



Cape Software

VP Link[®]

WOOD GROUP

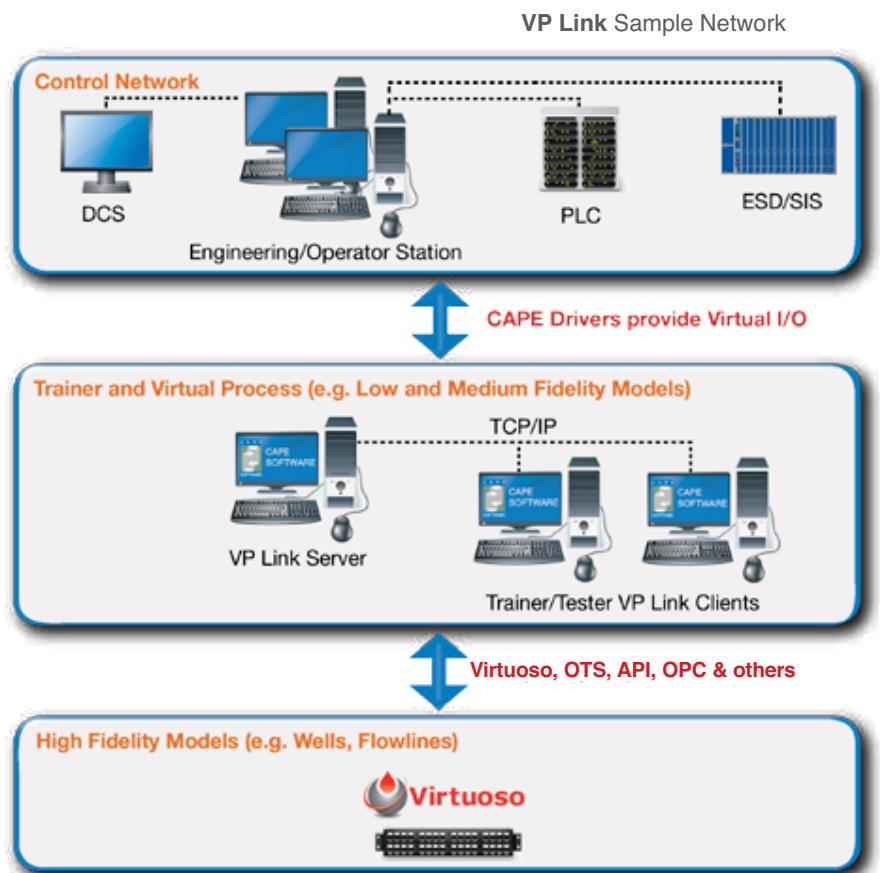


Cape Software: Virtual “Practice Plant”

VP Link is a dynamic representation of a chemical process to an offline control system that reads outputs as well as calculates the virtual process state using hybrid process modeling. **VP Link** writes values for process variables and offers GUI for the engineer or instructor to present scenarios such as equipment fault, process upset, or transmitter drift (failure). The software also allows for several user interfaces.

One of the key benefits of using **VP Link** is that it solves simulation needs from simple to sophisticated modeling in a continuous framework. OTS nodes can be used as a Test Bed system for prevention, periodic logic validation and change management. Unattended, real time performance

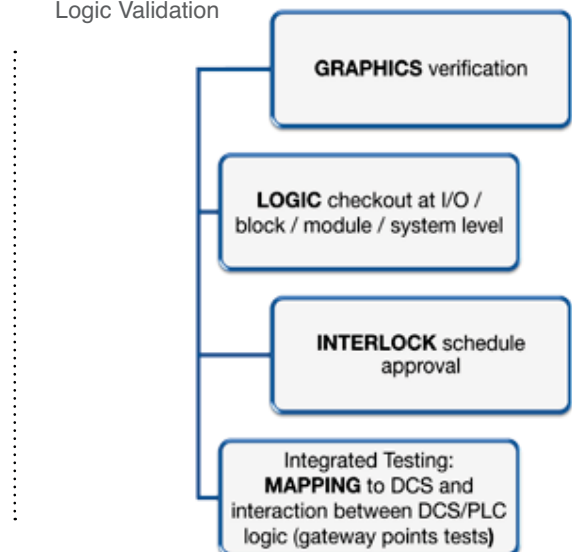
logs can be retrieved while the modeling environment remains flexible, easy to learn and easy to maintain. Cross platform functionalities make **VP Link** a portable, easy to reconfigure solution that is not only a cost effective simulation package for OTS and validation using off the shelf components, but is also the lowest total cost of ownership thanks to non-invasive stimulated I/O based simulation and emulation. **VP Link** also links to Wood Group’s **Virtuoso**® systems for integrated dynamic models, inclusive of production wells, flowlines/pipelines, subsea and topsides processing facilities.



