Experion PKS Turbomachinery Control Solution

The Experion® Turbomachinery Control Solution (TCS) delivers unique integration capabilities for applications requiring very fast response times such as found in turbomachinery control and protection systems.

Customers using the Experion Turbomachinery Control Solution do not depend on standalone PLC or black boxes anymore. Instead, they benefit from a unified control platform delivering boiler control, balance of plant control, turbine control compressor automation, compressor anti-surge protection, and general plant and safety controls from a single platform.

The solution is complete with 20 ms control support and custom displays and faceplates for ease of monitoring and enhanced operator effectiveness. The operator screens are customized to the specific needs of each application.

Benefits

Un-matched availability: Full redundancy and complete diagnostic integration

Integration cost reductions up to 30%: Delivered with a common hardware and software platform; common maintenance parts; common engineering, diagnostic, and documentation integration.

Flexibility to meet any application: Supports Custom Algorithms Blocks (CAB) enabling partners to run proprietary algorithms.

Complete automation solution from one source: Delivered and supported by Honeywell globally.

Ease of operation and training: With a common operator interface for the entire plant, personnel training and plant operation has been simplified.

Turbomachinery Control Solution Applications

The Experion Turbomachinery Control Solution is highly suitable for following applications:

- Steam turbines in industrial and utility power plants
- Steam turbines driving auxiliaries like blowers, pumps, and compressors
- Hydro turbines
- Industrial gas turbines
- Centrifugal compressors

Honeywell has entered into a teaming arrangement with several turbomachinery application partners to leverage their OEM independent expertise in turbomachinery control, in order to offer complete solutions to customers.

Solution Components

SPM & SVPM

The Speed Protection Module (SPM) and Servo Valve Positioner Module (SVPM) are Experion Series C I/O modules that support all standard redundancy, processor, power supply and communication levels, enhancing system reliability and availability. The solution is modular so that different turbomachinery control configurations, from a simple auxiliary turbine to the most complex main steam turbine in a large capacity power plant, industrial gas turbines, hydro turbines and centrifugal compressor anti surge control are all readily accommodated.

C300-20msCEE Controller

The 20ms C300 controller provides powerful and robust control as part of Honeywell’s field-proven, deterministic Control Execution Environment (CEE). The CEE provides superior control execution and scheduling, and strategies for each controller node are configured and loaded through a common Control Builder, an easy and intuitive engineering tool. The 20ms C300 controller shares its hardware design with the Series C I/O, offering an innovative design that reduces footprint, installation and maintenance cost.
Servo Valve Positioner Module (SVPM) Details

The SVPM provides an on-board PID positioning to support servo valves as used in turbomachinery control applications. The module accepts LVDT/RVDT (or regular AI signal) position feedback signals from the control valve, receives control valve demand remote set points from the C300-20msCEE controller, and executes on-board PID positioning loops to issue current outputs to the servo valve coil to control the control valve position.

**Key Features**
- On-board PID positioning loop delivering an overall loop latency of less than 10ms
- Accepts digital input signals to drive control valves to safe positions
- Extensive module diagnostics and wire break monitoring of field devices
- Supports a wide range of unipolar and bipolar current outputs.
- Provides configurable digital dither current modulation to compensate stiction in the controlled device (control valve).
- Supports control valve position calibration
- Supports redundancy

**SVPM offers the following signal interfaces**
- LVDT/ RVDT or Regular Analog Input – 2 channels
- Digital Input – 2 channels

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Speed Protection Module (SPM) Details

The SPM accepts up to four speed probe signals in the form of pulses, providing on-board signal conditioning and 2 out of 3 voting. Voted speed signals take part in speed regulation through control loops built in the C300 controller. The module also provides on-board limit value monitoring to trigger over speed trip protection relay provided on the same module IOTA. It is used for over-speed protection in Turbomachinery while general purpose I/Os provided on this module can be used in fast applications such as centrifugal compressor anti surge control and other fast process applications.

**Key Features**
- Accepts four channels of pulse input signal either from Active or Passive type speed pickup and computes the rotational speed and acceleration
- Uses on-board voting logic and limit-value monitoring to detect over speed condition and rate of change of speed (dn/dt)
- Activation of over-speed trip protection relay within 40ms
- Accepts eight digital input signals which can be configured for triggering trip protection digital output signal
- Accepts eight 4-20mA analog input signals which are scanned at 10ms sample frequency.
- Detects zero speed, reverse rotation, and missing/deformed teeth condition
- Offers extensive module diagnostics
- Supports redundancy
SPM offers following signal interfaces

- Analog Input – 8 Channels
- Analog Output – 1 Channel
- Digital Inputs – 8 Channels
- Digital Output – 4 Channels
- Speed (Active/Passive Probes) Input – 4 Channels