

# Control Interface Studio

## Integrated Development Environment

### Applications

Woodward's Control Interface Studio (CIS) is an integrated development environment (IDE) that control engineers or graphical user interface (GUI) developers can use to create custom graphical user interfaces for use on or with Woodward's Flex500 control platform.

Once installed onto a computer this software program allows users rapid development of custom GUI applications, which can be downloaded onto a Woodward control platform or a Windows, based computer or touch panel. These application programs when installed on a Woodward control, computer, or touch panel can be used as an operator control panel or service tool to operate and manage the control's driven equipment (turbine, compressor, engine, etc.).

After a CIS application program has been developed and downloaded onto a Flex500 controller, the controllers front display panel functions like a typical user interface allowing users to operate and monitor all aspects of the control and related equipment. If a CIS application program is downloaded onto a Windows based computer or touch-panel which is connected to a Flex500 controller, Woodward's RemoteView software can then be installed and used enable the device to function like a typical user interface allowing users to operate and monitor all aspects of the control and related equipment.

Woodward's RemoteView software program is a flexible software program that when used with a CIS application program allows the respective computer or touch-panel to function as a remote operator control panel and/or engineering station. Refer to RemoteView product spec 03424 for more information on the viewer, how to obtain the program, and related license.

As the CIS is compatible with Woodward's GAP programming language as well as the Flex500 hardware platform, this is an ideal IDE for programmers to use to quickly and efficiently create graphical user interface programs. The use of a special simulation mode also allows users to run and test both the GUI application program and the control's GAP program from a single computer, greatly improving development efficiency.

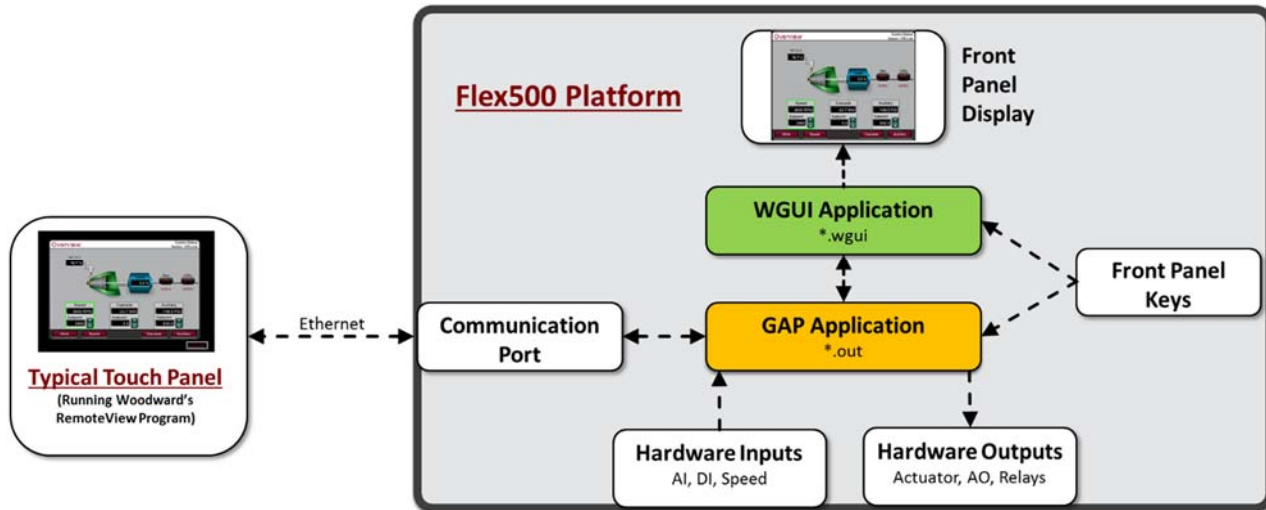
### Description

The CIS is a windows-based software program that can be used to create custom GUI software programs using an intuitive visual editor that can be used on or with Woodward's Flex500 control platform. The CIS includes a special library of Woodward components that can be easily connected to GAP based variables enabling users to easily read and write data to and from the control application.



