



Panel Systems

Panels - ANSI & IEC



Power System Enterprise Solution

ETAP is the most comprehensive analysis platform for the design, simulation, operation, control, optimization, and automation of generation, transmission, distribution, and industrial power systems.

Customize ETAP to fit your needs, from small to large power systems

ETAP Enterprise Suite provides one solution to your power system design, analysis, and operation needs. ETAP offers a comprehensive suite of analysis modules that can be configured to suit your specific needs. This modular approach allows you to purchase only the modules you need.

◆ Featured in this brochure



Cable Systems

- Cable Sizing - Phase
- Cable Sizing - Grounding/PE
- Cable Ampacity
- Electric Shock Calculation
- Underground Thermal Analysis
- Cable Pulling

Base Package

- Cable Ampacity & Sizing
- Transmission Line Constants
- Report Manager
- Project Management Wizards
- Output Report Comparator
- Multi-Dimensional Database
- Libraries

Distribution

- Unbalanced Load Flow
- Optimal Power Flow
- Transformer Tap Optimization
- Switching Sequence Mgmt.
- Reliability Assessment
- Optimal Capacitor Placement
- GIS View

Star Protective Devices

- Protection Coordination & Selectivity
- Sequence-of-Operation
- Relay Test Set Interface

Intelligent Load Shedding

- Adaptive Load Shedding
- Automatic Islanding
- Load Preservation & Management
- System Restoration & Control
- Load Shedding Validation

Data Exchange

- DataX
- MS Access® & Excel®
- CAD Interface
- e-DPP® Interface
- SmartPlant® Interface
- Third-Party Software

Transmission Line

- Line Constants
- Line Ampacity
- Mutual Coupling
- Sag & Tension
- HV DC Transmission Link

Arc Flash

- AC Arc Flash
- DC Arc Flash
- Result Analyzer
- Sequence Viewer

Monitoring & Simulation

- Real-Time Monitoring
- State Estimation
- Energy Accounting
- Predictive Simulation
- Event Playback
- Load Forecasting

Ground Grid Systems

- Finite Element Method
- IEEE 80 Method
- IEEE 665 Method

Dynamics & Transients

- Transient Stability
- Generator Start-Up
- Wind Turbine Generator
- User-defined Dynamic Model
- Parameter Estimation

Network Analysis

- Short Circuit – ANSI
- Short Circuit – IEC
- Load Flow
- Motor Acceleration

Energy Management System

- Automatic Generation Control
- Economic Dispatch
- Supervisory Control
- Interchange Scheduling
- Reserve Management

User-defined Dynamic Modeling

- Graphical Logic Editor
- Transfer Function Blocks
- Import/Export to Simulink®
- Excitor/Governor/Stabalizer
- Generic Load

Panel Systems

- ANSI Panel
- IEC Panel
- Code Factors
- Schedule Reports

Renewable Energy

- Wind Turbine Generator
- Wind Farm
- Photovoltaic Array

Intelligent Substation

- Substation Automation
- Switching Management
- Load Management
- Smart Grid
- Micro Grid

Power Quality

- Harmonic Load Flow
- Frequency Scan
- Harmonic Filters

DC Systems

- Load Flow
- Short-Circuit
- Control System Diagram
- Battery Discharge
- Battery Sizing

Panel Systems

Ultimate Tool for Panel Systems Design and Analysis



Developed for electrical designers and engineers, the Panel Systems module combines a graphical user interface and the intelligence of ETAP to easily design and analyze low voltage distribution systems. Coupled with exclusive features and advanced capabilities, Panel Systems seamlessly integrates between different ETAP power system study modules such as Short Circuit and Load Flow.

Panel Design & Analysis

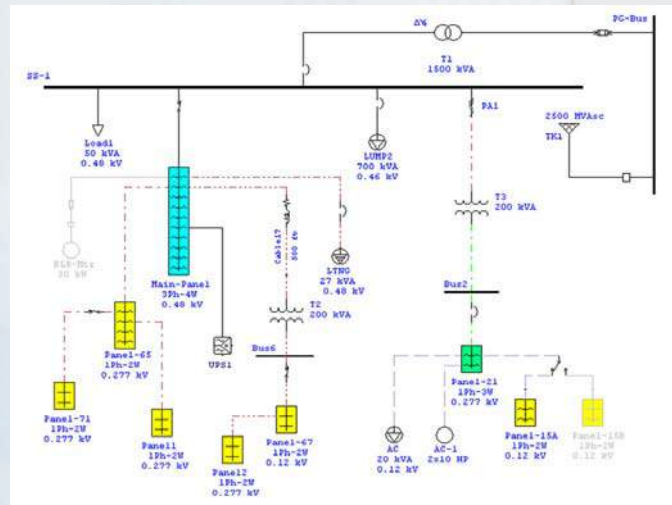
3-Phase & 1-Phase

ANSI & IEC Standards

NEC® & User-Defined Load Factors

Intelligent Panel Calculations

Automatic Update of Upstream Panels



Detailed low voltage distribution

Intelligent Design with an Integrated Layout

Capabilities

- NEC • ANSI • IEC Standards
- 3-Phase 3 Wire • 3-Phase 4 Wire
- 1-Phase 2 Wire • 1-Phase 3 Wire
- Column & standard layouts
- Unlimited branch circuits
- Unlimited sub-panel connections
- External network representation
- Internal (spreadsheet) load modeling
- Intelligent panel calculations
- Detailed panel loading summary
- Dynamic panel schedule updates
- Continuous & non-continuous load calculations

