical equivalent area analysis for complex structures
- Losses, risks, and economic assessment for multiple zones
- Consider the risk effect of surge protective devices, lightning protection systems, and equipotential bonding
- Considers buildings, structures, and valuables for economic loss
- Updated lightning frequency maps and flash density data sources
- Comprehensive LRA Excel reports
- Internal and external structure multi-zone validation
- LRA building project templates based on IEC 62305-2
- Consider multiple power lines, telecom lines, adjacent structures, and user-defined high and low-risk zones
- Scalable drawing area for larger structures up to 6 sq. km.

## HARMONIC ANALYSIS

Ensure compliance and improve power quality & reliability

- Simulate and analyze harmonic distortions for Inverter Based Resources (IBRs) based on:
  - Total Rated Distortion and Reference Point of Applicability based on IEEE 1547 and IEEE 2800
  - Compliance Rulebooks based on IEEE 1547 and IEEE 2800
- IEEE 519-2022 Compliance Limits and Harmonic Derating Evaluation for transformers and cables based on ANSI/IEEE C57.110-2012
- Transformer K-Factor evaluation based on C57.110-2018
- Enhanced Interharmonic Spectrum library capabilities

## AC CONTROL CIRCUIT DIAGRAM

New

Simulation of AC single-phase circuits in control panels

- CPT or direct connection to one-line diagram
- All elements for AC Control Circuits
- Voltage drop calculations determining pickup and dropout voltages, power flows, and losses
- Operation logic event viewer and graphic simulation
- Sequence of Operation
- Detailed reports
- Engineering library data of Control Relay, Solenoid, and Contacts

## FEEDER HOSTING CAPACITY

New

Simulation and analysis of renewable energy hosting

- AI-based optimization method for fast hosting capacity
- Maximum and minimum hosting capacity
- Optimize location and placement
- Assess the impact of Smart inverter
- Constraints including voltage, power factor, and thermal loading
- Feeder Hosting capacity plots

## UNIFIED DYNAMICS AND PROTECTION

New

Simulate all protective devices in transient stability such as overload, overcurrent, differential, and distance functions

- Solve transient stability for all symmetrical components
- Simulate all protective devices supported in Star and StarZ
- Unified simulation to avoid complex configurations of separate protection and transient stability tools
- Relay performance evaluation during power swings, loss of excitation, cascading events, and many more
- Study-wide area protection and control

## TRANSIENT STABILITY

Simulate and analyze the dynamic behavior of power systems under transient conditions

- Generator prime mover action
- Consider mutual coupling for transmission line
- Plots for Power Grid, 3W Transformer and Static Load
- Display current and voltage angles on a one-line diagram
- Calculate and report symmetrical components for grid code analysis

## ALKALINE ELECTROLYZER UDM MODEL

New

Simulate and analyze the transient effect on hydrogen production and storage

- Electrochemical Cell Behavior
- Electrolyzer Heating Process Thermal Characteristics
- Hydrogen Production and Storage
- Hydrogen Compression Components

## PASSIVE FILTER SIZING

New

Improved harmonic distortion mitigation simulations

- Size High-Pass Damped, Third-Order C-Type and Damped Static Filters based on IEEE 1531-2020
- Existing and calculated filter impedance plots
- Size static filters based on power factor correction

## ACTIVE HARMONIC FILTERS

New

Improve efficiency while improving power quality

- Digital twin modeling and simulation of active harmonic filters (AHF) or power conditioning systems (PCS)
- Model generic or vendor-specific active filters
- Establish harmonic targets based on current or voltage total harmonic distortion (THD)
- Fundamental power conditioning based on power factor targets, optimization, and load-balancing modes
- Automatically computes the harmonic injection based on control inputs from power and current transformers

## UNBALANCED NETWORK LOAD FLOW

Unified AC & DC unsymmetrical system power flow

- Compare and analyze results from multiple unbalanced load flow scenarios
- Protective device overload alerts on the one-line diagram and alert view
- Enhanced unbalanced network load flow result analyzer
- Algorithm enhancement for easier convergence of special systems