- Used to Develop:
  - Graphical User Interfaces
  - Engineering Workstation Interfaces
  - Service Tools
- Compatible with Woodward:
  - Flex500 platforms
- Includes Woodward Components Library
  - Allows easy interface to GAP variables
- Design Graphical Screens
- Alarm/Trip Log Screens with Time Tagging
- Real-Time Trending Screens
- Displays Turbine / Compressor Operating Parameters
- Embedded Password Security
- Automatic Screen Selection Based on Control Configuration
- Multilingual Capability
- Remote Terminal Capability

The CIS is made up of two software installation packages. The first is the CIS Kit which provides the IDE for developing GUI applications. The second is the special Woodward CIS Library Kit, which provides platform specific Woodward component libraries and PC simulation tools. The CIS kit can be used to develop GUI applications which run directly on a Flex500 controller's integrated display or on a PC or touch-panel mounted remotely which is connected to the Flex500 or MicroNet controller via an Ethernet link. Once an application is created, it can be run on any Flex500 or Windows-based computer or touch-panel.



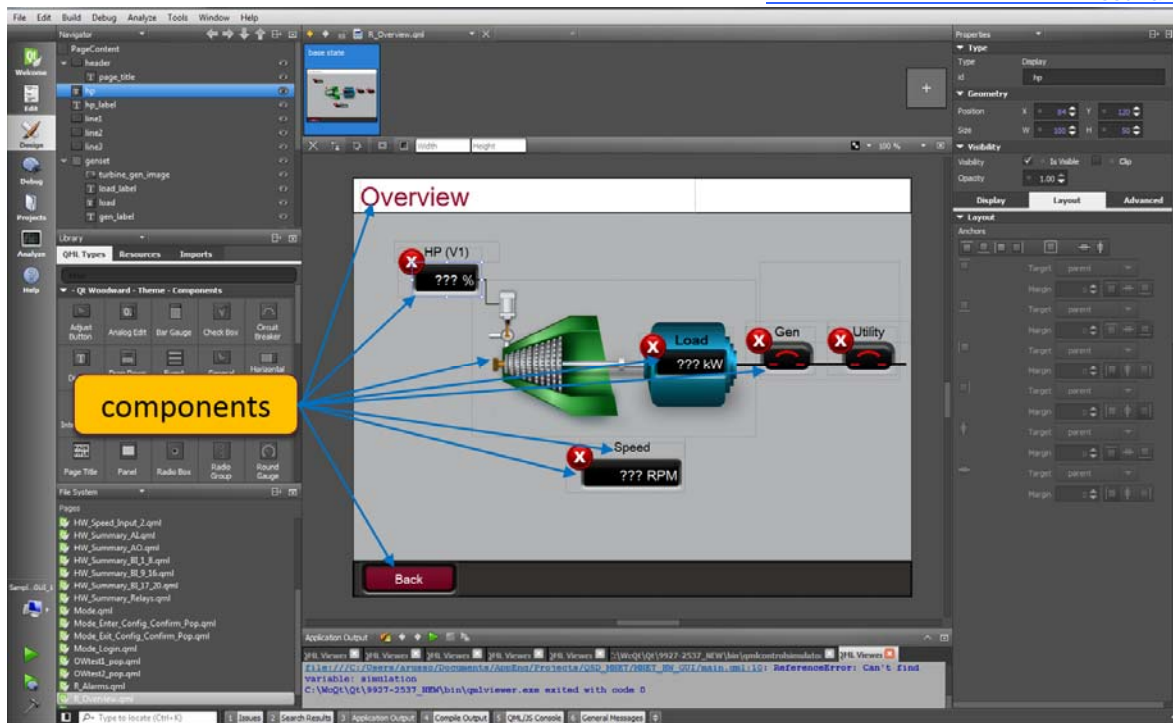
**Figure 1: Flex500 Platform Architecture**

To enable programmers to quickly create Flex500 based CIS application programs, the CIS Install Kit also includes a template GUI application and accompanying template GAP application program designed to be downloaded into a Flex500 platform. These template application programs contain GUI screens and GAP logic for all hardware IO, alarm and trip latches, a sample overview screen, and a sample Real-Time Trend screen. These templates can be used as a starting point for new applications.

Depending on the specific application's requirements different levels of password based security can alternatively be designed into the created GUI application program and related controller. The use of different security levels allows users to protect critical settings & adjustments from users who should not have access to this information, while allowing access to other users who need access to critical settings and controller adjustments.

