

Control System Diagram

Control Protect Integrate

ETAP seamlessly integrates the analysis of power and control circuits within one electrical analysis program. The Control System Diagram (CSD) simulates the sequence-of-operation of control devices such as solenoids, relays, controlled contacts, multi-sequence contacts, and actuators including inrush conditions. CSD has the capability of determining pickup and dropout voltages, losses, and current flows at any time instance as well as overall marginal and critical alerts. A large library of equipment enables engineers to quickly model and simulate the action of relays associated with control interlocks after given time delays.

Simulate Control System Operation Sequence

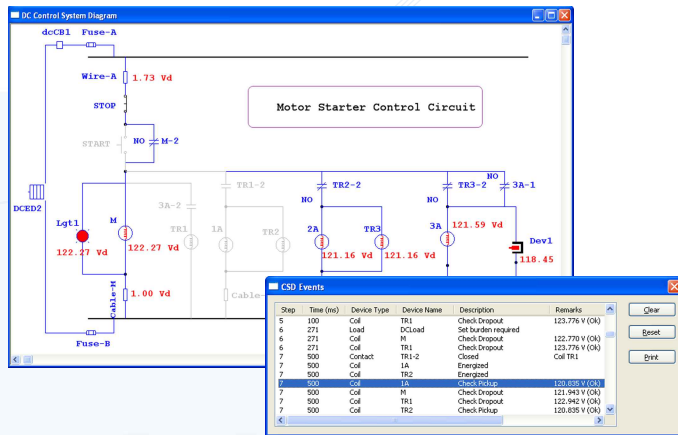
control system diagram

Key Features

- Simulation of Operation Sequence
- Pickup & Dropout Voltage Calculation
- Automatic Alerts
- Burden & Inrush Modes
- Controlled Contacts
- Integrated with Battery Discharge Calculation

Capabilities

- Detailed representation of control systems
- Step-by-step simulation of control system operation sequence
- Simulation of logic interlocks between controlling devices & contacts
- Calculation of device operating voltage & current
- Modeling of device burden & inrush modes
- Alert violations for operating voltage, current, & voltage pickup
- Built-in logic between control devices & contacts
- Multiple sources to a control system
- User's selectable modeling of protective device & contact resistance
- Coil/solenoid resistance temperature adjustment
- Cable/wire length adjustment
- Battery Discharge calculation using sequence-of-operation control diagrams



Integrated Control & Power Systems

- Unlimited Buses* & Elements
- No Voltage Limitations
- Looped & Radial Systems
- Integrated AC & DC Systems
- Multiple Battery, Charger, Inverter, & UPS Connections
- Multiple Isolated Sub-Systems
- Customizable Libraries
- Graphical Display of Results on One-Line Diagrams
- Customizable Font Types, Sizes, Styles, & Colors
- Customizable Display of Ratings & Results
- Graphical Display of Equipment Impedance & Grounding
- Automatic Error Checking
- Graphical Display of Overstressed Devices
- Graphical Display of Over/Under Voltage Buses
- Dynamically Adjust Display of Results

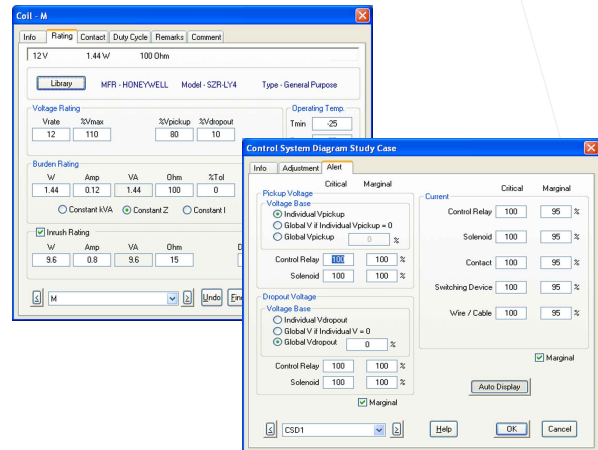
*Maximum number of energized buses during calculations is license dependent.

Study Cases

- Saves solution control parameters for each scenario
- Make changes to your system & re-run studies instantly
- Conduct unlimited 'what if' studies within one database
- Options to update initial conditions, voltage profiles, & duty cycles

Elements

- Extensive libraries
- Control relay • Coil • Solenoid • Light
- Generic load • Wire • Fuse • Circuit breaker
- Single-throw & double-throw controlled contacts
- Single-throw & double-throw switches
- Macro-controlled contacts



Display Options

- Dynamically adjust the display of calculation results
- Customize display of device names & ratings
- Customize display of equipment impedance
- Customize font types, sizes, styles, & colors
- Customize display of voltage drop calculation results directly on the one-line diagram

Reporting

- Customize output reports using Crystal Reports®
- Generate output reports in any language
- Voltage drops, losses, power flows, etc.
- Sequence of operation action summary log
- Input data, detailed voltage drop, & summaries
- Flag device pickup/dropout voltage violations
- Flag element current violations
- State-of-the-art graphic display of results
- Export outputs to your favorite word processing program
- Export one-line diagrams including results to third party CAD® systems



10 CFR 50 Appendix B • 10 CFR 21 • ANSI/ASME N45.2-1977 • ASME NQA-1
ISO 9001 A3147 • ANSI/IEEE Std 730.1-1989 • CAN/CSA-Q396.1.2-89