## STAR™ - Protection & Selectivity

Fast paced and automated Protection & Coordination

- Energy and current limiting characteristics viewer
  - Addition of energy and current limiting curves to MCCB
  - Display of cable energy withstand capability
  - Visual verification of cable size selection and protection
  - Display of current limiting curves for fuse
  - Selection and display of characteristics on the same graph
- Auto-Evaluation of cables based on let-through energy
  - Evaluation of cable withstand vs MCCB let-through energy
  - Verification of permitted voltage drop based on rule book
- Enhanced SQOP to support IEC 60909 steady state fault current
- Support of LL and LLG fault types and display in Star View
- Identification of Current Limiting Fuse and LV Breaker in editors
- Identification of Trip Units with ZSI capability in LV Breaker editor

## ENGINEERING LIBRARY MODELS

Verified & validated equipment libraries

- Energy and current limiting capability for MCCB
  - 17000+ New Protective Device models
  - 1000+ Fuses
  - 500+ HV Circuit Breakers
  - 14500+ LV Circuit Breakers and Trip Units
  - 200+ Relays
  - 1000+ Current Limiting MCCBs
- 3000+ New Cable, Harmonic Source, PV Array, and Coil models
  - 1000+ Cables
  - 2000+ PV Array
  - 75+ Harmonic Distortion

## DC CAPACITORS

New

Waveform smoothing and energy storage

- Digital Twin modeling of DC Capacitors
- Rating per
  - Cell
  - Pack
  - Bank
- Applied to DC system load flow, short circuit and arc flash studies
- Compliant with IEC 61660

New

## AUTOTRANSFORMERS

Efficient voltage regulation where variable voltage is required

- Digital Twin modeling of Autotransformers for Two-Winding and Three-Winding transformers
- Impedance adjustment user-defined or based on tap position
- No load power loss and buried delta winding
- Eddy current loss consideration
- Fixed tap and automatic load tap changer settings
- Various grounding types
- Harmonic source and K factor modeling

## ETAP LICENSE MANAGER

Quick and reliable license access management

- Over 30 enhancements towards improved Cybersecurity profile
- Foundational updates to harden against Common Vulnerabilities and Exposures (CVEs)
- Enhanced reliability of automated license key exchange for easier and effortless installation
- Ensures that ETAP license management can be installed and present alongside other licensing services

## RELIABILITY ASSESSMENT

Analyze the availability and cost of distribution systems

- Makes autonomous decisions to keep grids stable and reliable as more DERs come online
- Reliability library data based on
  - IEEE 493-2007
  - IEEE 3006.8
- Unbalanced load flow constraints for alternative sources
  - Power supply capability of distributed generation
  - All branch capability limits
  - Load point minimum voltage requirements
- New system indices: NIEPI, TIEPI, ASIDI, and ASIFI

New

## TECHNO-ECONOMIC ANALYSIS

Complex analysis of the investment, operations, and financing of electrical power systems

- NPV or TLCC analysis methods
- Cost: Installation, Loss of energy and System power losses
- Straight line or declining balance depreciation
- Discount Rate, Inflation Rate and Tax Rate
- Report Cost-Benefit results through Internal Rate of Return (IRR)
- System or individual feeder analysis

## CABLE SYSTEMS

Calculate optimal and alternative cable sizes

- Enhanced Cable Manager capabilities
- Additions to the cable library
- Complies with the latest NEC standard
- Extended raceway dimensions beyond the Neher-McGrath method

## GROUND GRID

Comprehensive, efficient, and safe approach to designing and analyzing electrical grounding systems

- Substation grounding design based on EN 50522 European Standard
- Enhanced conductor and rod library

## GridCode™

Automated grid code compliance

- Automated grid code evaluation of
  - Real and reactive power capability
  - Harmonic distortion and resonance
- Capability Curve for wind turbine generators and inverters
- Power Plant Editor
  - Define power plant active and reactive assets
  - Reference point of compliance applicability
- Grid Code Rulebooks
  - P-Q capability and equipment control
  - Voltage ride through
  - Voltage regulation
- Consider alerts during Grid Code PQ Capability analysis
- Global or individual assignment of
  - Power dispatch priority
  - Equipment capability curves

## GridCode™ - Smart Inverters

Ensure compliance with grid code with modern smart inverter modeling & simulation