Operator Training



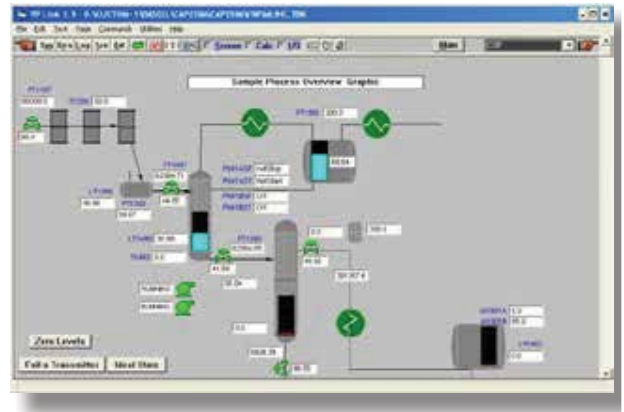
Logic Validation



Supported Systems

VP Link can be used with the following systems & scenarios:

- Rockwell ProcessLogix/ControlLogix, Aadvance, A-B PLC5/SLC500, CLX
- Honeywell Experion PKS ,TDC,TPS, FSC, Safety Manager, Plantscape
- Triconex: Tricon/Trident
- Foxboro I/A, Archestra, InFusion
- Yokogawa Centum VP, CS3000/R3, ProSafe
- Emerson Delta V
- GE Fanuc Series 90, Modicon, Siemens-Ti 505
- ABB Mod300, Advant, Industrial IT
- Siemens APACS, PCS7, S7 etc.
- or hardware signals to any processor and I/O
- or emulation within **VP Link** using regulatory control blocks



Industries & Example Modules

VP Link have been installed in the following industries:

- Aerospace
- Chemicals
- Chemicals - Air Separation
- Food & Beverage
- Mining
- Nuclear Industry
- Pharmaceuticals
- Power Generation
- Refining
- Upstream Oil & Gas Plants



VP Link can include but is not limited to following modules/algorithms:

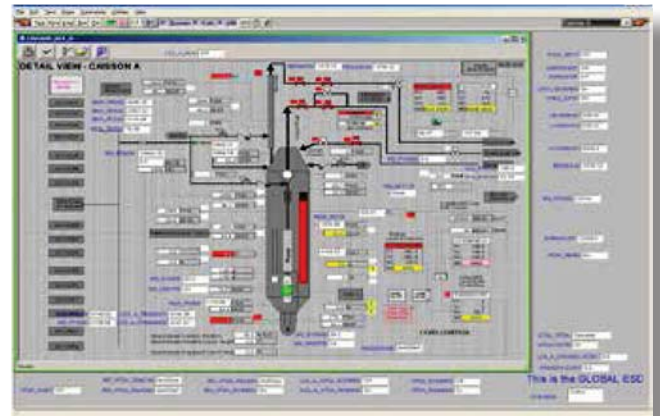
- Boiler
- Vaporizer
- Compressor
- Pump
- Heat Exchanger
- Jacketed Vessel
- Steam Heater
- Pump
- Mixer
- Separators
- Valve DP flows
- Track, First Order Tag
- Flip-Flop, Limit Switches
- Open Mathematical Expression



Applications: Operator Trainer Systems

The primary purpose of an Operator Trainer System (OTS) is to provide an environment where control room operators can train on the operations of a particular asset. In the eyes of the user, the OTS serves as the “*Practice Plant*”, where they can familiarize themselves with the intricacies of a particular operation.

