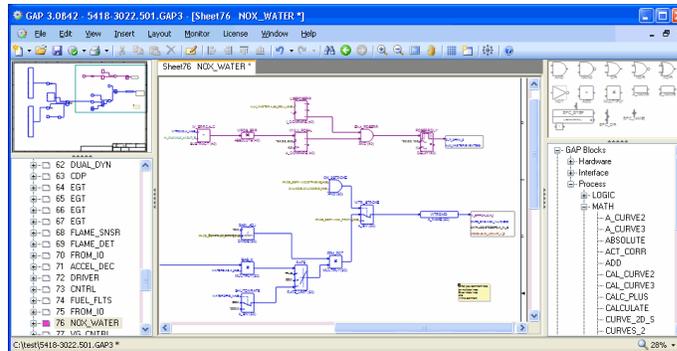


Core Software Modules

For Use with Woodward's Flex500 Control

Description

Core Software Modules (CSM) are software programs designed for use as the base software control program and graphical user interface for specific turbine or compressor applications. These CSMs allow qualified customers and channel partners to leverage all of the CSM's functionality into custom applications built upon the Flex500 hardware platform. Refer to Woodward product specification 03433 for more information on Woodward's Flex500 control platform.



CSMs include an application specific program developed in Woodward's Graphical Application Program (GAP) environment and a compatible graphical user interface (GUI) program developed in Woodward's Control Interface Studio (CIS) environment. These programs include all the necessary/core control algorithms, start logic, protection logic, and operator control screens for the specified turbine or compressor application. Refer to Woodward product specification 03216 for more information on Woodward's GAP programming environment. Refer to Woodward product specification 03448 for more information on Woodward's CIS development environment.

If the base CSM (GAP and GUI) software programs include all of the required functionality and visibility for the specific applied application then no other programming is required. The specific CSM's software programs can simply be loaded into the Flex500 control, the software programs enabled (with a purchased run-time software license key), and the control is ready to start and protect the prime mover.

If the base CSM programs do not include all of the required functionality or operator control screens for the respective application, then qualified turbine or compressor control engineers can easily add to or change the CSM programs to include the inputs, outputs, and related algorithms, logic, and visibility as required. Modify the CSM GAP program freely and or optionally tested using Woodward's NetSim simulation program with no restrictions or special licensing required. However, once the user GAP application program is complete and loaded onto the Flex500 control a special purchased "run-time software license key" is required to start the GAP program and ran on the Flex500 hardware platform.

Woodward's GAP programming environment is a Windows based software program that allows controls engineers to create application programs in block format for use within Woodward control systems.

- Designed for Flex500 control applications
- Field proven OEM qualified algorithms
- Can be applied and used without modification
- Included base algorithms and logic for the application
- Allows control customization
- Reduces engineering and project risks
- Woodward certified algorithms
- Designed for use by turbine and compressor engineers
- Planned Applications:
 - 505XT
 - Vertex
 - 505HT
 - GTC100
 - Etc.

Woodward's Control Interface Studio (CIS) is an integrated development environment that control engineers or graphical user interface developers can use to create custom graphical user interfaces for use on or within Woodward's Flex500 controllers or on connected computers or touch panels. Refer to Woodward product specification 03424 for information on Woodward's RemoteView program which allows use of the created GUI programs on connected computers or touch panels.

As Woodward's CSMs are fully tested field proven revision controlled software programs users greatly benefit from the associate engineering time/expense savings as well as shorter less problematic system start-ups. Depending on the system, OEM qualified control algorithms and protection logic ensure that the Flex500 control using these CSM will control and protect the respective turbine or compressor as designed and verified by the original equipment manufacturer (OEM).

Accessing & Licensing CSMs

Woodward's core software module's GAP and GIU programs are available for uploading from Woodward's TeamForge website. These programs are considered "Open Source" applications programs which allow qualified customers and channel partners to leverage all of the product functionality (i.e. 505XT, Vertex, etc.) into custom applications built upon the Flex500 hardware platform. Access to Woodward's TeamForge software download site and these software programs is restricted to Woodward qualifying OEM customers and Woodward Channel Partners. Contact your sales account manager for details on how to access this site.