- Makes autonomous decisions to keep grids stable and reliable as more DERs come online
- Multiple modes of operation and control
  - Volt – Var Control
  - Volt – Watt Control
  - Watt – Power Factor Control
  - Reference Point Power Factor Control (leading and lagging)
- Passive Charging
- Supports rulebook and user-defined control curves
- Supports bi-directional flow and BESS systems
- Real or reactive power priority modes
- Includes smart inverter constraints
- Maintains compliance per IEEE 1547 and California Rule 21

## eTraX™ - Railway Power Systems

Validated, user-friendly, and flexible software tools for designing, analyzing, and managing AC and DC railway infrastructure

- Zone and train mean useful voltage indices based on BS EN 50388-1: 2022 Annex B
- Informative and analytical substation and train summary reports
- Reports and plots supporting different unit systems
- Enhanced algorithm for better convergence and shorter simulation time
- Catenary and return conductor's mutual coupling
- Enhanced user-friendly interface

# APPLICATION SOLUTIONS

## ETAP APPLICATION

Improved compatibility & security compliances

- Performance improvements
- Advanced context option to export energized component list
- Simplified component copy and paste via clipboard
- New shape annotations
- Convert text boxes into embedded QR Codes allowing dynamic access to annotations or links via mobile devices
- Animated GIF support

New

## DOCUMENT TAGGING

Single source of information for all electrical assets

- Maintain and manage links to multiple documents and types for each asset
- Effortlessly drag and drop files and images directly into the one-line diagram
- Linking and storing equipment information such as maintenance information, specifications, cost sheets, etc.
- View all files associated with active view or selection
- Search and filter enabled
- Include in Datablocks

New

## ETAP ELECTRIC COPILOT

Employ an AI engine to gain efficiency

- First version of Electric Copilot
- Integrated AI Engine
- Natural language search
- Input data queries
- Result analyses- Load Flow, Volt/Var Optimization, FLISR

New

## ETAP USER EXPERIENCE

Modern ribbon, unifying intent & command

- Enhance productivity with personalized shortcuts, customized quick access buttons
- Fully Adaptable user environment tailored to your unique preferences and requirements
- Colorize your way and switch between various color palettes, including Dark Mode to suit your working environment
- Ribbon interface simplifies feature navigation, surpassing traditional menus, including a centralized backstage area for file management, settings, and essential functions
- Component toolbox search and customizable favorites

New

## DIGITAL TWIN ELEMENTS

Foundation for network visualization of electrical networks

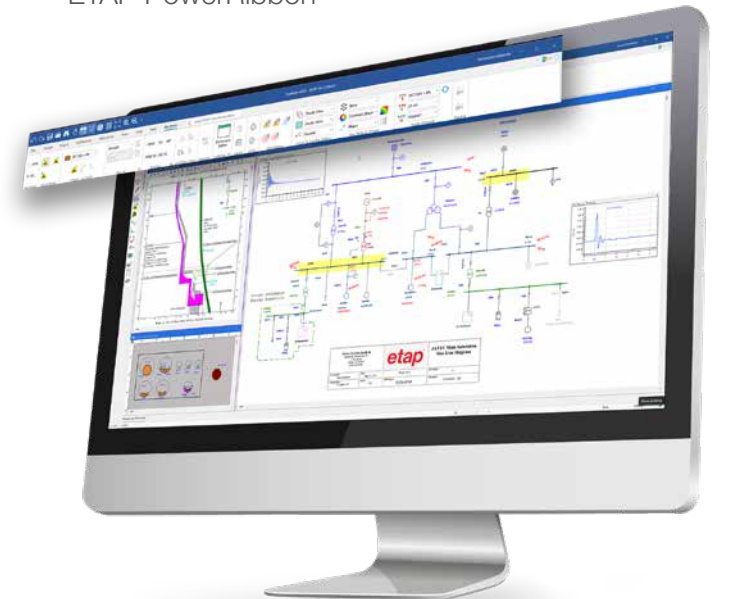
- DC Capacitor Digital Twin modeling and analysis for renewable energy systems and other applications
- Autotransformers (two-winding and three-winding) for transmission system applications
- Power grid single phase type selection for specific network phases
- Long line modeling of transmission lines and cables for transmission and submarine systems
- Enhanced smart inverter control capabilities for renewable energy systems