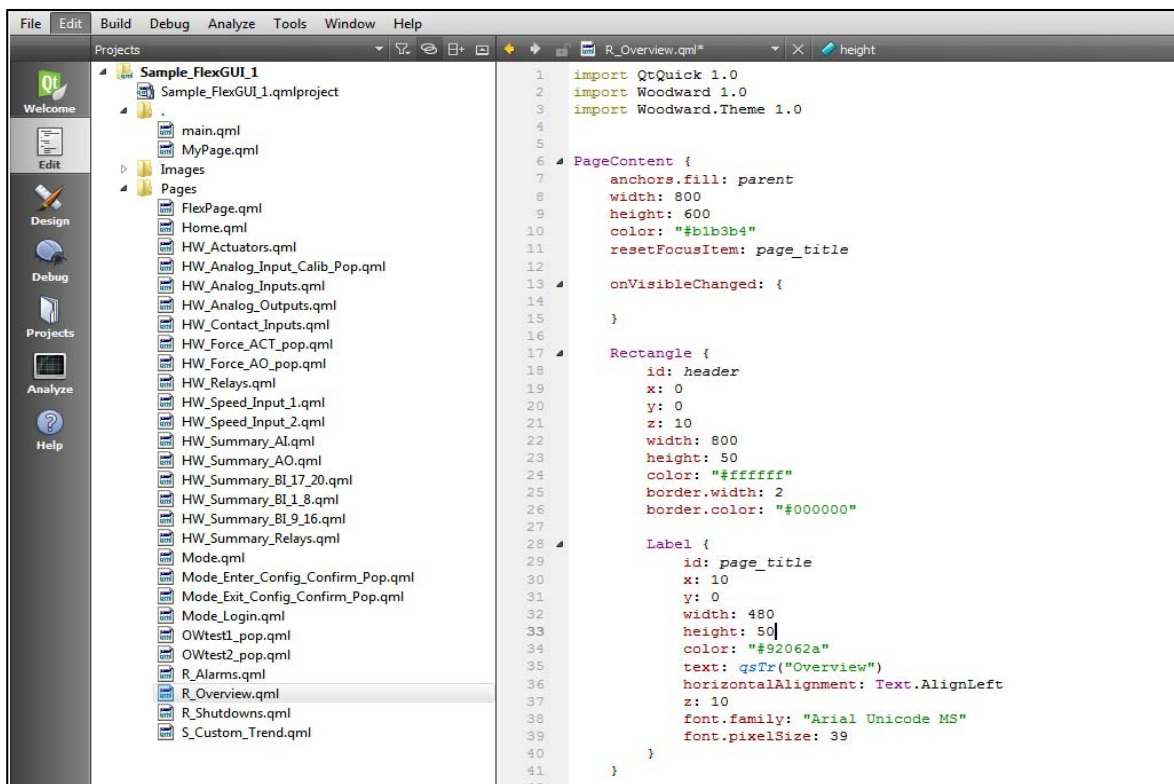
## ***Design Environment***

The CIS has two modes for GUI development. The first is a Design Mode, which provides a visual editor of the pages. In this mode, new components can be dragged-and-dropped onto the page from the Woodward Component Library and positioned on the screen. Individual component properties can be accessed and customized as required by the specific application's requirements within the "Properties panel" section of the Design Mode. Refer to Figure 2 below for an example screen view.



**Figure 2: Example Design Mode Screen**

The second mode of GUI development available to users is the “Edit Mode”. The Edit Mode is a text-based mode where users can directly customize a component’s QML code to set and define the visual properties of components and how they behave. The text-based code within this mode is automatically generated from Design Mode and continuously updates based on changes made in the Design Mode. However, after a certain level of code and script has been automatically created by the Design Mode, the Edit Mode allows users direct access to the components and program’s QML code and JavaScript language providing users with an added level of flexibility and customization. Refer to Figure 4 below for an example screen view.



**Figure 3: Example Edit Mode Screen**

To assist users with verifying program usability and operation the CIS also includes a simulation mode. From within the CIS simulation mode a created GUI application program can be run allowing users to continuously test and verify the related screens and program's functionality during development. Alternatively users can also "virtually connect" the GUI application being tested to a controller's GAP application program running on the same computer with the use of Woodward's NetSim simulation program. This capability to simultaneously run and test both a control's graphical user interface and its associated control logic provides for a very efficient way to develop and verify complete systems.