Libraries

- Extensive protection & control device libraries
- Comprehensive feeder & cable libraries
- Customizable libraries
- User-configurable defaults & layouts

Reporting

- Customizable panel schedules in Crystal Reports® format
- Comprehensive load summary for panel sizing
- Customizable reports for branch circuit evaluation
- Export one-line diagrams with results to third party CAD systems

Flexible Operation

- Diverse operating conditions
- Multiple loading categories
- Multiple demand factors
- Unlimited configurations
- Different nameplate data
- Global & individual bus load diversity factors

#	Phase	Fuse	Name	Link	State	VA	W	kV	A	% PF
1	B		Adm. Exp.	Internal	CR0	10000	10000	0.277	36.1	100
2	C			Internal	CR0	10000	10000	0.277	36.1	100
3	A	1	HVAC 1AB	Internal	CR0	500	500	0.277	1.805	100
4	B	1	Recep. Line 2	Internal	CR0	110	110	0.277	2.64	100
5	C	1	Laundry Rm	Internal	CR0	1500	1500	0.277	5.415	100
6	A	3	Panel 3	Ext. 1	CR0	12454	12450	0.277	44.96	100
7	B			Internal	CR0	10455	10450	0.277	33.74	100
8	C			Internal	CR0	9138	9130	0.277	22.16	100
9	A	1	Panel 2	Ext. 2	CR0	20312	20310	0.277	73.33	100
10	B	2		Internal	CR0	1500	1500	0.48	3.125	100
11	C									

Study Options

- Ten loading categories per circuit
- User-definable load types & factors

Panel Code Factors

- NEC load demand factors
- Customizable multiplying factors

Connected Load	VA	W	A	% PF	Operating	VA	W	A (avg)	% PF
Continuous - A	36775	36775	132.8	100	Design	83239	83230	100.2	100
Continuous - B	36820	36820	133.1	100	Design	83239	83230	100.2	100
Continuous - C	17643	17643	63.83	100	Design	83239	83230	100.2	100
Total Continuous	75240	75240	270.7	100	Design	83239	83230	100.2	100
Non-Continuous - A	6500	6500	23.47	100	Summer Load	83239	83230	100.2	100
Non-Continuous - B	866	790	3.126	87	Summer Load	83239	83230	100.2	100
Non-Continuous - C	866	790	3.126	87	Summer Load	83239	83230	100.2	100
Total Non-Continuous	8000	8000	29.72	94	Summer Load	83239	83230	100.2	100
Connected - A	43274	43274	156.2	100	Start-Up	83239	83230	100.2	100
Connected - B	37486	37486	135.2	100	Start-Up	83239	83230	100.2	100
Connected - C	18509	18509	66.45	100	Start-Up	83239	83230	100.2	100
Total Connected	99269	99269	357.85	100	Start-Up	83239	83230	100.2	100
Code Demand - A	53468	53462	189.4	100	Accident	83239	83230	100.2	100
Code Demand - B	28775	28774	104.6	100	Accident	83239	83230	100.2	100
Code Demand - C	20114	20067	72.37	100	Accident	83239	83230	100.2	100
Total Code Demand Cont.	94357	94303	346.44	100	Accident	83239	83230	100.2	100
Total Code Demand Non-Cont.	20000	20000	72.37	100	Accident	83239	83230	100.2	100
Total Code Demand	114357	114303	418.81	100	Accident	83239	83230	100.2	100

Load Name	A	B	C	FDR	Pch	CB	CMF	CMF	CB	FDR	A	B	C	Lead Name	
Adm. Exp.	10000			6	3	28	3	4	20	12	1200			Panel1	
HVAC 1AB	500			12	1	13	1	1	20	1	2000			Panel1	
Recep. Line 2	110			12	1	13	1	1	20	1	1500			Panel1	
Laundry Rm	1500			14	1	13	11	12	13	11					
Total Wts	A: 42260	B: 21949	C: 18280	Total Continuous Wts			A: 36360	B: 20819	C: 17400	Total Non-Continuous Wts			A: 6300	B: 730	C: 730

etap.com

Quality Assurance Commitment

ETAP is Verified and Validated (V&V) against field results, real system measurements, established programs, and hand calculations to ensure its technical accuracy. Each release of ETAP undergoes a complete V&V process using thousands of test cases for each and every calculation module. ETAP Quality Assurance program is specifically dedicated to meeting the requirements of:



ISO 9001:2009

10 CFR 21

ASME NQA-1

CAN/CSA-Q396.1.2

10 CFR 50 Appendix B

ANSI/ASME N45.2

ANSI/IEEE 730.1

ANSI N45.22

© 2011 Operation Technology, Inc. All rights reserved. Certain names and/or logos used in this document may constitute trademarks, service marks, or trade names of Operation Technology, Inc. Other brand and product names are trademarks of their respective holders.

B40-NA-0911-10