## INTELLIGENT CONTROLLERS

Renewable energy control systems including microgrids & power plant controllers

- Controller element for renewable energy modeling
- Microgrid and power plant controllers
- Hybrid and master power plant controller
- Inverters and energy storage controllers
- Import and automatic parameterization of 'black-boxed' DLLs
- Renewable energy control system modeling and analysis
- Ready to use controllers with user-defined parameters
- Renewables – Solar, Wind, Energy Storage System
- STATCOM, Fuel Cell, and Synch Check Relay
- Grid-following and grid-forming inverters
- Operator Training Simulator
- Interface to DNP3 server

ETAP PowerRibbon™



## etapAPI™

### ETAP RESTful API for interoperability

- Interact with ETAP using its built-in REST API
- Securely connect to ETAP from any device on a network
- Get ETAP project data and trigger ETAP commands and studies
- Interactive Swagger page allows testing API endpoints from a browser (no code necessary)
- Secure https connection
- A RESTful Python client is included in etapPY
- Create ETAP automations using scripting or your own programs against the ETAP REST API
- Reference documentation includes working examples for every endpoint
- New endpoints added in each release

## etapPY™

### Scripting & study automation using Python™

- Feature-rich ETAP-Python API and IDE for creating and executing python scripts
- Integration of ETAP and Python scripting language
- Run ETAP studies remotely and in parallel across machines
- Detailed reference documentation (descriptions, example code)
- Includes the ETAP API Python client
- Built-in Python REPL (shell) inside ETAP
- Working examples for every feature
- Run scripts from the ETAP UI or externally outside ETAP

## ENGINEERING LIBRARIES

### Verified & validated equipment libraries

- Industry-standard for the most comprehensive V&V engineering equipment libraries
- Expanded engineering libraries – Over 20,000 new models
- New protective device models
- New cable models
- New solar panel models
- New harmonic distortion models

## DataX™

New

### Accelerate digitization and data exchange through built-in conversions

- Schneider Electric ArcFM CIM Format File Import
  - ArcFM network import to ETAP GIS View by using CIM format XML
  - Automatic network generation in ETAP GIS View
  - Intelligent default element/property mapping in Universal Mapping
- eXCAD – AutoCAD DWG Exchange
  - Support for AutoCAD 2024
  - Improved connections, scaling, fonts and alignment in exported DWG
  - Added Peterson coil grounding symbols and new elements including UPS, DC Capacitor, 2-Winding Auto Transformer, and 3-Winding Auto Transformer
- Autodesk Revit Exchange
  - Support for Autodesk Revit 2024
- AVEVA Data Exchange
  - Support AVEVA Electrical 12.2 and AVEVA Engineering 15.7
  - Enhanced load flow walking logic to handle multiple sources
- ESRI ArcGIS Data Import
  - Support ESRI ArcGIS 10.8.1
  - Enhanced intelligent connections for components
  - Implemented phase and voltage propagation for missing data
- Excel Data Exchange
  - Combined Excel Open Format and Excel Fixed Format import
  - Enabled partial export to one-line diagram
- PSSE RAW Format Data Import
  - Improved one-line diagram layout by reducing remote connectors
- SKM Import
  - Enhanced built-in conversion from SKM PowerTools® to ETAP
  - Improved automatic one-line diagram generation
  - Enhanced library mapping
- EasyPower / ESA Import
  - Built-in conversion from EasyPower to ETAP
  - Enhanced automatic one-line diagram generation
  - Enhanced library mapping and interface beautification
  - New mappings for Synchronous Machine and Motors

## OPERATION SOLUTIONS

### eOTS™

#### Operator Training Simulator

- Improve and augment operator and dispatcher training for electrical systems through real-world practical learning to support decision-making via “what-if” simulations for steady-state and dynamic system conditions.
- Efficient power system analysis by comparing graphical results from multiple studies
- Advanced high-speed Python Framework
- Available for all modules with plot-based reports
- Automatic sizing and sub-plot arrangements
- Tooltip and cross-hair based value tracking
- Interlock enforcement

