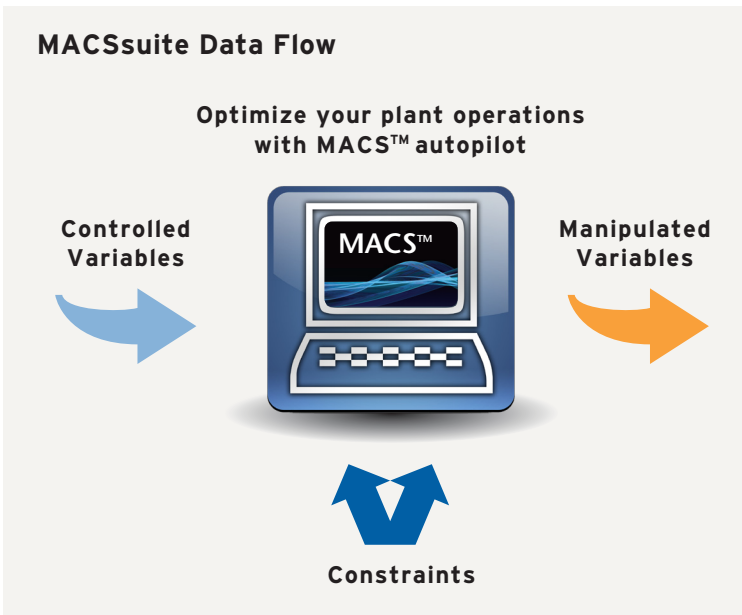





Capstone Plant Automation Advanced Process Control

Reduce energy costs, improve productivity and maximize product uniformity with our proven autopilot for industrial processes: MACSuite™ (Multivariable Advanced Control System). This innovative group of tools will automatically optimize your process across all operating ranges – improving control consistency while simultaneously minimizing energy consumption and maximizing yield. Featuring model predictive control, optimization, and system identification applications, MACSuite requires no proprietary hardware and practically runs itself.



MACSuite is:

Effortless: designed off-line and commissioned without in-house programming, which allows for rapid commissioning. And when it's up and running, it's easily maintained by site personnel.

Accessible: can be configured entirely through the graphical user interface and easily adapted online. Because there is only one tuning parameter for each variable, you'll get superior control performance with minimal tuning effort.

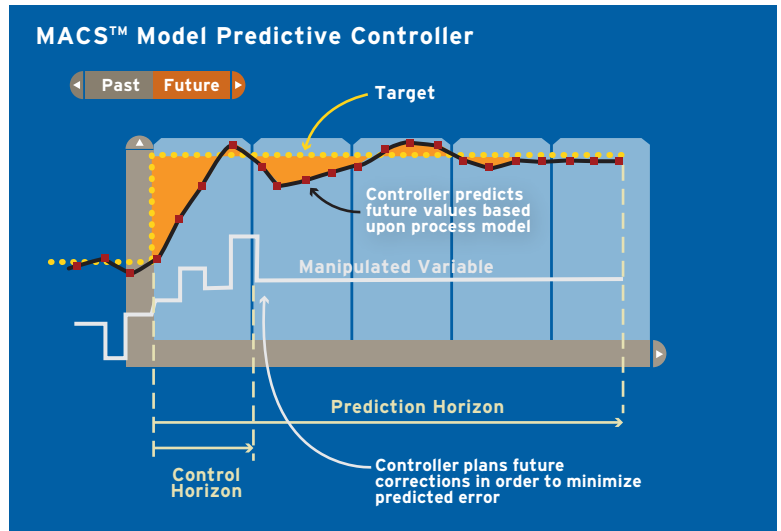
Flexible: designed to work across all operating ranges. Using dynamic process models, it controls process variables to specific targets or within constraint limits. It can be formulated to achieve an economic optimization while simultaneously satisfying product quality targets and process constraints.

Powerful: rigorous optimization delivers superior decoupling and control performance. Because it handles hundreds of variables, MACSuite can be configured for high-level, plant-wide economic optimization.

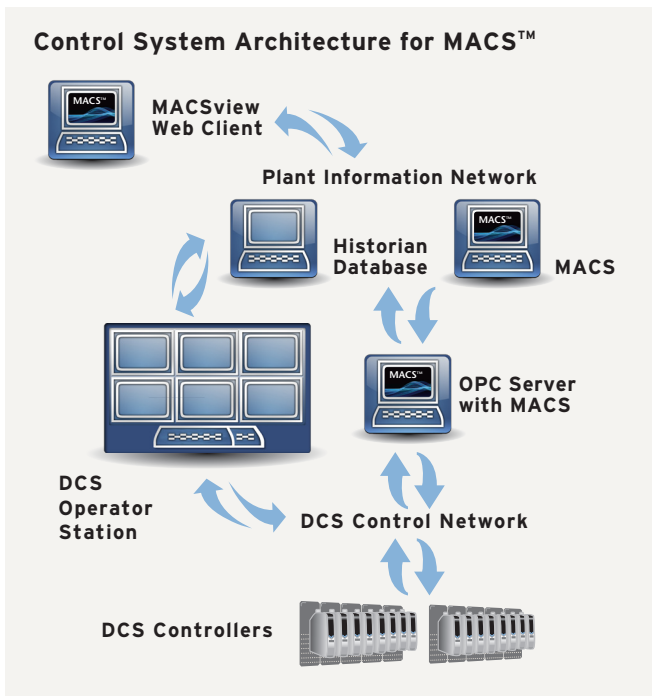
Economical: pays for itself quickly, offering a high return on investment almost immediately in terms of energy and material savings. Faster commissioning, high operator acceptance and superior results translate to lower cost of ownership than other solutions.

MACSuite modules are built around Capstone Technology's field-proven, proprietary control algorithm. Modules include:

- MACSmodel – process data analysis and model development
- MACSproject – development, tuning and testing of the multi-variable controller
- MACSruntime – online application of the completed controller.



Capstone Plant Automation Advanced Process Control



MACS Control Applications By industry, successful applications include:

Oil & Gas

- Gas fractionating
- Heavy oil reactor
- Grude unit
- Thermal oxidizer

Chemicals

- Sulfuric acid plant
- Hydrogen plant
- Air separation
- ADN refining

Pulp & Paper

- Pulping
- Chemical recovery
- Paper making
- Energy

Sustainability You can be confident that the peak performance of MACS Advanced Control applications is maintained after they are commissioned – Capstone offers our customers a variety of support and maintenance and sustainability services.

Other Services Capstone also offers an array of other services that complement our MACS plant automation tools and help improve plant performance, including:

- **Opportunity mapping**
- **Instrumentation and control audits**
- **Process performance audits**
- **Process troubleshooting**
- **Seminars**
- **Training**

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