For the Perdido project Wood Group built a customized Transient Engineering Simulator (TES) using **Virtuoso®** that was later tied in as the physics package for an Operator Training Simulator (OTS). Wood Group built the high-fidelity transient physics package modeling the entire asset from well bore to primary separation and recirculation facilities on topsides and



also supplied a custom-built user interface for running engineering simulations. Cape Software's **VP Link** package was then used to provide the data traffic manager to push and pull data from the various control system emulations.

Applications: Control System Logic Validation / Check-Out

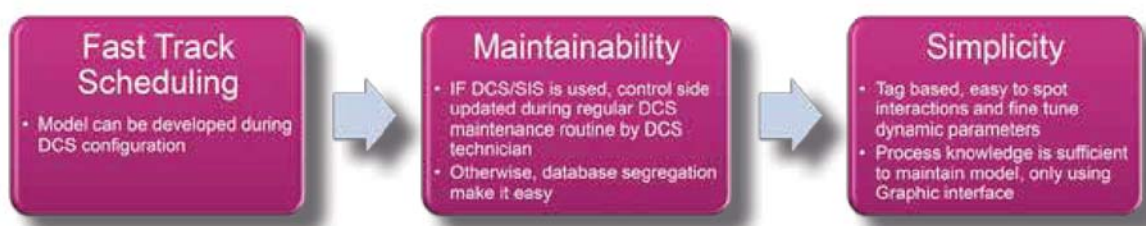
VP Link allows:

- Graphics verification
- Logic checkout at I/O / block / module / system level
- Interlock schedule approval
- Integrated Testing: Mapping to DCS and interaction between DCS/PLC logic (gateway points tests)

How?

- Automates repetitive testing task (i.e., resets, etc.)
- Facilitates FAT with customized graphics
- Collaborative testing framework thru distributed architecture
- “What-if” scenarios and logging capability for systematic testing

VP Link facilitates thorough system debugging prior to deployment, i.e., *Management of Change* and periodic testing.

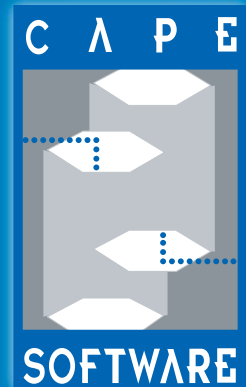


Who is Cape Software?

Wood Group's **Cape Software** provides products and engineering services that assist with factory acceptance testing (FAT), application logic validation and documentation, automated Safety Instrumented System (SIS) testing and operator training.

VP Link is used to simulate the field devices during the testing phase of process control systems. When **VP Link** is connected to a Distributed Control System (DCS), Safety Instrumented System (SIS), or Programmable Logic Controller (PLC), the logic will react as though it is on a live process. Think of **VP Link** as the "Practice Plant".

Our software systems are platform independent, which means we can support all of the Client's PLC, DCS and SIS projects with the same product. Our staff has vast experience in delivering customized **VP Link** models for various industries worldwide.



Our Background & Experience

Wood Group pioneered the real-time modeling of multiphase production networks in the 1990s and has since deployed over 100 real-time simulation-based solutions worldwide. Our passion for delivering technology applications to solve our customers' operational problems has resulted in a continuous evolution of the technology. Five core drivers permeate all the software technology that our team has created: *accuracy, speed, robustness, scalability and flexibility.*

We deliver fit-for-purpose solutions for each facility in order to address the challenges our clients face. Our wide-ranging knowledge enables us to design solutions that are easily integrated into everyday operations, thus delivering lasting value.

Wood Group

Our parent company Wood Group is a leading independent services provider for the oil & gas and power generation markets. Worldwide these services include engineering, procurement and construction management, facility operations & maintenance, and repair & overhaul of turbines and other high-speed rotating equipment. Wood Group comprises three businesses: **Wood Group Kenny (WGK), Wood Group Mustang (WGM) and Wood Group PSN (WGPSN).**

Our global reputation has been built upon decades of successfully managing even the most complex engagements for our clients, offering a broad range of integrated services across the asset lifecycle. Today, as always, we are focused on safely delivering innovative and cost-effective, fit-for-purpose solutions to our diverse base of customers.

Wood Group is an international energy services company with \$6bn sales and operating in more than 50 countries.





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