### AFAS™

#### Automated Fault Analysis System

- Operational and decision-support analysis software to analyze and locate the source of power disturbances and faults.
- Automatic fault information retrieval – COMTRADE
- Fault type, impedance and location identification
- Detect permanent versus temporary faults
- Graphical visualization and reporting of fault location
- Field data sequence of operation by relay, bay, substation and zone
- Compare sequence of operation between “as designed” and “as operated” cases
- Single-ended and double-ended fault location
- Line positive and zero sequence estimation
- Voltage Dip, Motor Start, Motor Stop, and Motor Acceleration detection
- Customizable detection logic for industrial applications
- Phasor, RMS, harmonics, power and frequency estimation
- Relay setting assistance via Python Scripting
- Automatic event report generation with model-based and rule-based root cause analyses
- Incident labels
- Integrates with ETAP eProtect™, eAPM™ and Outage Management System (OMS)

### FLISR™

#### Fault Location Isolation & Service Restoration

- Network components capacity evaluation
- Forecasted affected area based on trouble calls
- Fault location based on trouble calls, FPI Signals, protective device data and COMTRADE files
- Integrated with ETAP AFAS engine
- Automated isolation, partial restoration, and full restoration switching steps
- Control inhibition on affected feeders
- Integrated switching order management
- SLD and GIS graphical Web/Workstation displays
- Distribution and industrial systems configuration

### eSI™

#### Proactive Situational Awareness

- Identifies potential problems under current conditions
- Predicts system contingencies before operator actions
- Validates continuous process changes and indicates out of normal conditions

New

### eAPM™

#### Integrated Maintenance Management

- Access asset information via mobile device
- Manage maintenance with predefined groups and dashboards
- Create and manage work orders
- Integrated with ETAP Switching Order Management
- Centralized maintenance and work order calendar
- Integrated with ETAP Digital Twin
- Include procedures, test, and maintenance documentation
- SCADA visualization of scheduled maintenance works

## etap ADMS

### Model-Driven Planning, eSCADA, DMS & OMS Solution

Unlock the power of advanced distribution management with ETAP ADMS and empower grid resilience. Enhances grid reliability, responsiveness, and efficiency with real-time data, analytics, and control, ensuring a smarter and more resilient electrical distribution network.

- Volt/Var Optimization
  - Advisory and supervisory modes
  - HTML5 visualization dashboard
  - Reporting and validation charts
- Outage Management System
  - Crew management
  - Dispatch app
  - CIS integration
  - SOM integration
  - Reclosure support
  - FLISR integration
- DMS Integration with Operating Conditions
  - Feeder balancing
  - Switching optimization
  - Predictive simulation with distribution systems
  - Situational intelligence with distribution systems
- AMI Integration
  - Collection of AMI data
  - Creation of profiles from AMI data
  - Planning with AMI data
- Distribution Load Shedding
  - Rolling brownouts
  - Frequency and overload-based load shedding
  - Event-based load shedding

## eSCADA™

### Model Driven Electrical System Control and Data Acquisition

The gateway to intelligent electrical system control! Harness the power of your ETAP Digital Twin design by integrating real-time data to monitor and control your electrical infrastructure with an advanced, user-friendly solution, ETAP eSCADA. Effortlessly monitor, manage, and optimize your electrical infrastructure, ensuring not only reliability but also unmatched efficiency.

- HTML5 Web Client
  - BIM visualization
  - Load shedding events and monitor
  - Enhanced trending
  - Enhanced performance
  - Energy accounting viewer and reports
  - Complete alarm management
  - Enhanced cybersecurity
  - Enhanced GIS view
  - Waveform viewer
  - OMS outage details
  - Crew management integration
- Alarm Management
  - Email and SMS notification and acknowledgment
  - Web-based interface
  - Role-based authorization
  - Intelligent alarm reasons
- User Defined Reports
  - Predefined templates
    - System level
    - Shift change
    - Alarm reasons
    - Outage summary
  - Python-based customization report
  - Energy generation and usage reports

## etap DERMS

### Distributed Energy Resource Management System

Monitor, manage and optimize distributed energy resources to enhance the performance and reliability of the electrical network.

- Integrated hosting capacity analysis
- Microgrid central controller (MGCC)
- Integrated with ETAP ADMS for grid awareness, utility-scale DER management, operation and optimization
- Manage interconnections between DERS and the grid with a Hybrid Plant Controller
- Predictive analytics to anticipate potential issues and optimize resource allocation proactively
- Integrated with flexibility services and prosumer engagement platforms, including AutoGrid™ for program design, customer acquisition, enrollment infrastructure, notification dispatch, measurement and verification



## CLOUD SOLUTIONS

### eProtect™

#### Centralized Web-Based Protection & Asset Management

Solution for relay settings change management to manage location, information, and settings throughout the lifecycle of protective relays and substation assets.