Modify the core software module's GAP program freely and optionally tested using Woodward's NetSim simulation program with no restrictions or special licensing required. However, once the user application program is complete and the code is loaded onto the Flex500 hardware a special purchased "run-time software license key" is required to start the GAP program and run on the Flex500 hardware platform. Each specific Flex500 controller will require entry of a "unique software key" into a memory location to enable CSM programs to start and run. Consult your sales/commercial representative to purchase a license and receive a "unique software key".

Note: You must have the serial number of the target control hardware at the time of purchasing this license/key.

Warnings / Support

Woodward cannot control the quality of the modified software. The entity(s) modifying the software must validate that the final modified software is safe and fit for use in the intended application. By modifying this software and providing to end customers, the respective entity takes legal responsibility for the safety, fitness for use and overall quality of the software. Woodward makes no warranties for fitness of use or quality on any modifications to the software.

Woodward cannot provide technical support for end customer issues associated with third party modified software. When an entity creates a modified application using Woodward's CSMs they agree to accept responsibility for direct end customer support. End customers requesting software support from Woodward will be redirected to the Channel Partner/OEM who purchased the unit from Woodward. Refer to Woodward product "Application Note 51591 for instructions on where to install and locate unit specific Channel-Partner or OEM based support contact labels.

Applications

Steam Turbine: 505XT Programs & License:

The Woodward 505XT controller is designed to operate single valve, or single extraction/admission industrial steam turbines of all sizes and applications. This steam turbine controller includes specifically designed algorithms and logic to start, stop, control, and protect industrial steam turbines or turbo-expanders, driving generators, compressors, pumps, or industrial fans. The 505XT control's unique PID structure makes it ideal for applications where it is required to control steam plant parameters like turbine speed, turbine load, turbine extraction header pressure, turbine inlet header pressure, exhaust header pressure, or tie-line power. Refer to Woodward product specification 03423 for more information on Woodward's 505XT controller and its capabilities.

Woodward's 505XT GAP program (5418-7456) and GUI program (5418-7457) are available for uploading from Woodward's TeamForge website. These programs are considered "Open Source" applications programs which allow qualified customers and channel partners to leverage all of the 505XT product functionality into custom applications built upon the Flex500 hardware platform.

Note: there is one module within the GAP program that is locked and view restricted to protect Woodward's Intellectual Property and provide a licensing structure for the application code.

Consult your sales/commercial representative to purchase Core 505XT license 8447-5006 and receive a “unique software key” for each Flex500 controller which then entered into each Flex500 controller’s memory location to enable CSM programs to be started and ran.

Note: The serial number of the target control hardware is required to purchase this license/key.

Run-time license from your Woodward representative; Refer to Woodward product “Application Note 51591 for more information on accessing the 505XT’s CSM programs and related “unique software keys”.

Compressor: Vertex Programs & License: Planned future release.

Gas Turbine: GTC100 & GTC200 Programs & License: Planned future release.

Hydro Turbine: 505HT Programs & License: Planned future release.