## Functions

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The CIS allows developers to create GUI applications, which support the following functions:

- **GAP Variable Monitoring:** Available components allow all GAP variables to be displayed in real-time. Refer to below list of available components.
- **GAP Variable Adjustments:** Available components allow adjustment of all GAP variables by a user logged in at the correct security level as specified by the developer. Refer to below list of available components.
- **Alarm and Trip Viewing:** The Event Manager component directly connects to Woodward's GAP based a LATCH\_AE block allowing display of each event, related description, severity level, and time stamp information for all active events
- **Real Time Trending:** The Trend Chart component allows multiple GAP variables to be plotted real-time on time based graph
- **User Interface & Control Security:** Alternatively, access to the GUI screens and the control's settings and adjustments can be managed/protected via the CIS's account management functions. Additionally contained within the CIS install program is an example account management template, which can be leveraged to implement different security levels and control access.
- **Multi-lingual Capability:** Alternatively, CIS based GUI applications can be designed to allow the changing of different languages on the fly without interfering with the control's GAP application. Via the use of QT's Linguist program text strings within a CIS, created GUI application can easily be translated into any language.

## Available Components

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The following components are available with the CIS library for use in creating GUI application programs:

### Text/Drawing/Component Management

- Label
- Item
- Rectangle
- Switchable Panels
- Images

### Tunable Adjustments

- Analog Edit
- Integer Edit
- String Edit
- Checkbox
- Dropdown List
- Radio Group

### User Buttons

- Adjust Button
- General Button
- Toggle Button
- Momentary Button

### Navigation

- Page Navigation Button
- State Navigation Button

### Indicator/GAP Variable Reads

- LED
- Display
- Gauges – Round/Bar
- Progress Bars – Horizontal/Vertical

### Special/Advanced Components

- Event Manager
- Login Box
- Trend Chart
- XY-Chart

## Obtaining, Installing & Licensing the CIS Program

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Step 1: Purchase a CIS license from your Woodward representative