- Increased data quality and access management
- Automatic notification, processing and relay settings file generation
- Protection setting synchronization between a physical relay and ETAP Star protective device coordination
- Integrated with ETAP Automated Fault Analysis Software (AFAS)
- Station level reporting and settings grouping
- Bulk settings importing and relay settings validation
- Workflow management

### eWeb™

#### Web-based Simulation, Monitoring, and Reporting

Enhancements to ETAP's Web-based simulation, monitoring, and reporting provide a new era of flexibility, efficiency, and productivity in your electrical engineering projects. Harness the full potential of your electrical systems from anywhere, anytime.

- HTML5/JS based Web interface
- Unbalanced load flow simulations
- Asset management, relay management, and AFAS interface
- Real-Time Dashboard integration
- Crew management, scheduling, and dispatching
- Reports and work orders

### NetPM™

#### Network Project Management for Collaborative Tasks

NetPM allows for the simultaneous work of multiple engineers and teams on a shared project, enabling efficient coordination and project execution. ETAP NetPM is particularly beneficial for large, complex projects involving multiple stakeholders and disciplines. It enhances the efficiency and accuracy of power system analysis, design, and operation, ensuring that large teams can work together effectively while minimizing errors and optimizing project outcomes.

- Improved performance and optimization for distribution systems

## CYBERSECURITY

### Modern Internet Facing Application Security

Improved hardening and protection of application security, including encryption of passwords, messages, memory corruption vulnerabilities, and transport security.

- ETAP License Manager
- Mobile Field Data Collection and Synchronization (etapAPP)
- Network Project Management (NetPM)
- ETAP Real-Time eSCADA HMI Viewer
- ETAP Real-Time eWeb Dashboards

## AUTOMATION SOLUTIONS

### µGrid™ - Controller

#### Model Driven Microgrid Control & Management

An integrated model-driven design software and control hardware solution to develop, simulate, optimize, validate, and control microgrids.

- Rule-based and optimal dispatch of microgrid resources
- Grid-connected and islanding control and management
- Secondary voltage and frequency control in islanded operation
- Automatic and user-defined black-start
- Support soft energization of BESS during black-start
- Generation and load forecasting
- Performance testing and validation
- Model-driven configuration and testing software tool
- Multi-networked and nested microgrids

### ePPC™

#### Model Driven Power Plant Controller

Model-driven renewable power plant control and management with SCADA visualization, predictive analysis, optimization, and forecasting.

- Control and manage hybrid power plants
- Active and reactive power control for multi-networked power plants
- Dispatch priority based on device type or zone selection
- Energy storage management
- Power smoothing
- Supports software-in-the-loop (SIL) and hardware-in-the-loop (HIL) testing and simulation
- Design and operate for grid code compliance
- Performance testing and validation
- Model-driven configuration and testing software tool

## MOBILE SOLUTIONS

### etapApp™ 8.0

#### Mobile Field Data Collection & Synchronization

Increase accessibility to ETAP projects for data collection and verification with the updated version of etapAPP™, a tablet application made for field engineers.

- Effortless Sharing with One-Line Diagram Export
  - Flexibility to choose the format (PDF, PNG, SVG, JPG, etc.) that best suits your needs, whether you want to share a high-resolution image, a vector-based diagram, or a standard PDF file. It's all at your fingertips.
- Undo Changes – It's all covered.
  - Effortlessly reverse any changes made during your project. Whether adding, deleting, connecting, disconnecting, rotating, relocating elements and annotations, resizing buses, or modifying element property data.
- Image Capture and Assignment - Made Easy
  - Capture multiple images in one go, import them in batches, display them in a carousel, and even let our system automatically assign names to make organization a breeze.
- User Interface improvements
  - Simplified user experience including ergonomic button layout, text box search, conduit size selections based on English and Metric units.



Also available on



# Supporting a diverse range of business sectors

across the global energy landscape

Generation



Distribution



Renewable



Transportation



Industrial



Commercial



Transmission



Data Centers



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