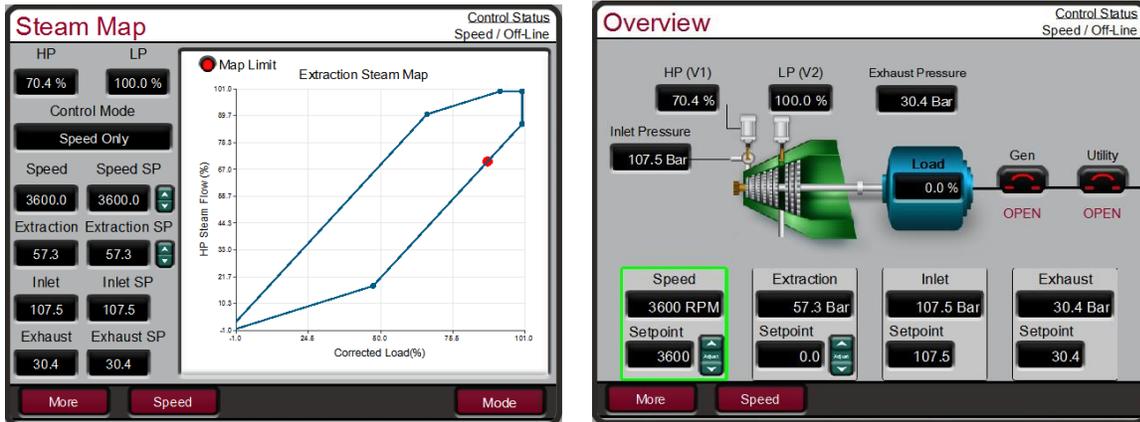


Figure 1. Example 505XT Screens

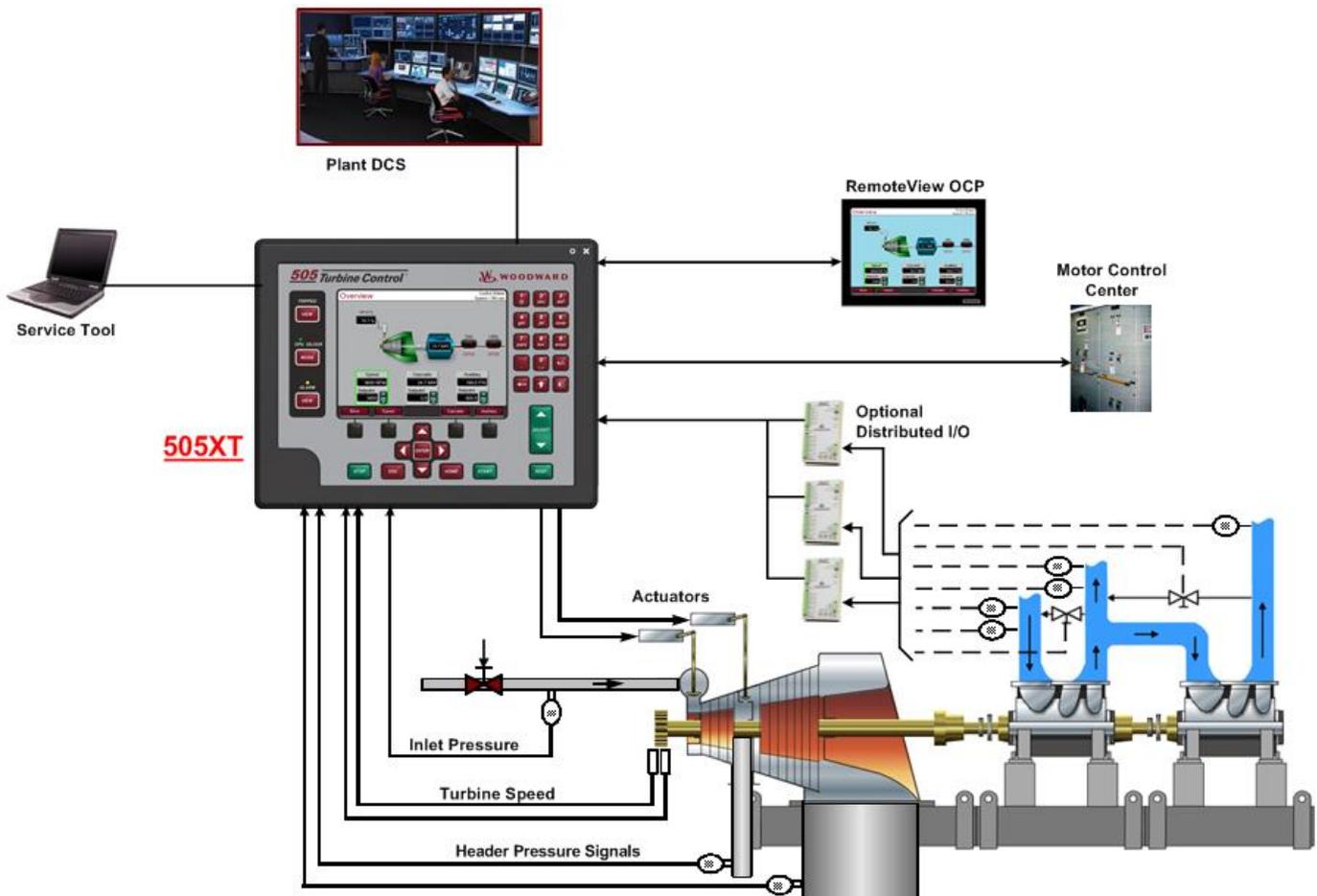


Figure 2. Typical 505XT Application



PO Box 1519, Fort Collins CO 80522-1519, USA
1041 Woodward Way, Fort Collins CO 80524, USA
Phone +1 (970) 482-5811

Email and Website—www.woodward.com

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