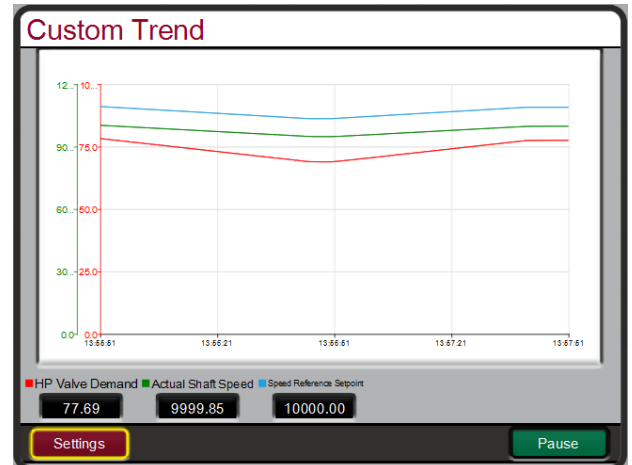
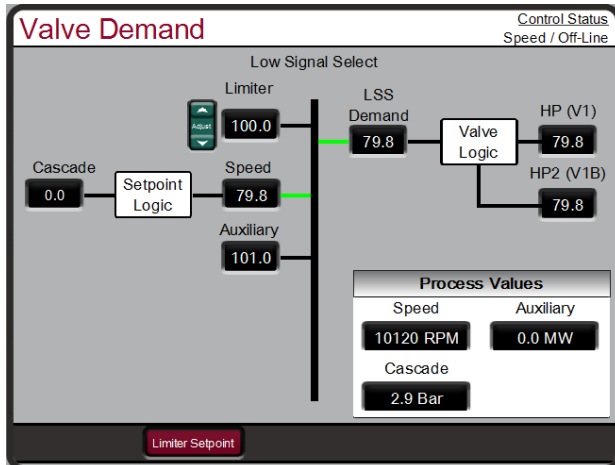
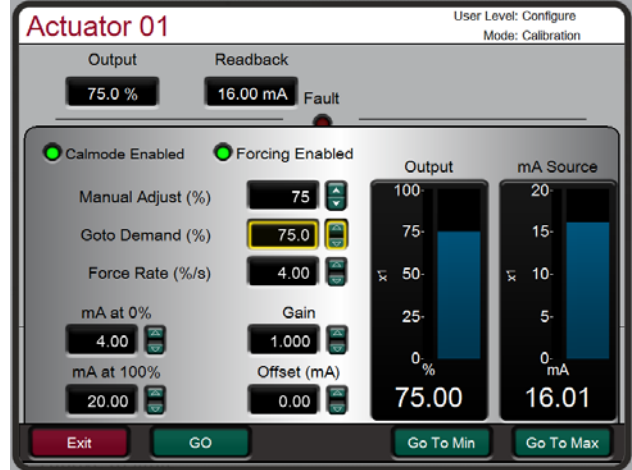
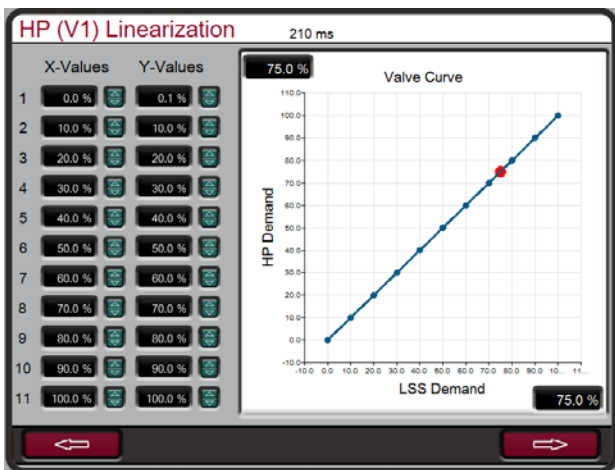
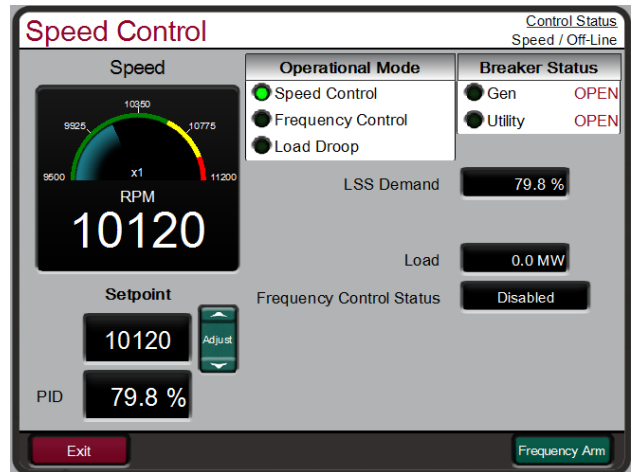
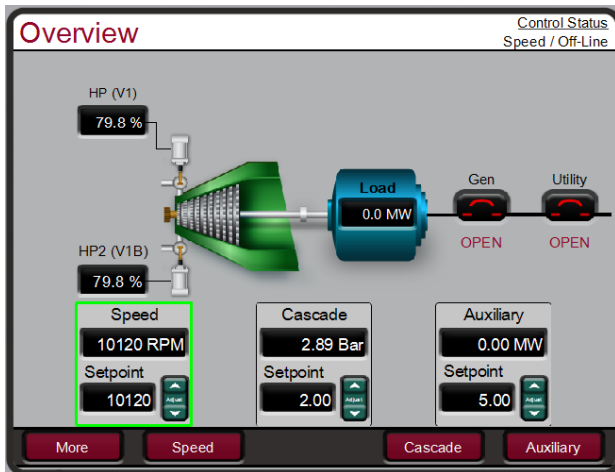
Step 2: upon purchase of a CIS license, the user will receive an email notification of Qt account creation and then 72 hours access to Qt's web portal is given to upload/install Woodward's CIS program and related component library

Step 3: Access Qt's web portal within 72 hours via the provided link (<https://account.qt.io>) and follow the instructions to upload/install the CIS program and related component libraries

## Computer Requirements

CIS installation programs are available for computers running 32-bit or 64-bit version of Windows 7, Windows 8, Windows 8.1, or Windows 10 operating systems.

## Sample Screens





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